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## Revisiting the essence and purpose of regional planning

*A historical analysis of regional questions - going forward?*

Galland, Daniel; Tewdwr-Jones, Mark; Harrison, John

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## ACSP 2021 Annual Conference

*This book includes the abstracts accepted for presentation at the 2021 Annual Conference. This book was completed and posted to [www.acsp.org](http://www.acsp.org) 06/22/21; then updated 7/13/21.*

*Compiled by Camden Miller, PhD Candidate, University at Buffalo, working for the ACSP 2021 Conference.*

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# Track 1 – Analytical Methods, Technology and Society

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### 1.7 PRE-ORGANIZED SESSION - DATA INNOVATION FOR URBAN CHINA RESEARCH

Pre-Organized Session 7 - Summary

Session Includes 291, 292, 293

HARTEN, Julia [University of British Columbia] julia.harten@ubc.ca, organizer

The use of new data sources and urban analytics remains geographically uneven with most of the recent, innovative work focusing on cities in the Global North where quality data is often already available. This pre-organized session aims to highlight the state of the art in a context where data is both abundant and scarce: the contemporary Chinese city. While pervasive cell phone and mobile internet use as well broad adoption of technological advancements and digital innovations produce a plethora of new data at unprecedented scale and speed, representative data available for research is often low-resolution, lagging in time and/ or incomplete. Participants in this session show with their research how data innovation can uncover new knowledge about urban China while at the same time discussing the unique challenges that arise with data innovation within China's socio-political context.

Objectives:

- Learn about innovative data solutions in a Global South context
- Appreciate data challenges in contemporary urban China

### AMENITY, HUMAN CAPITAL, AND THE LABOR MARKET IN SHANGHAI: AN ANALYSIS BASED ON OPEN DATA AND BIG DATA TECHNOLOGY

Abstract ID: 291

Abstract within Pre-Organized Session 7

LI, Han [University of Miami] han.li@miami.edu, presenting author

Human capital theory argues that by attracting skilled workers, urban amenities are increasingly important to the location decisions of firms and to employment agglomeration. However, this hypothesis has been questioned with respect to the direction of causality at the interurban level, the existence of endogeneity, and confusion between revealed and actual preferences of consumers. In this research, to contribute the existing debate over the relationship between amenities and jobs, we develop a new measurement of private service amenities based on the comments about facilities from Dianping.com, and further relate it to labor markets in Shanghai at the intra-urban level. We find that human capital theory and the distribution of amenities can partially explain the employment agglomeration in Shanghai, and their applicability is also influenced by types of amenities and sectors. Private service amenities, such as entertainment, shopping, for-profit healthcare facilities, and restaurants, are largely associated with the employment agglomeration of producer services at the subdistrict-level, which supports human capital theory, while the agglomeration of manufacturing employment is more likely associated with the development of public facilities such as transportation systems. Our study provides an innovative way to examine urban theories in the context of the social data revolution. It also suggests that the Chinese government has to encourage the decentralization of service amenities to overcome the increasing centrality of producer services and the accelerating marginality of manufacturing employment. Based on this study, we further argue that open data and big data technologies can enhance our knowledge of cities from three perspectives: 1) filling research gaps

caused by data gaps and data barriers; 2) providing an opportunity for urban planners and geographers to revisit existing urban theories; 3) propagating new data processing and spatial modeling methods.

#### Citations

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- Li, H., Wei, Y.H.D., Wu, Y., & Tian, G. Analyzing Housing Prices in Shanghai with Open Data: Amenity, Accessibility, and Urban Structure. *Cities*, 91, 165-179.

Key Words: Open Data, Urban China, Urban Amenity

### **BEHAVIORAL AND DISTRIBUTIONAL IMPLICATIONS OF AIR POLLUTION INFORMATION ON URBANITES' OUTDOOR PHYSICAL EXERCISE**

Abstract ID: 292

Abstract within Pre-Organized Session 7

FAN, Yichun [Massachusetts Institute of Technology] ycfan@mit.edu, presenting author  
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Air pollution is one of the most significant public health hazards worldwide. Governments usually advise citizens to reduce outdoor activities when ambient air pollution is high through publicizing air quality index (AQI) and pollution avoidance guidance. Despite the wide adoption of such information policy worldwide, there is limited causal evidence of how urbanites' engagement in outdoor activities changes in response to air pollution, as well as the distributional impacts across socio-economic groups. To fill in this gap, the key research questions asked by this research are: (1) How do people adjust outdoor physical exercise in response to information about ambient air quality? (2) How do the effects vary by socio-economic status and why?

We built a unique panel dataset using 22.4 million outdoor exercise records from smartphone App to track exercise activities of people all over China. The primary data are obtained from KEEP (<https://www.gotokeep.com/>), the most popular exercise App in China, from 2017-01-01 to 2017-12-31. This dataset tracks individuals over time and has rich individual characteristics, including location, age, gender, weight, and exercise history. We coupled this data with hourly meteorological and pollution data from thousands of monitoring stations all over China.

To properly identify causal effects, we develop an instrumental variable (IV) based on daily variation in wind directions and air pollution levels of upwind cities, which is exogenous to local activities. Based on IV analysis, we show that a 10  $\mu\text{g}/\text{m}^3$  increase in ambient PM2.5 concentration reduces the proportion of people doing outdoor exercise by 1.31%. In addition, we use regression discontinuity design (RDD) to test threshold effects and find that people respond to air quality index discontinuous around the "heavy pollution" threshold, suggesting that public pollution information plays a role in guiding avoidance behaviors.

Further results from subgroup analysis show that people in wealthier or better-educated neighborhoods have steeper response elasticity to ambient air pollution in reducing outdoor exercise. Such disparity is enlarged rather than narrowed when city governments issued air pollution alerts in advance. Using a large-scale survey, we find clear evidence that respondents with high income or college degrees have more negative perceptions of air pollution and its health impacts than others. These findings suggest that subjective awareness of pollution impacts can cause a significant disparity in avoidance behavior across socio-economic groups, even when access to objective pollution information is available to all.

This study provides three primary contributions to the existing literature. First, it adds to the literature of pollution avoidance behavior by providing the first large-scale causal evaluation of how urbanites' outdoor physical exercise responds to ambient air pollution. Previous research linking air pollution and physical activity primarily relied on self-reported cross-sectional surveys, which are susceptible to reporting bias and omitted variable biases. Second, this study adds to the emerging literature on environmental justice. Previous literature mainly focuses on the market-driven pollution exposure inequality like housing-price induced residential sorting or differential purchase power for defensive equipment. This paper provides evidence that awareness differences can cause people of lower socio-economic status to take up less zero-cost avoidance behaviors in their day-to-day activities, which should be integrated into policy considerations when balancing between public mitigation and private avoidance efforts. Finally, as physical exercise itself is an important health behavior, this research connects with the literature on the pollution's health impacts by adding an indirect pathway of pollution on health through avoidance behaviors.

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Key Words: air pollution, avoidance behavior, information policy, physical activity, China

#### **WHO GETS FIRST-TIER CITY JOBS AND WAGES? LEVERAGING WECHAT TO UNCOVER WHAT SHAPES ACCESS TO SOCIAL MOBILITY PATHWAYS FOR COLLEGE GRADUATES IN URBAN CHINA**

Abstract ID: 293

Abstract within Pre-Organized Session 7

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Migration and education are generally regarded as the two main strategies for social mobility. For China, a country marked by fast but uneven development, both have been fundamental to its social contract and its national development strategy. The Chinese household registration system hukou, which ties access to government service to place of birth, has been documented to shape both education and migration outcomes. However, the policy promise was that once attained, education would override any barriers related to background and birthplace when entering the job market. But, as more and more people are accessing tertiary education, precarity among some college-educated job market entrants has been growing as well as. Could it be that structural inequalities related to hukou and class are carrying over into labor market access and outcomes of the educated?

This study highlights city size and place of origin (hukou) for explaining differential job market experiences among China's urban young professionals. China groups its cities into tiers with tier 1 cities (Beijing, Shanghai, Guangzhou, and Shenzhen) being the largest and economically most successful with the highest paying jobs. To investigate how education and migration interact for this growing demographic, I draw on data collected via a cell phone social media survey distributed on 'WeChat,' China's largest messaging app with over 1 billion active users. Such online opt-in surveys have gained popularity among urban China researchers because detailed representative data on social issues is often not available, but the use of mobile internet and WeChat is pervasive. Repackaging a life history approach to ask about demographics, educational profiles, as well as employment and housing trajectories, my

survey instrument reached more than 25,000 respondents from cities all across China. To improve representativeness, I developed a scheme of iterative releases and what I call 'multi-pronged snowballing.' Prior to analyzing data, I also employed iterative proportional fitting (raking).

Using subpopulation and logistic regression analysis, I find that working in a tier 1 city more than having a degree from an elite university increases the odds of higher real income. Labor economists had previously stressed the role of educational quality in explaining horizontal stratification in returns to education. Adding a spatial lens, however, shows the central role of city size, in line with what the urban wage premium and human capital externalities literatures have documented for "the West." Importantly, further analysis shows that hukou more than elite education explains who works in tier 1 cities. Among those with first jobs in tier 1 cities, the number of tier 1 city hukou holders is 12 times that of non-tier 1 city hukou holders and the difference is statistically significant. Jointly, these results suggest that accessing the labor markets in China's superstar cities matters, but that this access is highly structured by place of origin. The findings add a new perspective to our understanding of social mobility and contemporary inequality in urban China.

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Key Words: WeChat Opt-in Online Surveys, Raking, Urban China, Social Mobility

### **1.16 PRE-ORGANIZED SESSION - PLANNING AND THE PANDEMIC: REFLECTING ON PHYSICALLY DISTANT PARTICIPATORY PLANNING**

Pre-Organized Session 16 - Summary  
Session Includes 841, 842, 843, 844

MILZ, Dan [University of Hawaii] [dmlz@hawaii.edu](mailto:dmlz@hawaii.edu), organizer

The Covid-19 Pandemic induced a wholesale shift to hosting public meetings online. This transition was made possible by the availability of reliable video conferencing platforms and other synchronous online participatory technologies (Afzalan & Muller 2018, Milz & Gervich 2021). Despite limited practical experience, planners took part in a global field test of these tools, adapting their processes and practices on-the-fly. Some of the more colorful experiences have been covered in the popular media, but this pre-organized session seeks to go beyond superficial anecdotes to offer researchers and practitioners a chance to reflect on our collective experience engaging the community digitally. In this session, we would like to explore a wide range of questions that focus, empirically, on how planners used OPT to continue hosting public meetings, workshops, charrettes, etc. during the pandemic. We'd like to talk about our experience with those activities and tools, and we'd like to talk about how this experience may or may not impact planning practice in the future.

#### Objectives:

- Document the use of synchronous online participatory technologies

- Describe how planners have adopted to conducting participatory planning online
- Discuss the future of participatory planning and online participatory technologies

## **FACILITATING VIRTUAL PARTICIPATORY PLANNING MEETINGS**

Abstract ID: 841

Abstract within Pre-Organized Session 16

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Internet-based video conferencing technologies have been available for at least a decade, yet have not been widely used for the purposes of conducting participatory planning processes (Milz & Gervich 2021). Despite their growing use and popularity for garden-variety business meetings, planners and other “process managers” have preferred instead to convene public meetings face-to-face. In the past, many communities may have live streamed or broadcast public meetings, but participation was almost always limited to in-person interactions. Online participatory technologies, where they have been used and studied, traditionally refer to asynchronous, distributed tools that can support but not replace face-to-face community engagement meetings (Afzalan & Muller 2018; Conroy & Evans-Cowley 2006). However, the COVID-19 Pandemic prompted a nearly universal and immediate adoption of video conferencing technologies for hosting and facilitating meetings with the public, synchronously and remotely. Planners were tasked with developing and implementing online meetings with little practical experience or guidance from the peer-reviewed literature. This paper describes how some planners navigated this transition.

During the summer and early fall 2020, we interviewed over thirty professional planners and facilitators. We asked them to tell us about their experiences convening face-to-face meetings and to describe how they have adapted their practices to virtual participatory planning meetings. The one-hour interviews were transcribed, verbatim, and coded inductively to identify topics and themes from across all the interviews. Findings from our interviews speak to both the strengths and weaknesses of the transition to online civic engagement. For example, our findings demonstrate the relatively seamless transition experienced by the professionals to whom we spoke, while also referring to initial obstacles or missteps. In terms of the technology, the interviewees noted that, despite the popular obsession with “Zoom,” they built a toolkit of applications and then used them in different combinations to meet the varying needs of unique clients/communities. Nevertheless, respondents struggled to adjust to the impersonal nature of video conferencing, reflecting on the loss of important communication signals like body language (Walther 2011). In many cases, our interviewees noted that virtual meetings were poor facsimiles for face-to-face public meetings. Our findings also reaffirm concerns about the digital divide and equitable access that have been particularly salient during the pandemic. Our paper addresses an important and previously overlooked aspect of how technology can play a role in participatory planning, and we discuss the theoretical and practical implications of our work.

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Key Words: Facilitation, Online Participatory Technologies, Participatory Planning, COVID-19 Pandemic, Online Meetings

## **PROPS AND PERFORMANCE: HOW VIRTUAL PARTICIPATORY PLANNING TRANSFORMS RITUALS AND SYMBOLS IN COMMUNITY ENGAGEMENT**

Abstract ID: 842

Abstract within Pre-Organized Session 16

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Rituals are common features of participatory planning workshops. Filling out name badges, sharing snacks or coffee, participating in icebreaker activities, jotting ideas on sticky notes, and similar activities are all common performative elements of public engagement meetings. Planning meetings also often include objects that carry symbolic purposes and meanings. Flip charts, lecterns and maps, among other objects, provide signals that help planners and participants interpret and create meaning as they experience a planning event. The body of research regarding rituals and symbols in the public sector often views these elements as tools for reinforcing roles and responsibilities, emphasizing power dynamics, creating shared meaning among groups, and constructing norms of interaction among participants (Kertzer, 1988; McComas, Besely and Black, 2009). Durkheim (1912), for instance, saw rituals as a way to reaffirm the moral consensus of citizens within a community, as communities in the early 20th century underwent rapid growth, expansion and diversification (McComas, Besely and Black, 2009). Forester (1997) emphasized the role of ritual in helping participants in planning processes make judgements about development opportunities. And, Innes and Booher (1999) explored one common ritual used in planning engagement: role-playing simulations.

Planners depend on rituals and symbols to facilitate public input, decision making, and plan making. Yet, many of the objects and ritualistic elements planners draw upon are invisible or nonexistent when planning moves online, as it did in March, 2020 due to the COVID-19 pandemic. This research begins from the premise that Synchronous Online Participatory Technologies, such as Zoom and GoToMeeting, significantly alter the dynamics of interactions in planning meetings (Milz and Gervich, 2020), and may, consequently, alter planning outcomes. This paper explores the roles of rituals and symbolic artifacts in planning processes and the changes that take place when these elements are no longer visible or usable. We ask: how are online planning processes and outcomes altered by the loss or transformation of common planning-related rituals and symbols?

This work draws from two data sources: interviews with 30+ planning professionals that are facilitating online meetings during the pandemic, and; a case study of planning processes in Plattsburgh, NY. Using grounded theory, we seek to understand how remote meeting technology alters the common rituals and symbols of participatory planning events, and the impacts of these changes on participant interactions and meeting outcomes. Specifically, we explore shifting roles and responsibilities; power dynamics; patterns of communication; and the development of trust. Ultimately, we aim to observe whether altered rituals and symbols influence the decisions and other outcomes of planning engagements. This paper will provide an overview of the literature on rituals and symbols in urban, regional and environmental planning. We will provide an overview of the case studies and interviews at the heart of the research. We will also provide conclusions from our empirical analysis and recommendations for planners seeking to continue using virtual platforms to engage their stakeholders.

It is very likely that virtual community engagement will remain a component of planners' work when the immediate



risks of the COVID-19 pandemic are reduced. New rituals and symbols may evolve for this medium, and planners may learn to adapt the common elements of face-to-face engagements to this virtual space. Yet, if the dynamics of online and in-person events are varied enough that they frequently yield different outcomes, planners will need to reconcile these two tracks of engagement.

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Key Words: Online Participatory Planning, Community Engagement, Rituals, Symbols, COVID-19 Pandemic

#### **PRACTICING PLANNERS' REFLECTION ON INCLUSIVE PARTICIPATION DURING COVID-19: NEURODIVERGENCE AND ACCOMMODATION**

Abstract ID: 843

Abstract within Pre-Organized Session 16

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Global pandemic has radically changed the course of participation and decision-making process: society has turned to online technologies to continue to conduct meetings where the digital divide and community engagement for meaningful participation becomes challenging. People with different abilities (e.g.: visual, sensory, hearing, neurodivergent, ADHD) and needs communicate and engage in different ways. Planners apply different sets of tools of engagement depending on the end goal, and, while the disability community is increasing, planners have yet to fully and meaningfully engage people with different abilities (PWDA). Meeting ADA accommodations shouldn't be an afterthought that causes angst. Planners are exposed to different tools and approaches based on common needs that are universal technology engagement practices that can be applied both online and as we pivot toward in-person community meetings and systematic inclusivity.

People with disabilities are not purposefully engaged in community meetings and are marginalized from participating for various reasons (e.g., lack of expertise, budget, training, transportation, time, etc.), but, through online platforms, opportunities are emerging to include/engage through universal technology engagement practices we have tested, implemented and incorporated into increasing inclusivity.

This research paper is based on the findings from semi-structured interviews of 31 practicing planners conducted during pandemic (August-November 2020). Planners reflected on peculiarities of public engagement during COVID-19, what 'inclusive participation' means to them, and how they think about neurodiversity and disability in terms of engagement. Several planners identified themselves as being neurodivergent, and/or having relatives who are neurodivergent.

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Key Words: inclusive decision-making, planning process, neurodiversity, sensory needs, accommodation

## ONLINE CIVIC ENGAGEMENT AND THE ANTECEDENTS OF TRUST DURING THE COVID-19 PANDEMIC

Abstract ID: 844

Abstract within Pre-Organized Session 16

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Covid-19 precipitated numerous changes in civil society, including participatory planning processes. Planners across the county amended their practices in order to convene public meetings remotely via video conferencing or live streaming (Milz & Gervich 2021). Developing trust is a crucial goal for participatory planning and consensus building (Coleman & Stern 2018), yet because very little research has explored the use of online participatory technologies for conducting public meetings, it has even less to say about how these tools support or inhibit the development of trust between planners and the public. Because trust is critical for successful governance and democracy (Innes & Booher 2000), it is important to understand the ways in which online civic engagement engenders trust or activates distrust. Therefore, the goal of this work is to understand how these changes have affected the creation and maintenance of certain forms of trust in online meetings.

Between June and October 2020, we interviewed thirty-two facilitators, planners, and other dispute resolution specialists to ascertain how professional process designers and meeting managers are handling transition to online public engagement. Through qualitative analysis, we explore how trust is engendered in this online context. Overall, we found that our interviewees were skeptical of their ability to build trust in online meetings. They prefer instead the intimate, interpersonal interactions that only occur in face-to-face settings. In spite of this preference, many respondents identified different approaches they had adopted to maintain and/or build trust while meeting remotely. This research will extend existing theory about trust and public participation, and will additionally offer useful guidance for professionals designing and running online meetings.

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Key Words: Public participation, Trust, COVID-19

#### **1.47 PRE-ORGANIZED SESSION - PARTICIPATORY PLANNING IN EXTENDED REALITY**

Pre-Organized Session 47 - Summary

Session Includes 388, 389, 390, 391, 392

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As our social interactions are gradually extending to the virtual world, the essence of planning and placemaking process is also shifting to a hybrid model of physical and virtual decision-making process. Therefore, a consideration for the future of planning is the integration of technologies such as Extended Reality (XR) in the urban design and planning practice. XR includes Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). The use of immersive technologies like VR, AR, and MR allows for users to experience what a development proposal may look or feel like. XR can be used as a tool for planners, and community members to communicate their perspectives on a design and planning proposal. However, all forms of XR require a certain level of technical competence and resources. Thus, the integration of this technology into the planning process should focus on inclusivity and access of all potential users and participants. In this session, we explore a range of research questions, related to the applications of XR, from technical to professional perspectives.

Objectives:

- Learn from the best practices in the implementation of XR throughout the design process of participatory planning, from initial ideation phase to community engagement efforts.
- Understand the technical and ethical opportunities and limitations of XR in participatory planning.
- Learn how to expand the inclusivity of XR in terms of digital literacy and access in both academic and professional settings

#### **INTEGRATING VIRTUAL REALITY IN THE URBAN DESIGN PROCESS**

Abstract ID: 388

Abstract within Pre-Organized Session 47

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With the growing industry of extended reality (XR), we can expect XR to become more intertwined with urban planning and design, whether that means engaging public with the design scenarios, or understanding how potential designs can interact with a current space (Jamei et al, 2017). Thinking critically about the users/participants, and those who are involved in the creation and presentation of Extended Reality (XR) and have access to associated hard-ware and software technologies, will be crucial to understanding XR technology's capabilities and limitations for its application in planning (Çöltekin et al., 2020). The focus of this research is on Virtual Reality (VR), and not the other forms of XR that encompasses Augmented Reality and Mixed Reality.

In recent years, a number of applications have been released that allows creating and porting digital models directly to VR without the need for game engines such as Unity. This is a game changer for participatory planning and design, due to the simplification of the VR implementation and minimizing project costs. This opportunity opens new frontiers for creativity in disciplines such as urban planning that traditionally were less accustomed to advanced visualization tools in comparison with Architecture or Landscape Architecture. With appropriate plugins and apps, modeling applications such as SketchUp and CityEngine, and mapping applications such as ArcGIS can be used to recreate a space in virtual reality, incorporating real-life elements (Meenar & Kitson, 2020).

In this research a number of VR applications have been evaluated to test their use in the urban design process, from ideation phase, to public communication, and final presentation. A new workflow of design process has been conceptualized to use a selected number of VR apps at different stages of planning and design. The proposed workflow is applied in the zoning and urban design project of a commercial corridor in the City of Gilroy, California, as part of an academic urban design Studio.

The selected apps have been applied in five stages of the urban design process: 1- Interact in VR with partners to organize information, 2- View conceptual models in VR, 3- Edit models in VR collaboratively, 4- Engage public by presenting multiple design scenarios in VR, 5- Present the final design in VR. The VR creators and participants' experiences are compared with the control group's experiences that were involved with the same project without the application of VR throughout the planning and design process. The benefits and limitations of VR at each stage are discussed and a set of recommendations for participatory planning using Virtual Reality are suggested.

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Key Words: Virtual Reality, Participatory planning, Urban Design

#### **UNDERSTANDING CITY IMAGEABILITY IN A MULTI-SENSORY AND MULTI-DIMENSIONAL IMMERSIVE VIRTUAL REALITY ENVIRONMENT**

Abstract ID: 389

Abstract within Pre-Organized Session 47

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Lynchian city imageability analysis and its affect in urban planning and design processes have been widely presented in the planning literature. City imageability is the quality of the city elements (e.g., nodes, paths, edges, landmarks, and districts) that trigger lucid images in an observer (Lynch, 1960). Lynchian techniques can be useful for planners and urban designers to understand public images of a city, create memorable and legible places, and advance people's sense of attachment to places. Lynch used mental mapping technique, which represents people's mental constructs, perceptions, or processes of geographical settings, as well as the tangible map products (e.g., sketch showing a rapid description of the city) they create (Lynch, 1960; Curtis 2016). Following Lynchian methodology, practitioners have explored city imageability mostly through field observations. A recent study has explored the role of digital technology, such as virtual mapping environments, in assisting planners conduct city imageability analysis and identify city elements (Meenar et al., 2019). The literature, however, is limited in identifying people's perception of city elements by using other types of technology such as Virtual Reality (VR).

A major aspect of VR technology is the degree of immersiveness of a simulation, exploring how much it can engage the mind and body of participants through visuals, sound, and/or touch (Isar, 2018). Research has shown that the planning and design process can be benefitted by the use of VR technology in several ways. It can increase public understanding of a development scenario; increase the volume, quality, and diversity of public participation and feedback; and offer an almost-real immersive environment by adding sensory stimuli to VR.

The purpose of this research was to explore how people understand city imageability using a multi-sensory and

multi-dimensional immersive virtual reality (IVR) environment. In this paper, I address two research questions: (1) how do people perceive Lynchian city elements by experiencing an IVR simulation of a future redevelopment scenario? (2) how does this perception vary when people are only exposed to standard presentation formats of the same scenario?

This paper is based on a follow-up study of an original project conducted in Glassboro, a historic small town in southern New Jersey, in 2018. As part of the original project, a redevelopment scenario was created for a few blocks in the downtown area and IVR simulations were created using Google Earth, Google SketchUp, Maya, and Unity software, in partnership with the Virtual Reality Center of Rowan University, NJ (Meenar & Kitson, 2000). Four focus groups were recruited in that study to do various activities. Among them, 20 participants experienced multi-sensory and multi-dimensional IVR simulation, while another 10 participants reviewed the scenario using standard presentation formats (e.g., plans, perspectives, and drive through/walk-through video of a 3D model). In this follow-up study, additional 10 people were recruited to review standard presentations. This paper is based on inputs from these 40 participants. In both stages, mental mapping technique was used to experiment how participants observed and understood Lynchian city elements of the redevelopment scenario.

A qualitative content analysis of 40 mental maps (sketches), memory recalls, and follow-up conversations revealed interesting findings. Overall, people who experienced IVR simulations, coupled with multi-sensory and multi-dimensional prompts, were able to identify more city elements and create more detailed mental maps. Participants explained how they were able to perceive and recall certain elements. However, several factors acted as barriers to their perception or interpretation process, including people's familiarity with VR technology; levels of physical and mental comfort with the technology; and levels of understanding the redevelopment scenario itself. The paper concludes with major takeaways for planning practice and research.

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Key Words: Immersive Virtual Reality, Mental Mapping, City Imageability

#### TRANSFORMING CITY OF CHARLOTTE WITH IMMERSIVE VISUAL DATA

Abstract ID: 390

Abstract within Pre-Organized Session 47

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Scenario planning that uses geographic information mapping to enable data input/analysis and facilitate communications has been frequently used in regional land use and transportation planning projects. Charlotte's current city-wide comprehensive planning project, Charlotte Future 2040, uses scenario planning as a tool to develop alternative plans for comparisons and dialogues. Conventional scenario planning relies on digital mapping software to provide contextual information and enable "painting" on digital maps to design a range of future development scenarios. This approach often leaves much information unexplored as 2D mediums may seem

confusing to participants who are not capable of reading and interpreting maps with mostly graphical symbols or 2D graphs. It does not offer real-time 3D visualizations nor allow for multi-user interactions.

In this presentation, we introduce the “Transforming City of Charlotte with Immersive Visual Data” project, funded by John S. and James L. Knight Foundation’s Smart Cities initiative to foster public participation through Extended Reality (XR) technologies. For this project, we develop an XR platform to assist in two critical scenario planning activities, including (a) using 3D visual data and immersive visual effects to reveal and communicate planning intentions and development goals and (b) engaging stakeholders and community members in meaningful decision-making roles. Our platform, which can be used in desktop computers, handheld devices, and head-mounted displays, will leverage XR technologies, geospatial data analytics, and scenario-based methods to create a new user interface to support these two critical community outreach activities for the on-going Charlotte Future 2040 Comprehensive Plan. This project is carried out by a collaborative partnership from university partners at UNC Charlotte, NC State University, local community leaders, app development consultants, and the City of Charlotte’s Planning, Design, and Development Department.

All citizens who are concerned with the future of Charlotte are the main audience of this project and we envision that the XR platform will be widely available to the public. Whoever wanting to be a part of Charlotte Future 2040 can use the XR platform to learn about how it may (re)shape the physical fabric of their neighborhoods, see the future urban form via this immersive experience offered by the platform, and in turn share their ideas with the staff in Charlotte Planning, Design, and Development. We have identified three use cases for the XR platform to be used at home, in the meeting venue, and outdoor. We are currently focusing on content production, including 3D immersive experiences for building types representing possible future development scenarios in Charlotte Future 2040 for the proposed use cases. Our team is working with local developers and a leading XR technologies provider to use their flagship immersive solution to build our XR platform. We have also developed a workflow of content production that enables us to generate immersive experiences with the most recent industry-level standards. In the next phase of the project, a pilot study with volunteer residents from several neighborhoods across Charlotte will be held to test the XR platform capabilities in providing immersive experiences for alternative development scenarios as proposed by Charlotte Future 2040. Information from these meetings will provide important insights to refine the platform, eventually made available to all Charlotteans to empower them to play active roles in Charlotte Future 2040.

The formal adoption of the Charlotte Future 2040 Comprehensive Plan by the City Council will only signal a new beginning of yet another round of planning efforts. The XR platform will continue to function in the next round of planning activities as a tool to assist in visualizing, collecting, and analyzing data at the neighborhood scale with a goal of revising city-wide unified development ordinance in mid-2022.

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Key Words: Extended Reality, Scenario Planning, Public Participation, Immersive Technologies, Visual Data

## **A MOBILE AUGMENTED REALITY PLATFORM FOR COMMUNITY ENGAGEMENT**

Abstract ID: 391

Abstract within Pre-Organized Session 47

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Socio-ecological models and human-scaled urban design approaches assert the influence of the built environment on physical activity and how improving built environment features, such as sidewalks, may enhance physical activity. However, many racial/ethnic and low-socioeconomic status communities have limited access to environments that encourage physical activity, causing a myriad of health and environmental discrepancies. Engaging communities may mitigate such disparities by incorporating residents' knowledge in decision-making and well-being promotion. The emergence of digital participatory planning methods, such as public participatory GIS (PPGIS), has created new opportunities to improve community engagement by fostering active citizen-government communications, saving participants' time, and reducing engagement costs. Despite these benefits, more improvements are needed to make current digital participation methods more intuitive for novice users and more capable for two-way communications between residents and decision-makers.

This presentation introduces a novel participatory platform that integrates mobile augmented reality (AR) into community engagement. AR blends real and virtual worlds by superimposing digital content on the real world. Mobile AR combines AR with smartphones' wireless communication and location-based services and enables users to point their smartphones to objects in their surrounding area and let the device augment digital information onto the environment. The ubiquity of smartphones makes them powerful tools to collect and share user-generated content and accelerate concurrent interactions of stakeholders and decision-makers. MAR has shown promise in visualizing designs at their final locations, resulting in enhancing the understanding of future designs for lay citizens, especially when it is used outdoors. The AR platform goes beyond current participatory planning methods by offering a visually intuitive tool for more effective participation, particularly among disadvantaged populations. Besides enabling community members to provide data to decision-makers, the AR platform facilitates presenting design scenarios developed by decision-makers to the community, enhancing two-way communications between residents and decision-makers.

The AR platform has three components: a mobile AR app called CommunitAR, a mapping service to visualize geo-tagged data generated through CommunitAR in real-time, and a cloud database to handle such data. CommunitAR is the core of the AR platform and consists of two main modes, COM and VIZ. In the COM mode, users can select an array of street features, place them in the environment, and manipulate their scale and placement instantly. Users can also capture screenshots of scenes and share them with their comments on social media. The VIZ mode enables users to visualize the entire design(s) in the corresponding location(s), vote on their preferred design(s), indicate the reasons for their selections, and share them with fellow residents and decision-makers.

We established a partnership with a group of communities of color in Charlotte, NC, with inequitable access to streetscape features important in improving physical activity. We implemented the AR platform through a series of participatory activities and evaluated its participatory aspects by comparing it to a conventional participatory method using printed maps. Our findings suggest that the AR platform is a valuable addition to current participatory planning methods. It provides an intuitive way to interact with the surrounding environment, visualize future designs at their actual locations, and enhance users' understanding of designs in situ. It also makes the community engagement inclusive by providing the opportunity for participation to those who are not able or not willing to engage otherwise. A broad range of qualitative and quantitative data collected from community members made the findings rich and uniquely useful in understanding residents' needs to improve neighborhood conditions, utilizing a novel digital participation method. The AR platform can be used in any participatory planning effort related to the

built environment, such as new housing projects, public plazas and parks redevelopments, and master planning.

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Key Words: Digital Participation, Community Engagement, Mobile Augmented Reality, Physical Activity, Disadvantaged Communities

#### EFFECTIVE AND ETHICAL EXTENDED REALITY FOR PARTICIPATORY PLANNING - THE CURRENT STATE OF PLAY

Abstract ID: 392

Abstract within Pre-Organized Session 47

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Twenty years ago, Stephen R.J. Sheppard called on the "crystal ball gazers" who were preparing three-dimensional views into the future using emergent visualization technology to pay mind to the power of these new tools to influence decisions (Sheppard, 2001). Visualizations of planned urban and environmental change have long been touted for their capacity to improve public access to and understanding of planning projects. More specifically, visualizations can convey more powerfully than two-dimensional plans the aesthetic, emotional and experiential qualities that the public associate with their environment and can help predict community reactions to planned environmental change (Sheppard, 1989). Despite these benefits, planning academics and practitioners have pointed to the potential of visualizations (either deliberately or inadvertently) to provoke uncertainty and confusion or, at worst, bias planning decisions. They have called for the use of professionally recognized standards and codes of ethics to ensure that visualizations are "effective" or, in other words, capable of facilitating the process of information exchange that is essential to participatory planning (Downes & Lange, 2015; Groulx & Lewis, 2019).

The implications for visualization use in participatory decision-making in planning practice remain significant, particularly as these increasingly powerful technologies become more immersive, interactive, and accessible, from a usability perspective, to any planner or urban design practitioner. However, the technical thrust that has conventionally driven visualization development and practice has contributed to concerns that developments in Extended Reality (XR) in particular are outpacing our understanding of how to use the technology effectively and the extent to which it can bias interpretations of planning proposals. This presentation serves as a timely reminder of the potential of immersive visualization technologies to support better decisions, and the implications for their misuse. We revive the evaluative framework proposed by Sheppard by examining its relevance to current XR use in planning and urban design practice. Through an environmental scan of the state of current practice that looks at contemporary use of XR technology in participatory planning and urban design across North America, we build the case for the continued application of ethical principles in the use of immersive and interactive visualizations. More specifically, we ask whether Sheppard's general principles of effective visualization communication, including



accuracy, representativeness, visual clarity, interest, legitimacy, and access, as well as his proposed code of ethical conduct can inform the ethical use of XR technology in planning practice. In addition, we ask whether the principles developed by Sheppard and used by planning and design practitioners ought to be refined to reflect the immersive and interactive capabilities of XR technology.

We find amidst the explosive growth in the power of XR technologies, and what we anticipate is coming over the next decade, that asking these critical questions is all the more vital. We reflect on our own project-based experiences in applied research and professional practice with XR technologies as well as findings from our state of play environmental scan to conclude that the XR technology cart may be leading the participatory horse. Planners need to think carefully about how to use these new and powerful visualization technologies ethically by incorporating well-established effective visualization principles in assessing and deploying new technologies for participatory process.

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Key Words: extended reality, participatory planning, digital engagement, visualization, ethics

## **ROUNDTABLES**

### **1.123 ROUNDTABLE - EXPLORING NONLINEAR RELATIONSHIPS WITH MACHINE LEARNING**

Abstract ID: 123

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Statistical modeling has been widely used in travel behavior research. Previous studies often assume that independent variables have a pre-defined (e.g., linear, log-linear, quadratic, and generalized linear) relationship with travel behavior. Although generalized linear models enable scholars to illustrate nonlinear relationships between variables, these models impose certain assumptions that may not reflect the true relationships between variables.

Recently, some studies have employed machine learning algorithms and advanced analytical approaches (e.g., random forest, gradient boosting decision tree, as well as generalized additive models) to predict nonlinear relationships between variables (Sabouri, Brewer, and Ewing 2020, Wang and Ozbilen 2020, Xu et al. 2021, Hu et al. 2018, Tao et al. 2020). These studies show that nonlinear relationships are prevalent in travel behavior research, and that the patterns of nonlinearity vary by variable. The nature of the irregular nonlinearity renders traditional methods that model nonlinear relationships inefficient. Furthermore, these advanced methods enable researchers

to relax restrictive assumptions and illustrate the relationships between variables more robustly than before. Some of the recent findings also challenge the conventional understanding of travel behavior and provide nuanced implications for planning practice.

As the number of nonlinear studies grows to a couple dozen, it is time to summarize the progress that has been made and to consider future development of this niche area. In this roundtable, four pioneer scholars will discuss the pros and cons of different approaches in addressing the irregular nonlinearity, novel findings compared to traditional methods, planning implications of the new findings, and caveats related to the recent development. We expect that this roundtable will enable planning scholars to have a better understanding of the nonlinear issue and adopt these approaches in their research, no matter whether it is about travel behavior or any other planning topics.

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Key Words: Nonlinear effect, threshold, GAM, machine learning

### 1.1040 ROUNDTABLE - AI IN PLANNING

Abstract ID: 1040

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In recent years, artificial intelligence (AI) methods have been widely used for urban informatics and computing, spurring novel thoughts for data-driven urban theories, planning, and decision-making. The movement towards smart/intelligent systems, which is closely related to progress in research areas such as control and automation systems, also creates new challenges to the economic, social, cultural, legal, and environmental systems in today's urban landscape. On the one hand, AI technologies present an unprecedented potential to the developments of smart cities, particularly the design, planning, simulation, and visualization of neighborhoods and cities. On the other hand, technological advances have brought up new challenges and opportunities about both theories, practices, and education on urban and regional planning. This is an opportune time to explore how AI should function and thrive in the context of planning, and vice versa, through a roundtable discussion of planning researchers.

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Key Words: smart cities, artificial intelligence, visual analytics, geographic information system, urban informatics

## **INDIVIDUAL PAPER SUBMISSIONS**

### **THE PROSPECTS FOR ARTIFICIAL INTELLIGENCE IN URBAN PLANNING**

Abstract ID: 18

Individual Paper Submission

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Since the late 1960s, urban planning has encountered a variety of advanced analysis methods with greater and lesser degrees of adoption. Geographic Information Systems (GIS) is probably the most notable, with others such as database management systems (DBMS), decision support systems (DSS), planning support systems (PSS) and expert systems (ES), having mixed levels of recognition and acceptance (Han and Kim, 1989; Pettit et al, 2018). The adoption of GIS, some will argue, has been primarily related to its cartographic capabilities and less so for sophisticated spatial analysis techniques. More recently there has been a re-emergence of artificial intelligence (AI) related methods. Applications of AI have been rapidly increasing, especially with respect to consumer goods and services. Amazon, Netflix, Google, and other companies have invested significant sums in these technologies to gain insights on consumer characteristics as well as improve supply chains and distribution. This paper reviews the literature (1960s to current) on AI-related methods to assess how language and perspectives have changed over time relative urban planning applications. Several interviews with urban planning methods experts were also conducted to add further nuance to the discussion and identification of the primary challenges involved. Increased data availability, increased processing speeds, and increased accessibility to AI methods have the potential to reconnect with urban planning processes and decision-making. But will it be different this time? The paper also draws on Lee's assessment of large-scale models from 1973 as a lens for evaluation. While it is only possible to speculate about the prospects of AI in urban planning, familiar cautions remain alongside optimism for new opportunities and possibilities.

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Key Words: planning, AI, technology, data science

## **USING MACHINE LEARNING TO REPLICATE URBAN MODELS IN DIFFERENT SETTINGS: THE CASE OF DEEP CNNs-BASED PARK IMAGE CLASSIFICATION**

Abstract ID: 42

Individual Paper Submission

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Computational urban models can enable a more forward-thinking, data-based, and transparent planning process. The adoption of these (sometimes complex) models across domains is difficult. Large-scale urban models can be spatially sensitive, data-hungry, with highly complex model parameters trained to a specific task (Deal, Pan, Pallathucheril, & Fulton, 2017). They are also typically built and tuned to a single context, so that their application to different places can require extensive data, time and financial resources to manually process input data, rescale and reset parameters (Manninen, Aćimović, Havela, Teppola, & Linne, 2018). For these reasons there are very few studies that have focused on replicating urban models using a universally applicable approach (Plesser, 2018). We suggest that machine learning techniques can help overcome these obstacles to model replication and adaptation.

In this study we apply deep machine learning processes (i.e. transfer learning), embedded with fine-tuning and data augmentation strategies, to test the replication of a geographically specific urban planning land use classification model. Transfer learning is a state-of-the-art computer science based approach for addressing cross-domain tasks. The technique is constructed to transfer knowledge across domains (or contexts), lower data requirements, reduce data variation issues, and simplify hardware environments –while maintaining valid outcomes (Tan et al., 2018). Reducing data and data manipulation requirements can improve adaptability and replicability by reducing time and resource requirements.

The proposed park classification framework is a first step toward testing the efficiency a transfer learning approach to model replication. It uses deep convolutional neural networks (CNNs) to classify urban parks based solely on public image data. Classifying urban parks and understanding how parks are used and for what purpose, is a fundamental principle behind urban green space planning and design. Current urban park classification approaches typically depend on local knowledge, manual labeling, and empirical (subjective) benchmarks (eg. park size and recreational activities) (Ibes, 2015). Geo-located images collected from online sources (e.g. social media) have the potential to provide robust and comprehensive information, but are seldom used because of the difficulty in collecting and parsing data. For example, image datasets can be sparse and of varying quality, come from diverse points, and the similarities between images even in different parks, are naturally high and difficult to differentiate.

To address these challenges, we use transfer learning techniques to pretrain deep CNNs to learn generic park features using a large and varied dataset. We integrate fine-tuning and image augmentation strategies to further decrease overfitting problems caused by low-quality and small datasets in the target domain. A park image dataset for Seattle, Washington is used to test our proposed park classification model and replication approach. Our model comparison results show that the classification framework is able to discern park usage with 73.34% accuracy. This is a relatively good performance considering the entire dataset only has only 122 images that represent 55 different parks.

This work focuses on exploring universally efficient approaches to allow easy replication and adaptation of models in different urban settings. It uses a transfer learning based deep CNNs, combined with image augmentation and fine-tuning strategies to maximum performance and to address the challenges of low-quality and small datasets. Our

results suggest deep machine learning techniques can assist in large-scale, complex urban model replication that can ultimately better support urban planning practices.

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Key Words: Machine Learning, Transfer learning, Model Replicability, Deep CNNs, Park classification

### **DETECTING VACANT, ABANDONED AND DISINVESTED (VAD) PROPERTIES IN SAVANNAH, GEORGIA USING MACHINE LEARNING**

Abstract ID: 68

Individual Paper Submission

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Vacant, abandoned, disinvested (VAD) properties are known to lower the neighborhood property values, increase crimes and taxpayer costs, and disproportionately impact the communities of color (Branas, Rubin & Guo, 2012; Akers, & Seymour, 2019; Sun et.al, 2019). In 2018, Savannah, Georgia passed a \$10 million special-purpose local-option sales tax to help redevelop at least 1,000 vacant, abandoned and disinvested (VAD) residential properties over the next 10 years. Once a VAD property is identified, the city or the land bank can acquire the property and regenerate the properties for affordable housing. This initiative is implemented with hopes that residents can benefit from cleaner, safer, and more prosperous neighborhoods.

Before redeveloping these properties, planners need a standardized, transparent method for detecting and prioritizing the VAD properties. To detect these properties, we use a machine learning model (following Hillier et.al, 2003; Appel et.al, 2014) to find the characteristics of a parcel that best predict whether it should be prioritized for intervention. This particular study will focus on how the model is implemented and applied, as well as how missing civic data problems are solved.

In this study, we build a random forest model for detecting VAD properties based on characteristics of 9,321 parcels of interest per the City of Savannah. We first construct an index of VAD by combining civic data such as crime and fire records, tax delinquency, utility status, and code violations in 2019. These attributes are legal criterions for the City of Savannah to initiate acquisitions. Each parcel is then ranked based on the VAD score (ranging from 1-1,574 for lots and 1-7,747 for lots with structures), where lower numbers indicate more blight. The predictor variables for the VAD index include lot size, year built, years since last sale, number of bedrooms, median neighborhood property value, property growth rate, location within a floodplain, and evidence of historic redlining.

We find that the most salient indicators of VAD properties are related to the property values and lot size, for parcels

with and without structures. Partial dependence plots further reveal that parcels valued at 6-13K USD are particularly conducive to a high VAD. We also find that location in a floodplain or a historic redlining area did not predict VAD well. In implementing this model, results helped planners quickly identify VAD properties and narrow the range of field surveys. Some parameters were counter-intuitive to planners' in-depth knowledge while most matched their intuition.

Lessons learned include a challenge in civic data fusion, as parcel characteristics were sourced from multiple city offices and service departments, each has its own biases at recording data for parcels. These data also had many N/A values across categories--compromising the integrity of the input variables for the random forest model, and we take different approaches to dealing with this issue vis-a-vis statistical learning. We also describe how this research benefited the City of Savannah.

Ongoing work on this project includes the administration of a neighborhood sentiment survey to engage with the community and collect community members' suggestions for properties. These responses will help contextualize VAD properties--adding dimension to an index score that is tabulated only with passive data. The integration of these results requires careful balancing of qualitative and quantitative variables in indexes as we integrate tacit knowledge from the community into a machine learning model. A major takeaway from this project is that cities struggle to define and detect blighted properties, and that machine learning can be used to predict properties in need of intervention.

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Key Words: Blight, Vacant properties, Abandoned properties, Machine Learning, Property management

#### **USING DATA MINING TO EXPLORE THE SPATIAL AND TEMPORAL DYNAMICS OF PERCEPTIONS OF METRO SERVICES IN CHINA: THE CASE OF SHENZHEN**

Abstract ID: 71

Individual Paper Submission

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Improving perceptions of service quality is a promising planning strategy for increasing the attractiveness and retaining the ridership of public transport systems. The widespread use of social media presents an opportunity to investigate the performance of transport services from the customer's perspective. This study proposes a framework for integrating quantitative and qualitative analyses to investigate the perceptions of transport services by mining data from social media. We utilise Sina Weibo data related to the Shenzhen metro system to illustrate a

text mining process categorised by semantic, spatial and temporal information. On the semantic front, in addition to identifying service attributes and sentiment polarity consistent with previous literature, we find attributes specific to the Chinese context. We also identify clear temporal variations among different service attributes by visualising the number of corresponding microblogs across varying time scales such as hours, days and weekdays. The spatial variations reveal five main clusters around central business districts and transport hubs, which produce the highest density of reports about crowdedness, waiting times, reliability and frequency. However, microblogs that report on perceptions of safety and personnel behaviour present a different spatial pattern. This research offers insights into the ways in which we can use social media data to identify key service areas for immediate improvement and to monitor and manage metro systems more effectively over the long term.

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Key Words: social media, data mining, perception, public transport, metro service

#### **DETECTING ABANDONED FARMLAND THROUGH HARMONIC ANALYSIS AND GRAY-LEVEL CO-OCCURRENCE MATRIX (GLCM); IN THE CASE OF YEONGDEOK-GUN, NORTH GYEONGSANG PROVINCE, SOUTH KOREA**

Abstract ID: 92

Individual Paper Submission

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Abandoned farmlands refer to the agricultural lands which has not been cultivated for more than 2 years. The presence of the abandoned farmland has negative impacts on human and natural environments, for example, reducing agricultural production, deteriorating local communities, and increasing the probability of wild fires and soil erosion. While appropriate managements are required, detecting those via field surveys or any type of manual works always involves a great level of efforts, time and budget.

Remote sensing technique is used as a supplement to the manual efforts. Commonly adopted method is to detect the abandoned farmland from other types of land use, using attributes derived from the satellite or aerial imageries. The choice of the attributes determines the accuracy of the classifications. Commonly, the attributes are two types; temporal and spatial. Examples of temporal features are vegetation phenology extracted from Vegetation indices (VIs). Examples of spatial features are spatial distribution extracted from texture information. While each type is used for classification separately, only a few studies took advantage of the diversification of attributes by adopting the two types together.

Under a belief that the detection accuracy can be improved by using both of the temporal and spatial characteristics, in this study we aim to detect abandoned farmlands through attributes extracted time-series analyses, as well as the attributes from the textural analysis. For temporal features, Harmonic analysis is used to decompose a vegetation index time series into multiple sine and cosine components of various frequencies, and extracted the magnitude of each. For spatial features, Grey Level Co-Occurrence matrix (GLCM) is used to extract fourteen texture features considering four directions. We use Sentinel-2 satellite imagery data and compare the accuracy from Support Vector Machine and Random Forest classification.

The study site is Yeongdeok-gun, North Gyeongsang province, South Korea, the province with the second largest agricultural land in the country. Although the main industry in Yeongdeok-gun is agriculture, the cultivation area decreased from 3,139 (ha) in 2000 to 2,048 (ha) in 2020 and rice production also decreased from 14836 (ton) in 2000 to 8650 (ton) in 2020. The study period is from Jan. 2018 to Dec. 2020. Abandoned farmland tends to have a good quality of natural resources, so there is a need for strategy to reuse abandoned farmland. The finding of this research would give guidance to local governments when detecting abandoned farmlands, and establishing the local policies of abandoned farmlands to prevent possible negative consequences. Our study can contribute to improve effective land use for policy for policy makers and city planners.

This work was supported by Creative- Pioneering Researchers Program through Seoul National University, and the Korea Environment Industry & Technology Institute (KEITI)/ the Korea Ministry of Environment (MOE) (2020002770003).

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Key Words: Abandoned farmland, Remote sensing, Harmonic analysis, Gray-Level Co-occurrence Matrix

#### AN ONLINE PLANNING SUPPORT TOOLKIT

Abstract ID: 101

Individual Paper Submission

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Planning support systems (PSS) have attracted a great deal of academic interest since they were introduced more than thirty years ago (see, for example, Brail and Klosterman 2001 and Brail 2008). Unfortunately, these systems have not been widely used in planning practice, largely because they generally provide sophisticated and hard-to-use analysis and spatial modeling systems that do not meet user's needs (Vonk, Geertman, and Schot 2005).

This paper illustrates a different approach to PSS development and use. It describes a collection of online planning support tools that make simple, easy-to-use urban and regional analysis and projection methods at the core of planning education and practice readily available on the Web. The methods provided in the toolkit are thoroughly described and applied to a real community in a published text (Klosterman et al, 2018), which identifies data sources for applying the methods in the United States. The computational routines provided in the tools are fully documented in a collection of spreadsheets that are also available online.

The tools have been developed in the popular R programming language and only require users to upload their data from simple spreadsheet files. The tools allow users to instantaneously see the results of using different data sets and assumptions online. The analysis results can be viewed onscreen as graphs and tables that can be downloaded



to the user's computer. The paper describes and illustrates the online planning support toolkit and considers its advantages and limitations for planning education and practice.

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Key Words: planning support systems, planning methods, online, R programming language

#### **YOUTUBE JOURNALISM AND HOUSING STUDIES: MINING INFORMATION DELIVERY AND CONSUMPTION PATTERN IN YOUTUBE**

Abstract ID: 121

Individual Paper Submission

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Background: In making housing-related decisions such as housing purchase or residential choice, we rely not only on personal experiences but also on a variety of information from others (McCray et al., 1987). Among them, in large part, we are exposed to and influenced by information from various media (McCollough & Karani., 2014).

Meanwhile, as the Internet environment becomes common, the way the people consume the information is changing substantially. In this trend, one of the most remarkable changes in recent years is the rise of YouTube journalism, suggesting that the role of information delivery as a media is gradually being replaced by YouTube from newspaper or TV (Paulssen & Harder, 2014). The information delivery and consumption pattern in YouTube differs from the existing media in several ways, which may further influence the housing-related perception and behaviors of YouTube viewers. For example, YouTube viewers have a relatively wide range of information choice compared to existing media. Rather than just being exposed to information, they tend to choose the information they want via selecting YouTube channels and contents. Some housing-related information, such as housing market situation or government policy, can be delivered in different forms and methods depending on the YouTube content creator's frame. In this case, their perception on housing can be further reinforced by repeatedly consuming only the information they believe (Tsfati & Cohen, 2003). Thus, this study aims to investigate the information delivery and consumption pattern by mining YouTube contents related to housing issues, and further discuss the potential influences on individual's housing-related perception and behavior.

Method: First, to identify what kind of housing-related information is being provided in YouTube, we collect the relevant YouTube contents for the last year by web-crawling. By mining the video titles, we categorize the information type and examine the differences by information providers. As an example, besides the user created video contents, some broadcasting companies have recently begun uploading TV news to their YouTube channels as an information provider. Second, to further examine how the information is delivered in YouTube, we extract the sentiments in the YouTube video contents. The sentiment reflects the purpose and belief of the information provider and it is expected to vary depending on the information type and the nature of information provider. Here, the voice information in the video is converted into text format to be analyzed. Third, since the comments represent how viewers react to the video contents, we intend to find some implications for information consumption pattern in YouTube by through the sentiments revealed in the comments. Lastly, we present a discussion about how the

distinctive information delivery and consumption pattern in YouTube affect the individuals' perception on housing and their behavioral outcome.

Expected result & Implication: As housing-related YouTube contents continuously expand, and since the information is delivered in a way that is more easily understood through video format, it is expected that information consumption will be expanded in terms of quantity. On the other hand, since many YouTube contents are made by individual creators, it may tend to express their argument more directly and explicitly. Moreover, continuously watching videos of certain YouTube channels that only specific information on housing market can cause confirmation bias. We expect that this study provides some empirical implications to investigate the above possible outcomes by changes in information delivery and consumption pattern around YouTube. This knowledge of individual perception and behavior at the micro level is also helpful to understand the inherent mechanism of housing market at the macro level.

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Key Words: YouTube journalism, Information delivery, Information consumption, Text-mining, Sentiment analysis

## ESTIMATING DIVERSITY AT POINTS OF INTEREST (POIS) IN ATLANTA, GEORGIA USING ORIGIN-DESTINATION TRIP DATA

Abstract ID: 151

Individual Paper Submission

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Segregation in cities has led to disinvestment and inequality in education, public health, and other opportunities, and a potential lack of social mixing across the city. However, residential segregation is only one part of segregation in a city. The location of jobs and third places (i.e. points of interest (POI)) may also perpetuate a lack of mixing among populations of different races, ethnicities and income groups. Analysis of individuals' activity spaces shows that segregation is not just residential, but that activity spaces are segregated as well (Farber et al., 2015; Wang et al., 2018). Furthermore, segregation of activity spaces can be more intense than expected by residential geographic segregation (Dong et al., 2020), and perhaps explained by residents forgoing nearby POIs for more socially and culturally-attractive POIs (Arentze & Timmermans, 2008; Etmnani-Ghasrodashti & Ardeshtari, 2015).

In this research, we ask which kinds of POIs (by neighborhood location and by category) have a more diverse set of visitors, defined as the proportion and number of visitors from neighborhoods of varying racial compositions and median annual income composition. We use 4,952 POIs within the city limits of Atlanta, Georgia as destinations. POIs are categorized as food outlets, retail, health/care services, personal services, or recreation. For each POI, we record the number of trips that originated in block groups of certain racial compositions and income compositions (from U.S. census data at the block group level) from March to June 2019. Trip data is provided by Safegraph at the block group-to-point level, and all trips are within the city of Atlanta.

We find that POIs in the downtown area, in nearby Midtown, and in adjacent gentrifying neighborhoods had a more diverse set of POI visitors. Our results also show that food outlets (restaurants, bakeries, bars, cafes, etc.) had the most diverse visitor populations in terms of both race and income. Additionally, many food outlets and recreation destinations had more frequent visitors from majority-white neighborhoods. Conversely, healthcare and retail POIs (supermarkets and other goods retail shops) attracted visitors from more homogeneous neighborhoods. The result was similar regarding income level. Lastly, residents in majority-Black or lower-income neighborhoods frequently visited places in an opposite socio-demographic setting of their own neighborhood, while residents in majority-white or higher-income neighborhoods did so less frequently.

We note limitations regarding potential ecological fallacy issues; that trajectories could represent workers and not patrons; and that the data may not capture most travelers or have spatial errors. Nevertheless, this research supports efforts to understand how POIs serve as potential mixing areas in the city and to serve urban residents more equitably with amenities and services. Urban planners seeking to facilitate connections across communities may be interested in how POIs may play a role in fostering new and existing social relationships and equitable services. In the future, we hope to perform similar analyses across multiple cities, and with more racial and ethnic groups, to find commonalities among locations that equitably attract visitors from across the community.

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Key Words: Points of Interest, Segregation, Trips, Origin-Destination Data, Income

## EXAMINING EQUITY AND RESILIENCE TO EXTREME HEAT IN PHILADELPHIA USING GPU-ACCELERATED URBAN MICROCLIMATE MODELLING

Abstract ID: 161

Individual Paper Submission

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The increasingly frequent and intense extreme heat events in large U.S. cities cause more climate-related mortalities than any other hazardous weather event (Stone et al., 2010). In the context of global warming and urban heat island, heat waves are supposed to be more frequent and intense in many cities. The extreme urban heat is not distributed evenly across neighborhoods of cities, and not all populations are impacted by the extreme heat equally (Reid et al., 2009). A fine level of quantitative information about where and which populations are vulnerable to heat is important to identify the most vulnerable neighborhoods and populations in order to mitigate the negative impacts of heat on urban residents. The ground surface temperature estimated from remotely sensed thermal imageries has been widely used to map the intensity of the heat at large scales (Shandas et al., 2019; Harlan et al., 2006). However, the land surface temperature derived from remotely sensed imageries cannot fully represent human actual outdoor heat exposure because factors, such as shade, wind speed, humidity that impact human thermal comfort are not considered. In addition, the coarse resolution remote sensing-derived land surface

temperature usually cannot show the fine-level spatial variations of urban heat across neighborhoods.

This study proposed to use the mean radiant temperature ( $T_{mrt}$ ) to indicate the distribution of urban heat in Philadelphia. Since the  $T_{mrt}$  considers the urban form and meteorological parameters, it is more reasonable to indicate the human actual heat stress level. In this study, the SOLWEIG (SOLar and LongWave Environmental Irradiance Geometry) model was applied to map the  $T_{mrt}$  in Philadelphia based on the high-resolution (1m) urban 3D model and meteorological data using the Graphics Processing Unit (GPU) parallel computing. This study further investigated the different heat exposure levels of different neighborhoods and population groups in Philadelphia. Results show that there is no significant disparity in terms of outdoor heat exposure levels for different racial/ethnic groups in Philadelphia. Generally, the elderly, who usually are more vulnerable to extreme heat, tend to live in neighborhoods with less outdoor heat exposure in summer. The higher-income people tend to live in thermally more comfortable neighborhoods. The GPU-accelerated urban microclimate modeling based on publicly accessible high-resolution urban 3D models is a generalizable and scalable method to examine the vulnerabilities to extreme heat for cities across the US, which would benefit urban heat management and building thermally equitable and resilient cities. The fine-level urban heat maps generated by the modeling would be directly applicable for guiding urban landscape design and urban planning for mitigating the negative impacts of extreme heat.

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Key Words: climate equity and resilience, Urban extreme heat, urban microclimate modeling, GIS, GPU parallel computing

#### A GENERALIZED FRAMEWORK FOR MEASURING PEDESTRIAN ACCESSIBILITY AROUND THE WORLD USING OPEN DATA

Abstract ID: 200

Individual Paper Submission

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Pedestrian accessibility refers to the extent to which the built environment supports walking access to destinations of interest. Monitoring spatial indicators of pedestrian accessibility helps planners and policymakers evaluate the impacts of urban planning and transport interventions, and guides targeted interventions towards creating healthy, sustainable cities. However, measuring spatial indicators of built environment features around the world to enable cities to be compared is challenging because local official data are either unavailable, not accessible to the public, or vary widely in coverage and format. Subject to data availability, indicators can be defined at very different scales of spatial aggregation by different government agencies, and the quality and usage of these indicators can be affected

by local contexts. Indicators developed with proprietary GIS software and non-comparable types of data often lack reproducibility and replicability. Existing spatial analysis tools can have limited functionality and transparency, or be expensive to use. These limit the ability of policymakers and researchers in resource-constrained contexts to derive indicators, reproduce results, or monitor change over time, further contributing to inequities in the ability to develop evidence-informed policy.

To address these challenges, this study develops a framework using open source software and open data (e.g. OpenStreetMap) to deliver a generalized method for measuring pedestrian accessibility indicators within and between cities in diverse contexts. The method developed in this research enables calculation of the key indicators of pedestrian accessibility, including but not limited to street connectivity, population density, daily living amenities access, and overall walkability. The open data approach allows researchers and practitioners to obtain relatively consistent data across cities and use them to calculate, analyze, and compare the indicators at both the local neighborhood scale and the spatially aggregated city level. To address data quality questions, methods for open data validation have been developed to investigate real-world representation and suitability for indicator calculation.

We describe the method using a case study project involving analysis of the 25 cities across 19 lower-middle- to high-income countries, representing a diverse range of urban contexts. Using the present method, we calculated pedestrian accessibility indicators for the 25 cities at two distinct geographical scales: fine-grained hexagonal grid level and city level. The present framework has been validated with local knowledge from collaborators in our case study cities. The validation results confirm that neither official nor open data are a perfect representation of the real world. While the open data displayed some divergence from approximately comparable official data, there was a relatively high correspondence such that local contexts were considered to have been represented adequately in most instances; thus, open data was found to be broadly suitable for the purposes of deriving indicators of pedestrian accessibility in urban contexts.

The present method framework is made publicly available for reuse in an open repository. The methods are scalable and customizable for inclusion of alternative data sources and study regions, helping to remove barriers to application of indicators in policymaking for low resource settings. The indicator output generated from the tool can be used to compare and track within- and between-cities' inequities, planning progress, and to support public health, urban development, and transportation research. This research points out the need for more work toward understanding the underlying mechanisms for measuring built environment indicators to guide city development.

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Key Words: Pedestrian accessibility, Open data, Open source software

## IMPACTS OF NEIGHBORHOOD AND HOUSEHOLD DYNAMICS ON CENSUS RESPONSE RATE; EMPIRICAL EVIDENCE FROM THE STATE OF ILLINOIS

Abstract ID: 201

Individual Paper Submission

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The 2020 Census is a key venue which aims to collect critical data from every individual living in the U.S. The massive effort and investment in Census success can support employment of these datasets in allocation of federal funding and resources, establishment of policies, determination of the number of congressional seats, and many other critical policy actions. Thus, many states had strived to increase response rates of people to avoid omitting population. Illinois is one of the states that created a metric and platform to build strategies for outreach to encourage census participation.

According to the analysis (1), the census self-response rate computed by residents' responses vary across different geographies in the state of Illinois. For instance, the response rates in big cities are lower than the rates in small rural areas. It is possibly affected by the different demographic and socio-economic factors associated with different geographies such as racial composition, jobs, or education level. However, the census participation can be also different by individual and household characteristics. Individuals even though live in the same neighborhood, they might have different attitudes towards census participation. The key question is whether and to what extent the participation attitude or tendency of people could change by moving to a different neighborhood, e.g., an individual who moved from a rural area to a big city or from a poorer neighborhood to wealthier. This study focuses on this question. The results can contribute to understanding the mechanism of the census participation. It also provides bases to build more effective strategies for national level surveys at the state level.

To analyze the attitude or tendency changes, this study uses 2010 and 2019 individual and household data in Illinois, created by Infogroup. We also use 2010 and 2019 American Community Survey 5-year estimate data, and self-response rates of the 2010 and 2020 Census from the Census Bureau. First, we extracted households who had moved to a different census tract between 2010 and 2019 from Infogroup data. Then, in order to capture neighborhood characteristics using ACS data, we employed PCA (Principal Component Analysis) which is one of the widely used techniques to reduce the dimensions of variables. PCA is particularly more effective among highly correlated variables like neighborhood characteristics. Last, we built a multiple regression model using a difference in the self-response rates between 2010 and 2020 as a dependent variable. Independent variables are 1) principal components from PCA of the neighborhood variables, 2) two types of the household variables (unchangeable characteristics such as race and changeable ones such as marital status or household income, and 3) geography changes by their intra-state move. We added interaction terms to see the neighborhood effects by household characteristics.

Our findings reveal three points. First, the changes in a neighborhood dynamic have an influence on the self-response rate changes after controlling the geography change. If a person moves to a neighborhood with more white population or higher household income, the response rate in the new place increases. Second, the changes in household characteristics also influence the response rate changes. The change in marital status from single to married increases the response rate, compared to households remaining single. Finally, the interaction terms are significant and influence the response rates. The results show that if a black household moves to a higher income neighborhood with more white population, the household's response rate increases more than other races. This result explains different census participation by neighborhood and household characteristics as well as difference in the characteristics between the previous and current location and time regardless of living in the same neighborhoods.

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Key Words: 2020 Census, Self-Response Rates, Neighborhood Effects

## GENERATING AN INTEGRATED SPACE QUALITY MAP FOR A NEIGHBORHOOD PARK IN SHANGHAI, CHINA

Abstract ID: 205

Individual Paper Submission

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Citizens require outdoor space for their daily activities, such as socialize and exercise, while people tend to stay in the spaces that satisfy their needs to perform their activities. In order to vitalize urban open spaces to attract more people, high quality space should be designed and constructed. The quality of an outdoor space encompasses many factors. The spatial distribution of some factors, like such as convenience, view connectivity, and microclimate, can be quantitatively analyzed through computational techniques, such as mapping the depth distance in Space Syntax and visualizing the thermal stress distribution by Computational Fluid Dynamics (CFD). However, a comprehensive mapping of the integrated space quality was still lacking. This paper proposed a method for the generation of an integrated outdoor space quality map by encompassing traffic accessibility, connectivity and microclimate.

A neighborhood park in Shanghai, China with 60,600 m<sup>2</sup> was chosen as the target of investigation to perform the integrated mapping. Depth value and connectivity was mapped in Space Syntax program Depth map as the indicator for traffic accessibility and pedestrian level sight. Spatial distribution of microclimate variables, such as air temperature, thermal radiation, humidity, and wind speed, were simulated by the CFD program ENVI-met in a summer afternoon. The Physiologically Equivalent Temperature (PET) was employed as the index to indicate the effect of microclimate. After the fields of depth value, connectivity, and PET were obtained, the values of different indicators were normalized, weighted, and summed up to represent the integrated space quality. With the calculated integrated space quality values in each grid, MATLAB visualized its distribution for the neighborhood park.

Since the park only have one entrance, the depth value increases as the space moving away from that entrance, indicating poor traffic accessibility. Residents, especially the elderly may be hard to reach the other end of the park. The high connectivity found in the central areas of the park indicate that people may easily notice the central spaces and conduct activities there. The PET map, which denotes the microclimate, shows that in summer Shanghai, the distribution of heat stress was mainly dominated by shading of solar radiation. In other words, spaces with shading had a better microclimate than those without. By integrating the maps of depth value, connectivity, and microclimate, it can be found that some spaces had a better space quality than others.

This study has several limitations. The microclimate analysis neglected other seasons and was only determined in summer afternoon because the simulation is computational expensive. In fact, it is more reasonable to conduct an annual analysis of microclimate if possible. The integration of space quality factors did not include other important

aspects such as facilities and aesthetics. Future studies should consider the above aspects. In addition, validation studies should be conducted to test if high quality spaces identified by the integrated map have more occupant and higher vitality. Nevertheless, this study had outlined a general method to create an integrated space quality map. The generated map is useful in many aspects. For example, the method can be used to locate the best position for commercial amenities. Moreover, during the design stage, the method can be employed to comprehensively evaluate the space quality. Retrofit project can also benefit from integrated space quality map to identify the target areas for improvement.

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Key Words: Outdoor space quality, Space syntax, microclimate, computational fluid dynamics

#### USING EMERGING HOT SPOT ANALYSIS TO EXPLORE SPATIOTEMPORAL PATTERNS OF HOUSING VACANCY

Abstract ID: 259

Individual Paper Submission

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Sophisticated methods for studying changes in the physical forms of shrinking cities (i.e. cities that are losing population) are lacking in the literature. In their review of spatial metrics, Reis et al. (2016) found 123 methods for studying urban growth, but only 15 for studying shrinkage. Therefore, in this study, we highlight the use of a newer method—emerging hot spot analysis of space-time cubes from defined locations—for examining the spread of housing vacancy (a common indicator of shrinkage) in large, Ohio MSAs. This method has not been previously applied to the study of vacancy, and it differs from traditional hot spot methodologies by identifying statistically significant spatiotemporal relationships. We also contribute to the literature by simplifying ArcGIS Pro’s auto-generated emerging hot spot results from 17 nominal categories to 7 ordinal categories, providing more options for subsequent data analyses.

In this presentation, we begin with a description of why vacancy is a salient issue and how researchers have previously studied its spatial patterns. We then describe the aforementioned method in detail, and investigate how the spread of vacancy relates to population change (another indicator of shrinkage) at three geographic scales (tract, city, and MSA). Then, we present the results of our analyses, as well as the urban planning and policy implications of our methodology and findings.

By using the aforementioned methodology, we found variation in the extent and location of the spread of housing vacancy within and between Ohio MSAs. In alignment with prior literature, vacancy spread in our study was most pronounced in central cities, particularly in shrinking cities located within shrinking MSAs. However, unlike prior literature that presumes a relatively uniform spread of vacancy from a cluster of vacant housing units (Morckel, 2014), we discovered that many Ohio MSAs concurrently experienced spread, contraction, and vacancy stabilization in tracts located adjacent to, or within close proximity of, one another. These results indicate that how vacancy proliferates is not solely a matter of geographic determinism, whereby high vacancy in one tract predicts high vacancy in neighboring tracts in future years.



We also found potential relationships between vacancy spread at a small scale (the tract) and the interaction of population dynamics at much larger scales (city and MSA). As such, our results run counter to much of the housing literature that theories vacancy as a neighborhood-level phenomenon. Our results further suggest that initiatives intended to reduce vacancy (e.g. foreclosure prevention programs, demolition funding) should account for population trends in adjacent neighborhoods, the city as a whole, and the MSA—and not just physical conditions within a particular neighborhood. Two neighborhoods that are located in different contexts (different cities with different population dynamics) may not respond similarly to a vacancy reduction strategy, even if vacancy levels are comparable at the time of intervention.

Overall, our work is an early contributor to a better understanding of the spatial patterns of vacancy proliferation and the relationships between population dynamics and city shrinkage. Because there is mounting evidence that grow-oriented urban planning strategies do not work in a context of shrinkage, there is a need to better understand the physical manifestations of shrinkage such as housing vacancy. When combating neighborhood decline, researchers and practitioners should carefully consider concepts like Seger et al.'s (2020) “shrinkage in growth,” and what we might term “shrinkage in shrinkage” (i.e. shrinking neighborhoods located in a broader context of shrinkage). Urban planners and policy makers must view the city as an intricate system with interventions at one geographic scale potentially affecting all others.

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Key Words: vacancy, spatial analysis, shrinking cities, neighborhood change, urban decline

#### **SPATIO-TEMPORAL MODELING OF LAND-USE CHANGES INCORPORATING TRAFFIC NETWORK AND SOCIO-ECONOMIC INDICATORS**

Abstract ID: 278

Individual Paper Submission

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Land use change models provide vital information about land development dynamics. Different land use change models have been developed, incorporating characteristics of built and physical environments, neighborhood structures and basic socio-economic indicators (Bell & Irwin, 2002; Carrion-Flores & Irwin, 2004; Carrion-Flores, Flores-Lagunes, & Guci, 2009; Nahuelhual et al., 2012; Deng & Srinivasan, 2016). However, road infrastructures, traffic volume, and comprehensive socio-economic indicators can play a significant role in achieving robust land use change models. For instance, transportation systems have impacts on land use change potentials through the possible effects of relative accessibility and congestion (Iacono et al., 2008). Also, better representation of human decision-making processes using comprehensive socio-economic indicators such as; household income, education levels, occupations, age, financing options, etc. are likely to improve our understanding about the land use changes

in cities. In this research, relationships between land use change potentials and components of traffic network and comprehensive socio-economic characteristics are investigated using spatio-temporal statistical modeling approaches.

There are mainly two goals in land use change models: (1) discovery of transition rules using statistical methods, (2) prediction of future land use changes using simulation-based, Machine Learning (ML), and Artificial Intelligence (AI) methods. Due to the well-established statistical inference methods, factors behind land developments can be effectively investigated using such methods. A successful statistical analysis of determinants behind land use changes improves predictive power of simulation-, ML-, or AI-based models. Another important component in land use change modeling is to account for spatial and temporal dynamics. Recent studies show the importance of these dynamics on land use change models (Ferdous & Bhat, 2013; Tepe & Guldman, 2017; Tepe & Guldman, 2020; Wang et al., 2012).

In this study, Florida land development dynamics at the block group level were derived from the statewide parcel database between 2010 and 2019. Traffic network and annual traffic volume information were obtained from Florida Department of Transportation (FDOT). Five-years estimates of American Community Surveys are used for gathering detailed socio-economic indicators at the block group level. In this study, introduced modeling framework is used to test 200+ potential explanatory variables while accounting for both contemporaneous dynamics in neighborhoods and temporal lag effects. Also, our modeling approach include network dynamics in traffic volume at the state level. Spatial Lag, Error and Seemingly Unrelated regression models are tested to achieve robust model results. Our preliminary results indicate benefits of incorporating traffic network and socio-economic indicators in land-use change modeling. This study improves our understanding about the relations between traffic network and land developments. Also, the study highlights the importance of socio-economic factors in land developments. Robust land use change models provide essential information to practitioners and policymakers about potential future land developments.

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Key Words: Land-use change, Traffic network, Spatio-temporal modeling, Socio-economic environment, Florida

#### **VALUE OF COMMUNITY BASED APPROACH TO UNDERSTAND POLICY AND PLANNING NEED FOR EXTREME HEAT ADAPTATION AMONG MARGINALIZED POPULATIONS.**

Abstract ID: 303

Individual Paper Submission

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Recent observational studies report the decreasing trend of heat sensitivity, due to the advancement in meteorological forecasting and structural adaption such as air conditioning. Despite the decreasing trend of heat-related mortality and the public health developing pathways to address individual heat-related health issues, heat

persists as a major public health concern in the United States. This is mainly attributed to increasing temperature from climate change coupled with the Urban Heat Island (UHI) effect. Exacerbating the effects of climate change are increasing disparities in heat-related mortalities across racial and ethnic groups due to increasing socio-economic and health disparities that limits the capacity of low-income and people of color to adapt, and a larger system of structural inequality that shapes access to amenities like parks/green space and the benefits it provides. While a growing number of communities have implemented heat action plans, distribution and utilization of the municipal heat intervention remain questionable and largely unevaluated in practice. In addition, mainstream extreme heat planning efforts often have to compete for limited time and resources with other competing climate threats or urban problems which are often seen as higher priority.

While traditional prescriptive approach in heat planning have failed to capture the complexity of impacts among vulnerable communities, uncertainties and complex socio-economic conditions, there is a greater need on the representation of diverse ways of thinking to better understand challenges marginalized communities face during heat events. This research uses Value Focused thinking (VFT) to engage high heat risk vulnerable population in Boston Metro Area and applies multidisciplinary approach to bridge people, planning and policies to formulate socially sensible heat adaptation practices at the local level. While eliciting residents' 'visceral experiences' of heat, the community based research generate policy and planning insights regarding the heat adaptations needs, resource and services preference of communities during high temperature days and extreme heat events. The study highlights the novel methodological framework that priorities residents "lived experiences" as vital indices and marginalized communities as "context experts" for policy and planning in urban heat management. The study contributes to the extension of methodologies for meaningful engagement of vulnerable communities to develop heat adaptation interventions for effective and socially sensible climate resilience strategies.

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Key Words: Extreme heat events, Heat Vulnerability, Participatory research, Value Focused Thinking

#### **ACCESSING THE SPATIAL DISTRIBUTION OF URBAN PARK IN SHANGHAI THROUGH MOBILE PHONE-DERIVED HUMAN ACTIVITIES: ACCESSIBILITY AND INEQUITY**

Abstract ID: 314

Individual Paper Submission

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Urban parks are deemed as having the potential to provide both physical and psychological health benefits for residents, as well as improving social and environmental quality. Given that urban park resources cannot be allocated with absolute equity in the city, examining whether disadvantage groups—defined according to individuals' gender, age, income, socioeconomic status, ethnic-racial characteristics or many other factors, are discriminately treated in park access became the primary issue of social and environmental justice. However, evidence from empirical studies on urban park equity are quite mixed due to the measurement of park accessibility

and the definition of disadvantage groups. Our study aims to re-discuss the park accessibility and inequity in the big data context. We took advantage of a big dataset of 23 million anonymous mobile phone users in 2014 to identify low-mobility groups, which had lower values of mobility indicators and were defined as disadvantage groups in our study. Focusing on the 395 selected parks in Shanghai, we compared actual park usage of low-mobility groups and the total population. We propose to answer the following questions: (1) How to measure park accessibility and identify low-mobility users using mobile phone data? (2) To what extent were activity-based park accessibility different from GIS-based park accessibility. (3) In Shanghai, were low-mobility users treated discriminately in urban park resources? To address our research question, we proposed an analytical framework including three parts: (1) "Identifying low-mobility users". We built three mobility indicators, including Miles Traveled for Recreation (MTR), Time Spent on Recreation (TSR), and Destination Diversity of Recreation (DDR), and low-mobility group was defined as mobile phone users whose values of three mobility indicators are all below 30% quantiles; (2) "Linking parks to mobile phone towers". We linked parks and mobile phone towers one to one. For each park, we chose its closest mobile phone tower within 500m buffer as the matched tower, whose recorded activities were defined as park activities; (3) "Measuring park accessibility and social equity". We built three activity-based indicators to measure park accessibility at the Jiedao tract level, including Frequency of Park-activity per day (F\_PA), Average Trip Length for Park-activity (TL\_PA), and Average Time Duration of Park-activity (TD\_PA).

To reflect the relative park accessibility for low-mobility groups compared with the total population, we introduced Gini Index and Location Quotient. The results showed that: (1) Park accessibility measured by activity-based approach presented an obvious smaller Gini Index compared with that measured by geo-based approach. The reason could be that people's self-selection and self-movement have weakened the disparity of park distribution; (2) Compared with the total population, the low-mobility group was not found to be spatially discriminated in park resource, being proved by the average Location Quotient of each Jiedao tract is slightly larger than 1.0; (3) Though low-mobility users were not spatially discriminated in park resources, their average park-activity frequency was only one-third of the total population, which means other factors (e.g. socioeconomic factors) might influence their park usage and consequently bring inequities. Accordingly, our study provides new visions for park resource management. On the one hand, self-movement helps to relieve disparities in park distribution, which implies policy makers to first differentiate low self-movement areas from high self-movement areas, and then take policy interventions mainly in low self-movement areas with poor park resources. On the other hand, due to self-selection, building new parks might have limited effects. Time budget, income level, and other socioeconomic factors might influence an individual's park preference besides distance

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Key Words: park accessibility, social inequity, urban resource, mobile phone data, Shanghai

#### HAVE THE FACTORS ASSOCIATED WITH THE USE OF ONLINE SHOPPING CHANGED OVER TIME?

Abstract ID: 320

Individual Paper Submission

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While the ability to purchase goods and services online has existed for quite some time, online sales have experienced a sudden growth as of late with the advent of COVID-19. Pandemic-related stay-at-home orders, lockdown measures, and a general reluctance to shop in person lead to a meteoric rise in online shopping, which now accounts for as much as 14% of total retail sales in the US (U.S. Department of Commerce, 2021). Despite this rapid growth, much uncertainty surrounds the ways in which this newform of commerce may transform our day-to-day activities, travel behaviors, and urban landscapes. At the heart of these many unknowns lies the fundamental question of who is responsible for the recent rise in e-commerce. Is it caused by an increase in units purchased by experienced online shoppers, or rather the result of this industry reaching a broader share of the population? Understanding this distinction will help determine whether the recent increase in online shopping has improved or exacerbated economic inequalities.

Using a unique longitudinal dataset, we investigate the factors that influence the use and frequency of online shopping both before and during the pandemic to establish whether these have changed over time, and ultimately determine who is responsible for the recent growth in e-commerce. Benefiting from a longitudinal dataset, this analysis further compares the short- and longer-term impacts of the COVID-19 pandemic on online shopping behaviors, by examining the use and frequency of e-commerce services during the spring 2020 and fall 2020 periods and will offer insights as to whether this increase in online shopping is likely to persist beyond the pandemic. Findings from this study will prove valuable to researchers interested in the economic ramifications of the pandemic, and to policymakers seeking to properly regulate the online shopping sector to ensure it aligns with cities equitable and sustainable objectives.

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Key Words: Online shopping, e-commerce, COVID-19

#### **ASSESSING THE BIASES IN LARGE ANONYMISED MOBILITY DATA**

Abstract ID: 325

Individual Paper Submission

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Increasingly ubiquitous sensor networks and passive data collection are becoming a norm in planning research and city management (Singleton, Spielman, and Folch 2018). Unlike traditional research that relied on surveys, participant observation and other curated data collection enterprises, lately we are relying on large public and private administrative datasets such as parcel maps (Lester, Kaza, and Kirk 2013), sales and property records (Holt and Borsuk 2020), cell phone usage (Ratti et al. 2006; Zhou et al. 2021). Some key advantages of these datasets are their high temporal and spatial resolution, exhaustive coverage as well as their currency. However, it is unclear if these advantages outweigh the advantages of active data collection enterprises that try to ensure representativeness and the expense of exhaustiveness. In this paper, we try to excavate the hidden missingness in a specific case -Safegraph Weekly Patterns dataset- and understand the implications of this bias on our understanding of travel pattern changes during COVID-19 pandemic.

We developed CarolinaTracker, a website and a visualization platform (<https://carolinatracker.unc.edu/>), to provide easy access to critical and timely information on the economic and social health of North Carolina counties during the COVID-19 pandemic. Collating information from different public and private data providers in five domains, we continually monitor, update and visualise over thirty different indicators. One of the key datasets, we rely upon is the patterns dataset from SafeGraph which covers ~6.3 million points of interest (POI) in the United States. The dataset is the about hourly visits to each of these POI and is updated on a weekly basis. The data is collected from unspecified applications on cellphones that continually track location information of the users. Anonymised data is provided to the researchers to study the impacts of COVID-19 pandemic on places and businesses. This data is used to study how the patterns of visits have changed during the pandemic at relatively high sectoral and spatial resolutions.

However, the conclusions drawn from this dataset might be problematic because of opaque data collection and adjustment protocols (e.g. cellphones drop in and out, inaccurate GPS). The collection of POIs are not stable either (e.g. opening and closure of businesses or just business practices). In this paper, we demonstrate the validation of this dataset by comparing it with other administrative datasets (such as hospital records), government records and try to assess the representativeness and exhaustiveness of the Safegraph data. We follow and extend the methods proposed by Coston et. al (2021) to excavate the hidden biases in this dataset that might color our conclusions. This effort is ongoing and results are expected in early in the summer.

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Key Words: COVID-19, Mobility Data, Data Bias

# MEASURING POLYCENTRIC URBAN SPATIAL STRUCTURE IN CHINE PREFECTURE-LEVEL CITIES, 2000 TO 2020

Abstract ID: 329

Individual Paper Submission

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Polycentric spatial development has become a topical issue in the scholarly debate in recent years. Polycentricity has evolved from an analytical concept to explain urban structure to a normative agenda in spatial plans and policies, where the concept is promoted as means of achieving more efficient, balanced, and sustainable development patterns as well as reducing the agglomeration diseconomies such as air pollution and traffic congestion. As a country experiencing rapid urbanization, China has implemented a set of policies to promote city (sub)centers and the growth of medium- and small-size cities to achieve more integrated and polycentric cities and regions.

The most recent poly-centricity studies in China have focused on two consecutive questions: the measures of poly-centricity and the empirical justification of its benefits in facilitating regional development. There are, however, two potential methodological gaps that may undermine the validity of these studies, especially those focusing on empirical justification. The first is a lack of comprehensive studies on poly-centricity measures at the intra-city scale. The existing studies usually utilize a single data resource and method to identify (sub)centers, for example, nightlight imagery and minimum threshold methods, which seems arbitrary and lacks validation from other data resources and methods (Lee, 2007). Second, recent studies have shown that the degree of poly-centricity is highly sensitive to the number of (sub)centers (Zhang and Derudder, 2020), which further indicates that existing studies in identifying (sub)centers may derive invalid polycentric index and, consequently, lead to biased regression estimates in quantifying the marginal benefits of poly-centricity.

We address these methodological gaps by developing more robust poly-centricity measures utilizing multiple data sources and methods. Specifically, we intend to apply both Chinese township level decennial census, nightlight imagery, and land price transaction records at two time periods, 2000 and 2010, to operationalize poly-centricity. Four center identification methods are proposed, including the minimum density threshold method (Liu and Wang, 2016), the non-parametric GWR regression (McMillen, 2003), the local indicators of spatial autocorrelation (LISA) (Arribas and Gracia, 2014), and finally, the local municipality as city (sub)centers. The identified (sub)centers will then be analyzed using a stepwise polycentric measure which allows for a sensitivity check of the degree of poly-centricity to the number of (sub)centers. The contributions of our research are twofold. First, we compare the performance of different data sources and methods in identifying (sub)centers to develop a more comprehensive and robust measure of Chinese intra-city poly-centricity. Second, we are able to operationalize poly-centricity at multiple time points to examine polycentric development in China from a dynamic perspective.

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Key Words: Urban Spatial Structure, Polycentricity, Center identification, Sensitivity check, China

## CITIZEN-CENTRISM IN SMART CITIES: REALITY OR RHETORIC?

Abstract ID: 393

Individual Paper Submission

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Smart cities have often been portrayed as cities that effectively utilize information and communication technologies to tackle many contemporary urban issues, such as dwindling economic growth, lack of sustainability, and poor citizen participation. Following critiques of overly top-down and technocratic urban governance, smart cities have re-branded themselves as citizen-centric, promising enhanced citizen participation (Joss et al. 2017; Pereira et al. 2017). However, few studies have examined whether this citizen-centrism rhetoric materializes into reality. In turn, we ask whether citizen-centrism employed by Washington D.C., as a case study of a smart city, materializes into reality. To do this, we start by assessing the literature on smart cities, citizen centrism, participation, urban governance, the role of information and communication technologies in participation, and how urban governance is being radically transformed by technology. We cut through the (re-)branding efforts of neoliberal strategies to simply induce investment and economic development and ask, what should genuine participation in smart cities look like?

To examine whether Washington D.C.'s citizen-centric rhetoric materializes into reality, our methodology focuses on developing a holistic approach to assess citizen-centrism claims in smart cities. We employ content and discourse analysis – the latter of which is a novel approach to assessing citizen-centrism rhetoric, especially in first asking whether such rhetoric exists, rather than presuming it is an inherent aspect of smart cities. The content analysis includes an examination of existing academic literature, city indexes and reports, and official city documents and webpages explicitly related to the case study. Additionally, we develop a conceptual and evaluative framework – using Arnstein's ladder of participation (1969) and Cardullo and Kitchin's (2019) scaffold of citizen participation as a foundation – that allows us to effectively probe and analyze e-participation mechanisms. Our analysis spans a period of 2014 (when Washington D.C. first floated the smart city concept) to 2021 (the time of writing). In turn, we critically examine the discourse used within two Washington D.C. planning documents, as well as their official smart city website.

Our findings, based on the application of the framework and discourse analysis, illustrate that Washington D.C. does not offer genuine citizen participation mechanisms in line with the smart city rhetoric that it espoused and within the narrative of citizen-centrism. The e-participation mechanisms are limited to the provision of information electronically, including city-level data, and watching meetings live. Furthermore, civic paternalism and top-down technocratic governance are prevalent due to the aforementioned neoliberal underpinning. Such paternalism, according to Arnstein, is one of the most significant roadblocks to achieving genuine levels of participation (Arnstein 1969). We argue that citizens ought not to be treated as mere recipients of information and re-branding exercises (smart city or otherwise) and ought not to be employed as a means of silencing detractors. Finally, our paper makes particular headway in that there is very little literature on citizen participation in Washington D.C. – the smart capital city of the U.S.

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Key Words: smart cities, citizen participation, Citizen-centrism, e-participation, governance

## IDENTIFYING AND MEASURING STAYING ACTIVITIES IN URBAN PUBLIC SPACE THROUGH WIFI SENSING TECHNOLOGY

Abstract ID: 395

Individual Paper Submission

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Vibrant public spaces are an indicator of the quality of urban life in an area, and their success or failure depends on how people use and interact with others in these spaces. As a primary tool, direct observation has traditionally been used to observe public life; however, it has been implemented mainly for a small sample size at single points in time and place due to its high cost. In order to reduce the effort, various automation tools with advanced technologies have been proposed to digitally measure people's behavior. WiFi sensing technologies is one of them as a non-invasive tool for monitoring pedestrians outdoor by analyzing MAC addresses in WiFi signals sent regularly by access points (APs) and WiFi-enabled devices.

While WiFi sensing technologies open up a range of possibilities, their applications in urban design and planning are limited to measure only moving activities, a part of public life. Most of them are intended to estimate the pedestrian volume and flow around sensors (Duives et al., 2020; Johnson et al., 2019; Soundararaj et al., 2019). This helps identify the pedestrian activity as an indicator of a city's vibrancy over a long period of time, such as a 24-hour pedestrian counting system installed in the City of Melbourne (Doan et al., 2015). However, the WiFi applications may not be enough to support in decision-making in planning and design processes except measuring another important part of public life: staying activities. Few studies have attempted to mining people's behavior with WiFi data, but they are either simulation-based or not validated. (Chilipirea et al., 2018; Zhou et al., 2020).

In this study, we aim to fill this gap by presenting a methodology to determine stationary and moving activities through WiFi sensing data. With the deployment of 26 WiFi sensors over 26 days, we collected all anonymous WiFi signals on the UNIST campus along with the GPS and WiFi MAC addresses of 100 students which were used as ground truth datasets. Our proposed algorithm infers people's behavior (staying and moving) based on a similarity of consecutive patterns of WiFi signals; if staying, WiFi communication continues with similar APs, resulting in a consistently high similarity score. The results indicate that our algorithm outperforms baseline approaches. Next, we applied the algorithm for a total of 13,491 unique devices to identify their staying activities and mapped their spatiotemporal patterns. It showed that staying activities decreased overall during the midterm week and concentrated near food booths during the festival.

We demonstrate the feasibility of WiFi sensing as a tool for public life studies. WiFi sensor network in a city with the developed algorithms allows 24 hours to measure people moving and staying, as well as the stickiness index, the ratio of the two, at the site- and neighborhood- level. This provides insight into how design elements, amenities, and programmed events make public spaces sticky by providing longitudinal evidence regardless of day or night. Afterwards, applications on other key aspects technologies (e.g., moving together patterns) will raise the value of the technologies as an evaluative and analytical tool.

Citations

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Key Words: Staying activities, pedestrian behavior, Public life studies, WiFi sensing, Smart cities

## THE GERRYMANDERED AMERICAN CITY

Abstract ID: 396

Individual Paper Submission

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### The Gerrymandered American City

Decades of research on the local government boundary problem in metropolitan areas has highlighted the important role of jurisdictional boundaries in determining local authority over taxation, spending, and land use and in shaping patterns of residential segregation and the efficiency of service delivery (Dawkins, 2005; Kim & Jurey, 2013; Kübler, 2018). Although this research has examined jurisdictional fragmentation (i.e., the number of local governments) in detail, relatively little attention has been paid to an equally problematic local boundary problem: the gerrymandering of jurisdictional borders. Prior research suggests that the redrawing of city borders via the process of municipal annexation often occurs in ways that lead to the exclusion of communities of color from cities (Durst, 2018).

In this study, Python Programming Language is used to develop a method to identify areas that have been systematically excluded from cities via the gerrymandering of their jurisdictional borders. The method uses a series of expanding and contracting buffers of differing distances to identify unincorporated enclaves located in close proximity to but outside of the jurisdictional boundaries of cities. Results are presented for a first-ever nationwide analysis of the gerrymandering of cities in the United States. The study then examines the potential implications of municipal gerrymandering by presenting an analysis of the socioeconomic and demographic characteristics of neighborhoods that have been excluded from cities via the delineation of their jurisdictional border. The results illustrate that unincorporated enclaves created via the gerrymandering of cities have higher shares of people of color and lower shares of white residents than do other areas along the unincorporated fringe, suggesting that the racial gerrymandering of cities' jurisdictional boundaries is much more common than previously understood. The paper concludes by discussing the policy and planning implications of these findings, with an emphasis on issues such as voting rights and equitable access to housing and infrastructure.

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Key Words: Municipal annexation, Gerrymandering, GIS, Racial discrimination, Residential segregation

# **THE HUMAN FACTOR PERSISTS: HOW MARGINALIZED COMMUNITY MEMBERS PERCEIVE AUTONOMOUS MOBILITY ON RESIDENTIAL STREETS AFTER INTERACTING WITH AN AUTONOMOUS FOOD PANTRY SERVICE IN THEIR NEIGHBORHOOD**

Abstract ID: 458

Individual Paper Submission

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This research investigates the community perspectives of a smart mobility pilot program in Columbus, Ohio. As transportation engineering disciplines emphasize research on the scope of what is technically possible and economically feasible, planning scholarship remains a leader in questions of why, when, and for whom such technologies are deployed. This work aims to contribute to this discussion by continuing to explore the tension and synergy between the smart and the sustainable, specifically from the perspective of an historically underserved and marginalized community.

Throughout 2020-2021, the City of Columbus oversaw the daily operation of an autonomous electric shuttle named ‘Linden LEAP’. The shuttle is part of a suite of transportation technologies led by Smart Columbus and partially funded by the US Department of Transportation. This technology demonstration is among the first of its kind in the United States, where an autonomous shuttle is permitted to operate in the public right-of-way in a residential neighborhood. One of the primary purposes of the autonomous program was to provide a mobility service that enhances equitable access to resources for an underserved community. The city selected the Linden neighborhood on the east side of Columbus as the experimental deployment district. Prior to the COVID-19 pandemic, the shuttle briefly operated as a 1-mile fixed-route passenger transit loop. After the pandemic, the shuttle operated as a mobile food pantry distribution site, distributing approximately 40 food pantry packages each weekday.

The study sampled community members who used the Linden LEAP mobile food pantry service. The goal of the research was to understand: What are the perceptions of autonomous technology among the Linden LEAP patrons and community members? Researchers obtained responses from 80 Linden LEAP patrons via an online survey and via 17 one-on-one interviews conducted over the telephone. Respondents described their: demographics, overall access to transportation resources, overall access to food resources, most recent trip to the mobile pantry site, most recent trip to the nearest food pantry, service satisfaction, and their opinions on autonomous shuttle operations, safety, and community impact. Due to COVID-19, researchers did not have any in-person contact with the food pantry patrons or staff. Survey and interview participants were compensated with mobile grocer vouchers and/or grocery store gift cards.

The researchers found that the community members largely described the food pantry distribution service

favorably, but that did not lead to total acceptance of fully autonomous technology. When compared to the nearby ‘brick-and-mortar’ food pantry site, the percent of patrons who walked to the site increased from 4% to 14% and the percent of patrons who waited less than five minutes for their food pantry items increased from 33% to 64%. In the in-depth interviews, all 17 participants indicated a positive overall experience and elaborated on a variety of factors influencing their overall positive experience. These factors included positive feelings regarding the customer service provided by staff working at the site; ease of use, variety of food products, timelines of service, and the importance of the service for providing food access to those without a vehicle. Even with overwhelming positive views of the social service, varying opinions persisted on children’s safety and the way the vehicle should operate on neighborhood streets (some vs any street, separate vs any lane). Further, participants overwhelmingly reported the continued need for an on-board operator (77%) even when largely reporting that their trust in self-driving technology had improved after interacting with the shuttle (80%). These results demonstrate the role of the human factor in provisioning social services and enhancing community cohesion, reinforcing that autonomous vehicle operators have an inherent social value that is not replicated with full automation.

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Key Words: Autonomous vehicles, Smart City, Transit, Food access

#### **ANALYZING THE SPATIOTEMPORAL VARIATION OF URBAN HEAT ISLANDS IN WINTER CITY NEIGHBOURHOODS: A CASE OF EDMONTON, CANADA**

Abstract ID: 498

Individual Paper Submission

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Urban heat island (UHI) refers to an area in a city that is warmer than its rural surroundings (Fischer et al., 2012; Stewart and Oke, 2012). UHIs occur in almost all cities around the world and have close relationships with new urban developments and changing climate (Stewart and Oke, 2012). Despite numerous studies on this topic, very few quantify the influence of various contributing factors such as presence of greenery, characteristics of the city, and anthropogenic heat (Sangiorgio et al., 2020) particularly in winter cities. In Canada, the UHI effect has been studied only within a few cities such as Toronto and Montreal and only one study in Toronto (Rinner and Hussain, 2011) focused on the neighbourhood level.

This study focuses on Edmonton, North America's northernmost city, sitting at about 54th parallel, with a metropolitan population over one million. Among large Canadian census metropolitan areas, the built-up area in Edmonton increased multiple folds during the 1971-2011 period (Agrawal, 2016). Our assumption is that this increased built-up contributed to the UHI effect of the city as the built surfaces tend to absorb and store a large

quantity of solar radiation (Fischer et. al., 2012). Also, removal of vegetation cover could have further hastened this phenomenon in the city. However, no study in Edmonton has focused on temporal UHI changes and intra-urban UHI patterns. With this background, the study strives to answer the following questions: (1) Was there a significant UHI change across the city of Edmonton over the last two decades? (2) Does UHI vary across neighbourhoods within a high-latitude, winter city, such as Edmonton? (3) What factors affect UHI at the neighbourhood level?

We are pursuing both qualitative and quantitative methods to improve the understanding of the nature of the UHI phenomenon in Edmonton. Within the quantitative analysis, we use Landsat 5 and 8 satellite images from 2000 to 2020 acquired during summer and winter periods to generate neighbourhood land surface temperatures (LSTs) and land use maps. In qualitative analysis we will use relevant City documents, field observations, and residents' feedback to understand possible contributing factors such as land uses, population density, green spaces, and impact of UHI on residents in different neighbourhoods in the city.

Our preliminary results show a significant UHI increase within residential neighbourhoods particularly in developing neighbourhoods over the last two decades. Developing neighbourhoods are essentially master-planned communities developed on greenfield areas in the last decade or so. The temperature increase in these neighbourhoods was strongly linked to the reduced vegetation and increased built-up areas. We also noticed that in summer, surface temperature difference in some industrial and residential neighbourhoods within the city core showed increase of 4-9 °C compared to surrounding rural areas. These results demonstrate that high latitudes winter cities exhibit significantly amplified UHIs. Our statistical analysis quantifies the influence of major causing factors on formation of UHI such as percentage of natural landscapes, characteristics of built-up areas, road network density and traffic volumes and air quality at neighbourhood scale.

This outcome will help municipal planners and policy-makers to develop heat mitigation and adaptations strategies for existing neighbourhoods. It will also inform the planning and design of new neighbourhoods, so they elicit minimum UHI effects.

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Key Words: Urban Heat Island (UHI), Neighbourhoods, Vegetation cover, Built-up area

#### THE CHALLENGE FOR CITIES OF GOVERNING SPATIAL DATA PRIVACY

Abstract ID: 505

Individual Paper Submission

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The emergence of new data sources and analytical techniques enables the collection, recording, and analysis of unprecedented amounts of information, both online and offline, by city administrators as well as the general public.

As society attempts to capitalize on these new developments in pursuit of smarter urban governance and socio-economic progress, they encounter growing data privacy challenges, which can impede data sharing, cause economic harm, and exacerbate social inequity. In particular, recent research and prominent court cases highlight the ease with which spatial trace data can be used to identify individuals, and thus compromise privacy. This paper examines associations of reidentification vulnerabilities of spatial data and the urban built environment in the City of Seattle, and discusses how such empirical findings can be integrated into current practices by the City in governing spatial data and associated technology.

Studies have shown that anonymized spatial traces remain uniquely distinguishable due to the high dimensionality of spatial data, created by the tuple of coordinates and time stamps. Yet, to implement their findings in practical applications, there are two major limitations. First, most studies only assess the privacy risk within a single dataset without considering the possibility of combining it with external information. This especially becomes an issue in a data-rich environment where publicly available datasets with spatial attributes abound. The datasets can be easily linked with mobility data to reidentify people and reveal sensitive personal information such as family income, medical records or political alignment. Second, existing studies lack a general understanding of how privacy risks are associated with built environment characteristics. Municipalities make regular sustained use of spatial data for city operations, and cities are increasingly adopting practices for governing municipal data with the privacy of residents in mind. However, the computational complexity of privacy assessment algorithms required to exhaust all possibilities of reidentification limit its practical application in municipal-level public agencies.

This paper demonstrates the role of variation in the features of the built environment in heightening privacy risk, and highlights the heterogeneity of identification vulnerabilities across different types of built environment in the City of Seattle. Utilizing a Global Position System (GPS) mobility dataset, this paper measures the risk of re-identifying individuals from anonymized datasets with common privacy measurements, such as k-anonymity, and investigates the associations between measured privacy risks and built environment characteristics, including urban density, property value, and walkability. The results demonstrate that, due to consumers' accumulated routine behaviors, the privacy vulnerability of spatial data is not idiosyncratic to each dataset but follows a systematic pattern across urban space.

Next, this paper places the problem posed by reidentification from spatial data within the context of the City of Seattle's practices for governing municipal data for privacy. The paper reviews the current practices by the City of Seattle, through processes such as the administration of the city surveillance ordinance, privacy policies, open data system, application review process, and data inventory, for their relationship to the heightened risk of reidentification posed by spatial data. Seattle has been a pioneer among municipalities in actively managing potential privacy risk of its data and technology repositories through the surveillance ordinance act and privacy impact assessments across municipal departments, including planning. The paper discusses how Seattle and other cities could benefit from a more systematic understanding of the associations between privacy risk and urban space and play a more proactive role in the design and location choice of various urban sensors and location-based services, which will have a direct impact on data privacy in the public interest.

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Key Words: Spatial Data Privacy, GPS, K-anonymity, Privacy Impact Analysis

## UNDERSTANDING THE PSYCHOLOGICAL BENEFITS OF WALKABLE AND ACCESSIBLE NEIGHBORHOODS USING SOCIAL MEDIA

Abstract ID: 514

Individual Paper Submission

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Given the increasing popularity of urban lifestyle and growing awareness of environmental issues caused by suburbanization, making urban environments inclusive, healthy, livable, and salubrious has become a critical issue for urban planners. As one of the planning practices to make urban healthy, urban planners and scholars have stressed the importance of making communities walkable and accessible. Walkable design can bring in manifold benefits to communities in terms of social, economic, and environmental aspects. However, the impact of walkable and accessible design on the level of community-wide psychological well-being has been still understudied. Therefore, this case study is designed to understand the impact of accessible and walkable neighborhood design on the psychological well-being of urbanites while considering other neighborhood contexts in the City of Los Angeles.

This study used tweets to measure the level of mood as a proxy for psychological well-being; using sentiment analysis, this study translates tweets into the level of positive mood. This study also accounts for other neighborhood characteristics, such as the level of walkability, the number of consumer-facing businesses, violence, natural places, and socioeconomic status. Using geospatial analysis, this study proposes three different models to understand the relationship between the level of psychological well-being and the number of accessible local businesses and walkability.

The first set of the models revealed that communities with better walkability and more accessible local businesses are likely to support the better psychological well-being of people who live in or visit the environments when it is compared with less walkable and accessible communities, controlling for other neighborhood characteristics. Moreover, the second set of the models found that third places not only within communities but also in surrounding neighborhoods have an important role in the psychological well-being of urbanites, holding other variables constant. Lastly, the presence of consumer-facing businesses in the surrounding neighborhoods can be more important for people who live in or visit less walkable communities.

This study highlights the importance of making communities walkable and accessible for better life quality of urbanites. Also, this study contributes to the existing literature by providing empirical findings that support the proposed impact of walkable design on mental health and psychological well-being.

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Key Words: Walkability, Psychological Well-Being, Social Media, Twitter, Sentiment Analysis

## URBAN-SEMANTIC COMPUTER VISION: A FRAMEWORK FOR CONTEXTUAL UNDERSTANDING OF PEOPLE IN URBAN SPACES

Abstract ID: 530

Individual Paper Submission

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Increasing computational power and improving deep learning methods have made computer vision technologies pervasively common in urban environments. Their applications in policing, traffic management, and documenting public spaces are increasingly common (Ridgeway 2018, Coifman et al., 1998, Sun et al., 2020). Despite the often-discussed biases in the algorithms' training and unequally borne benefits (Khosla et al., 2012), almost all applications similarly reduce urban experiences to simplistic, reductive, and mechanistic measures. There is a lack of context, depth, and specificity in these practices that enables semantic knowledge or analysis within urban contexts. This paper will critique existing uses of artificial intelligence and computer vision in urban practices to propose a new framework for understanding people, action, and public space.

This paper revisits Geertz's (1973) use of thick descriptions in generating interpretive theories of culture and activity and uses this lens to establish a framework to approach evaluating the varied uses of computer vision technologies that weigh meaning. By discussing cases of implemented examples of urban computer vision—from LinkNYC and Numina's urban measurements to the Detroit Police's use of DataWorks Plus's facial recognition technology—we propose a framework for evaluating the thickness of the algorithm's conclusions against the computational method's complexity required to produce that outcome. Further, we discuss how the framework's positioning may differ between different users of the technology, from engineer to urban planner and policymaker, to citizen.

This paper also discusses how the current use and training of deep learning algorithms and how this process limits semantic learning. Through this description, this paper proposes two methods by which technology developers can gain a thicker understanding of activities in urban spaces: a priori by creating a spatio-specific library that contains descriptions of actions that are distinct and calibrated to urbanism; and a posteriori whereby an algorithm clusters similar activities from recorded images and humans verify and label tag these clusters with thicker descriptions. Further, we discuss how the latter method could be a method by which we can identify new, unknown meanings from existing phenomena, similar to how William H. Whyte (1980) identified both repetitive behaviors and eccentric quirks in small urban space.

This paper contributes to the critical conversations regarding the proliferation of artificial intelligence by challenging the current applications of these technologies in the urban environment by highlighting their failures within this context while also proposing an evolution of these algorithms that may ultimately make them sensitive and useful within this spatial and cultural milieu.

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Key Words: Artificial Intelligence, Emerging Technology, Computational Methods, Computation and Society, Smart Cities



## THE SOCIAL EXPOSURES OF GENTRIFYING NEIGHBORHOODS

Abstract ID: 565

Individual Paper Submission

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Does gentrification pave the way for more diverse social mixing? Existing research is ambivalent about its influence on reducing race and class segregation. Schoon (2001) cites potential benefits such as better resources, a stronger local economy, social cohesion, and potential economic opportunity as. However, the realities of social mixing have been questioned in multiple respects. Many have argued that social mixing is a rhetorical instrument for gentrification (Huning and Schuster 2015; inter alia) while the social “tectonics” of neighborhood dynamics remain parallel and un-integrated (Robson and Butler 2001). Other quantitative research (Freeman 2009) has shown that while gentrification does not precede a decrease in diverse mixing, it also may not increase it.

New forms of data can contribute to this debate through describing a wider range of social activities and social mixing opportunities previously unaccounted for in traditional residential census data. Using high density anonymized mobile application GPS data in Chicago that shows dynamic mobility activity, this study examines whether gentrification relates to more opportunities for racially and socioeconomically diverse interactions. It characterizes these opportunities through addressing the following questions: How does the duration and frequency of interaction potential, which both signal stronger potential for social bonds, vary between different groups of people? Do members of the same racial and socioeconomic group or residents of the neighborhood have longer and more frequent interactions? Do some groups have more exposure to diversity than others, as suggested by previous research (Wang et al. 2018)? This research has both methodological and policy implications: It can allow us improve our measurement social-spatial processes as scale as well as address questions of the social impacts of gentrification.

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Key Words: mobile phone data, gentrification, social mixing, segregation

## AN URBAN INFORMATICS RESEARCH FRAMEWORK FROM AND FOR URBAN PLANNING

Abstract ID: 571

Individual Paper Submission

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The emergence of urban informatics attributes to many technological advancements in information and communication technology (ICT) and Internet of Things (IoT). While these applications largely improve people's daily life, they also generate enormous data for urban researchers. Urban informatics is a growing interdisciplinary academic field involving urban planning, information science, computer science, and data science. However, as an emerging interdisciplinary area, the academic has not yet reached a consensus in answering a critical question: which science, if any, should urban informatics belong to? Is it computational social science or applied data science? Albeit the nuanced difference, they are two sides of the same coin. The former addresses urban problem-solving more than the computational means, while the latter is more focused on the data and effective methods to transform data to information in the urban setup (Kontokosta, 2018).

Early definitions of urban informatics allude to the second viewpoint that it should be a computational social science. Foth defines urban informatics as an emerging interdisciplinary field in which researchers understand people and places in cities using data from locative media and mobile technology (Foth, 2009). Based on Foth's definition, Kontokosta defines urban informatics as studying urban phenomena through a data science framework and addressing domain-specific urban challenges (Kontokosta, 2018). Thakuriah et al. unpack the domain-specific urban challenges in their definition. They state that urban informatics should analyze and interpret big urban data to develop dynamic resource management strategies, improve received wisdom, promote public engagement, and facilitate urban planning policy decision-making (Thakuriah et al., 2017). In the urban informatics context, big urban data extends the focus on the massive volume in big data and places a particular emphasis on its inclusion of spatiotemporal information (Batty, 2013). Other scholars have pointed out that compared to traditional survey-based data, big urban data is usually passively collected without a predefined purpose but can potentially be used in research by adopting data mining and machine learning techniques (Chen et al., 2016).

Albeit the emphasis on the urban perspective, the body of urban informatics literature has mainly focused on using new big urban data and computational techniques in solving urban problems. Few have applied a theoretical lens to urban informatics and examined its root in urban research. Without a clear understanding of where urban informatics posits in the scholarship, researchers might risk losing the essence of its urban problem-solving origin in their work and find themselves drowning in the data ocean and blinded by the buzzy technologies. To bridge this knowledge gap, we propose a research framework for urban informatics studies by tracing its origin in the urban planning scholarship. We identify four major topics through a review of urban informatics research: human activity, human/environment interaction, quality of life, and public participation. We then identify seven commonly used techniques in computer science, data science, and information science. We find the dominant planning theories that articulate the conceptual framework in previous empirical work for each topic. In particular, rational planning theory, complexity theory, and the engineering science tradition are found in close relation to urban informatics research in human activity and human/environment interaction. The just city theory, communication action theory, and crowd wisdom tradition play important roles in the research on the quality of life and public participation. By proposing the research framework, we argue that urban informatics follows the rational planning paradigm in the information era that nurtures new opportunities to build smart cities but bears long-standing data-determinism and technocracy challenges. Future urban informatics researchers should place enough emphasis on the planning origin in their empirical work and reclaim the problem-solving essence in times of confusion.

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Key Words: Urban Informatics, Urban planning, Technology, Society

## **WORKING IN THE SMART CITY**

Abstract ID: 576

Individual Paper Submission

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Not since the era of the family farm has such a large fraction of the employed population worked from home. The spike in remote work due to COVID-19 pandemic is temporary, but it highlights an underlying trend. Remote work at home and in “third” places such as cafes, hotels, and airports has been enabled by access to wireless networks and mobile cloud computing collaboration software. Such a spatial and temporal fragmentation of related work activities is not available to everyone, but it affects an increasing fraction of the population. It features prominently in popular images of the future of work. This paper examines how the relationship between space, technology, and the workplace has developed over time, how power relations embedded in these overlapping physical and cyberspaces constrain our behavior, and what novel ethical and equity concerns arise in the emerging smart city. It relies on original interview and observation data from the New York (USA) metropolitan area augmented by national statistics. Findings include identification of multiple points where control of overlapping physical and cyberspaces either enables or prevents the fragmentation of work activities. These carry important implications for those who work in the smart city and those who design it.

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Key Words: work, smart city, time use, activity fragmentation

## **TRANSFER LEARNING USING SATELLITE IMAGES FOR TRAVEL DEMAND MODELING IN DISADVANTAGED REGIONS**

Abstract ID: 581

Individual Paper Submission

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Accurate prediction of transport demand and the competitive and complementary relationships among transport modes are crucial inputs for the public authorities to plan transport infrastructures and for the transport firms to determine what services to provide (Tsekeris and Tsekeris, 2011). Today, travel demand estimation still primarily relies on the collection and analysis of travel survey data. However, acquiring reliable travel survey data faces some

critical challenges: firstly, the collection of high-quality survey data is usually costly; secondly, the response rates of large-scale surveys such as the National Household Survey (NHTS) have been falling (Lawson, 2018). This challenge is particularly striking in the disadvantaged area, which consequently leads to the data-deprivation problem in these regions.

Given the difficulty in collecting high-quality survey data, it is crucial to find alternative data source for travel behavior estimation. With this regard, this research considers satellite images and OpenStreetMap (OSM) images as potential data for travel demand estimation, as these passively collected images have increasingly become widely available and were proven to have great potential for estimating socio-economic indicators such as poverty outcome with the adoption of machine learning techniques (Jean et al., 2016). Satellite images contain plentiful landscape information that could be correlated with people's travel behaviors. In fact, a sizable amount of existing literature has shown that urban form, urban design and built environment can impact people's travel habits. The novel convolutional neural network (CNN) techniques enable automatic extraction of features that are predictive of people's travel behavior from the satellite images, thus can greatly facilitate travel behavior prediction particularly when the survey data is absent.

On the other hand, acknowledging the regional disparity that rich regions are usually flooded with data while poor regions often lack for data, it is important to find approaches that can utilize the knowledge learned with the abundant data in the rich region to assist the prediction of travel behavior in the poor areas where the travel demand data is often unavailable. Luckily, this goal can be achieved with a transfer learning technique. In this study, we first use a CNN model to predict the car and non-car mode share in the high-income regions using the aerial and OSM images, with an autoencoder added to the classic CNN model to make the feature representation transferable. We then fit the model trained in the high-income regions to the images of the low-income regions to predict the car and non-car mode share in these regions by fixing the common layers between the rich and poor regions and retraining the layers that are specific to the poor regions.

The results show that the standard transfer learning approach can be effectively adopted for travel behavior modeling. With aerial and OSM images, transfer learning at the census-tract level for the estimation of car and non-car mode share in the low-income regions can explain a large amount of the total variation of the dependent variable. If the basic socio-economic data is added to the model, the model performance is even better, exceeding the traditional models using only the socio-economic data as inputs. Our results also show that transferring at the census tract level is most effective, compared with transferring at the city-level or state-level. Overall, this work demonstrates that the aerial images in combination with deep learning approaches can relieve the travel data deprivation in the poor areas, at least based on the NHTS 2017 data set. By using the aerial images to infer people's travel demand, the reliance of policymakers on conducting survey will be largely reduced, particularly in the poor regions.

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Key Words: satellite imagery, travel demand modeling, convolutional networks, transfer learning

#### INFILL OR RESILIENCE? ESTIMATING THE LOSS OF URBAN TREE CANOPY USING AUTOMATED FEATURE EXTRACTION OF SATELLITE IMAGERY

Abstract ID: 586

Individual Paper Submission

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The city of San Antonio in Texas is Bexar County's urban center and the seventh largest city in the United States. Between 2011 and 2016 the city's population grew by 10 percent to reach a total of 1,439,358 because of rapid urbanization, particularly in existing neighborhoods in areas around the city's urban core. For the past decade, in most of these areas, several infill projects were added. Infill development studies largely focus on the benefits of infill development including enhancing the conservation of environmental resources and economic investments and strengthening social fabric by absorbing growth into existing communities. In historic neighborhoods, the city of San Antonio imposes additional guidelines stemmed from the Secretary of the Interior's "Standards for the Treatment of Historic Properties" including preserving some degree of pervious land. Nevertheless, and despite the evident rapid urbanization of its 31 historic neighborhoods, the city fell short on adopting measures to estimate and mitigate the impacts of urbanization on resilience, particularly the changes in pervious land covers and urban tree canopy (UTC). Due to its critical role in tempering land surface temperature (LST) that causes surface urban heat island (SUHI) effect, any loss of UTC could have major consequences. In urban areas in particular, SUHI poses a threat to human health and thus maintaining UTC coverage helps to improve health and reduce energy consumption in cities.

This paper questions whether standard federal guidelines in historic neighborhoods have failed to address the loss of pervious land covers and UTC. In San Antonio Dignwity Hill historic neighborhood, trees tend to be old and mature. These trees often capture, filter, and store more precipitation than typical UTC, thus they regulate the volume of runoff water, which protects water quality of watersheds and surface waters. They also preserve air quality, mitigate climate effects, provide spiritual and cultural resources, and offer unparalleled opportunities for passive recreation. As such, any decrease in UTC of old and mature trees raises an alarm to climate change as it increases SUHI effect in the city's urban center.

With the advanced geotechnology, surface types including UTC can exclusively be determined by aerial or satellite-based remote-sensing techniques. Availability of satellite imagery through open sources of Texas Natural Resources Information System (TNRIS), spatial analysis of geographic information systems (GIS), and standardized interpretation techniques has today become simple to implement by researchers and local governments. This study utilized an automated feature-extraction method using Object-Based Image Analysis (OBIA) tools that were integrated in eCognition Developer 9.1 software. Three types of fine spatial resolution (0.5 m) images were analyzed including 2010 National Agriculture Imagery Program (NAIP), 2015 Texas Orthoimagery Program (TOP), and the 2010 Strategic Mapping Program (StratMap) LiDAR point data. A feature-extraction was created using a rule-set workflow in eCognition, a programmed process to segment and classify land cover of Dignowity Hill historic neighborhood. By comparing 2010 and 2015 results from the two satellite imageries, the author detected the locations and changes -in square foot unit- in pervious land cover and UTC. The automated model was also assessed for accuracy and future improvement.

The results yielded a 38.1 percent decrease in UTC area, and an overall 52.6 percent decrease in pervious land cover, which should be mitigated by adopting more strict Low Impact Development (LID) guidelines. The error matrix of the eCognition process showed an 81 percent accuracy. The study recommends integrating additional rules and thresholds in eCognition workflow to improve the detected objects' boundaries, enhance the level of accuracy, and thus the results. Nuisances and challenges of mapping multifaceted elements in complex urban settings of historic neighborhoods are also discussed.

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Key Words: Object-based image analysis (OBIA), Light Detection and Ranging (LiDAR), Historic districts, Urbanization, eCognition

## THE EFFECT OF COVID-19 ON SALES REVENUE IN SEOUL, SOUTH KOREA: AN AGENT-BASED MODELING APPROACH

Abstract ID: 606

Individual Paper Submission

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COVID-19 or coronavirus disease 2019 pandemic has struck the world. As of March 2021, the cumulative confirmed cases amount to 125.42 million in 213 countries, among whom more than 2.75 million have died. The pandemic has changed our economy. Sudden modifications of conventional routines, such as adopting remote-work strategies, may have lowered workers' effectiveness and hence lowered productivity. Some industries, such as manufacturing, are unable to adapt to the new norm at all. In the second quarter of this year in the United States, gross domestic product (GDP) declined by 32.9%, and the World Bank projects that the global economy will shrink by 5.2% in 2020.

While macroeconomic projections have begun to be presented cautiously, the microeconomic consequences of COVID-19 in everyday lives—especially changes in individual consumption activities—have been relatively less studied. COVID-19 has brought about new customer behaviors. The demand for necessities of life, essential goods, and groceries has increased as a part of panic buying and online shopping has become preferable to traditional methods.

Studies of this type, however, have been made on the basis of descriptive statistics of data collected for various periods, such as simple before-and-after comparisons. From these, it is not possible to understand more direct and detailed consumer behaviors in response to the spread of COVID-19 on a daily basis, controlling for all other factors that simultaneously affected the consumption. How does the information on daily confirmed cases of COVID-19 in the neighborhood or in the country alter individual consumption behavior in retail sectors? Also, how do the preventive measures enforced by public authorities alter individual consumption behavior in retail sectors? And do those behavioral changes differ by age group?

Against this backdrop, we investigate the effect of COVID-19 —the case confirmations and the relevant public measures—on daily consumption behavior of different age groups in food-service retail sector, using agent-based modeling. Agent-based modeling is a computational tool that enables simulation of complex geographical systems within which individuals can be centered and reacting to environments.

To the best of our knowledge, this study is the first attempt to assess the immediate response of consumers to COVID-19 outbreaks with a big data on the daily credit-card transaction and records of a public alert system. The study site is Seoul, South Korea, where the pandemic swept through in the initial phase of global spread and where reportedly an early control has been successfully achieved. The study period is from January to December, 2020.

Support: MOE (KEITI) 2020002770003, and Creative-Pioneering Researchers Program of Seoul National University

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Key Words: COVID-19, food-service businesses, retail sales revenue, human behavior, agent-based modeling

## IMPACT OF COVID-19 ON BIKE-SHARING USAGES IN SEOUL, SOUTH KOREA

Abstract ID: 625

Individual Paper Submission

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The COVID-19 pandemic and social distancing restrictions have had a significant impact on urban mobility. As micro mobility offers less contact with other people, docked or dockless e-scooters and bike-sharing have emerged as alternative urban mobility solutions during the pandemic. Despite previous studies on the benefits of micro mobility and the impact of COVID-19 on other public transportation services (Shaheen & Chan, 2016; Griffin & Jiao, 2019; Wang & Zhou, 2017; Bai & Jiao, 2020), little empirical research on the relationship between diverse factors in urban environments and micro mobility ridership during the pandemic has been conducted. In recent years, data collections of real-time dynamic spatial information (telecommunication floating population, metro, bus, and micro mobility ridership) have become possible in a few cities and have gained attention in smart mobility research. However, there is a lack of research on how real-time spatial-temporal movements of the population affects micro mobility ridership during the pandemic. To address this gap and the importance of micro mobility as an alternative public transportation solution during and after COVID-19 in urban areas, this research aims to study how COVID-19 affects bike-sharing services and how other factors impact bike-sharing ridership. The data in this study was analyzed in two phases. First, we investigated the spatial-temporal patterns of docked bike-sharing service in Seoul, South Korea by utilizing daily urban big datasets. Second, we conducted a stepwise negative binomial (NB) panel regression model that tested the consequences of 1) climate factors, 2) transportation factors, 3) land use factors, 4) social factors, and 5) COVID-19 factors on the two key indicators of bike-sharing ridership - total number of ridership and total time duration of ridership - for 488 days between March 1, 2019 and June 30, 2020.

This study empirically tested the consequences of the COVID-19 pandemic on bike-sharing ridership. When the passenger volumes of other public transportation modes decreased from the direct impacts of the COVID-19 pandemic, Seoul bike-sharing ridership was empirically analyzed to show increases during the COVID-19 period. Our results also showed that open space areas and green infrastructure had statistically significant positive impacts on bike-sharing usage. Therefore, open space and green infrastructure strategic planning should be prioritized to develop better urban environments for bike-sharing usage. Especially during COVID-19 and post COVID-19, people are more likely to visit open spaces and prefer green infrastructure in urban areas where there is less close contact with other people. Moreover, this study is significant in that it utilized real-time telecommunication floating population datasets. Compared to registered population factors, real-time telecommunication floating population had a significant positive relationship with both bike trip count and trip duration. Traditional urban planning data analysis usually utilizes census or registered population data which does not represent peoples' actual movements. Registered population data is not enough to explain how people move around or to study direct impacts of spatial and temporal patterns of population on micro mobility ridership. Specifically, because there were not any city-level lockdown social distancing measures in Seoul during COVID-19, consideration of real-time big urban data from

telecommunication floating population was able to explain the consequence of social factors on bike-sharing ridership in this study. Also, this research considered other big urban datasets to test the consequences of climate factors and transportation factors on bike-sharing usage. Thus, diverse aspects of urban environments that might affect bike-sharing ridership were analyzed in this study. As micro mobility has emerged as an alternative urban mobility solution, these findings could offer useful guidelines for emerging shared mobility planning during and post COVID-19 in many cities.

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Key Words: COVID-19, Bike-Sharing, Telecommunication Floating Population, Urban Environment, Spatial-Temporal Analysis

#### **AN ARTIFICIAL INTELLIGENCE-AIDED AND DATA-DRIVEN DESIGN (AIDD) FRAMEWORK FOR URBAN DESIGN COMPUTATION**

Abstract ID: 631

Individual Paper Submission

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The recent advances in artificial intelligence (AI) and big data provide new opportunities for urban design computation. An increasing number of studies have been emerging in this field adopting these new techniques and data, which can be generally categorized into two research streams based on their focus: design optimization studies that focused on generative design with advanced AI search algorithms such as genetic algorithms, and data-informed design studies that used big data such as Streetview images to understand the site to inform design. But both streams encountered difficulties in their representation and process, two major parts in design computation. Design optimization studies often struggled with the symbolic representation limited for the complex physical form, and the shortage of well-developed simulation models necessary for the design process, especially perceptive or complex performance models. Data-informed design studies, on the other hand, usually either adopted the parametric design that has the same representation issue and unclear evaluation criteria for the design generation process, or relied heavily on manual representation and design process. A few studies in the field tried to use the raster (sub-symbolic) representation to better represent physical form in the design process, but generated designs in raster were often hard to use even after their direct conversion to vector. Moreover, both streams focused on one of AI and big data, without integrating the two technological advances to address the emerging need to synthesize data, science, and design: Design optimization studies often relied on simulated data based on available scientific models rather than more informative and real big data in design generation, and data-informed design studies mostly had difficulty in applying scientific knowledge from big data analysis to guide the design process. This study aims to fill the research gap by developing an artificial intelligence-aided and data-driven design (AIDD) framework. The AIDD framework adopts AI techniques to facilitate representation conversion, learn scientific models from big data, and apply the data-driven models and expert knowledge to guide the design process, thereby integrating data, science, and design. The framework contains six stages. In the problem formulation stage, design



objectives and reference areas are defined. In the data preparation stage, physical form vector data and performance data are collected, integrated, and converted to a training dataset with form raster as features and performances as labels. ResNet, a widely used deep learning method, is adopted to learn a raster-vector conversion model and performance models based on the training dataset in the model learning stage. In the design generation stage, NSGA-III, a well-known multi-objective optimization method based on genetic algorithms, is used to find equally optimal designs with learned performance models as objective functions and expert knowledge as constraints. Those raster designs are then converted to vector using the learned conversion model in the design reconstruction stage, which are further presented to stakeholders in the design decision stage. The AIDD framework will be demonstrated in a hypothetical urban design case in New York with improving safety perception and mitigating urban heat island effect as design objectives. The dataset includes the physical form, safety perception, and surface temperature collected from the city open data portal, MIT Place Pulse dataset, and Landsat imageries. A total of 30,000 training samples of 512 x 512 m size will be drawn from the dataset for model learning. Urban design schemes will be produced in vector as equally optimal solutions to the design objectives. The proposed AIDD provides a new and comprehensive framework for urban designers to better utilize and synthesize the power of both AI and big data in generating well-represented and highly-performative design schemes to support design decision making.

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Key Words: Urban design computation, Data-driven design, Form representation, Deep learning, Multi-objective design optimization

#### **REKINDLING HENRI LEFEBVRE'S RHYTHMANALYSIS: MEASURING DISASTER RECOVERY RHYTHMS WITH SOCIAL MEDIA POSTS FROM THE U.S. ATLANTIC TERRITORIES**

Abstract ID: 642

Individual Paper Submission

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Rhythmanalysis examines repetitive patterns found in nature and human-related phenomena as recorded through the Arts, Humanities, Social Sciences, and the Physical Sciences. Urbanist Henri Lefebvre's 20th Century explanations on everyday living – including the use of Rhythmanalysis as a research theory and method – are examined in the second decade of the 21st Century for their relevance and applicability. This open-ended, participant observation research initiative explores how everyday people from two contrasting, complex, and peripheral societies – namely Puerto Rico and the United States Virgin Islands – resiliently respond to loss and uncertainty following Hurricanes Irma and Maria (2017). The aim is to rethink ordinary people's creative capacity to organize disaster recovery initiatives individually and collectively, notwithstanding the day-to-day challenges. Social media platform capabilities, millennial ingenuities, timely donations by mega-star philanthropists, and indigenous knowledge systems figure prominently. Unconventional examples of social entrepreneurship supplement for governmental, material, and financial shortcomings. Near real-time analyses of conceived, perceived, imagined, and lived actions

clarify the complex realities of human impulses and exertions over time. Dualistic scenarios such as observed graceful resilience and character, or unforeseen disruption, are common. Both case studies serve as living laboratories for finding common ground amidst difference through social media dialogue, sensory experiences, and creative problem solving. Distinct and similar rhythmic patterns and creative opportunities are observed in the thirdspace, a definable void between fixed rhythmic beats, acts, or occurrences. Research findings support the invaluable bottom-up disaster recovery contributions by ordinary people through increasingly independent, innovative, and sustainable community rebuilding processes and practices. This work contributes to the growing toolbox of research methods associated with the Indigenous Planning paradigm.

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Key Words: Indigenous Planning, Disaster Recovery, Nature, Culture, and Resilience, Social Media Usage, Millennial Leadership

#### **PROMOTING HEALTH SOCIAL NORMS IN ONLINE COMMUNICATIONS IN COVID-19: A DATA-DRIVEN SYSTEM DYNAMICS MODELING**

Abstract ID: 651

Individual Paper Submission

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Social norms are the shared belief systems within a social group that provide information on how to behave and manage relationships (Lapinski and Rimal, 2005). Health-related social norms can promote COVID-19 preventive measures, e.g., wearing masks and social distancing, by influencing individuals' compliance with the adoptions of these measures (Olivera-La Rosa et al., 2020; Ridout and Campbell, 2014). In the online discussion about COVID-19 preventive measures, health-related social norms can influence individuals' social media messages on the content, attitudes, and behaviors related to sharing and adhering to related online information (Rösner and Krämer, 2016). Individuals can perceive the online social norms from multiple sources, especially their social network including the users they have followed. Specifically, individuals perceive online social norms based on the received normative information, which contains the belief towards specific issues and is widely regarded as normative (Rogers et al., 2019). However, some widely accepted "normative" information in their networks is not factual. Individuals may easily perceive the counterfactual information as social norms and their attitudes towards specific issues (e.g., preventive measures of COVID-19) could then be misguided. To mitigate this potential condition, it is necessary to understand the relationships between the factors of normative information (i.e., virality and the attitudes contained in online messages) and the mechanisms of how these factors influence individuals' information-related behaviors. Specifically, virality refers to features of message spreading while the contained attitudes describe users' belief towards related topics.

Therefore, this research aims to explore: how are individuals' attitudes and information dissemination behaviors toward COVID-19 prevention measures influenced by the virality and contained attitudes of the perceived normative information in their individual social networks? We utilized System Dynamics as the basic model, which included normative information that was factual or misinformation. The model was established based on the Twitter messages about the prevention measures of COVID-19, and the tweet dataset was collected with Twitter API. In general, the System Dynamics model consists of the attitudes and virality factors of online information from Twitter users and the perception of social norms from their social networks. With this model, we quantified and evaluated the relationships in the research question by extracting and analyzing the tweets from general users, their peer users, and the whole discussion regarding the COVID-19 preventive measures, and we mainly analyzed the contents and data volume of these tweets.

We expect to identify the relationship between (i) Twitter users' information dissemination behaviors and attitudes about the COVID-19 preventive measures and (ii) the attitudes and virality factors of messages from the Twitter users' peers and the general discussion about the COVID-19 preventive measures. This research provides a reference for future practices that aim to help the public form appropriate perceptions of health and other crisis events and encourages them to perform preventive measures. This research advances existing crisis communication studies because it examines the feasibility and applicability of improving online crisis communication from the norm perspective instead of the information level, which can essentially influence the public's crisis perception and their response behaviors. With System Dynamics modeling, our study offers a novel approach for urban informatics studies to model online information and the social media population in the complex digital world.

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Key Words: crisis communication, social norm, System Dynamics, Twitter

#### **MASSIVE LAND-USE SUITABILITY ANALYSIS BASED ON PARALLEL COMPUTING: A CASE STUDY IN ORANGE COUNTY, FLORIDA**

Abstract ID: 652

Individual Paper Submission

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#### Research Question

Land-use planning is one of the most influential planning routines in directing and managing the development of a city. Although its introduction dates back to the late 1960s, Geographic Information System (GIS)-based suitability analysis still plays a crucial role in contemporary practices of land-use planning. The notion of suitability wins favor

with land-use practitioners because of its capacity for effectively synthesizing community values, planners' expertise, and results from GIS analysis. However, the time cost of performing such analyses conventionally—working with GIS software on a desktop computer—largely constrains land-use practitioners' ability to sift through a variety of alternative future land-use scenarios to make better informed decisions about land use. To help overcome this obstacle, I present a case study integrating parallel computing with land-use suitability modeling. The noticeable speed gain in rapidly simulating large numbers of land-use scenarios demonstrates a promising application of the technology in land-use planning.

## Methodology

This study chose the Land-Use Conflict Identification Strategy (LUCIS), developed by Peggy Carr and Paul Zwick at the University of Florida in the early 2000s, as a platform on which to integrate high-performance computing with land-use suitability analysis. LUCIS is a goal-driven GIS model—initially developed with ModelBuilder in Esri ArcGIS software—that supports land-use decisions through measuring and analyzing suitability based on various sets of criteria for different land-use types. To implement parallel computing in the LUCIS model, I first developed Python for Land-Use Suitability Analysis Tools (PyLUSAT), a cross-platform open-source Python package that contains a series of vector-based functions for geospatial analysis. Built on these functions, a set of analyzing modules was developed for each land-use type that: (1) transforms LUCIS from raster-based to vector-based GIS; (2) empowers the model to work across different operating systems; and (3) can be run in parallel via any pythonic and/or system-specific means.

The computational efficiency raised by parallel computing also enables fast simulation of many future land-use scenarios. Since LUCIS uses the Analytic Hierarchy Process (AHP) to perform multiple criteria decision making (MCDM), one possible approach to conduct massive simulation is through randomizing the priority vector (a vector of weights) generated by AHP. Moreover, to allow concurrent data connections and to secure high-speed data reading, the study introduced the PostGIS/PostgreSQL database as the mechanism for both spatial and non-spatial data storage.

## Case Study

A job that involved 45,909 land parcels in Orange County, Florida, was assigned to the parallel-computing-enhanced version of LUCIS—pLUCIS. Specifically, I tested and compared the performance of running this job in both a symmetric multiprocessing (SMP) environment—a quad-core desktop computer—and a cluster computing environment—a computing cluster with ninety-five cores on HiPerGator (a high performance computing cluster) at the University of Florida.

## Implication

It cost roughly five and a half minutes to run the LUCIS model on HiPerGator for the study area. The substantially diminished runtime for modeling established the viability of integrating parallel computing into land-use suitability analysis, which in turn assured that the method I implemented is broadly replicable. Moreover, during these 5 and a half minutes, I conducted a simulation of 120 scenarios within the study area. This capacity of massively simulating alternative scenarios gives rise to a new strategy of practicing land-use planning that is based on probabilistic models and statistical inference and can be applied on multiple scales. For individual parcels, the method can be used for site search/selection. And on a regional scale, it can be used to support the formulation of land-use plans for entire municipalities.

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Key Words: land-use suitability modeling, probabilistic future scenarios, high-performance computing, python, open-source software

## **PREACT: PLANNING FOR RESILIENCE AND EQUITY THROUGH ACCESSIBLE COMMUNITY TECHNOLOGY**

Abstract ID: 707

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The climate crisis is not only a crisis of nature, but also of people, understanding, and action. Today, many of our most pressing challenges lie around information, decision-making, collaboration, and design for inevitable adaptation. Data analytics can have a significant impact on helping the public response, but translating data insights into effective policies with public support has been challenging, especially when trade-offs are involved. It's essential that we develop ways to better communicate the trade-offs associated with planning for climate change – one way to do this is by visualizing the results in a way that is accessible to the public.

In Philadelphia, a city that we expect will be much hotter and wetter in the future due to climate change, low-wealth communities face the very real and on-going legacy of disinvestment, discriminatory land use, and exclusionary planning combined with the pressures of rapid gentrification making it hard to focus on issues around climate change. Many residents in these neighborhoods are dealing with a wide range of pressing day-to-day challenges including, but not limited to, under and unemployment, difficulty paying rent and mortgages, evictions, food access, rising utility costs, underperforming neighborhood schools, childcare access and costs, overabundance of vacant lots, crime and drug use, illegal short-dumping, lack of access to parks and recreation, and health concerns.

The types of planning changes we make today for a sustainable future often don't align with very real community concerns — especially in low income communities. Scientific research is pointing to the severity of urban heat island effects, the climate pressures on aging housing and civic infrastructure, the need for a transition to distributed and renewable energy resources, the challenge of weatherization of buildings, and the need to invest now in resilience planning such as green space and flood protection and mitigation [1-2]. However, residents may view the focus on long-range planning and climate as ignoring their immediate needs, and thus feel further excluded from planning decision-making and priority setting. Or they may perceive investments in sustainability as contributing to green gentrification [3-5].

Our research bridges disconnects among academics, planners, city officials, and residents by building trust through partnerships and developing a framework for a community-centered collaborative planning tool. PREACT (Planning for Resilience and Equity through Accessible Community Technology) is a multipurpose and multi-scalar climate preparedness and neighborhood planning software application informed by community need and community assets. PREACT takes into account the needs and experiences of community members, designing a model of technology co-production that addresses community needs and allows for the integration of social and scientific data for more informed decision-making. PREACT enables users to specify a geographical area of interest, choose from and weigh the importance of a range of factors relevant to a climate planning concern, and generate a map indicating the areas of greatest vulnerability. PREACT also helps identify ways to systematically address vulnerabilities through support for existing community assets, opportunities to reinvest in social, ecological, and physical infrastructure in communities, better local enforcement of existing public health regulations, and changes

in land-use decisions and planning. The inclusion of citizen groups in the creation of PREACT ensures that the data and assumptions that underpin PREACT are more representative of community need and informed by lived experience. Through the process of creating and using PREACT, we open up opportunities for a more deliberative dialogue among citizens, scholars, government, and business about needs and preferences for policy interventions. This project creates a technological tool that empowers citizens and makes the government more responsive to community needs.

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Key Words: equity, climate, community-based, justice, data

#### ADDRESSING THE METHODOLOGICAL SHORTCOMINGS OF TRANSIT-INDUCED GENTRIFICATION RESEARCH: A CASE FOR COMPLEX SYSTEMS THINKING

Abstract ID: 733

Individual Paper Submission

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The role of public transportation has shifted over the last two decades, as planners and policymakers increasingly promote new transportation infrastructure as an economic growth tool. Because of this, transit infrastructure is valued beyond mobility, as it is successfully used to promote density, revitalize urban cores and foster a particular lifestyle. This success however has also positioned new infrastructure as driving neighbourhood change and gentrification, leading to the evolution of literature that argues for the phenomena of transit-induced gentrification. This concept can be defined as the process wherein new transit infrastructure, paired with transit-oriented development, induces neighbourhood change - characterized by socioeconomic upgrading and the eventual displacement of lower-income residents who traditionally benefit most from improved transit access (Dawkins & Moeckel, 2016; Padeiro et al., 2019). As this body of literature grows however, research has become fragmented, with scholars arguing that inconsistent methodological approaches, dominated by quantitative studies, have made comprehensive understandings of transit’s role in gentrification difficult (Barton, 2016). In response to these criticisms, researchers are calling for the integration of qualitative and mixed-methods approaches into this field, highlighting the importance of lived experiences in conversations of transit-induced gentrification (Padeiro et al., 2019). With transit-induced gentrification becoming more prevalent across large and increasingly mid-sized cities, and a lack of methodological consistency, our research asks: how can complex systems thinking be used to better understand the process of transit-induced gentrification? And further, can this methodological approach be used to produce tangible recommendations for planning practitioners?

The formal study of complex systems is becoming increasingly interdisciplinary; used to gain a deep understanding of the components contributing to a problem to generate targeted solutions to effectively alter the system's outcomes (Moffatt & Kohler, 2008; Tulier et al., 2019). In this research, we argue that a complex systems approach can be used to address 'wicked' planning problems, such as transit-induced gentrification. To test this, we undertake an in-depth analysis of scholarly literature, policy and popular media and apply a systems thinking lens to produce a number of feedback loops that break down transit-induced gentrification into its social, political and economic components. We use this methodology to illustrate the interconnectedness of the system and to demonstrate how small oversights in the planning and development process of new transit infrastructure can fuel transit-induced gentrification in a given city. We also use these feedback loops to provide recommendations useful for cities considering new transit infrastructure to minimize negative externalities to low-income and marginalized groups.

Through our analysis, we found that systems thinking is a strong tool for research exploring transportation's role in driving neighbourhood change. Beyond identifying the problem - an already complicated task in this area of study - systems thinking provides a tool to create actionable change. Ultimately, complex systems thinking can help planners and policymakers build targeted interventions tailored to the specific needs of the populations in question which leads to better outcomes than blanket policy derived from more general quantitative methodologies. This is significant for gentrification research, but also has the potential to be applied to a plethora of complex planning problems. Overall, our research functions to illustrate the potential a complex systems methodology has to become a strong resource for planning practitioners and theorists alike.

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Key Words: Systems thinking, gentrification, methodology, light-rail transit, Planning research

#### **WALKABILITY FOR EVERYONE? RELATIVE ASSOCIATIONS OF MACRO, MESO, AND MICROSCALE WALKABILITY ON WALKING BEHAVIOR**

Abstract ID: 752

Individual Paper Submission

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Walkability is a composite concept that involves various contributing factors, ranging from macroscale urban form components to microscale streetscape details. While macroscale factors can easily be measured for large geographic areas using GIS and are studied extensively, measuring microscale factors require manual audits or surveys, which resulted in the frequent omission of microscale factors from widely used walkability indices as well as in walkability-related studies. This omission can be problematic, particularly for disadvantaged populations. Disadvantaged populations tend to be less sensitive to macroscale factors (Adkins et al., 2017; Lovasi et al., 2009; Manaugh & El-Geneidy, 2011) because they are often exposed to unfavorable microscale factors (Bereitschaft,

2017; Neckerman et al., 2009; Sallis et al., 2011). This suggests that macroscale factor-based studies and interventions may have a limited impact on these populations.

This study measures macro, meso, and microscale factors of walkability using GIS and novel methods based on computer vision and systematically collected and corrected street view images. Combined with the National Household Travel Survey 2017, this study examines their relative contributions to walking mode choice in Atlanta, GA. This study incorporates an equity perspective by examining how the relative contributions change depending on disadvantage status. Considering microscale factors are easier and cheaper to modify, the results can offer insights on how to frame policy interventions effectively for different population groups.

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Key Words: Walkability, microscale factors, computer vision, disadvantaged populations

## VISUALIZING COMPLETE STREETS SCENARIOS GENERATED FROM 3D RULE-BASED MODELING AND TRAFFIC SIMULATION IN VR

Abstract ID: 770

Individual Paper Submission

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#### Background:

Complete Streets have been adopted around the US as a street design approach to support all road users including pedestrians, bicycles, and transit. Design of Complete Streets is a complex process that requires considerations of many variables like physical street layout, streetscape, travel modes, traffic performance, and to name a few. To handle some of this complexity, various visualization and simulation tools such as procedural (rule-based) modeling and traffic simulation have been utilized to support multiple street design scenarios before construction. However, due to technical and organizational barriers, actual street design occurs in a disconnected fashion, especially during the conceptual design phases, though the process requires prompt feedback among professionals and stakeholders. To overcome some of these barriers, this study investigates a methodology to integrate rule-based modeling and traffic simulation into a VR experience to facilitate efficient communication of design ideas among various street design professionals and even the general public.



#### Study Design:

We explore integration of rule-based modeling and traffic simulation approaches by creating a set of toolchains inside a game engine and visualize it in VR. Using a case study area in Florida, we apply the following process: First, we create multiple street design scenarios using CityEngine, which is rule-based modeling application. Next, we run traffic simulation using microsimulation to compute trajectory data, which can be used inside the game engine. Finally, using the Unity game engine and the Oculus system, we develop a VR to show the street design scenarios with interactive data-driven multi-modal traffic. The VR allows for dynamic control of parameters including vehicle, pedestrian, and bicycle density which provide users to experience diverse traffic flows as well as time of the day in real world context.

#### Results:

The integration result in an interactive data-driven environment for the user to experience street designs and dynamic traffic at 1:1 scale in VR. The results demonstrate several advantages of the integrated approach including: (a) increased efficiency in modeling and visualization due to the rapid generation using rule-based modeling techniques; (b) immersive experience of the street design overlaid with the data-driven traffic simulation via the VR scenes, allows users to compare and contrast the scenarios in real scale; (c) enabling of opportunities for innovative public engagement and effective collaboration in street design proposal by using interactive VR.

#### Conclusion/Contribution:

In conclusion, we find that this integrated approach can help overcome some of the limitations of the existing approaches and demonstrates the promise to serve as an effective framework for street design, visualization, evaluation, and participatory planning and design in a true-to-life scale.

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Key Words: Rule-Based Modeling, Virtual Reality, Traffic Simulation, Street Design, Complete Streets

#### **ARE URBANITES LESS STRESSED IN ACTIVE HIGH-DENSITY AREAS WITH A HIGH SYMBOLIC VALUE? : AN ASSESSMENT USING SOCIAL COMPUTING AND GIS AUTOMATION.**

Abstract ID: 813

Individual Paper Submission

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The existing mental health and built environment literature claims that the prevalence of mental health disorders increases in the urban areas and especially in the high-density urban cores [1, 4]. The argument is primarily based on the premise that urban cores are crowded than their rural counterparts, resulting in social and cognitive overloads

on individuals. Here crowding is simplified and measured by population density and it is linked with higher levels of anxiety, stress, and mental health disorders in people. Active high-density areas are defined as urban areas with a higher population or employment density, located closer to transit, with an improved bike-pedestrian infrastructure [2]. Commonly, these areas are very similar in their characteristics to the urban cores described as detrimental for mental wellbeing. Such construct in the mental health literature can keep the findings of the popular urbanists muddled. The big question here is whether advocacy of urban living by urbanists is best for the mental wellbeing of the urbanites? Our research addresses the controversy and disentangles the research gap by using social computing and GIS-based fine-grained computation of the built environment.

We mined social media data (Tweets) and evaluated the stress level expressed in the microblogs using Deep Learning algorithms. In the next level, we evaluate the proximate built environment characteristics for a large scale of Tweets by automating the GIS process. Our results show that the stress levels are less in the active high-density areas with a higher symbolic value, where symbolic value is a non-material value attributed to areas based on their historical significance, economic status, and perceived safety [1]. Our findings are supported by the theories on crowding, which explain crowding by itself is neither good nor bad. It intensifies certain existing social conditions but rarely causes any urban problems. In the mental health literature, crowding is not differentiated from overcrowding when explaining the cause of stress. Overcrowding primarily results from a lack of resources for livelihood, where resource limitations may result in a lack of control over one's personal space. With the inability to secure the needed privacy due to poverty, or excessive rent burden, people experience extreme stress, anxiety, and other mental health issues. Another issue of the earlier findings is that the definition of urban is kept too generic and has not been differentiated based on fine-grain built environment characteristics. Our research reinstates that "crowding by itself does not negatively impact the mental health of the urbanites." The statement only holds for the conditions of overcrowding. Higher population density, higher footfall, greater accessibility by active transportation, on the contrary, allows people to de-stress, given that they have higher symbolic value and no signs of overcrowding.

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Key Words: Social computing, Natural Language Processing, Tweets, Social Media, mental wellbeing

#### UNDERSTANDING TRANSIT RIDERSHIP OF LOW-INCOME CARLESS INDIVIDUALS THROUGH A COMPARISON OF STATISTICAL AND MACHINE LEARNING ALGORITHMS

Abstract ID: 848

Individual Paper Submission

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Accurate modeling of travel behaviour is an important component in transportation planning and travel demand management. For decades, extensive efforts have been devoted to identifying and improving methods in travel

behavior research, including using discrete choice models, the shift from trip-based to activity-based models, and, more recently, experimentation with “big data” and machine learning methodologies. From a social justice perspective, improving model accuracy is vitally important to understand how different people respond to different types of changes in transportation and, accordingly, how to better plan for the needs of traditionally marginalized communities. Within justice-based transportation planning, travel behaviour models help researchers predict activity and travel behaviour outcomes associated with transit investments, which help planners evaluate the equity implications of different planning scenarios. Moving beyond the typical buffering exercises involved in Title VI and Environmental Justice analyses, travel behaviour-based assessments examine how transit investments unlock potential for higher life quality. This can be done by forecasting, by population segment, behavioural responses such as changes in auto-ownership, transit mode share, and out-of-home activity participation rates.

This paper aims to assess the potential for using machine learning-based travel behaviour models to accurately predict travel behaviour responses to transit investments among marginalized populations. Since the 1980s, most mode-choice problems have been addressed and modeled by traditional discrete choice models – e.g., multinomial logit. Their simple mathematical formulation and interpretation have made them popular (Lee, Derrible, & Camara, 2018). However, Machine Learning (ML) algorithms are proving to be robust and accurate in various research contexts and have received particular attention within the travel behavior modelling literature. An ML algorithm utilizes a set of rules or models to learn complex patterns within a dataset. This is very different from traditional models that are firmly grounded in microeconomic theory. ML’s flexibility in dealing with non-linearity and capturing complex relationships between input and output variables makes them promising for modelling complex and heterogeneous patterns, even though they are popularly referred to as “black-box” estimators since they lack theoretical formalities that allow analysts to easily describe relationships between variables in the model. Nonetheless, travel behaviour researchers have been gradually adopting ML models for travel demand modeling, particularly mode-choice decisions (Xie, Lu, & Parkany, 2003; Zhang & Xie, 2008; Cheng, Chen, De Vos, Lai, & Witlox, 2019). Within this burgeoning literature, to the best of our knowledge, there have been few efforts that examine the pros and cons of using ML models within equity-focused research and planning. We hope to discover how the potential forecasting accuracy benefits of ML approaches stack up against their potential drawbacks, namely, that they are not derived from behavioural theory, and they do not provide easily interpretable relationships between input and output variables.

In this study, we test ten ML algorithms and traditional travel behaviour models to predict the transit use of low-income, carless people in the Greater Toronto and Hamilton Area, Canada. Our primary analysis reveals that conventional models have lower predictive performance – e.g., accuracy, precision, and recall – compared to ML models. We further test the models within a forecasting setting, by predicting the effects of transit investment – i.e., job accessibility improvement – on transit use within marginalized strata. Initial results show considerable disagreement among different algorithms in terms of the scale and spatial distribution of the new transit trip generations. Accordingly, our study elucidates the importance of model selection in assessing policy recommendations for socially disadvantaged groups, and leads to recommendations for transportation planners vis a vis model selection and accounting for uncertainties that stem from the choice of model specifications.

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Key Words: Machine learning, Logit models, Travel behaviour, Transit accessibility

## RE-CLASSIFICATION OF MEDIUM-SIZED URBAN PARKS USING VISITOR CHARACTERISTICS

Abstract ID: 857

Individual Paper Submission

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There have been lacks of understanding on visitors' activities of urban parks. The conventional wisdom generally assumed that residents living in adjacent neighborhoods are the main group of park users (Perry, 1929; Xiao et al., 2019). Also, classification of those parks are often based on physical, locational, or administrative characteristics of the parks. Except for children's playgrounds, visitor characteristics are not much of a concern. This study examines what kind of grouping appears when we classified the parks based on visitor characteristics and how those groups are related to prevailing assumptions of park visitors and to existing classification scheme.

The study area is the 23 inner wards of Tokyo, Japan. Among the over 5000 designated parks, we selected 85 parks with surface areas between 3 ha and 10 ha, which is the recommended size range for district level parks (Ishikawa, 2001). Park visitors and their home locations were estimated through cell phone GPS data. The cell phone GPS data are fully anonymized for security reasons but it is possible to retrieve two aspects of park visitors, home-park distance and visit frequency, without identifying any other demographic information (Guan et al., 2020). We performed cluster analysis taking advantage of four variables: total number of visitors, percentage of visitors from within a 4 km radius, percentage of frequent visitors (more than four times a year) from 10km or further away, and percentage of one-time visitors from beyond 20 km distance. The last three variables represent different visitor groups: neighborhood visitors, park users among commuters, and annual visitors/tourists, respectively. Although this grouping criteria may not be highly accurate, they certainly reflect different user group characteristics existing in reality.

Using hierarchical cluster analysis, we identified three to four distinctive categories. The first category, which includes 67 parks, has a high proportion of visitors from neighborhood areas, on average 46%, and is characterized by relatively small numbers of visitors. The 16 parks in the second category has the highest percentage, approximately 20%, of the 'park users among commuters' category and also exhibits small visitor volumes. The third and fourth categories consist of five and two parks respectively. They share similar visitor characteristics except that the two parks in the fourth category have the largest number of visitors among all sample parks. However, the number of visitors of the third category is large as well, ranked just after the fourth category. These parks have on average approximately 31% of one time visitor-tourist from more than 20km away. The high visitor volume and high proportion of one time visitors from far locations imply that these parks may be destinations attracting tourists for specific events or seasonal landscape.

The varying compositions of different visitor groups already tell us that not all district level parks are being used by the same ways. In the further analysis, we will map the four park categories found through the clustering process and compare their visitor characteristics with the existing administrative guidelines. This empirical approach will add meaningful information to understand visitors of parks and to disclose the gap between normative guidelines and actual usage of the parks.

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Key Words: Urban parks, Park visitor characteristics, Cluster analysis, Big data, Park usage

## BIKESHARE TRIPS IN SEOUL, SOUTH KOREA

Abstract ID: 861

Individual Paper Submission

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The bikeshare program in Seoul, the capital of South Korea, generates more than a million trips per month with more than 1500 bikeshare stations and about 20,000 bikes operating across the city. We examine the spatial patterns of bikeshare usage in Seoul, which is a very densely populated city with a large metro system. We analyze the association between land use, subway stations, employment density, population density, and bikeshare usage with negative binomial conditional autoregressive models that account for spatial correlation. For all the models, results show a positive association of bikeshare usage with the number of subway stations and employment density, with the former having a larger effect. Agricultural and Amusement land use have negative associations with bikeshare usage in many models. We also examine different types of trips to distinguish differences between “loop trips” (starting and ending at the same station) and purposeful trips between two destinations. The former displays a pattern suggesting “loop trips” are more likely to be recreational trips.

In this research we analyze bikeshare trip patterns in Seoul. Prior works have found that various land use factors, proximity to subway stations, and bicycle infrastructure are associated with bikeshare trips. We focus on Seoul with the objective of answering the following questions: Do trips that start and end at the same station have different usage patterns than those between different stations? How do trips vary throughout the day and seasonally? And ultimately, how are various land use patterns, subway stations, employment density and population density associated with the number of trips generated from each bikeshare station?

Our reason for analyzing Seoul, beyond the fact that the data is publicly available (albeit in Korean), is that Seoul is unique in comparison to most North American and European cities where much of the research on bikeshare has been done. In particular, Seoul has a population density of 16,541 residents per square kilometers, and this extends across 605.24 sq. kms of developed land. There are multiple employment centers, and these are connected by a well-designed and extensive public transit network. Every day, about 5 million passengers use the public transit system in Seoul with a mode split of about 65% using transit versus 25% using a car. Moreover, the City of Seoul has long been encouraging people to bicycle and has improved its bicycle infrastructure, including about 961 kms of bicycle lanes and more than 145,000 bicycle racks. The park developed along the Han River is one area with extensive cycling, including 78 km of bicycle lanes and 2500 bicycle racks. The topography of Seoul can make it difficult to cycle in some areas with mountains and steep hills. Nonetheless, Seoul City initiated a public bikeshare program, and usage is high with about 52,000 trips per day, on average. This likely includes both recreational use and commuting. These unique characteristics of Seoul, in particular the large spatial extent and population density of the city, its multiple sub-centers, and a large and extensive transit network, can provide a unique case study of bike-share usage for comparison with other cities.

Our analyses follows established methods previously used to understand bikeshare trips, for example the analysis of Citi Bike in New York City in Noland, Smart, and Guo (2016). We first examine some of the patterns of daily and seasonal usage, followed by a spatial econometric analysis linking land use, subway stations and other spatial data

to trips generated at each station. We also explore some of the differences between “loop” trips (i.e., starting and ending at the same station) and those between two stations.

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Key Words: Bikeshare, Travel Behavior, Spatial Analysis, Micromobility, Bicycle

## FACTORS AFFECTING ELDERLY AND CHILD PEDESTRIAN CRASH HOT SPOTS: A DEEP LEARNING APPROACH

Abstract ID: 878

Individual Paper Submission

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Pedestrian-friendly environment can address social equity among the transportation disadvantaged, thereby contributing to sustainable development. Thus, it is important to examine factors affecting pedestrian crash hot spots for the transportation disadvantaged. In particular, the elderly and children are among the most vulnerable groups to pedestrian fatality risks due to their physical, cognitive, and behavioral traits (Oxley et al. 1997; Gitelman et al. 2019).

Recently, computer vision techniques have been increasingly utilized as they can provide new opportunities to better understand cities through images thanks to a rapid advancement of deep learning. However, they have been mostly used on motor traffic not on pedestrian safety (Bustos et al. 2021). In addition, most studies on pedestrian crash are based on perceptual information rather than recorded and actual pedestrian crash data (e.g., Kwon & Cho 2020; Naik et al. 2014) due to data scarcity. Utilizing deep learning-based technologies on actual pedestrian crash data allows a more accurate analysis on pedestrian fatalities.

We use Traffic Accident Analysis System (TASS) data that were collected by Korea’s Road Traffic Authority to examine factors affecting elderly and child pedestrian crash hot spots in the Seoul Metropolitan Area in Korea. TASS provides pedestrian crash hot spot data including specific locations based on actual accidents. We also collected Google Street View images of pedestrian crash hot spots and non-hot spots. Then, we employed deep learning-based semantic segmentation and object detection methods to extract key variables from images, and performed a logistic analysis to examine the effect of each variable. The empirical results show that both existence of specific objects and percentage of pixels corresponding to those objects in the images affect elderly and child pedestrian hot spots.

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Key Words: Pedestrian accident, deep learning, computer vision

## USING LOCAL REVIEW DATA TO ANALYZE SHIFTING “CATCHMENT AREAS” OF GENTRIFYING AND CONTROVERSIAL BUSINESSES

Abstract ID: 881

Individual Paper Submission

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Millions of people rely on digital location-based services (LBS), local review and digital mapping platforms, to navigate their world and make decisions about where to spend time and money in cities around the world. While a growing body of scientific literature uses anonymized LBS data to understand human mobility patterns and home locations (see Chen and Poorthuis 2021), most of this work uses LBS data to understand individuals and groups of people, not the local businesses that they visit and their place in shifting urban and regional economies. Drawing on Richard Ocejo’s research on the transterritorial nature of “taste communities” brought together at upscale consumption sites like gourmet restaurants, coffee shops, and cocktail bars (Ojeco 2014), this paper uses spatiotemporal analysis of LBS review activity to depict and analyze the shifting “catchment areas” (to borrow a term from economic geography) of local businesses as measured through the locations of their reviewers over time.

This paper focuses on two forms of “scale-jumping” that can lead to broader spatial distributions of reviewers over time. The first form is that of businesses deliberately targeting external taste communities as their clientele, whether tourists or newer (typically wealthier and whiter) residents in gentrifying neighborhoods, though the widespread usage of LBS platforms in both familiar and unfamiliar locations has eroded some of the differences between these groups. Put crudely, a craft cocktail bar may draw reviewers from around the country and the world, where a fast food restaurant may reach a much more targeted local audience. When one type of business succeeds the other, as is often seen in gentrifying neighborhoods, the changing geography of the new establishment’s customer base can be analyzed and compared to other measures of neighborhood change, and even used as an advance metric for communities concerned about a potential influx of wealthier residents and development interests.

The second phenomenon is the increasingly frequent and usually inadvertent enmeshing of a local business into a political controversy unrelated to normal business operations, like the hundreds of negative reviews that Washington D.C.-based pizzeria Comet Ping Pong received from believers of the Pizzagate conspiracy theory. Using GIS-based analysis of case studies encompassing national and local politics, including the 2016 and 2020 U.S. elections, the #BlackLivesMatter and #MeToo movements, and contested responses to the COVID-19 pandemic, this paper also examines how various location-based services and web mapping platforms use systems combining automated and human judgment to delineate the limits of acceptable political speech in local reviews, and shows

how these decisions forcibly restrict the “catchments” of controversial businesses to their local context even as they become subjects of national political concern.

Like other online forums that rely on unwaged user-generated content, LBS are vulnerable to coordinated inauthentic behavior, including techniques like “brigading” made common on sites like Reddit and 4chan (Marwick and Lewis 2017). On sites like Yelp that require users to declare a home location and record their review history publicly, the sudden signal of an increased rate of reviewing from users outside a business’ typical catchment area is one of the algorithmic signals to trigger an “Active Cleanup Alert” locking profile pages and warning users not to post reviews that don’t reflect “firsthand consumer experiences” (see Kuehn 2013 on Yelp’s narrow framing of “review democracy”). In the case studies in this paper, I contrast Yelp’s interventionist approach to the relatively laissez-faire attitude of competitors like Facebook, Google, and Foursquare, less reliant on local advertising revenue, and consider the consequences of this form of “algorithmic censorship” (Gillespie 2018) for the very real impact on local business performance that these reviews provide.

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Key Words: GIS, Location-Based Services, Urban Data Science, Gentrification, Disinformation

## INVESTIGATING SUSTAINABILITY AND RESILIENCE OF METROPOLITANS IN THE US USING ARTIFICIAL NEURAL NETWORK CLUSTERING TECHNIQUES

Abstract ID: 905

Individual Paper Submission

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The goal of promoting sustainability and resilience has never been more crucial in this era under the pressure of continued urban growth and limited resources for dealing with different urban challenges (e.g., COVID-19). While sustainability and resilience have been attracting increasing attention, there is no consistent approach to measure them and explore their relationship due to their complicated multi-dimensionalities from different concerns and fields such as urban planning, transportation, and environmental studies (Fiksel, 2006; Redman, 2014). Although the use of indicators has been adopted in urban planning models, arguments remain on the selection of appropriate indicators and relevant applications. It therefore results in the missing of a comprehensive and efficient approach to assess and compare regional sustainability and resilience, which would limit decision-makers’ capacity to design and implement corresponding practical policies to promote long-term development.

To fill this gap, this study conducts a thorough literature review to identify indicators to assess sustainability and



resilience at the metropolitan statistical areas (MSAs) level. Sustainability indicators are identified based on social, economic, and environmental aspects. In addition to these three aspects, resilience indicators also consider community capital, institution, housing, and infrastructure. 21 indicators are calculated for regional sustainability and 46 resilience indicators are calculated for 378 MSAs in the contiguous US. The indicators are compiled based on the literature review and the available data. Some of data are collected directly at MSA level while others are collected at county level and aggregated to MSA level.

Then, the indicators are analyzed using an unsupervised learning technique, self-organizing map (SOM), a type of artificial neural network, to cluster and compare the MSAs. The SOM is widely applied to address the exploration and clustering problems of representing multi-dimensional data with two dimensions (Kohonen, 2013). It is usually a “map” made by a square arrangement of  $n \times n$  hexagons. The size of a SOM affects its quality and stability. Thus, the size as well as the quality and stability of a SOM are examined using Quantization Error and Bootstrap (Cottrell, de Bodt, & Verleysen, 2001). In this study, each hexagon represents a cluster of MSAs. MSAs in one cluster are the most similar ones in terms of the given indicators. Then, the clustering results of identified sustainability and resilience indicators are geographically mapped to investigate the spatial patterns of these indicators across the MSAs in the contiguous US. The SOMs and their associated geographic maps allow us to discover and compare the spatial patterns of sustainability and resilience and evaluate the relationships between them. The weight planes generated by the SOM toolbox also help assess the relationships among all the indicators to identify their similarities and differences which could help decision-makers improve the efficiency in assessing sustainability and resilience.

Our study results can help regional planning in four ways. First, a MSA may compare with other MSAs to find the relative level in terms of sustainability or resilience and identify similar MSAs. This will help the decision-makers of a MSA identify inspiring and comparable MSAs. Second, the spatial distribution of sustainability and resilience clusters may help the MSA decision-makers identify the similarity and difference with nearby MSAs and therefore, develop strategies for regional collaborations. Third, comparing sustainability with resilience, allows a MSA to identify how to allocate resources effectively by taking differences between sustainability and resilience into consideration. Fourth, the SOM results can help identifying indicators that are highly correlated. The understanding of the dynamic relationships among different indicators should help decision-makers more effectively and efficiently develop corresponding strategies. Overall, our study shows that more insights can be gained with investigations on the consistency between sustainability and resilience assessments.

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Key Words: Regional sustainability, Resilience, US metropolitan areas, self-organizing maps

#### CLASSIFYING URBAN PARKS BY THE DAILY VISITING PATTERN DURING COVID-19 USING MACHINE LEARNING

Abstract ID: 929

Individual Paper Submission

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During the pandemic of COVID-19, urban parks have proved their true value in promoting urban sustainability more than ever. Since state and local governments imposed social distancing measures, the number of park visitors has increased in almost every city globally (Geng, Innes, Wu, & Wang, 2021). The demand for outdoor leisure activities such as strolling and jogging has increased to avoid contact with others in confined indoor spaces such as shopping malls and gyms. Some parks indeed have served as a buffering place as a haven for social isolation and outdoor activity, significantly restoring physical and mental health, while others have seen a decline of visitors during the pandemic. Different daily visiting patterns classify urban parks into several types during the pandemic.

This study examines the change in the visiting pattern of urban parks during the pandemic of COVID-19 to classify them, and attempts to identify their locational factors and design features that determine the typology. For this, the number of visitors to 425 parks in Seoul, Korea was tracked with mobile phone travel data provided by SK Telecom. We used the spatiotemporal data to analyze time-series changes in the number of park visitors for 366 days in 2020. The big data was analyzed using K-shape clustering and multinomial logit model.

Following Manley, Zhong, & Batty (2018) who identified the clusters of travel patterns over space and time captured by smart card big data, this study uses K-shape clustering to classify urban parks by the time-series change in the number of daily visitors. This machine learning method identifies the similarity between different time series by measuring the distance between data with the Dynamic Time Warping method. It repeats and refines the process of designating points with similar phases as one cluster to create homogeneous and well-separated cluster groups (Paparrizos & Gravano, 2015).

Some distinctive clusters of visiting patterns will be detected: 1) not drastic but constant increase, 2) volatile fluctuation, 3) increase only when social distancing measure is strengthened. Based on the time series clustering results, we build a multinomial logit model to identify the park's design features and locational characteristics that determine the clustering, such as the ratio of the green area, leisure amenities, public transportation accessibility, parking capacity, and the composition of land use in the surrounding area. The results will show which parks with what design features have successfully performed the role of COVID shelter. This will contribute to promoting the possibility of urban parks functioning as infrastructure to improve the city's resilience during health crisis.

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Key Words: urban park, machine learning, visiting pattern, resilience, outdoor activity

#### **A STRUCTURAL EQUATION MODEL TO EXAMINE EFFECTS OF SOCIAL AND INSTITUTIONAL BARRIERS ON FLOOD RESILIENCE IN US COUNTIES**

Abstract ID: 941

Individual Paper Submission

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Flooding has caused more damages and impacts to communities than any other natural hazards around the world. Flood risk is projected to increase monotonically in many parts of the United States due to continued urban

development in floodplains and climate change. For example, in 2017, coastal counties make up less than 10% of the total land area in the US but account for 40% population (NOAA, 2017). Effective adaptation planning focusing on reducing vulnerability and risk requires understanding the effects of the national flood insurance programs (NFIP) and federal risk mitigation projects on flood vulnerability and resilience of local communities.

Previous research has examined interactions between the NFIP and the federal flood adaptation policies. For example, Kousky et al. (2018) applied a fixed-effects model to examine causality between federal disaster aid and flood insurance and found the average amount of insurance coverage would decrease after a community receives individual assistance. Frimpong et al. (2020) also found a significant and positive effect of community rating system (CRS) participation on insurance take-up rates. Although many studies have examined effects of NFIP in pre-disaster mitigation and post-disaster recovery, whether these policies effectively enhancing community resilience is not clear. Based on previous work, this study proposes the following research questions, including (1) How vulnerable are US counties to flood risk over the past decade? (2) How do FEMA's risk mitigation programs improve community resilience? Answering these research questions would improve the decision-maker's understanding of key determinants in improving community resilience, and therefore, could facilitate more efficient local adaptation policies, such as revising building and planning codes and bridging organizations, under the changing climate (Wilby & Keenan, 2012).

This study aims to examine flood vulnerability and resilience of US counties under economic, social, and institutional barriers by integrating multiple sources of datasets. More specifically, this study will integrate FEMA's NFIP policy and claims datasets, NOAA's historical natural hazard datasets, and American Community Survey (ACS) datasets from 2009-2019 and apply the structural equation model (SEM) as an analytical method to determine causal relationships between community vulnerability, resilience, and federal risk mitigation policies. County-level flood vulnerability will be investigated through multiple variables, including the number of historical natural hazards, cumulative flood damage, the average cost of NFIP policies, the number of post-FIRM buildings, as well as socioeconomic and demographic factors. On the other hand, Population migration rate will be used as an indicator for community resilience, and impacts of potential important social, economic, and institutional factors on population change will be evaluated using the SEM.

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Key Words: Flood vulnerability, Resilience, Adaptation, Structural Equation Model

#### **ANALYZING THE ASSOCIATIONS BETWEEN STREET-LEVEL BUILT ENVIRONMENTS AND LOCAL CRIME PATTERNS: APPLICATIONS OF GOOGLE STREET VIEW AND INTERPRETABLE MACHINE LEARNING**

Abstract ID: 961

Individual Paper Submission

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While a great deal of attention has been paid to the relationship between the built environment and crime patterns, our understanding of the relationship is far from complete. Previous research has often relied on linear models that do not allow one to capture the complexity involved in the built environment-crime relationship. Challenges also exist in measuring the built environment, even though land use mix, density, and street network-based metrics have become increasingly available over the past few decades.

This study presents a new way of understanding the association between the built environment and crime by utilizing Google Street View (GSV), semantic segmentation, and interpretable machine learning (IML) techniques that make it possible to avoid the pitfalls of black-box modeling. Specifically, the present study is conducted in three steps. First, this study acquires GSV images on a 20-m interval along with a road segment in the City of Santa Ana, CA, and quantifies the streetscape features by employing a semantic segmentation. Second, we built several machine learning models (e.g., Random Forest, Support Vector Machine, Deep Neural Network) and compare their performance in predicting crime patterns with that of a conventional negative binomial model. Lastly, the SHapley Additive exPlanations (SHAP) algorithm, one of the most promising IML methodologies, is applied to capture the potential non-linear relationship between crime pattern and built environment, which provide new insight into the relationship.

The results of this study are as follows. First, machine learning models outperform the negative binomial model in predicting the number of crimes on the road segment. In particular, the Deep Neural Network (DNN) shows the highest accuracy, which indicates that using the machine learning approach enables us to better understand the associations between the built environments and local crime patterns. Second, the results of interpreting the DNN model through the SHAP method indicate that most streetscape elements show non-linear relationships with crime. For instance, although walls and fences, which are representative elements related to CPTED, have some effects to prevent crime, analysis results indicate that the crime deterrence effect was greatest after surpassing a certain threshold. In conclusion, this study demonstrates the efficacy of streetscape big data for auditing detailed streetscape features related to crime activity as a methodological contribution. This study also confirmed the non-linear relationships between street-level built environments and local crime patterns, which can provide insights into the complicated associations between them and provide policy implications for public safety.

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Key Words: Crime, Urban Streetscape, Google Street View, Semantic Segmentation, Interpretable Machine Learning (IML)

#### QUANTIFYING STREET VENDORS IN MEXICO CITY: APPLYING COMPUTER VISION TECHNIQUES ON GOOGLE STREET VIEW IMAGES

Abstract ID: 968

Individual Paper Submission

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Street vending has been a practice that goes back to pre-colonial times and it is impossible to think about Mexico City's landscape without envisioning people selling all kinds of products on the street. Despite the increase of national and transnational retail chains since the opening of the economy in the late 1980s, street vendors have also increased in quantity and variety of forms, sometimes even functioning as distributors of large companies' products. Unfortunately, until now, quantifying street vendors has been an impossible undertaking due to their suboptimal living conditions, living under daily high levels of uncertainty and fear, lacking health insurance, and left unprotected from authorities' harassment on the streets.

Most research on street vendors has focused on processes of clientelism, state enforcement, crime and displacement in cities. While all these studies have elucidated processes of vendors' claim to work in public space and wellbeing, none of them have analyzed how these processes change according to different types of street vendors and their placement in the city. Thus, the purpose of this research is twofold: 1) to generate an algorithm through computer vision that quantifies fixed street vendors at a large scale; and 2) to carry out analyses between the density of vendors and neighborhood characteristics to assess if the number of people working in public space is associated with socioeconomic status, political party, or the level of presence from vendors' associations.

While I would like to map out the heterogeneity of street vendors, I will first map out fixed street vendors outside of subway stations, commercial malls, hospitals and schools to understand the spatial distribution of vendors across different municipalities of Mexico City. In order to carry out these analyses I will use images near subway stations from Google Street View and detect street vendors' stalls by deploying computer vision techniques. While most Google Street View image processing has been mainly focusing on built environment and street measures, food outlet detection is being increasingly recognized by recent studies (Cohen, et al. 2020; Mestre, 2020). The ultimate objective is to create a scalable algorithm that is generalizable to other cities in which other type of vendors can be identified and where researchers can better understand how the distribution of public space is contested across cities.

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Key Words: street vendors, spatial distribution, computer vision, Mexico City

#### WHAT ROLES WOULD TECHNOLOGIES PLAY IN AN AGING SOCIETY?

Abstract ID: 1015

Individual Paper Submission

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At present, technologies are evolving rapidly. This trend is intersected with another trend of population aging in the U.S. and other countries. Technologies are destined to play important roles in an aging society, such as:

First, technologies could help older adults to age in place by building smart homes. Such smart homes include technology-equipped sensors, appliances, doors, windows, garages, and mesh Wi-Fi systems. These technologies would provide several aging-related monitoring services, such as physiological monitoring and cognitive and sensory monitoring and assistance.

Second, technologies could help older adults to maintain mobility and independence. For example, with smartphone apps, older adults could hail rides from Transportation Network Companies (TNCs) such as Uber and Lyft. When older adults stop driving, they have to rely on public transit, paratransit, and other alternative transportation modes. Technologies may significantly help public transit operators. For example, Global Positioning Systems (GPS), Automatic Vehicle Location (AVL), Computer-Aided Dispatch (CAD), Scheduling, Routing, and Dispatching software, and others can directly assist transit operator's fleet management and advanced operations. Technologies could help the dispatching and routing/scheduling of paratransit vehicles as well.

Third, as part of technology, coordination and integration software could coordinate and improve human services transportation catering to the growing demand of the transportation-disadvantaged population, by increasing its efficiency and reducing costs.

This research describes and examines the application of technologies in an aging society through conducting comprehensive literature review and U.S. case studies, with a focus on smart home technologies and smart mobility technologies.

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Key Words: Technology, Smart Home, Smart Mobility, Older Adults, Aging Society

#### **A SEMANTIC NETWORK ANALYSIS: WHAT ARE THE DIFFERENT GENTRIFICATION ASPECTS OF ITAEWON AREA IN SOUTH KOREA?**

Abstract ID: 1044

Individual Paper Submission

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Over the last few years, the issue of "gentrification" has spread to many academic disciplines. Gentrification is a term originally proposed by Glass (1964) which usually is used to describe the processes and spatial changes in many metropolitan cities, with the suburbanization reversing around the old city centre, the return of the middle class to the city centre, and the push of the working class and the common people (Shin & Kim, 2015).

The purpose of this study is to clarify 'semantic association' and relationship structure among related key words,

focusing on 'gentrification' issue in Itaewon area in Korea. Itaewon is formed by various political, economic, and cultural contexts of Korean society. Especially, Itaewon has the parallel with the process of Town-centered development of Seoul city government after 1960s and it has established the identity as the consumption space by neo-liberalism formally introduced after 2000s. Moreover, based on the historical practice called the 'US military government', Itaewon obtains its own unique placeness as a foreigner's place and a place combined with various cultures. To examine phases and aspects of how gentrification affects to Itaewon area, this study focused on semantic network analysis applying big data and social network analysis. Semantic network analysis is a method that applies 'big data' and 'social network analysis'. This provides a useful perspective for explaining micro-behaviour and macrosocial structures by examining the behaviour of individual actors in the context of the macroscopic structure constructed through the connections and interactions between the micro-behaviours. Through the collection of big data on the data, this study has an implication in comprehensively examining the macro and micro aspects of Korean-style gentrification, especially when it is reminded that research costs, time limits, and subjective intervention in research designs set by the individual researchers may be less feasible. By doing so, we delaminate how the gentrification phenomenon was broadly reflected in the landscape of Korea, how it is being developed, and what are the differences between each stage. By entering into critical debates on gentrification, we expect to present implications for conceptual defining of the Korean-style gentrification.

As a result, gentrification in the Itaewon area is divided into four stages. The first stage of gentrification (2007 ~ 2010) is to induce revitalization of the city through redevelopment, and the main keywords are 'space' and 'life'. Gentrification stage 2 (2011 ~ 2013) is the initial stage of gentrification, and the main keywords are 'city', 'space', 'art', 'market', 'region', 'people', etc. The third stage of gentrification (2014 ~ 2015) is the period of commercialization as a gentrification growth stage, and the main keywords are 'legal system', 'Seoul', 'rental', etc. The fourth stage of gentrification (2016 ~ present) is the maturation period of gentrification, and the main keywords are 'policy system', 'urban regeneration' and 'preservation'.

The Korean-style gentrification phenomenon was revitalized through the input of public policy such as urban regeneration, and the existing commercial and neighbouring facilities were commercialized by the rapid capital entry in the process of urban regeneration. The tenants and indigenous people who contributed to the revitalization of business were displaced. In addition, housing has lost its meaning as a place of life for local residents and has become a tourist destination for outsiders. In the process, space has changed and the identity of the area has been damaged. Moreover, over time, the spontaneous migration of the gentrifier, as well as the Aboriginal people, took place simultaneously. Eventually, in order to prevent the collapse of the local community and the deterioration of the quality of life of the residents, the government puts urban regeneration projects.

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Key Words: Gentrification, Social Media, Semantic Network Analysis

#### **WHERE DO PEOPLE WOULD LIKELY TO WORK AT HOME - EXPLORING THE ASSOCIATION BETWEEN BUILT ENVIRONMENT PATTERN AND TELECOMMUTING IN THE U.S**

Abstract ID: 1076

Individual Paper Submission

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Since its emergence in 1970, telecommuting/ working from home has become an essential work mode in the United States. The COVID19 epidemic in the United States has made this working from home concept more widely accepted than ever before on an unprecedented scale. Furthermore, this change is likely to be permanent, not going away as the epidemic recedes. Many businesses such as Google and Facebook have already declared that they are sticking with remote working after the pandemic ends. The impact of this new normal on our lives and especially on our travel behavior is enormous because it no longer requires people to physically commute anymore. So how should urban planners prepare for this change? It is crucial to understand how the built environment of our cities relates to this rapidly rising lifestyle. More importantly, does this preference for space conflict with or contribute to the smart growth ideology that the urban planning field has always been promoting. When job accessibility is no longer a constraint for choosing where to live, will people re-embrace low density urban sprawl community?

Many studies have discussed the impact of telecommuting on urban form since 1990s, mainly through simulation and speculation. However, the conclusions are bazaar that both decentralization, centralization, and insignificant effect have their support (Audirac,2002; Nilles, 1991; Glaeser, 2020). This article approaches this question by using empirical methods to test their association at census block group level and contiguous U.S scale via multi-level regression. The dependent variables are the count and ratio of residents working at home in each census block group. They are extracted from Question 'A09001. Travel Time to Work for Workers 16 Years and Over' from ACS 2015-2019 database. Then a census block group level the built environment database is compiled based on factors that are expected to influence commuting choices, including land use, density, diversity, design, accessibility, and distance to transit (Ewing, 2010). The data sources contain ACS 2015-2019, Longitudinal Employer-Household Dynamics, Openstreet map, and EPA smart location database. Besides creating individual measures, we also used clustering methods to identify the holistic built environment patterns based on their characteristics to test the effect of the factor combinations. In the next step, regression is conducted to evaluate the impact of individual built environment characteristics and its overall patterns on telecommuting. The reason for using multi-level regression here is to control the group-level variance in county and state. Finally, for the significant built environment patterns in the result, we took a further case study to check their compositions and the examples in real world to illustrate what specific types of places that telecommuting like or hate to live.

The preliminary result shows that, in general, most built environment factors that smart growth theory was promoting are negatively associated with both the count and ratio of people who work at home. But there are several built environment patterns that feature fits the smart growth theory and show a statistically significant positive effect on telecommuting. This potentially means that although the rise of telecommuting could not contribute to smart growth practices in general. There is a hope that, when handled in the right pattern, both the preference of the teleworker and the urban planner's vision can be met at the same. This challenge proposes a more detailed requirements for future urban planners. Instead of focusing on improving separated built environment factors individually, planners should promote the right path of developments from a holistic perspective, such as the patterns we found in this study.

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Key Words: Telecommuting, Working from Home, Built environment pattern



## **DIAGNOSING GENTRIFICATION: THE USE OF GOOGLE STREET VIEW IMAGERY ACROSS ALL CITY FORMS**

Abstract ID: 1102

Individual Paper Submission

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Gentrification is an ongoing process; it is not only apparent retrospectively — it can be observed “in real time.” Cities with the ability to diagnose it in time can take action to mitigate the negative effects they see happening. The object of this research is to establish a reliable method using widely-available data that cities can use to make early diagnosis and act accordingly.

In their 2014 article on gentrification, Hwang and Sampson established a method for studying gentrification in Chicago that included the use of Google Street View (GSV) images. The use of qualitative data, such as that captured by GSV imaging, has proven to be both a strong alternative to dependence on census data (Hwang & Sampson, 2014) as well as a complementary source of information.

Other studies using GSV have studied disorder (2017, Bader et al.) and physical urban change (2017, Naik et al.). The method has been applied to the urban forms of cities including New York, San Jose, Detroit, Philadelphia, Baltimore, Boston, and Washington DC. In each application, researchers have used different methods for selecting GSV images to study; parameters for using GSV to study urban form, including changes associated with gentrification, have not been established. As a result, use of GSV varies in terms of sample sizes and frequency, structured v. random sampling, etc.

In this research, we seek to establish a process whereby the Hwang & Sampson GSV visual survey method can be applied to cities across a range of population and housing densities, area of census tracts, block sizes, etc. Our goal is to create a customizable sampling method, taking into account pertinent urban variables, that can be easily applied by planning practitioners and academics.

### **Citations**

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Key Words: Gentrification, Methods, Google Street View, Neighborhood Change, Planning Practice

## **GEOGRAPHIC TECHNOLOGY ADOPTION IN MID-SIZED MUNICIPALITIES**

Abstract ID: 1111

Individual Paper Submission

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Social dynamics among municipal workers affect how mapping technologies are implemented within municipalities, how data is verified and how new data is updated. These dynamics have implications for the accuracy of map-based data and its trustworthiness for alternative uses. In the last 20 years, an increasing number of municipalities have been adopting technology to migrate and store maps of their water and sewer infrastructures in electronic formats such as Geographic Information Systems (GIS). While centralized, online maps portray the confidence that data from those GIS-based maps are available to make better, data-informed decisions, a look into the social and organizational dynamics behind how those numbers are created and updated give a more complicated picture.

The driving force behind the investment in GIS was often described as the desire to have a better sense of the state of their underground infrastructure and to have a central repository that could be used for data-informed decision making. However, there is a cultural lag in how workers perform their tasks and how decisions are made within the municipality that affect how GIS is adopted.

The data are based on interviews with municipal employees across the US exploring the process of GIS adoption and the influence of social and organizational dynamics in the implementation of this technology in maintaining the water and sewer infrastructures. This paper seeks to contribute to the literatures on computers, urban systems and built environments in providing an interdisciplinary approach that highlights the importance of these social factors in how mapping technology is implemented within municipalities.

This is a qualitative study consisting of three stages. First, a pilot was conducted using the University of Illinois at Chicago campus as a test case. At this stage, a questionnaire was developed and tested through 11 interviews with individuals who create and update maps of underground infrastructure along with those who use maps of underground infrastructure in their work. Second, was a study of municipalities in the Chicago metropolitan area. Interviews in the Chicago metropolitan area consisted of 17 interviews across 5 municipalities with individuals working with and implementing spatially-based technology. The third stage was a nation-wide survey of employees in 14 randomly-selected municipalities with a population over 10,000.

Among the findings are that social dynamics among municipal workers affect how mapping technologies such as GIS are implemented, how data is verified and how new data is updated. The introduction of mapping technology was seen to raise issues of underlying dynamics of how data are created and updated, thus social dynamics affect the quality of data generated. Further, municipalities differ widely along the scale of adoption of GIS-based tools and their use of data for decision making on water and sewer infrastructures. The interviews have revealed differences in how data is updated from the field into the map and conversely, how Public Works employees use the maps to make decisions. There is a cultural learning that is happening within the municipalities that changes how the technology is used. The findings from this research suggest that more attention needs to be focused on the organizational learning and social practices that enable municipalities to make the best use of the technology.

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Key Words: Cultural Shift, Municipal Budgeting and Planning, Organizational learning, Mapping

## **POSTERS**

### **A GEOSPATIAL TOOLKIT FOR MODELING PUBLIC TRANSIT ACCESSIBILITY TO COMMUNITY ESSENTIAL SERVICES**

Abstract ID: 687

Poster

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#### Background to Problem:

Practice and literature indicate that public transit services are essential to facilitate access to jobs, goods, and services. Ensuring accessibility to essential services, such as hospitals, parks, and grocery stores, via public transit is a critical job of transportation planners. Although there have been several studies and tools developed to measure public transit accessibility, the process still requires execution of many semi-automated GIS tasks. To this end, measuring accessibility to public transit is important to evaluate the effectiveness and the equity of such services.

#### Description of Application:

To provide more user-friendly tools for transportation planners, we developed the Transit Accessibility Analyst (TAA), which can be used to evaluate public transit accessibility and improve transit services. This toolkit works in ArcGIS environment and it provides a one-stop solution to accessibility modeling, which saves stakeholders from the repetitive tasks of the analysis and allows them to focus more attention on making adjustments to improve their services. TAA is written in Python and distributed as a Python toolbox in ArcGIS Pro. It contains four tools: (1) Create Network Dataset, (2) Calculate Impedance and Opportunity, (3) Measure Accessibility, and (4) Update GTFS using Proposed Routes.

The toolkit uses General Transit Feed Specification (GTFS) dataset, GIS street centerlines, destination opportunity points, and census geographic boundaries. TAA enables stakeholders to answer the following questions more efficiently: (a) how well public transit can fulfill the travel needs of users to various destinations, (b) how service changes may impact the accessibility, and (c) how expanded service can improve public transit accessibility compared to the current situation.

Unlike other existing toolsets, TAA is based on a widely adopted GIS platform, ArcGIS Pro, which means it requires no transitioning efforts for many in academia or professional practice. And, as an extension to ArcGIS Pro, the toolset can be easily integrated into other sections of the software such as ModelBuilder. Although the toolkit offers dedicated tools to analyze transit data such as the Transit Feed toolset, measuring transit accessibility using native geoprocessing functions in ArcGIS Pro is still a somewhat clumsy process. With TAA, we made efforts to streamline such process by organizing and modularizing it into separate but interconnected tools. In the meantime, TAA still maintains high configurability in terms of variable analysis zones, multiple choices of accessibility metrics, and different measuring scales, i.e., relative scale and definite scale. Also, to improve computational efficiency, we employed the NumPy package in the Measure Accessibility tool for its vectorization and broadcasting features, and the pandas package in the Update GTFS using Proposed Routes tool for its versatility in manipulating tabular data.

We have tested the toolkit with data from Gainesville, Florida, which maintains a very active public transit service. Three different scenarios are examined: (a) current accessibility to amenities and essential services, (b) how did COVID-19 impact transit accessibility, and (c) how can a new proposed route improve the current accessibility.

#### Statement on Why Application is Noteworthy:

The testing results show that TAA provides great flexibility and a variety of metrics to measure accessibility. The toolkit generates standardized accessibility scores by analysis unit. In addition, users can measure and visualize accessibility results in different spatial units such as, Transportation Analysis Zones, census block group, census

block, or their own custom geographic unit.

The findings demonstrate that the toolkit was successful in identifying areas with low public transit accessibility. TAA can be used as an effective planning tool to explore various scenarios to assist transit planners and policymakers in improving transit services in underserved areas.

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Key Words: Geographic Information System (GIS), Public Transit, Accessibility, Python

#### **DOES ACCESS TO DIVERSE URBAN FACILITIES REDUCE STRESS AMONGST URBANITES? AN ASSESSMENT MINING SOCIAL MEDIA MICROBLOGS AND POINTS OF INTEREST.**

Abstract ID: 965

Poster

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Psychiatric geography claims that higher levels of stress and anxiety are associated with mixed land-uses [1]. Higher accessibility and permeability of urban areas are identified as one of the risk factors for crime [2]. The assumption here is that diversity and accessibility invite potential offenders to urban areas. Another competing hypothesis that challenges Jane Jacobs's theory of street safety is that the perception of increased pedestrian traffic in residential neighborhoods leads to increased fear in residents who lack social integration [3]. Other findings suggest that large parklands or escape facilities in natural settings are key to good mental health for the urban population as they act as a buffer against high-density living [4, 5].

The findings of these studies contest the founding principles of urban theories that advocate land-use diversity, accessibility, and high-density living. In order to understand the gaps in the psychiatric geography and urban theory literature, we use social computing to understand how people's stress levels vary around the diverse facilities or points of interest (POI). We used Deep Learning techniques to assess the Tweets' stress levels (or microblogs) and compute the POI diversity and accessibility for each Tweet location. The points of interest are categorized as urban parks (including tails and open areas), community facilities, cultural or religious facilities, healthcare facilities, public transit stops, etc. The initial results of our findings show POI's with greater accessibility and higher surrounding diversity is heavily used by the urbanites for relaxing and de-stressing, contrary to the claims of the psychiatric geography literature. Our results show, while larger green spaces such as state parks and hiking trails are essential for people to decompress in nature, density does not act against people's mental wellbeing. Rather, access to diverse commercial recreation facilities such as cafés, restaurants, shopping facilities, and access to smaller urban parks and open areas are vital for social interactions, and the mental wellbeing of the urbanites. The poster offers a visual platform for explaining details of the POI classification where we link these classes with the stress levels of the

Tweets.

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Key Words: Social computing, Natural Language Processing, Tweets, Social Media, Mental wellbeing

## Track 2 - Community Development

### PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

#### **2.28 PRE-ORGANIZED SESSION - WHY ARE WE COLLECTING THIS? UNDERSTANDING THE POWER OF DATA FOR COMMUNITIES**

Pre-Organized Session 28 - Summary

Session Includes 544, 545, 546, 547

HOWELL, Kathryn [Virginia Commonwealth University] klhowell@vcu.edu, organizer

We measure what we think is important. From evictions to tree coverage to life expectancy, data is produced at increasing granularity to understand patterns across jurisdictions. However, in most cases, data are rarely produced, disseminated and used by and for impacted communities. This can mean that the data have the potential to further pathologize communities and reproduce existing power relationships; erase community power and assets; or completely mischaracterize the relationships and institutions that make a community thrive. Increasingly data have been collected, managed and disseminated through processes that center community interests, including narrative creation, power building, visibility and decision-making. This panel examines several cases of community-centered data collection and usage at neighborhood, jurisdiction, state and regional scales to understand the opportunities, challenges and needs for this type of data in planning practice.

Objectives:

- Understand the broad range of contexts for community-centered data

#### **DATA FOR, NOT ABOUT, TENANTS: AN EVICTION TOOL TO INCREASE COMMUNITY ENGAGEMENT AND POWER**

Abstract ID: 544

Abstract within Pre-Organized Session 28

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Housing instability through eviction has critical implications for civic engagement and political power. Because households that have been displaced or expect to be displaced have to overcome the concurrent challenges of finding and keeping housing, accessing jobs, catching up in school and maintaining mental and physical health, they are often unable keep up with voter registration (Squire et al 1987) much less engage in community organizations, local advocacy, or political organizing (Fullilove and Wallace, 2011). Thus, housing-unstable households, regardless of tenure, are often unable to collectively advocate for changes in their buildings, neighborhoods, or cities. Having a stable sense of place is important for identity, claims-making, and for challenging the conditions that produce urban inequality (Good, 2017; Pierce, Martin, and Murphy, 2011). These conditions are exacerbated through inadequate or inaccessible data that matches the needs of tenants and tenant organizations. While landlords can learn intimate details about the tenants' rental histories, credit and other legal and financial issues, tenants have difficulty understanding who owns their buildings, much less the history of code violations, evictions and other relevant practices. Even where evictions data repositories exist for social scientists and policy makers to analyze social problems, they may not be structured to allow tenant organizers, legal aid providers, and tenants to prevent evictions. Tenants cannot access critical information that can help them shift the balance of power and advocate for policies that will get to the root of housing instability.

Acknowledging the role of data to reproduce existing power relationships, this paper takes a counter-mapping approach to eviction data that seeks to “render visible the landscapes, lives and sites of resistance and dispossession” that are often hidden through the eviction process (Maharawal and McElroy 2017 pg 381). We propose the development of an adaptable data tool rooted in community needs and data limitations that will facilitate meaningful organizing, community-based policy development and advocacy. Building on ongoing work in three cities, Richmond, VA; Cleveland, OH; and Atlanta, GA, we will collectively assess needs for a public data tool, the challenges of using existing tools and discuss the processes used to assess the local needs for housing data.

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Key Words: Data, Eviction, Community Building

### USING SITUATED DATA TO RETHINK THE AESTHETICS OF AUTOCONSTRUCTION IN SÃO PAULO, BRAZIL

Abstract ID: 545

Abstract within Pre-Organized Session 28

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Scholars have considered autoconstruction, a practice that people use to build their own homes in informal settlements, as evidence of political insurgency (Holston, 1991), cultural agency (Jacques Berenstein, 2009), and material expression (Poiani, 2019). Less attention has been directed to how autoconstruction is changed by intensive State-led redevelopment projects. A particular missing perspective is that of residents who create their own ‘situated data’ about how redevelopment transforms autoconstructed dwellings (Stiphany, 2021). Our research seeks to fill this gap by asking: how does urban redevelopment shape the praxis and spaces of autoconstruction, and in what ways is this relationship represented by residents who incrementally build and evaluate autoconstructed housing? Drawing on a situated data-action study undertaken by one of the authors in São Paulo, Brazil, our research aims to identify common aesthetic patterns that span autoconstructed dwellings across settlements that have been intensively redeveloped. Using several data sources from a combined household survey and post-occupancy analysis of autoconstructed dwellings in two communities, we construct a typology of post-redevelopment aesthetic patterns. These patterns include dwelling densification, enclosure, interior and exterior surfaces, furnishings, and symbols of permanence and change (Kowaltowski, 1998). The study of autoconstruction’s post-redevelopment aesthetics provides insights into why people preserve their homes while others adapt and expand them. It also shows how residents negotiate space in a redevelopment environment that is simultaneously mutable and obdurate. The aesthetics of redevelopment is an important dimension of documenting urbanization through the smallest scales of change, and from the perspective of people who have used homebuilding to expand political inclusion. Understanding how autoconstruction has changed and is changing the study and representation of informality can inform how planners engage situated scales of urban transformation.

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Key Words: Situated data, autoconstruction, incremental housing, informality, Brazil

## **PROTOTYPING A REGIONAL EQUITY ATLAS**

Abstract ID: 546

Abstract within Pre-Organized Session 28

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Many U.S. localities use digital mapping to visualize inequities to inform the activities of policy makers and advocates alike. This paper explores the ongoing process of coalition building and prototyping such a tool for the context of the region around Charlottesville Virginia. Drawing from participation in an effort to produce an Equity Atlas that focuses on redress of historical and present-day racial and economic inequity through community-engaged scholarship, this paper considers how such efforts might draw from methods of co-production and address some of the limits of current approaches to equity mapping.

This team represents a portion of an emerging coalition of community-engaged academic scholars, local government actors, local advocates and community leaders, and others who are using a multi-pronged methodological approach to develop an atlas tool to support progress toward racial and economic equity in the region. This paper will cover the methods used so far in this effort over the past two years. It will represent and synthesize the team's work across formalized qualitative research, cross-sector collaboration with local governments to develop tools for accountability and equitable decision-making, and rapid prototyping of data visualizations and mapping platform in collaboration with local advocates and journalists. The work is highly relevant to the planning scholarship, practice and education, as it aims to put principles of equity and justice planning into practice through ethical data collection and representation.

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Key Words: Equity Planning, Justice Planning, Equity Atlases, Mapping

## **LEVERAGING TECHNOLOGY FOR IMPACT: UNIVERSITY-LED ENGAGED RESEARCH WITH AFRICAN AMERICAN COMMUNITIES DURING THE COVID-19 PANDEMIC**

Abstract ID: 547



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From 1865-1930, formerly enslaved African Americans in Texas founded 557 historic black settlements known as freedmen's towns or freedom colonies. Since then, their population has dispersed, physical traces have disappeared, and memories of their locations and founding vanish as descendants pass away. This panel will explore the engaged research strategies The Texas Freedom Colonies Project, an educational, social justice initiative based at TAMU's College of Architecture, employs to preserve and protect freedom colonies' heritage and remaining historical sites. Since 2014, Project team members have traveled the State to gather data that fills freedom colony knowledge gaps. As a transdisciplinary research initiative, the Project deploys various methods requiring various degrees of interpersonal engagement, including GIS analysis, archival research, and engaged ethnography, including oral histories. The Project's online Atlas collects and spatializes data about settlements' remaining schools, churches, and cemeteries. Then, it invites freedom colony descendants to reconnect to places and each other by sharing archival materials and memories through crowdsourcing surveys. Data collection and visualization are meant to amplify emerging threats, needs, and promising grassroots preservation practices.

The panel will describe how--because of the infectiousness of COVID-19--the team's research methods changed in the spring of 2020. Panelists present their adaptive strategy— Information and Communication Technology (ICT) for participatory preservation praxis. Through selected social-media-based ICTs, the team adapted to human subject research restrictions while sustaining connections to collaborators, collecting data, and educating the public. The panelists will share multimedia data associated with each ICT through which The Project engaged the public: an online Atlas which crowdsources place data; a monthly Facebook live "talk show" featuring advocates, preservationists, and descendants of freedom colonies; and Instagram freedom colony stories from crowdsourced entries. Black counterpublic theory, engaged community-based research, and participatory preservation literature inform the team's approach to coding themes and identifying patterns in the data collected. Finally, the team will assess each method's efficacy by describing their experiences, observed shortcomings, and identified social-media-based, collaborative heritage conservation potentialities. Researchers found that using social media-based ICT's for online counterpublic development amplifies oppressed groups' voices across multiple spaces. Attendees will learn how to leverage ICT's to help marginalized groups create counternarratives that strengthen the cultural fabric, even during a natural disaster or emergency. Participatory preservation praxis demonstrated through ongoing community-based counternarrative creation demonstrates the possibility that local effort can have a global impact on behalf of emerging counterpublics in the public sphere.

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Key Words: African-American, Mapping, Preservation, Rural, Community

## **2.40 PRE-ORGANIZED SESSION - PLANNING AND PUBLIC SCHOOLS: FACILITIES, FUNDING, AND EQUITY CONCERNS**

Pre-Organized Session 40 - Summary

Session Includes 211, 212, 213, 214

REECE, Jason [The Ohio State University] reece.35@osu.edu, organizer

Schools are a critical part of community infrastructure that are often neglected in planning practice. As a form of public infrastructure schools are vital to child development, economic development/work force, community development, and community well being. Despite the importance of schools as a form of public infrastructure, inequities in school resources and facilities are found throughout the U.S., between metropolitan and rural areas and within cities and metropolitan regions. The infrastructure and resource base for schools are highly dependent on planning, zoning/development policy, and local fiscal policy. Neoliberal policies in redevelopment/economic development and exclusionary land use policies can undermine resources for schools while widening inequities. The session will focus on presenting the landscape of school funding models across the nation and their relationship to planning and equity. The session will explore points of potential conflict and models of innovation in respect to planning policy and school infrastructure/resources.

Objectives:

- Present a comprehensive overview of the intersection of land use policy, planning policy, and school funding. Introduce the work of the Public Schools Interest Group in the APA. Preview the forthcoming APA Planners Advisory Service report on Planning for Schools.
- Introduce equity concerns related to tensions between economic development tax incentives and school funding. Introduce recent data and analysis by Good Jobs First on the equity implications of tax abatements.
- Present model cases or innovations in addressing equity concerns in school funding and facilities.

## **SACRIFICING URBAN EDUCATION FOR THE GROWTH MACHINE: A CASE ANALYSIS OF COLUMBUS OH**

Abstract ID: 211

Abstract within Pre-Organized Session 40

REECE, Jason [Ohio State University] reece.35@osu.edu, presenting author

Urban growth machine regimes emphasize the interests of land owning elites and entrepreneurs in driving development, often at the expense of other opportunities for marginalized communities (Farahani 2017). Property tax abatements have been identified as a mechanism of growth machine regimes which harms local educational resources for youth and significantly diminish resources for urban education (Weber, 2003). Research from Good Jobs First revealed that in the 2017 fiscal year, public schools across the United States had more than \$1.8 billion USD divested from them through the use of TIFs alone (Good Jobs First, 2018).

The proposed case study explores the durability of the growth machine and its impact on urban youth in Columbus, OH. Through annexation policies and aggressive embrace of neoliberal redevelopment tools, the elastic city has nearly doubled in population since 1960 while its urban school district has lost more than half of its student population (Jacobs, 1998). Due to the historical disconnection of the Columbus school attendance boundaries with the city's annexation policies, the district is more economically and racially segregated than the overall demographics of the City of Columbus. After the Brown v. Board decision in 1954, the Ohio legislature approved municipal annexation without school district expansion. The goal of this policy was to support the city's aggressive annexation policy of nearby suburbs, while assuring White suburban households that they would not be integrated into the City's public school district (Jacobs, 1998).

The district is an exemplar for case analysis because of its aggressive embrace of neoliberal urban development and urban education policies, such as charter schools, school vouchers and punitive state policies for districts not presenting progress in testing outcomes. Conditions in the district also mirror many of the typical conditions experienced in urban public schools. The city of Columbus is recognized as a leader in aggressively embracing public private partnerships, this approach, known as 'The Columbus Way' has been featured in case studies by the Brookings Institution and the Harvard Business School. Similar to Chicago, Columbus is one of the few urban school systems, where the teacher's union (Columbus Education Association) has centered tax abatements as a critical policy conflict in union district negotiations.

I explore the geography and impact of tax abatements and public education in Columbus, Ohio. The paper quantitatively analyzes the impact of residential tax abatements on public schools funding and educational equity. Additional semi structured interviews from stakeholders provide additional insights on the motivations and consequences of the abatement policy on educational conditions. I find the effects of the urban growth machine has compounded the city's inequality furthered and creates unsustainable conditions for urban youth.

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Key Words: education, abatement, segregation, inequity, schools

#### **BEYOND POLICY GUIDANCE: PROMOTING EQUITABLE COMMUNITY DEVELOPMENT THROUGH THE INTEGRATION OF PUBLIC SCHOOL PLANNING IN URBAN PLANNING PRACTICE AND EDUCATION**

Abstract ID: 212

Abstract within Pre-Organized Session 40

MAKAREWICZ, Carrie [University of Colorado Denver] [carrie.makarewicz@ucdenver.edu](mailto:carrie.makarewicz@ucdenver.edu), presenting author

The provision of public education in the United States is uneven and inequitable. This is due to structural inequalities in school funding and other education policies, but also from methods of urban planning and development that contribute to these inequitable structures, as well as a lack of professional knowledge on the interactions among schools, planning, and development. Despite the central role that schools play in communities, regions, and social mobility, most planners know very little about school district planning or operations. Further, research on schools is rarely conducted or published by urban planning academics and their major journals (Sanchez 2019; Fang and Ewing 2020). In 2015, a group of planners and academics started the Public Schools Interest Group (PSIG) within the American Planning Association (APA) to rectify this disconnect. Since its founding, PSIG members have had four of seven session proposals accepted to the National Planning Conference, and a few members contributed to APA's first Equity Planning Guide, ensuring schools were included in this landmark document. As of 2021, the PSIG has grown to 313 members, enough to apply for formal Division status within the APA, which while give the group more funding and other supports. But obtaining Division status will not alone attract the interest of planning researchers as a legitimate and important planning research topic or improve planning professionals' knowledge and understanding of school planning and operations—separately, and in relation to community planning.

Among other strategic initiatives to promote schools within professional and academic planning practice and research, the PSIG received approval and funding from APA to write a Planning Advisory Service (PAS) report on “Public Schools and Planning”. The report is the collective effort of 25 contributors from planning practice and academia. The process to develop its proposed content took two years among this group and with the APA editorial team. This paper is on the development and analysis of the report’s content as a critical pedagogical tool in light of the group’s effort to achieve awareness and legitimacy in the planning field, and more importantly, to actualize the school planning recommendations that were adopted in the Equity Planning Guide. The author uses participant observation, content and discourse analysis, and the theoretical lens of critical pedagogy to study how professionals and academics made sense of the bricolage of reality to contribute knowledge to the planning profession. Specifically, the paper asks: 1) In what ways did the PSIG PAS report authors from academia and practice break the presumed division between knowledge production and practice to produce critical praxis that includes both theory and action; and 2) As an educational tool, how can a PAS report help to develop more critical planners in both cities and school districts to better understand the forces shaping public education that fall outside the control of schools and teachers?

The study finds that the process of developing practical and theoretical knowledge for the planning field requires an iterative and collaborative process that is open to ideas, seeks similarities and differences in perspectives and processes, makes connections between the past and present, and utilizes multiple cases. Through this process, the author team pinpointed the disconnects between school districts and cities that have led to current siloed planning practices and inequitable education, as well as unique innovations. This study and the PAS report provide new detailed cases of processes, policies, and planning methods in relation to schools and their broader role in the community that planners can draw from in their own cities and regions. The study also suggests new avenues for research and provides guidance on using the PAS report in planning programs.

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Key Words: schools, community development, planning education, critical pedagogy

#### JOINT USE BETWEEN COMMUNITIES AND SCHOOLS

Abstract ID: 213

Abstract within Pre-Organized Session 40

WARNER, Mildred [Cornell University] mew15@cornell.edu, presenting author

Schools are critical community institutions. In addition to their critical educational role, schools can be used as centers for access to recreation, nutrition, adult education and health care. The community schools movement has been growing in some urban areas, but little is known about the level of school-community collaboration across suburban and rural communities. This study helps fill that gap.

Schools often exist as silos onto themselves. But that is changing. Planners are beginning to engage with schools

and recognize the critical role schools, as an institution, play in communities. In 2015 the American Planning Association approved a Public Schools Interest Group “ to enable planners to better collaborate and promote the role of planning in public schools and districts and with local governments.” The American Planning Association is currently developing a Planning Advisory Service memo on planners’ role with schools.

This study focuses specifically on the level of joint use service delivery between communities and schools. Using a national survey we conducted of 1312 cities and counties across the US in 2019, we assess the community level factors that lead to more joint use services with schools. Joint use services include services for children (After-school programs, preschool, child care, walk to school program, child nutrition for evenings and weekends or summer), services for adults (adult education, nutrition programs for seniors, using school buses to transport seniors) and services for the entire community (recreation and health care services for all ages, community partnerships with schools to deliver information). We differentiate the key factors that differentiate higher level of joint use services with schools. We find the importance of trust, formal joint use agreements, planning for schools and budget control. Engagement of families and seniors in the planning process also is associated with more joint use with schools. Interestingly, demographics do not differentiate levels of joint use.

This study shows the importance of planners engaging with schools. While 31 percent of communities report planning for schools or school siting, only 17% report that their community has budgetary control over schools. By contrast 57 % report partnering with schools for services to children and seniors and 66 % report using schools for information and service delivery. Cross agency collaboration has been shown to be key in helping communities provide more services for children and seniors.

To build communities better for children, their families and seniors, schools can become a community resource, if planning reaches out to build partnerships.

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Key Words: schools, community, joint use, planning

#### **MAKING THE STUDENTS PAY? THE IMPACT OF TAX INCENTIVES ON EDUCATIONAL FUNDING ADEQUACY AND EQUITY**

Abstract ID: 214

Abstract within Pre-Organized Session 40

WEN, Christine [Good Jobs First] rahalucni@gmail.com, presenting author

This paper investigates the impact of tax incentive spending on educational funding adequacy and equity in the U.S. Tax abatements are meant to stimulate economic development, but they could reduce the revenues of school

districts and, if growth occurs as a result, lead to increased enrollment and hence higher funding requirement. To assess the effect, this study conducts cross-sectional statistical analyses using district-level tax abatement, school finance, and other fiscal data from 2019; these are supplemented by qualitative inquiries in New York and Ohio—two of the seven states in the sample. The main explanatory variable is the revenue strain caused by tax abatements, and it is measured with foregone revenue (as reported by school districts in their financial audits pursuant to Governmental Accounting Standards Board’s Statement No. 77 on Tax Abatement Disclosures), district size, total revenue, and share of local property tax revenue. The main outcome variables are measures of spending adequacy and fairness from the School Finance Indicators Database by the Albert Shanker Institute at Rutgers University. State-level fixed effects include the use of funding equalization formulas, stringency of tax and expenditure limits (using measures developed by the author for a previous publication), share of students enrolled in public schools, and other relevant factors that could affect school funding. Preliminary analyses have revealed that higher tax expenditures are related with lower socioeconomic status of a district’s students. In states where districts cannot offset the foregone revenue (through increases in local levy or state aid), tax abatements undermine funding adequacy, and the effect is more pronounced for poorer districts. Based on these findings, this paper recommends that states cap or exclude schools’ portion of the taxes from abatements or give school boards the option to veto or opt out of incentive agreements.

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Key Words: school finance, tax incentive, equity

## 2.65 PRE-ORGANIZED SESSION - ENVIRONMENTAL JUSTICE OF/FOR/WITH WATER I

Pre-Organized Session 65 - Summary

Session Includes 553, 554, 555, 556

SIMPSON, Sheryl-Ann [Carleton University] sheryl-ann.simpson@carleton.ca, organizer

From drought to flood, household water access, conservation and contamination, energy production, alongside ceremony and recreation, the work of fishers and water protectors these are just some of the ways in which humans and water interact. Beyond human interactions, water also has its own work to do, and its own relationships with more-than-human beings to maintain, even though humans often interfere and disrupt that work and relationships. We aim to bring together a wide range of perspectives on relationship between water and environmental justice. Re-proving the fact of harm and inequitable experiences with water related to race, class, gender, caste, disability, sexuality and ongoing colonialism is not the goal of the session. Instead the goal is to bring together work that aims to untangle the processes, institutions and structures that maintain these inequities. Alongside work that explores ideas around, and examples of care- and liberation-focused approaches to addressing harm and inequity related to water, and for moving towards thriving relationship with water.

#### Objectives:

- understanding of environmental relationships around water in planning

## FROM GROUNDWATER RIGHTS TO CONTAMINATION: CONTEMPORARY WATER DISPOSSESSION IN THE COACHELLA VALLEY

Abstract ID: 553

Abstract within Pre-Organized Session 65

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Access to water is often considered an in-existent problem in the United States. However, in 2019, the American Community Survey found that approximately 2.9 million people in the United States live without running water. In places like Southern California's Coachella Valley issues of water access are dire and unequal. Here, residents living in unincorporated and tribal areas, mobile homes, and in the Eastern Coachella Valley (ECV) lack access to running water or public water infrastructure. Issues of water access in the Coachella Valley go beyond whether households have running water – they are also about whether accessible water is safe for use. For example, in the ECV, over 30% of the population rely on private wells to fulfill their water needs; wells contaminated with chemicals like arsenic and boron significantly above healthy benchmarks (Wadsworth n.d.). This paper examines the systematic deprivation of water in the Coachella Valley through water governance. To understand how access to water is governed I conduct interviews of government and non-government actors and I use document analysis to examine policy and archival documents. I use dispossession as a framework for analyzing the scales of governance that limit potable water access. The concept of dispossession is commonly mobilized to describe extractive and exploitative relationships to land, housing, and property. More recently, scholars have used the analytical lens of dispossession for water to reframe the human right to water (Morinville & Rodina, 2013), examine the effects of water laws (Koppen et al., 2014), and study the collision of water financialization and colonial dispossession (Hartwig et al., 2020). Understanding water access by using the lens of dispossession makes visible the regulatory and accepted processes used to enclose water. In this paper, I argue that the dispossession of water in the Coachella Valley is enacted through multiple modes including accumulation, groundwater rights, contamination, neglect, zoning and permitting, debt, overuse, and diversion. Enacted through overlapping jurisdictional governance, the different methods for dispossessing water are hierarchical; groundwater rights, bolstered by zoning and permitting, enable dispossession through diversion, accumulation, contamination, and overuse, which in turn incentivizes dispossession through neglect and debt. What is created by water dispossession in the Coachella Valley is a spatial inequality of water access that is often overlooked. The conditions of water access in the Coachella Valley are not just spatially unequal, but spatially unjust. The framework of dispossession helps to illuminate when spatial inequality is, in fact, an issue of spatial injustice, offering important implications for policymaking and urban planning. Spatial injustice must be addressed through spatial justice, requiring a set of tools different than those that might address spatial inequality. The orientation towards spatial justice contends that space and social relations be taken into account together in order for governments and communities to address socio-structural and physical issues at the local level. Spatial justice processes are constructed from the ground up and sustained through daily practice. This is exemplified in the Coachella Valley through the work of grassroots, tribal, and state-wide organizations challenging long-standing political and planning processes that enable dispossession by encouraging gentrification, industrial production, chemical violation, and water overcharge.

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Key Words: Dispossession, Water Access, Water Governance, Spatial Justice

## **VIETNAMESE AMERICANS IN CLIMATE AND ENVIRONMENTAL JUSTICE: UNDERSTANDING TRANSNATIONAL MIGRATION AND RESILIENCE**

Abstract ID: 554

Abstract within Pre-Organized Session 65

NGUYEN, Peter [UC Davis] pvtnguyen@ucdavis.edu, presenting author

More than 1.6 million Vietnamese refugees were displaced and resettled since the end of the Vietnam War in 1975, which is one of the largest groups of refugees that arrived in the U.S. Although Vietnamese Americans have a large population across the U.S., there is a gap between how Vietnamese refugees have been part of environmental and climate justice discussions. However, since Hurricane Katrina there has been a large community of Vietnamese Americans in the Gulf Coast who have been directly impacted by natural disasters advocating for environmental and climate justice.

Vietnamese Americans in the Gulf Coast have long since endured strenuous hardships through natural disasters such as Hurricane Katrina, oil spills, illegal toxic landfills, and other environmental injustice issues. However, Vietnamese Americans have exhibited strong resilience bouncing back and eventually returning back to their homes along the Gulf Coast. In the face of increasing natural disasters, shifting seasons, and rising sea levels this research aims to explore how Vietnamese Americans are currently adapting to climate change, particularly in the city of New Orleans and community of New Orleans East. How do different contributing factors and relationships impact Vietnamese Americans' adaptation and what role does each relationship play?

There are three parts that this research aims to answer, which are outlined in the following questions: 1) For Vietnamese Americans in New Orleans East, how do their experiences as refugees resettling in the U.S., post-Katrina and post-Deepwater Horizon oil spill resilience, and current endurance through the Covid-19 pandemic, impact their approach to climate adaptation? 2) What aspects of community capital are key in influencing their methods of resilience and adaptation? 3) What is the specific role that community organizations play with regards to climate adaptation within the Vietnamese American community?

Through partnerships with local community leaders and organizations, the methodology used will consist of key informant interviews, surveys, participant observations of community and project meetings, and document analyses of community organization reports. Qualitative data are then analyzed through qualitative coding that underscores major themes from the discussions. These methods are employed through a specific case study analysis of two community-led organizations in New Orleans East that have been vital to the Vietnamese American community and the role that they play in working with the community on both climate adaptation and community empowerment.

Preliminary findings illustrate that there is a strong link between the Vietnamese American community's refugee experiences in having endured past trauma and migration journeys that have contributed to their resilience and unity around their shared experiences. In analyzing community capital, social networks and cultural capital through shared religious beliefs have established a tight-knit community in New Orleans East. Secondly, community-led initiatives are taking place around adaptation in addressing alternative livelihood practices that have been impacted by past natural disasters, oil spills, and the current Covid-19 pandemic. These initiatives are centered around urban farming and gardening to support residents who practiced fishing as their main source of income.

This research contributes to the environmental and climate justice literature that benefit from learning about refugees and resettlement locations, which tend to be places that are most impacted by poverty and government



divestment that directly leave fewer safeguards from environmental catastrophes. Moreover, both Vietnamese American and Asian American communities are understudied around these literature, particularly in areas outside of California, thus it is important in expanding upon these communities in the Gulf Coast. By understanding the connection between refugee experiences, post-disaster resilience, and climate adaptation we can develop ways to best support locally led resilience and adaptation actions not only for these communities in the Gulf Coast, but also transferring this globally.

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Key Words: Vietnamese, Climate, Environmental, Resilience, Adaptation

#### **MEXICO-USA BINATIONAL WATERS: INSTITUTIONAL AGREEMENTS AND ENVIRONMENTAL JUSTICE AT THE LAS VIRGENES DAM**

Abstract ID: 555

Abstract within Pre-Organized Session 65

VAZQUEZ CASTILLO, Maria Teresa [Universidad Autonoma de Ciudad Juarez] ma.tere.vazquez@gmail.com, presenting author

Water has always been a topic of contention in the Mexico-USA binational agenda. Even more so, in 2020 when farmers of the Las Vírgenes Dam in the northern state of Chihuahua refused to provide the amount of water that was obliged to deliver to Texas in order to meet the 1944 binational treaty that regulates shared border waters. Supposedly, the agreement was set in place to plan and guarantee an equitable distribution of water on both sides of the border. Different planning institutions were involved in a context that made evident processes and structures that maintain uneven distribution and use of water. Bilaterally, the planning institutions that participated in this negotiation were the Comisión Internacional de Límites y Aguas (CILA) in Mexico, and the International Boundary and Water Commission (IBWC) in the United States. Other Mexican institutions were involved as well such as the Comisión Nacional del Agua (CONAGUA or National Water Commission) and the Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT or Environment and Natural Resources Ministry). Using media sources, official documents, and interviews with planners at these institutions, this paper focuses on the case of the Las Vírgenes dam, the planning process in place, the social unrest that provoked the fulfillment of the bilateral agreement, and the unveiling of unexpected environmental injustices at different scales. It explores the actors and the institutions intervening in either protesting and/or negotiating this international water related issue. It elucidates uneven regional conditions as well as power relations that challenged access to water for different kinds of populations and for different economic activities. It proposes that access to water and international agreements need to be reviewed and renegotiated in order to make sure that water will be available locally, regionally, and bilaterally. It proposes the assessment of economic activities and the entities that regulate them in order to set priorities in times when water resources in this desertic area are getting to critical levels. In an area as the Mexico-US border, planning and

distribution of shared natural resources requires an innovative regional approach, a bilateral knowledge of current conditions, and an awareness of environmental justice across border.

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Key Words: Mexico-United States, Water, Planning Institutions, Environmental Justice, Presa Las Virgenes

### **DROUGHT, THE RESILIENCE FETISH AND THE DEEPENING OF WATER INJUSTICE IN CAPE TOWN**

Abstract ID: 556

Abstract within Pre-Organized Session 65

KARUNANANTHAN, Meera [University of Ottawa] mkaru021@uottawa.ca, presenting author

In January 2018, the City of Cape Town made international headlines when it announced that it was three months away from running out of water. Three consecutive years of drought in the Western Cape region had led to critical water shortages in municipal water dams that supplied the city's 4 million residents.

This paper investigates how discourses of scarcity and urban climate resilience were instrumentalized in the aftermath of the drought to deepen unequal hydro-social relations in South Africa's second largest city. Combining feminist ethnographic research with critical discourse analysis of policy documents, I examine the multi-scalar politics of water conservation underscoring the ways in which the urban water system is fetishized through narratives that obscure power asymmetries and legitimize the ongoing socio-ecological deprivation of historically marginalized groups. I argue that these discursive strategies construct a fantasy in which capitalism can "save water" using innovative green technologies and market-based solutions. Within the context of post-apartheid Cape Town, I argue, these narratives that fetishize water serve a racial capitalist agenda that seeks to control and criminalize the life sustaining activities of working class racialized populations, which stand in the way of capital accumulation.

My research foregrounds the resistance led by racialized working class women living in precarious housing conditions to municipal water conservation strategies that devalue their lives and intensify their burden of social reproduction. Guided by feminist standpoint theory, my research highlights acts of individual resistance and collective protest as important sites of knowledge production regarding the racialized violence of neoliberal urban environmental programs. It offers bottom-up critiques of global processes co-constructed through dialogical methods foregrounding everyday embodied experiences of racialized, working class women confronting water management and climate resilience policies in their homes and neighbourhoods.

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Key Words: environmental justice, water, resilience, drought, South Africa

## **2.104 PRE-ORGANIZED SESSION - ENVIRONMENTAL JUSTICE OF/FOR/WITH WATER II**

Pre-Organized Session 104 - Summary

Session Includes 549, 550, 551, 552, 567

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From drought to flood, household water access, conservation and contamination, energy production, alongside ceremony and recreation, the work of fishers and water protectors these are just some of the ways in which humans and water interact. Beyond human interactions, water also has its own work to do, and its own relationships with more-than-human beings to maintain, even though humans often interfere and disrupt that work and relationships. We aim to bring together a wide range of perspectives on relationship between water and environmental justice. Re-proving the fact of harm and inequitable experiences with water related to race, class, gender, caste, disability, sexuality and ongoing colonialism is not the goal of the session. Instead the goal is to bring together work that aims to untangle the processes, institutions and structures that maintain these inequities. Alongside work that explores ideas around, and examples of care- and liberation-focused approaches to addressing harm and inequity related to water, and for moving towards thriving relationship with water.

Objectives:

- understanding of environmental relationships around water in planning

## **EMPOWERING CITIZENS TO CHANGE THE STATUS QUO: THE 2021 JACKSON (MS) WATER CRISIS**

Abstract ID: 549

Abstract within Pre-Organized Session 104

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In February of 2021, what was thought to be a late, pithy, winter snow and ice storm, turned into a series of cascading events that included power outages, transportation stoppages, burst water pipes, causing the malfunctioning of Jackson, Mississippi's fragile water system that lasted nearly 30 days. These particular events led to citywide water shortages resulting in major health, economic, political, human, and social disruptions impacting over 100,000 residents. Jackson, a predominantly African-American capitol city, is also home to a majority white state legislature, with a history of ignoring the needs of its citizens based on race. For a number of years, black political officials have brought the issue of the fragile water system and outdated infrastructure to the attention of the conservatively ran state legislature; however, their requests for assistance have gone unanswered; in turn, causing irreparable damage to the city and adding to the misery of its citizens for years.

Similar Occurrence

In 2014, the Flint Water Crises in Flint, MI erupted as one of the most impactful public health emergencies in modern times. In changing water sources from the Detroit River to the

Flint River, water officials failed to properly treat drinking water that flowed through corrosive lead pipes. Subsequently, this incident increased the amount of lead in the drinking water, which caused a number of fatalities and impacted the health of hundreds of thousands of people, including children. Community groups in Flint and from across the state of Michigan responded to the needs of the people by laying the foundation for advocacy campaigns and harnessing resources needed to empower vulnerable communities during this difficult time.

#### Theoretical Framework

The theoretical framework identified for this study is empowerment theory. Empowerment theory is defined as the process of increasing personal, interpersonal, or political power so that individuals can take action to improve their life situations (Gutierrez, 2001, p. 216). Empowerment theory assesses the current situation; concerns such as the impact of environmental factors and personal characteristics are examined through a critical lens; and lastly, attention is focused on needed resources that have the power to change a particular situation. The theory argues that if given the required resources, the problem or issue of concern can be mitigated or eliminated, resulting in an improved quality of life. Furthermore, the theory asserts that as people possess the power need to exact change, the individual, organization, group, or community are better off. According to Poulin and Matis (2021), empowering systems give them the tools and skills necessary to do something...helping enhance self-efficacy or boost self-confidence in clients (p. 89). Thus, understanding the tenants of empowerment theory moves the subject from deficiency to becoming resourced.

Using Empowerment as a framework, this qualitative research captures the narratives of African-Americans living in Jackson, Mississippi, who were impacted by the water crisis. Their narratives will be used as mechanism to dismantle functionalist ideology held by the status quo government. Through their voices, the research will provide strategies to address the issues of racial bias and inequity of state government and provide steps to collectively untangle injustice, thereby remedying the water crisis. In addition, implications for policy and planning will be discussed as a foundation to build trust regarding the water system with the citizens of Jackson.

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Key Words: Jackson, MS, Water Crisis, Sustainability

#### **LIVING WITH WATER: COMMUNITY PLANNING AND CONCENTRATED DISADVANTAGE IN LOÍZA, PUERTO RICO**

Abstract ID: 550

Abstract within Pre-Organized Session 104

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The risk of flooding in cities is often compounded by political and economic decisions made on watershed management, land development, and water infrastructure and provisioning. It has also become a point of conflict between a region's objectives for development and the struggles of marginalized residents living in low-lying coastal and riverine areas to remain in place (Goh 2019). In the case of disasters, the issue of urban flooding directly shapes recovery policies and funding, often leading to forced displacements in informal, low-income communities. These

issues are all present in Loíza, a historically marginalized municipality in Puerto Rico.

Conceptually and methodologically, this paper builds on the work of Pendall, Theodos, and Franks (2012) and uses the concept of concentrated disadvantage as an analytical device to (a) better grasp the multiple layers of environmental injustices related to urban water systems in Loíza, and (b) to develop a framework that allows us to build alternative water realities. The notion of concentrated disadvantage takes into consideration the kinds of vulnerability “associated with the personal characteristics of individuals”, the precariousness derived from people’s living situations, and the larger environment, which involves “the natural, built, social, and economic systems in which people operate and their situations are located.” In other words, this approach requires exploring intersections between multiple forms of individual or personal vulnerability (e.g., race, gender, age, income, etc.), housing precariousness (e.g., aging housing, tenure insecurity, etc.), and regional resiliency – or lack of – (e.g., disinvestment, informality, marginalization).

Based on mixed-methods research, this paper explores the interrelationships between biophysical and sociopolitical factors behind urban flooding in Loíza. The paper considers multiple scales of analysis, including the ecological scales of the watershed, the infrastructural scales associated with flood protection, and the urban scales of planning, governance, and social activism. The paper concludes with a proposition for a multidimensional approach to thinking and acting on problems of urban flooding in more socially just and humane ways.

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Key Words: urban flooding, vulnerability, concentrated disadvantage, disaster recovery, hazard mitigation

#### **INFRASTRUCTURE INTERDEPENDENCIES CONTRIBUTE TO WATER AND SANITATION CHALLENGES IN DISADVANTAGED UNINCORPORATED URBAN COMMUNITIES**

Abstract ID: 551

Abstract within Pre-Organized Session 104

VIDMAR, Abby [University of South Florida] abbyvidmar@usf.edu, presenting author  
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This presentation discusses the results of ethnographic research that examines perceptions and experiences of water and sanitation insecurity in disadvantaged unincorporated urban communities in Tampa Bay, Florida. Safe and secure water and sewer infrastructures are not universal, even in high-income economies such as the U.S. (Meehan et al. 2020) where local and regional governments grapple with aging and underfunded infrastructures that produce water and sanitation vulnerability (Wells et al. 2020). When these issues are compounded with systemic racial, gender, and socioeconomic inequalities, health and wellbeing are compromised (Wells and Whiteford 2021). Moreover, recent research in disadvantaged unincorporated urban communities (DUUCS) demonstrates that water and sanitation infrastructures are often interdependent, such that failures in one sector can have cascading effects across other sectors (Mohebbi et al. 2020). In order to address water and sanitation insecurity in DUUCS, we therefore must understand the ways and extent to which water and sanitation challenges are interrelated and how infrastructure interdependencies compound or exacerbate these challenges.

Our team of applied anthropologists and environmental engineers from the University of South Florida are studying these issues in the University Area Community (UAC), a DUUC on the northern edge of the City of Tampa where

research reveals persistent water and sanitation challenges over the past decade. Part of the UAC is serviced by City of Tampa utilities, yet over 1,000 residents are located on properties with well water and onsite wastewater treatment. Potable water quality is an ongoing issue for many residents and inconsistent knowledge of safe water and quality sanitation complicates these challenges. Our research examines the problem from both the bottom up (working directly with community residents) and the top down (working on a city-county team of engineers who recently started examining water problems in the community). This dual perspective allows us to analyze how local knowledge and authoritative knowledge overlap with or diverge from one another, and how the gaps might inform positive interventions. This research thus contributes to better understanding environmental justice and urban planning in disadvantaged unincorporated urban communities.

Overall, we find that UAC residents identify both water and sanitation problems but do not see their interconnections (e.g., contaminated drinking water from wells located adjacent to septic leach fields). City/county officials, on the other hand, are generally unaware of water and sanitation problems in the community but understand the interdependencies between the infrastructures. Recent research by our team also found that water and sanitation infrastructures are managed independently and differently between the city and county (Wakhungu and Wells 2019). Thus, there are managerial and policy disconnects in being able to address joint water-sanitation challenges. The greater goal of this work is to inform context-sensitive planning interventions in the UAC and to promote positive policy changes aimed at creating more equitable water and sanitation infrastructure for UAC residents and other DUUCS.

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Key Words: water and sanitation infrastructure, infrastructure interdependencies, disadvantaged unincorporated urban communities, environmental justice

#### **HENKAN. SHIN-KICHI: MILITARY REALIGNMENT AND OKINAWAN UPRISING IN THE "POST"COLONY**

Abstract ID: 552

Abstract within Pre-Organized Session 104

IWAMA, Daniel [University of California, Los Angeles] diwama@ucla.edu, presenting author

This article concerns the protracted opposition of Okinawans and their allies to the construction of an oceanic military base expansion off the coast of Henoko Village in the Yanbaru region of Okinawa Island. The US-Japan Security Alliance has been unresponsive to Okinawan calls for actual demilitarization (Kashiwagi 2019). At the same time, the promise of institutionalized processes of military land redevelopment remain limited by the private

property regime and gender inequalities established in the settlement period. Therefore, I argue that multi-sited peaceful protest against the new base performs a dual function. On one hand, the Henoko sit-in deters oceanic catastrophe and the desecration of indigenous remains in service to further militarization. At the same time, it creates a physical space that animates new and old socio-spatial imaginaries not provided for in mainstream pathways to demilitarization.

Occurring within the constellation of the US's "empire of bases" (Vine 2015), the struggle at Henoko is one instance of local people grappling with the particularized effects of the US forces' "pacific pivot" and related base realignments. As the military pursues greater "flexibility" in the region, marginal selections of base land have been returned and redeveloped by national governments and dispossessed landowners pursuant to these plans. This has allowed militaries and settler governments to construct narratives of "burden reduction," while consolidating actual military functions upon remaining and newly militarized land and waters elsewhere. This cup-game of militarism unevenly effects indigenous islands, where the exceptional political status of peoples like native Hawaiians, Okinawans, and Chamorro have historically made it easier for military planners to expropriate lands from them (Davis 2011). Ecological destruction, sexual violence, noise pollution, and dislocation from sacred places thus remain endemic in Okinawa, where local people are pushed to direct action to materialize a good life (Yoshikazu 2006).

In constructing my argument, I utilize preliminary findings from extensive participatory methods, key informant interviews, and policy and discourse analysis. This work produces a deeply contextualized and historic understanding of Okinawan protest in the post-millennium, and contributes more broadly to our knowledge of the ways in which peoples' uprisings disrupt colonial power throughout the global US military empire.

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Key Words: Okinawa, Military, Social Movement, Indigenous, Water

#### **BUILDING RESILIENCE THROUGH WATER: THE CASE OF COMMUNITY AQUEDUCTS IN PUERTO RICO**

Abstract ID: 567

Abstract within Pre-Organized Session 104

PEREZ-FIGUEROA, Omar [University of California Irvine] operezfi@uci.edu, presenting author

Recent studies suggest that extreme weather events are made more frequent or more severe by human-caused climate change. These extreme events represent a threat to society but this does not imply that they will automatically turn into disasters. Therefore, looking for ways to cope with them is not only relevant but vital to human survival. I propose that under our current climate change context, effective disaster resilience must incorporate environmental equity and community empowerment goals. Furthermore, it must support decentralized/polycentric water governance systems. This study aims to provide insights on ways to reduce the vulnerability of communities most impacted by disasters in the global south in the wake of future disaster events and to aid in the creation of disaster policies that are more effectively attuned to the ways in which communities

prepare for and cope with disasters

My proposed research explores whether different water governance systems—defined as the rules and social relationships that establish who gets water, when water is distributed, and how this distribution is done (Lu, Ocampo-Raeder & Crow, 2014; Obertreis, Moss, Molinga & Bichsek, 2016)—affect disaster resilience. I focus on the case of Puerto Rico’s Non-PRASA communities, which are community aqueducts that are not served by the Puerto Rico Aqueduct and Sewer Agency (PRASA). While the United Nations continues to stress the need to increase disaster resilience to address disasters and hazards, it is less clear how to achieve that resilience or what resilience looks like for local communities. My research questions seek to address both needs, on one hand testing the idea that water governance can influence recovery practices and produce resilience, and on the other hand observing how communities define, discuss, and interact with water governance and disasters, including those networks created from those interactions.

Puerto Rico represents a critical case to study how disaster resilience and water governance look when an island lacks the political power to execute effective disaster policies. I will focus on Non-PRASA communities, as they can serve as examples of resilience when considering future extreme climate scenarios. During prolonged droughts and extreme rainfall, a few Non-PRASA communities were still able to provide drinking water. Furthermore, the Non-PRASA communities enhanced the region’s overall resilience to hurricanes’ effects, as they both provided water and transferred knowledge about water management to neighboring PRASA communities that did not have access to water.

This research employs a comparative case study to provide a deeper understanding of the institutional design of Non-PRASA communities, the policies that shape them, and their relationship with disaster resilience. This research uses a variety of data sources including (a) interviews, (b) social media, (c) policy documents to understand how everyday practices involving the connection between water governance and disaster resilience are understood by community members. The combination of different data sources would allow me to identify (1) what are the different water governance structures in these communities; (2) whether horizontal or vertical structures are available, used, preferred, maintained; (3) and whether these structures are connected to good quality water. Information from interviews will determine factors that make some of these communities more resilient to disasters.

Initial findings reveal that Non-PRASA’s water governance structure affect had implications for access to recovery funds and improving water services. Additionally, this research uncovered how, through their social ties, many of these community aqueducts provided other services beyond providing water, like caring for the elderly, disinfecting services, and entertainment activities these latter activities have helped their communities deal with disasters, including COVID 19. Narratives of thriving Non-PRASA communities and water infrastructure beckon us to understand how they work and why they persist alongside large-scale, highly technical solutions.

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Key Words: community water aqueducts, environmental justice, community resilience, just recovery, water governance

## **2.150 PRE-ORGANIZED SESSION - RESILIENCE IS A NET WE WEAVE: REGENERATIVE PRAXIS FOR ENVIRONMENTAL AND CLIMATE JUSTICE**

Pre-Organized Session 150 - Summary

Session Includes 895, 896, 897, 898, 899

WALSH, Elizabeth [University of Denver] elizabeth.walsh@gmail.com, organizer

How might planners break from neoliberal models of resilience planning in the face of climate catastrophe? What tools, mental models, and methods can be leveraged to these ends? Shifts away from extractive, exploitative, and oppressive systems do not come from disembodied rationality; as Audre Lorde reminds us, “the master’s tools will not dismantle the master’s house.” Hegemonic modes of planning research and engagement miss opportunities to build the community power and collective wisdom required to disrupt systems of oppression and co-create living systems of liberation and regeneration. Approaching planning praxis through lessons shared by social movements as well as Black, Indigenous, anti-racist, and feminist researchers and theorists, this panel presents tools, frameworks, and stories from the field that can root resilience efforts in reciprocal relationality, reparation, and regeneration. We come together with backgrounds that range from engineering to community organizing, the majority of whom share white-settler positionality. We hold an intention to embody anti-racist, decolonial, regenerative praxis in our lives and work.

Objectives:

- Hold space for critical, compassionate self-reflection regarding the tension of liberatory praxis in the face of virulent white-settler culture carried in our institutions, our bodies, and our work.
- Articulate a paradigm shift in our epistemological and methodological approaches for the co-production of knowledge and power to advance environmental justice and climate resilience.
- Explore methods to support co-creation of reparative and regenerative infrastructures needed to support geographies of radical resilience.

## **BEYOND THE "PLANNER'S TRIANGLE" AND "LADDER OF CITIZEN PARTICIPATION": NAVIGATING WITH A COMPASS OF COLLECTIVE POWER AND WISDOM FOR EQUITABLE, REGENERATIVE DEVELOPMENT**

Abstract ID: 895

Abstract within Pre-Organized Session 150

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In the 25 years since Scott Campbell (1996) introduced the “Planner’s Triangle” and over 50 years since the publication of Sherry Arnstein’s (1969) “A Ladder of Citizen Participation,” what have we learned about community engagement that can help us plan in an era of climate volatility for societal transformation and a just transition to equitable and regenerative economies?

A growing consensus recognizes that our communities’ most urgent and persistent challenges are far too complex to be solved alone; we must work together, thinking across systems and centering the voices of underrepresented populations (Innes & Booher, 2018). Increasingly climate justice leaders and planners recognize that the dominant development paradigm achieved economic growth for power-brokers at the expense of the majority of human beings and the ecological systems of which they were part (Walsh & Wilson, 2020).

At the same time, our field's over-reliance on the Planner's Triangle and the Ladder of Citizen Participation as heuristics for engagement constrains our capacity to address the complex challenges before us. First, there are significant limitations endemic to use of the models themselves (e.g., they neither support paradigm shifts for systems transformation, nor offer guidance on building the power of diverse citizens to address complex social and ecological problems). Second, our field - even from its foundation in the work of Patrick Geddes - has a much greater wealth of (a) methods/practices of engagement and (b) theories of knowledge and power we can draw upon to support climate transformations in the 21st century.

Recognizing that visual heuristics are helpful for framing understanding and taking action, we offer a flexible framework - a compass that can help us navigate the wealth of methods we've inherited in the past to cultivate the collective wisdom and power we need today to plan for equitable, regenerative development in the future. Instead of "directional arrows," this compass points us to three "directional questions," while also signaling that our powers are more diverse than even the nine listed here.

At the center, the "inner" compass is a triangle, with each side representing a principle of natural law: integrity, reciprocity, and liberty. Beyond being "good" social norms, integrity and reciprocity are how the biophysical world works; billions of years ago, a solar economy of plants created a living world from inanimate materials, constantly regenerating life through networks of reciprocity, and ecosystems of integrity (Walsh, 2021). Liberty - the exercise of sovereignty in our entangled webs of relations - is both a birthright and duty of human beings (Allen, 2014). As Campbell argued, the goal for planners is not to eliminate conflict, but to engage it productively. This heuristic embraces tension as a source of co-creative energy.

The "outer" compass is represented by a spectrum of collective powers radiating out of the prism - each representing a path through which we can direct our vital energies to advance social and ecological well-being. Arnstein believed in the untapped potential of citizen power, and the need to redistribute resources and decision-making power to address the gap between the "haves" and the "have-nots." Building on Arnstein's legacy, we identify the power to redistribute as one of nine forms of collective power, including the power to disrupt, heal, host, appreciate, integrate, envision, co-create, and govern.

Drawing from a wealth of practical wisdom from the canon of planning and beyond its traditional boundaries from those leading on the frontlines of climate injustice, we provide a summary of methods drawn from existing literature, available to us to cultivate these collective powers through our planning processes, from design to implementation and ongoing management. We also share illustrative examples from planning practice.

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Key Words: climate justice, regenerative development, resilience planning, participatory methods, ethics

## **“WISE” RESILIENCE PLANNING: TOOLS FOR ADVANCING RECIPROCAL RELATIONSHIPS AND RAPID ACTION IN SAVANNAH, GA**

Abstract ID: 896

Abstract within Pre-Organized Session 150

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Grounding the interpretation of big data in authentic community experience is challenging for planners and residents because of time and trust limitations. To move from “smart” city planning to “wise” city planning requires deep, thoughtful engagement with local specificity in the form of environmental, historical, and relational assets and challenges, as well as with difficult questions about power and governance (Young and Lieberknecht, 2019).

Particularly in the context of resilience, a tension emerges in our pursuit of ethical, effective, and efficient action between a need for urgency, and a need to slow down in order to build sustained and sustaining relationships. We must “move at the speed of trust” (brown, 2017: 42), while also keeping an eye on the ever-encroaching horizon of climate change-induced disaster(s). This is what is meant by “bounce forward” resilience (Kresge, 2015) – the ability to take advantage of disastrous moments to advance systems change. And yet, it is our relational capacity that positions us to bounce forward in a just and regenerative way.

This paper presents a case study from Savannah, GA that includes three tools used to support resilience planning. The tools were woven together for a multidisciplinary research project to respond to concerns around community resilience in a small southern city. Harambee House, the community partner, has reviewed, supports and piloted these tools employed in the study.

These tools are discussed in the context of moving towards wise city planning, and what ground they offer for productively engaging the tension described above. The three tools include (1) the map room, an interactive and tactile counter-mapping pilot project (Corbett and Loukissas, 2019); (2) the community profile, a document that aggregates detailed vulnerability and asset data for one neighborhood to provide local actors with information to contest official stories; and (3) the promise inventory, which serves as both a process for engaging deeply with local history and context, as well as an evaluation tool for showing impact and calling upon partners to uphold their commitments. Participants will come away from this session with tools that help to address the “people” side of resilience by building relational capacity and ultimately regenerative power (Walsh, 2021).

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Key Words: resilience, community engagement, climate change, smart cities

## THE ROLES OF SOCIAL CAPITAL IN EARTHQUAKE RECOVERY IN ECUADOR

Abstract ID: 897

Abstract within Pre-Organized Session 150

MCMULLEN, Shelley [University of Colorado - Denver] shelly.mcmullen@ucdenver.edu, presenting author

Disaster recovery and resilience has often been addressed in terms of physical infrastructure and economic systems, excluding considerations for the recovery and resilience of social systems. The social fabric and networks within a community provide keys to building the capacity for adapting to changes, recovering and moving forward, and those connections and networks within a community are the primary elements of social capital (Campanella & Godschalk, 2012). It is social capital that allows individuals to cooperate for a common purpose (Aldrich, 2012; Putnam, 1995).

Because the social impacts of disasters have traditionally been less studied than economic or infrastructure impacts (Tierney, 2019), there is still much discussion and disagreement between researchers regarding the role resilience and social capital play in disaster recovery (Sadri, et al., 2018). Researchers have found that disasters impact poorer populations far more than the wealthy and the ability to cope and recover is far more difficult for those in poverty (Tierney, 2019). Destruction may cause the displacement of survivors or fracturing of neighborhoods, resulting in the severing of social supports that may have otherwise helped alleviate some of that stress (Tierney, 2019). Understanding the social fabric and networks within a community can help researchers better understand community resilience (Campanella & Godschalk, 2012). Little research has studied what has gone right during disaster recovery in resilient communities (Aldrich, 2012).

By comparing the recovery progress and social capital of several small communities in Bahía de Caráquez, Manabí Province, Ecuador after the 7.8 magnitude earthquake in 2016, this case study attempts to better understand the influence of social capital on resilience and recovery after a disaster event. The research question asks how influential social capital was on long-term disaster recovery after an event. This study surveyed eight different communities in coastal Ecuador to better understand the influences of the three types of social capital (bonding, bridging and linking) to the perception of recovery. Social capital characteristics that were measured included community roots, social interaction, community cohesion, community trust, social responsibility, social infrastructure, and assistance from the surrounding community. Assistance from government and personal earthquake damage from the earthquake were also measured against perceived recovery. The results from the analysis showed that regular social interactions between community members and assistance from local volunteers or NGOs had positive, significant relationships to the perception of recovery.

The findings from this research support both scholars and practitioners in understanding the importance of social capital to disaster recovery at a neighborhood scale and attempts to fill gaps in the existing literature regarding long-term recovery and the role of social capital in communities in a community located in the Global South.

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Key Words: Disaster Recovery, Social Capital, Community Resilience

## CONSUMPTION AS CARE: TOWARDS A MODEL FOR REGENERATIVE PLANNING

Abstract ID: 898

Abstract within Pre-Organized Session 150

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Since the revolts of the 1960s, planners have, at least rhetorically, centered participation. But as cities struggle with the weight of decarbonizing energy systems, adapting infrastructure to rising seas and a whole range of other climate catastrophes, they do so in a landscape that remains structured by racist housing and urban development policies, and through methods that reify technocratic expertise. This has meant that most top-down interventions in the name of resilience may simply reproduce racialized patterns of risk and benefit and do little to change the calculus of the climate catastrophe (Meerow et al, 2019). The framework of resilience itself, which was largely devised and promoted by foundations in partnership with the insurance industry, has been observed to consistently advance neoliberal governing strategies while obscuring environmental injustice (Fainstein 2018).

Planning within a green new deal framework may offer a path out of this conundrum, though planners have already cautioned that it is no panacea. While planners rhetorically prioritize participation, we already know that the scale of energy decarbonization will require massive technocratic and top-down coordination. Kian Goh (2020) has challenged planners to recognize the tension between an ethical mandate to redistribute power and the necessity of top-down leadership, and to find a generative path forward. Following Goh's call, and building on concepts of degrowth (Kallis, 2018) and regenerative cities (Thompson & Newman, 2018), in this paper, I examine two sets of grassroots efforts to reshape consumption in New York City.

Urban consumption of energy and materials is central to extractive capitalism, but while city policy remains steadfastly neoliberal, grassroots and community organizing offers pathways for New York City residents to build a regenerative economy from the ground up. The two Brooklyn-based initiatives studied here—one a cooperative renewable energy installation in Sunset Park, and the second a set of informal sharing and buy-nothing groups—are actively building new institutions for consumption, the first for energy, the second for materials. Each initiative builds capacity and community outside of formal, market-based exchange networks. They both facilitate the supply of basic necessities in less damaging, or even nurturing ways, while also building political knowledge and capacity among participants. This research asks two questions. First, how do these small initiatives support the stated priorities of city leaders and planners, as articulated in the city's most recent plans and policy statements? And second, how can planners learn from and support these potentially transformative initiatives that embody, more purely than any public resilience effort in the U.S. to date, goals of redistribution, justice, and balanced sociocultures?

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Key Words: Regenerative, Resilience, Consumption, New York City, Care

## RELATIONAL INFRASTRUCTURE FOR JUST RESILIENCE: THE IMPACT OF COMMUNITY BASED PLANNING AND DESIGN ON SOCIAL CAPITAL, PLACE ATTACHMENT, AND LOCAL KNOWLEDGE IN NORTHEAST HOUSTON

Abstract ID: 899

Abstract within Pre-Organized Session 150

SLABAUGH, Danielle [CU Denver] dani.slabaugh@ucdenver.edu, presenting author

Climate change is a social justice issue; disasters tend to amplify racial, class, gender, age, ability, and other disparities (Wilson, 2018; Wisner et al., 1994). As planners, engineers, designers and policy makers grapple with climate adaptation and resilience, many such efforts focus on the built environment. This approach leaves out critical social and place-based networks of resilience while often creating conditions for green gentrification, which has a deleterious impact on relational dimensions of community resilience (Gould, 2016). As low-income Black, Indigenous, and Communities of Color (BIPOC) are pushed out, relational networks that play a greater role in the resilience of marginalized communities, who often lack access to other safety nets in the form of savings or adequate insurance, are weakened or destroyed.

How might planners expand the scope of their impacts and more fully address climate justice issues that arise from displacement? Social capital, place attachment, and local knowledge offer the framework of relational infrastructure, a relationship-based network that serves as adaptable scaffolding for community resilience. Through the lens of relational infrastructure, the planning process comes into focus as a tool for building both tangible physical and intangible, relational resilience infrastructure.

Using semi-structured interviews, the impacts of community-driven and community-controlled neighborhood flood recovery and resilience planning on these three resilience indicators was assessed among low-income Black and Latinx community participants in Northeast Houston. Interviews with participants exposed several themes that tie the community-based planning methods to improved resilience. This case study reveals a significant-increases in both bonding and bridging community social capital, as well as interconnected increases in place attachment and community self-efficacy that members attribute to their involvement in the planning and advocacy process. Improved post-disaster mental health outcomes also emerged as a theme from this case study, suggesting that further research is needed to assess the impact of community-based planning and design methods on post-disaster mental health outcomes that disproportionately impact low-income BIPOC groups (Ahern & Galea, 2006).

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Key Words: Climate Justice, Community Adaptive Capacity, Post Disaster Mental Health, Social Capital, Community Based Planning

## **ROUNDTABLES**

### **2.674 ROUNDTABLE - URBAN PLANNING AND ANTI-ASIAN RACISM**

Abstract ID: 674

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KIM, Anna [San Diego State University] anna.kim@sdsu.edu, participant  
YANG LIU, Cathy [Georgia State University] cylu@gsu.edu, participant  
LUNG-AMAM, Willow [University of Maryland] lungamam@umd.edu, participant  
RAMASUBRAMANIAN, Laxmi [San José State University] laxmi.ramasubramanian@sjsu.edu, participant  
SPENCER, James [Louisiana State University] jhs@lsu.edu, participant  
ZHUANG, Zhixi [Ryerson University] zczhuang@ryerson.ca, participant  
KIM, Do [California Polytechnic Institute, Pomona] dohyungkim@cpp.edu, participant

Between March 19, 2020 and February 28, 2021, Stop AAPI Hate received reports of 3,795 incidents (Jeung et al., 2021). The Atlanta shooting on March 16, 2021, which took the lives of eight people, including six women of Asian descent, further pinpointed persistent racial discrimination and xenophobia in North America and revealed the complex intersectionality of race, gender, class, and immigration status. Since the Atlanta shooting, communities call for further changes to stop prejudice, stigmatization, or racism.

Long before the Atlanta shooting and the recent surge of anti-Asian violence, researchers and scholars, including the panelists in the roundtable, have examined the hardships and discrimination faced by the Asian population across North America (Portes & Zhou, 1993). In their scholarly works, the panelists have shown (references of the panelists' works are not provided due to the limited number of references allowed) that although native-born and immigrant Asian people have strived for "American dreams", engaged in self-employment and entrepreneurship, and invested in their communities and cities, Asian people still face severe risks of violence, residential segregation, a lack of access to the economy outside of ethnic enclaves, and barriers to participating in decision making. These hardships are similar to those faced by other marginalized groups but have not been widely recognized or acknowledged outside of Asian communities (Brockell, 2021).

In their works, the panelists have also proposed strategies to engage with Asian and Asian American/Canadian communities in creating equitable and just cities for all. These strategies include innovative approaches of participatory planning such as story mapping, developing cultural competence in urban planning research and practices, facilitating the welcoming movement of local governments. Moreover, they underscore that, in urban planning education, it is important to build community-university partnerships and engage diverse students in effective ways when teaching equity and advocacy planning.

Against this backdrop, we convene this roundtable to reinvigorate and expand the conversation, which centers around combating racism towards Asian people while striving for eliminating discrimination against Black, Indigenous, Latinx, immigrant, and sexual/gender and religious minority communities. This panel will center on how the Asian experience of racism has unique characteristics that overlap with these movements, but with particular features that must be addressed.

This roundtable is the start of a conversation to engage our ACSP colleagues to address the following questions:

1. How to raise the awareness of implicit and systemic biases toward Asian and Asian American/Canadian faculty and students in the field of Urban Planning?
2. What are the tools and resources available to faculty and students to navigate the structural, institutional, and political dimensions of implicit and systemic racism in urban planning and to combat discrimination against Asian and other minoritized groups?
3. In planning education and practices, how to build infrastructure and support systems that are welcoming and equitable for all?

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Key Words: Asian, racism, planning education

## **INDIVIDUAL PAPER SUBMISSIONS**

### **MEASURING IMMIGRANT-SERVING NONPROFIT STRATEGIES IN US CITIES**

Abstract ID: 30

Individual Paper Submission

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Immigrant-serving nonprofits employ many strategies to promote the inclusion of immigrants in communities throughout the US. This includes, for example, enacting cross-sectoral and organizational partnerships, engaging in administrative policy advocacy with city officials, and strategically framing immigrant issues (de Graauw, 2016). The strategies that practitioners employ are also shaped by their political environments (Casteñada, 2020; de Graauw, 2015). There is also evidence to suggest that different strategies result in disparate inclusion outcomes (de Graauw, 2015). While the literature on the interrelations between nonprofit strategies, their environments, and immigrant outcomes is robust, many studies employ primarily case study methods focusing on organizations in one or a few cities which limits generalizability. Hence, to precisely understand the degree to which local context and organizational strategies matter when it comes to immigrant inclusion outcomes, needed in the literature is a study that evaluates organizations operating throughout the US using statistical methodological approaches.

This study addresses the aforementioned empirical limitation by investigating the two questions: (1) What are the strategies of the US immigrant-serving nonprofit sector? (2) Do strategies significantly differ in inclusive and exclusive cities? Drawing from the literature, it is hypothesized that organizations nested in more inclusive cities will display more advocacy while organizations in more exclusive cities will employ more services. To identify nonprofit strategies, qualitative interviews with nonprofit practitioners (n=27) across the US are conducted with practitioners. Results from the interviews are used to develop an original scale that allows for measuring immigrant-serving nonprofit strategies. The scale is implemented on a stratified random sample of organizations located in inclusionary and exclusionary US cities (n=122). To measure the degree to which cities are inclusive for stratification purposes, a scale is created. Confirmatory factor analysis is used to validate both scales and to confirm the dimensionality of the strategies. A one-way ANOVA is conducted to evaluate whether strategies significantly differ among organizations nested in environments with varying degrees of immigrant inclusion.

Preliminary findings from the interviews reveal that there are at least nine mesolevel strategies operating in the field. This includes enacting community participation; educating the community; providing social, legal and cultural services; faith organizing; launching collaborations; policy advocacy; and engaging in confrontational practices. These strategies can be further specified into several functional strategies. Analysis of the survey data will determine whether strategies significantly differ across political contexts.

Findings from this research will have empirical, theoretical, policy and practice implications. Empirically, it expands



on current works by revealing the dimensionality immigrant-serving nonprofit strategies. It also results in two validated scales that can be used for future empirical testing. Theoretically, this research advances a conceptual framework for the concept *immigrant inclusion*. The practical implication is that results reveals potential (in)effective practices for promoting immigrant inclusion outcomes, which can benefit practitioners and immigrants. The policy implication is that the study provides a measure on how local city governments in US cities are doing when it comes to promoting immigrant inclusion in their community, which can be useful for diversity and inclusion planning.

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Key Words: immigrants, inclusion, immigrant-serving nonprofits, strategies

#### TELLING THE TALE OF CREATIVE PLACEMAKING ADOPTION THROUGH STAKEHOLDER VOICES, AN APPLICATION OF SPRADLEY'S UNIVERSAL SEMANTIC RELATIONSHIPS TO UNDERSTAND PLACE-BASED IDENTITY PERCEPTIONS

Abstract ID: 49

Individual Paper Submission

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Creative placemaking has been defined as a process of identity co-production specific to a location and its stakeholders within the arts; therefore to understand creative placemaking there is a need to understand people's subjective perceptions of the place at hand (Gaumer et al, 2019; Markusen, 2013; Kelkar & Spinelli, 2016; Sweeney et al., 2018; Wortham-Galvin, 2008). Additionally, there is a need to understand how various stakeholders' perceptions of a place relate to each other within creative placemaking (Salzman & Yerace, 2018). However, it can be a challenge to capture often under-represented community perceptions as well as those of decision-makers who are under bureaucratic constraints to discuss their own take on planning efforts (Becker & Meyers, 1974; Lupia & McCubbins, 1994; Philips, 1987). Yet, understanding decision-makers' and community members' perspectives on creative placemaking efforts is necessary to understanding how is creative placemaking is being adopted within a local context. This research applied Spradley's Universal Semantic Relationships framework to analyze a representative sample of archived in-press quotations from a variety of stakeholders; this content analysis identifies themes and situates them within a case study arts district located within an Ohio university district. Content analyses have been used when researching the role of arts and culture within urbanism, branding, and destination placemaking (Hanser, 2018; Reason & Garcia, 2007; Thomas et al., 2015; Schwartz, 2003). Additionally, archive analysis can assist in identifying hard-to-reach stakeholders within a case study (Yang, 2014). A framework for situating socially constructed themes relating to stakeholders is Spradley's Universal Semantic Relationships (Denitch, 1971; Howe, 1990; Spradley, 1970; Spadley, 1979; Spradley, 1987; Thanem, 2012; Wester et al., 2004).

This research gathered perspectives on creative placemaking within an Ohio university district through an archival search of in-press articles concerning the current implementation of an arts district. Twenty-six stakeholders (University District Businesses / Community Organizations, n=4; University Trustees, n=3; University Planners & their Communications Staff, n=7; University Students, n=6; Area Developers, n=3; University Faculty Members, n=3), produced 128 quotes, treated as segments for this content analysis. 52 of these quotes were classified as *Opposed* or *Neutral* (here neutral was defined as having counter-balanced perspectives or functioning primarily as neutral,

informative pieces perspectives) to the arts district, while 76 of the quotes were classified as in *Support* of the arts district development. From this sample of quotes, open coding was initially used to identify themes within these data. 49 initial codes were identified within these quotes and were subsequently collapsed into 39 codes. Interim coding was undertaken at this point to create a hierarchical structure using Spradley's Universal Semantic Relationships around these initial codes to organize thematic relationships. The semantic codes were then organized under three emergent categories: (1) the identified decision-makers for the arts district, (2) the place-identity of the arts district, and (3) the intended users for the arts district. Seven possible categorical state relationships were identified as the following: (1) Place-Identity, (2) Decision-Making, (3) Users, (4) Place-Identity & Decision-Making, (5) Place-Identity & Decision-Making, (6) Decision-Making & Users, and (7) Decision-Making, Place-Identity, & Users. Analysis of code types (and their related segments) within these category states found an interesting void - no stakeholder group discussed who the intended User for the arts district was to be in isolation. However, the combination category states with Users -- such as Place-Identity & Users and Decision-Makers & Users -- had the highest number of coded segment representations. Findings here are suggestive that all stakeholder perceptions about creative placemaking at this location did not have a clear view of who the intended users of the arts district were or should be and presents the need for creative placemaking to better envision the user of proposed places.

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Key Words: Creative Placemaking, Place-based Perceptions, Qualitative Methods, Case Study, Archival Research

#### THE PLAN AS A VISION: HINDSIGHT 2020

Abstract ID: 69

Individual Paper Submission

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Around the turn of the century (2000), it was trendy for communities updating their community plans to title them “Vision 2020” due to the catchy name, the approximate 20-year time horizon of these plans, and the recognition that 20/20 vision signifies “perfect” eyesight. A plan, in many regards, is a tool to achieve a community vision (Klein et al. 1993). This study retrospectively analyzes “Vision 2020” community plans from this period, with a critical analysis of their vision statements and subsequent implementation. Evaluation and appraisal review of plan implementation is a valuable component of the planning and community development process; reflection fosters improvement (Seasons, 2003). This study uses document data and personal interviews with local planning professionals from different communities throughout the United States of America to discover outcomes and identify barriers and gateways to successfully implementing community visions. A varied sample was extracted from a dozen plans implemented over 20 years which exemplified a focus on community visioning. Findings discuss what worked, what did not work, and lessons learned. Subsequent recommendations are intended to aid planning professionals with future community visioning processes and implementation (Pig et al., 2015). The practical lessons

observed by Hindsight 2020 offers conclusions relevant to the discourse on local planning and community development practice (Littrel & Littrel, 2006).

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Key Words: Visioning, Planning, Implementation, Evaluation

### **RESEARCH ON CHINESE COMMUNITY REGENERATION BASED ON DYNAMIC ANALYSIS OF TERNARY NETWORK— CASE STUDY OF DAXUE ROAD IN SHANGHAI**

Abstract ID: 75

Individual Paper Submission

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In recent years, with the urban stock development and downward shift of social governance focus, community regeneration has become an urgent need to deal with the uncertainties of local development in China. It includes not only the improvement of the community built environment, but also the optimization of the governance mechanism in the process of public participation and the reconstruction of social relationship between neighbors. Therefore, it is particularly important to study the space-society relationship in the process of community regeneration. How to quantify the overall effect of community regeneration? How to build a spatial-social interpretation model? How to reveal the dynamic regularity of public participation? This research attempts to use the method of social network analysis, taking Daxue Road in Shanghai as an example, to construct a ternary network analysis model to explore the answers to these questions.

Daxue Road is the only internet celebrity street in Shanghai with a legal outside position. Block with mixed functions has created three-dimensional commerce and prosperous streets, and had become the fuse for conflicts between residents and businesses. At the beginning of 2019, Daxue Road experienced a mandatory fire prevention rectification led by the government, which has led to mass retreat of the creative stores and the gradual disappearing of vitality. Then the local real estate operator tried to introduce external social organizations, through the micro-regeneration of "Happening Convenient Store" and community empowerment, to build an inclusive, neutral, and friendly non-profit Third Space, which remotivated the community's internal vitality and realized space-society interaction.

Firstly, this study collected community spatial resources, behavior trajectories and social relationship information through on-site exploration, issuing questionnaires and semi-structured interviews, and comprehensively used social network analysis methods and spatial analysis techniques to propose a community ternary network research framework including spatial network, habitus network (spatial behavior trajectories) and social network, which is a space-society interpretation model. Secondly, it develops an analysis index system covering individual, partial and overall network characteristics, tracks and measures the static characteristics and dynamic differences of the ternary network structure in the whole process of public participation in Daxue Road. Thirdly, through the dynamic comparison and correlation analysis of ternary network characteristics, it reveals the iterative mechanism of spatial

network following social actions, the mechanism of space-society interaction, and the growth mechanism of social network following spatial practice.

The findings of this research are as follows. Firstly, in the face of the prevalence of consumerism, the community should introduce cultural life and natural experience to public space, shape the local spirit, maintain a continuous quality public life, and bring social power to the heterogeneity of the street. Secondly, multiple co-governance and multi-party collaboration should be incorporated into the local government framework and the action plan of the community regeneration. The community should integrate local resources and carry out systematic institution innovation in order to realize the long-term and healthy development of the community. Thirdly, the local developer operation team introduces social organizations to provide a unified voice platform for the creative community. However, the involvement of social organizations is temporary, and community development needs to stimulate the consciousness of local subjects.

In terms of community planning theory, this research constructs an interdisciplinary space-society interpretation model. In terms of research methods, it designs a multi-dimensional community regeneration utility (spatial efficiency and social performance) measurement system. In terms of research perspectives, it achieves dynamic analysis of public participation in whole process. At the same time, it also provides a practical sample of community regeneration through the interaction of space revitalization and social empowerment.

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Key Words: community regeneration, social network, habitus network, spatial network, public participation

## USING ART MURALS TO UPLIFT COMMUNITIES THROUGH ECONOMIC DEVELOPMENT AND PLACEMAKING

Abstract ID: 78

Individual Paper Submission

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Urban design and aesthetic improvements have been connected to increased feelings of safety and social capital by influencing resident's interactions with one another (Wood et al, 2008). Among these, public art is a beneficial urban design strategy that can create spaces for public expression, economic opportunity and wellbeing (Kleinert & Horton, 2016). However, these initiatives can also fail to promote comprehensive community development and benefit low-income minorities living in urban centers. Elitist representations of culture can be used as window-dressing to rebrand cities and hide more systemic issues (Zukin, 1996). Thus, this research presents how public art can have tangible positive impacts on underprivileged communities through the case study of mural festival in Springfield, MA. This paper presents an example for planning practitioners and scholars of how socially committed public art can involve marginalized communities in the placemaking process by giving them power in shaping the urban realm (Palermo, 2014).

During the summer of 2019, the Fresh Paint Mural Festival (FP) brought dozens of artists to paint 10 murals in large building walls throughout downtown Springfield. The festival had community engagement as one of its core

principles and hosted several events where community members could work alongside artists. This study employs multiple data sources collected over the span of two months. A total of 168 attendees were surveyed about their spending during FP events, which informed an economic impact study of how much the festival had contributed to the local economy. The survey also included questions related to placemaking and about the impact of public art on people's perceptions of downtown Springfield. Additionally, in-depth interviews with community members involved in the event assessed whether FP had an impact in other intangible aspects connected to urban vibrancy and placemaking. The interviews targeted residents of a public housing who were overwhelmingly latino and African American and had extensive participation in festival events and in a mural installation on their building wall.

Results indicate that administrative decisions to implement FP were responsible for its success in effectively benefiting minorities and the local community of Springfield in two fronts: economic and wellbeing. Economically, FP spent nearly 50% of its budget in women or minority-owned businesses, even though women or minorities own only 12% of businesses in Springfield. Considering the relation between community health and economic security, the decision to invest locally exemplifies how an economic agenda can have broader social implications for minorities. Additionally, by using art to uplift Springfield communities, the event fostered wellbeing by building on intangible assets. An overwhelming majority of respondents agreed that the murals improved sense of safety and walkability downtown and improved perceptions of Springfield as a desirable place. Interviewees mentioned that FP built community by creating experiences of inclusivity and belonging in Springfield's downtown. The interviews provided valuable insight into how art allowed citizens to see themselves as part of Springfield, to feel that their city was being loved and to feel hope for a brighter future.

The information collected on the impacts of Fresh Paint provides meaningful metrics and attests to the potential of public art as a tool to catalyze comprehensive community health, which depends on financial, social and psychological aspects. Although beautification alone is not enough to undo the years of neglect of black and latino communities, Springfield residents said the festival started a hopeful process of reparation.

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Key Words: Placemaking, Public Art, Economic Impact, Minorities, Sense of Place

#### **GENTRIFICATION BEFORE TRANSIT IN DIVERSE SUBURBS: THE STORY OF THE PURPLE LINE CORRIDOR**

Abstract ID: 98

Individual Paper Submission

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The State of Maryland is currently building a new light rail system, known as the Purple Line, which spans two suburban counties outside Washington DC. It will connect multiple major activity centers and subway lines with new

high capacity transit along its 16 mile, 21 station circumferential route. The Purple Line will greatly increase transit accessibility to jobs and points of interest along its path, including in majority Latinx neighborhoods where low-income residents may be vulnerable to displacement (Lung-Amam and Dawkins, 2020). This paper assesses whether or not gentrification is occurring along the Purple Line in advance of the line's operation.

The prevalence of gentrification and one of its primary consequences, displacement, is subject to ongoing debate. One reviewer of gentrification noted the subject is viewed in qualitative and micro-level studies as a social issue that is "deeply problematic and consequential for longtime residents" (Brown-Saracino, 2018, p. 517). In the same review, Brown-Saracino notes that macro-level quantitative analyses offer a viewpoint that gentrification is not as widespread as commonly thought, and further that "displacement is far from endemic" (2018, p. 520). This paper offers novel evidence from a case study of a transit line, in advance of its operation, that will directly impact hundreds of thousands of residents in nearby neighborhoods.

The Purple Line as a case-study is relevant given recent advances made and questions posed in the literature. Large-scale public investment, like the over \$2 billion investment in the Purple Line, has been shown to influence processes of gentrification and potentially catalyze displacement (Zuk et al. 2017). However, macro-scale evidence has shown that new rail transit stations do not directly catalyze higher rates of displacement for low-income residents who live nearby (Nilsson and Delmelle, 2020). Further, a growing amount of scholarly work shows that evidence of the extent and location of gentrification is irrevocably tied to how the concept is defined (Preis et al. 2020).

Given these challenges, we advance our case study using both traditional and novel sources of data, coupled with our experience as activist-scholars embedded in the Purple Line's planning process. We test for the presence of gentrification using census socioeconomic and demographic data at differing spatial scales, using both the census tract and the census block group. We measure gentrification over multiple time periods from 1980 to 2018, using different lengths of time to account for economic cycles. To identify gentrification, we create a subset of eligible areas based on race, ethnicity and income. We then track certain supply and demand indicators along with race and ethnicity to identify gentrification.

We supplement our identification of gentrification at the local scale with two unique sources. The first is a panel dataset of multifamily apartment rents conducted by Montgomery County, Maryland, which allows for between-census comparison of multifamily rents. The second is another panel dataset, the Quarterly Census of Employment and Wages (QCEW), which is an administrative database of firm geolocations and wages. That dataset will allow for identification of increased economic activity, proxied by firm openings and wages, in census tracts or block groups which may or may not be gentrifying. Combined, these two data sources will "ground-truth" both the supply and demand sides of gentrification, by indicating if gentrifying areas are experiencing upward pressure on rents and increased levels of economic activity.

We find that gentrification is occurring in the corridor, but exactly where one finds it depends on how one looks for it. The ground-truth data offers clear evidence of gentrification in certain areas, providing evidence to practitioners that that gentrification does not wait for new transit to come before it takes hold.

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Key Words: gentrification, transit, displacement, light rail

## **WHITENESS IN BLACK SACRED SPACES: POWER, PROCESS AND PREDICAMENT IN PRESERVING HISTORIC BLACK CEMETERIES**

Abstract ID: 163

Individual Paper Submission

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During the progressive era, the development of public space was centered on elites who controlled the design and programming of public spaces (Belanger, 2009; Schmidt, 2008). However, particularly in the segregated South, this control meant that public spaces - including cemeteries, an early form of public space in cities - were unavailable to African Americans. To assert control over their environments and build strength, African Americans began to build their own institutions and spaces, including cemeteries (Silver & Moeser, 1995). These institutions facilitated the development of a Black counter-public, or community at least nominally outside of the white gaze and control (McKittrick, 2011; Roberts, 2020). Yet the racialization of space – or the identification of space within Black communities – reified the ongoing disinvestment by the state even as white communities received support for critical infrastructure to prevent neighborhood deterioration (Lipsitz, 2007; Goetz et al., 2020)

Yet, by the early 20th century, vast numbers of Black families left the South during the Great Migration to escape restrictive Jim Crow laws, leaving behind African American cemeteries founded without perpetual care funds to ensure future maintenance - and without state subsidies that by law have been allocated to maintain Confederate graves, markers and memorials. Without these resources, family plots were consumed by vegetation, vandalism and illegal dumping (Smith, 2020). Today, there is a "preservation crisis" in Black cemeteries, fraught with disagreement over how to preserve, and the roles in which the Black community - including descendant families - should play in the preservation of these sacred places that have been neglected for decades (Mortice, 2017).

This paper examines the role of white-led institutions engaging in Black spaces through a case study of the restoration process of Evergreen Cemetery, a historic Black cemetery located in Richmond, Virginia. Founded in 1891 by African American leaders, Evergreen Cemetery emerged as a resting place for affluent African American during the Reconstruction Era, and was designed as a counterpart to burial sites designated for Richmond's most influential white citizens, including Confederate president, Jefferson Davis. We examine the structures that create inequality of access and resources, and engage with the case study through analysis of the process, and the values and power structures that underlie engagement in Black spaces. We use a reparative planning framework to investigate ways that white-led institutions can break patterns of white supremacy and support Black power over Black spaces. We argue that white institutions engaging in Black spaces must adopt a reflective practice that acknowledges the legacy of white supremacy in our communities, recognizes our role in reproducing or changing these dynamics, and considers what has to change for a truly reparative approach to the future of engagement.

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Key Words: Black space, Preservation, Planning process, White power

## HOW NEIGHBORHOOD CONTEXT, DENSITY, AND GENTRIFICATION SHAPE IMMIGRANT INTEGRATION

Abstract ID: 166

Individual Paper Submission

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In this study, we investigate the role urban planners can play in building pathways for immigrant integration, or the dynamic, two-way process in which immigrants and their receiving society work together to create secure, vibrant, and cohesive communities. Current research in this area suffers from two major gaps. First, integration is often measured based on objective variables such as economic incorporation, language acquisition, or educational attainment (Portes and Rumbaut, 2014). Second, the field has rarely considered the role of neighborhood context (i.e., “place”) in creating a sense of belonging for immigrants.

We ask: How do neighborhood built environments affect whether and to what extent immigrants feel more or less integrated into their communities? Answering this question helps generate new insights into how planners, policymakers, and immigrant-serving organizations can build place-based pathways for immigrant integration. Using a sequential, mixed-methods research design, we examine how, in the context of a changing patterns of immigrant settlement in metropolitan areas, an immigrant’s neighborhood can shape their feelings of integration and belonging, measured based on the US feeling more like home than their birth country (Burciaga and Martinez, 2017).

For the quantitative portion of the study, we draw on 356 original surveys of immigrants administered in neighborhoods throughout the Denver Metro Area. We expected that immigrant integration rates will be higher in urban contexts than in urban edge and suburban contexts (hypothesis 1), in areas with higher population density (hypothesis 2), and in areas that are not at risk of gentrification (hypothesis 3). To assess the impact of neighborhood context, we sorted each respondent into one of three categories established in Denver’s form-based zoning code: urban, urban edge, or suburban neighborhood. We then use logistic regressions to assess associations between respondents’ experiences of integration (dependent variables) and independent variables included in our three hypotheses, while controlling for potential confounders such as education levels, immigration status, and duration of stay in the U.S.

Our findings refute the first hypothesis and provide support for the second two: Feelings of integration are higher in suburban and urban edge contexts (compared to urban), in areas with the highest population density, and in areas not at risk of gentrification. We then provide examples of neighborhood types that contain immigrants that feel “most integrated” into the receiving society. We use field observations to paint a picture of these neighborhood types and uncover other neighborhood characteristics that might be conducive to immigrant integration.



Planners should be encouraged by these findings as they provide clear direction for the practice. First, we should seek to understand what it is about suburban areas in particular that increase positive integration outcomes more than the traditional urban enclaves which first-generation immigrants have historically called home. Second, these findings lend support to planners taking action to retrofit lower-density suburbs into the denser, inner-ring suburban neighborhoods where immigrants report the highest sense of belonging and integration (Lung-Amam 2019). Third, these findings show that gentrification risk affects immigrants, suggesting that planners should target gentrification-vulnerable, immigrant-rich neighborhoods with anti-displacement initiatives.

This study contributes to an emerging body of literature and policy in a number of ways. First, it introduces a key spatial-analytical construct for immigration scholars that can help tease out the relationship between the built environment and immigrant integration (Németh, 2019). Second, it recognizes the important role that planners and designers can play in building more inclusive and integrative spaces for underserved populations, as our findings show that place matters in creating more positive contexts of reception for immigrant. Third, it helps nonprofits, policymakers, and other state actors advocate for built environment improvements in existing and potential arrival neighborhoods.

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Key Words: immigrant integration, neighborhood effects, built environment, belonging, gentrification

## **COPING THROUGH NEIGHBORHOOD CREATIVITY: DRIVEWAY, SIDEWALK AND STREET MESSAGING AND ART DURING COVID**

Abstract ID: 168

Individual Paper Submission

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The COVID-19 pandemic has upended lives in deep and disparate ways: increasing mortality, hospitalization, unemployment and possibly future eviction and foreclosure rates; fragmenting family and friends; transforming computers into workplaces and schools; and overall tethering people more strongly to their homes and neighborhoods. Emerging research explores how these effects are dynamically shaping people's mobility and engagement in local economies (Conway et al. 2020). Relatively less is known, however, about how the pandemic is changing people's engagement with their neighborhoods, particularly during and after stay-at-home orders.

Our scholarship helps to fill this gap by using fieldwork and photographic and spatial analysis (Gaber 2020) to explore the evolution and nuances of one type of neighborhood engagement over the pandemic: the use of transportation infrastructure, such as driveways, sidewalks, and streets, for informal creative expression, like chalk

drawings and inspirational messages. We use data collected from on-the-ground observations, Google Street View, and Instagram to investigate trends in the geography, longevity, intensity, purposes, and participants of creative practices prior to and during the pandemic, with special attention to trends across three neighborhoods with diverse demographics and built environments in the Phoenix region.

Preliminary findings indicate that residents across the lifecycle are using neighborhood transportation infrastructure to originate unique forms of expression and adapt others promoted through social media to cope with pandemic-induced disruptions, losses, and uncertainty. A dominant practice is neighbors' use of transportation infrastructure for "art therapy" (Braus & Morton 2020), a space to express their concerns, values, and experiences. Other prevalent practices include neighbors' use of driveways, sidewalks, and streets to creatively adapt traditions like birthdays and graduations and connect, educate, and play with one another. We also have discovered distinct temporal and spatial trends in these practices, with dramatic upticks 1) during the pandemic's early stages in the spring 2020 and 2) related to messaging the public and neighbors, particularly on sidewalks and driveways. These trends, though present in all communities to some degree, were more prominent in more sprawling, white, affluent, and single-family home communities. Practices also exhibit spatial clustering within neighborhoods, suggesting an infectious or coordinated quality to them.

The broader impacts of our research for planning scholarship and practice are twofold. First, our findings contribute to existing and new theories of how residents engage with their communities to meet their needs and build a sense of place in creative and informal ways during a global pandemic (Mukhija & Loukaitou-Sideris 2014). Second, our findings suggest that planners and decision makers should exhibit caution in constructing jurisdictional definitions of graffiti and vandalism, given that the freedom to use neighborhood transportation infrastructure for informal, temporary expression may help communities cope with crises.

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Key Words: COVID-19, neighborhoods, creativity, informal city, transportation

#### **REDEVELOPING A DISASTER RECOVERY MODEL FOR 21<sup>ST</sup> CENTURY NEEDS**

Abstract ID: 281

Individual Paper Submission

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Over 40 years ago the Kates Pijawka Model for Disaster Recovery was introduced in the book chapter *From Rubble to Monument: The Pace of Reconstruction* (Kates & Pijawka, 1977). Since its publication in the 1977 the model has been used and cited hundreds of times to explain the process reconstruction post-disaster, such as New Orleans post Katrina (Kates et al., 2006) and New York post Sandy (Jahan, 2015). While this model has been used many times, the question prevails whether in the face of rapid urbanization and climate change over the decades, does the model still hold true or has it reached its shelf life? Furthermore, what can be done to update it for the third decade of 21<sup>st</sup> century?

Through an in-depth view of the literature and an examination of how model has been used, this paper will look to answer the question of model's usefulness and it will suggest how changes can be made to it. Upon deciding on those changes, they will be put to the test using the case study of Hurricane Maria in Puerto Rico. The aim of the paper will be to create an updated version of the model which can be used by academics and policy makers to assess recovery success and for planners to be better design and implement more resilient urban forms that can adapt future shocks to the systems as well as alter their physical design to be more prepared in a more unstable climatic world.

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Key Words: Disaster Recovery, Resiliency, Climate Change

#### **ADVANCING TRANSIT-ORIENTED COMMUNITIES & PLANNING FOR EQUITY IN LOS ANGELES**

Abstract ID: 297

Individual Paper Submission

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Twice in the past decade, voters in Los Angeles County have approved ballot initiatives raising sales taxes to finance transport infrastructure investments throughout the region. In the face of uneven gains and displacement risks, the Alliance for Community Transit- Los Angeles (ACT-LA), a broad-based coalition of transportation advocates, community and neighborhood groups, and work centers, has led citywide and regional campaigns to ensure that the transit investments serve LA's largely Black, Indigenous, and People of Color (BIPOC) transit rider communities, and are coupled with affordable housing, tenant protections, and inclusive workforce and economic development policies.

This research explores two-interrelated questions: (1) How do infrastructure-based struggles and mobilizations led by frontline organizers reveal and challenge social supremacies baked into and reproduced through the built environment and prevailing spatial development? (2) How can planners and designers align our creative practices with frontline communities to combat spatialized supremacies and help repair, heal, and make whole urban environments and social relations? The multi-method study combined archival research and document analysis with interviews, direct participation, and deliberative discussions.

Findings highlight ACT-LA's strategic approach of combining social movement repertoires and agonistic politics with pragmatic policy and planning acumen to address mobility and spatial injustices in LA's stratified racial, ethnic, and class geography and highly speculative real estate market. They conduct grassroots organizing, popular education, and mobilization of working-class communities of color around mobility justice and equitable and sustainable urban development. This allows them to build collective knowledge and power as well as exert pressure on public officials and agency representatives while enlisting institutional allies. ACT-LA moreover continually builds trust and capacity among their organization membership by collaborating on research, strategy, policy and planning prototyping along with organizing and advocacy. They additionally partner with value-aligned planning, design, and legal experts to develop proposals and strategies that support transit riders while taking direction from directly impacted communities and organizers.

This case of Alliance for Community Transit-Los Angeles is particularly relevant and instructive to planners in academia focused on questions of equitable infrastructure and spatial development (without displacement) along with issues of justice and inclusion, power and politics, and planning ethics, and building careers around engaged community partnerships.

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Key Words: Just transitions, Reparative planning, Transit-induced displacement, Mobility justice, Equitable development

#### **BEYOND COMMUNITY POLICING: CENTERING COMMUNITY DEVELOPMENT IN EFFORTS TO IMPROVE SAFETY IN IMMIGRANT COMMUNITIES**

Abstract ID: 333

Individual Paper Submission

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Black and Brown communities have been the hardest hit by current events – from COVID-19 and its economic fallout to newly revealed police violence levels. But recent uprisings have spurred critical conversations about addressing the underlying conditions that produce and exacerbate vulnerabilities in these communities. Calls to defund police have centered on investing in alternative modes of ensuring community safety that does not rely on traditional policing. Our case highlights community-based organizations' critical role in helping residents imagine and execute programs that improve community safety and perceptions of security.

This paper reports on a four-year community-led effort to reduce crime and improve safety in a predominately Latina/o/x immigrant suburb outside of Washington DC. The effort was a federally sponsored "community policing" program supported by the U.S. Department of Justice's Community-Based Crime Reduction Program (CBCR). The program sought to reduce crime by leveraging community knowledge and expertise, focusing on neighborhoods where crime is concentrated, and addressing crime's root causes. A community-based immigrant rights organization with longstanding community relationships received the grant and enlisted us as researchers from area universities to provide regular data on crime, conduct resident surveys and focus groups, learn about their safety and police perceptions, and evaluate program initiatives' effectiveness. Project activities focused primarily on community-building activities, including gang prevention programs, infrastructure improvements, alcohol awareness, public resource campaigns, youth soccer leagues, and community walks. They also provided regular meeting spaces for police officers and community residents to share data and provided language training to local officers to increase communication and trust with residents.

Our evaluations of the initiatives, interviews with participants, and data collection from the annual survey

demonstrated that community policing activities did little to increase residents' sense of safety and improve their police relationships. Alternatively, the community development efforts that focused on building community, engaging and educating residents, and improving community infrastructure greatly impacted residents' sense of security more significantly. We argue that such efforts re-center the focus of policing discourses from the criminalization of people to the criminalization of state-sanctioned neglect and underinvestment in Latinx communities. The case highlights the insecurity and precarity produced by the state's failure to provide adequate and equitable public services and over-police low-income immigrant neighborhoods. In doing so, it highlights the importance of investing in underfunded place-based community development efforts and CBOs as alternatives to traditional and community policing. Such measures not only ensure that Black and Brown communities feel safer but address the root causes of crime and neighborhoods' uneven risks and vulnerabilities to crime.

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Key Words: community policing, community development, defund police, public safety, Latinx

### **LEVERAGING COMMUNITY SCHOOLS FOR COMMUNITY DEVELOPMENT: LESSONS FROM BALTIMORE'S 21<sup>ST</sup> CENTURY SCHOOL BUILDINGS PROGRAM**

Abstract ID: 363

Individual Paper Submission

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The COVID-19 pandemic has affirmed the critical role that schools play in the delivery of the social safety net. Schools are not only sites of teaching and learning but also sites where resources – including meals, healthcare, and other social services – are delivered to families. The community schools model is one approach to school-community partnerships that aims to link schools to their surrounding communities. The model begins with the premise that students' success is dependent on their – and their families' – overall wellness and links schools with local partners to provide education, healthcare, expanded learning opportunities, and other resources for families and community members (Coalition for Community Schools, n.d.; Warren, 2005). Community schools are neighborhood assets – open both to the school-based community (e.g., students, families, educators) and the place-based community (e.g., neighborhood residents, community partners).

In practice, community schools policy design and implementation has traditionally centered on the school improvement goals of the community schools model (Holme et al., 2020), with a focus on bringing partners and resources into schools to benefit students and their families. What might it look like to extend the community schools' model and create a more porous boundary between the school and the neighborhood? Moreover, what might it look like when community schools are positioned as neighborhood assets that can catalyze community development, cementing the link between schools and their surrounding neighborhoods?

This article draws on data collected for a larger study of the implementation and early outcomes of Baltimore’s 21<sup>st</sup> Century School Buildings Program (21CSBP) to understand the potential of community schools for catalyzing community development. In this article, we define community development as a process of place- and people-based initiatives that infuse resources into economically disadvantaged and disinvested communities (Wolf-Powers, 2016).

The 21CSBP leverages an unprecedented \$1.1 billion investment to Baltimore City Public Schools System (BCPSS) buildings. The design of the new and renovated buildings would not only support schools’ academic programs but also recreational opportunities, school partnerships, and joint-use of school facilities. Stakeholders saw an additional opportunity to use these schools to catalyze community development and make improvements in neighborhood infrastructure like housing and transportation. We draw on interviews with philanthropic partners, city agency and school district personnel, as well as interviews with school- and community-level stakeholders in three communities – Southwest Baltimore, Southeast Baltimore, and Cherry Hill – to understand the role of 21CSBP community schools in neighborhoods and their potential to catalyze community development.

We ground our analysis in Valli, Stefanski, and Jacobson’s (2016) school-community partnerships typology, which we use to understand the relationships between 21CSBP community schools in each of the focal neighborhoods. We find that across the three neighborhoods, the 21CSBP schools demonstrated elements of the full-service community schools approach and offered a range of services to the schools’ students, their families, and the broader community. We also found elements of the community development approach to partnerships, which was possible when lead agencies and their staff had a clear vision for the link between schools and their surrounding communities and the structures to support development. We argue that the lead agencies’ mission and vision for community schools can support a more porous boundary between schools and their surrounding neighborhoods and promote broader community development.

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Key Words: community development, community schools, collaboration, public education, equity

#### FROM AN ART FESTIVAL TO A YOUTH MOVEMENT: CITIZEN PLANNING IN A BRAZILIAN FAVELA

Abstract ID: 387

Individual Paper Submission

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Jardim Colombo, a highly dense favela in the outskirts of São Paulo lacking a solid civic infrastructure, has historically struggled to address its social challenges (Mesquita, 2016). That fate changed with the birth of a self-proclaimed youth movement during the first art festival in this neighborhood, on July 22, 2018. Planned and delivered in one month, the festival gathered dozens of volunteers and hundreds of neighbors to dream together about the transformation of a dumping site in the middle of the neighborhood into a park for the community. Thrilled by the

spark that had been ignited, a group of young leaders of Jardim Colombo acting like “citizen planners” (Beard, 2012) met shortly after to envision an ambitious social and cultural agenda for the months and years to come (Moya-Latorre, 2019). One of this movement’s greatest achievements took place only two years later, when the COVID-19 pandemic hit. Given the impossibility of physical distancing, young community leaders quickly organized to ensure access to healthcare and food supplies while the lockdown lasted. Months later, they would proudly communicate that no single resident in Jardim Colombo had died of COVID-19 during the first wave of the health emergency.

How did an art festival overcome existing barriers for community engagement and turn into a larger youth movement? What defining qualities in its conception were crucial for its later consolidation as a civic infrastructure with growing capacity to respond to multiple social challenges? How much of this youth movement was indeed result of a conscious process of community planning? In this paper, I address these questions to understand what makes this youth movement a unique account of community engagement and citizen planning in an urban periphery of a city in the Global South.

This article draws from three months of fieldwork in the Summer of 2018 during which I employed participatory action research and ethnographic methods. During my fieldwork I focused on (1) co-facilitating the first art festival in Jardim Colombo and engaging in participatory design with the local community; (2) taking detailed, regular fieldnotes on my observations and experiences; and (3) “reflecting in and on action” (Schön, 2011) with the team and individually about the experience of the festival and what followed – the latter taking place over the two years after my fieldwork.

On the analytical side, I conclude that this nascent movement was possible thanks to a powerful cocktail of qualities – including its spatial dimension (Tonkiss, 2005), its co-generative origin, and its celebratory character. Crystallized during what I call “cycles of creativity” – a concept inspired in Sidney Tarrow’s “cycles of contention” – this rich combination of attributes resulted in a powerful civic infrastructure capable of adapting to different goals and challenges in the years to come, including the urgency of an unprecedented pandemic. As for the implications for community planning practice, I ultimately argue that multifaceted, art-based civic infrastructures of this kind can be planned to build in adaptability and embrace the unforeseeable.

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Key Words: Citizen planning, Cycles of creativity, Civic infrastructure, Art festival, Co-generation

#### **PRESERVATION AND DEVELOPMENT OF TRADITIONAL VILLAGE BASED ON ACTION THEORY: A CASE OF DIMEN, GUIZHOU, CHINA**

Abstract ID: 427

Individual Paper Submission

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Historic preservation in some contexts (in Chinese cities, for example) focuses mainly on the “top-down” governance, resulting in many residents’ behaviors violating the preservation plan. Based on the action theory, with

the case of Dimen traditional village in China, this paper elaborates systematically how “structures” (namely resources and rules) can guide and restrict residents' actions and therefore influence spatial production, and how “actions” in turn reconstruct “structures”. It aims to offer an empirical experience for the more effective implementation of the preservation plan from the perspective of the “bottom-up” process.

This paper first summarizes Giddens' theory of action and relevant sociological discourses on the production of space. The key argument is: Spaces are transformed into “locales” by social structures through people's actions. It means how people use space and interact in space will shape the form of space. Because people's actions are enabled by rules and resources, the form of space is subject to social regulations and the resources (both material and authoritative) available to the actors. Since the motives for people's actions are closely related to social relations, power, and the symbolic properties of social goods, space embodies these social order. Space, in turn, also affects social structures and people's actions in it.

Subsequently, with the case of Dimen village, this paper first analyzes the consistency between the historic spatial order of the village and the villagers' traditional daily routines. Then by comparing the author's field research on the status quo of the village in 2017 with the preservation plan formulated in 2014, this paper finds that although the public spaces of the village are well protected, many new renovations carried out by villagers in their private residential buildings violated the preservation plan and damaged the historic landscapes. For example, some historic buildings were expanded arbitrarily, and some villagers adopted “fake wooden facades” on their concrete houses or even imitated the western classical column order on the facades.

This paper analyzes the motives for these renovations from the social relationship and symbolic properties of social goods: The local traditional collective public life is being transformed into a lifestyle that focuses more on the nuclear family and brings different demands of living space; Villagers generally regard western building components as a symbol of more affluent or modern culture. This paper analyzes how these renovations are enabled from the perspectives of resources and rules (structures): Public and private buildings receive different proportions of subsidies through different channels; New building materials and techniques introduced from eastern China weakened the advantages of traditional wooden houses; The decline of the public enterprise of the village decreased the authority of the local government, while the accumulation of the household assets increased the power of individuals; Some rules in the preservation plan are too strict, so residents adopted a compromise method between completely wooden and completely concrete houses to meet both their own needs and the regulatory requirements. Finally, the paper discusses how these changes prompted urban planners to modify certain rules in the preservation plan and offer new resources to make it easier for the residents to implement the plan and avoid these negative renovation actions.

To sum up, historic preservation plan can guide and restrict residents' actions through rules and resources, thereby affecting spatial changes. In turn, the actions of residents have also reshaped the rules in the plan. The changes in the spatial order manifest the transformation of social relationships and social order. Urban planners should theoretically analyze residents' actions so that they can actively guide, motivate, and utilize the initiative contributes of local actors, and make the preservation plan more practical.

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Key Words: Historic Preservation Plan, Chinese Traditional Village, Action Theory, Production of Space

## **EVALUATING PUBLIC ENGAGEMENT USING OPEN SURVEY FOR A LONG-TERM URBAN OPEN SPACE DEVELOPMENT IN SEOUL**

Abstract ID: 433

Individual Paper Submission

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Public engagement for urban open space development has been gaining attention since the mid-20th century when urban renewal projects began to receive criticism for top-down policy implementation without public communication. However, the long-term nature of the urban development makes it difficult for sustained participation by the public, as well as the assessment of such public engagement efforts. Furthermore, studies in community participation in general has been under constant criticism regarding its evaluation, as the effect of community participation is difficult to measure with precision. In addition, with the technological advances in planning and public engagement, as in the online platforms, information distribution channels, public participation GIS systems, etc., the diversity of public engagement methods continues to grow; hence, a comprehensive exploration into the effects of these methods is necessary for those who will be designing and executing public engagement programs as part of the urban open space planning schemes in the future. How does the public respond to the different public engagement methods? Furthermore, in the face of the pandemic, what methods should we adapt to maximize the effects of the public engagement for urban open space planning without endangering the public?

This study conducted an online survey of 2,000 people on the public engagement of urban park development policy, particularly of the Yongsan Park in Seoul, up until 2020. Yongsan Park Development Scheme is a long-term project in South Korea whose primary goal is to repurpose a U.S. Army Garrison in Seoul, or Yongsan Garrison, into a large park. Spanning over 300ha, Yongsan Garrison has a long history of foreign occupancy throughout the 20<sup>th</sup> Century. Plans to turn this space into a park has been an ongoing debate between the two nations since the late 80s; with the Yongsan Park Master Planning Project coming to a close in 2018, the Park Development Scheme is preparing for the eventual park construction. However, because of the site's unusual scale and contextual complexity, the Korean public has yet to come to a consensus regarding the outcome of the overall process.

In this study, the authors hypothesized that the survey should demonstrate the following: (1) the public engagement efforts for Yongsan Park development has been ineffective; (2) mass media is an efficient option for delivering information to the public, while the quality of the information deliverance cannot be guaranteed; and (3) mixed methodology in public engagement is necessary to cater to multiple needs of the public, particularly as remote engagement becomes a viable alternative.

While a survey has its limitations in terms of evaluating a long-term project, this study nonetheless found several noteworthy results pertaining to the following: determining a target for public engagement, the varying perspectives according to age or regional categories, the difference and possible incorporating of the in-person participation and the remote participation, the issue of mixed-messages in long-term urban developments, online mass media and the public impact, and policy effectiveness according to the public.

Several features of the Yongsan Park Development Scheme make this study a unique venture: its central location in Seoul; century-long occupation by foreign military bodies; and the discussions and design process under way despite the prolonged occupancy by the U.S. Army. The results not only evaluate the objective efficiency of the Yongsan Park Development Scheme, but also demonstrate the need for mixed methodology which can cater to the diverse

public that are concerned with the urban open space development from varying degrees of interests. Finally, this study shows that while public engagement is essential for urban open space planning, its methodology must adapt to different sociocultural needs and situations to garner maximum efficiency.

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Key Words: Public Engagement, Yongsan Park, Urban open space, Open survey, Community informatics

#### HEALTHY PLACES, HEALTHY PEOPLE: THE ROLE OF PLANNING, BUILT ENVIRONMENT AND SOCIAL ENGAGEMENT

Abstract ID: 437

Individual Paper Submission

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Neighborhood and the built environment are important social determinants of health. Walkability and mixed-used built environment are recommended planning actions in the public health field. However, there is limited evidence showing the connection between urban planning and population health for two reasons: 1) the historical separation of land-use in American zoning regulations inhibits mixed-use development, and 2) the lack of data on local indicators of built environment to examine the health effects of planning policy. This research fills the gap.

In 2019, we conducted a national survey on 1312 local governments' actions to build a livable community for all ages. The survey explores built environment features including walkability (sidewalk systems, bike lanes, and complete streets), and mixed-use (a mix of retail, services, and housing, parks and playgrounds, public gathering spaces, and fresh food markets). The survey also measures how these relate to planning and zoning regulation, and public participation. We link the survey data with socioeconomic data from the American Community Survey to model key domains of social determinants of health: built environment, social context, health insurance coverage, and economy. Health data are constructed from the most recent CDC 500 Cities & Place data portal at the census tract level, and include the crude prevalence of obesity, diabetes, and physical unhealthy for more than 14 days. This comprehensive dataset allows us to address the following questions: does the built environment matter for population health after controlling for other social determinants of health? What role does planning play? Does social engagement matter? We run Structural Equation Models to answer those research questions.

Results show a positive relation between walkability and mixed-use built environment and all the health outcomes. Although the marginal effects of built environment are lower than the effects of economy and health insurance coverage, we find that people living in communities with more walkable streets have a lower percent of obesity; people living in communities with more mixed-use neighborhoods have fewer physically unhealthy days; and people living in communities with neighborhood walkability and fresh food markets have a lower percent of diabetes. We also run a built environment model to explore the role of planning. Results show that zoning codes promoting

walkability and mixed-use have the largest effect on better built environment outcomes. Results also show an urban bias, as denser places have better built environment outcomes.

Social engagement matters for health outcomes. Results show that communities with more volunteer opportunities have a lower crude prevalence of obesity. Obesity is a preventable disease that is lower in communities with more social engagement. Models also show that having a comprehensive plan is not directly related to the built environment, but civic participation in the planning process is related to better built environment outcomes.

Building a healthy community requires planning efforts to encourage both walkability and mixed-use environments. Planners should also recognize importance of social engagement in increasing the sense of community and promoting public health.

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Key Words: healthy place, urban planning, mixed-use development, social engagement, zoning code

## REFUGEE RESETTLEMENT IN THE US: ORGANIZATIONAL NETWORKS THAT SUPPORT INTEGRATION

Abstract ID: 442

Individual Paper Submission

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Resettled refugees regularly conjure considerable debate about their potential to either drain a city's resources or contribute to a city's revitalization (Maxmen, 2018). Yet, how the city that refugees are resettled in affects their ability to thrive and contribute productively to the cultural, economic and social fabric of their host community is rarely considered by urban planning scholars or practitioners. Moreover, the U.S. refugee resettlement program does not consider a city's characteristics when deciding where to place refugees. Once refugees are slated to come to the U.S., national resettlement agencies determine where to place refugees based on family ties or which federally-funded local agencies have immediate capacity to administer resettlement services, with little input from local governments or consideration of other grassroots agencies that often emerge to offer refugee support (U.S. GAO, 2012). Refugee resettlement services center around economic self-sufficiency, viewing refugees as workers (Gonzalez Benson & Taccolini Panaggio, 2019; Okour, 2019). Furthermore, local resettlement agencies are funded to work with their clients for 30 to 90 days, a short amount of time for their clients to adjust to a new culture and gain economic independence.

In other major resettlement countries, integration - where both the immigrant and host community are open to change and diversity - is what resettlement processes center on. The conceptual framework of integration provides a comprehensive understanding of the refugee experience, proposing that successful integration falls into four thematic areas, including "achievement and access across the sectors of employment, housing, education and health; assumptions and practice regarding citizenship and rights; processes of social connection within and

between groups within the community; and structural barriers to such connection related to language, culture and the local environment” (Ager & Strang, 2008). Yet in the U.S., our fragmented resettlement system, which differs among states, does not make clear which agencies are responsible for these services.

This research examines the network of formal and informal agencies that assist refugees in resettlement, focusing on two rust belt cities that have served as major resettlement locations in recent years. In addition to a review of municipal policies and plans, data collection methods include semi-structured interviews with local resettlement agencies, government officials, representatives from refugee-run grassroots organizations, and other agencies that support refugee populations. Preliminary findings suggest that more formal institutions such as local governments, healthcare providers, and federally-funded local resettlement agencies work together, but there is a disconnect with grassroots organizations that are centered within the refugee community.

Findings from this research have various implications for refugee resettlement and planning practice, informing the needed networks to provide successful resettlement systems. As a global leader in refugee resettlement, having a more critical understanding of the effects of placement in the US refugee resettlement program, it is crucial for ensuring that refugees have the tools to integrate more effectively. Understanding impacts of city placement is imperative, particularly as the number of refugees resettled in the U.S. sharply increases in coming years.

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Key Words: Refugees, Integration, Grassroots organizations, Professional practice

#### CRITICAL REVIEW OF NATIONAL FLOOD POLICY OUTCOMES

Abstract ID: 461

Individual Paper Submission

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Populations are increasingly exposed to natural hazards due to expanding development and climate change. This exposure is exacerbated by sociodemographic and socioeconomic factors limiting resources for disaster mitigation and recovery. Federal disaster assistance is a crucial lifeline for impacted communities in the wake of catastrophic events by supplementing local resources. However, recent research suggests that federal disaster assistance may exacerbate existing inequality across social groups within vulnerable communities. The most pervasive and costliest disaster in the United States is flooding. The federal government maintains a suite of programs supporting flood mitigation and recovery assistance, yet a comprehensive understanding of how these programs may foster

inequitable outcomes across social groups is lacking. This paper uses a systematic review of federal flood policy literature over the last decade to fill this gap and identify patterns in the social and situational contexts that may contribute to inequitable flood outcomes. Results suggest that the policies themselves do not explicitly lead to inequitable outcomes. There is evidence, though, that policies prioritize equality over equity, and in turn do not overcome historical and systematic oppressive and racist decision-making. These findings further the understanding that social vulnerability to natural hazards is a complex and contextual issue.

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Key Words: flood, federal policy, hazard mitigation, disaster recovery, social vulnerability

#### **VULNERABILITY OF THE BUILT CULTURAL HERITAGE IN THE URBAN CENTER OF THE MUNICIPALITY OF PONCE, PUERTO RICO: A LOOK AT PUBLIC POLICIES AND RISKS MANAGEMENT PLANS FOR EARTHQUAKE RESPONSE FROM THE PERSPECTIVE OF CULTURE AND HISTORICAL PRESERVATION**

Abstract ID: 466

Individual Paper Submission

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On January 7, 2020, a 6.4 magnitude earthquake shook the southern part of Puerto Rico. This event was followed by major sequels that further weakened the already compromised structures causing considerable damage to many Spanish colonial buildings in Ponce: one of the oldest and most important municipalities of the Island. Ponce have a rich history dated from 1692 and typical of its origins its urban center houses many colonial buildings with prominent architecture. Some of these structures are included in the National Register of Historic Places. Due to its geographical location, earthquakes have always been a threat to Ponce and particularly to its rich built cultural heritage. From a cultural framework, the importance of heritage preservation is evident when defining the term "culture" as the past and the future synthesized in its present identity. If culture implies a harmony of ideas in a shared meanings, values and representations that serves to structure beliefs and actions and dictate order in society, then culture can induce sense of belonging to a community that allows the preservation of its historical heritage.

This research examines the public policies and risk management plans applied to the municipality of Ponce from the perspective of the preservation of its built cultural heritage and in the light of earthquakes. The investigation explores if changes in governance models are necessary to reinforce Ponce's cultural identity as an important community asset for development. Fundamentally, the analysis seeks to find answers to the following questions: What were the lessons learned through the seismic history of Ponce? Before the recent earthquakes, were there risk management plans for the built heritage of Ponce? Is there governance aimed at maximizing the social, cultural, and economic potential of Ponce's-built heritage? Is there room for improvement?

The methodological approach is based on the analysis of existing public policies aimed at urban regeneration in the context of risk management for historic buildings. Also includes comparative analysis of the physical conditions of some historical properties owned by both, private and governmental sectors to study correlation between actors and preservation. Finally, the methodology performs analogous case study of a community conservation initiative with the purpose of identifying best practices that could be applied to the municipality of Ponce.

The research suggests that the lack of cultural identity does not encourage preservation, and that this mindset appears to be institutionalized in public policies and permeated communities. Additionally, higher-ranking legal instruments do not consider culture as an important element for development. In turns, these laws are aimed at boosting economic growth indicators rather than promoting structural changes. Furthermore, it is inferred that the fact that there are government agencies committed to the preservation using culture as means to conservationist ends, and at the same time there are higher-hierarchy legal instruments that disregards that cornerstone, points out careless governance practices that usually results in poor execution. Finally, existing private initiatives committed to enhance the historical context of the built heritage promotes community empowerment which results in spontaneous preservation. However, perhaps due to the perception of seen culture as a matter of the elites, these initiatives have not managed to insert themselves into popular governance to form part of institutional public policy. To achieve the preservation of the built historical heritage of Ponce it is necessary to implement risk management plans before, during and after earthquakes. Concurrently to this plan, it is necessary to strengthen culture as a fundamental element of identity to create a sense of belonging that allows the conservation of its heritage.

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Key Words: Earthquakes, Heritage, Ponce, Preservation, Risks

#### **PUSHING BACK ON DISPLACEMENT: COMMUNITY-BASED REDEVELOPMENT THROUGH HISTORICALLY BLACK CHURCHES**

Abstract ID: 539

Individual Paper Submission

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Gentrification and subsequent displacement are common problems in cities, and result in the removal of poor communities and communities of color from urban areas as they move to cheaper locations in the metropolitan region. Here we describe a community-based approach to redevelopment by historic Black churches that seeks to counter such displacement and cultural removal. We explain the history of a historically Black neighborhood in Seattle and the founding and rationale for a church-led project called the Nehemiah Initiative. Our perspective is that of participants in the work of the Nehemiah Initiative and as faculty and students from a local university partner supporting it. We conclude with policy strategies that can be used to support such redevelopment in Seattle, with understanding that some may be broadly applicable to other cities.

Seattle's Nehemiah Initiative is a faith-based community redevelopment organization that takes advantage of the fact that many historic Black churches are longtime landowners in a rapidly transforming city. The Initiative is the collaborative effort of a number of pastors and their churches. Seattle faces a lack of affordable housing, and as new, more expensive buildings and homes rise in the place of old, a conflict over affordability and provision of housing continues to unfold.

In the paper, we review the historic and current context for gentrification and related displacement in Seattle's Central District. We describe the Nehemiah Initiative, both how it came to be and what it is attempting to do. The Initiative is a potential model for other communities struggling with similar issues of growth, gentrification, affordability, and displacement. The model intends to demonstrate an innovative solution to the challenges based on the combination of church land ownership, community participation, professional skills and vision in a rapidly growing region, and the support of local government and university collaboration in the goal of providing and preserving housing opportunity for all residents of the city. Finally, we also describe a developing university-community partnership in which students and faculty from the University of Washington's College of Built Environments have worked to support the Initiative.

Members of the Nehemiah Initiative began working with faculty members from the College of Built Environments during the summer of 2019. To date, the Nehemiah Initiative and the UW have collaborated on five classes over academic years 2018–2019 and 2019–2020. The College has hosted studio-style courses focusing on various aspects of the church-based development proposed by the Nehemiah Initiative. Plans are in place for such studios/collaborations to continue. This paper focuses on the courses and projects that involved the Department of Urban Design and Planning.

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Key Words: gentrification, displacement, Black churches, community development, university-community partnership

#### FIGURING OUT SOCIAL ROLES IN NEIGHBORHOODS: MIDDLE-AGED SINGLES IN THE CITIES—A CASE FROM TOKYO, JAPAN

Abstract ID: 572

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For several decades, the number of single-person households in large metropolitan areas has significantly increased, and those singles' backgrounds are diverse (Klinenberg, 2012). Part of the single-person households vigorously discussed in the literature is highly educated young professionals returning to the inner cities, often proving to be gentrifiers or the creative class (Florida, 2002; Lees, Slater, & Wyly, 2008). Another part is elderly singles, which raises concerns over their well-being (Klinenberg, 2001). Both groups experience weaker ties to neighbors and social fragmentation in urban cities (Putnam, 1995). However, there is little attention paid to middle-aged singles born in the cities or who entered when they were young. Most of them live in the city for work and are still relatively healthy and active, while just started to think about their retirement without direct family members. Despite a large number of middle-aged singles, their social roles in the city and neighborhood and how they build relationships are relatively unknown. By interviewing 22 singles and examining the survey data (N=2,598) of those between age 35 and 64 in central Tokyo, Japan, this paper explores this demographic's social relationships with family members, friends, and neighbors and examines their "roles" in society.

In the interviews, the singles expressed the ease of living in a large city for convenience, entertainment, and anonymity. Without close family members requiring support, singles tend to move locations and jobs. Some described active social relationships with friends through work and activities, such as sports and listening to live music. However, because many moved to Tokyo from other regions, they often lost ties with childhood friends. Moreover, they resisted social relationships with those with families because of difficulty finding common ground. There are also cultural norms in Japan suggesting that singles are "losers" or "immature," and self-evaluation makes them refrain from playing active roles in the neighborhood. Without clear "roles," middle-aged singles struggle to find a place—physical space and social position—in the cities and neighborhood.

There are also gender differences in how they approach neighborhood activities. Women tend to join the activities if friends ask them or if the group's mission aligns with their interests. In addition, more women buy apartments believing it is financial independence they earned and a reliable asset for retirement life. In contrast, middle-aged single men seek marriage and feel it will help them become a part of the neighborhood community. They think marriage will solve issues of isolation and loneliness, although the reality may not reflect that.

In conclusion, this paper finds that despite large cities giving singles freedom to choose their lifestyles, singles struggle to find a meaningful way to engage in the neighborhood community and society at large, a problem more apparent for men. The paper advocates needs in changing social norms, which would predetermine the social roles according to gender, age, and marital status.

It is also crucial for neighborhood organizations and local institutions to include singles as proper members of the neighborhood by sharing roles with them. Middle-aged singles playing active roles can be a great asset for cities, and they can contribute to society if they find appropriate roles.

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Key Words: middle-aged singles, social roles, neighborhood activities, gender, Japan

## **MOBILIZING A VULNERABLE COMMUNITY FOR TRAFFIC SAFETY DURING COVID**

Abstract ID: 619

Individual Paper Submission

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The worldwide coronavirus pandemic created new obstacles to community engagement with only online methods as means for reaching community members. As Afzalan and Muller reported, online methods potentially “intensify social injustice and an unequal distribution of power.” Testing whether online approaches instead can serve community needs is an important planning concern. Our paper attempts to answer the question: can we successfully adapt a proven community outreach approach (Sloane et al, 2019) to an online project to listen, learn, and develop priorities around traffic safety for an underserved, under-resourced ethnic and racial community?

Traffic safety is a critical community development issue given the high number of injuries and deaths. Motor vehicle collisions are the leading cause of death for Los Angeles children aged 5-14. Multiple researchers have written about the role of infrastructure and environmental changes intended to improve traffic safety, especially on large arterials (Dumbaugh & Rae, 2009; Yu, Zhu, and Lee, 2018). Fewer studies (Banerjee, Uhm, Bahl, 2014) have considered the role of traffic around schools, especially in ethnically and racially diverse neighborhoods.

In spring 2020, a collaborative group received a small grant to conduct a series of art-based interventions to combat the high number of pedestrian and cyclist injuries in a neighborhood in South Central Los Angeles. The residents and collaborators chose to focus on traffic and community safety issues around 5 schools – 4 elementary, 1 elementary to high school. The area where the project is being conducted is home to a dense, poor, renter population with over 14,000 school children. In 2019, 6 area streets had been designated part of the city’s High Injury Network.

In summer 2020, street-based interventions had become impossible, so the collaborative— university professor, creative studio for civic engagement, pedestrian safety advocacy group, and local school-based safety program – pivoted to begin an online engagement process with the neighborhood’s largely Latinx and Black residents.

This paper presents the initial findings of our effort to use online methods through which the residents could define and refine their safety concerns. The group was able to develop cohesion among the over 3 dozen residents, organize a “story map” to illuminate their issues, and begin the process of creating a list of necessary improvements for their neighborhood.

After the initial listening sessions led to the decision to focus on the schools, residents were asked to map their routes to schools, places where they had witnessed dangerous driving and collisions, and other infrastructure and social attributes. Building off of Banerjee, Uhm, and Bahl’s (2014) finding that social issues were as important as infrastructure issues regarding safe routes to schools, residents did not simply focus on infrastructure, they identified places they loved and feared.

These initial findings were collated into a “confetti” map that was presented back to the residents in further meetings, during which the group (residents and collaborators) learned about issues surrounding traffic safety and decided on next steps. The next step was to refine the information, systematize the visual representation of the problems, and begin development of a “story map” that could represent the neighborhood’s traffic safety issues to planners and policymakers.

Planners need to be more conscious of the consequences of cars and speeding in neighborhoods. This paper provides insight into outreach into communities that may be hard to reach physically, such as during the COVID pandemic, and methods for achieving a high rate of continuing participation. Over 40 residents joined a series of Zoom meetings where they voiced their initial concerns, went out and mapped, photographed, and wrote up their experiences, and established, with the collaborators, possible solutions to enhance their community's safety.

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Key Words: Engagement, Traffic Safety, COVID, Pedestrians, Online Methods

#### **ADAPTATION PATHWAY OF RESILIENCE IN RESPONSE TO COVID-19 FOR URBAN RESIDENTS**

Abstract ID: 636

Individual Paper Submission

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COVID-19 has posted severe challenges to cities - more than 95% of cases were reported in urban areas, which spread 1,430 cities in 210 countries (Mishra, Gayen, & Haque, 2020). Urban resilience has been widely used, through the framework and pathways, to help mitigate and recover from shocks or stresses, such as disease outbreaks, climate change, etc. In response to COVID-19, many researches have focused on actively allocating resources, providing health services, obtaining external assistance, and supporting economic recovery to absorb and mitigate negative influences in the early stage of the epidemic (Fu & Wang, 2018; Peters, 2020). However, the contribution of adaptation ability of urban residents to urban resilience is still unclear. To fill in this gap, this study proposes a comprehensive framework to assess the interaction and adaptation of urban residents in the pandemic. Besides widely used economic, institutional, and social dimensions of adaptation, we investigate how urban settings, community services, learning ability of residents, and individual adaptive behaviors improve resilience through a bottom-up process. A questionnaire was designed and a survey was conducted in Yangling, Shaanxi, China, to collect thoughts, opinions, and suggestions from urban residents. Descriptive statistics and principal component analysis were used to analyze 336 valid responses. The preliminary results indicate that community resources, family income and savings, newly learned personal activities in the pandemic, and education level are primary influencing factors for residents' adapting to COVID-19. Urban resilience could be enhanced by leveraging the internal and external resources of individuals and communities through interconnected social networks.

The survey can be modified for similar studies in other cities. The study result can help form adaptation strategies according to residents' cognitions and conditions. It also provides scientific support for municipal officials and community leaders, as well as urban residents to adjust daily routines and learn to cope with public health

emergency, a critical part of urban resilience.

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Key Words: COVID-19, urban resilience, adaptation, urban residents

### MI SALA, TU SALA? PRACTICAL AND PEDAGOGICAL LESSONS FROM A COMMUNITY TACTICAL PLACEMAKING INTERVENTION

Abstract ID: 657

Individual Paper Submission

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This paper presents findings from a multi-year teaching, community engagement, and research endeavor to design, build, and study a small-scale “creative placemaking” intervention in a quotidian urban neighborhood. Recognizing that creative placemaking and tactical urbanism are frequently employed in trendy neighborhoods or as part of economic redevelopment efforts, the project set out to explore what a more community-based placemaking effort could look like in a diverse neighborhood when explicitly reflective of local cultural identity and priorities for public space. In 2018, graduate and undergraduate students in an innovative two-semester urban design studio and practicum worked with community members in the Northside / Luna Park neighborhood of San José, California, to envision, design, and install a tactical urbanism-style placemaking improvement. The resulting space - a “community living room” outside of a laundromat - was then studied for two more years through on-site observation, interviews, and photo-documentation. The research shows that, despite some mistakes, a thoughtful and relatively durable public space was created through a process that a diverse array of stakeholders were engaged by and that left many interested community members pleased with the result; and that, over time, while not universally beloved or widely used, the space itself has attracted local caretakers and seems to have had a modestly positive effect on the surrounding streetscape. Pedagogically, the case represents a unique model for teaching community-driven design through ethnographic and participatory fieldwork, including the challenges of fostering equitable community participation in planning. The empirical findings, meanwhile, suggest opportunities and pitfalls for would-be placemakers to consider (from engagement strategies to technical mishaps). The study thus has implications for how planning scholars and practitioners alike might better understand culturally-relevant placemaking and urban design at the neighborhood level, including the potential limitations of so-called tactical approaches in adequately capturing local priorities and producing meaningful public spaces.

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Key Words: community, creative placemaking, participatory design, pedagogy, tactical urbanism

## **NISHNAWBE ASKI NATION (NAN) HOUSING STRATEGY - CENTERING THE LIVED EXPERIENCES OF FIRST NATIONS PEOPLES IN HOUSING EVALUATION.**

Abstract ID: 686

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On-reserve housing crises have been declared by governments and First Nations alike; however, definitions and proposed solutions vary widely. However, without a distinct evaluation framework quantifying the crisis relies on the standardized Canadian approach of Core Housing Need; which has been documented to be culturally inappropriate. Failing to measure specific impacts of climate, culture and geography on housing need makes evidence-based decision-making, for all parties, impossible. Creation, and measurement, of occupant-focused housing metrics presents opportunities for identifying alternative housing development strategies, policy options and funding mechanisms focused on equity.

Nishnawbe Aski Nation (NAN) Housing Strategy, an immersive and participatory project centering the lived experiences of First Nations peoples in housing evaluation. NAN represents 49 First Nations across northern Ontario, a territory experiencing inequitable housing outcomes because of generations of failed colonial interventions. Over a two-year period, members co-created unique housing metrics which considered the region's unique context. The result is an evaluation framework which can demonstrate longitudinal change in housing systems rooted in occupant priorities and a novel, place-based understanding of 'need'.

Findings demonstrate both theoretical and practical applications of Indigenous, community-based planning practice and show potentials and limitations for multi-disciplinary and cross-sectoral partnerships in creating policy change. While the specific metrics developed are uniquely connected the region, findings point towards a transferable approach to evaluation frameworks. Importantly, local conceptualization of housing need points towards the need for wholistic understanding of housing which incorporate well-being and social infrastructure indicators.

### **Methodology**

This project, and its foundational partnership, are rooted in anti-colonial and Indigenous planning theories. Counter to western, state-based planning principles, validity herein privileges the lived experiences and knowledge of Indigenous peoples; recognizing them as enablers of their own communities (Jojola, 2013). Utilizing Indigenous research methods (Drawson, Toombs, & Mushquash, 2017; Lavallee, 2009; Wilson, 2001) and participatory action research (PAR) (Kemmis, McTaggart & Nixon, 2014) as primary methodological tools in the development of a housing evaluation framework. Including interactive and immersive tools which engaged all community members—from Elders to youth—about their priorities and experiences of home. Importantly, the process was iterative, recognizing that research entails processes of translation and analysis findings remained rooted in local understandings.

Given the cross-cultural and multi-disciplinary nature of the research team all project stages required a focus on reflexivity. Partnership itself, and understandings of the specific practical challenges associated with the

implementation of anti-colonial theory given power imbalances present important methodological learnings.

## Findings

The primary finding of research is a locally-specific housing evaluation framework that has been tested in NAN First Nations. The framework presents an important turning point in data sovereignty for NAN First Nations and reframes the discussion of evidence-based decision-making in housing between First Nations and governments. In addition, through the participatory research process which developed the metrics which form the evaluation framework, a new and more wholistic understanding of housing 'need' was conceptualized. Using this wholistic definition of need creates a clear explanation for previous gaps in how to address how the housing emergency.

Specific metrics created may not be transferable, but the process and challenges faced in defining housing priorities and developing occupant-focused practices will have application with other populations experiencing inequitable outcomes. This practical application of documenting lived experiences and prioritizing cultural understandings of place to create policy change, contributes to a growing literature of bridging Indigenous and anti-colonial planning theory and practice.

## Relevance

This project identifies that each methodological approach has boundaries in the creation of community-developed, occupant-focused housing evaluation in First Nations. This work brings the concept of decolonizing planning processes to the scale of house/home to create equity in the lived environment.

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Key Words: Indigenous planning, Housing, Participatory planning, Housing evaluation, Participatory Action Research

## **INDIGENOUS CHURCHES AND SOCIAL SERVICES: THE ROLE OF TONGAN LATTER-DAY SAINT CONGREGATIONS DURING COVID**

Abstract ID: 743

Individual Paper Submission

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Third sector civil society that include faith-based organizations (FBOs) and institutions fill the gaps not provided by the state or the market. Churches, mosques, synagogues, and other faith-based religious organizations and institutions are uniquely positioned and often the most trusted local neighborhood frontline contact among indigenous, immigrant, low-income communities of color. Indigenous Pacific Islanders in the U.S. diaspora are no exception. Catholic churches, Evangelical churches, Jesuit churches, Latter-day Saint (LDS) Mormon churches,

Methodist churches, Protestant churches, and Seventh Day Adventist churches are prominent faith-based organizations and institutions among Pacific Islander populations. Churches are the central anchor institutions among Pacific Islander communities. I looked specifically at the role of local, neighborhood Tongan LDS ward and stake congregations in social services delivery during the COVID-19 pandemic. I applied Critical Race Theory (CRT), Indigenous Tongan Tā-Vā (Time-Space) Theory, and Brown Church Theory as conceptual, theoretical frames of understanding the social services delivery response of Tongan LDS Mormon ward and stake faith congregations among its communities throughout the COVID-19 pandemic. Such theories depict how Tongan LDS communities encompass an indigenous margin from the centered mainstream, but willingly participate within a space that has been indigenized in particular ways to provide symmetrical tauhi vā (economic, social, and spiritual well-being) during ongoing crises and shock disaster events like COVID. Using talanoa (informal conversation, ‘talk story’) semi-structured interviews with individual church leadership and legacy congregation members, survey focus groups with specific church entities, and church archives, data collection occurred in three different states, namely California, Hawai’i, and Utah, where a critical mass of Tongan LDS populations exist. Narrative stories collected empirically depict the central role indigenous Tongan congregations play throughout the COVID-19 pandemic in providing community and a safety net, and in delivering important social services. Faith communities are often limited in capacity and better serve its members by partnering and collaborating services with the state. Additional and needed delivery of social services from the other two sectors of society – the state and the market – among Pacific Islander populations impacted by COVID-19 requires coordination and collaboration with indigenous Pacific Islander churches in the United States to both enhance delivery and impact as well as minimize bureaucracy and duplication.

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Key Words: faith-based organizations, ethno-race, community development, Tongan

#### INEQUALITY AND INEQUITY IN HAZARD MITIGATION AND DISASTER RECOVERY POLICIES

Abstract ID: 753

Individual Paper Submission

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This paper uses spatial data on mobile home parks (MHPs), Hurricane Harvey FEMA Individual Assistance Claims, and geospatial flood zone data to compare the relative vulnerability to flood risk for single family housing and mobile homes in the Houston Metropolitan Area. MHPs serve as affordable and attainable housing, often for marginalized populations, and provide opportunities for their residents to engage in social activities as a part of a

community (Durst and Sullivan 2019). Studies show that, although affordable housing options positively affect long-term community resilience to disasters by reducing social vulnerability, the residents and housing structures tend to be disadvantaged in hazard mitigation and disaster recovery policies (Rumbach and Makarewicz 2016). This holds true for MHPs. A case study of MHP recovery after the 2013 Colorado Floods found that parks were more exposed to severe risks, and thus, greater damage (Rumbach, Makarewicz, and Németh 2016; Rumbach, Sullivan, and Makarewicz 2020). Moreover, “socio-spatial stigma” from prejudicial perceptions toward mobile home residents, further affected disaster recovery decisions (Rumbach, Sullivan, and Makarewicz 2020).

This study further investigates the inequities in disaster management policies related to mobile homes and MHPs by answering the following research questions: 1) to what extent are mobile homes and MHPs more likely to be located in flood prone areas relative to other housing types; 2) did mobile homes and MHPs experience greater rates of damage from Hurricane Harvey flooding due to their locations relative to flood zones; and 3) whether and how the share of verified damage covered by FEMA’s post disaster assistance varies by housing types and income? To answer these questions, we created a unique geo-spatial inventory of MHP-parcels from multiple data sources including parcel data, county assessors records, satellite images, and MHP industry data. We used the MHP-parcels to calculate the shares of Census blocks with and without MHPs in the high risk flood zone, and compared this to other housing types in these flood zones and all blocks throughout the region. We then compared these results to the FEMA Individual Assistance claims for Hurricane Harvey, which reports each claim by block and includes housing type, income, amount of FEMA-verified damages, and actual amount awarded for short-term rent, personal property, and real property.

The findings show that MHPs were more likely to suffer damages during flood events compared to other housing types because of the unequal geographic location of mobile homes in flood prone areas, rather than from mobile homes’ structural characteristics. This accords with our earlier findings from field observations, which showed the three foot elevation requirement for mobile homes protected them during the Harvey storm and flooding. We also found inequality and inequity in the post-disaster assistance that mobile home residents received relative to residents of single family housing, as well as by income. An additional finding is the inaccuracy of the American Community Survey (ACS) estimates of the location and number of mobile homes. In many cases, ACS does not report mobile homes in block groups where we identified MHPs and where there were FEMA claims. Using the ACS to study mobile homes may lead to inaccurate results.

This study reveals how planning regulations for housing development in flood prone areas increases risk for vulnerable populations and an important source of affordable housing. It further shows how FEMA housing recovery assistance policies exacerbate and perpetuate inequities in social mobility by failing to restore housing stability for populations with lower incomes. It also contributes a new methodology for accurately locating MHPs, which fills a gap due to inaccurate and incomplete records from other sources, including county assessor records, the ACS, and industry associations.

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Key Words: Mobile Home Parks, Flood disaster, Social Vulnerability, Affordable Housing, Disaster risk management policy

## **SUBURBAN AGING: AN EXAMINATION OF BUILT ENVIRONMENT AND SOCIAL INFRASTRUCTURE SUPPORT IN GREAT MELBOURNE**

Abstract ID: 762

Individual Paper Submission

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Growing old in a suburban environment can be difficult. As we age, we are increasingly likely to experience some kind of physical or cognitive impairment. Simultaneously, the likelihood that we do not, or cannot, drive an automobile grows. As a result, our life spaces shrink. Without reliable transit, easy access to services, family and friends, older adults in suburban neighbourhoods may face loneliness, depression, and other health risks. The importance of supportive built and social infrastructure in all communities is critical to aging well. It is especially critical in the Australian context – one of the world's most suburban and rapidly aging countries. Over two thirds of Australians live in suburban environments and the Australian "baby boom" generation is, proportionally, one of the largest in the world. This paper examines the magnitude and spatial distribution of demographic aging in relation to the built environment and social infrastructure in the city and surrounding suburbs of the Greater Melbourne metropolitan area. Specifically, we ask: what is the relationship between built and social environments at the neighbourhood scale to individual older vulnerability? And how are(n't) planners and policymakers addressing challenges of aging in unsupportive environments?

Our study follows a two-part research design. First, we undertook a quantitative neighbourhood-by-neighbourhood analysis of Greater Melbourne's 257 neighbourhoods and found that (1) neighbourhoods with lower levels of built infrastructure support also have lower levels of social infrastructure, (2) 70% of older adults aged 65 years and over live in areas with low levels of built environment support and one third live in areas with both low social infrastructure and built environment support, and (3) there are distinct intragenerational geographies of older adults living alone with residents aged 85 years and above being more widely dispersed in the region and less concentrated near the central business district.

Secondly, the opportunities and challenges of suburban aging-in-place were assessed through the analysis of semi-structured interviews with fifteen local, state, and federal policymakers and stakeholders. The results demonstrate that practitioners are aware of the challenges faced by older adults – especially in suburban areas. There has been considerable effort by local and state government to cultivate age-friendly communities and engage older Melburnians. However, the vast majority of the effort has been focused in a relatively narrow band of solutions and programs and often relies on the downloading of responsibility to community groups. Furthermore, there has been a consistent reluctance to tackle the most critical and costly challenges facing the older adult community: housing, transportation, and outdoor spaces and buildings.

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Key Words: aging, Age-friendly cities, social infrastructure

## THE NETWORK THAT (RE)BUILT COMMUNITY? FROM INSURGENT INTERNET TO CO-OPTED TECHNOLOGY

Abstract ID: 801

Individual Paper Submission

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As information communication technologies (ICTs) continue to evolve, scholars have continuously debated their effects on the concept of community. Do ICTs disintegrate social bonds or foster new collectives? However, past and current scholarship on this question in the digital era are either general population studies or only investigate upper to middle-class homogenous neighborhoods. Additionally, these studies do not extend themselves into the field of Community Development, which increasingly relies on providing access to ICTs for underserved residents in marginalized neighborhoods, bridging the digital divide.

Therefore, to fill this gap in the research, I ask: 1) How does the introduction of a new information communication technology into a disenfranchised neighborhood affect the concept of community? and 2) When a community is disenfranchised in physical space, how do its members then re-assert their identity in digital space? Using the case of Red Hook WIFI, a local Internet network that youth from Red Hook public housing in Brooklyn, NYC built and managed from 2011-2016 to connect neighborhood residents to information, create spaces for self-expression, and generate local economic activity. Through ethnographic data and participatory action research, I show how this information communication technology began as an insurgent organizing tool and then transformed into a disaster recovery infrastructure after Superstorm Sandy, facilitating a strong sense of community in Red Hook. However, eventually, Red Hook WIFI became a technology co-opted by city agencies and funders for the purposes of job training. Neighborhood youth then began seeing the Internet network as a ticket out of their neighborhood, leading to a loss of community solidarity.

These findings have implications for the practice of Community Development. In Red Hook, economic development over-shadowed amplifying voice. In disenfranchised communities, having voice and having an income are equally important. Both of these factors are necessary for individuals to aspire and for an effective democracy. Ultimately, I argue planning practitioners and scholars must include access to information communication technology and media production as an issue area in the field to effectively address inequality.

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Key Words: youth, technology, community development, communication infrastructure

## **PUBLIC SPACES AND LONG COMMUTES: THE (DIS)USE OF NEIGHBORHOOD PARKS AS SITES FOR CIVIC ENGAGEMENT**

Abstract ID: 852

Individual Paper Submission

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This project seeks to understand the impact of dislocation, a term we use to describe the experience of increases in distance between where people live and work, by posing the following question: how does dislocation impact whether, when, and how people use neighborhood parks to engage with others in the community? Given the import of public spaces to democratic societies, if, when, and how people use public spaces matters to both communities and civic leaders and decision-makers who decide whether to fund and maintain them.

Our study site, Tacoma, Washington (population of 210,000), has almost three acres of public land, including 69 parks and recreation properties and four community centers; in this setting, park usage is expected. Along with this expectation comes the assumption that residents benefit from their parks and experience improved mental and physical health. However, research has yet to explore whether these benefits are reaped by residents that experience above-average commute times. According to a 2018 U.S. Census Bureau report, average commute times went up for all major regions in the U.S. in 2019. Tacoma happens to be in one of the top ten areas in the U.S. where people face the longest commutes to and from work. Tacoma commuters have the longest average travel time in the region of 32.5 minutes.

Within the city, we selected Tacoma's Central Neighborhood Council (TCNC), a centrally located area with 20,650 inhabitants within 9,317 households. We see TCNC as a cross-section of the city. Importantly, TCNC's tenure breakdown and owner/renter percentage of cost-burdened households (paying more than 30% of their income on housing) closely match the city's. Finally, most households in TCNC (97%) have moderate or higher access to open space.

We are conducting this mixed-methods study in three stages. We conducted a series of structured observations in all of TCNC's parks. Next, we will mail 1,000 households a survey to gather data about their average commutes and use of nearby parks. Finally, we will convene focus groups in English and Spanish to gain more detailed information about park awareness and usage from among survey respondents.

Integral to planning practice, understanding park use among those who experience long commutes is an initial step in understanding how revisions to public life have happened and will continue to occur in a neoliberal society that shapes local communities' social fabric. Given the well-documented correlation between public space and public life (Whyte, 1980; Mattson 1999; Gehl 2007), the impact of dislocation merits further study. Moreover, the effect of dislocation on park usage deserves greater critical attention because not everyone is experiencing dislocation equally. According to a 2020 Urban Institute report, "the average person using some form of government housing aid is likely to face tougher odds of getting a job near their neighborhood than the average job-seeker who is not using assistance." Tacoma-area residents are experiencing high dislocation rates in general, especially those in low-income households; thus, the question we pose in this study takes on greater social justice exigence. Tacoma may well enjoy abundant and high-quality parks and community facilities. Still, not everyone benefits from this social infrastructure (Klinenberg, 2018), resulting in a public commons where people of color and lower-income residents

are mainly absent.

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Key Words: public spaces, commuting, civic engagement, neighborhood parks

### **ORGANIZATIONAL DISPLACEMENT AND MISSION DRIFT: HOW SOCIAL SERVICE PROVIDERS ADAPT TO GENTRIFICATION**

Abstract ID: 886

Individual Paper Submission

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Nonprofit social service organizations provide critical resources for low-income individuals and families. They also tend to be located in the low-income, central urban neighborhoods that are prime candidates for gentrification. How do nonprofit organizations in gentrifying neighborhoods adapt as the populations they serve move further away and they find themselves in an area that is outgrowing its need for social services? To what extent do nonprofit organizations continue to serve low-income and marginalized populations as the neighborhood around them becomes more affluent? Do financial pressures lead to organizational displacement? This mixed-method research addresses these questions through a study of nonprofit organizations located in gentrifying neighborhoods in Boston.

The findings reveal that gentrification provides both challenges and opportunities, especially for organizations that face difficult funding environments. In response to gentrification, traditional organizations adapt their missions, programs, service areas, and fundraising. Some face displacement pressures, regardless of whether they rent or own their buildings. At the same time, gentrification provides some new opportunities, especially in regard to fundraising. Overall, this research builds on scholarship about how gentrification affects low-income and marginalized populations, but it does so through an organizational lens.

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Key Words: Gentrification, social services, community-based organizations, displacement

## **NUESTRA TELENÓVELA: FOR THE LOVE OF PILSEN'S LANDMARK ORDINANCE DEFEAT IN A HISTORIC PLANNING DISTRICT**

Abstract ID: 888

Individual Paper Submission

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Community development organizations, planners, preservationists, and community residents have a tenuous relationship when it comes to neighborhood revitalization specifically in lower income communities. Add to this mix the corruption of elected officials and a distrust of city hall who advocate programs and policies toward pro-developers with minimal incentives to homeowners to keep them from being displaced in a gentrifying community. Juxtapose these dynamics with the introduction of a historical landmark ordinance's where opponents argued that the historical designation protects the building and not the residents. Proponents for the ordinance argue that by not passing it, the community is not protected from gentrification; yet the way that the ordinance was written, it provided more red tape than incentives towards the preservation of 900 buildings located within a quarter of a mile in Chicago's Pilsen community. Moreover, if there was no action on the part of the City Council, the designation would pass making it the largest historical landmark district in Chicago. This paper examines the process confronting the city of Chicago and the community of Pilsen around a landmark proposal and its different iterations for landmark preservation after a city council vote. The main argument is how disempowered communities can prevent the coalition of developers and City Hall from taking further advantage of uneven systems.

This research is part of a longitudinal study of Pilsen's immigrant Latino community's trajectory over the past 30 years through a historical genealogical approach using grounded critical visualization. Using published and unpublished materials from archives, secondary data, published research, interviews, and participant observation, we document Pilsen's struggle to stay put against the forces of gentrification. We also address the nature of using different planning tools for slowing down gentrification and its impact toward homeowners and renters. Lastly, as researchers and a community activist impacted by this Ordinance, we address how community engagement has been utilized by city government, elected officials, developers and residents within the two-years of its introduction and defeat during the COVID-19 pandemic. The findings provide not only insight into policy implications for the development of local preservation ordinances but also provide a roadmap for the various approaches that low-income communities can take to push back developers and the city.

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Key Words: historic district, gentrification, community participation/engagement, landmark, Chicago

## COMMUNITY ENGAGED SCHOLARSHIP: AMETHYST AT FIVE POINTS

Abstract ID: 890

Individual Paper Submission

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Community-engaged scholarship provides unparalleled opportunities for university-community collaborations that result in reciprocal benefits. The integration of teaching, applied academic and community participatory research elevates these benefits in ways that continue to influence scholarship through practice. Planning faculty working in concert with community stakeholders and students are well positioned to enjoy multipliers of this phenomenon. This paper illuminates a faculty-led university-community venture that engaged Revitalization Studio students in an evolving community initiative. Three questions were posed to guide the work:

1. How could members of the collaboration gauge residents' opinions about the reuse of 8.5 acres of newly acquired land?
2. What contributions could each collaborator make to the project?
3. What was the highest and best use of the 8.5 acres vacant land?

Informed by the engaged scholarship precepts originating with Ernest Boyer in the 1990s, the conjoint venture, Community Engaged Scholarship: Amethyst at Five Points, focused upon Studio course participants working closely with the local community. Consistent with the four types of scholarship explicated by Boyers, the project incorporated: The scholarship of discovery, integration, sharing knowledge, and the application of knowledge. The project required close and regular interactions between the faculty member, students and community residents. In addition to residents' participation in various aspects of neighborhood research and data collection (community-based participatory research), they shared lived experiences and historical accounts of the community. These contributions strengthened the work and underscored the inextricable link between scholarship and community concerns.

The initiative included sequential steps that responded to community needs while concomitantly ensuring the achievement of student learning outcomes specifically designed to expand scholarship through active participation in community participatory research. Within the work plan, project collaborators addressed a variety of planning issues that included: Evaluating 8.5 acres of land for reuse; conducting a community profile; identifying site conditions; researching the zoning and land use history; developing a survey, conducting focus groups; and proposing the highest and best use for the property through regeneration or recycling. The proposed land use had to be compatible with community character and respectful of residents' desire to maintain the historical integrity of the five neighborhoods contiguous to the 8.5 acres study site.

Outcomes: All of the actors experienced firsthand the benefits of community-based participatory research, emerging citizen scientists, and the acquisition and production of transferable knowledge. Students were able to utilize and share existing skills and talents while learning new ones. A value-added benefit to students was that the experience amplified the strong connection between theory, classroom activities, practice and applied research. The outcome was a solid connection of seemingly disparate parts into a cogent final product reflective of teaching, community service, and engaged scholarship.

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Key Words: engaged scholarship, community engaged scholarship, community collaborative research, university-community partnership

## **DIVERGENCE AND CONVERGENCE OF PUBLIC AND ELECTED OFFICIALS' OPINIONS ON A DOWNTOWN ARENA PROJECT: A CASE FROM THE CITY OF CALGARY, CANADA**

Abstract ID: 891

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In the summer of 2019, Calgary City Council approved the construction of a new 'Event Centre' to house the Calgary Flames of the NHL. The Event Centre was approved with the intent to strengthen Calgary as a tourist destination, attract and retain young talent, and fuel development of a new Cultural and Entertainment District on the edge of Calgary's downtown (City of Calgary).

Since the 1990s, sports arenas and stadiums have found acceptance as part of the downtown revitalization toolkit, making them important to the planning profession. Robertson outlines common strategies for North American downtown revitalization, including efforts to enhance pedestrian experiences, redevelop abandoned waterfronts, strengthen the office sector, and introduce special activity generators (SAG)—a broad term encompassing convention centers, sports arenas, and stadiums (1995). Chapin notes that for decades, construction of new sports facilities was rationalized on the basis of its economic impacts, however, a major shift regarding the impact of sports facilities emerged in the 1980s (2004). Contemporary venues have been rationalized on the basis that they are central anchors and catalysts for district redevelopment (Chapin, 2004; Spirou, 2010).

Herein lies the debate for the City of Calgary, as community residents, planners, developers, and elected officials debate the potential benefits or harms of an SAG-driven development project. The proposed development of a new Event Centre, which was more commonly known to the public as the new arena for the Calgary Flames, sparked discussions among the stakeholders regarding its financial implications and benefits. Those in favor of the project emphasized its catalytic effects on revitalizing the city centre, while those who objected claimed that the overall costs will burden the people of Calgary with increased tax.

The public discourse surrounding the proposed event center has taken a number of forms—from inside City Council chambers to social media. As part of the public engagement process, the City of Calgary collected approximately 6,100 emails between July 22<sup>nd</sup> and July 29<sup>th</sup> of 2019. Informally, several council members debated the merits of the proposed event center on their Twitter feeds. And, formally, the Event Centre featured prominently in City Council meetings between 2019 and 2020.

In this research, we examine the divergence and convergence of public and elected officials' opinions on a controversial downtown arena project. We analyze the text data extracted from the City Council minutes, public emails, and elected officials' Tweets. We performed Natural Language Processing (NLP) analysis techniques, including Topic Modeling, n-gram analysis, and Sentiment Analysis, to identify emergent patterns from within a

massive amount of project-relevant text data. The findings reveal similarities and differences across multiple stakeholder groups within the context of a major downtown redevelopment project and publicly-funded arena, ranging from public perceptions to elected representatives. This research demonstrates how planners can use NLP techniques to systematically engage with and analyze digitized text data at a massive scale. Further, our findings elucidate the degree to which the convergence and divergence of public opinions can affect elected decision-makers' positions on major development projects.

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Key Words: Downtown revitalization, Sports arenas and stadiums, Public Participation, Text mining

#### **AN ANALYSIS OF DIFFERENT PERCEPTIONS OF GENTRIFICATION AND DISPLACEMENT: A CASE STUDY OF KOREATOWN, LOS ANGELES**

Abstract ID: 900

Individual Paper Submission

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Koreatown is one of the most well-established immigrant communities in Los Angeles, CA. The overwhelming development boom for upscaling the housing and retail in Koreatown exacerbates the displacement pressures to the most vulnerable and disadvantaged people in the community. Although the previous studies using quantitative data analysis confirmed that gentrification has been underway in the community, the macro-level analyses missed the distinctive features of the process or a clear understanding of the actual needs and concerns of the community (Loukaitou-Sideris et al., 2017).

Applying a qualitative research approach, this in-depth case study of Koreatown utilizes open-ended semi-structured interviews. The purpose of interviews with different stakeholders in the community is to uncover the differences in perceptions regarding neighborhood change, gentrification and displacement, from small business owners, ethnic-specific non-profit organizations for Koreatown, and public planning agencies. The research question to be answered is how different are the impacts of gentrification between the actualities and the perceptions from various stakeholders in Koreatown.

As an interesting result, the observations and experiences of gentrification from different informants are almost converged regardless of their positions in the community, although the perceptions of gentrification vary by their positionality and relations of the community. This gap in perceptions of gentrification from different positionalities may hinder equitable development in the community. The findings will suggest a better understanding of what the community actually needs and wants under the pressures of gentrification and displacement in Koreatown. Also, the research will conclude with how to tailor the planning policy or equitable development strategy by incorporating the actual needs and concerns of the communities. Further, this case study will contribute to understanding the

neighborhood change in Asian/Asian-American urban communities at risk of gentrification while many gentrification studies overlook the ‘model minority.’

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Key Words: Koreatown, Gentrification, Displacement, Case Study, Interview

### WHY CHANGES IN BUILT ENVIRONMENT CANNOT CHANGE PEOPLE’S HEALTH BEHAVIORS? AN EXPLORATORY STUDY

Abstract ID: 916

Individual Paper Submission

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**Background:** In the past two decades, plenty of research have addressed built environment’s implications to health, such as active living, healthy diet, and access to healthcare. It is well established that safe, walkable neighborhoods promote physical activity, reduce driving, and prevent health conditions such as obesity and chronic disease. However, studies have also identified limitations and provided critiques to current evidence base on the association between “D-variables” of urban form—density, diversity, design, destination accessibility, distance to transit, etc.—and health behaviors. Some studies also found counter-intuitive results. For example, a meta-analysis found that compact development features, measured by “D-variables”, has very little influence on people’s driving behavior, and in particular, people even drive more when the land use mix increases (Stevens, 2017). Given this background, this research seeks new approaches to planning and policy design to promote healthy behaviors.

**Analysis:** This paper analyzes three groups of health-related behaviors: physical activity, food access, and social interaction. Based on the evaluation and critique of the determinants of health behaviors found in current approaches to built environment interventions, this paper provides four distinct perspectives of criticism: (1) activity budget perspective. Activity budget is similar to a time budget, implying that built environment may make limited contribution to a person’s totally physical activity (Forsyth et al., 2008). (2) Built environment design efficiency perspective. This perspective argues that current built environment interventions explain only a small part of health behavior change. (3) Activity maintenance perspective. Changes in built environment has limited ability to change people’s attitudes and behaviors due to the difficulty in the maintenance of behaviors beyond six months of behavior adoption (Marcus et al., 2000). (4) Health benefits and risks perspective. Many health concerns are contradictory, and it is important to identify the combined health impacts of different behaviors. For instance, walking and bicycling are physical activities that are good for health, but people may be exposed to higher risks of injury and air pollution (Useche et al., 2019). Planners should expect that these health benefits and risks vary by built environment contexts.

**Recommendations for future practice:** The future of health-oriented planning requires not only built environment change, but also behavior change. This paper argues that behavioral-oriented policies for health promotion is a cost-effective approach to built environment interventions. The goals and objective should be primarily focused on behavior and behavior change, recognizing heterogeneity in health-related behavior formation. In addition, built environment interventions should be driven by the awareness of behavioral factors, including people’s attitudes,



values, and behavioral orientations.

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Key Words: Built environment, Health behavior, Physical activity, Food access, Social interaction

#### ***DIVERSE GRASSROOTS STRATEGIES AND ACTIVIST NETWORKS IN THE GENTRIFICATION DEBATE IN THE BOYLE HEIGHTS NEIGHBORHOOD OF LOS ANGELES AND BEYOND***

Abstract ID: 926

Individual Paper Submission

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Boyle Heights is a historically working-class Latinx neighborhood in Los Angeles, where strong grassroots resistance to gentrification and a severe lack of affordable housing have effectively developed into a compounding political and public health crisis. Collectively, community-based organizations have struggled to mobilize to influence development in the neighborhood and protect residents from displacement. One popular strategy among grassroots groups has involved insurgent activism. This has consisted of multiple coalitions of resource-poor activists and grassroots organizations engaging the debate with contentious tactics pushing their anti-gentrification politics, working directly with those most vulnerable to displacement, and targeting gentrifiers both online and offline. Their targets have included gentrifying businesses, political elites, and local investors. Across the neighborhood's grassroots landscape, their overarching goals lie beyond traditional channels of local politics and market driven urban development as they demand direct democracy in urban planning and community development. However, through closer observation, the specific tactics and demands held across groups are more nuanced and complex. In this political landscape, there is a wide range of tactics on display. Some groups build rapid-response networks and mobilize residents to directly confront landlords, local politicians, and professionalized non-profit community-based organizations with the claim that such actors are implicated in gentrification. Others opt to reclaim public resources, create cooperative community spaces, and develop networks that advocate for the collective ownership of land, housing, and labor. The political activities and networks of radical grassroots organizations requires a closer analysis to understand the perspectives of this political landscape that challenges traditional channels of urban politics, conceptions of community, and visions of an urban future.

This paper examines the type of insurgent tactics and political frameworks utilized by local grassroots activists in Boyle Heights and their networks throughout Los Angeles to advance their views concerning urban development and urban futures. Though activists making up radical grassroots mobilizations appear to be similar, they express their rights claims to the city in very different ways. While one sector of grassroots organizations fights to directly confront urban antagonisms and unequal power relations on the ground to call attention to irreconcilable class-based structural issues, others invoke indigeneity as a cultural identity to build and integrate new cooperative organizations to reclaim and protect public resources. Using a robust database of newspaper articles, participant observations between 2019 and 2021 and interviews gathered from sixty-five local activists within and outside of Boyle Heights, this paper aims to identify the different expressions of the right to the city, the activist networks

responsible for producing different discourses, and how activists work to reconcile (or not) discursive differences within the movement. Examining the differences among and within the grassroots political landscape can provide important lessons on how political discourses and networks work in relationship to political demands and representation in the built environment. These lessons have larger implications on the integration of marginalized voices in planning processes and civil society at large.

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Key Words: Urban Politics, Community Development, Housing Debates, Gentrification

#### FAITH-BASED COMMUNITY DEVELOPMENT THROUGH ETHNOSPIRITUAL FIGURATION

Abstract ID: 937

Individual Paper Submission

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U.S. faith-based community development (CD) organizations “have grown significantly because of the 1996 U.S. Welfare Reform bills and President George W. Bush’s faith-based initiatives” (Tarpeh and Hustedde 2020, 4). According to the White House Briefing Room, President Biden, not long after of his inauguration in 2021, reestablished “The Office of Faith-Based and Neighborhood Partnership,” a program had been started twenty years ago by President Bush. Despite CD’s wide application, Wilson (2015) argues, the relationship between identity, culture and community development is “immeasurable” and planners and practitioners of community development “often ignore these connections in their homogenizing development initiatives” (p.1). Identities can be national, ethnicity, location based, or professional in character and play important roles in development project outcomes. In these contexts, culture and identity are not separated (Ibid.,1).

Planning practitioners working in community development need to be well equipped to understand the sensitive nature of ethnic and cultural meanings, and interests. The importance of culture is emphasized not just in community development, but in planning. The conceptual boundary of planning and its practice has been widening, and challenged in the past decade and a half, to incorporate new meanings. Among these Porter (2010) argues for as cultural practice and “seeing planning as a cultural practice makes it become specific to particular peoples, life views, times and spaces (2). Porter (2010) argues that planning needs to pay attention to its own historic context where planning as a discipline and professional practice evolved to its present form.

Ammerman (2020) points out that sociological approaches failed to understand “much of the religion we see” (7). The issue is not just religion ‘messiness’ but religion’s conceptualization as “fixed, unitary”, or “coherent” (McGuire 2008, 12). Little attention was given to the historic, and cultural contexts where religious meanings and their definitions came to be (Ibid). Religion is produced by culture and the historic power struggles are rooted in its definition (Ibid). In the late 1990s scholars started paying more attention to religion-as-practiced, or simply as lived (Ammerman, 2020). Now more than two decades later, under the umbrella term of “lived religion” (Ammerman, 2020) much work resulted to understand religion, including spirituality in the every-day walks of life. McGuire (2008) explains religion as the result of historical and sociocultural struggles in the past and present, while the meaning of

religion is continuously changing by people. In light of these scholarly discussions and pressing societal changes for ethnic, religious, and cultural rights and just space we need to expand theorization on inclusions of religion and faith in community development.

This presentation expands on the findings of a social constructivist qualitative analysis that investigated three Historic Hungarian Churches role in community development in Romania. As a result of a study a substantive theory of religious institution driven defragmentation was developed (RIDD Theory). The RIDD theory captures a form of community development (ethnospiritual figuration) that is practiced through cultural (ethnic) and religious (spiritual) means. These practices, in the context of the RIDD theory, were captured as defragmenting activities in terms of ethnic community, space, among others.

In essence, ethnospiritual figuration is a form of community development that is performed through cultural-religious practices in ethnic Hungarian minorities. The RIDD theory's applicability in USA and international context will be discussed with sensitivity to culture, religion, and territoriality. Community development professionals and planners will learn about the dimensionality of faith and religion as it is lived and practiced, and bring the "practitioners of religion" closer to "practitioners of planning and community development." Practical take-aways for practice will be provided and discussed through examples from the USA, and Europe.

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Key Words: faith-based community development, religion, planning as cultural practice

#### **APPLYING HERITAGE TRILSCAPES AS AN ACTION RESEARCH STRATEGY FOR REGIONAL COLLABORATION—A CASE STUDY OF THOMSON-MAXWELL HERITAGE TRAIL IN TAIWAN**

Abstract ID: 1048

Individual Paper Submission

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In an increasingly fragmented society, how to promote collaboration among communities to create synergy and consolidate resources has become an important planning issue. Heritage trails have been gradually gaining more attention as a strategy for tourism development and community economic development at the local and regional scales. Especially in rural areas, heritage trails serve as a network linking human settlements and natural environments by connecting local cultural, agricultural and ecological features. They are not only unique local landscapes that keep records of history and culture but also a common ground where communities share experiences and identities. This research is based on the author's participation in rural revitalization projects in southwestern Taiwan during the past five years. The motivation of this action research is to promote community economic development, strengthen local identity and promote regional collaboration via community-based tourism.

In this paper, we demonstrate the potential of heritage "trailscape" as a strategic medium to promote collaborative

planning among stakeholders in the rural region. We will discuss a particular trail, documented by Scottish photographer John Thomson in the 19th century, that connects aboriginal communities in southwestern Taiwan. By using document analyses of historical photos, literature and maps, important people, events, locations, architecture, artifacts and landscape of the trails are systematically analyzed, geocoded and reorganized into tourism themes and planning principles. In-depth interviews and workshops with stakeholders are conducted to understand the potential effects of the reconstructed “trailscape” as a medium to enhance the dialogue, consensus and actions. More specifically, we take institutional capacity in collaborative governance as the framework of evaluation. This research uses knowledge resources, social-relational resources and mobilization capacity as the indicators of evaluation. By inviting the stakeholders to the collaborative planning and participatory evaluation, this research determines how heritage trails might work as a potential public realm for rural community participation to develop regional identity and as a platform for promoting cross-scaled and cross-organizational collaboration.

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Key Words: community economic development, rural tourism, trailscaapes, collaborative planning, heritage trail

#### **SPATIAL VARIATION OF NEIGHBORHOOD SOCIAL CAPITAL, CIVIC PARTICIPATION, AND SAFETY**

Abstract ID: 1057

Individual Paper Submission

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Urban neighborhood characteristics and transition is important for formulating effective programs for revitalization and community development. This article is motivated from an intellectual tradition that seeks to explain variations of neighborhood outcomes such as crime and civic participation. While there are various factors that matter with spatial variations of neighborhood outcomes (inequalities) in an urban area, this study is particularly interested in place based social capital and their impact on neighborhood outcome such as safety. In urban planning fields, social capital has been applied in a variety of contexts to explain the ability of a community to solve the problem of collective action. The spatial dimension of social capital arises from the fact that their value and the way they are valuable to an individual depends on the physical distance. Social ties/networks may be restricted by the geographic location. Thus social capital is location specific.

The paper examines the interconnectedness and spatial dynamics among social capital, civic participation and neighborhood safety (crime), using GIS and statistical models. The main research question is “Do social capital contribute to neighborhood outcome (i.e, lower crime rate)?” In doing so, a novel approach is introduced to create the social effect composite index to contain spatial dimensions of place based social activities. Thus the spatial dynamics of social indicators are analyzed at a finer level of analysis such as parcel and street level. The traditional and common method of social capital research uses survey methods, with the unit of observation being either metro areas or cities or counties or zipcodes. This method is not necessarily well suited to capture the spatial dynamic nature of neighborhood characteristics at a finer level, e.g. street or parcel level. The paper proposes

methodological improvement to fill this research gap. The fast growth of GIS and spatial data removes former barriers to increasing spatial resolution, and the improvement of statistical modeling supports spatial data analysis of the research to be better worked. For empirical testing, SEM (Simultaneous Equation Modeling) and Path models are utilized. The study area is the City of Lincoln, Nebraska. Lincoln has a strong history of community organizations, voluntary activities, and neighborhood social capital supports.

The findings show that place-based neighborhood social capital and civic participation strongly influences the spatial variation of neighborhood outcome - crime. Government authorities see social capital as a heuristic tool that sheds new light on public intervention and the way in which public services can use this potentially valuable ingredient to attain their objectives. Along this line, the research reinforces the importance of developing formal organizational dimensions of social capital to support collective civic engagement in urban neighborhoods. To identify implication for planning practices, the paper discusses environmental strategies to promote positive social effects.

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Key Words: Neighborhood Social capital, Neighborhood safety, Community development, Spatial dynamics

#### CRITICAL MAPPING: A TOOL OF ACTION FOR SOCIAL JUSTICE

Abstract ID: 1064

Individual Paper Submission

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In today's digital age, critical mapping is gaining more and more relevance in the architectural design and future urban planning decisions, since it plays a powerful instrumental role, observing and describing the urban social phenomena as much as creating and building it in a particular way.

In the last two decades, architects have started to think beyond their disciplinary boundaries, understanding spatiality not only as a "physical object and form", but as a "political and psychological social processes that flow through space" ( Corner, 1999). In this context, architects and urbanists expand their practices in the area of activism, advocacy and strategic decisions, redefining their role in community-based social strategies. By engaging in participatory civic actions, architects and urbanists are becoming more conscious of their ability to promote justice within their social climate but before this, the urban vulnerabilities of a place it is mapped. In this sense, we talk about mapping as a form of activism: maps not only inform and represents but they inspire and propose, being tools with an enormous power to re-shape the city for the emergence of new spatial decisions.

Critical mapping, at its most effective, is recognized as an innovative democratization of cartography that does not only describes the social injustice, hidden or neglected aspects of the reality, but has the power to reveal opportunities for activism and public engagement.

In the context of the contemporary digital technologies, where the process of collecting spatial information and mapping it is out from the control of the experts, we question the conventions of the map as an objective and rational survey of existing information and the use of maps as an instrument of power in order to control.

For a better understanding of the relation between design and planning practice and sociological frameworks of social justice, a series of significant examples of activist critical mapping techniques will be reviewed in order to answer to a series of questions : How can architecture and urbanism practices promote social justice? ”? How can be linked social justice to space?

One of the most recent examples of critical mapping used as a tool for and inclusive urban recovery is the “The Observatory of the Reconstruction” digital platform which provide a shared base of spatial information for/about the August 2020 post disaster reconstruction of Beirut from various perspective including historical development, geography and social urban trends. The standard reconstruction approach which is generally based on a collection of quantitative and physical data of damages, doesn’t take into consideration the multilayered dimensions for an inclusive recovery process. Treating the map as an applied research, the aim of the platform is to provide ongoing geographic documentation of the city by first disclosing and then staging and sharing the information as a strategy to generate collaborations and future people-centered decisions making.

With an increasingly focus on what it is called critical mapping, the article is embracing the idea that maps have great force to transform and act, not as means of projective power-knowledge but as an formative, creative and democratic instrument of any design and planning process. The critical map must remain a technique for both the acquisition of critical knowledge but also as a form of activism for an inclusive and people-centered design and planning decisions.

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Key Words: critical mapping, activism, public engagement, hidden realities, social justice

#### **NONPROFIT GROWTH MACHINES AND THE PRIVATIZATION OF COMMUNITY ENGAGEMENT: LESSONS FROM CHICAGO’S SOUTHSIDE AND THE OBAMA PRESIDENTIAL CENTER**

Abstract ID: 1077

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Nonprofit actors, including foundations and universities, increasingly play a key role in urban development and urban governance more broadly. Recent scholarship focuses on the growing influence of nonprofit actors on governance in the context of fiscal austerity and limited government capacity, raising questions about accountability in public decision-making processes. This trend mirrors the rise of private consultants and exceptionality measures in the urban development process, yet further complicates the tension between private interests and public process. Nonprofits can effectively straddle the divide between public and private, articulating public intent while

mobilizing elite interests free of public accountability. Drawing upon a case examining the politics surrounding the proposed Jackson Park site for the Obama Presidential Center on Chicago's Southside, we highlight the singular political capacities nonprofit actors such as the Obama Foundation deploy in the politics of urban development. In particular, we highlight the Obama Foundation's strategy to script, manage, and control community engagement and participation in order to gain support for its project and quell opposition. We argue this effort served to substitute, not merely displace, a democratic process of community engagement and debate tied to a formal political decision-making process located within local government. Community actors found creative ways to respond and influence the process, albeit circumscribed and delimited in content and scope. We identify tensions between theoretical approaches that assume a neutral role of local state and planning actors, the continuing relevance and contemporary limits of urban growth machine frameworks, and the tensions inherent within planning discourses that conflate race and class in the context of sharp racial and class disparities and their intersections.

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Key Words: Community engagement, Politics of urban development, Democratic planning process, Privatization, Racial and political inequality

#### DISPLACEMENT IN THE CITY AND THE RISE OF SUBURBAN POVERTY

Abstract ID: 1082

Individual Paper Submission

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This paper considers the prevalence and intersection of two increasingly powerful processes in the transformation of the U.S. metropolis —rising poverty in the suburbs and gentrification in the city. Some claim that a contributing factor to the rise in suburban poverty is gentrification-induced displacement from city neighborhoods (Ehrenhalt, 2012; Meyer and Graybill, 2016). The suburban poor are, in a sense, 'economic refugees' forced out of gentrified neighborhoods in the city (Filion, 2015).

From a theoretical perspective, the literature suggests a combination of factors contribute to the suburbanization of poverty in the U.S., many related to city dynamics. One influence are private market policy solutions aimed at dismantling social housing in city neighborhoods and decentralizing low-income inhabitants (Goetz, 2013). Furthering the process is fundamental labor market restructuring that contributes to low-wage sprawl in the periphery and, significant to the process of gentrification, the rise of professional, white-collar occupations in central locations. Overall, a major shift is occurring such that marked spatial polarization between gentrified neighborhoods in the city and low-wage neighborhoods in the suburbs is becoming the new reality (Randolph and Tice, 2017). As we focus on in this study, changes resulting from the emphasis on revitalizing the city through gentrification

(Newman and Ashton, 2004) create a situation where low-income households can no longer afford to live in certain city neighborhoods. This process of a 'great inversion' where white, high-income groups increasingly live in the city and low-income people of color are forced to the periphery (Ehrenhalt, 2012) has enormous implications for the socio-spatial arrangement of the U.S. metropolis.

In this paper, we examine, using linear regression fixed effects modeling, the relationship between displacement from urban neighborhoods and the rise in suburban poverty between 2000 and 2016 in the top 100 most populated metropolitan regions in the United States. We highlight several key findings. First, poverty is still largely an urban rather than suburban phenomenon. Second, in almost every metropolitan region in our study, suburban poverty rose at a faster rate than black urban poverty between 2000 and 2016. Third, there is a relationship between city neighborhood displacement and a subsequent rise in suburban poverty, but largely in those metropolitan regions that experienced high levels of gentrification over a given time period. Our results suggest that as gentrification-induced displacement intensifies in the future, suburban poverty is likely to continue to increase.

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Key Words: Gentrification, Displacement, Suburban, Poverty

#### COMMUNITY DEVELOPMENT CORPORATIONS (CDCS) AND RESIDENT ENGAGEMENT SERVICES

Abstract ID: 1103

Individual Paper Submission

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One of the main critiques about community development corporations (CDCs) is that they have grown so big – in numbers, funding, and influence – that they are no longer of, or for, the community (Swanstrom, 2020). CDCs are beholden to multiple sources of funding – government, foundations, and banks – and rely on elites or professionals to obtain funding. Raising funds is essential to CDCs, for not only operating and sustaining the organization, but also building affordable housing, which has become the primary program of CDCs. Critics argue that this perpetuates the spatial inequalities that CDCs initially sought to address, because poor neighborhoods often lack such sophisticated, strong CDCs and as a result, affordable housing and other resources are distributed unevenly within and among cities.

On the other hand, CDCs are able to navigate the complex housing policies and funding mechanisms, such as the low-income housing tax credit (LIHTC), to build quality, affordable housing in otherwise disinvested and gentrifying communities. (LIHTC has been the largest funding source of affordable housing for the past several decades.) Affordable housing directly benefits low-wage workers and their families because it provides housing stability and security, which allows tenants to pursue educational and other skills development opportunities (Reid, 2018). One study also noted that the higher quality of LIHTC housing gave tenants motivations to succeed (Reid, 2018). In addition, affordable housing in central locations provide greater access to public transit and employment centers. Finally, as mission-driven landlords, CDCs often offer various services to tenants, including case management and



other social services, and make efforts to build community within buildings (Burnstein, Gallagher, Oliver, 2019; Plassmeyer, Brisson, Lechuga-Peña, 2018).

While most studies on affordable housing focus on its impacts on housing retention or economic mobility, few, if any, have considered the process or implementation of services offered to its residents, i.e., whether they reach the intended target population. This study thus seeks to fill the gap in the CDC and affordable housing literature by highlighting the provision of services by one CDC in seven of their affordable housing developments. Using several years of sign-in sheet and administrative data, I identified individual, household, event, and building characteristics associated with program participation. I then interviewed the CDC staff and seven tenants – one from each building – for more context on why or how some tenants utilize services more than others.

Initial analyses of the data show that adult and elderly women are more likely to participate, and most tenant-participants are Spanish-speakers, which reflects the demographics of the tenants and community. Family-friendly, community-building events have much higher levels of participation, compared to financial empowerment or health and wellness workshops. On the other hand, youth participation is low, even in after-school programs. Tenants' council members are much more likely to participate, but also many non-tenants attend various types of workshops, as most events were open to members of the community.

Interviews with staff, tenants' council members, and tenants suggested that tenant services and organizing staff were central to engaging residents. According to staff, the organizing department worked with tenants to develop leadership skills and engage them in larger political campaigns, including the legalization of street vending and developing a community land trust. It remains a question, however, whether their resident engagement and tenants' council model is sustainable, as the organizing department has since left the organization. This development reflects Sites et al (2007)'s concern that not defining and identifying the different traditions and practices of community organizations can lead to uncertain goals and conflicting strategies.

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Key Words: community development, affordable housing, program evaluation, community organizing, economic mobility

## **POSTERS**

## MANAGEMENT IMPACT OF ELDERLY SHARED HOUSING ON THE COMMUNITY IN JAPAN

Abstract ID: 621

Poster

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### Background:

Elderly shared housing called Elderly Group Living (hitherto referred to as EGL) is a living style of about 10 residents that have their own rooms and have dinner together in a house. It emphasizes by free and secure living for the elderly by purchasing neighborhood community based livelihood support services from the neighborhood community. The EGL concept started from “COCO Shonandai” in 1999, and there are about 20 similar types of EGL in Japan. Many are managed as community businesses by NPOs, and people in the community participate as staffs. There have been and continue to have ample studies on EGL residents. This study focuses on the management impact of EGL on the community and clarifies what new ties have been created in the community, and what values EGL community brought in the nearby area.

### Methods:

The study was conducted at EGL-B, which is located in the suburbs of Tokyo. EGL-B was launched in 2003 by NPO-B and Company M (hitherto referred to as Co. M). Co. M is a building provider, that rents out rooms, and operates a café in the same building. NPO-B provides EGL-B residents with meal, cleaning, and livelihood services. It also organizes hobby classes, and other events for the local people. Both Co. M and NPO-B aim to contribute to regional development. The study sample are comprised of 34 members who work at EGL-B, as operator, meal staff, cleaning staff, livelihood support staff, hobby activities staff, cafe staff, etc. We analyzed the formation of communities, changes in personal networks, the actual conditions of activities, and the operating system. In addition, the values EGL community brought in nearby area. The research methods employed in the study, were a survey using a self-administered questionnaire, semi-structured personal interviews using interview schedules, and participation observation. Data collection was conducted during February and March, 2019. Out of a total of 34 questionnaires that were distributed, 32 were collected and 30 valid responses were recorded.

### Result:

Through working at EGL, Networks of acquaintance and selective networks were formed in the members. And a feeling of trust was brought to the neighborhood. EGL doesn't only allow elderly people to live in peace, but also has a function to strengthen the community. While EGL doesn't pay much to members, they don't take great responsibility for their work. EGL work isn't time consuming, and members participate because it is fun. Members can work happily because a leader has prepared an equal relationship, a flexible work style, and respect for spontaneity in the workplace. The values that were created to nearby area by EGL management, such as consultation, watchfulness, intergenerational exchange, motivation for living, fun, and mutual help in times of disaster. It is said that there are two types of local community in Japan, “the community on local ties” and “the community on theme.” In “the community on local ties,” elderly men are the main players, and the participation of younger generations and women is limited. “The community on theme.” is on the decline with the decrease in the number of full-time housewives who were the main players. On the other hand, EGL, a community business, provided not only a choice of part-time employment for housewives, but also a choice of participation for people of different ages and occupations. New community ties created by EGL can be called a “new layer of local community” that is different from the local tie type and the theme type.

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Key Words: Elderly Group Living, Shared housing, Community, Management

## MEASURING THE DREAM FOR AN EQUITABLE AND SUSTAINABLE FUTURE

Abstract ID: 880

Poster

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More than 50 years after Dr. Martin Luther King, Jr.'s assassination, what has become of his call for social, political, and economic equality for African Americans? A new generation of activists is giving new urgency to the call for racial justice and equality, even as polarization increases. How do we equip a new generation of advocates and activists with the knowledge, techniques, and strategies of past activists and assessments of the effectiveness of the policies that were implemented and/or defeated in the struggle for justice and equality? How do we measure our progress toward a more just and equal society? The Measuring the Dream (MTD) project anticipates where and how communities, decision-makers, and institutions can engage to build an equitable future. The goal of MTD is to inform, enable, and inspire a diverse audience to understand the history of the journey toward a more equal society. To quantify national changes in equity since the 1950s, the project created the MTD Index which identifies six arenas in which the struggle for equal justice has taken place and can be objectively traced, including: criminal justice, education, citizenship rights, health, residential segregation, and poverty. Data for high impact variables within each area are cataloged and then combined to calculate a MTD Index score from pre-1950 to today. No single index exists with this set of indicators that provides the scaling and longitudinal framework necessary to assess America's strive towards prosperity and equality for all. The MTD Index assigns objective measures and sets a baseline from which to measure progress toward equality for African Americans and other populations in the changing demographics of U.S. society. The project aims to educate leaders to fully understand the nexus between the legacy of racism and the continuation of gaps in wealth, education, criminal justice, and quality of life between White and Black Americans. This poster will describe the importance of a national equity measurement, the process to select indicators, the challenges of historical data, and construction of the MTD Index.

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Key Words: composite index, equity, social justice, racism, inequality

## **ANALYSIS OF SPATIAL PATTERNS AND CHARACTERISTICS OF THE ELDERLY POPULATION USING BIG DATA**

Abstract ID: 912

Poster

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There is a rapid increase of elderly population in South Korea. The country had already entered an aged society and is on the verge of entering a super-aged society. To prepare for this aged society, different policy measures at the city and national level are required. To do so, it is necessary to understand the region characteristics where the policy will be introduced, and consider the elderly population's changing activity levels due to various reasons such as longer life expectancy and their desire to participate in social activity. However, not many studies exist on the activity of the elderly population in terms of space, and the existing studies on spatial pattern analysis of the elderly population assumes that the activities of the elderly are centered around the residential area, especially on the neighborhood living area. Consequently, most studies focus on elements of neighborhood living amenities or use population statistics based on resident registration of residential areas.

In contrast, this study utilizes the current population (service population statistics) big data provided by mobile telecom service carriers to examine the activities of the elderly population and by visualizing the spatial patterns by age and time of the day. By doing so, this study aims to examine the regional characteristics that make up these patterns. The study was conducted in Seoul from November 2018 to April 2019, when the big data was secured for the average per-hour current population.

The analysis was carried out in two steps. First, the daytime and nighttime intervals were divided based on the distribution of the current population by time, then the spatial distribution pattern by age group during the day and night was examined through a cluster analysis based on ArcGIS. The aim of this study is to reveal that there is a significant difference in activity patterns between the elderly in their 70s and older, and people in their teens to people in their 60s in the above process, then to focus on the activities of the aged population by comparatively examining the spatial patterns of the aged and the non-aged populations. To explain the form of the aged and non-aged population clusters during the day and night times more effectively, the space was classified into four types (living area, external activity centered area, commuter town area, and underpopulated area).

Second, a multinomial logistic regression analysis was performed by selecting variables showing regional characteristics to examine these characteristics by cluster type. As variables, land use characteristics, social characteristics, economic characteristics, living infrastructure characteristics, and accessibility were considered and to determine how each variable affected the aged and non-aged populations. Therefore, there were differences in the characteristic variables that significantly affect each type, and it was found that the cluster type of the aged population was largely influenced by the living infrastructure. In addition, even though they are of the same type, it was found that the characteristics of the aged and non-aged populations were different.

The aim this study was to examine the spatial patterns of the elderly population and the factors that influence these patterns through comparison with those of the non-aged population. Unlike in the past, the patterns continue to change according to the specific age range of the aging population. This study classifies the patterns by age and time and explains them in terms of cluster type and characteristic variables. As part of preparing for the aged society, more studies on the elderly population by spatial unit and discussion on pattern changes are needed, and based on these basic data, gradual changes in spatial policies for the elderly population can be expected.

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Key Words: elderly population, big data, spatial analysis, regional characteristics

# Track 3 – Economic Development

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### **3.49 PRE-ORGANIZED SESSION - PROMOTING SOCIAL EQUITY WITH ECONOMIC DEVELOPMENT PRACTICE 1**

Pre-Organized Session 49 - Summary

Session Includes 225, 226, 227, 228

GREEN, Jamaal [University of Pennsylvania] jamaalg@upenn.edu, organizer

This session will focus upon a variety of issues in economic development with an explicit focus on how they address, or not, ongoing issues of social inequity. The past year has shown in stark relief how the racialized and gendered aspects of our labor market disproportionately expose groups to exploitation and danger. Combine this realization with the latest iteration of the Black Lives Matter protests and it is clear that the role of the labor market and local development in encouraging, or inhibiting, social inequality is of immediate and vital concern. This session will explore different ways that economic development, and regional labor market change, are implicated in reproducing inequity and also hold the potential to attack systemized inequality.

Objectives:

- Explore explicit links between social inequity and economic development theory and policy

### **GEARING UP: ADVANCING ECONOMIC INCLUSION THROUGH MANUFACTURING EXTENSION**

Abstract ID: 225

Abstract within Pre-Organized Session 49

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In Northeast Ohio a local manufacturing extension provider promotes racial equity through an early career pre-apprenticeship program, working with inner-city, public high schools to help youth of color gain access to promising manufacturing careers. Last year, this same extension provider joined a national learning initiative to build capacity to engage communities of color in support of equitable manufacturing employment growth. Roughly 300 miles away in Illinois, another manufacturing extension provider is 7 years in to an equally-transformative process called the Genesis Movement. Piloted in 2014 in the Chicagoland region, Genesis starts with the premise that workforce practices are central to business operations, productivity and competitiveness and therefore manufacturing extension services need to promote improvements to job quality in support of long-term business success.

We raise these illustrative examples to demonstrate what is possible when you layer goals of economic inclusion onto a robust and far-reaching industrial extension system. Both these Illinois and Ohio-based extension providers are part of this nation's federally-funded Manufacturing Extension Partnership—a national network of 51 centers (375 field offices) that employ over 1,400 specialists who provide business and technical assistance to small- and medium-sized (SME) manufacturers. In 2019, this national MEP network interacted with more than 28,000 SME manufacturers, generating billions of dollars in cost savings and new and retained product sales, also creating and retaining 114,000 U.S. manufacturing jobs.

U.S. manufacturing extension offers a proven institutional platform for boosting firm performance, with room to also strengthen support family-sustaining, opportunity-rich jobs, particularly for entry-level workers and workers of

color. But while manufacturing extension, as a revered business-facing institution, may offer a promising channel for improving worker livelihood, it is unclear the degree to which individual MEP centers use their on-going engagement with smaller-sized manufacturers to influence inclusive employment strategies and decisions. Are the examples from Illinois and Ohio exceptions to the norm or are they suggestive of a broader shift to institutionalizing similar actions across the MEP network? How, if at all, have the dual crises of the COVID-19 pandemic and systemic racism amplified (or stalled) this strategic direction? And what institutional barriers or resource constraints might stand in the way of continued progress?

This paper will answer these questions by examining the conditions under which manufacturing extension centers promote better quality, more inclusive employment opportunities as they serve and support SME manufacturing businesses. We will draw on a mix of quantitative (administrative data from the NIST-MEP office) and qualitative data sources to examine the extent to which economic inclusion gets institutionalized through manufacturing extension. We present cases studies that examine how MEPs extend workforce assistance to their manufacturing clients, also exploring the extent to which that support extends down the organizational hierarchy and outwards into the surrounding community, reaching historically excluded populations in the process.

We hope to illuminate examples where that support is potentially farther-reaching and transformational, in turn providing a resource for guiding MEP decision-making both now and throughout the post-pandemic economic recovery. Additionally, by capturing a variety of MEP strategies and institutional partnerships that may support economic inclusion, this research will provide baseline information for assessing the economic gains for individual workers and their manufacturing employers.

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Key Words: manufacturing extension, economic inclusion

#### **DO INDUSTRIAL ZONES SUPPORT QUALITY JOBS AND A DIVERSE BUSINESS MIX COMPARED TO OTHER TARGETED EMPLOYMENT AREAS?**

Abstract ID: 226

Abstract within Pre-Organized Session 49

GRODACH, Carl [Monash University] carl.grodach@monash.edu, presenting author

Planners in strong market cities have rezoned a significant proportion of inner and middle suburban industrial land for higher value residential and mixed-use development. Alongside this, cities have designated new "innovation districts" and other areas intended to concentrate and grow knowledge economy jobs and advanced services. These trends combine to reinforce a long-standing shift towards a bifurcated and polarized economy consisting of highly skilled professional service jobs and often minority and immigrant labor funneled into lower wage services

industries. Further, under Covid-19, those working in consumer service jobs that are unable to be performed at home are increasingly vulnerable. This culmination of trends points toward the need for equity over growth-oriented economic development.

Researchers argue that manufacturing and industrial lands provide a route toward more sustainable and equitable economic development (Chapple, 2015; Leigh and Hoezel, 2012). However, while urban industrial policy in some cities recognizes the equity opportunities of manufacturing and industrial lands, this often does not translate into actual plan implementation. Additionally, many places continue to work from an outdated vision of industrial land that has not kept pace with changes in manufacturing (Grodach and Gibson, 2019).

Do industrial zones support quality jobs and a diverse business mix compared to other targeted employment areas? This paper seeks to provide an evidence base to support urban industrial planning and contribute empirical research on the equity roles of industrial lands. We examine if and how industrial zones in Greater Melbourne and Sydney, Australia support a mix of jobs and industry clusters and compare this to other designated employment areas in each city. We selected these cities because they contain the highest shares of industrial employment in the country as well as highly competitive property markets where the pressure for industrial rezonings is greatest. Analysis includes GIS mapping of job density and diversity based on employment/population ratio (EPR) and kernel density measures. We also analyze income, industry, and occupational mix across the employment areas. We find that industrial zones are more likely to provide a diverse employment and income base compared to other employment areas. This evidence base can equip planners to better consider a balanced employment mix in their land use planning efforts

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Key Words: economic development, employment, industrial policy, manufacturing, zoning

#### **HAVE WE BEEN HERE BEFORE? MANUFACTURING RETENTION AND PROSPECTS FOR EQUITABLE DEVELOPMENT IN DETROIT**

Abstract ID: 227

Abstract within Pre-Organized Session 49

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What possibilities are available for practitioners to reform or renew entrenched economic development institutions towards normative principles of social equity? From the 1950s through the 1990s, the City of Detroit pursued an economic development strategy of “industrial urban renewal” to retain and upgrade its automotive manufacturing base through a combination of land assembly and incentive policies. Against an expensive and decades-long record of failure to mitigate job loss and disinvestment, the sustained application of this approach led to claims that local politicians and practitioners had succumbed to institutional path dependency and “policy lock-in” (Thomas 1990, Jones and Bachelor 1993). To the extent that there has been a strategic reorientation away from heavy industry and towards the downtown real estate and professional services sectors in the 21<sup>st</sup> Century, this process has deepened racial and spatial inequalities, as it has generated more jobs for suburbanites than Detroiters and failed to direct significant income or investments to neighborhoods outside the urban core (Reese et al 2017). Since 2018, however, state and local agencies have touted a new round of large industrial projects in the city, justifying the extension of



public support on claims that they will bring growth with equity. In what ways, if any, do contemporary economic development projects replicate or deviate from the shortcomings of earlier deals? How, and to what extent, do they address development disparities in Detroit?

This paper addresses these questions through an extended, comparative case study of economic development projects related to two automotive complexes in Detroit, owned by GM and Chrysler (now part of the Stellantis joint venture), at two periods of time, the late 20<sup>th</sup> Century and the present day. In the 1980s and 1990s, both firms constructed facilities on or near the sites of obsolescent plants – retention projects which were heavily subsidized by fiscal incentives and aggressive land assembly actions. Again, in 2019, both firms received state and local support in exchange for new investments at these same locations. Drawing on archival documents, secondary literature and interviews, I examine three aspects of the retention deals during both periods: the public policies applied, incentive negotiations among various public agencies and the automakers, and the public and private actions and collaborations that implement the deals. My analytic approach builds on research by Lowe and Feldman (2018) and Pike et al (2007), among others, who draw attention to how practitioners develop and institutionalize collaborations across apparently unconnected policy realms to resolve strategic or normative tensions. Here, I consider possibilities for resolving material and political tensions related to the distribution of benefits and burdens from industrial development.

Variations in the projects across sites and over time indicate a meaningful break with late-20<sup>th</sup> Century practice. Fiscal incentives and, in the FCA case, land assembly remain the controversial fulcrums of public-private negotiations. Yet in different ways, the recent deals incorporate stronger performance requirements, and policy insiders have leveraged these to develop local hiring pathways and mechanisms that mitigate negative externalities in surrounding neighborhoods, among other institutional elements, which were absent from earlier efforts. In doing so, they draw in labor market intermediaries and community development organizations as collaborators in the implementation processes.

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Key Words: Detroit, equity, institutions, industry, local hire

#### THE GEOGRAPHY OF WAGE THEFT ENFORCEMENT- INDUSTRIAL STRUCTURE AND WORKFORCE COMPOSITION

Abstract ID: 228

Abstract within Pre-Organized Session 49

GREEN, Jamaal [University of Pennsylvania] jamaalg@upenn.edu, presenting author

By some estimates, employers steal upwards of \$15 billion a year from workers (Cooper and Kroeger 2017). Of that \$15 billion that vast majority of stolen wages are taken from predominately low wage service industry workers, particularly retail and food service workers. Research on wage theft is highly varied, ranging from national studies using Current Population Survey data to specialized survey projects focusing on low wage immigrant workers in a

sample of large cities (Bernhardt, Spiller, and Theodore 2013; Cooper and Kroeger 2017). Additional recent research has examined the rise of community-labor coalitions' roles in passing stricter wage theft enforcement at the state level (Doussard and Gamal 2015).

These studies are principally concerned with estimating the incidence or prevalence of wage theft and the politics of labor standards enforcement. While these studies offer essential information on wage theft patterns and enforcement they are generally limited by their geographic and industrial scope. This study takes a different tact in tracking the geography of wage theft enforcement decisions at the federal level in order to gain a better understanding of the prevalence of wage theft and the role that local industrial structure and workforce composition plays in wage theft.

This descriptive analysis makes use of the Department of Labor's Fair Labor Standards Act enforcement data combined with the Quarterly Workforce Indicators from the Census to match wage theft enforcement decisions down to the county-industry level for the US, as a whole. I find that wage theft enforcement awards are concentrated in primarily low wage industries, but also in industries that make extensive use of subcontracting, such as construction work. In order to explore the role of local industrial structure and workforce composition, I present regression model results of the role that industry concentration, as represented by location quotient, plays in backwages awarded compared to the concentration of Black and Hispanic workers in particular county-industry pairs. Preliminary results show that both workforce composition and industrial structure matter with respect to wage theft enforcement.

The tens of billions of dollars a year stolen from primarily low wage, non-white workers represent a massive transfer of income that is generally invisible and matters for questions concerning income inequality as well as the health of local labor markets. Economic development planners concerned with helping high opportunity economies grow should be more aware of the risks that vulnerable workers face that limit not only their own work respects, but regional economies as a whole.

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Key Words: Regional Inequality, Labor Standards

### 3.66 PRE-ORGANIZED SESSION - PROMOTING SOCIAL EQUITY WITH ECONOMIC DEVELOPMENT PRACTICE 2

Pre-Organized Session 66 - Summary

Session Includes 298, 299, 300, 301, 302

GREEN, Jamaal [University of Pennsylvania] [jamaalg@upenn.edu](mailto:jamaalg@upenn.edu), organizer

This session will focus upon a variety of issues in economic development with an explicit focus on how they address, or not, ongoing issues of social inequity. The past year has shown in stark relief how the racialized and gendered aspects of our labor market disproportionately expose groups to exploitation and danger. Combine this realization with the latest iteration of the Black Lives Matter protests and it is clear that the role of the labor market and local development in encouraging, or inhibiting, social inequality is of immediate and vital concern. This session will

explore different ways that economic development, and regional labor market change, are implicated in reproducing inequity and also hold the potential to attack systemized inequality.

Objectives:

- Explore explicit links between social inequity and economic development theory and policy

## **BIFURCATED ROADS: EQUITABLE ECONOMIC DEVELOPMENT STRATEGIES ACROSS GEOGRAPHY**

Abstract ID: 298

Abstract within Pre-Organized Session 66

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Different regions have adopted various types of economic development strategies. Economic development researchers have developed various typologies to describe these strategies. The most prominent typology classifies development strategies into three “waves” (Bradshaw & Blakely, 1999). The first wave begins in about the 1850s, focuses on Eisinger’s supply-side strategies, and offers tax abatements, subsidies, and low-cost land to attract footloose firms to locate in a jurisdiction (Hanley & Douglass, 2014). The second wave emerges in the 1980s, focusing on investment and entrepreneurial policies that foster innovation, nurture new businesses, breed high-technology industries, and promote local businesses (Hanley & Douglass, 2014). The third wave, starting in the 1990s, gears toward enhancing the local context for economic development instead of a particular firm’s needs, such as enhancing regional competitiveness and promoting industrial clusters (Bradshaw & Blakely, 1999).

However, recent studies have found that the “waves” typology does not truly represent how jurisdictions put their strategies together. Instead, jurisdictions bundle different strategies to form a managed portfolio (Lowe & Feldman, 2018). Moreover, some suggested that there might be a fourth wave of development strategies dealing with issues such as sustainability and social inequity (Stokan, Deslatte, & Hatch, 2020; Liao et al., 2020). A few questions emerge from these recent discussions. What is the most recent “wave” of economic development strategies really about? Is there even a fourth wave? If yes, which jurisdictions adopted it? Does the “waves” typology hold or are jurisdictions more likely to mix different waves of strategies? Which waves are mixed with the fourth wave of equitable and sustainable planning?

To answer these questions, I collected 376 most updated Comprehensive Economic Development Strategies (CEDS) from Economic Development Districts all over the nation and adopted a Latent Dirichlet Allocation topic modeling technique to identify clusters of keywords. This results in a data-driven typology of development strategies. Moreover, this approach allows a quantification of how many texts each development strategy and each wave of strategies accounts for. Thus, it can empirically answer the question of whether the fourth wave of strategies focusing on social equity and environmental sustainability is prevalent across local jurisdictions, and which jurisdictions adopted it. In addition, the mixing of strategy portfolios can also be quantified for each jurisdiction, and we, therefore, can identify which jurisdictions adopted equitable and sustainable strategies, and what other strategies they have mixed in their portfolio.

This study delivers a new data-driven typology of economic development strategies. For researchers, this empirically verifies the “waves” typology, whether the fourth wave exists, and how jurisdictions are mixing their strategies, and thus help settle the theoretical debates about strategy typologies. For practitioners, a quantification of local strategy portfolio can yield insights on the appropriate coupling of different strategies, especially what works well with equitable and sustainable strategies. As a result, it can help economic development planners design a more compatible and complementary package of strategies for their communities.

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Key Words: Economic development strategy, Social equity, Waves typology, Text mining

### **SPOTTING THE HUMAN DEVELOPMENT WAVE: WHICH CITIES ARE INVESTING IN PEOPLE?**

Abstract ID: 299

Abstract within Pre-Organized Session 66

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The idea of human development increasingly displaces the flawed metaphor of human capital in economic development. In doing so, it expands the scope of economic development in a way to value the creation and expansion of human capabilities. This leads to a concurrent practical shift to policies and strategies focused on public health, security, and amenities available to all, including individuals who rarely appear in human capital thinking. Our paper documents this shift in practice and evaluates the uneven adoption of human development approaches across U.S. urban regions.

We first document the shift towards human development in economic thought and as a response to expanding social and economic inequalities. We then analyze evidence on the roll-out of equity-focused policies across U.S. cities and states. This analysis shows that equity-oriented economic development practice has been emerging in local jurisdictions, and recent policy changes are evidence of the emergence of a human development wave of economic development. Free community college, college promise programs, universal pre-kindergarten pilot programs, basic income pilot programs, chief equity officers within city departments, fair scheduling ordinances, earned sick time legislation, free or reduced-cost child and elder care, and housing trust funds are diffusing across U.S. cities and states since the 2010s. For example, Stockton, California and Jackson, Mississippi have authorized Basic Income Pilot Programs; New York City, San Francisco, Seattle and many other cities have mandated fair work schedules and introduced earned sick time legislation; Vermont, Florida, and District of Columbia have initiated universal pre-K programs.

Our analysis replaces normative arguments in favor of human development theory with practical questions of how, where and how far human development programs operate. We find that most human development policies are implemented in large cities with more resources and large, diversified economies. These cities are taking the lead in introducing pilot programs and the promotion of social equity policies. However, fostering equity-oriented economic development efforts without institutional change risks the possibility of a more balanced distribution and diffusion of progressive and redistributive development policies. The turn is already uneven, and we argue that this has the potential to be the source of a new round of uneven development, where diversified and competitive economies have more leverage to make investments in people and households.

The paper concludes by highlighting the need for thinking of this wave as a potentially transformative moment, a project that focuses on the transformative power of cities to address economic and racial disparities rather than

narrow fixes to major challenges. Otherwise we will continue to see a trend similar to what Stokan, Deslatte, & Hatch (2020) have already found evidence of: Places that face less competitive pressure and have more resources and intergovernmental connections will be more likely to embrace and yield the benefits of equity-enhancing development strategies.

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Key Words: Human development, Social equity, Economic development policies

### **UNDERSTANDING LOCAL AND REGIONAL EFFORTS TO ADVANCE INCLUSIVE ECONOMIC RECOVERY**

Abstract ID: 300

Abstract within Pre-Organized Session 66

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The economic and social upheavals of 2020 have led many local and regional development organizations and governments to rapidly shape their strategies and plans to drive future economic recovery (Dzigbede, et al. 2020). In the majority of cases, inclusive or equitable recovery is one of their stated values or goals. However, there does not yet exist a common understanding or shared consensus around the meaning of inclusion, nor of the strategies and actions that might best advance inclusion in the context of local and regional economic development and recovery (Schmitt, et al, 2020). To fill this gap and extend our collective knowledge, our research seeks to answer two main questions: 1) How are concerns for inclusive economic recovery exhibited in local and regional recovery planning processes? 2) What are the strategies being deployed to promote inclusive recovery? Our research incorporates preliminary findings from a comprehensive survey of economic development and planning organizations in Virginia and Maryland as these entities initiate and work through their economic recovery planning processes, allowing us to identify common themes and differences as well as possible opportunities for knowledge generation and dissemination pertaining to inclusive economic recovery.

In 2016, the Rockefeller Foundation defined an inclusive economy as "one in which there is expanded opportunity for more broadly shared prosperity especially for those facing the greatest barriers to advancing their well-being" (Pacetti, 2016). The Foundation identified five inter-related characteristics of an inclusive economy and proposed associated indicators for each: participation, equity, growth, sustainability, and stability. Researchers with the Brookings Metropolitan Policy Program then worked with the Rockefeller Foundation to develop and employ this framework in their own work on measuring inclusive urban economies (Berube & Irons, 2016). Practitioners have simultaneously explored the idea of inclusive economies, though the concept has been deployed in fairly disparate contexts with little clarity or commonality in terms of meanings and implications. We observe that the fuzziness of this concept is particularly widespread and pronounced in the case of economic recovery plans, especially in the United States at the sub-national level.

For some entities, inclusive economic development means increasing the diversity of board members or diversifying

the types of industry present in a region. Both of these may indeed be worthy and relate to components of inclusive economic development, but in light of recent events they seem insufficient, especially when we consider the extent to which communities and neighborhoods with heavier concentrations of minority residents have been disproportionately impacted by the COVID-19 pandemic coupled with a long-standing racial wealth gap and institutionalized racism (Noel, et al 2019).

Data collected through our survey of Virginia and Maryland regional planning and economic development organizations shed light on the extent to which their planning processes incorporate concerns for – and define the term – inclusive economic recovery, as well as the strategies they plan to use to promote inclusive recovery. Though some common characteristics were identified, the results demonstrate widespread differences seen in both the extent to which inclusivity is prioritized as well as the ways in which it is conceived of in recovery plans across the two states and amongst the local and regional entities. The findings suggest the need for further dialogue about how inclusivity is defined and how it can best translate into actionable strategies. We conclude that while many economic development organizations are signaling a commitment to inclusivity, albeit in assorted ways, time will tell whether they are able to transcend mere signaling in order to enact lasting change.

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Key Words: economic development, economic recovery, inclusive recovery

### **BUILDING AN INCLUSIVE ECOSYSTEM FOR WOMEN AND MINORITY ENTREPRENEURS: A CASE OF COLUMBUS CITY GOVERNMENT, OHIO**

Abstract ID: 301

Abstract within Pre-Organized Session 66

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There has been an overwhelming empirical evidence that women and minority entrepreneurs underperform in entrepreneurship compared to men and Caucasian counterparts (Coleman and Robb 2012; Bradford 2014; Harper-Anderson 2019). It is one challenge to analyze structural causes for this disparity, which scholars are only beginning to understand (Sperber and Linder 2019; Motoyama et al. 2021). It is another and even larger challenge to build knowledge about how we can reduce such disparity. In this paper, we will analyze a case study of Columbus, Ohio, in which the City Government created the Small Business Assessment Committee with a specific aim to improve the ecosystem inclusive of women and minority entrepreneurs in January 2019. We will start with a descriptive analysis of the Committee's agenda, discussions, and recommendations for the city government. Those recommendations fruited as city's Small Business Agenda announced by Mayor Ginther in December 2019. The Agenda set four goals and established two positions of “ecosystem builders” in order to accelerate the local connectivity for women and minority entrepreneurs. The Committee's work continued in 2020 despite the pandemic and further advanced to

track the progress of city's works and regional ecosystem based on surveys, private data, and other publicly available data. We will extract key strategies, tactics, and lessons learned from this experiment and provide policy implications.

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Key Words: Entrepreneurship, Local systems, Women, Minority, Local government

#### WHAT DRIVES EQUITABLE ECONOMIC DEVELOPMENT: AN ANALYSIS OF LOCAL GOVERNMENTS

Abstract ID: 302

Abstract within Pre-Organized Session 66

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Local governments must balance economic growth against the competing goals of social or racial equity, quality of life and ecological preservation. Yet, it is understood that they clearly prioritize economic growth (Peterson, 1981; 1995; Stone, 1989; Wolman and Spitzley, 1996) and utilize a broad range of policy instruments to that end (Reese, 1993; Rubin, 1988; Rubin and Rubin, 1987; Stokan, 2013; Zheng and Warner, 2010). Yet, what drives local governments toward greater commitments to social equity at the expense of economic growth is less certain and has garnered less research attention. Despite the field of public administration recognizing social equity as an equal pillar, on par with economic growth and efficiency, for more than 50 years (Frederickson, 2005) cities and administrators have struggled to properly balance these goals.

The fungibility of resource allocations and capabilities away from economic growth toward sustainability (Deslatte and Stokan, 2017, 2020) and social equity (Stokan, Deslatte, and Hatch, 2020) is possible; however, research demonstrates that doing so necessitates lowering resource dependencies on external environmental controls to overcome path dependence and "lock in" effects. Resource Dependence Theory has been shown, cross-sectionally and longitudinally, to explain greater commitments toward sustainability and equity over economic growth (Deslatte and Stokan, 2017; 2020; Stokan and Deslatte, 2020; Stokan, Deslatte, and Hatch, 2020); however, this theory has neither been causally tested nor have competing theories been fully dismissed. To address this gap, this paper uses changes in guaranteed federal resources, which trigger changes in RDT, as governments become "entitled" to CDBG funds. Thus, when municipal governments cross the 50,000 population threshold (increasing RDT), or conversely drop below 50,000 (decreasing RDT), they can reallocate resources in a way that prioritizes growth or equity.

With a newly created dataset of HUD CDBG expenditures aggregated to the municipal level matched to the International City/County Management Association (ICMA) economic development surveys, and Lincoln Institute's Fiscally Standardized City Database we ask whether an increase (decrease) in RDT leads governments to prioritize social equity (economic growth) using paired difference-in-differences and generalized synthetic control methods. To root out other competing causal explanations for such prioritization, we account for institutional form, policy

learning and diffusion, changes in citizen demand and ideology, and changes in the levels of community need. Supplementing the quantitative analyses with 10 case studies of cities that crossed the 50,000 population threshold, we explore the causal mechanisms leading governments to prioritize social equity.

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Key Words: Local Economic Development, Social Equity, Local Government

### 3.79 PRE-ORGANIZED SESSION - PLANNING TO STRENGTHENING ECONOMIC DEVELOPMENT ASSETS

Pre-Organized Session 79 - Summary

Session Includes 378, 379, 380

HILL, Edward [The Ohio State University] hill.1973@osu.edu, organizer

Three papers are presented that examine efforts to build community-based economic development assets: philanthropic grant making in community development, regional sector-led workforce development, and Main Street programs in rural downtowns. Ned Hill's workforce paper posits that a region's workforce is a common pool resource hypothesizing that those that are successful share the governance characteristics of common pool resources developed by Elinor Ostrom. Observations are made on sector-led efforts both nationally and in Ohio. Andrew Van Leuven presents an overview of downtown revitalization as a place-making and economic development strategy in non-metropolitan communities. The third paper is an in-depth examination of shifts in community development grant making by philanthropic foundations. Jeelson Oh investigates efforts to promulgate a model of urban development by an influential national philanthropic network, Living Cities, offering insights into shifting approaches to urban (re)development by prominent foundations.

#### Objectives:

- Strengthening community development assets
- Governance of regional and community development
- Evaluation to inform practice

### GOVERNING SECTOR-LED REGIONAL WORKFORCE TRAINING USING ELINOR OSTROM'S RULES FOR GOVERNING THE COMMONS

Abstract ID: 378

Abstract within Pre-Organized Session 79

HILL, Edward [Ohio State University] Hill.1973@osu.edu, presenting author



## Research Question

Workforce training has changed in three ways over the past several years: the customer's identity transformed; control over the training curriculum shifted; the definition of the service territory expanded from political geography to economic geography.

First, the identification of the products of workforce training programs has changed fundamentally. Previously public policy, and possibly the public, thought of students as the customers of education and training providers. In this model, students disciplined the workforce system by voting with their feet and finances. The evolving model depicts the graduates of training programs as the product or output and employers as the customers.

Second, with the change in public policy's conceptualization of students as customers to products and depicting employers as the customers, power over content has shifted from education and training providers to sector-led intermediaries. This shift results in a move away from community college and vocational school degrees and certificates to industry-recognized credentials. One of the purported benefits of transparent standardization is lower search costs by employers.

Third, the geography of service provision is shifting away from political geographies of municipalities and counties toward economic geographies of labor markets.

What has not changed is the dominant source of funding of workforce training—it is a mixture of federal and state funds supplemented, at times, with student tuition payments and debt. Public financial support, the change in geography, and private demand for the product (trained workers) imply that new governance models are required. This research explores this question after offering a provocative hypothesis.

Hiring a worker is both excludable and rival, making labor a private good. At the same time, spillover benefits generated from general education and training makes labor a merit good. Declaring labor a merit good results in student-consumers forming the demand side of education markets. Unfortunately, this long-standing metaphor of labor markets breaks down when labor is a product, employers are customers, and positive externalities exist. I offer an alternative hypothesis: labor is a common pool resource, as conceptualized by Elinor Ostrom. The first part of the paper explores this hypothesis and builds out its implications.

If this hypothesis is credible, then Ostrom's guidance on governing the commons offers guidance on how sector-specific regional workforce training programs should be governed and affect program outcomes.

## Approach

### Literature review

A review of the professional and academic literature on sector specific workforce training will be undertaken with an emphasis on the manufacturing and the health care sectors. Guidance on demonstrated best practices and best bets will be recorded. These programs will be examined to identify their conceptualization of the customer and the product. We will also identify funding sources, geography, industry-specificity, and governance. The governance principles used in those programs will be examined to determine how they correspond to Ostrom's guidance.

### Examination of Ohio's Workforce Programs

The author has access to the manufacturing sector-led partnerships in the state of Ohio and the office that funds these programs, Innovate Ohio. An inventory of sector-led workforce training programs will be undertaken and data on program structure, funding, governance, purpose, and the issue of product will be collected. Effort will be made to collect data on manufacturing, health care, and software training programs.

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Key Words: economic development, workforce development, governance

# **FROM NEIGHBORHOOD PLANNING TO URBAN INNOVATION? UNDERSTANDING SHIFTS IN PHILANTHROPIC FOUNDATIONS' ENGAGEMENT IN URBAN DEVELOPMENT THROUGH A PROMINENT FOUNDATION NETWORK, LIVING CITIES**

Abstract ID: 379

Abstract within Pre-Organized Session 79

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This paper investigates efforts to promulgate a model of urban development by an influential national philanthropic network, Living Cities, offering insights into shifting approaches to urban (re)development by prominent foundations. A number of prominent foundations have inspired different models of urban development from neighborhood planning to Comprehensive Community Initiatives. Additionally, a subset of large foundations have been critical to the births and growth of Community Development Corporations and national community development initiatives such as the Local Initiatives Support Corporation (LISC) and the Enterprise Community Partners. Much of the support to these place-based community development organizations has been through funding and technical assistance and focused on neighborhood-scale projects such as affordable housing (Rohe 2009).

In the recent decade, however, a growing number of large foundations have shifted away from merely providing resources for community development organizations. These foundations seek to act as change agents themselves, advancing major planning initiatives or directly engaging in the development and implementation of urban agendas (e.g. Detroit Future City Strategic Framework, Bloomberg Philanthropies' American Cities, Rockefeller Foundation's 100 Resilient Cities). Using Living Cities' signature urban development model, The Integration Initiative (TII), as a case study and the concept of sociotechnical vanguards (Hilgartner 2015) as a theoretical framework, this paper analyzes discourse and practice of this prominent network of national foundations. The guiding research question is how can planners and policy-makers make sense of the shifts in large foundations' practice in urban development from a broader perspective on the work of Living Cities?

Drawing upon mixed methods that combine grant data analysis, discourse and document analysis, and semi-structured interviews with foundation officers and members from relevant organizations, this paper systematically compares Living Cities' discourse and funding activities with those of four longtime members of Living Cities—the Annie E. Casey, the Kresge, the Ford, and the Surdna Foundation. The objective is to examine why and how the network and the participating institutions co-produce discourse and actions. This study then investigates TII in Cleveland, Baltimore, and Detroit to assess the interconnectedness between foundation practice at the local level and Living Cities' model of urban development.

The findings are threefold. First, substantive interconnections exist among discourse and practice of Living Cities and the four member foundations, suggesting process within the network in which organizational interests are negotiated, amplified, or redefined, and manifested in discourse and practice. Secondly, this internal negotiation process has led to the development of two streams of discourse that Living Cities has used to expand its operational boundary and to project its prominence as a pioneer in creating visions for the future of American Cities: innovation and collective action. Lastly, Living Cities' collective action framework employed throughout TII model has galvanized a prevalent use of 'foundation collaborative' in the broader foundation practice. On the other hand, the very top-down nature of TII model created tension between the network and participating local institutions

including place-based foundations.

This paper seeks to contribute to the planning scholarship and practice. While social scientists have theorized, using policy entrepreneur or advocacy coalition theory, how foundations promulgate and advance policy reform agendas through networks (Reckhow and Tompkins-Stange 2018), much of the planning literature focuses on case studies that examine individual foundations within specific local contexts (Berglund 2020; Lowe and Grengs 2020). Applying a sociotechnical vanguards framework to the analysis of this national foundation network, this study contributes to conceptualizing the broader shifts taking place in philanthropic foundations. The paper also contributes to planning practice by shedding light on the directions prominent foundations are heading in as they assume increasingly direct roles in urban planning and development.

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Key Words: economic development, philanthropy, foundations, urban development, urban innovation

#### LESSONS FROM MAIN STREET: TRIANGULATING THE IMPACT OF DOWNTOWN REVITALIZATION EFFORTS IN THE RURAL MIDWEST

Abstract ID: 380

Abstract within Pre-Organized Session 79

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What does it take to revitalize a small-town central business district? How should we measure "success" when evaluating downtown revitalization efforts? Do revitalization programs lead to spillover benefits for the community? In this paper, I answer these questions by reviewing evidence from two recent econometric studies which focus on the long-term effects of the "Main Street Program" as a widely adopted downtown revitalization strategy in the rural Midwest. The first study used difference-in-differences analysis to identify the causal impact of Main Street Program adoption on job and business establishment growth in rural communities throughout Iowa, Michigan, Ohio, and Wisconsin. The second study used hedonic price analysis to estimate the relationship between downtown proximity and home sale prices in Ohio small towns with an active Main Street Program. I begin the paper by providing an overview of downtown revitalization as a place-making and economic development strategy in non-metropolitan communities. Next, using the data and findings from both econometric studies as a backdrop, I discuss the challenges associated with operationalizing "economic vitality" in evaluating the long-term impact of downtown revitalization efforts such as the Main Street Program. I conclude with a discussion of two overarching observations from my research. First, local context matters: regional differences in implementation may bring about pronounced disparities in estimated impact. Second, even when the impacts of downtown revitalization efforts are modest, such efforts can successfully elevate the *relative* position of small-town business districts within their larger regional housing and labor markets.

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Key Words: downtown, revitalization, rural, economic development, place-making

### 3.101 PRE-ORGANIZED SESSION - REPOSITIONING ARTS AND CULTURE IN PLANNING

Pre-Organized Session 101 - Summary

Session Includes 738, 739, 740, 741

ASHLEY, Amanda [Boise State University] amandaashley@boisestate.edu, organizer

Arts and culture is a growing subfield in planning scholarship and practice. Important instrumental research has sketched out the arts as industry (Currid 2008), the artist as a worker (Markusen and Schrock 2006), the arts as spectacle (Eisinger 2000), the arts as a placemaker (Zitcer 2020), the arts as community developer (Grodach 2010), and the arts as a force for protest (Ashley 2018). These valuable studies help us understand the role of arts and culture in our cities, but there is limited information in the U.S. about how arts and culture may influence planning policy and practice. This session connects to the art and science of planning (Birch 1980) through diverse collaborations that draw on distinct methodologies and approaches. The session includes several multi-city studies that deepen knowledge on how planners can support artist workforce development, how public universities perform as arts and cultural planners, how diversity, equity, and inclusion is addressed in arts and cultural plans, and how culture influences the way planning can be done. This session considers how arts and culture can shape planning through formal and informal channels.

Objectives:

- To learn about connections between arts and culture and planning that affect practice and scholarship

### OUR DIVERSITY IS OUR STRENGTH: EXPLAINING VARIATION IN DIVERSITY, EQUITY, AND INCLUSION EMPHASIS IN MUNICIPAL ARTS AND CULTURAL PLANS

Abstract ID: 738

Abstract within Pre-Organized Session 101

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Arts and cultural investment is an increasingly widespread economic development strategy, often guided by municipal arts and cultural plans, yet these plans often do not involve planners or contain the types of fact bases and commitments to equity that comprehensive plans do. In this study of 64 US municipal arts and cultural plans,

we investigated what kinds of places are producing arts and cultural plans that do a better job integrating concepts of diversity, equity, and inclusion, and what factors can explain these differences. We found that newer plans with more robust public processes more strongly emphasized most aspects of DEI, while more diverse and older cities' plans more strongly emphasized some aspects of DEI. Plans were much more willing to talk about diversity and inclusion than the specifics of equitable distribution of arts and cultural resources. Planners need to ensure that planning processes for arts and cultural plans meet the same standards we expect for comprehensive plans. They must be based on inclusive processes, able to understand the range of diversity of people in the city, and do the hard work of thinking about what a truly equitable distribution of arts and cultural resources would look like.

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Key Words: Diversity, equity, inclusion, arts, culture

#### LOCATING ARTISTS IN THE CREATIVE ECONOMY: RESULTS FROM A 3-CITY SURVEY

Abstract ID: 739

Abstract within Pre-Organized Session 101

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Arts and culture has long been on the urban agenda, viewed as a tool for economic growth, a driver of tourism, and an intrinsic good for the local population (Strom 2010). Planners regularly highlight culture as an important driver of quality of life in municipal and neighborhood plans. At the same time, artists themselves often struggle to thrive in the urban political economy, due to low wages, insecure employment, and lack of systemic support for them as a class of workers (Markusen and King 2003). The COVID-19 pandemic was a catastrophe for the arts workforce. The pandemic massively impacted arts and culture, as live performances and public exhibitions were virtually eliminated due to health concerns. Amidst the ongoing severity of the crisis, some artists organized and were able to secure federal, state and local funds to bail out artists and venues (Limbong 2021). Philanthropy also stepped in, making emergency funds available to artists affected by the shuttering of the economy. These actions were nearly unprecedented, given the paltry culture funding available to artists in non-pandemic times compared to peer nations around the developed world (National Endowment for the Arts 2012).

This paper explores the conditions artists face in three cities on the U.S. East Coast (Philadelphia, PA, Baltimore, MD, and Richmond, VA), as well as the effects of the COVID-19 pandemic on their livelihoods. Data are derived from a three-city survey of artists conducted in Spring 2021. This research extends the findings of an earlier pilot project that utilized focus groups in Philadelphia to gain an understanding of artists' living and working conditions, as well as planning and policy interventions that might bolster their collective stability (Teresa and Zitcer 2020). The survey data explores the changing geography of living, working, and exhibition spaces for artists in these cities, as they are impacted by gentrification and neighborhood change. It also explores housing, income, debt and more. Finally, it

asks artists to voice their policy preferences for how planners and policymakers can best support their ongoing ability to thrive in the contemporary city.

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Key Words: arts, culture, public policy, creative class, economic development

#### **CULTURE AS PLANNER AND POLICYMAKER**

Abstract ID: 740

Abstract within Pre-Organized Session 101

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In the past year art and design have reshaped how we navigate the world and our shared priorities as a society. Consider the following examples of culture shaping planning and policy: Urban spaces previously designated for cars have become city-sanctioned as redesigned sidewalk cafes, gathering spaces, and playgrounds amid the COVID-19 pandemic. Calls for racial justice galvanized public spaces through protests, featuring visual artwork through signage and performance through civil disobedience actions as well as at temporary memorials and online recreations. Calls for a renewed WPA model advocate to not just create jobs for artists but make art-led solutions central for social and economic recovery as well as the reconceptualization of our cities, homes, and offices. Each of these examples is a turning point in which art and design influence decisions by demonstrating new ways of supporting resident daily lives and connecting city services with constituents. This is culture for planning and policy in action.

Culture does not rely on governments and planners to ensure its existence, rather culture itself shapes and advances planning agendas. This paper posits culture as a planning and policy tool and not just an industry that needs outside infrastructure to create the context in which it can function, enabling its existence. Building on current research advocating for the expanded impact of art and culture beyond economic metrics alone (Banks, 2018), this paper reviews existing research from urban design, public art, planning, policy, and geography in order to build a theoretical framework for understanding culture for planning and policy. This theoretical framework is grounded in examples of culture for planning and policy in action such as: participatory planning for urban development; artists embedded in government functions such as transportation and public health (Lithgow & Wall, 2017); cooperative social movement practices in shaping the built environment (Wilson, 2018); and advocacy for universal design, disability, and access (Hamraie, 2017).

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Key Words: art, culture, public policy, economic development

## THE PUBLIC UNIVERSITY AS A CONTEMPORARY ARTS AND CULTURAL ANCHOR: ASSESSING A NEW IMPACT ASSESSMENT TOOL

Abstract ID: 741

Abstract within Pre-Organized Session 101

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How do public universities serve as arts and cultural anchors, contributing to community planning and workforce development? A three-year interdisciplinary research project funded by NEA's ArtWorks program supported the development of an assessment tool to investigate this question. The tool is *The Innovative Arts University as Cultural Anchor: Impact Assessment*. The tool is a series of data-informed questions about key components of the innovative arts university. It assesses the role of the university as a cultural planning partner, workforce development engine, and arts innovator. Our research goal is to test and refine the impact assessment tool with four universities serving as case studies: Arizona State University, University of Colorado at Boulder, Boise State University, and Portland State University. We selected these four because each of these are public universities, in metropolitan locations, are not land-grant universities, are major population centers for the state, are located in the American Intermountain West and Pacific Northwest and are part of the WESTAF continuum. These cases are different in key ways so that we can test and control for whether the assessment works for a range of universities funding types and for different approaches to arts innovation. The selected universities are either Research 1 or Research 2 universities with substantially different levels and resources. Each institution has a spectrum of arts innovation in curriculum ranging from traditional to contemporary practices and each are involved with the community arts and planning ecosystems in varying degrees. Participating leaders include deans of schools and colleges of arts and science, art department chairpersons, arts innovation program leads, and university research vice presidents. To test the tool we invited participants to use the tool. After using the assessment tool each subject completed an individual survey and participated in one or two focus groups to gather their collective feedback on what worked and what did not work about the assessment tool. Findings were used to revise and update the impact assessment tool. Our findings revealed that university administrators are not fully aware of the role or potential of the university as an arts anchor in the community. The implications for the field are significant in that this tool can be used to help university leaders assess and tell the story of their artistic and pedagogical innovation, cultural relevance, centrality to community planning and economic impact to their various stakeholders. The tool demonstrated its potential to be an accelerator because it highlights areas where the university can invest resources, including filling gaps in developing or established campus and local arts ecosystems, forging deeper community connections aimed at advancing social good, partnering with municipal cultural planning efforts to improve the creative economy, and creating a vibrant creative workforce prepared to meet the challenges of twenty-first century employment.

Key words: anchor institution, university, creative workforce

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Key Words: university, anchor, workforce, culture, creative

## **ROUNDTABLES**

### **3.94 ROUNDTABLE - REIMAGINING THE POLITICS AND PLACE OF SKILL**

Abstract ID: 94

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Skill is often presented as a technical problem: something to be addressed through better measurement of industry skill needs, through increased training program enrollment or through incentives to encourage individuals—or their employers—to invest in upskilling. This panel brings together authors of recent skill-focused books that challenge reductionist narratives around skill and outline instead the politics of skill that is too often used to exclude and marginalize large segments of the working population. While these books focus on vulnerable workers in very different national contexts—India, Qatar, the United States—they speak to the need to reinterpret skill and the power that is wielded by those who categorize, control and claim rights to skill. But with this critical assessment also comes the possibility for a reimagined future of work, with room for institutional and creative action to raise up and advocate for workers that are summarily dismissed as unskilled.

The three books featured on this panel include:

*Does Skill Make Us Human? Migrant Workers in 21st Century Qatar and Beyond* by Natasha Iskander. This book provides an in-depth look at Qatar's migrant workers and the place of skill in the language of control and power. Iskander takes readers into Qatar's booming construction industry in the lead-up to the 2022 World Cup. She reveals that skill functions as a marker of social difference powerful enough to structure all aspects of social and economic life. She demonstrates that skill categories adjudicate personhood, creating hierarchies that shape working conditions, labor recruitment, migration policy, the design of urban spaces, and the reach of global industries. Iskander also discusses how skill distinctions define industry responses to global warming, with employers recruiting migrants from climate-damaged places at lower wages and exposing these workers to Qatar's extreme heat. She considers how the dehumanizing politics of skill might be undone through tactical solidarity and



creative practices.

*Managing Migrants by Class: Indian Emigration as a Development Tool* by Rina Agarwala. This project employs a comparative-historical examination to examine how sending country governments manage the out-migration or emigration of their citizens and how migrants react to and reshape sending state actions? Agarwala compares the Indian state's relations with its poor emigrants to the Middle East (who are legally classified as "unskilled") and its wealthy emigrants to the U.S. (legally classified as "skilled") from the 1920s to the present. In India, emigration has been used to empower some classes, while disempowering others. This difference in policy treatment has been justified within the democratic context of India using the parlance of "skill."

*Putting Skill to Work: How to Create Good Jobs in Uncertain Times* by Nichola Lowe. Lowe starts with America's employment problem—not enough good paying jobs to go around or clear pathways leading to them. Skill-based solutions are critical for addressing this employment crisis, but the transformational power of skill is frequently misunderstood. For Lowe, the real power of skill lies in its uncertainty: reflected in the elemental yet enigmatic questions of who possesses skill, where it resides and whose responsibility it is to build over time. She tells the stories of pioneering workforce intermediaries that harness and at times heighten skills ambiguity to extend economic opportunity to workers at the bottom of the labor market. With renewed policy emphasis on skill development, these opportunity-rich solutions can be further expanded—ensuring workers across the entire educational spectrum contribute skills that drive innovation forward and share the gains they generate for the twenty-first century workplace.

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- Rina Agarwala. In review. *Managing Migrants by Class: Indian Emigration as a Development Tool*

Key Words: skill, work, workforce intermediaries, India, Qatar

### 3.202 ROUNDTABLE - WHAT'S NEXT IN ECONOMIC DEVELOPMENT?

Abstract ID: 202

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Economic development has always been a key topic of academic inquiry. The question of why some regions are rich while others are poor is among one of the most important puzzles in the social sciences and directly relates to the livelihoods of millions of people (Lucas, 1988). Over the past decades, economic development researchers extensively examined the development process, alongside attendant strategies, and outcomes (Leigh, & Blakely, 2016). Recent reviews of the field highlight the shifting priorities and emergent paradigms of economic development in the US. For example, Currid-Halkett & Stolarick (2011) unveiled top keywords in articles published in *Economic Development Quarterly*. The themes they highlighted cover what we would now consider traditional topics in economic development including, but not limited to: cluster analysis, labor market change, economic development incentives, high tech, education, industry, innovation, and redevelopment. In a more recent update, Fang (2021) conducted a bibliography analysis of economic development studies, and found sustainable development, climate change, local and regional development, developing countries, and development strategies as

the predominant research themes in the recent five years. Compared to previous trends, economic development appears to be moving towards a more sustainability-oriented path with a global perspective.

Beyond advancements in the literature, our current economy is undergoing a potentially new round of dramatic restructuring. The role of technological advances such as AI will likely be a major disruptor in labor markets. The COVID-19 pandemic accelerated the trend of “work from home” and the dis-association of workers to their employers’ locations. Moreover, the death of George Floyd and the latest iteration of the “Black Lives Matter” movement have elevated questions of racial and income inequality to the forefront of policy makers’ concerns. Overall, these changes raise major questions for economic development planners. These urgent issues represent a critical point for our cities and require us to evaluate the current state of economic development research and to critically examine where the field should go into the future. In this pre-organized roundtable session, we’ve invited leading scholars in the field to discuss the next big questions and future directions of our field. We’ll discuss the following questions:

What are the next big questions for economic development researchers and practitioners? What topics would you like to see the next generation of economic development planners and researchers devote their time?

To what extent has COVID changed the way we work and live? Are these changes here to stay? If so, which ones? What are some of the implications for the urban economy, form and community organization? What should economic development planners do in face of these new trends?

What are the most prominent racial, income and other social equity issues economic development planners face moving forward? How can economic development planners more effectively deal with them?

Will new technology such as AI completely change the way we work and live? What are the implications for economic development planners?

We hope these questions, and our panelists, can steer the field of economic development in new directions, offer some clarity in these overwhelming times and inspire colleagues and students to take on the ambitious task of answering these questions.

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Key Words: Economic development, Big questions, New trends, Social equity, Work from home

## **INDIVIDUAL PAPER SUBMISSIONS**

### **DO LOCAL GOVERNMENTS LISTEN TO THE EXPERTS? EVIDENCE FROM AMAZON’S HQ2 CONTEST**

Abstract ID: 4

Individual Paper Submission

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Amazon.com, Inc.'s recent "HQ2" headquarters competition made local economic development policy a top news headline. The spectacle spurred two contrasting assessments: one saw it as a heightened "race to the bottom" competition in which local and state governments outdid each other in giving away their tax bases. The other characterized it as signaling a decisive shift in regional economic competition towards "place-based" investments in local workforce skills and productivity, infrastructure, and quality of life. To date, only two scholarly studies have attempted to determine which of these two views more accurately captures what local governments proposed – a question with significant consequences for our understanding of the state of local economic development planning. Each study concluded in favor of one of the opposing stories.

This paper attempts to clarify what this competition – which attracted over 200 detailed applications – can tell us about what economic development policy models hold sway, in what places, and why. It does so through two primary advances: first, it gathers a larger set of local proposals (n=114) than has previously been analyzed. And second, it analyzes proposals based on the substance of policies that they describe (e.g. policy type, resources committed), as opposed to previous studies' emphasis on measuring the rhetorical and thematic emphases in proposal texts. Based on this approach, this paper establishes an overall view of what are the "modal" and "outlier" policies that cities practice in local economic development. "Outlier" in this context entails an uncommon or unique level of commitment to securing economic benefits for local workers and business owners, especially those from marginalized backgrounds. We leverage the sample size to examine and compare subsamples (e.g. large vs. medium-sized cities, cities from different US regions) to better understand which cities show the strongest commitment to reducing inequality and elevating local populations' chances of economic mobility, as well as how they mobilize these commitments.

We establish cities' varying adoption of "outlier" vs. "modal" policies by coding the proposals in terms of the breadth and depth of commitment to the policies described. Amazon required submissions to enumerate specific information across a wide range of criteria, including local resources and institutions for worker training and education, infrastructure investments (e.g. roads, air travel, renewable energy, public transit, active pedestrian/bicycle mobility), programs to support businesses (e.g. permitting processes and support), and local housing supply. Policy breadth is captured by the variety of policies, while depth is captured using an ordinal scale to measure the level of commitment to a policy.

By establishing what are the "modal" and "outlier" local economic development policies, and how their adoption varies by city size, region, demographics, and political partisanship, we contribute to the planning literature's knowledge of the range of local approaches to investment in long-term workforce productivity and social mobility. While there is a general academic consensus that "place-based" policies focusing on marginalized groups' skills and opportunities are needed, there is also strong agreement that political incentives often make these policies difficult to implement. By examining who is listening to the experts, we can better understand the conditions under which place-based economic development policies are implemented, and to what ends.

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Key Words: Local economic development, Amazon, place-based development, development incentives, regional competition

## **GREEN JOBS AND CLIMATE JUSTICE IN AMERICAN CITIES**

Abstract ID: 19

Individual Paper Submission

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Climate justice can be defined as “the mobilization of justice with respect to climate policy” (Bulkeley et. al, 2013). Efforts to mitigate climate change should strive for climate justice to combat the current global crisis in which extreme weather events are becoming frequent and vulnerable communities are being hit the hardest. Considering that these efforts can unfold on a variety of scales, this study focuses on American cities. Seeing as the built environment contributes to 59% of greenhouse gas emissions, it is imperative to promote changes in cities to move towards carbon pollution-free cities (Fitzgerald, 2020; Mi et al, 2019). In the context of climate justice, such changes can consist in making green jobs available to those who need them the most.

With the aim of providing useful findings on green jobs initiatives, this study investigates how programs adopted by cities, or programs partnered with cities, can improve the livelihood of low-skilled workers by including them in the green workforce through training for local “green” jobs. The following research questions are posed: How do city governments attempt to respond to climate mitigation in ways that promote justice by implementing workforce development and training programs to include low-skilled workers in the green economy? What is the role of cities in managing green job creation through local-led workforce development and training programs? How do city governments interact with local organizations in the process of implementing green workforce development and training programs?

To compare 8-10 different programs in green jobs across the U.S., in-depth interviews with program staff will be conducted and the contents of the program materials available online will be analyzed. An example of such program is the Oakland Green Jobs Corp Program, which is based on a city-college partnership, and is designed to help disadvantaged community residents’ transition to green careers. Our analysis will examine themes such as urban politics, fairness, local leadership, and technological change. The findings will assist urban planners and public officials interested in learning how to combat climate change in ways that improve the livelihood of vulnerable residents in cities. By identifying good practices, these initiatives can be scaled up.

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Key Words: climate justice, green jobs, climate change mitigation

## SMALL MANUFACTURING ENTERPRISES IN THE DEINDUSTRIALIZING CITY: SHIFTING GEOGRAPHIES AND SPACES OF OPPORTUNITY

Abstract ID: 36

Individual Paper Submission

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Manufacturing has been the backbone of the US economy for more than a century. Whether the emphasis is on durable goods or biotech/life sciences, our ability to make things continues to drive local markets. Globalization has shifted these trends; with larger, multinational firms often moving operations and manufacturing to cheaper labor markets.

Compounding the global challenges, more recent urban economic development and land planning practices in core urban areas have been replacing lost industrial activity with service-based industries, threatening the integrity of legacy industrial corridors in crucial urban markets. Such development trends are evident in legacy urban neighborhoods where workers once lived within blocks of employment. These industrial neighborhoods are now home to eclectic live work/spaces, shabby chic retail, and hipster coffee houses. Aging infrastructure becomes art as 'new and improved' development erases a once thriving industrial past.

Yet urban manufacturing, small to mid-sized (SME) firms in particular, remain a core component of the US economy, providing diversification strength in local markets and overall fiscal health at a time when municipal budgets continue to strain as a fallout from the lingering effects of the Great Recession of 2008 and now the coronavirus pandemic. SMEs represent an important but often under- appreciated aspect of urban industrial economies. Small-scale manufacturing has generally experienced patterns of decline that follow the broader sector. Pressures from globalization, off-shoring, automation, and now supply-chain challenges continue to threaten manufacturing jobs in the US. Economic developers and urban planners have become increasingly concerned about pressures on urban manufacturing over the past decade. These concerns have mirrored and shaped municipal efforts to identify and protect active urban industrial land in cities around the United States. Together, these two efforts have led to the emergence of a small but important corpus of research seeking to understand and address the loss of viable urban industrial landscapes.

Contributing to previous urban manufacturing work, this study analyzes both the experiences of individual firms and patterns of real estate, land use, and infrastructure change to assess the opportunities and threats facing St. Louis City's manufacturing economy. The paper reports on the findings from a series of interviews (conducted prior to the coronavirus pandemic) of SMEs in the City of St Louis. The researchers interviewed firm owners/operators in a variety of manufacturing sub-sectors, exploring their industry concerns and how they view the role that city industrial development policies play in supporting the region's manufacturing and industrial base. While noting that the pandemic has had an unprecedented impact on the global economy, the interviews underscore the concerns about market instability and an uncertain future are not new. Lessons were learned as cities emerged from the 2008 recession that can be applied to the pandemic recovery. The findings suggest that renewed attention on the manufacturing sector needs to extend to SME firms if the pandemic recovery is to have a lasting hold.

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Key Words: Urban Manufacturing, Industrial Development, Economic Development

## **BRITISH COLUMBIA'S COMMUNITY BENEFITS AGREEMENT: DISCERNING ECONOMIC JUSTICE FOR INDIGENOUS WORKERS FROM UNION POLITICS IN URBAN INFRASTRUCTURE PROJECTS**

Abstract ID: 58

Individual Paper Submission

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In 2018, the British Columbia (BC) government announced a province-wide agreement with a coalition of 19 prominent unions (the Allied Infrastructure and Related Construction Council of British Columbia (AIRCC)) that is referred to as the provincial Community Benefits Agreement (CBA). This agreement covers public infrastructure projects that mainly service urban areas and aims to address the province's looming labour shortage in the construction trades by increasing the hiring and retention of Indigenous workers and other underrepresented groups (Community Benefit Coalition of BC, 2019). While similar impact benefit agreements have been made with First Nation groups for specific projects, the CBA uniquely covers infrastructure projects across the province, and requires that the AIRCC increase the representation of Indigenous people in apprenticeships and as employees. Current projects under the CBA include the Pattullo Bridge Project (in metro Vancouver), the Highway 1 four-laning project (connecting Alberta border to the City of Kamloops, BC), and the Broadway Subway Project (in Vancouver) (BCIB, 2020).

Literature on community benefits agreements (CBAs) has grown in recent years, and has indicated that these agreements can be a successful way to distribute the benefits of development to underrepresented or politically marginalized communities (Leavitt, 2006). However, this literature has also revealed some challenges with CBAs, including concerns about these agreements being co-opted by local governments or other entities, such as developers, self-interested community organizations, and/or organized labour. Wolf-Powers (2010) and Gross (2008) also express concern about labour unions and government entities being involved as direct stakeholders in CBAs, as they may cause negotiations to be swayed by labour movement politics, rather than representing community interests. There has been a lack of research about the ways that CBAs may be leveraged to benefit Indigenous communities that are often greatly impacted by the proliferation of urban development, particularly in regards to large scale infrastructure and in its environmental impact. Existing literature on Indigenous workforce development focuses on job creation in resource extraction industries, rather than urban infrastructure and development. This research aims to address these gaps in the literature by asking whether British Columbia's Community Benefits Agreement is a means to promote economic justice for Indigenous workers, and what successes and barriers exist to distributing economic benefits of development in this way.

This research is a content analysis of stakeholder interviews, policy documents and informational materials about the agreement. The 17 stakeholders interviewed include: 1) Representatives from labour unions (5); 2) Members of other organizations involved with/impacted by the CBA (3); 3) Contractors who have business partnerships with First Nations in BC (3); 4) Representatives of First Nations that have been impacted by the CBA (4); and 5) Members of resource management consultancy firms who represent First Nations groups in negotiations for the CBA (2). We found that while there is optimism that the CBA may help advance public discourse on economic justice for Indigenous Peoples, that there are significant barriers that have gone unaddressed in this and other labor agreements due to a lack of community engagement. These challenges include lack of housing and transportation

needed to work in urban job sites. Additional challenges are the continued marginalization of Indigenous workers into unskilled labor in the construction sector, and the potential to reinforce economic dependence on non-Indigenous businesses and economies. Ultimately, the question of whether the CBA represents a means to economic justice is complicated by the co-optation of the process by political interests; as Indigenous groups are not formal stakeholders, the opportunities for employment, and whether engagement is done to recognize and address barriers to hiring for urban infrastructure projects remain in the balance.

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Key Words: community benefits agreement, workforce development, Indigenous peoples, urban infrastructure, Indigenous planning

#### **PATHWAYS TO EQUITABLE GREEN JOB GROWTH**

Abstract ID: 102

Individual Paper Submission

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To many, 'green jobs' suggest highly-skilled labor. Research and development is an important element in the greening of the economy, and one that has received much scholarly attention. But could it be that green jobs are not as skewed towards highly skilled labor as is often assumed? And if so, how does that change the way we understand the geography of the greening of the economy? On the assumption that green jobs require a highly-skilled, highly educated workforce, policies that focused on traditional R&D that stimulates green innovation have received a great deal of scholarly attention. But what does the greening of the economy look like when we see that the top green job growth happens in construction, installation, and maintenance sectors? My initial calculation according to data from the Bureau of Labor Statistics (BLS) from 2014 to 2018 suggests the top green job growth happens in construction, installation, and maintenance sectors, which mainly serves the local markets and require relatively low skill levels.

This misperception of green jobs has much to do with a rich scholarly work to investigate the relationship between environmental regulations and innovation (Popp, 2019). This strand of work argues that environmental regulations would incentivize firms to innovate in clean technology, greening their process, therefore creating jobs in these positions that would normally require high-skill labor. And such job growth would only be likely to occur in geographies within some innovation eco-system. However, green job growth is spatially far more dispersed than green innovation, indicating that strategies that focused more on the R&D side may not be the strongest drivers for green job growth for some places than the other (Chapple et al., 2011). Therefore, this paper would like to investigate the green job growth trajectories for the past 10 years in major US MSAs. How state and local policies differ in effect according to the preexisting local conditions, namely the preexisting knowledge base and industry

composition? Theoretically, this paper would like to provide empirical evidence to challenge the “job versus environment” argument and adds to the emerging regional innovation system literature around the green economy. Practically, it would provide insights on local pathways of green job growth according to local conditions.

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Key Words: Green Job

### NEW ECONOMY IN CITIES: WHAT ATTRACTS ENTREPRENEURIALSHIP IN BIOMEDICAL INDUSTRIES

Abstract ID: 104

Individual Paper Submission

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The concept of entrepreneurial ecosystem is a focus of research on the formation of startups which are important drivers of economic growth, employment, innovation, and productivity. Research on entrepreneurial ecosystem has particular implications for China because in recent years mass entrepreneurship and innovation has become a national agenda in China. Particularly concerning the spatial characteristics of entrepreneurial ecosystem, geography provides a platform to organize economic activity. Research in new economic geography has found that innovation is spatially concentrated and the proximity to related institutions and actors is important for creating an entrepreneurial ecosystem. However, despite the long list of relevant factors including human capital spillovers, proximity to local universities, financial development, and market sizes that can facilitate the formation of an entrepreneurial ecosystem, industry-specific co-location is rarely explored and needs more research attention, especially in biomedical industries. This research investigates two factors that associate with the cultivation of biomedical startups at the city level in China using datasets containing their geographical locations between 1999 and 2019. The first factor is related to knowledge base. New firms tend to locate in industry-specific localization economies so that new firms and existing firms can benefit each other through shared new technologies, competencies, and resources. Secondly, considering that pharmaceutical and medical products are consumed in hospitals, hospitals are closely related to the biomedical industry. Therefore, this research examines the co-location of existing firms in biomedical industries, hospitals, and startups. This research contributes to the existing literature on entrepreneurial ecosystem by describing the evolving characteristics of places through time and focusing on an emerging industry.

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Key Words: Entrepreneurial Ecosystem, Biomedical Industries

## **PROMOTING MITIGATION THROUGH POST-DISASTER SMALL BUSINESS RECOVERY PROGRAMS.**

Abstract ID: 111

Individual Paper Submission

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Small businesses are critical stakeholders in local economic recovery after disasters. And their resilience against disasters can affect that of the economic development as a whole. But rarely do they receive the same level of attention or aid as their neighboring households. Unlike large and medium-sized businesses, small businesses are particularly vulnerable to disaster recovery. Small businesses tend to have fewer financial resources, less access to political capital, take fewer mitigative actions against disasters and generally are less prepared for disasters. Small businesses not only have fewer programmatic options to aid them in their post-disaster recovery, but these programs often require significant and tedious paperwork that acts as a barrier to business participation. For instance, the U.S. Small Business Administration (SBA) requires small businesses to show Credit Requirements (e.g. credit history, repayment, and collateral) to receive a disaster recovery loan, which some small businesses cannot easily provide. Furthermore, existing small business recovery aid programs underutilize the recovery moment as an opportunity to promote long-range mitigation and resilience actions. Also, small businesses are less likely to adopt disaster mitigation and resilience-based strategies. It is unclear as to whether small business recovery programs, sparse as they are, provide an opportunity to take mitigative actions against the next disaster. This missed opportunity is rendered even more significant in light of the fact that businesses are more likely to do mitigation and resilience planning immediately after a disaster, rather than before it occurs.

While research on indicators of disaster resilience has grown significantly in the last few years, much less is known about programmatic dimensions of resilience-building. Insights from disaster planning and environmental management literature suggest that programs that focus on mitigation and resilience-thinking generally share a set of specific characteristics. They encourage long-range planning, including mitigation planning; encourage adaptive thinking in the face of uncertainty, such as through circumventing red tape; promote the use of creative funding mechanisms, to work around resource constraints; increase engagement with nonprofits to improve resource availability; and promote networking and collaboration between various stakeholders to better identify local needs and improve response.

This paper uses this resilience-focused framework to examine whether small business recovery programs are utilizing the opportunity presented by disaster recovery to promote mitigation and resilience-thinking. First, we review business recovery program (i.e., grant, loan, and other economic recovery schemes) in four disaster-affected states, namely New York and New Jersey (2012 Hurricane Sandy); North Carolina (2016 Hurricane Matthew), and Texas (2017 Hurricane Harvey) to identify program aspects such as implementing agencies (federal, state or local), scale of implementation (state or local), primary funding source, and programmatic innovations. These include creative financing mechanisms, incorporation of mitigation or resilience-focused actions (e.g. promoting use of insurance, business continuity plans, structural upgrades, etc), and other innovations such as involvement of nonprofits in program design or implementation, efforts to reduce red-tape. Secondly, to better understand decision factors in mitigation focused recovery planning, we will use snowball sampling methods to identify 10-15 key state and local officials from agencies involved in economic recovery planning for Salt Lake City after COVID-19 and 2020 Magna earthquake. Salt Lake County had suffered from two different disasters at the same time. We expected that some programs are more likely to mitigate the next disaster, others programs only focus on recovery right after disaster despite the fact that they name the mitigation.

This study fills many gaps in the literature. It sheds light on small business recovery after disasters, its relationship with disaster recovery policy, and the ways in which the post-disaster recovery moment can be used as an impetus to promote resilience-based thinking in the long-run.

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Key Words: local economic resilience, mitigation actions, small business, policy analysis

### **WHICH START-UPS BENEFIT MOST? EXAMINING THE DIFFERENTIAL IMPACTS OF LOCAL ENTREPRENEURIAL SUPPORT ORGANIZATION PARTICIPATION**

Abstract ID: 207

Individual Paper Submission

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At the earliest stages of conception, before a start-up has accessed finance, its resources are limited to a combination of human and social capital from founders. Human capital, in the forms of advanced degrees and prior work experience, is associated with increased performance (Dencker et al. 2009; Gruber et al. 2012; Symeonidou & Nicolaou 2018). In the case of technology start-ups, entrepreneurs' prior experiences supply them with technological knowledge and organization-specific tacit knowledge useful to starting a firm. An entrepreneur's prior work and educational experiences also contribute to the formation of social capital through network affiliations, which provide access to resources for problem solving and acquiring information.

Entrepreneurs augment these resources by participating in local entrepreneurial support organizations (ESOs)—e.g., incubators, accelerators, co-working spaces, mentoring programs—where they benefit from external networks and knowledge about growth strategies and how to access finance (Clayton et al. 2018). These are often publicly run or nonprofit economic development tools. Part of the story of geographically defined entrepreneurial ecosystems is that ESOs are necessary for a robust entrepreneurial economy. Firms embedded in ecosystems benefit from location advantages such as access to specialized resources and lower information costs (Hsu & Ziedonis 2013; Stam 2015; Spigel et al. 2020), which in turn facilitate further innovation and growth (Dahl & Sorenson 2012; Huggins & Thompson 2014).

Missing from the literature on local ecosystems and ESOs is an understanding of which firms' benefit most from participating, and how the level of social and human capital that founders bring to their firms influence the relationship between ESO participation and firm outcomes. Several recent studies indicate women and minority groups as well as different types of start-ups experience local ecosystems differently (Cowell et al. 2018; Harper-Anderson 2017; Motoyama et al. 2021). While some studies examine the relative or combined influence of human and social capital on firms (Adner & Helfat 2003; Pennings et al. 1998), few investigate the relative role of human capital, social capital, and ESO use (with exceptions such as Davis et al. 2006). An important question is whether firms that already have high levels of social and human capital benefit more from ESO participation or whether ESOs better help the firms that are most in need of support.

This paper addresses this gap using an historically rich and detailed database of the universe of 865 life sciences firms founded in the Research Triangle region of North Carolina between 1991 and 2015 (Feldman & Lowe 2015). Using data on the firms, their founders, and participation in four local ESOs (three incubators and one venture mentoring organization), the paper asks whether certain firms benefit more from ESO participation than others in terms of their exits, funding acquisition, and commercialization. Specifically, using regression and event history analysis the paper examines whether start-ups with already high levels of social and human capital benefit more from participating in ESOs and whether participant firms with women founders experience different benefits than firms without women founders.

Preliminary findings indicate that there are different outcomes for firms. Specifically, firms that already have high levels of pre-founding social and human capital receive more funding on average after using an ESO, while firms with women founders also benefit more than firms with only male founders in terms of funding. Overall, the contribution of this paper is to more holistically consider the local entrepreneurial ecosystem and the heterogeneity of firms by bringing together literatures on social capital, human capital, and ESOs typically considered in isolation. The paper concludes with practical implications for technology and entrepreneurship-based economic development.

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Key Words: entrepreneurial support organization, entrepreneurial ecosystem, social capital, human capital, technology-based economic development

## HOW DOES THE COLLABORATIVE NETWORK STRUCTURE AFFECT INNOVATION? A STUDY OF FLORIDA'S HEALTHCARE INDUSTRY

Abstract ID: 229

Individual Paper Submission

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Collaborative interaction helps generate innovation that fuels economic development. Prior studies have empirically established the positive relationship between innovation and collaboration within urban agglomerations and industrial clusters at the local level (Malmberg & Maskell, 1997), but few examined networks across cities over long distance. In practice, policymakers have recognized the importance of regional collaboration, but lack a strategic plan to form a meaningful collaborative network for their jurisdictions. This paper fills the academic and practical gaps by modeling the co-patenting networks in two healthcare industries among cities in the state of Florida. We study the following questions: (1) What network structure is more conducive to innovation? (2) What position in the network can encourage innovation in cities? And (3) what position in the network can help cities better sustain economic shocks? Healthcare industries are booming and highly innovative industries in Florida, and the state of

Florida itself is a rising state with expanding innovation economy; thus, they provide an ideal setting to study innovation.

The patent data come from the U.S. Patent and Trademark Office (USPTO) and cover all patents since 1976. We focus on two healthcare industries defined by the United States Patent Classification: surgery; and drug, bio-affecting, and body treating compositions. These two industries are patent-intensive with the largest number of patent grants among all healthcare industries in Florida, and thus perfect for studying patenting activities. The patent data document the inventors and their locations at the city level; two cities are perceived as having a collaborative relationship if they have co-patented. The more they co-patented, the stronger their connection.

We adopt social networks analysis (SNA) to quantify the collaborative network among cities. SNA provides a conceptual framework and a set of analytical tools to visualize and analyze interactions and social structures as networks of nodes and ties (Dempwolf & Lyles, 2012). We quantify the density and network centralization of the entire patent network, and various centrality measures for selected cities. By comparing these measures for the co-patenting networks over the past forty years, we distinguish hierarchical network structure from decentralized ones, and cities in different positions in the network, and evaluate which network structure and node position are more conducive to innovation. So far, we have collected and cleaned all co-patenting data of Florida from 1976 to 2020, and visualized the network dynamics. Next step we will calculate the network metrics over time and examine their relationship with innovation output.

This study sends three messages to policymakers. First, policymakers can target key innovation hubs in the network to facilitate regional knowledge spillovers. This study identifies cities in the network that play an important knowledge brokerage role, and policymakers can create positive externalities and spillovers to the whole region by targeting these cities for the dissemination of new information, knowledge and technology. Second, policymakers can connect isolated cities to the innovation network. This study also identifies marginalized cities in the network, and policymakers can facilitate their connection to the whole region and boost the synergies between cities for sustained regional development (Eraydin, Armatlı Köroğlu, Erkuş Öztürk, & Senem Yaşar, 2008). Third, policymakers can also strive to make the network structure more resilient to external shocks. A certain degree of redundancy of connections in the network is crucial in ensuring the network to remain intact when external shocks break some existing connections. Thus, this paper helps policymakers to identify where there is little redundancy and steers their efforts toward building resiliency there.

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Key Words: Economic Development, Innovation, Social Networks Analysis, Cluster, Healthcare Industry

#### INCORPORATING CREATIVE CITY REPORTS IN MUNICIPAL CULTURAL PLANNING

Abstract ID: 327

Individual Paper Submission

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The creative economy is touted as an engine for economic prosperity and social good in urban areas. A combination of the cultural industries, city branding, cultural tourism, and the creative class, this field has gained attention worldwide as a tool for municipal policymakers to foster city building. Many cities and consulting entities have produced studies and reports on the promise of the creative economy. However, there exist few analyses of these reports and their inherent policy value.

This article explores five creative economy reports from cities on three continents –Adelaide, Austin, Chicago, London, New York – using the Narrative Policy Framework through an iterative coding framework. This emergent policy framework looks at the setting, the characters, the plot, and the outcomes or moral of the story to analyze the framing of policy in a new and different way. Exogenous and endogenous shocks are often the sparks that motivate the creation of analytical reports and studies. Financial challenges, changes in neighborhood composition, and the exodus of creatives from a city due to escalating urban cost of living, rising density, and dearth of affordable creative spaces are factors leading to the call for analysis. Some cities may produce these creative sector profiles to inspire the acceptance of this arena as an economic engine, encouraging policymakers to compete on the international stage as a creative force.

One often-cited aspect of the creative economy is its reliance on entrepreneurship and entrepreneurial action as a tool for innovation and economic development, and cities themselves are entrepreneurial in their collective effort to compete for development resources, attract jobs, and attract people. This creative economy rationale incorporates economic growth as a goal for cities, putting forward the tool of arts and culture as well as innovation as a solution to the challenges of attracting residents, tourists, and businesses, resulting in a stronger tax base.

The project of the city puts it in competition on local, national, and global scales and encourages entrepreneurial action (e.g., identifying and capitalizing on opportunity, capturing an audience, building a recognizable brand identity.). Reports on the “creative city” have been written and commissioned to operationalize local creative economies, measure creative economic outputs, create a picture of the labor force, and contextualize the value of artistic creativity within a municipality.

There have not been sufficient efforts to analyze the policy value of such creative city reports—we seek to fill this gap by analyzing the ways that creative economy reports use evidence to make claims and recommendations. In short, we ask: How do creative economy reports construct and image of the city as an entrepreneurial actor in its orientation toward measuring, contextualizing, and deploying the arts and creative industries as an engine for economic development?

Within the creative industries there is fundamental engagement in innovation: pursuing untapped markets, developing product innovations, recognizing and seizing opportunity, or the pursuit of change. This may lead to fostering creative mindsets in seeking to attract residents, workers, and corporations to specific cities.

Creative economy reports are used to market urban areas to the world. Urban advocates, called ‘policy boosters’, take up ideas that represent their city as solutions to urban challenges. They tout their municipality as the great hope for mastering these conundrums and, in so doing, compete with others for attention. Positioning one’s city as ‘creative’ can make a difference in fostering the image policy boosters are hoping to attain.

The key contributions of this article center the ways that creative economy reports use rhetorical devices and empirical data to support their claims and recommendations and forwards policy learning and adaptation as an important tool for municipal policymakers.

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Key Words: municipal cultural planning, economic development, Narrative Policy Framework, creative city reports, urban branding

## EXPLORING INFLUENTIAL FACTORS OF WAREHOUSE LOCATION: A MULTILEVEL APPROACH

Abstract ID: 401

Individual Paper Submission

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Growth of e-commerce has influenced not only our daily lives but the logistics industry itself. According to Statista Digital Market Outlook (2020), in the U.S., the revenue of retail E-commerce sales was \$274 billion in 2017, and it is expected to grow by \$ 599 billion in 2024. The size of the contract logistics market also has been growing from \$13.6 billion to \$21.8 billion between 2010 and 2018 (Armstrong & Associates, 2019).

The change in the logistics industry is not confined to its size: it includes the transformation of freight distribution pattern, real estate footprint, and logistical facilities (Rodrigue, 2020). One prominent change is the location of warehouses. The location of warehouses has received a great deal of attention recently among academicians. Regarding warehouse locations in the U.S., the literature has three main focuses which are logistics sprawl, logistics agglomeration and clustering, and locational factors.

Nevertheless, the literature has largely ignored the warehouse location and its relationship with geographic and economic factors at multiple levels. The focus of the literature has been heavily concentrated on whether warehouse and logistics facilities are centralizing or decentralizing. Furthermore, although the industries involved in e-commerce have been diversified, the literature has examined only the transportation sector as the relevant industry of warehouse locations. Therefore, more diverse industries and their influence from different geographic levels needs to be explored.

Several research questions emerge from the shortcomings of the literature. The primary research question is, "Do the significant factors affecting warehouse location vary across different scales of geography?" Listed below are additional questions to be investigated.

What are the unexplored factors that influence the location of warehouses?

What are the interactions between factors operating at different geographic levels that affect warehouse locations?

Are there certain industries that are highly correlated relevant to the location of warehouses? If so, what kinds of industries? This study will use multilevel generalized quasi-Poisson model with three levels. We hypothesize that interactions between different levels of geography are related to warehouse location. We further hypothesize that the influential factors of warehouse location exist not only at a small geographic level but also at larger geographic levels. In the analysis, the number of warehouses in 17,694 Zip Code Tabulation Areas (ZCTA), which belong to 1,899 counties and 392 MSAs across the U.S., will be analyzed with explanatory variables at three different geographic levels.

This study contributes to the literature in several ways. We investigate the associated factors of warehouse locations focusing on not only conventional factors, e.g., infrastructure accessibility, but other factors that have been rarely studied. This includes the proximity of selected industries and the economic structure of the area. We identify the extent to which other factors influencing warehouse location vary across different geographies. These levels include ZCTA level, county level, and MSA level. Moreover, possible interactions between different levels of factors influencing warehouse location are examined.

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Key Words: Warehouse location, Multilevel analysis, Infrastructure, Economic structure

## IMPACT OF SOCIAL DISTANCING ON OFFICE BUILDING OCCUPANCY AND FALLOUT EFFECT OF OCCUPANT SPENDING POWER

Abstract ID: 531

Individual Paper Submission

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While office markets have experienced various crises through time, the SARS-CoV-2 pandemic led for the first time to an unprecedented closure of buildings. In contrast to other crises, this is the first beyond the terrorist attacks of September 11<sup>th</sup>, 2001, to catalyze significant discussion on the reinvention of future office spaces, requiring security and cleaning protocols regarding social distancing and circulation with the objective to minimize potential exposure to airborne and surface hazards. Efforts to suppress exposure to the virus brought about a significant and likely sustained transformation in the office sector, with cascading effects for the businesses that depend on proximity to the workforce. As a result, the following questions have emerged: 1) How would office buildings become safer through workplace transformation? and 2) How will these transformations affect occupancy levels and therefore building occupant spending power in the surrounding area? An increasing number of surveys of C-suite executives suggest that a percentage of their employees will continue to work remotely even after the pandemic and therefore the floor layout and related safety measures will continue to be critical to the perception of risk in an office environment. The methods used to answer the first question will influence the second, and have an effect not only on the building itself but also the surrounding area through the spending power of the workforce in large-scale buildings or dense downtowns.

The study utilizes an interdisciplinary approach, beginning with a comparison of the implications of alternative methodologies for determining pandemic-related office safety through architectural design, followed by spatial

occupancy projections and analysis of economic effects, with implications for real estate and planning. The study consists of all class A office buildings within the city of Seattle, and the downstream effects of alternative approaches on the downtown area. The study utilizes both office building characteristics (e.g., number of floors, floorplans including workstation location, rentable square feet, etc.) and spending power. Architectural analysis compares generative design and software for floorplan alterations to determine the max occupancy levels based on a buffer distance of 6ft, 9ft and 10ft and space syntax analysis of circulation. The methodology proceeded by first formulating a typology of building types, floor plans, and available square feet, and collecting a sample of detailed floorplans for a subset of buildings, fitting low-rise, mid-rise, and high-rise categories. Using the typology of buildings and the results we obtained from comparing generative and typical architectural approaches, we extrapolated the effects on occupancy and workforce to all buildings in the area within each group. We then used these occupant estimates to determine the average spending power within a 1- and 3-mile radius around the buildings.

Results are two-fold, with implications for continued pandemic-related workforce safety, real estate, and economic prospects for downtown areas and associated planning activities. Results suggest that the office space per worker (sf/w) can range from 86 to 330 raising the question of market impact and the increased hoteling and remote working options for employers which could lead to smaller tenant footprint and larger vacancies in buildings. We also found that social distancing restrictions could lead to 40-70% decreases in building occupancy rates and \$25-\$40 millions lost in annual spending power per building. In the short-term, implications for planning and real estate suggest a focus on the economics of downtown business, especially in proximity to high-rise single-use commercial zones. Over the long-term, implications stretch into questions regarding mixed-use reconfigurations of downtown space.

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Key Words: Office buildings, spending power, COVID19 pandemic

#### THE LONG-TERM AND SUSTAINING EFFECTS OF PLACE-BASED POLICY

Abstract ID: 592

Individual Paper Submission

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The adoption of place-based policy (PBP) begins with the rationale that spatially-targeted intervention can make a difference in local economic trajectories (Todes & Turok, 2018). Concentrated investments in the designated areas are expected to stimulate local economic activity and improve socio-economic conditions. With these rationales, the implementation of PBPs has been increasing in the U.S. and tax increment financing (TIF) is among the PBPs that have been widely adopted.

This research examines the effectiveness of TIF in Cook County, Illinois from 1990 to 2019. TIF districts are designated in the expectation of revitalizing blighted neighborhoods for 23 to 35 years in Illinois. Funds borrowed against future increases in assessed property values earmarked to a TIF district, are invested to provide direct



incentives to areas that hold potential to have a positive effect on the local economy.

Does this place-based policy effectively address spatial variation in terms of socio-economic growth? Numerous studies have attempted to assess the effects of TIF (Drucker et al., 2019; Kane & Weber, 2016). Despite such attempts, the results of the assessments are inconsistent, and scholars are far from a consensus on their effects.

This study fills the research gap and provides rigorous evidence by examining long and evolutionary temporal dynamics stretching beyond the policy expiration. Measuring long-term effects enables researchers to capture cumulative positive and negative feedback processes unlikely to be observed when looking at more immediate effects. As Neumark and Simpson (2015) note, however, studies on the long-term effects of PBPs (not just TIF) are scarce and this lack of long-term evidence is among the key causes of the skepticism regarding PBPs.

This research also illuminates the after-program expiration period of TIF to examine whether TIF districts have established long-lasting and sustaining effects on their local economies, which is one of the desirable goals of PBPs.

To measure the effects of TIF, this research uses two-way fixed effects (TWFE) regressions as a baseline regression model. In addition, this study also adopts recently developed a staggered difference-in-difference design to address possible heterogeneous policy treatment effects.

The findings contribute to the empirical urban studies and growing literature on policy evaluation that quantify the effects of PBPs and inform how PBPs can best meet the objectives of economic development and achieve sustainable growth.

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Key Words: Place-based policy, Tax Increment Financing, Policy evaluation, Economic development policy

#### **REGIONAL CHARACTERISTICS OF HIGH-GROWTH FIRMS AND THEIR JOB CREATION EFFECTS IN SOUTH KOREA: THE PRE-COVID-19 AND POST-COVID-19 COMPARISON**

Abstract ID: 637

Individual Paper Submission

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Many have discussed how the current economic turmoil driven by COVID-19 differs from other economic crises. The near-crisis economic downturn stems from stay-home-orders and lockdown which immediately affected regional, national, and global economies. Because the underlying reasons are not financial, there is no monetary policy that can fully address the solution (Rapisardi and Beiswenger, 2020). And there seems to be almost no geographical and industry sectoral exception that is untouched by the current problem.

However, the uneven distribution of economic consequences over a broad area is quite the same as former economic crises. For instance, against the backdrop of abrupt surges of the number of people who filed for an unemployment insurance claim, large gig corporations' stock value sharply went up. While businesses and workers in the seasonal and consumer service industry sectors, such as tourism, restaurants, and entertainment, were hit by COVID-19 the hardest, the manufacturing sector seems to do better (Cortes and Forsythe, 2020). Despite various constraints, many companies managed to find their ways to operate successfully without face-to-face interactions by exploiting cutting-edge technologies, and so on. It is evident that COVID-19 will deepen the already existing inequality in economic growth (Stewart, 2020). But how will it unfold? Will it only exacerbate the current patterns of inequality? Or will it shift the pattern of uneven distribution as it could offer new types of opportunities for some regions that were not available before?

This study attempts to answer the above questions by focusing on eight metropolitan areas in South Korea including Seoul, Busan, Daegu, Incheon, Kwangju, Daejeon, Ulsan, and Sejong. Although South Korea is known for its relative successful industrialization, post-industrialization, and the continued GDP growth, when looked closely, the growth was unevenly shared by region. Particularly, the Seoul Metropolitan Region, covering 12% of South Korea, not only takes up 48% of the entire population, generating half of the country's GDP, and but also enjoys the concentration of various resources and opportunities to access them from technology, culture, medical services, jobs, education, and more (Seoul Metropolitan Government, 2020).

This study examines how the already existing regional disparity shifts after COVID-19 among eight metropolitan cities. In doing so, this paper will perform longitudinal comparisons of various socioeconomic indices between before and after COVID-19. Most importantly, this paper will include the regional characteristics of high-growth firms and their job creation effects in measuring regional disparity shift. There are reasons to add high-growth firms. Even healthy firms that found new ways to operate their businesses in a contact-free way still are at risk of losing months of revenues. There is a possibility that the loss of revenues for an extended period will transform strong companies into weak ones. This, in turn, will slow down the growth of firms. This study expects to find a fewer number of high-growth firms in almost every region. However, one important aspect we need to note is that a very small subset of firms that still achieve high-growth under the recent turmoil could indicate where the regional growth strength lies. Thus exploration of regional characteristics of high-growth firms will not only tell us about how the growth momentum has shifted from the pre-COVID-19 era but also where to look for the future economic recovery.

For various socioeconomic indices, this paper will use government-published statistics. It will use an employer-employee matched panel data for the high-growth firm analysis and the foci of analyses will be given to the number of high-growth firms by type, and their new job creation effects, and whom they hire. These elements will be compared with the pre-COVID-19 patterns at each city level.

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Key Words: Uneven economic development, COVID-19 driven regional disparity, Post-COVID-19 economic recovery, High-growth firms, Regional resilience

## THE RIGHT BALANCE BETWEEN TECHNOLOGY-ORIENTED AND PEOPLE-CENTRIC CITY: CAN A SMART CITY BE AN INCLUSIVE CITY?

Abstract ID: 670

Individual Paper Submission

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The technology of smart cities is often perceived as a sought-after strategy for urban planning and development. As technological advancement has made our lives better, the technology of smart cities is believed to improve urban functions, such as sustainability and livability, for overall urban benefits, including people, economies, environments, and most urban-related concerns. Therefore, smart city projects are often excessively focused on technologies and driven by IT firms and land developers. Consequently, many smart cities have been developed into technology-oriented cities.

Technology-oriented smart cities are economically developed cities for the profit of stakeholders. They are not designed to serve citizens nor to provide equal public services for people. From the business perspective, smart city development represents new city-making industries for an array of interests and capabilities between a partnership of developers, investors, government, and IT firms. Thus, many smart city projects paid less attention to public benefits and provoked uneven development and spatial inequality. The uneven benefit of smart city development is raising important questions concerning the sustainability and livability of the city because it can affect social equity and cohesion and exacerbate existing inequalities within and across the cities.

Fundamentally, smart cities are spatial platforms where people are living. The true value of smart city development should be a thoughtful consideration of people, not implementing technologies. Therefore, finding the right balance between technology-oriented and people-centric cities should be significant for smart city development. For example, state-of-the-art technologies will make housing less affordable and unsustainable due to expensive development costs. However, intermediate technologies, which should be relatively cheaper, will make housing more affordable and sustainable for many people, and it can still satisfy the people's needs and governments' demands.

The objective of this study is comprehensively understanding the significance of the people-centric city against the technology-oriented city and analyze the feasibility of developing a smart city into an inclusive city. Thus, this study draws attention to the impact of smart city development on people. First, the study examines the development impacts of technology-oriented smart cities on housing affordability from the case of the smart city Songdo, Korea. Second, the study surveys people's perception and awareness of smart cities and compares their needs to the demands of governments. Third, the study systematically reviews the concept of the inclusive city and finds the feasibility of developing inclusive smart cities for underprivileged people. This study uses secondary data from the Korean housing census and primary data collected in Korea by surveys and interviews.

The result of this study demonstrates the feasibility of smart city development in developing countries or underdeveloped cities as a development tool that improves their resiliency and sustainability.

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Key Words: smart city, economic development, inclusive city, uneven development

## **IMPACT OF COVID-19 PANDEMIC ON LOCAL GOVERNMENT FINANCES IN MEXICAN MUNICIPALITIES**

Abstract ID: 672

Individual Paper Submission

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Municipal governments throughout Mexico have struggled to maintain healthy local finances as a result of a number of factors including reduced funding from central government sources. Weak municipal finances have been profoundly exacerbated by the COVID-19 pandemic, which has rapidly increased the social and financial pressures on already struggling municipal governments throughout Mexico. Moreover, while the United States federal government has provided assistance to local, state, and tribal governments through the CARES Act, the Mexican federal government has decreased its financial transfers to municipal governments in the past year. This research addresses how the COVID-19 pandemic has affected the proposed income and revenue collection strategies of municipal governments in Mexico. To answer this question, I use data from approved budget and income laws of the fifty largest municipalities in Mexico from 2018 to 2021, as well as media notes and interviews. Findings provide an insight into the financial resilience of local governments in Mexico and into how they prioritize their budgets and revenue raising strategies (tax rates and fiscal incentives) in moments of financial uncertainty. These results also present important implications for urban planning in that they highlight urban programs whose funding has been affected as a result of the pandemic, bringing to light potential future challenges for Mexican cities.

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Key Words: local public finances, resilience, revenue collection

## **UNEVEN REAL-ESTATE INVESTMENT IN OPPORTUNITY ZONES: EXPLORING INVESTMENT OUTCOMES BY DEVELOPMENT POTENTIAL ACROSS ZONES**

Abstract ID: 681

Individual Paper Submission

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Between April and June 2018, the Federal government authorized States' Opportunity Zone (OZ) designations, officially making OZ designated tracts eligible for investor incentives. The goal of the program is to entice high net-worth investors through tax incentives to invest in real-estate projects in low-income communities (U.S. Congress. Joint Economic Committee 2018). Unlike Empowerment Zones in the 1990s, where zones were guaranteed investments from the federal government, a potential issue with OZs is that these areas may not receive uniform

investment because the program operates through incentivizing private investors to finance projects in OZs rather than a guarantee of appropriations into each zone. Since investors want to minimize risk in their investment, OZs that represent the safest investments or highest opportunity for return on investment (ROI) may be most likely to be impacted by the program while comparatively lower opportunity areas may be neglected by investors (Gelfond and Looney 2018). Private investors neglecting many OZs would render the program ineffective in certain areas that the program was created to target

In this paper, I propose assessing investment impacts of OZ designation in two ways. First, I assess whether or not OZs pass the “but-for” test by examining whether or not they create new economic activity in the form of aggregate real-estate transaction amounts and average prices, or subsidize economic activity that could have reasonably expected to have occurred without the subsidy. Second, I measure how changes in investments differ in designated OZ tracts according to a measure of their baseline development potential to shed light on how OZ designation may lead to differential impacts across zones. Real-estate data for this analysis will use Zillow’s ZTRAX dataset to estimate investment outcomes for residential and commercial real-estate transactions.

This analysis is a critical piece of the program’s evaluation because the OZ program relies on private market actors to make investment at their own discretion. In that sense, the program may not effectively target many areas designated as OZs meaning that the program’s prospects to deliver widespread economic investment in low-income communities are low. A key contribution of this paper is an extension of the evaluation of place-based economic development policy beyond the traditional question of if a program is impactful in aggregate to a question of which types of areas does the program have impact in. This paper adds to the early literature on the real-estate impacts of OZs (see Chen, Glaeser, and Wessel 2019; Sage, Langen, and Van de Minne 2019).

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Key Words: Opportunity Zones, Place-based development, Incentives

#### **PLACE-BASED COLLEGE SCHOLARSHIP PROGRAMS AND LOCAL ECONOMIC DEVELOPMENT: PROSPECTS AND PITFALLS OF THE BIRMINGHAM PROMISE**

Abstract ID: 702

Individual Paper Submission

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This paper examines the potential prospects and pitfalls for the newly established Birmingham Promise (Alabama), a place-based college scholarship program that will provide universal last-dollar full-tuition college scholarships to in-state public post-secondary institutions for graduates of the Birmingham City Schools starting with the graduating class of 2020. The program is based on the Kalamazoo Promise program and other subsequently established place-based scholarship programs that have the dual objective of promoting academic success in secondary and post-

secondary education, as well as contributing to local economic development (Miller-Adams, 2015; Miller 2018). The Birmingham Promise represents a novel application of a place-based scholarship program for local economic development as the school district's students are roughly 90 percent African-American and more than half of the school district's college-bound graduates typically go on to attend Historically Black College and Universities (HBCUs).

The Birmingham Promise contrasts with existing place-based scholarship programs in locations such as Kalamazoo, Pittsburgh, and Buffalo in terms of the underlying demographic, institutional, and economic factors that may impact the potential success of the program (Bifulco et al., 2019; Page et al., 2019; Perna & Leigh, 2018). Five specific issues will be examined and contrasted to existing "promise" programs and their locations, including: (1) the demographic composition and academic performance of the Birmingham City School (BCS); (2) the preference of BCS graduates to attend HBCUs; (3) the public-private partnership funding and operational model of the program; (4) the inclusion of the scholarship program within a suite of related local economic development programs, and (5) the relevance of Birmingham's city and metropolitan economic structure.

Examination of these structural issues serves as the context for evaluating the strengths and weaknesses of the Birmingham Promise as it begins to pursue its stated objectives, including: (1) promoting economic development, (2) enhancing human capital, (3) stimulating urban revitalization, and (4) addressing racial disparities ([www.birminghampromise.com](http://www.birminghampromise.com)). The concrete findings of this work will be used to establish benchmarks for the success of the program, as well as to deliver operational recommendations for the on-going program that can be implemented by post-secondary institutions receiving Birmingham Promise students and stakeholders in the local public-private partnership for local economic development.

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Key Words: Economic development, Community development, Workforce development, education, HBCUs

#### THE IMPACT OF THE COVID-19 ON DEMAND FOR TELEWORKING

Abstract ID: 797

Individual Paper Submission

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In response to the COVID-19 pandemic, state and local governments have adopted a set of policies, such as stay-at-home order, social distancing, and mask mandates, and have strongly encouraged workers to work from home if possible. This sudden transition to telework raises questions about which occupations and how many jobs can be

done from home. While the shift in workplace from office to home is a temporary transition for many workers during the pandemic, the experience of teleworking during the pandemic may affect the demand for flexible working arrangements after the pandemic. Thus, this study examines the economy's telework capacity by estimating the share of jobs in the U.S. that can be performed remotely before the pandemic. Then it compares that estimates with the share of workers who actually worked from home during the pandemic. Based on historical trends, this study determines whether the demand for teleworking remains even after the pandemic.

Our study of the impact of COVID-19 on teleworking demand follows three analytical steps. First, we classify occupations based on their telework feasibility using the Occupational Information Network (O\*NET) survey data, which captures occupational characteristics and working conditions across the U.S. economy. We follow the methodology presented in Dingel and Neiman (2020) to identify which occupations can be done or cannot be done at home. Second, we merge this classification with occupational employment counts from the American Time Use Survey (ATUS) to examine the actual incidence of teleworking activities. We compute the share of jobs that have been performed at home by occupation and industry between 2003 and 2019. We assume that the observed shares of jobs from the ATUS represent teleworking behavior patterns under normal circumstances without the COVID-19. Similarly, we merge the classification of occupations with occupational employment counts from the monthly Current Population Survey (CPS) data during the pandemic. We assume that the observed shares of jobs from the CPS show teleworking behavior after the COVID-19 outbreak. Finally, we develop a series of trend analysis to estimate the share of jobs that can be done at home for the year 2021 based on the ATUS and CPS data. We believe that the discrepancy between the two estimates for the year 2021 indicates the impact of the pandemic on teleworking demand. In sum, this study will shed light on what policy responses and interventions are necessary to support the demand for teleworking beyond the pandemic.

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Key Words: Work from home, Telework, COVID-19, Pandemic

#### **FROM STATE DEPARTMENTS TO PUBLIC-PRIVATE PARTNERSHIPS: A MULTI-CASE APPROACH TO EXAMINING CHANGES TO STATE ECONOMIC DEVELOPMENT DEPARTMENTS**

Abstract ID: 810

Individual Paper Submission

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Beginning in the late 1970s, U.S. states began to engage in what Eisinger (1988) called more entrepreneurial approaches to economic development policy that involved more complex relationships between the state and the private sector. Over the same period, local and regional economic development policy became increasingly dominated by quasi-public and fully private economic development organizations. More recently, state governments have followed suit and vested responsibility for economic development with public-private partnerships (PPPs) of varying forms. Some have even gone so far as to effectively privatize entire state departments. The new agencies supposedly bring private-sector expertise to state efforts to attract new business investment and create new employment opportunities, but some advocates argue that these arrangements make

them less efficient and more prone to corrupt practices (Mattera et al., 2011).

Government structures matter. Davidoff (1965) contended that planning expertise should extend beyond technical knowledge and include elements of advocacy and political negotiation. On the other hand, Progressives asserted that organizations should protect experts so they can act in isolation from an ever-shifting political landscape (Doig, 1983). Concerning economic development planning specifically, Cable, Feiock, and Kim (1993) found that the probability of adopting certain economic development policies diminishes with greater institutional openness and public access, further highlighting the importance of organizational structure.

This paper is a first attempt to make sense of the processes behind and the rationale for privatizing state economic development agencies. Specifically, we ask: what are the predictors affecting whether states privatize economic development agencies? To answer this question, we take a multi-case approach and examine the privatized economic development agencies in 4 states. While the agencies in these states are not necessarily identical to one another (as there is no universal definition of what constitutes a privatized economic development agency), the agencies in these states are neither formal state departments nor are they housed within the governor's office. Through archival work, legislative research, media analysis, and interviews, we identify key trends among the states in question.

We identified agencies by carrying out a desk review of the economic development agencies in all 50 states. Of the 50 states, 12 had agencies that were not a formal state department or held within the office of the executive. Those 12 agencies show considerable variation in form and governance, specifically the type of control retained by the public sector. In order to generate more robust findings, we choose four states with varying degrees and types of public sector control including Iowa (where the role of the public sector is quite small) and Indiana (where the Governor and Secretary of Commerce act as Chairperson and CEO, respectively). Our case study design is aimed at literal replication across the cases, following Yin (2009).

The results of the research will provide a more detailed picture of a policy taken up by nearly a quarter of U.S. states. In addition, the findings will set up further research that will compare the policies and actions of privatized economic development agencies with their more conventional public sector counterparts.

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Key Words: economic development, privatization, public-private partnership, organizational change, governmental structure

#### **FOREGROUNDING TEMPORALITY IN HACKWORTH'S DEMOLITION AS URBAN POLICY: TRAJECTORIES OF DEMOLITION AND REDEVELOPMENT IN POST-CRISES CHICAGO**

Abstract ID: 826

Individual Paper Submission

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Demolition has long been a common practice shaping the urban fabric in shrinking cities. The Great Recession and associated foreclosure crisis intensified vacancy and abandonment across the post-industrial landscapes of the Midwest (Harrison & Immergluck, 2020). Geographically targeted, publicly led housing demolition is a prevalent policy response to hypervacancy, population loss, economic decline, and the retreat of private capital (Mallach, 2018). Specifically, housing demolition in which the city has taken a direct property right is posed as a necessary step to kickstart private economic development in disinvested areas. Critics argue, however, that demolition practices center unjustly on marginalized communities and are reminiscent of Urban Renewal which displaced thousands of Black and brown households and destroyed communities for the sake of redevelopment (Akers & Seymour, 2018). Jason Hackworth (2016) points out, however, that ‘demolition as urban’ policy may be even more insidious than mass demolition under Urban Renewal. While neoliberal redevelopment schemes characterize demolitions as ad hoc, Hackworth argues demolitions accumulate over time to an even greater scale than Urban Renewal. Moreover, there are no specific plans for redevelopment.

While scholars often focus on mass demolition as a spatial phenomenon, the temporal dimensions have been less well studied. How then does housing demolition interact with racial and material contexts to reproduce or transform temporal trajectories of redevelopment in shrinking cities in the postcrises period? Foregrounding temporality in the conceptualization of demolition as urban policy - as Hackworth does – focuses attention on the discursive role of policy. To further this endeavor, I explicate the temporal aspects in Hackworth’s theory within a multilevel modeling framework. I use detailed administrative data, the United States Postal Service vacancy data, and the American Community Survey across 2011-2020 to empirically ground the analysis in Chicago. Findings indicate the importance of scale in understanding the role public intervention plays in shaping redevelopment within neighborhoods, but reaffirm the primary importance of the market mechanism for redevelopment at the urban scale. In general, modeling demolition as urban policy reveals the complex temporalities at work constituting the Chicago landscape.

Furthermore, understanding discourse in the strong materialist sense – that discourse is constituted through everyday sociospatial interactions and shared meanings through time - the model asserts the primacy of sequence to emphasize that time is not just another independent variable. To the contrary, temporality is integral to spatial relations, the constitution of shared meanings, and therefore to the study of place. Policy discourse, then, emerges through the carrying out of policy (administration) in spatial settings already imbued with meaning. Demolition as urban policy, in particular, draws out the material aspects of policy discourse, as demolition is an especially stark intervention into the sociomaterial fabric of the city.

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Key Words: Redevelopment, Neoliberal Urbanism, Housing Policy, Demolition, Multilevel Model

#### UNDERSTANDING THE EXTENT AND NATURE OF SUBCENTERS ACROSS US METROPOLITAN REGIONS

Abstract ID: 869

Individual Paper Submission

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At the turn of the twentieth century, the economies of urbanized areas in the US were dominated by a central core, the geographic expansion of which was constrained by limitations in communication and transportation technologies. Largely facilitated by the prevalence of automobiles, as well as public investment in roads, today the majority of jobs and residents in U.S. cities are located outside of their historical cores. This transformation has induced change in urban theories, once grounded in models of the monocentric city, to account for the dispersed nature of employment and residents within cities. At the same time, empirical work has sought to understand the scope and nature of dispersed patterns of employment within cities (Giuliano and Small, 1991; Garreau, 1991). In particular, studies have sought to measure the emergence of subcenters of employment – hubs (or centers) of dense employment within cities – which is in contrast to studies that identify development that is more random and dispersed in nature (Gordon and Richardson, 1996).

The current study focuses on the location of employment within metropolitan regions in the US. Due to both data and computational limitations, measures of sub-centers have been mostly limited to the analysis of single regions. Few studies have attempted to measure the extent and nature of subcenters in regional economies as part of a comprehensive, multi-regional analysis. This study seeks to provide a more robust basis for understanding the landscape of decentralized employment patterns across U.S. regions by comparing the extent and scope of subcenters across 377 metropolitan regions. Additionally, there is little research into the nature of economic activity within subcenters. For example, are subcenters home to relatively higher paying jobs, on average, are they more likely to be home to services compared to manufacturing activities, and do jobs within subcenters require higher educated workers than in non-subcenter parts of regions?

To address these gaps, the current research is motivated by four primary research questions. First, what percentage of employment is found within sub-centers across cities, and does this vary by city size and geographic region (the Northeast compared to the South, for example)? Second, what is the average count of subcenters across regions and how does this vary by region size? Third, what is the nature of employment activity within sub-centers and which industries tend to locate in subcenters compared to non-subcenter areas? Fourth, has the concentration of employment within subcenters become more or less pronounced over time? Giuliano and Small's (1991) identification approach is used to measure subcenters and is adapted to different regional contexts, although the findings presented in this research are consistent across different approaches of subcenter identification. The Census Bureau's Longitudinal Employer-Household Dynamic (LEHD) program will be the primary dataset employed in this analysis. LEHD provides employment counts by 2-digit NAICS category for census block groups over the period 2002-2018.

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Key Words: Subcenters, Polycentricity, Decentralization

#### **A WAY OUT OF NO WAY: STRUGGLES FOR ECONOMIC SURVIVAL IN BLACK MILWAUKEE**

Abstract ID: 876

Individual Paper Submission

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Following the departure of many large employers in the 1980s, local public policy has focused on subsidizing so-called “value generating” activities, fully embracing the creative class thesis in the early 2000s (Zimmerman, 2008) and coalescing around a dual strategy of industrial development and revitalization of the city’s downtown. While these efforts have succeeded in gentrifying several Milwaukee neighborhoods (Maciag, 2015) data suggests that many communities remain in the midst of a decades-long economic downturn (Levine, 2020).

I argue that the local state’s economic development strategy has continually failed to address Milwaukee’s protracted crisis in social reproduction because of its adherence to racialized and gendered conceptions of value that invisibilize collective and non-capitalist solutions to social and economic challenges. In the context of the U.S., the obsessive hierarchical juxtaposition of “blighted” and disadvantaged inner cities against advantaged white suburbs elides the relational nature of poverty and denies actually existing practices of urban life-making. This ideological orientation ultimately leads to practices of public investment aimed at individual uplift and aesthetic remediation rather than direct support for livelihoods in marginalized communities.

Drawing on insights from feminist political economy and black geographies, this paper adopts an epistemological framework that seeks to recognize and make visible the ways in which poor and working-class Milwaukeeans in the city’s most disinvested neighborhoods are envisioning and enacting new economic relations based in the radical potential of the local community. I do this through a case study of the Sherman Phoenix, a self-described “hub for black entrepreneurs” created out of the literal ashes of a multinational bank, which was burned down during a night of protest over the police killing of a local black man. In its refusal to view black Milwaukee as only ever a space of lack, the Sherman Phoenix demonstrates the complex and sometimes contradictory ways in which struggles to survive and thrive after abandonment are negotiated. I suggest that this alternative approach to development constitutes what J.K. Gibson-Graham call an experiment in building a “community economy” (Gibson-Graham 2013).

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Key Words: economic development, race and gender, community economies, Milwaukee

#### DISASTER ASSISTANCE WINNERS AND LOSERS: DO SMALL BUSINESSES BENEFIT?

Abstract ID: 885

Individual Paper Submission

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Small businesses are important to our communities in normal times and after disaster events. However, this study identifies and tests conflicts for Federal disaster aid providers and impacted businesses that might affect how much small businesses actually benefit from recovery funds. For aid providers, loan-based assistance leads to a balance between allocating aid to businesses that were most damaged and those that will be able to repay the funds; for businesses, capital is crucial to their post disaster survival, but the threat of long-term debt can deter them from

participating, even if loans are below market rate. This study uses the case of Galveston, Texas after Hurricane Ike to understand which of these forces takes precedence in the amount of funds approved to businesses and which businesses chose to utilize the funds in recovery.

This research finds that these conflicts lead to a paradox where businesses that are both more likely to receive more funding and utilize loans are more likely to have the resources to recover in the first place. Specifically, the analysis finds that repayment ability was a key determinant of loan amount, with larger businesses, older businesses, and corporations being approved for more funds. Conversely, debt played a role in business decision-making when it came to using funds: loan term and damage were negative predictors of whether a business accepted and used the funds once approved, whereas business size was a positive predictor. These findings suggest that planners may need to create their own recovery programs specifically targeting subgroups of businesses that are important to their communities. Because, although important to many economic development initiatives, small businesses, entrepreneurs, and sole proprietors may not benefit from federal assistance, particularly if they were severely damaged.

Lastly, this research lends evidence to suggest there is a recovery dichotomy for businesses after a disaster, which highlights importance of training businesses in continuity, mitigation, and recovery planning. The existing literature suggests a vicious cycle where if a business is damaged, they not only face costs related to replacing the physical capital but also by the secondary losses due to the interruption of its operations. If recovery funds are delayed, repair can't begin and interruption is prolonged. This research shows that physical damage was only a marginally significant indicator of loan amount and was a negative predictor of disbursement; time to application and deliberation time were both positive predictors of loan amount, and deliberation time was a positive predictor of the business choosing disbursement. This lends some empirical evidence to the idea that if businesses can avoid initial damage and are able to continue their operations so that delay time isn't compounding their losses, they are more likely to benefit from Federal disaster assistance. By reducing initial damage, businesses may not just avoid the vicious cycle, but may actually put themselves into a virtuous cycle, which can be promoted through planning initiatives.

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Key Words: small business, economic resilience, disaster planning

#### **STATE RESPONSES DURING COVID-19 PANDEMIC AND THEIR IMPACTS ON SMALL BUSINESSES**

Abstract ID: 887

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The unexpected outburst of the Covid-19 pandemic in March 2020 has had immediate impacts on small businesses. Studies from the early stages have predicted severe consequences, including massive job losses and closures (Fairlie 2020; Bartik et al. 2020). While early stages studies were crucial for an initial assessment, none of them could have foreseen that a second and much larger wave would follow the first in late 2020.

Beyond the severity of the pandemic itself, the responses adopted by state and local governments produce yet another set of changes in small business operating environments. A closer examination of state executive orders reveals substantial variation in local responses based on how orders affect public liberties, alter or suspend existing rules and regulations, and degree of enforcement (Curley and Federman 2020).

This paper provides evidence of how small businesses experience these institutional environment changes during 2020 across the United States over a more extended period: April to December. The main question is how the diversity of policy responses affected small businesses in three indicators: perceptions of general effects of the pandemic on the business, recovery expectations, and overtime availability of cash on hand (aka financial resilience). We rely on data from the Small Business Pulse Survey – a monthly panel data beginning in April 2020 – combined with other sources such as the State Orders database, Google mobility data, Covid-19 cases and deaths, Current Population Survey, Business Dynamics Statistics, and others.

We carry a three-stage empirical strategy. First, we gather insights from descriptive analysis. Next, taking advantage of the panel structure of the Pulse data, we provide fixed effects estimations, which allows the study of the pandemic and the policy responses absent unobserved state-level heterogeneity. Such estimation, however, prevents us from studying time-invariant characteristics known to affect the levels of entrepreneurship and business activities such as the industry mix, taxes, average firm size, diversity, and others (Armington and Acs 2002). To examine the extent to which those factors affected businesses during pandemic times, our third strategy comprises a set of pooled OLS estimates.

Our discussion has implications for several other social dimensions. Not only do small businesses comprise a large share of all employers, but they are often run by minority and immigrant owners, usually with more challenging access to credit and financial resources (Huang and Liu 2020). Understanding how they experienced the pandemic and were affected by local policies is also informative of how these communities did.

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Key Words: Small Businesses, COVID-19, State Policy

#### **THE ROLE OF CITY GOVERNMENT IN SOCIAL INNOVATION: SEOUL, KOREA’S SOCIAL INNOVATION NETWORK**

Abstract ID: 930

Individual Paper Submission

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City-level governments throughout the world are increasingly seeking to reconcile strategies for urban innovation with goals of social inclusion. Seoul, South Korea is one example. Over the past 20 years, Seoul’s social economy has developed rapidly as a result of social innovation policies designed by the municipal government. For example, the number and the sales of social economy organizations (SEOs) nearly doubled between 2014 and 2019. This research aims to understand the characteristics of social innovation in Seoul by examining the institutional context of the

innovation and analyzing the social innovation ecosystem through Social Network Analysis of SEOs in Seoul Innovation Park.

Although the definition of social innovation varies, this study defines social innovation as a regional process of including subjects and issues that were previously excluded from in economic development process. In Europe, social innovation has been largely driven by grassroots movements and civil society actors (Unger, 2015), but in South Korea, government entities have played a more instrumental role in social innovation efforts. The Seoul government began to promote social innovation to include marginalized people in the background of serious unemployment and economic inequality structured after the 1997 financial crisis. The policymakers tried to promote citizen engagement through social innovation on one side (Kim et al., 2015), but also regarded social innovation as an alternative to the crisis of political and aggressive civic movement that once led the democratization movement in South Korea. Moulaert et al. (2005) argued that linking theories on social innovation to resistance against social exclusion and innovative emancipatory strategies is significant in the explanation of local development. We need to better understand how local government efforts to promote social innovation engage and support social economy actors on the ground.

Seoul Innovation Park was established by the City of Seoul in 2015 as a spatial platform for social innovation, where various actors discuss and experiment to address social issues. We conducted a Social Network Analysis of 132 SEOs located within the park to assess their connectivity to one another. We find that Seoul's social innovation network shows a diversity of relationships among SEOs, with a high centrality of government-affiliated intermediate support organizations within those networks but fragmentation among those organizations. We additionally conducted interviews to better understand the qualitative characteristics of the network. While the benefits gained from the network varied depending on the stages of growth of SEOs, they commonly mentioned that psychological stability, confidence and socialization were the most important resources gained through the network. However, we find that SEOs tend to rely primarily on government projects for their financial resources, and they often evaluate financial sustainability as not high as a result. Furthermore, respondents pointed out the excessive diversity of the organizations in the park as a hindrance of knowledge sharing through the network and showed skepticism about the efforts of intermediary support organizations to promote networking opportunities as an end in itself.

Our findings suggest both potential and limitations for local government-led efforts to promote social innovation. We find that the localization of resources within a district-based innovation park facilitates accessibility for SEOs as they startup and manage enterprises. And local government involvement can bring a mix of scale, resources and local context-specificity that may be harder for grassroots- or national-level policy actors to achieve (Schrock and Wolf-Powers 2019). But especially in an institutional context like South Korea's with a strong history of state developmentalism, active local government involvement can easily become bureaucratic in character. This can potentially hinder the formation of collaborative relationships among social economy organizations, which may limit their collective efficacy for innovation and social-economic change.

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Key Words: Social Innovation, Social Economy, Social Network Analysis

## **AN ANALYSIS OF THE ECONOMIC IMPACT OF COVID-19 AND THE C.A.R.E.S. ACT ON AFRICAN-AMERICAN WORKERS AND BUSINESSES IN VIRGINIA**

Abstract ID: 1010

Individual Paper Submission

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The impact of the COVID-19 pandemic on the entire US economy has been one of the most severe in the country's history. The health crisis and the lockdown it necessitated has triggered an economic crisis. However, the impact has been disproportionately severe on historically disadvantaged minority groups. Blacks and Hispanics have suffered the most both in terms of health and economics. To add to the trauma, during the height of the COVID pandemic, a racial crisis unfolded in the summer of 2020, exacerbating the challenges in an already difficult situation leading many to dub the situation the "triple pandemic."

From their arrival on the banks of Virginia as slaves, Blacks have always been in a precarious economic position in the US. A system enshrined with racist policies and conventions that has resulted in systematic and institutional racial inequality over time. Underlying structural inequality meant that blacks were already in a vulnerable economic position in early 2020. The pandemic exacerbated those vulnerabilities and highlighted the structural and institutional causes. Historically blacks have been the hardest hit and the slowest to recover from the economic crisis. Further, policies designed to assist, in some cases, have further marginalized vulnerable groups.

The \$2.2 trillion CARES Act provided direct payments to citizens, loans to businesses, and expanded unemployment coverage. Like its predecessor, the American Recovery and Reinvestment Act (ARRA) of 2009, the CARES Act was rolled out quickly, increasing people and communities' potential of falling through the cracks. History has proven that ARRA did not benefit Blacks in the same way that it did other groups due to oversights in implementation planning. A significant proportion of Black-owned businesses could not capitalize on the available resources due to complicated and often overwhelming requirements. Further, black workers were systematically excluded from the jobs created due to a focus on industries where they were underrepresented. Black communities received far fewer dollars per capita than white communities (Harper-Anderson, 2012). Preliminary evidence suggests that implementation of the CARES Act is having similar results.

The purpose of this research is to assess the economic impact of COVID-19 on Blacks compared to Whites in Virginia. I use Current Population Survey microdata to analyze the impact on employment and business closure by race, disaggregating results by occupation and industry. I next examine the implementation of policy responses focusing on the unemployment insurance claims and PPP loans by race using UI claims data and SBA PPP loan data. Finally, I compare results from the current pandemic to those of the Great Recession in terms of racial inequality and make recommendations for a more equitable recovery.

I find that between February and December of 2020, Blacks have been disproportionately impacted by the pandemic both in employment and business closure. Further, while unemployment is lower in Virginia than in the US, the Black-White gap is larger and grew during the pandemic. The policy response, including unemployment insurance payments and PPP loans, were not distributed equitably. Whites received larger loans earlier and in greater numbers than blacks. Preliminary analysis suggests that black received fewer benefits even after controlling for occupation and industry and were less likely to work from home and receive pay without working.

The triple pandemic will leave deep economic wounds, particularly for people of color, requiring policy interventions at all levels. The field of planning has a long history of promoting policies and programs that have an enduring negative effect on Blacks' economic fate. Recovery from the triple pandemic will require innovative strategies in workforce development, economic development, and housing to help communities recover. This research plays a

role in highlighting obvious places to start.

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Key Words: COVID, inequality, entrepreneurship, employment

### THE ROLE OF SPATIAL PROXIMITY FOR URBAN INNOVATION PERFORMANCE IN CHINA'S ELECTRONIC INFORMATION INDUSTRY

Abstract ID: 1016

Individual Paper Submission

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While theories of agglomeration economies have long predicted that spatial proximity between economic agents generates agglomeration benefits and promotes growth and innovation, only a few studies explored whether these positive externalities, especially knowledge externalities, are highly localized or spill over beyond the limits of a city or region (e.g. Andersson & Karlsson, 2004; Breschi & Lissoni, 2001). Moreover, empirical evidence on the expected role of agglomeration in innovation in China are relatively few (e.g. Sun, 2000). Focusing on China's Electronic Information (EI) industry, this study aims to explore the relationship between agglomeration economies, knowledge spillover and the geography of technological innovation performance across Chinese cities. Two key questions are explored here: 1) whether and to what extent spatial access to knowledge sources (e.g. research universities/institutions), skilled labors and markets in other cities matter in urban innovation performance of the Electronic Information (EI) industry; 2) how the role of spatial spillover effects vary among cities of different sizes and regions.

The 75 "innovation pilot cities" in China that are prefecture-level and above are chosen as the study areas. Following the standards by the Statistical Bureau of China, these cities are categorized into 5 classes (i.e. small, medium, large-I, large-II, extra-large) based on the 2016 urban permanent population and are assigned to 4 different regions of China (i.e. East, North-East, Central and West). The 2013 Economic Census is used as the primary data for constructing city-level variables. Technological innovation activities are represented by patent grants queried from China Intellectual Property Bureau for the years 2016 to 2018 and are further differentiated into major innovation (i.e. invention patents) and minor innovation (i.e. new utility models and exterior design patents), based on their relative importance to regional economic development (Sun, 2000).

Following the conceptual framework of innovation systems (Fischer, 2001), we include measures of manufacturing, scientific, producer service, and institutional sectors as key determinants of technological innovation at the city-level. To account for the potential spillover effects from other cities, spatial regression models are applied to include spatially lagged independent variables that embed measures of accessibility to resources (e.g. research institutions) and actors (e.g. R&D personnel, customers) at other cities (Paez, 2004). To test for the different effects of accessibility on cities of different sizes and regions, interaction terms are generated between each of the spatially lagged independent variable and city size or region categories, respectively.

The preliminary results indicate that the overall economic size, specialization in the EI industry, and the number of



research universities/institutions at the city-level are positively associated with urban innovation performance in the EI industry. Larger R&D investments and longer years of a city getting innovation policy supports are positively associated with major but not minor innovation activities in the EI industry. Moreover, positive and significant spatial spillover effects on both major and minor innovation are mostly found for small (i.e. 200,000-500,000 population) and medium sized (i.e. 500,000-1 million population) cities as well as cities located in the Central region of China.

This study adds to innovation studies by investigating urban innovation capacity among Chinese cities in recent years. Our findings imply that while the future growth and innovation pole of China's EI industry may still be concentrated in large cities in East and Central regions of China, small and medium sized cities in the Central region have the potential to further enhance their innovation capacity through "borrowing size" from larger and higher-order cities. Methods to improve accessibility and decrease the inter-city time distance between those cities and higher-order cities in the East and West regions may have the potential to improve their innovation performance in the EI industry.

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Key Words: Technological innovation, Agglomeration economies, Knowledge spillover, Electronic Information industry, China

#### **RACE, GENDER, AND THE URBAN WAGE PREMIUM: WHO BENEFITS FROM INCREASES IN A CITY'S POPULATION?**

Abstract ID: 1049

Individual Paper Submission

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A large body of research has documented that workers' wages are systematically higher in more populated and denser cities, a phenomenon known as the "urban wage premium." Moreover, it is becoming increasingly accepted that the urban wage premium is mostly true for college-educated workers, who gain substantial benefits from locating in more populated cities, while for non-college-educated workers, there seems to be little wage advantage to locating in a larger city. A handful of recent papers however, have shown that the urban wage premium varies not only across education levels but also race and gender, leading to larger racial and gender wage gaps in more populated/denser cities. From these recent papers, we know that cross-sectionally, city-size and density are associated with stronger (and rising) racial and gender wage inequality across U.S. cities. Conversely, this paper seeks to understand whether increases in population and density over time within cities are positively related to increases in Black-White, Latinx-White, and female-male wage inequality. After controlling for a range of individual and urban-level characteristics, I find that rising population within U.S. city-regions is strongly correlated with increases in Black-White nominal wage inequality, though there are clear relationships with Latinx-White and female-male inequality as well. At the same time, increases in wage inequality depend not only on whether a city-

region's population grows, but also who drives that population growth.

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Key Words: wage inequality, race, gender, urban wage premium, migration

### THE WHOLE FOODS EFFECT? THE RELATIONSHIP BETWEEN SUPERMARKET DEVELOPMENT AND PROPERTY VALUES IN HARLEM, NEW YORK

Abstract ID: 1053

Individual Paper Submission

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In 2016, the global real estate database company, Zillow, published a study that found the typical home near a Whole Foods or a Trader Joe's cost more and appreciated faster than homes lacking proximity to these supermarkets. Food gentrification and residential gentrification are correlated but do high end supermarkets like Whole Foods spur gentrification or do they follow it? We examine housing prices surrounding the Whole Foods on 125th Street in Harlem, New York City. We create a hedonic price index for residential sales. We apply a fixed effects difference and difference estimator model to examine changes in housing prices in  $\frac{1}{8}$  mile buffer increments. We find that the opening of the Whole Foods on 125th Street did not increase real estate prices within the immediate vicinity of the store but that it may have spurred price increases at greater distances. We also find that real estate appreciation may have been captured before the opening of the store.

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Key Words: Gentrification, Neighborhood Retail, Economic Development, Quasi Experimental Design, Hedonic Price Model

### PATTERNS OF ECONOMIC DEVELOPMENT COLLABORATIONS: EVIDENCE FROM IOWA

Abstract ID: 1067

Individual Paper Submission

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Collaborations lie at the core of the third-wave economic development planning and policy. Scholars have theoretically discussed the prevalence of public-private partnerships and the barriers to intergovernmental collaborations at the local level. However, we still have limited understanding on how state and local governments pursue economic development collaborations in practice. To address this gap, we analyze formalized economic development collaborations in Iowa. Our analysis aims to answer the following five questions: (1) Who are the partners of state and local governments in economic development collaborations? (2) In what institutional forms (e.g., service contract, joint operation, and transfer of authority) local governments collaborate with other governmental and non-governmental organizations in economic development? (3) In what economic development areas (e.g., business incentives, workforce development, and physical infrastructure) local governments collaborate with other governmental and non-governmental organizations? (4) Under what conditions state and local governments choose to enter economic development collaboration agreements with other governmental and non-governmental organizations? (5) What are the challenges that arise during these collaborations? And what practices are used or could have been used to address these challenges?

To answer the first three questions above, we conduct a content analysis on the Iowa 28E economic development collaboration agreements. Chapter 28E of the Iowa Code permits state and local governments to provide joint services and cooperate with governmental and nongovernmental agencies for accomplishing mutual interests through intergovernmental agreements. These collaboration agreements are filed with the Iowa Office of the Secretary of State. Chapter 28E defines public agencies as political subdivisions in Iowa or another state, federal and state government agencies, and federally recognized Indian tribes. The digital repository of agreements is publicly available (<https://sos.iowa.gov/>), which include more than 120 agreements signed for the economic development purpose since 2007. Our preliminary analysis has identified the active role of the state government in workforce development through service contracts. At the local level, we report that city governments collaborate with various governmental and non-governmental organizations in seven areas of economic development activities and through a variety of institutional forms.

To answer the last two questions, we will conduct semi-structured interviews with state and local government officials who are/were involved in some of the recent Iowa 28E economic development agreements. This qualitative analysis will shed light on the benefits, costs, and best practices in economic development collaborations.

This research contributes primarily to planning practice. It provides insights into how government pursues economic development collaborations in different areas of economic development activities.

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Key Words: economic development, inter-jurisdictional collaborations, public-private partnerships, local government

## ECONOMIC DEVELOPMENT AND HOUSING STRATEGIES: AN ANALYSIS OF THE NEW ECONOMY OF NORTH AMERICAN CITIES

Abstract ID: 1106

Individual Paper Submission

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Over the past two decades, North American cities have pursued the attraction of highly skilled and educated workers, alongside a series of entrepreneurial and innovation-oriented strategies to support tech-led development (Florida 2018). Such strategies have become deeply embedded in economic development practices despite critiques by urban planning scholars and activists alike. Yet, there are growing concerns that housing in major North American cities is becoming unaffordable, fuelled – in part – by these very same activities. There is growing concern that major cities that are ‘successful’ in the new economy have become less affordable for, and inclusive of, a broader spectrum of people (Lee 2018; Zukin 2019). As a result, high housing costs are increasingly viewed as a potential barrier to attracting young, skilled workers (Moos et al. 2018), especially in cities where these ‘new economy’ activities have taken hold.

In this paper, we advance our previous exploratory analysis of the relationship between housing policies and economic development strategies in major North American metropolitan areas by including a quantitative analysis of the relationship between local economic development plans, housing strategies and place-based characteristics. We draw upon a database capturing the policy details associated with 131 local economic development plans and 119 housing strategies across 59 metropolitan regions in Canada and the United States with populations greater than 1 million. We derive 13 variables capturing the local economic development and housing policy context drawing on methods and analytical techniques similar to those used elsewhere (cf. Kramer and Filion 2011). We assemble socio-economic data from the 2016 US American Community Survey (ACS) and the 2016 Canadian Census for these jurisdictions to describe key place-based socio-economic and demographic characteristics, including industrial structure, the prevalence of tech jobs, the proportion of young adults and educational attainment.

First, we examine whether these economic development plans identify talent attraction as a key element of their strategies, whether there was a specific youth or young adult focus related to talent attraction, and if housing and housing affordability issues were considered. We find that the majority of economic development strategies tout the presumed value of ‘talent attraction’, particularly young workers, as well as the importance of housing.

Second, we assess the housing strategies within these same jurisdictions to determine whether there was a bias toward young, skilled workers. We find that young adults entering the housing market for the first time receive little explicit attention in housing strategies. We also find that most housing strategies focus on low-income and marginalized populations, especially in the US due in part to federal requirements. Yet, in most cases, housing and economic development strategies are not explicitly linked, especially when it comes to the actions delineated in these strategies.

Finally, we conduct a principal components analysis using our place-based socio-economic, demographic and policy variables to establish a typology of metropolitan regions capturing the relationships that exist between concentrations of a young, skilled workforce, housing affordability and the local economic development and housing policy context. Overall, we conclude that – but for a small number of jurisdictions – these two domains of planning remain largely disconnected in practice and argue that economic development planners must actively consider housing market dynamics and affordability. Moreover, planning scholars have a role in drawing closer attention to the relationship between these domains.

Citations

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Key Words: economic development, housing affordability, youth, new economy, talent attraction

## **POSTERS**

### **CIRCULARITY, REUSE, AND ZERO WASTE DEVELOPMENT: PARTICIPATORY RESEARCH TO ADVANCE THE REGIONAL CIRCULAR ECONOMY**

Abstract ID: 95

Poster

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Visions for a circular economy seek to disrupt the enormous amount of waste generated by a linear system that extracts raw materials from the earth to construct the built environment, including its buildings and infrastructure, only for those materials to be dumped into landfills after a relatively short lifespan (Fusco Girard & Nocca, 2019). In a circular system, natural resources and embodied carbon are conserved through prolonging the lifespan of existing building stock through preservation, retrofitting, and repair (Huuhka & Vestergaard, 2019; McCarthy & Glekas, 2019); deconstructing buildings and salvaging usable fixtures and building materials; and transforming new construction through designing with repurposed building materials and for deconstruction (Hebel et al., 2014).

There have been growing calls for whole countries, regions and communities to achieve circularity, particularly within Europe and Asia (Kovacic et al., 2019). Within North America, there have been efforts to re-envision local government and private sector systems of demolition with deconstruction, particularly within Vancouver, CA; in the Bay Area Deconstruction Working Group; Portland, Oregon; and New York, NY. However, research into how concepts of circular economy fit within the highly variable and uneven regulatory context of urban planning and historic preservation in North America remain limited. Likewise, there has been limited planning scholarship into how deconstruction efforts might fit into the creation of green jobs and sustainable transformation of construction activity.

The Circularity Reuse, and Zero Waste Development (CROWD) Taskforce developed out of an alliance of community leaders and academics concerned with a vast system of building material waste within New York State. CROWD seeks to advance sustainability, resilience, and green jobs within the built environment. CROWD's efforts are aimed at helping communities realize the environmental, cultural and economic benefits of prolonging the lifespan of buildings and reusing building materials and architectural elements through research, education, policy initiatives and design that emphasizes deconstruction, salvage, and preservation.

The Task Force draws three programs at Cornell University - the Just Places Lab in the Department of City and

Regional Planning; the Circular Construction Lab in the Department of Architecture; and the Susan Christopherson Center for Community Planning. The research labs and community planning center have employed a wide variety of research methods in support of developing practical means of advancing a spectrum of building reuse to deconstruction and re-use of building materials. The efforts of the working group employ participatory action research; analysis of demolition and deconstruction ordinances; spatial analysis of demolition sites; social scientific methods to understand the perspectives of actors involved in demolition, deconstruction, salvage, and reuse; and architectural studies of deconstruction potential. The group is sustained through the community leadership within organizations such as Historic Ithaca, Preservation Association of Central New York, the Finger Lakes Reuse, Inc., among other nonprofit and governmental leaders.

This poster provides an overview of the research frameworks and efforts that underpin CROWD's work, the outcomes of research that combines the efforts of community organizations, faculty research, and students in research positions and classes. The aim is to share not only the results of this research, but provide insights that could be compared with efforts in other communities and replicated in other regions.

#### Citations

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Key Words: Circular Economy, Circular Cities, Zero Waste Development, Reuse, Circularity

# Track 4 – Environmental Planning & Resource Management

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### 4.2 PRE-ORGANIZED SESSION - URBAN GREEN PLANNING AND CLIMATE JUSTICE: CONFLUENCE AND CONFLICTS

Pre-Organized Session 2 - Summary

Session Includes 22, 24, 25, 26, 1007

CONNOLLY, James [University of British Columbia] jconnoll@mail.ubc.ca, organizer

Can urban planning address climate change by greening cities without compromising social justice? Recent literature argues that conflicting pressures generate inevitable tradeoffs wherein even equity-driven urban adaptation or mitigation projects are left not going far enough to redress past urban injustices, including unequal development; inequitable enforcement of zoning regulations; and deeper histories of exclusion, segregation, settler-colonialism, and dispossession. Viewing these issues as fundamental in shaping the possibilities for urban climate justice within the globalizing green city orthodoxy, this panel highlights ways that planning can address the underlying conditions generating pressures to tradeoff between social and ecological goals. The studies presented unearth the foundations of a way of practice that shifts planners toward a deep engagement with issues of climate justice in the context of urban greening. Both climate mitigation and adaptation measures that seek to make cities more just require such a shift in practice as superficial adjustments to orthodox green planning have proven to be insufficient.

Objectives:

- Examine the role of green planning relative to a variety of urban socio-environmental tensions related to climate justice
- Highlight fundamental lessons, bases of knowledge, and examples of action pointing toward a mode of planning that is informed by climate justice challenges
- Foreground issues of greening and racial change in neighborhoods, green gentrification, equitable jobs through green infrastructure, and exclusive green design and urban renaturing programs, among others

### THREE HISTORIES OF GREENING AND WHITENESS IN AMERICAN CITIES

Abstract ID: 22

Abstract within Pre-Organized Session 2

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How has urban greening related to the degree of whiteness in neighborhoods? The answer to this question provides an essential “historical diagnostic” that can be used to develop an approach to urban ecology which integrates racial and ethnic change into the planning for proposed interventions. In this paper we employ state sequence analysis to analyze the historical trend of greening (including the implementation of new parks, greenways, community gardens, green recreation areas, and nature preserves) between 1975 and 2014 in a sample of nine cities in the United States relative to concentrations of white and non-white residents. We divide the nine cities into three common growth trajectories and separately examine the trends for each growth trajectory. We further illustrate these trends by mobilizing qualitative data from field work in selected neighborhoods to help explain the processes that generate certain key findings in the quantitative data. We find that the relationship between greening and

race/ethnicity differs according to city-level growth trajectory. Cities with continuous high and rapid levels of growth in the postwar period have the strongest link between increased greening and whiter populations. Meanwhile, in cities that contracted or had a punctuated growth pattern, non-white areas had a uniformly low level of greening that occurred mostly in recent years. In all, we show how urban growth, greening, and whiteness are inextricably associated qualities of American cities. We argue that understanding this association is essential for development of a race-conscious model for green planning.

#### Citations

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Key Words: Urban Greening, Racial Justice, Green Gentrification, Green Reparations, Climate Justice

#### **THE PARADOX OF THE CLIMATE-RESILIENT POST-INDUSTRIAL CITY: INFORMAL GREEN SPACE AND GENTRIFICATION IN PHILADELPHIA, PENNSYLVANIA**

Abstract ID: 24

Abstract within Pre-Organized Session 2

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Considerable research on green gentrification has been conducted in large cities with consistent population growth and limited land availability: Boston (Anguelovski et al. 2020), New York City (Checker 2011), Seattle (Dooling 2009), and Vancouver (Quastel 2009). Many of these cities have climate resilience planning efforts that enhance green gentrification or climate gentrification through infrastructure upgrades (Shokry, Angulovski and Connolly 2020). However, green gentrification is also occurring in other cities with modest population growth, fewer land pressures, and less private investment, yet also face climate vulnerabilities, such as increased rainfall and hotter temperatures. Post-industrial cities with a history of depopulation and disinvestment have vacant land available for development and growth, as well as extensive green space, though much of it is informal and overgrown. This type of leafy green vegetation has yet to be thoroughly explored in the green gentrification literature, and it presents an interesting context for promoting climate resilience. Large, leafy, overgrown lots contribute to urban vegetation cover, though many residents and planners view this type of vegetation as a nuisance that attracts undesired activities, such as crime or dumping. Post-industrial cities caught in economic decline seek to reinvent themselves as sustainable, attractive cities that balance sustainability with economic growth. The dual aims of economic growth and environmental sustainability present a paradox: the greener, officially, a city becomes, the more informal green space that could be applied towards climate resilience it loses. This study conducts a time-series analysis over two decades to examine the relationships among vegetation abundance and condition, surface temperature, and gentrification in Philadelphia, Pennsylvania. We draw on satellite imagery from the Moderate Resolution Imaging Spectroradiometer (MODIS) 16-day Vegetation Index Product and 8-day Land Surface Temperature Product from 2000–2020 to examine changes in vegetation cover and surface temperatures, land use data, building permit data, and demographic data from the 2000 US Census, 2010 Census, and American Community Survey in Philadelphia,



Pennsylvania to examine the following research questions: 1) How have development dynamics across urban neighborhoods in Philadelphia influenced patterns of vegetation and temperature from 2000-2020? 2) How does the relationship between vegetation cover and temperature vary across the changing socio-economic context? Building upon Pearsall and Christman (2012), we hypothesize that the relationship between temperature and vegetation responds to development dynamics and reveals uneven impacts of development on changing neighborhoods. This study points towards a dilemma for post-industrial cities simultaneously seeking to promote economic development and growth while becoming more climate resilient.

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Key Words: green gentrification, climate resilience, urban greening, time-series analysis, vacant land

### DECOLONIZING THE GREEN CITY: FROM ENVIRONMENTAL PRIVILEGE TO EMANCIPATORY GREEN JUSTICE

Abstract ID: 25

Abstract within Pre-Organized Session 2

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The expanding reach of urban greening across the United States and beyond often materially and immaterially impacts communities of color, leading to displacement and decreased access to new urban amenities. While many scholars point to the persistence of racial inequality, we see the urban greening orthodoxy in urban planning and development as evidencing a deeper strain of environmental injustice bound up in white supremacy. In this paper, following the prompts of the Black Lives Matter Movement to enact life-affirming Black geographies, we call for decolonizing the green city and for an emancipatory spatial imaginary to enact green justice. Reflecting on the development of the 11th Street Bridge Park in the predominantly Anacostia neighborhood in Southeast, Washington DC, we ask how urban greening can enact a more emancipatory green justice. Building on 30 interviews with residents, activists, community organizations, and planners, we trace the contours and constraints of current greening and equity logics and practices and contend that decolonization and emancipation fundamentally require new spatial planning practices. While the green project is deployed as an “intentional” equity-centered infrastructure, it is limited in its ability to embrace multiple forms of land recognition, redistribution, control, and reparations and to develop green practices that engage with the history of a multi-layered geography of dispossession and include cultural and symbolic recognitions of networks of resilience and care. We thus argue for a more emancipatory spatial imaginary that confronts white supremacist forms of dispossession; centers resistance to anti-Blackness; and articulates a geography of reparations through decolonizing settlement patterns at multiple

geographical scales.

#### Citations

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Key Words: green justice, green gentrification, abolitionist ecologies, black geographies

#### PLANNING AT THE END OF THE WORLD

Abstract ID: 26

Abstract within Pre-Organized Session 2

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Keywords: futurity, Anthropocene, urban greening, otherwise planning

Cities have become key sites where people are confronting what it means to live together and collectively inhabit the so-called Anthropocene, if in radically uneven ways (Pulido, 2018). Projections of urban futures are not only important for how they shape possible futures but also for how they function biopolitically in the present (Smith and Vasudevan, 2017). At the turn of the twenty-first century, Detroit, Michigan—the city that put the world on wheels—was transformed into a laboratory for postindustrial futures. In 2013, a citywide plan called Detroit Future City proposed a major reordering of the city's land use and services. Widely touted as bringing together the brightest leaders and cutting-edge planning practices for sustainably managing cities, the framework sought to remedy the city's spatial mismatch between a declining population and historical urban footprint through urban greening. This talk uses the tensions and complex question of justice that arose as plans unfolded to decommission and ruralize parts of Detroit to think about the ethical and political imperatives to embrace "otherwise" planning—that is, to plan in ways that break from white supremacist, colonial, and capitalist spatial and ecological imaginaries (Bates et al., 2018). As Detroit became an exemplar of urban shrinkage, the newly inaugurated Detroit Metropolitan Truth and Reconciliation Commission on Racial Equity was engaged in a different kind of future-making project—one of racial healing. Drawing on ethnographic fieldwork in Detroit, this talk analyzes the confluence of these two projects, specially how they rubbed up against residents and activists' visions for their own futurity. I consider the aspirations and politics of recuperation and knowledge embedded in these competing imaginaries and the stakes thereof for collectively building more just, livable cities able to meet the urgency of our times.

#### Citations

- Edited by Lisa K. Bates with, Sharita A. Towne, Christopher Paul Jordan, Kitso Lynn Lelliott, Lisa K. Bates, Sharita A. Towne, Christopher Paul Jordan, Kitso Lynn Lelliott, Monique S. Johnson, Bev Wilson, Tanja Winkler, Anna Livia Brand, C. N. E. Corbin, Matthew Jordan Miller, Annette Koh, Konia Freitas & Andrea R. Roberts (2018) *Race and Spatial Imaginary: Planning Otherwise/Introduction: What Shakes Loose When We Imagine Otherwise*, *Planning Theory & Practice*, 19:2, 254-288, DOI: 10.1080/14649357.2018.1456816

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<https://doi.org/10.1177/0263775817699494>

Key Words: futurity, Anthropocene, urban greening, otherwise planning

## THE GREEN JOBS BEHIND GREEN INFRASTRUCTURE: A REVIEW OF THE LITERATURE AND IMPLICATIONS FOR ENVIRONMENTAL JUSTICE

Abstract ID: 1007

Abstract within Pre-Organized Session 2

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Environmental justice frameworks located in urban planning elucidate the potential consequences of green infrastructure in historically marginalized communities. This scholarship accounts of the grey, noxious infrastructure that has been sited in low-income communities of color (Melosi 2004). At the same time, needed greening initiatives can spur “climate gentrification” and increase local property values that lead to residential displacement (Gould and Lewis 2016). This greening effect creates a conundrum for local organizers and advocates who want to improve the conditions of their neighborhood without uprooting existing residents (Anguelovski, 2016).

Critical examinations of green infrastructure projects address neighborhood-level economic impacts, yet communities have also approached economic justice from the perspective of jobs. Community based organizations, unions, and educational institutions have promoted green jobs associated with skilled trades—for example, construction workers and technicians—as a workforce development strategy. They regard green jobs as well-paid, stable opportunities that can create career pathways for people of color (Scully-Russ, 2018).

To foreground these economic justice strategies in relation to green infrastructure initiatives, this review does multiple things. First, the paper contextualizes green jobs discussions in environmental justice scholarship. This body of work has long called for the redistribution of planning’s benefits, including resultant economic opportunities (Schweitzer and Valenzuela 2004). Second, it identifies the green jobs under discussion by applying federal classifications that track labor trends in the green infrastructure planning, operations, and maintenance sectors. It then provides a review of the scholarly and applied research on the equity implications of these jobs. Literature from the fields of community and economic development, sociology, and ethnic studies, as well as studies from policy institutes, document the inequities within these jobs categories. This research also highlight local social movements that have successfully advanced unionization efforts and secured living wages for workers. The review’s synthesis discusses if and how these moves toward economic justice effectively mediate the consequences of capitalism.

This paper proposes several directions for future research, including a call to strengthen inquiries on the intersection of climate action and economic justice. This would ideally involve building a stronger association to investigations of worker protections, including unionization efforts and health and safety protocols. Because the climate action path ahead is a long one, the paper also stresses a needed focus on training and education programs that create career pathways. By bringing together several domains of research and identifying implications for planning research, this review helps fill a critical gap in how we need to understand and rethink green infrastructure.

Citations

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Key Words: Green infrastructure, Green jobs, Community development, Economic development, Climate Action

#### **4.8 PRE-ORGANIZED SESSION - SOCIAL AND ENVIRONMENTAL (IN)JUSTICE IN PLANNING RESPONSES TO NATURAL HAZARDS: A COMPARATIVE STUDY OF THE U.S. EXPERIENCE**

Pre-Organized Session 8 - Summary

Session Includes 215, 216, 217, 218, 268

HUR, Misun [East Carolina University] hurmi@ecu.edu, organizer

The industrial revolution has brought rapid environmental changes. Human integrations have augmented the negative effect on the environment further. As a result, extreme weather conditions and more substantial natural disasters have been observed globally, which caused severe damages to people in various ways locally. Although disrupting for all, the damages are not equally detrimental to everyone by raising an issue of social and environmental (in)justice. In this pre-organized session, we explore diverse subjects in various geographic locations through the lens of environmental (in)justice. Presenters will demonstrate the evidence of the social and environmental (in)justice by presenting and comparing different location-specific hazards and related planning actions cross-sectionally and longitudinally. As a result, we will explore the planning actions for marginalized communities' preparedness in future environmental events. By participating in the discussions, audiences will be able to construct the measures to better support such communities for a sustainable future through reducing the social and environmental imbalances.

Objectives:

- To demonstrate the evidence of the social and environmental (in)justice by presenting and comparing different location-specific hazards and related planning actions cross-sectionally and longitudinally.
- To explore the planning actions for marginalized communities' preparedness in future environmental events.

#### **IOWA'S WATERSHED MANAGEMENT AUTHORITIES: FLOOD RESILIENCY AND ENVIRONMENTAL JUSTICE**

Abstract ID: 215

Abstract within Pre-Organized Session 8

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In states whose native landscapes have been heavily altered by row-crop agriculture, increasing precipitation rates and flood resiliency are pressing concerns (Weber et al., 2017, Villarini et al., 2015). Iowa is one such state, and after catastrophic flooding in 2008, the state created the Rebuild Iowa Office to provide recommendations on increasing resiliency through regional planning efforts. Part of these recommendations include managing floodplains through

watershed-wide regions. In 2010, Iowa followed-through on this recommendation by legislating the ability for communities to create Watershed Management Authorities (WMAs). WMAs are intergovernmental agreements between cities, counties, and Soil and Water Conservation Districts within subbasin-size watersheds, meaning they can contain several counties and dozens of communities. More important, perhaps, is that the creation of WMAs and their subsequent planning and implementation efforts are voluntary. Given the dominance of row-crop agriculture on Iowa's landscape, the onus for flood mitigation and resiliency is largely on farmers and landowners voluntarily implementing Best Management Practices (BMPs) to store water or slow its release into waterways. Watershed plans created by WMAs recommend practices for farmers and landowners to implement, while recognizing that flood impacts that can be felt downstream. Evidence suggests that vulnerable populations face inequalities when recovering from flood damage, however (Muñoz & Tate, 2016), which calls into question how a voluntary approach to flood mitigation can serve environmental justice.

The research here aims to answer if relying on recommendations and voluntary practices can serve a broader purpose of environmental justice for those living in flood-prone areas. To this end, a review of current WMAs' watershed plans was conducted, with a focus on how many WMAs have completed plans, how extensive they are in implementing flood mitigation, and how many areas of the state do not yet have such plans. Current plans were compared to assess how environmental justice may or may not be taken into account. Preliminary analysis indicates that extensive work has been done to demonstrate the hydrology of the watersheds and provide scenarios for how best to mitigate flooding. However, there is uneven attention paid to the most vulnerable populations. A social vulnerability index that can be overlaid with flood risk maps has been created for some WMAs, though easy access to this data appears reliant on funding source. Implications of the research include the need for practicing planners and local governments to better understand how their resiliency can be tied to communities upstream. To increase environmental justice considerations, practicing planners may need to take a financial interest in voluntary adoption of BMPs in other communities, as well as a financial interest in creating their own social vulnerability indices.

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Key Words: Environmental justice, Resiliency, Watershed

#### **SOCIAL INEQUALITY IN VULNERABILITY TO SEISMIC AND CLIMATE-CHANGED-INDUCED HAZARDS**

Abstract ID: 216

Abstract within Pre-Organized Session 8

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It has been examined in many past studies that a comprehensive city plan with physical mitigation measures can significantly reduce the impact from a natural disaster to lives and properties in a city (Burby et al., 1999; Olshansky,

2001). However, these studies often neglect the need of different mitigation strategies for different socioeconomic groups. For instance, the city of New Orleans decided to build the city back to the original status after Katrina, even though this will make those socially disadvantaged neighborhoods remain vulnerable to the next catastrophic storm. One of the reasons is the citizens' refusal to accept any of the planners' more physical comprehensive approaches by the fact of race (Levy, 2016). The lesson learned here indicates the need to consider different strategies for different social groups since they are vulnerable to natural hazards in different ways. For instance, a retrofit or relocation project might not work for a neighborhood with more low-income families. A neighborhood with a higher crime rate is also difficult to develop a community sense to adapt to climate change. Therefore, it is extremely important to identify who is vulnerable to a specific natural hazard and thus design a mitigation strategy which is suitable for that neighborhood according to its socioeconomic status.

To fill up this gap, this study aims to (1) firstly identify seismic and climate-change-induced (sea-level rising and wildfire) hazardous locations, (2) and then examine whether all neighborhoods in the San Francisco Bay Area (Bay) from four dimensions (economic conditions, social status, land uses, capital investments) are equally exposed to each of the three natural hazards (earthquakes, sea-level rising, wildfire) at different spatial levels (county, region, the Bay) over two different time periods (2020-2060, 2060-2100) to the end of the 21<sup>st</sup> Century. The Bay area is selected as the study region because it is prone to the three natural hazards and likely exists inequality in the four dimensions listed above.

Methodologically, the peak ground acceleration (0.32, 0.48, 0.64 g) is used to represent seismic hazards to divide the Bay into hazard and non-hazard zones, based on the seismic hazard dataset provided by National Geospatial-Intelligence Agency (2012; updated in 2017). Similarly, in the case of sea-level rise (SLR), 1, 1.5, and 2.5 meters are used as thresholds for identifying low, median, and high SLR hazard zones. Finally, we will use 25% (low), 50% (median), and 75% (high) burned area for a cell in a gridded map as thresholds to identify wildfire hazardous locations for two time periods (2020-2060, 2060-2100), using the wildfire simulation data from Westerling (2018). After identifying the natural hazards, vulnerability characteristics for each census block group are collected from the four dimensions listed above. With the collected data, a two-sample t-test will be conducted to examine whether each of the vulnerability characteristics is different between hazard and non-hazard zones for each hazard at each spatial level.

The findings will reveal where, together with its socioeconomic characteristics and physical conditions, is more vulnerable to each natural hazard. This will help with local governments' finances by targeting at those who are the most needed for mitigation strategies. The results will be also summarized into three spatial scales and two time periods. The local governments will know better whether they should work on mitigation alone, or cooperate with other counties, or act as a metropolitan area during different time periods.

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Key Words: Social Inequality, Vulnerability, Seismic, Sea-level risin, Wildfire

## NEIGHBORHOOD CHANGE AND CLIMATE GENTRIFICATION: MYTH OR FACT?

Abstract ID: 217

Abstract within Pre-Organized Session 8

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Traditional theories of neighborhood change focus on ecological factors, political economy, subcultural factors, and other factors (Galster, Cutsinger, & Lim, 2007; Harvey, 1973; Li & Morrow-Jones, 2010; Rothenberg et al., 1991). The natural succession of neighborhoods goes through a few stages, such as suburbanization, in-filling, downgrading, thinning out, renewal or rehabilitation, but is not always linear, and different neighborhoods change differently over time. Ecological factors, such as residential preferences and mobility, and the natural process of aging in housing and infrastructure, determines the fundamental change of neighborhoods. The push and pull factors explain the directions of mobility. Public agencies often use pull factors to attract intended residents. The push factors often stem from neighborhood decline and/or neighborhood revitalization, while such revitalization may be pull factors for other types of residents. When residents are pushed away involuntarily due to increased property value and rents, and/or cultural changes due to revitalization, displacement from gentrification may occur.

In recent years, climate change associated with increased intensity of human activity and increased carbon footprint has yielded an alarming trend of melting glaciers and rising sea levels. Although the projected magnitude of sea-level rise (SLR) is different based on different models, the overall unpredictability of weather patterns, increased tropical cyclone activities, and worsening king-tide inundation in low-lying urban areas along the coast have prompted many developers and home-buyers to consider elevation and flood exposure when making home development or purchase decisions. Speculations about developers eyeing higher-elevation areas for redevelopment have prompted researchers to investigate whether climate related gentrification is happening in higher-elevation low-income neighborhoods. In a study in Miami-Dade County, Keenan, Hill, & Gumber (2018) found that housing units in higher elevation areas tend to have higher appreciation rates than units in lower-elevation areas. While higher-income/higher-elevation areas may be resistant to displacement, lower-income areas may be more susceptible. Some of the higher elevation areas are the neighborhoods with predominantly Haitian (Little Haiti) and low-income minorities (Liberty City). In addition to the threat from climate gentrification, many also worry about the spillover effect of redevelopment and property value increases from adjacent neighborhoods, for example, Wynwood Business Improvement District in the City of Miami. Existing study about the impact of climate gentrification, particularly flooding, is scanty and mostly focuses on parcel-level research on price appreciation. This current study takes a different angle to explore whether neighborhood change relates to elevation and flood exposure.

We use the American Community Survey five-year data for all the block groups in the tri-county South Florida area, Palm Beach County, Broward County, and Miami-Dade County. The selected neighborhood-level and city-level socioeconomic and regulatory variables are combined with the average elevation at the block group level using the Digital Elevation Model (DEM) from the USGS (U.S. Geological Survey) and the flood exposure calculated from the floodplain data from FEMA to measure changes in selected neighborhood characteristics. For example, neighborhood and city-level variables in 2000, 2010, 2020, along with neighborhood elevation and flood exposure, are used to measure changes in certain neighborhood characteristics, such as median household income, housing value, and percentage racial and ethnic minorities from 2000 to 2010, and from 2010 to 2020 (or the latest year the data are available). A Hierarchical Structural Equation Modeling (SEM) system and panel models are used to measure all the change variables.

If our analysis indicates that higher elevation and less flood exposure are significantly related to neighborhood change variables, potential neighborhoods with the most impact will be identified and policy recommendations will

be made to ensure such change would not cause displacement of residents, particularly vulnerable populations such as lower-income minorities and immigrants.

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Key Words: neighborhood change, climate gentrification, gentrification, sea-level rise

#### **COMMUNITY RESILIENCY PLAN PRIORITIES FOR FOUR SAN FERNANDO VALLEY NEIGHBORHOODS: SIMILAR NATURAL HAZARDS AND DIFFERENT SOCIOECONOMIC STATUS AND ENVIRONMENTAL (IN)JUSTICE ISSUES.**

Abstract ID: 218

Abstract within Pre-Organized Session 8

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Resilience plans have received increased attention and development to address the ability of neighborhoods to bounce back from shocks and stresses (Meerow and Pajouhesh, 2019). A funding program, launched by the Rockefeller Foundation in 2013, entitled “100 Resilient Cities,” has been instrumental in expanding the concept of community resilience planning to include social and economic concerns as well as environmental ones (Fainstein, 2018; Boswell, Greve and Seale, 2019).

Environmental (In)Justice recognizes that the poor and people of color have greater exposure to pollution and high-risk natural disaster areas (Fitzgibbons and Mitchell, 2019). To counterbalance these negative positions, policies to prevent new pollution sources and reduce current ones have been discussed and implemented (such as California Senate Bill 535 which has one-quarter of the Greenhouse Gas Reduction Funds focused on projects to reduce pollution in disadvantaged communities).

Neighborhood resilience plans have been developed as professional projects by the Masters of Urban Planning students for four San Fernando Valley (Los Angeles, California) neighborhoods. The methodology used to develop the plans was consistent between the plans and focused on communicative methods to maximize neighborhood feedback.

The four neighborhoods experience similar risks due to climate change and natural hazards: earthquakes, wildfires, flooding and heat. They differ in their exposure to air pollutants and other man-made pollution. The socioeconomic status also differs among these four neighborhoods, which will be discussed to highlight the issues of environmental (in)justice. The study will present the background of the neighborhoods and their risks. Then it will compare the types of recommendations preferred by the neighborhoods to be included in their resilience plans.

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Key Words: Environmental (In)Justice, Resiliency Plans, Climate Change, Natural Hazards

## **SPATIAL ANALYSIS OF THE FEMA FLOOD HOUSING ASSISTANCE FOR DISASTER RISK RESILIENCE IN SOUTHERN COASTAL COMMUNITIES**

Abstract ID: 268

Abstract within Pre-Organized Session 8

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Floods are the most common natural disaster, which counts almost 75 percent of declared disasters in the United States (Montano & Savitt, 2018). The United States Geological Survey (USGS) reports 36 significant flood events in the US since 2011—four events per year on average. Major hurricanes caused the eight most recent flood events—Hurricane Dorian in 2019, Hurricanes Michael and Florence in 2018, and Hurricanes Nate, Maria, Jose, Irma, and Harvey in 2017. All resulted in devastating environmental, socio-demographic, and economic damages in southern coastal regions. The trajectory of damages compounds in the economically disadvantaged communities due to the limited resources.

Social and racial vulnerability (Fussell & Harris, 2014; Cutter, Boruff, & Shirley, 2003) and the resilience to disasters (Boon, 2014; Cox & Perry, 2011) are well researched. Researchers emphasize the social capital and a sense of place for community resilience in disaster-prone areas (Boon, 2014; Cox & Perry, 2011; Laurien et al., 2020). As a result, the social network has been mentioned as a critical response and recovery strategy (Karunaratne & Lee, 2020; Varda, 2017). Another focus is on government responses to a natural disaster (Howell & Elliott, 2018, 2019). Researchers heavily criticized the unequal distributions of disaster recovery funds for the socially vulnerable population (Howell & Elliott, 2018, 2019; Muñoz & Tate, 2016). As Howell and Elliott (2019) state, "the more funds areas receive from FEMA, the more this wealth inequality increases, (p. 450)" there seems a deeply rooted fracture in the system. However, the literature is discrete with mostly case-studies. A comprehensive analysis is needed.

The US Federal Emergency Management Agency (FEMA) assists individuals, households, and organizations after a natural disaster for recovery. Since properties are a major factor in the increasing costs of floods, FEMA provides housing assistance by the National Flood Insurance Program (NFIP) and the Individuals and Households Program (IHP). Although the size of NFIP assistance is massive (the total coverage of NFIP policies in 2020 was \$1.3 Trillion according to FEMA.gov), the program's beneficiary is limited to the household with flood insurance. Likely, the most needed population doesn't hold flood insurance unless required by a lender. On the other hand, IHP covers the housing needs of anyone whose damages—basic needs—are not covered by insurance or by other sources. In this research, we will focus on the homeowner and renter housing assistances under IHP.

This research has a hypothesis: *The FEMA flood housing assistance in the US southern coastal communities has distributed unequally in terms of race and economic means when environmental or disaster-induced factors are controlled*. The hypothesis will be tested by developing a model that consists of various socio-economic (race, education, and household income), housing (housing type and homeownership), ecological (elevation, vegetation, and floodplain), and disaster-induced damage factors in the area. We will conduct a series of spatial data analyses

(GIS analysis) by utilizing secondary data from the FEMA, US Census, and USGS.

The coastal communities in the US Southern States—e.g., Texas, Louisiana, Florida, South Carolina, and North Carolina—will be examined by the zip-code as the unit of analysis. FEMA IHP homeowner and renter assistance data with major flood events in recent years will be compiled. US Census and USGS data will be further added into the GIS system to run the spatial statistics for modeling. The findings will reveal the spatial patterns of injustice and key drivers in FEMA aids.

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Key Words: Flood, FEMA, Inequality, housing assistance

#### **4.30 PRE-ORGANIZED SESSION - RESPONDING TO CLIMATE INDUCED DISPLACEMENT AS A PATHWAY TO CLIMATE JUSTICE**

Pre-Organized Session 30 - Summary

Session Includes 139, 140, 141, 142, 143

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This panel brings together researchers to examine climate induced displacement and to construct pathways to climate justice. Climate change impacts have the potential to drive displacement and climate migration in multiple ways. Direct displacement is often linked to hazard exposure and vulnerability. Indirect displacement may come as hazard impacted communities and households seek new places to settle, some inevitably locating in areas that are already established communities. Climate gentrification literature hypothesizes that some lower income communities, especially communities of color in safer areas (often higher ground), will be under pressure from increased interest and investment, driving out low-income residents as property values increase and gentrification follows. The heaviest burden of displacement will fall on lower income residents who can least afford relocation. We propose to examine the extent to which these phenomena are occurring, how planning and policy strategies can slow direct and indirect displacement, and how to orient toward greater equity and justice as we face the climate change crisis.

#### Objectives:

- Examine drivers of displacement related to climate change and how different actors are responding to these drivers to minimize displacement outcomes.

#### **CLIMATE IMAGINED? DIFFERENTIATING GENTRIFICATION, GREEN GENTRIFICATION, AND CLIMATE GENTRIFICATION**

Abstract ID: 139

Abstract within Pre-Organized Session 30

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“Climate gentrification” is the new turn of phrase used to highlight the disproportionate impacts of climate change on low-income populations of color. The global community turned its attention to climate justice identifying the ongoing and future disproportionate impacts of climate change on small and developing nation economies, livelihoods, and lands. The pivot to climate gentrification adds nuance by examining displacement of lower income populations of color as communities undergo neighborhood change and property values rise due to green or grey climate infrastructure investments and/or land speculation in higher elevation areas in flood prone cities. “Climate gentrification” gained traction in the late 2010s and can be traced to media and scholarly work in Miami, Florida with expanding applications in Louisiana, New York, Texas and others. Scholars have not settled on this term as some use “resilience gentrification” or “low carbon gentrification” with similar meaning.

Climate gentrification is an under-researched concept that is early in its development and does not yet make the connections between green gentrification and climate adaptation pathways to displacement. The key hypotheses associated with climate gentrification are multi-faceted, but the central idea is that land values will rise as risks associated with climate impacts fall. Climate adaptation investments that increase protections from flooding can make nearby lands more attractive. Investments in parks, tree planting, walkability, and mass transit as low-carbon transition strategies might also increase real estate values on nearby properties. Small and large redevelopment projects that upgrade housing stock and commercial districts in low income neighborhoods on higher ground to avoid future coastal flooding from sea level rise might also shift lower value properties to higher value properties. In all of these cases, the theorized dynamics are the same—as property values rise, existing residents are displaced either voluntarily (e.g. selling land if they own) or involuntarily (e.g. being evicted by new land owners as property developers convert low-income rentals to higher value uses).

We develop a literature review that first lays out how residential displacement is defined and measured as a frame for differentiating conventional gentrification, green gentrification and climate induced gentrification, arguing for a clearer analytical distinction. We explore related concepts of green and ecological gentrification which postulate that displacement can occur with investments by “greening” neighborhoods or restoring environmental amenities, such as parks, trails, greenways, and infrastructure for alternative modes of transportation, which can attract new residents, sometimes displacing longer term lower income residents. We connect these ideas to the concept of climate gentrification to examine dynamics that illustrate the linkages, interconnectedness and distinctions between gentrification, green gentrification and climate induced gentrification that may result in similar impacts of displacing low-income communities of color, further exacerbating existing inequalities. We explore the merits of these ideas and problematize analysis conducted in this domain thus far.

While there is merit to this theoretical conceptualization of the phenomenon, there is a need to evaluate the underlying dynamics and drivers of gentrification to determine how and whether displacement of lower income populations of color is driven by climate induced investments, or are other drivers responsible for residential displacement. We problematize the growing use of the term “climate gentrification” and seek to sort out what this adds to the discourse about climate change, displacement, and justice. We focus on housing policy and affordable housing as a lens through which to view this phenomenon in contrast to the usual orientation to real estate and land values. We explore how housing policy can be a useful intervention to reduce displacement pressures of low-income households (those least capable of moving) regardless of the drivers of displacement.

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Key Words: Gentrification, Climate gentrification, affordable housing, displacement, communities of color

## **A CLIMATE TALE OF THREE CITY-REGIONS: EXAMINING THE DYNAMICS OF CLIMATE RELATED DISPLACEMENT RISKS IN MIAMI-DADE, TAMPA BAY-PINELLAS AND JACKSONVILLE-DUVAL, FL.**

Abstract ID: 140

Abstract within Pre-Organized Session 30

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Sea level rise threatens to reshape life on the Florida coast. Higher elevation neighborhoods may become gentrification hotspots through speculation and permissive development incentives for migrating coastal populations facing eventual retreat (Keenan et al. 2018). The process of inland retreat may also lead to secondary displacement of long-term residents as the pressures of gentrification, investment and development take hold, particularly in lower income communities of color (Angelouovski et al. 2019). While there is growing attention to the potentials for mass migration and retreat from the coast (de Koning et al. 2020; Hauer et al. 2020), there is limited empirical analysis of the spatial dynamics of displacement related to sea level rise and the planning mechanisms in place to manage impending neighborhood change in higher elevation communities (McAlpine et al. 2018).

We employ a multi-staged research design to explore how major urban centers in Florida are planning for and developing policies to address the disproportionate impacts that marginalized communities are likely to experience due to rising sea levels. The three stages of the research methodology include 1) mapping of displacement risk indicators, 2) a modified network of plans policy analysis, and 3) semi-structured interviews conducted with key actors in Miami-Dade County/Miami, Duval County/Jacksonville, Pinellas County/Tampa Bay regions. We identified (1) specific municipalities where the risks of inundation have the potential to lead to displacement of low income households directly as well as displacement of higher income households to lower income neighborhoods on higher ground triggering a secondary round of displacement of lower income households; (2) strategies, projects, and policies that aim to address displacement pressures, provide affordable housing, and account for marginalized populations in the process of managed retreat to higher elevation neighborhoods and (3) perspectives on planning responses and potential for displacement in the near horizon from housing specialists, resilience officers and community advocates in these counties.

Our spatial analysis reveals that in each region, census block groups with high displacement risk were characterized as having lower education attainment levels, high renter populations, high Hispanic and/or African American populations, high levels of poverty, high eviction rates, more single parent households, and lower school and job proficiency rates. Some areas of high displacement risk also correlated with planning designated boundaries such as opportunity zones and community redevelopment areas.

Through the plan analysis, we identify disconnects between policies concerned about the effects of sea level rise and housing protection policies used to manage neighborhood change and prevent displacement. However, this disconnect is not insurmountable, as actors acknowledged the need to break down silos and focus on integrated

and intersectoral approaches to address climate change risks with an explicit focus on the equity outcomes of policies and decisions.

Local variations across the three cases emerge as divergences in the salience of climate displacement perceptions and responses. In Miami-Dade, areas that are primed for potential displacement are explicitly identified as inland communities of color which are already undergoing neighborhood change. In Tampa Bay-Pinellas, planners are in the process of understanding the vulnerabilities related to sea level rise, sources of affordable housing stock and identifying potential areas where primary and secondary displacement may occur. In Jacksonville-Duval, community advocacy organizations are leading the charge in sounding the alarm, with limited engagement with public agencies.

This paper advocates for anticipatory adaptation planning and proactive examination of climate planning and housing policies focused on anti-displacement strategies to identify gaps in coverage and opportunities to promote greater equity and address the risks associated with first order and second order displacement before these coastal urban centers have no more tales to tell.

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Key Words: Sea level rise, Displacement risk, Coastal retreat, Affordable Housing, Gentrification

## THE GREAT CLIMATE MIGRATION OF THE 2030S AND ON: PREPARING RECEIVING AREAS FOR JUST AND SUSTAINABLE TRANSITIONS

Abstract ID: 141

Abstract within Pre-Organized Session 30

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Climate disasters, including both fast-onset events like hurricanes and slow-onset events like sea level rise, are creating conditions for mass movement of people from hazardous to safer locations. As many as 13.1 million persons in the U.S. alone could, for example, be at risk of migrating due to a sea level rise of 1.8 m by 2100 (M. Hauer 2017). An increase in extreme heat days may also compel populations to relocate to cooler regions. We can therefore expect to have sending communities, where residents finally leave after experiencing one too many floods, wildfires and extreme heat days, and receiving communities with greater safety. Many inland and cooler urban and peri-urban areas in the U.S. can expect to experience large domestic in-migration in the next decades (Rigaud et al. 2018). As a result, scholars and policy-makers from physical and social sciences have recently identified attending to domestic migration receiving areas as a strong research need. In this paper we synthesize planning-related literature to explore the future of climate-migration receiving areas.

We begin by characterizing the types of in-migration that can be expected, from sending areas' perspectives. Forsyth and Peiser (2021) identify proactive retreat, which moves at-risk whole communities into new locations before an extreme event, and reactive retreat which moves settlements after a hazard; implicit in these is a strong government role in planning change. There is a third force for movement, which we call individual household retreat. In this scenario, government assistance and direction is limited and instead residents, faced with repetitive hazards and perhaps the loss of insurance, individually move. We explore the existing literature projecting how many people will move and where they will go, reviewing existing modeling efforts and identifying gaps. The next section of the paper will explore what is known to date about the role that city and town choices will play in outcomes (e.g., Rigaud et al. 2018). Aspiring post-industrial cities and towns may want to be Climate Refuges or Climate Havens, while other places will hope to pull up the ladder and prevent much influx. Some incomers can be accommodated in New Towns (Forsyth and Peiser 2021), but absent anticipatory policy, most are likely to disperse into suburbs near their old homes or go further into rural areas, creating significant pressure for sprawl, landscape fragmentation and attendant ills. And there are, as always, justice implications as those with less wealth move under more duress and experience harsher outcomes (Anguelovski et al. 2016). These changes suggest some anticipatory principles of what receiving areas ought to do to minimize stress for existing as well as new populations, such as assuring zoning and permitting supports new and affordable housing, scaling human services to meet increasing demand, and using participatory practices and scenario planning to identify paths forward. The article concludes by identifying research needed to ensure as best we can that climate migration creates just and sustainable towns, cities and regions.

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Key Words: migration, climate change, demographic modeling, land use

#### **VULNERABILITY TO CLIMATE GENTRIFICATION: FROM VISIONS OF A GREEN RESILIENT CITY TO NEW URBAN RISKSCAPES**

Abstract ID: 142

Abstract within Pre-Organized Session 30

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Green climate resilient infrastructure is increasingly a key feature of climate adaptation planning, growth-driven neighborhood redevelopment and city branding programs (Anguelovski et al., 2019). Hailed as a win-win and no regrets solution, the health, safety and economic co-benefits of these green interventions are especially emphasized to boost their political salience and financial feasibility. While plans tend to focus on reducing climate risks and impacts through techno-managerial solutions that may exclude alternative politics and desires (Finewood et al., 2019). The drivers of social vulnerability to climate change – historic and ongoing environmental racism and inequitable and unsustainable urban development patterns – are also often ignored (Hardy et al., 2017; Ranganathan & Bratman, 2019). This suggests that green resilient infrastructure (GRI) may actually exacerbate social vulnerability, with lower-income residents and communities of color benefitting least from climate protection through their dispossession and displacement. Recent studies have begun to explore this hypothesis, identifying a challenging link between green resilient measures and gentrification processes that reconfigure, but do not necessarily eliminate, climate insecurities (Shokry et al., 2020). What remains underexplored, however, is the role of neighborhood contextual factors, such as neighborhood (re)development efforts and social support resources, in either advancing sensitivity to gentrification and displacement, or conversely, strengthening adaptive capacity in the face of it. In this presentation, we will discuss findings from a mixed spatial quantitative and qualitative study that examines the extent to which planned and recent GRI may be associated with possible future climate gentrification. To what extent are recent and proposed green climate resilient infrastructure being sited in neighborhoods vulnerable to future gentrification – those less likely to be inhabited by socially vulnerable residents in the future – and which neighborhood contextual factors are most associated with this vulnerability? Philadelphia is a forerunner among cities worldwide for its expansive green stormwater infrastructure program, which was integrated into a local climate adaptation planning framework in 2015. The city also created a heat relief plan in 2018 featuring GRI as a means for reducing heat vulnerability in highly exposed neighborhoods. Other cities are attempting similar programs to mitigate stormwater surges, flooding and heat island effects. Our paper therefore assesses multiple overlapping and intersectional factors in generating vulnerability and resilience to future climate gentrification by analyzing both spatial quantitative trends and qualitative interviews conducted in Philadelphia with relevant activists, non-profits, planners and policy makers. We develop a novel methodological approach by first identifying the statistically significant clusters of all variables (e.g., redevelopment certificates, historic districts, affordable housing and community based organizations) that we theorize to contribute to vulnerability to gentrification (i.e., a combination of exposure, sensitivity and adaptive capacity) and, in a second step, compare the current and planned GRI in each census tract to its spatial overlap with vulnerability to gentrification clusters. Lastly, we discuss our results in relation to respondents’ perceptions of green climate gentrification and how two socially vulnerable neighborhoods are confronting displacement pressures. Findings suggest that residents face a perpetual double insecurity and displacement risk – one by climate risks and impacts and the other by future climate gentrification via resilience interventions. The paper therefore contributes to debates on the equivocal role of greening and urban planning in climate justice and injustice dynamics by offering an example of how to mobilize and theorize vulnerability to future climate gentrification as cities adapt to and provide protection against climate risks and impacts.

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Key Words: climate gentrification, adaptation planning, vulnerability, green infrastructure, climate justice

## LEARNING FROM SUBNATIONAL BUYOUT PROGRAMS: PURSUING EQUITABLE RESPONSES TO INEQUITABLE FLOOD RISK

Abstract ID: 143

Abstract within Pre-Organized Session 30

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Climate-exacerbated flooding has renewed interest in home buyouts as a pillar of managed retreat from coastal zones and floodplains. However, federal programs funded by the Federal Emergency Management Agency (FEMA), Department of Housing and Urban Development (HUD), and the U.S. Department of Agriculture (USDA) have drawn criticism for being inequitable and insensitive (Howell & Elliott, 2018, 2019; Mach et al. 2019; Siders 2018). In response, we study the country's largest and most sustained state, county, and local buyout programs in New Jersey, Washington State, Charlotte-Mecklenburg County (North Carolina), and Harris County and the City of Austin (Texas) to understand the extent to which they offer alternative approaches that can inform federal reforms or subnational program expansion.

We contrast the literature's criticisms of buyout programs with programs' goals, objectives, operational strategies, funding, and evaluations metrics to consider how they frame issues of social well-being and fairness, which types of social concerns their strategies respond to, and what innovations they have developed as compared to federal programs. Interviews with program managers and field staff asked: How and why do these programs frame and operationalize goals for human well-being and fairness as they do? What challenges do they confront in expanding the social equity and justice of their programs? Focus groups with managers, case workers, and external stakeholders asked: What possible pathways point towards greater equity in floodplain risk management?

Findings to date suggest that these programs have developed strategies to address key limitations of the federal buyout funding programs. Programs with local sources of funding (such as utility or property taxes) are especially able to develop criteria and processes that center residents' experience. These include larger compensation packages to help afford a comparable replacement home locally, a longer period during which buyouts can occur, and investment in trained staff to work directly with residents. These innovations can be incorporated into federal programs. Despite this more sensitive approach, however, subnational programs similarly struggle with addressing the underlying drivers of inequitable floodplain risk and post-relocation inequity. Key barriers programs face in improving equity outcomes include: (a) the limited purview, capacity, and downstream role of stormwater and public works agencies charged with buyout work; and (b) the narrow metrics used to determine costs and benefits of buyouts, which focus on a snapshot of the buyout parcel rather than the social after-effects of relocation, remaining households who were not bought out, surrounding neighborhoods that rapidly gentrify with the addition of new recreation trails and green amenities, and historic inequities in flood infrastructure investment.

On the one hand, these findings suggest opportunities to learn from subnational buyout programs. Since only wealthier states and cities can afford such supplemental funding, federal reforms that incorporate local and state experiments are essential to assure more widespread improvement of experiences. On the other hand, they suggest



how efforts to improve the equity of buyout programs too narrowly construe the basis of the equity problem, which lies in the area of housing construction regulations and permitting, volume of affordable housing production on higher ground, housing assistance policies, and tax and development incentives. So long as buyout programs (local, state, or federal) are framed only as flood risk and infrastructure responsibilities, they will only be able to narrowly address the issue of fairness and reparative justice for disadvantaged households living in floodplains. This suggests the need to structure programs that integrally address floodplain health, regional affordable housing production, and socio-ecological relationships between human and environmental well-being.

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Key Words: buyout, flood, relocation, equity, state and local innovation

#### **4.31 PRE-ORGANIZED SESSION - RESPONDING TO CLIMATE INDUCED DISPLACEMENT AS A PATHWAY TO CLIMATE JUSTICE**

Pre-Organized Session 31 - Summary

Session Includes 144, 145, 146, 147, 148

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This is the second of two panels on this topic. This panel brings together researchers to examine climate induced displacement and to construct pathways to climate justice. Climate change impacts have the potential to drive displacement and climate migration in multiple ways. Direct displacement is often linked to hazard exposure and vulnerability. Indirect displacement may come as hazard impacted communities and households seek new places to settle, some inevitably locating in areas that are already established communities. This can cause cascading cycles of displacement. In this panel, we propose to examine not only the extent to which these phenomena are occurring, but also how planning and policy strategies can be used to slow both direct and indirect displacement. We focus on housing responses related to evictions and recovery and the disproportionate impacts that lower income communities face in the context of climate change impacts.

#### Objectives:

- Examine drivers of displacement related to climate change and how different actors are responding to these drivers to minimize displacement outcomes.

#### **PUERTO RICO'S REPAIR, RECONSTRUCTION, OR RELOCATION PROGRAM (R3): CONCERNS AND RECOMMENDATIONS**

Abstract ID: 144

Abstract within Pre-Organized Session 31

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The 2017 Hurricane Maria damaged over 300,000 homes out of 1 million in Puerto Rico, and three years after, there still 30,000 people living under blue tarps. In 2019, with federal funds, Puerto Rico's Housing Department started its "Repair, Reconstruction, or Relocation Program" (R3 program) to help those whose FEMA assistance proof to be short or were disqualified. This study explores through the use of publicly available data from the R3 program, over two dozen documents, 20 interviews, and over 50 meeting conversations for over several years the regulations of the program. The article seeks to understand (1) what the concerns raised by advocates and grassroots organizations about the R3 program are? and, (2) how the R3 program compares to other relocation programs? Although there is a number of studies from different fields on buy-out programs, the planning field is still limited in its understanding of voluntary home buyouts due to extreme weather events, and this article seeks to fill that gap.

This article explores three specific policies that have raised some concerns. The first policy explored is that the program does not allow in-situ elevation. The study finds that advocates have criticized this policy because it promotes the relocation of program beneficiaries instead of on-site reconstruction. Although most buyout programs in the US are used for mitigation purposes (e.g., raising a home or employing other techniques that make people more resilient or relocating them) if they lived in a flood zone or landslide areas, this study finds that most people living in a risk area have been denied. This is because the program targets those who have suffered severe damages, and they belong to a prioritized vulnerable group (e.g., older adults, people with disabilities). Usually, the state would prioritize the communities at most risk (using FEMA flood map or landslides) and draw a boundary for those who can participate from the buyout, but in Puerto Rico is mainly based on need (policy two). Finally, in other buyout programs (third policy explored), communities would self-organize through a participatory process to say they would like to be part of the buyout. However, in Puerto Rico, individuals apply with little to no conversations at the community level about the program and what it entails.

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Key Words: buyout, disaster, housing, CDBG, relocation

#### PREVENTING EVICTIONS AFTER DISASTERS: THE ROLE OF LANDLORD-TENANT LAW

Abstract ID: 145

Abstract within Pre-Organized Session 31

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Extreme weather events will become more common as climate change accelerates. Disaster researchers have asked for a more detailed understanding of how residents experience housing distress and/or relocate following disasters, arguing that these decisions and processes unfold over long timeframes, and are embedded in local institutions and

contexts (Elliott & Pais, 2006). The existing literature on the operations of housing systems following disasters establishes that many of the conditions associated with evictions: property damage, renovations, and disruption to wages, are commonly present in rental housing and rental households in the year following a disaster (Esnard & Sapat, 2014). In this research we ask (1) whether evictions rise during the disaster recovery period, and (2) whether increases in post-disaster evictions are affected by state legal frameworks.

Forced moves through an evictions process are associated with a series of negative outcomes for households and families. These include homelessness spells; worsening neighborhood quality followed by a series of relocations, long-term losses in household wealth, and increases in stress-related illnesses. If a household must relocate in the year following a natural disaster, an eviction process is arguably one of the worst ways by which relocation can happen. If evictions are an important process governing the post-disaster trajectory of socioeconomically vulnerable households, preventing eviction should be a key part of disaster recovery.

In this research, we examine whether evictions rise after extreme weather events, and if state-level statutory protections have any effect on rising evictions following a disaster. We measure the rise in eviction rates after extreme storms and flooding events in five states: South Carolina (Hurricane Joaquin, 2015), Southern Alabama, including the Mobile and Montgomery regions; the panhandle of Florida, including the Pensacola and Panama City regions (flooding events of April, 2014), and the New Haven, Connecticut region (Hurricane Sandy, 2012). Applying state-landlord tenant law typologies in the literature, we classify these four sites by landlord-tenant regime (Hatch, 2017). Florida is a pro-landlord state with little-to-no tenant protections; Alabama and South Carolina have tenant protections mixed with landlord protections, and Connecticut has strong tenant protections without landlord protections. We compare the rise in eviction rates between disaster-affected areas and neighborhoods in adjacent, unaffected counties.

We find that evictions rise sharply after a disaster, rising by 16% - 42% relative to neighboring areas that were not impacted by the storm. The increase in post-disaster evictions occurred all states with landlord-friendly laws, and the presence or absence of statutory tenant protections did not have a significant effect. In Alabama, South Carolina and Florida, evictions rose sharply in disaster affected areas compared to nearby, unaffected areas. Conversely, in Connecticut, a protectionist state, there was no increase in post-disaster evictions. This finding suggests that a pro-landlord policy environment leads to higher eviction rates, and that individual statutes offering tenant protections present in South Carolina and Alabama are not sufficient to outweigh other factors. Our findings are in line with other research into the importance of legal culture, or state-wide policy environments on eviction outcomes, which suggest that statutory tenant protections do not lead to better outcomes for tenants in places where the broader legal context favors landlord outcomes (Sudeall & Pasciuti, 2021).

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Key Words: eviction, disaster, climate, displacement, housing

#### HOUSING, DISASTER RECOVERY AND DISPLACEMENT IN PUERTO RICO AFTER HURRICANE MARIA

Abstract ID: 146

Abstract within Pre-Organized Session 31

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Climate change has exacerbated the pace and scale of disasters such as hurricanes. When devastating storms are met with a failed recovery process, many are displaced, especially the most vulnerable, and migration becomes a common strategy or an unchosen reality for households and communities responding to crises (Esnard, 2014). Understanding post disaster mobility, and when and how disasters spur migration, is of increasing importance.

Housing dynamics are a key component of the disaster recovery process. Past research has shown that recovery processes are often directed at restoring private property rather than rebuilding the social fabric and networks that ensure community recovery (Davis, 2005). Moreover, both the legal ability to remain, as well as the pace of reconstruction are affected by housing factors such as clarity of title, tenure (renting/homeownership), housing type, and quality of construction (Peacock et al., 2007).

The Puerto Rican context is characterized by informality in tenure, construction, and infrastructure (Fontáñez Torres, 2020; López et al., 2019), and a recovery process situated within the colonial relationship with the United States (Rivera, 2020). In this research, we investigate the intersections between housing, FEMA recovery programs, and migration. We merge neighborhood level data on Puerto Rico's housing context and from FEMA's individual assistance program with individual data on housing status, displacement and migration following Hurricane Maria.

While we confirm other research findings of increased out-migration from Puerto Rico, our most notable findings are a spike in regional migration in response to the disaster, suggesting reliance on local community support systems in the absence of effective disaster recovery policies. We link internal and external migration patterns to FEMA recovery programs and to housing systems on the island, finding that the dollar amounts of "pending need" — the difference between damage estimates and the amount of assistance disbursed per household — are highly predictive of internal moves, and that the presence of flood and homeowners insurance reduce this internal displacement. Finally, we examine the shift in the pace and composition of in-migration to Puerto Rico in the three-year period following the disaster, showing that migrants to the island were progressively older and more wealthy in the years following the disaster.

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Key Words: Housing, Displacement, Puerto Rico, Disaster recovery

## JUSTICE ALONG THE JOURNEY: THE RECEPTION OF CLIMATE DISPLACEMENT HOUSEHOLDS IN THREE RECEIVING COMMUNITIES

Abstract ID: 147

Abstract within Pre-Organized Session 31

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Scholarly and policy attention has turned to the environmental vulnerability, demography, and public aid for households and whole communities facing or undergoing climate-related displacement. Yet, we know little about the communities where migrants resettle and how they are received. This paper presents findings from a current mixed-methods study of three "receiving communities:" Houston in relation displaced households from Louisiana following Hurricane Katrina in 2005; Orlando and Puerto Rican settlers after Hurricane Maria in 2017; and the ongoing resettlement north in southeastern Louisiana from repeat flooding, including Isle de Jean Charles residents. Findings cover migrants' perceptions of their welcome (including job discrimination, housing competition, and cultural integration), as well as the qualitative perceptions and quantitative capacity of public-, private-, and civil-sector service providers in the receiving communities to prepare for and integrate the newcomers. The findings also shed light on the generalizable policy and social questions about how communities that are likely receive climate migrants in the future should prepare.

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Key Words: Climate, Migrants, Justice, Resettlement

## SEEKING CLIMATE JUSTICE: INTERESTS AND OUTCOMES IN LOUISIANA'S CLIMATE RELOCATION

Abstract ID: 148

Abstract within Pre-Organized Session 31

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We need effective climate adaptation policy to assist people who are making difficult decisions about how to adapt to climate change that simultaneously leads to environmentally and socially restorative action (Bronen and Chapin 2013; Maldonado 2014). Coastal planners and residents face imminent adaptation and relocation decisions and there is a dire need for immediate assistance. However, policy outcomes will diverge from stated intent if policy makers do not address contradictory assumptions within current frameworks.

Drawing on 87 interviews with residents and planners working in Terrebonne Parish, Louisiana, and an analysis of the Parish's planning documents, this paper examines how residents and planners are working towards alternative futures that account for coastal land loss, sea level rise, and community change. Although plans and policies increasingly recognize relocation as a coastal adaptation strategy, relocation goals and different programs can be contradictory in ways that reproduce inequitable structures of advantage and disadvantage (Nelson et al 2020; Rivera 2020).

In this paper, we examine two tensions in coastal climate change planning. A contradiction arises in stated planning goals between those that intend to enhance property values through recreational development and camps for fishing, and those that intend to return an area to ecological functions or reduce infrastructure and development to reduce the need to maintain the area for people's use. Our respondents discussed the contradictions that arose when formal planning documents promoted recreation along the coast as relocation programs were considered for their communities. Residents also recognized that oftentimes the recreational users were the only buyers for property, so that they and their neighbors contributed to this cultural shift even as they were adversely affected by it. A second tension arose because existing and proposed programs were based on limited views of property and land claims and they did not reflect the actually existing land tenure relationships. The initiatives assume that properties have a single family ownership structure, and that people are willing to sell their house if they can acquire another. Our respondents however spoke of a range of situations, including but not limited to shared family property ownership, one of multiple owners living on a property who would need assistance to find alternative housing (but would not receive most of the buyout funds), intergenerational property that families were unwilling to sell, and community members having emotional and social ties to neighborhood that was not tied to land ownership. In addition, some residents rent property or owned a house with a long term land lease. These situations created complexity for conventional relocation and adaption programs.

Our paper contributes to planning research and practice by examining how competing interests and divergent outcomes operate in Louisiana's coastal communities. Our interview respondents also spoke about transitions that went beyond buyouts, addressing the ways in which people live, and what would make better sense if they had to move. A second contribution is to consider climate relocation policy through the lens of racial and Indigenous justice movements to show paths to restorative policy frameworks (Biondi 2003; LANDBACK.org).

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Key Words: climate change, climate justice, coastal communities, informal housing adaptations

#### 4.46 PRE-ORGANIZED SESSION - EXTREME HEAT AND CLIMATE JUSTICE

Pre-Organized Session 46 - Summary

Session Includes 336, 506, 507, 508

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Climate change, in combination with the urban heat island effect, is increasing risks of extreme heat worldwide (Stone & Rodgers, 2001). While other climate hazards garner more media attention in the US, extreme heat is the deadliest (Hondula et al., 2015). It also causes declines in quality of life, increases in mental health and behavioral disorders, declines in economic productivity, and strains water and energy infrastructure and ecosystems. Extreme heat is a climate justice issue with risk inequitably distributed across cities and populations, such as higher heat severity in historically redlined neighborhoods (Hoffman et al. 2020, Wilson 2020). Despite increasing recognition of

the threat extreme heat poses, heat policy and planning remains underdeveloped in comparison to other natural hazards (Keith et al. 2020). An assessment of over 3,500 climate adaptation resources in the U.S. found that only 4% focused on heat (Nordgren et al. 2016) and even fewer consider social justice (Lambrou and Loukaitou-Sideris in press). This session will explore diverse perspectives in the current state and innovations in planning research and practice for extreme heat.

Objectives:

- Attendees will learn the current state and new innovations in planning for extreme heat
- Attendees will learn about how extreme heat is a climate justice issue
- Future directions for extreme heat research will be identified and discussed.

## **ADVANCING EQUITY AND JUSTICE THROUGH PLANNING FOR EXTREME HEAT**

Abstract ID: 336

Abstract within Pre-Organized Session 46

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Extreme heat presents a significant and growing challenge for communities around the world. In the last 30 years, heat has killed more Americans than any other category of climate-related disaster. Combined, the heat waves in Europe in 2003 and Russia in 2010 caused well over 100,000 excess deaths. Heat disproportionately impacts already vulnerable individuals and communities, making it a clear case of environmental and climate injustice. The COVID-19 pandemic and other public health and ongoing economic crises have worsened the impacts of extreme heat. Those most vulnerable to heat include individuals who are low-income, the elderly, those who work outdoors, those who are part of a racial or ethnic minority or immigrant community, those experiencing homelessness, as well as those with preexisting health conditions. Urban residents are also particularly vulnerable to rising average temperatures and heat waves due to the compounding effects of the urban heat island (UHI) effect. Heat has been broadly recognized as an environmental and climate justice issue by activists, policy makers and scholars like, however, how this understanding is research and practice remains unclear. This paper analyzes how equity is being framed, measured and actualized through a systematic review of empirical research connecting heat vulnerability and planning.

The findings from this study reveal three main trends. First, less than a fifth of the literature connecting heat vulnerability and planning explicitly mentions equity or justice. Second, only a third of the literature that does explicitly mention equity or justice actively centers these concerns in the research. A majority of this literature treats equity as a peripheral concern, emphasizing instead the measurement and mapping of vulnerability without grappling with the connections between social vulnerability and concerns around equity and justice. This approach aligns closely with traditional hazards research and mainstream techno-scientific approaches to climate mitigation and adaptation. Lastly, the literature that does grapple with questions of equity and justice takes a fairly narrow view of these ideas, focusing for the most part on distributive justice, both in terms of uneven exposure and sensitivity, as well as uneven access to resources to cope with heat. While several studies acknowledge the impacts of historically uneven development on current patterns of social and environmental vulnerability, none explicitly discuss the role of colonization in the production of climate change and uneven climate vulnerability, or connect heat equity with growing calls for racial and indigenous justice.

These findings reaffirm the need for greater attention to equity and justice in heat vulnerability research and planning practice. Research has focused on measuring vulnerability and while the concept of vulnerability has expanded in recent decades, surprisingly little attention has been given to how heat equity is defined and experienced locally. While research has found that heat vulnerability mapping has not been used to inform practice, scholarship plays an important role in the construction of analytical frameworks that can influence how planners and policymakers think about climate problems and solutions. Empirical research has affirmed the need for heat

adaptation to address the root causes of social vulnerabilities in order to address (rather than worsen) social inequities. Policy-oriented research is also needed to help us better understand the trade-offs associated with ecosystem services and different approaches to addressing heat. In order to advance equity and justice in heat planning, researchers need to ground our questions and recommendations in the experiences and needs of those most impacted by climate change and communicate and present our work and findings in ways that make it accessible and useful to those doing the work of planning and adapting on the ground.

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Key Words: heat equity, climate justice, environmental justice, planning

#### FRAMING URBAN HEAT GOVERNANCE THROUGH FIVE CASE STUDIES

Abstract ID: 506

Abstract within Pre-Organized Session 46

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Extreme heat is an increasing climate risk for cities across the United States (U.S.) due to both the urban heat island (UHI) effect and climate change (Stone & Rodgers, 2001). Extreme heat is the deadliest climate risk in the U.S. and impacts the most vulnerable populations such as children, the elderly, and those with lower income. Historically redlined neighborhoods (Wilson, 2020) and Latinx neighborhoods (Dialesandro, 2021) have higher heat severity than their wealthier and whiter counterparts, making extreme heat a climate justice issue. Urban heat governance, as framed within this study, is the institutions, organizations, decisionmakers, stakeholders, plans, and initiatives that comprise a community’s heat management and heat mitigation efforts. Heat management strategies (e.g., heatwave warnings, cooling centers, utility assistance programs) and heat mitigation strategies (e.g., increased urban vegetation, site design, and land use changes) are both key to address extreme heat risk equitably. Planning and governing studies have identified a need for “more governance capacity” for both heat management and mitigation strategies for increasing extreme heat risks (Keith, Meerow, & Wagner, 2019). Studies also suggest that more collaboration is needed across city departments, levels of government, academic disciplines, and stakeholder groups (Mahlkow & Donner, 2017).

To better understand the current state of urban heat governance and equity implications, we utilized an exploratory multi-case study approach in five U.S. communities, including Baltimore, MD; Detroit, MI; Tucson, AZ; Houston, TX; and Seattle, WA. Case study communities were selected for their climatic and geographic diversity. We first conducted a scoping review that included relevant peer-reviewed papers, government and organizational websites,



media articles, mapping and climate information sources, plans, policies, and other heat-related initiatives. We then conducted semi-structured interviews with five decisionmakers in each community, including an urban planner, hazard mitigation planner, sustainability or resilience director/coordinator, emergency manager, and public health practitioner. Participants were asked about stakeholders and organizations currently working on urban heat initiatives, heat-related plans and policies, risk management and heat mitigation strategies, sources of information used and needed, barriers to action, and opportunities to advance urban heat governance. Interview transcripts were then coded and analyzed for similarities and differences both across and within the disciplines and communities.

Consistent with the literature, study findings confirm that urban heat governance is in its infancy in each case study community with a great deal of diversity and experimentation in how each address extreme heat risk. Participants in each community reported different responsibilities, resources, information sources, plans, and strategies. For example, cooling centers were the responsibility of some community's public health departments, but in others were run by the parks and recreation department. Similarly, information sources such as UHI and vulnerability maps were managed and used by different groups in each community. On a positive note, a majority of participants discussed the equity implications of extreme heat risk in their community. Despite the high awareness of equity implications, participants also reported that siloed approaches to addressing heat vulnerabilities were significant barriers to advancing efforts. Participants across disciplines and communities expressed the desire for more guidance to address extreme heat risk comprehensively. Findings from this study help frame emerging urban heat governance structures and future directions for research and practice.

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Key Words: extreme heat, urban heat, urban heat governance, climate justice, climate equity

#### **THE INFLUENCE OF BUILDING AND NEIGHBORHOOD CHARACTERISTICS ON INDOOR AIR TEMPERATURE DURING HEAT EXTREMES IN DETROIT, MICHIGAN; ATLANTA, GEORGIA; AND PHOENIX, ARIZONA**

Abstract ID: 507

Abstract within Pre-Organized Session 46

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The public health threat of exposure to extreme heat is increasing and indoor residential environments are commonly the source of heat exposure that lead to illness or death. Much of the existing research evaluating extreme heat events assumes that outdoor temperatures equal indoor temperatures. At 140 homes in Detroit, Michigan; Atlanta, Georgia; and Phoenix, Arizona, we measured indoor and outdoor air temperatures, collected unit

specific building and neighborhood characteristics, and surveyed residents to determine the presence and use of air conditioning. In our sample, 35% in Detroit, 57% in Atlanta, and 95% in Phoenix used central air conditioning. In Detroit, extreme heat at 5 am was defined as any temperature at or above 25.4 C or 77.7 F (95<sup>th</sup> percentile) and at 5 pm it increased to any temperature at or above 33.1 C or 91.6 F (95<sup>th</sup> percentile). In the Detroit sample, three independent variables significantly impacted indoor temperature at 5 am (masonry, access to air conditioning, and neighborhood tree canopy coverage) and 4 independent variables significantly impacted indoor temperature at 5 pm (masonry, access to air conditioning, distance to Detroit River, and nearby tree canopy coverage). Together, at 5 am, the R<sup>2</sup> of the Detroit regression model explained .75 while at 5 pm, the R<sup>2</sup> of the regression model explained .66. In Atlanta, extreme heat at 5 am was defined as any temperature at or above 25.7 C or 78.3 F (95<sup>th</sup> percentile) and at 5 pm, it increased to any temperature at or above 35.7 C or 96.3 F (95<sup>th</sup> percentile). In the Atlanta sample, two independent variables significantly impacted indoor temperature at 5 am (year of construction and access to air conditioning) and three independent variables significantly impacted indoor temperature at 5 pm (neighborhood tree canopy, nearby tree canopy, and access to air conditioning). At 5 am, homes built between 1940 and 1949 had indoor air temperatures that were 5.94 C warmer compared with homes built either before or after that period. At 5 am, homes accessing air conditioning were 8.53 C cooler and at 5 pm, homes accessing air conditioning were 2.95 C cooler. In the Atlanta sample, at 5 pm, homes with higher tree canopy both nearby (1.77 C) and in the neighborhood (4 C) resulted in significant cooling. Together, at 5 am, the R<sup>2</sup> of the regression model explained .91 while at 5 pm, the R<sup>2</sup> of the regression model explained .93. In Phoenix, extreme heat at 5 am was defined as any temperature at or above 31.1 C or 88 F (95<sup>th</sup> percentile) and at 5 pm, it increased to any temperature at or above 43 C or 109.4 F (95<sup>th</sup> percentile). In our model, at 5 am homes with air conditioning were 4.2 C warmer. No neighborhood or building characteristics significantly altered the indoor temperature at 5 am. At 5 pm, larger homes (at the 75% percentile of the size range) were 2.7 C cooler than smaller homes (at 25% percentile of the size range). Together, at 5 am, the R<sup>2</sup> of the regression model explained .85 while at 5 pm, the R<sup>2</sup> of the regression model explained .80. Unlike most other studies, this research compares the significance of common building and neighborhood characteristics across cities in different climate zones. During extreme heat conditions, residents in each city experienced indoor temperatures that exceeded the safe upper limit of 30.6 C (87 F) and this underscores the need to measure indoor temperatures and not assume that outdoor temperatures are an appropriate proxy for indoor heat exposure.

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Key Words: extreme heat, climate change, environmental justice, tree canopy, urban heat island

#### HOUSING AND HEAT VULNERABILITY: LESSONS FROM SAN JOSE, CALIFORNIA

Abstract ID: 508

Abstract within Pre-Organized Session 46

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A growing body of scholarship examines the causes and consequences of urban heat and can inform planning to reduce vulnerability. This is important because extreme heat is the largest weather-related cause of death in the United States, and it is expected to worsen with climate change. Past research has demonstrated that affordable housing is disproportionately at the intersection of heat and social disadvantage (Gabbe and Pierce, 2020). Relatedly, recent research has indicated that some housing structure types can elevate interior thermal exposure even beyond urban heat island-derived warming in an arid climate (Stone et al., 2021).

Our research analyzes intra-city disparities in heat exposure and adaptive capacity. We answer two questions for San Jose, California. First, how does outdoor temperature vary by housing type? Second, what associations exist between adaptive capacity measures and housing characteristics? We hypothesize that multifamily housing types, particularly those in which low-income residents reside, are in hotter parts of the city and/or have characteristics that hinder adaptation to heat.

Several datasets are created and compiled for answering these questions. We use air temperature measured as part of a NOAA Heat Watch Campaign in summer 2020. We compile a dataset of parcel characteristics based on county assessor data and city of San Jose affordable housing data. We model air conditioning (AC) provision at the parcel level using a method adapted from Gronlund and Berrocal (2020). We compile a tract-level dataset of factors that influence thermal exposure, including socio-economic characteristics, tree canopy, impervious surface, and residential energy efficiency.

Our approach includes a combination of descriptive statistics and spatial regression models. We first present a descriptive analysis of outdoor temperatures, tree canopy, and AC prevalence by housing type. We then specify spatial lag models at the parcel scale to associate heat risk with key housing and neighborhood characteristics. The dependent variable is a measure of heat risk based on Mitchell and Chakraborty (2015). The independent variables include parcel and neighborhood characteristics.

Preliminary descriptive results show that in terms of outdoor heat exposure, the average single-family unit is in a cooler location than the average multifamily one in San Jose. These results are partially explained by San Jose's geography, including the San Francisco Bay's cooling effects; heat trapped in the Coyote Valley at the city's south; and foothills with south-facing aspects resulting in peak afternoon sun exposure. Meanwhile, multifamily housing — and particularly affordable housing — is located in areas with less tree canopy and more impervious surfaces.

We speculate that there are bigger disparities when looking at AC provision, which more directly impacts residents' health due to higher frequency and duration of exposure indoors. Data from the Santa Clara County Housing Authority — which operates 21 public housing developments in San Jose — indicate that 32% of units have central AC; 44% have individual AC units, and 24% have no AC. By comparison, an estimated 42% of all larger multifamily developments in San Jose's climate zone have central AC based on a statewide study. As a next step, we will model AC availability across San Jose by parcel and housing type — and correlate prevalence with socio-demographic and housing characteristics.

Planners and policymakers can reduce residents' heat vulnerability through indoor and outdoor strategies. This paper contributes to planning scholarship and practice by analyzing factors related to heat at a fine spatial scale, and connecting these characteristics to housing by type, tenure, and affordability. While there have been several studies that have used social vulnerability indices, or individual components, to map neighborhood-level vulnerability, there has been limited study focused specifically on housing at the parcel scale.

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Key Words: housing policy, affordable housing, climate adaptation, extreme heat

#### **4.51 PRE-ORGANIZED SESSION - URBAN GOVERNANCE AND WATER ACCESS**

Pre-Organized Session 51 - Summary

Session Includes 231, 232, 233, 269

PIERCE, Gregory [University of California Los Angeles] [gpierce@luskin.ucla.edu](mailto:gpierce@luskin.ucla.edu), organizer

There remains quite a bit of debate around the US and the world regarding forms of urban water governance, their necessary planning supports, and their implications for essential access and livelihood outcomes, especially in light of climate change. Efficiency claims have been challenged and increasing evidence suggests concerns with social equity and environmental protection. This session explores the current state of urban water governance research around the globe. What theoretical perspectives can be used to understand the shift toward privatization, back toward public ownership or hybrid models? What does the empirical evidence suggest regarding efficiency, equity and conservation under different governance structures? Quantitative and case study papers will be presented.

Objectives:

- Interrogating forms of urban water governance and their implications

#### **CITY-LEVEL WATER SYSTEM ARRANGEMENTS IN CALIFORNIA: INFLUENCES AND IMPLICATIONS FOR GOVERNANCE AND PERFORMANCE**

Abstract ID: 231

Abstract within Pre-Organized Session 51

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Cities are expected to either directly or indirectly provide basic utility services to their residents, as the proportion of the population residing in cities grows across the globe. The type of provider serving a city has considerable albeit mixed implications for service and non-service outcomes, as shown in the literature on urban water service provision. Some cities directly provide drinking water and other utility services, whereas others contract out these responsibilities, with considerable implications for service and non-service outcomes. There is both a robust literature considering reasons for city versus private providers, as well as a growing number of studies assessing the rise in special district service provision within urban contexts. On the other hand, there are few if any studies assessing these three main provider types jointly, as well as fully accounting for the diversity of institutional arrangements in urban drinking water service.

In this study, we provide empirical evidence to introduce the idea of city-level water service provider arrangements

using a dataset we manually constructed and coded for all 482 cities in California. Our governance analysis shows that while 60% of cities have either city or private providers and 80% with the addition of special district providers, 20% had more than one service provider, and 68% of these cities were also served by more than one system type. Using multivariate regression techniques, we explain additional complexity in the typology of drinking water service providers serving individual cities beyond city and private providers. We find that city incorporation date most profoundly influences the mix of water systems in cities, especially arrangements involving special districts or multiple system types, with implications for performance and affordability. We also present suggestive evidence of differences in water conservation and affordability within cities depending on their water-system arrangements.

Our findings suggest that water system fragmentation is prevalent even within city boundaries, including those served by private systems, and that there is considerable potential for consolidation efforts by proactive city governments. Further research is needed, however, into how historical growth, development, and annexation decisions account for the existing water system arrangements seen in incorporated cities.

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Key Words: Public-private, urban governance, drinking water, utilities

### INVESTOR-OWNED UTILITIES IN CALIFORNIA: LOCATION, PERFORMANCE, AND AFFORDABILITY

Abstract ID: 232

Abstract within Pre-Organized Session 51

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The privatization of water infrastructure has been controversial regarding performance and equity. This study compares geographic distribution, affordability, leakage, and water quality compliance between public and private utilities in California. Private utilities were found to charge more for water, although not to a degree that could be considered unaffordable on average, while providing more low-income assistance and shutting off fewer customers for nonpayment. Higher rates were also associated with lower leakage rates. This supports the notion that well-regulated private utilities can invest more in asset management by charging more for water than public utilities while protecting lower income customers.

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Key Words: Water utilities, Privatization, Affordability, Spatial structure, California

## **SPLINTERED ACCESS AND PLANNING IMPLICATIONS IN HYBRID WATERSCAPES OF THE GLOBAL SOUTH**

Abstract ID: 233

Abstract within Pre-Organized Session 51

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Rapid urbanization across the Global South is generating a growing demand for water. Water policies are emerging to fulfill this demand and to achieve the UN Sustainable Development Goals. In India, water needs are acute in small cities and peri-urban regions that house the urban majority (Subramanyam, 2020). Planning's historical neglect of these geographies has resulted in hybrid waterscapes on the ground, where people access water from multiple infrastructures and sources that are governed by a plethora of actors to cope with intermittent and unreliable municipal water supply (Acey, 2019; Spencer, 2019).

This paper investigates how emerging water policies and infrastructures are transforming the everyday governance of hybrid waterscapes and the experience of socio-environmental inequalities in small cities. In particular, I ask, how are everyday practices of water access and governance, and the exercise of political agency evolving with urbanization and concomitant changes in waterscapes? In what ways do differently situated residents contest the unequal costs of water access in this hybrid waterscape through everyday practices and politics? How do these everyday practices challenge elite-led water infrastructure plans and construct alternative visions for sustainable, water-secure futures in small cities? I examine these questions in the case of Tiruppur, an economically vibrant, growing small city-region in south India. The paper uses primary data gathered using mixed methods, including a participatory action research project involving a monthly water calendar maintained by ninety-four purposively sampled, working class households across Tiruppur. The data from the water calendars, along with a household survey, over fifty interviews with water providers and users, and observational data helped me trace and explain the relationships between the everyday practices and politics of connecting to different water sources and the exercise of political agency in water (and urban) governance in Tiruppur.

My findings reveal that the costs of access to quality water and the exercise of political agency in Tiruppur's hybrid waterscape are highly splintered by users' social and spatial identities. Individualized, quotidian acts of securing water from multiple sources construct different and unique relations between water users and the local state, even among users who are co-located and otherwise similarly marginalized based on their class or caste status. I find that these highly individualized relations of water governance devolve demands for accountability away from the body politic to the individual (cf. Jepson & Brown, 2014). In an urban context where there is little to no organizing outside political society to contest inequalities in service provision (Harriss, 2007; Benjamin, 2008), I argue that these individualized approaches prevent the sustained articulation of collective demands for improvements in city-level public infrastructures, and result in an overall acquiescence to exclusionary forms of water infrastructure planning. Overall, this work contributes to the planning literature on citizen participation and everyday governance in hybrid water markets by showing how political agency is influenced by both the materiality of infrastructure as well as multiple, intersecting social and spatial identities that include local citizenship and tenancy status. I also discuss

methods to measure and theorize the different non-monetary, unaccounted-for-costs of water access under conditions of intermittency and hybridity. The paper concludes with recommendations for just water infrastructure planning that seeks to reduce the costs of water access, advance equity, and foster collective action at various scales within the hybrid waterscapes of water-scarce, small cities like Tiruppur across India.

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Key Words: water infrastructure, everyday governance, environmental inequalities, political agency, India

### **PITTSBURGH'S WATER MOBILIZATION: A CASE OF TRANSLOCAL ACTIVISM AND THE NEW PUBLIC**

Abstract ID: 269

Abstract within Pre-Organized Session 51

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This paper contributes to the water privatization and governance literatures by examining the case of Pittsburgh where renewed efforts of water privatization have emerged after a controversial private management arrangement between the local water authority and Veolia ended abruptly in 2015. We argue that, as the water authority aims to rebuild trust in the community, citizen mobilization has played a key role in hindering further privatizing arrangements and has exerted influence in defining what constitutes the "new public" water in Pittsburgh, by advocating for increased transparency and accountability in governance, infrastructure improvements and protections for low-income residents.

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Key Words: water governance, water privatization, human right to water, social movements, new public water

#### **4.61 PRE-ORGANIZED SESSION - ADAPTING TO CLIMATE CHANGE IN COASTAL CONTEXTS: LESSONS FROM FLORIDA RESEARCHERS**

Pre-Organized Session 61 - Summary

Session Includes 520, 521, 522, 523, 524

LINKOUS, Evangeline [University of Southern Florida] elinkous@usf.edu, organizer

Florida is often considered ground zero for climate change impacts in the US. With a highly developed coastline under threat from tropical storms and sea level rise, and the entire state facing increased incidence of excessive heat events, wildfire, and drought, Florida is facing an almost existential crisis if little is done to avert the worst impacts of climate change. However, the policy response in Florida has been limited and incremental, all while population growth and coastal real estate development continue with few signs of slowdown. This panel brings together a group of Florida-based scholars to highlight the breadth of climate change-related issues facing Florida. Papers in this session address changing approaches to local land use planning and hurricane evacuation policies, climate gentrification and neighborhood change, innovations in modeling and community engagement technologies, and emerging strategies for infrastructure planning and finance.

Objectives:

- Present and assess Florida local government policies that respond to climate change
- Highlight the impacts of climate change on Florida community and economic development and infrastructure
- Showcase emerging technologies and strategies for responding to climate change from Florida universities

#### **DENSITY INCREASES IN THE COASTAL HIGH HAZARD AREA: HOW FLORIDA LOCAL GOVERNMENTS REGULATE NEW RESIDENTIAL DEVELOPMENT IN FLOOD ZONES**

Abstract ID: 520

Abstract within Pre-Organized Session 61

LINKOUS, Evangeline [University of South Florida] elinkous@usf.edu, presenting author

This research examines Florida local government policies that address development in the places where people, property, and infrastructure are most at risk from storm surges. Under Florida Statutes, Coastal High Hazard Areas (CHHA) are defined as the area below the elevation of a Category 1 storm surge line and are those places most likely to be significantly damaged or submerged by sea water. Florida requires that local governments designate CHHA areas within the local comprehensive plan and limit CHHA development in accordance with the hurricane evacuation capacities supported by local transportation infrastructure. Although Florida's CHHA rules have changed over time since first adopted as part of the 1985 Growth Management Act, the overall intent has been to limit development in the CHHA for the purpose of maintaining evacuation capacity and minimizing loss related to public infrastructure and other public expenditures (Puszkin-Chevlin & Esnard, 2009).

Many Florida communities have long-established policies prohibiting additional residential density in the CHHA, resulting in zoning codes that are "frozen in time" (Puszkin-Chevlin and Esnard, 2009, 36). This led to concerns about the abilities of some communities to accommodate projected population growth, support economic development, and provide affordable housing. These concerns were amplified following a 2016 update to the Florida Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model used to identify the CHHA. In many communities, the update resulted in a significant expansion of the CHHA, nearly doubling the footprint in some communities and forcing a rethink of areas targeted for growth and redevelopment.

This research provides a survey of Florida local government policies for accommodating residential density in the CHHA. Specifically, it addresses three research questions:



- What are the local government's baseline rules for addressing new density in the CHHA?
- How have requests for additional density in the CHHA been decided over the last decade?
- What changes to the CHHA density rules have been considered or adopted since the 2016 update?

The research includes three phases. In phase one, a survey of local government comprehensive plans that include Coastal Management Elements will be conducted to identify policies for addressing new density in the CHHA. Policies will be analyzed to identify major approaches, such as those that strictly limit new density, those that incorporate incentives such as transferable development rights that direct density to specific areas, and those that use criteria such as building code or hurricane evacuation standards to permit density increases.

In phase two, case studies of at least four Florida communities will be developed to examine how requests for additional density in the CHHA have been decided over the last decade and to identify CHHA density rule changes that have been proposed or adopted. The case study research will include interviews with key stakeholders, a review of relevant planning decision meeting minutes, and analysis of local media coverage.

I have currently prepared a database of density policies in the CHHA for Tampa Bay area communities and am actively working with a graduate research assistant to extend this work statewide. I have also developed a case study of the City of St. Petersburg, which faced a 41% increase in the CHHA following the 2016 model update which resulted in text amendments to their Comprehensive Plan in 2020 that shifted from a strict prohibition of new development in the CHHA to a criteria-based project evaluation approach.

The research will provide information about best practices in addressing density in flood prone areas. Florida's experiences provide instructive lessons on the balancing act involved between protecting human lives and public assets, preventing climate gentrification, and accommodating demand for housing and redevelopment near existing urban infrastructure.

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Key Words: Density, Sea level rise adaptation, climate change, hurricane evacuation, Florida

#### **DEALING WITH CLIMATE GENTRIFICATION: HOLDING BACK THE WATER AND STABILIZING NEIGHBORHOODS TO ADDRESS THE DUAL CRISES OF SEA LEVEL RISE AND AFFORDABLE HOUSING SHORTAGE IN FLORIDA**

Abstract ID: 521

Abstract within Pre-Organized Session 61

BUTLER, William [Florida State University] wbutler@fsu.edu, presenting author

Florida is often considered ground zero for sea level rise (SLR) impacts in the United States. With extreme scenarios predicting sea levels at 2.5 meters above year 2000 levels by 2100, Florida's low-lying coastal cities and counties are facing an existential threat. And yet, development continues unabated as municipalities invest in infrastructure upgrades to keep the water out.

Despite this persistent focus on protecting the coastline, some inland and higher elevation areas of Florida are becoming targets for redevelopment. This trend is increasing property values and threatens displacement of some inland residents in a process called "climate gentrification." While scholars have been identifying the potential for inland migration for years, less attention has been paid to whether displacement from the coast will lead to cascading displacement.

This paper examines planning efforts to address the risks of first order displacement from the coast and mitigate second order displacement in low-income inland communities on higher ground. We selected the three most populous coastal areas in Florida for the study—Jacksonville, Duval County; Miami, Dade County; and Tampa Bay, Pinellas County. The project includes mapping, policy analysis, and interviews to address the research question: How are Florida communities responding to the risks of displacement from high cost coastal properties and the pressure of increasing displacement risks in higher elevation but often lower cost neighborhoods further inland?

First, we mapped the vulnerability of coastal areas to SLR inundation at 3 feet of SLR, a generally accepted level for planning purposes, and characterized the demographics of the population likely to be displaced. We also mapped a range of demographic and housing market factors to locate inland lower income neighborhoods that might be vulnerable to gentrification. The mapping exercise allowed us to select neighborhoods to focus on for deeper analysis. Second, we undertook a policy analysis that included a network of plans approach. We used a scoring mechanism to determine: 1) what level of protection is offered neighborhoods along the coast including strategies to reduce SLR impacts and slow coastal inundation, and 2) what level of protection of affordable housing and neighborhood stabilization is provided by plans that guide housing policies in inland neighborhoods at greatest risk of gentrification. Finally, we interviewed housing specialists, resilience officers, and community advocates in the three counties to determine the extent to which key policy actors are attempting to anticipate and respond to these threats and whether policies are being effectively implemented to curb displacement risks.

From the mapping exercise, we see a convergence of inland gentrification risk and targeted redevelopment investment through Community Redevelopment Agencies and Opportunity Zones. This suggests a commitment to target neighborhood investment, but not necessarily to minimize displacement. From our policy analysis, we find high variability across neighborhoods and counties in the application of SLR protections and affordable housing preservation strategies. County and regional plans play an outsize role in addressing SLR while municipal plans vary greatly in their commitment to SLR protection. Affordable housing protections are uneven across the cases as well, but county, municipal, and CRA plans all have language that lays a foundation for protection. Despite what is on the books, our interviews with planners and housing advocates suggest that they are struggling to stay ahead of the threats and unable to sufficiently protect affordable housing and reduce displacement pressures on low-income households who are least able to afford relocation.

This paper advocates for anticipatory planning and proactive examination of climate resilience and anti-gentrification housing policies to identify gaps and opportunities to equitably address the risks associated with displacement before coastal cities and neighborhoods have run out of time and land.

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Key Words: climate gentrification, sea level rise, climate justice, affordable housing, adaptation planning

## **TOWARD RESILIENT COASTLINES AND TRANSPORTATION INFRASTRUCTURE**

Abstract ID: 522

Abstract within Pre-Organized Session 61

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This presentation reports the results of two coastal resilience studies. The first explores the use of immersive technologies to visualize sea-level rise impacts on transportation infrastructure. The second examines the role of natural, green, and integrated infrastructure in shoreline stabilization.

Sea-level rise impacts threaten urban mobility, a vital component of community resilience (Sun et al, 2020). Local government officials, including transportation planners, usually rely on two-dimensional (2D) visualizations, including charts and GIS-generated maps, to convey future sea-level rise (SLR) scenarios to coastal communities. However, three-dimensional (3D), immersive visualization technologies such as virtual reality (VR) allow participants to “identify and locate themselves” in planning for flood-risk management (Wang et al., 2019, p. 8). For this study, the research team designed, built and tested immersive models as a public engagement tool in planning for projected SLR impacts on transportation infrastructure. Using a quasi-experimental design, the study compares 2D representations versus 3D VR models to educate stakeholders about potential SLR impacts in community meeting settings in Fort Lauderdale, Florida. VR technology proved effective in increasing participants’ self-reported understanding of SLR. The study also found evidence that the VR experience could (1) overcome bias typically associated with political identity and (2) overcome limited understanding of complex spatial concepts, as manifested in the many participants reporting that VR provided new information although the SLR data presented in 2D and 3D was the same.

Coastal ecosystems play a critical role in shoreline protection and flood risk reduction (Chang et al., 2018; Kurth et al., 2020). As the concern about the impacts of coastal armoring grows, coastal communities seek to invest in adaptive and alternative strategies to protect developed shorelines and coastal ecosystems against stressors caused by climate change and coastal development (Smith et al., 2018). The green infrastructure approach offers an array of alternative solutions to flooding risk and erosion hazards. This outline of a methodology at a landscape scale links a proposed framework of generic shoreline stabilization project types to a cumulative exposure index considering non-storm and storm conditions. The proposed approach integrates coastal engineering modeling, geospatial analysis, and expert opinion elicitation to identify potentially high-risk areas and areas suitable areas for alternative shoreline stabilization. Specifically, the multicriteria analysis combines a typology of generic shoreline stabilization options with a GIS-based shoreline exposure index and expert-derived parameter weights. Working in close collaboration with The Nature Conservancy and Monroe County, Florida, an application of the proposed framework to the Florida Keys' developed shorelines illustrates the approach. The study results are incorporated into a web application to support the coastal resilience efforts in the Florida Keys (<http://maps.coastalresilience.org/seflorida/#>).

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Key Words: coastal resilience, transportation infrastructure, immersive technologies, coastal ecosystems, shoreline stabilization

## A COASTAL VULNERABILITY FRAMEWORK TO GUIDE NATURAL INFRASTRUCTURE FUNDS ALLOCATION IN COMPRESSED TIME

Abstract ID: 523

Abstract within Pre-Organized Session 61

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Hurricane Maria, a category 4 tropical cyclone, hit the US non-incorporated territory of Puerto Rico on September 20, 2017. Widespread physical and natural infrastructure damage was observed, especially in already vulnerable coastal communities. As public sector funding availability for natural infrastructure (ex. coastal ecosystems) increases, mechanisms for its efficient and equitable allocation are lacking. An accessible and replicable coastal vulnerability indicator framework is presented to assist state and federal policy makers in the allocation of funding for coastal natural infrastructure recovery. To assess funding prioritization gaps and test the applicability of the proposed framework, spatial patterns in the estimated funding need identified in state-led post-Hurricane Maria assessments for natural infrastructure rehabilitation efforts were compared to physical and social coastal vulnerability estimations. Three main challenges that emerge during the implementation of a vulnerability indicator framework were considered for its design: 1) the compressed time frame in which decisions are made after an extreme weather event, 2) the availability of data to calculate indicators in a reduced time frame, and 3) the accessibility of results to a broad variety of stakeholders. We propose a vulnerability indicator framework that can become operational in a relatively short period of time, attempts to simplify data gathering efforts, and uses

methods that aim to be more transparent and understandable to a broad group of stakeholders.

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Key Words: vulnerability, equity, hurricane, funding allocation

#### **GETTING TO RESILIENT TRANSPORTATION INFRASTRUCTURE: HOW FLORIDA MPOS ARE ADDRESSING RESILIENCE**

Abstract ID: 524

Abstract within Pre-Organized Session 61

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Transportation resilience is a major area of concern both at the national and state level. The Transportation Research Board lists “Resilience and Security” as one of twelve major areas of concern for the nation’s infrastructure over the next 10 to 20 years (National Academies, 2018a). The FAST Act of 2015 includes requirements to consider resilience and stormwater issues in the planning process, but does include commensurate guidance (Weilant, Strong & Miller, 2019). The Florida Transportation Plan (FTP) set a goal for “agile, resilient, and quality infrastructure” (FDOT, 2015) in both the FTP Policy and Vision elements. Resilient transportation systems are those designed to endure and recover from the impacts of climate change and extreme weather events. Resiliency principles must be integrated into various components of the transportation system, including but not limited to long-range planning, project development and environment, design, construction, transportation systems management and operations, and asset management.

Some state DOTs and MPOs have begun integrating resiliency into the transportation planning process. A study of all state DOTs and 101 MPOs nationally found that about half had incorporated resiliency into their transportation plans (Dix, Zgoda, Vargo, Heitsch, & Gestwick, 2018). Of those addressing resiliency, most were still in the early phases of the planning process and had not widely integrated resiliency into practice or implementation (Dix et al., 2018, National Academies, 2018b). Obstacles to planning and implementation include the lack of information about climate impacts, vulnerability assessments, and models to assess impacts (Dix et al., 2018), and the need for resiliency champions and leadership (National Infrastructure Advisory Council, 2015). In Florida, several MPOs have begun to incorporate resiliency into the planning process, but there has not been a comprehensive assessment of their activities to date.

Current updates to the FTP call for increased focus on resiliency and the need for more state support and guidance for regional and local transportation partners. Recommendations from the FTP-SIS Resilience Subcommittee include (1) development and implementation of policies, tools, guidance, and design standards that reduce risk and (2)

integration of resilience data into transportation planning and design. Addressing these recommendations first requires an understanding of the status of regional resiliency planning efforts and specific needs. To support these efforts, we conducted a comprehensive assessment of how Florida MPOs are incorporating resiliency into the long-range planning process. We reviewed and categorized the latest long-range transportation plans from each MPO to evaluate the extent to which resiliency is defined and utilized in setting goals and objectives, project prioritization, and implementation. We will next conduct interviews with MPO staff to evaluate obstacles, challenges, and needs in regards to implementing resiliency into the long-range transportation planning process. Following that, we will produce a comprehensive assessment that details the current state of practice of Florida MPOs regional resiliency efforts and recommendations on specific data, tools, and guidance needed to advance climate planning for regional transportation agencies. This assessment will assist FDOT in strategically focusing resources to support implementation of resilient strategies into practice.

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Key Words: climate, transportation, resilience

## 4.69 PRE-ORGANIZED SESSION - MANAGING FLOODPLAINS IN A CHANGING CLIMATE

Pre-Organized Session 69 - Summary

Session Includes 282, 347, 349, 350

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In the face of rising sea levels and more intense storms, there is growing urgency to manage floodplains in a way that promotes community wellbeing and resilience. Despite long-standing recognition of the importance of land use planning and policy for reducing natural hazard risk, many obstacles remain to realizing effective floodplain management. This session will explore how floodplains have developed and continue to evolve. It will also explore policy, planning, and legal tools for promoting climate-smart land use and for effective post-disaster recovery. We draw on diverse geographies and examples to highlight the social production of climate risk: the ways in which social, legal, economic, and political systems distribute risk among groups, often leading to inequitable outcomes.

#### Objectives:

- Demonstrate how land use choices create and distribute flood risk across different groups

## IS LAND USE PLANNING INCREASINGLY CONFRONTING EQUITY CHALLENGES IN HAZARDOUS AREAS? A CASE STUDY OF HOUSTON

Abstract ID: 282

Abstract within Pre-Organized Session 69

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Every flood event reveals hidden disparities within cities - disparities in capacities to anticipate, respond to, and recover from disasters. Numerous studies examining drivers of disparity have found that highly socially vulnerable (e.g., poor, minority) neighborhoods sustain more damage, have access to fewer recovery resources, and experience slower recovery (Van Zandt et al., 2012). Scholars argue that these disparities in impact and recovery are partly due to inadequate planning. In socially vulnerable neighborhoods, planning has failed to (1) target infrastructure that reduces vulnerability to floods (e.g., ecosystem enhancements), and (2) account for the unintended consequences of flood risk reduction policies that further disadvantage socially vulnerable households (e.g., green infrastructure causing displacement) (Anguelovski et al., 2016). Moreover, effective flood mitigation and climate adaptation have suffered from inconsistencies and fragmentation across planning sectors and scales (Berke et al., 2015).

Past studies have examined the impact of climate adaptation policies on equity (Anguelovski et al., 2016) and diagnosed gaps in integrating hazard mitigation across cities' networks of plans (Berke et al., 2015; 2019). However, there is a lack of understanding on how the distribution of *all* land use policies driving development in hazardous areas impacts social equity, and whether cities' networks of plans are increasingly planning for equitable flood mitigation. To address these gaps, we ask:

1. To what degree is hazard mitigation integrated into networks of plans in low- and high- socially vulnerable neighborhoods before a disaster?
2. To what degree has the integration of hazard mitigation changed in networks of plans from before to after a disaster in low- and high- socially vulnerable neighborhoods?

We use natural experiment research design to evaluate network of plans before and after Hurricane Harvey in Houston. Although frequently criticized for lack of planning, growth in Houston is driven by planning at multiple scales and sectors. This has produced a large and diverse network of plans (e.g., plans for infrastructure, housing, mitigation) both before (n=26) and after Hurricane Harvey (n=31). The city also has a long history of systematic discrimination in the distribution of planned resources and services and is a poster child for the environmental justice movement (Bullard, 1996). Yet, the city's recent focus on resilience planning, makes Houston an ideal case study to evaluate whether plans are more focused on collectively mitigating floods and whether planning is mitigating floods equitably.

Preliminary analysis of the before-Harvey network of plans reveals a tendency to distribute resources equally rather than equitably or based on needs. In high socially vulnerable neighborhoods, fewer policies avoid dangerous development in flood prone areas or enhance land uses that foster natural flood management (like acquiring vacant land for parks). In the after-Harvey network of plans, degree of integrated effort to address flooding improves in both low and high socially vulnerable neighborhoods. But this improvement is much smaller in high socially vulnerable neighborhoods, reinforcing pre-disaster disparities.

This suggests that, despite the catastrophic effects of Hurricane Harvey, Houston's network of plans continues to overlook needs for more integrated hazard mitigation across plans in high socially vulnerable neighborhoods. From these findings, we draw recommendations to better target policies in socially vulnerable neighborhoods across different types of plans. We also discuss implications of our findings for tradeoffs between economic development,

flood mitigation, and equity in socially vulnerable urban neighborhoods in the US. As climate change exacerbates flood risk, it is imperative that planning confronts challenges of disparate impacts, loss, and adaptive capacities. This study takes a critical first step in this direction by evaluating how inequitable distribution of land-use decisions perpetuates the legacy of discrimination and by exploring opportunities to reverse this trajectory.

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Key Words: Distributive Equity, Longitudinal Plan Content Analysis, Plan Integration for Resilience, Flooding, Climate Adaptation

#### DEVELOPMENT PATTERNS AND THE PRODUCTION OF FLOOD RISK IN NORTH CAROLINA

Abstract ID: 347

Abstract within Pre-Organized Session 69

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Managing development in hazardous locations has long been recognized as a critical component of broader efforts to limit damages from natural hazards. The benefits of managing exposure through avoidance and retreat have been well documented, especially in relation to floods. Over 60 years ago, Gilbert White, known as the father of floodplain management, recognized floodplain land use management as possibly “the single adjustment most likely to lead to a decline in national flood losses” (White et al., 1958). Larger amounts of open space, presence of wetlands, and tightly clustered developments have all been linked to fewer flood losses (Brody et al., 2011).

Despite this long-standing recognition that managing who and what is located in hazardous places is critical to limiting damages, data on floodplain development patterns remain scarce. A series of measurement efforts from the 1930s through the 1980s documented an increase in the number of floodplain structures in nine US cities, estimated through a combination of surveys and interviews of local officials, aerial photographs, and document review (Montz & Gruntfest, 1986). Another study sought to estimate floodplain development using building permits as a proxy (Burby & French, 1981). However, due to the difficulty of identifying the locations and timing of new development at large scales, standardized data on changes in floodplain exposure at large scales have remained elusive.

How do floodplain development patterns differ across communities with different geographic and socioeconomic



characteristics, and to what extent are other floodplain management activities associated with limited floodplain development? In this paper, we construct a novel parcel-level dataset to measure changes in floodplain development over time (2001-2016) in North Carolina, allowing us to identify which municipalities have undergone development while limiting flood risk. We also leverage a unique statewide, structure-level elevation dataset to assess the relationship between floodplain development and risk over time.

We find that higher rates of floodplain development are more likely to occur in wealthy coastal communities and less wealthy inland communities. In addition, construction of new housing in NC floodplains has far outstripped collective efforts to remove houses from flood-prone areas. Since 1996, 3,721 properties have been restored to open space through floodplain buyouts, while housing has been newly constructed on over 47,000 floodplain parcels. Finally, commonly-used measures of floodplain management “effort,” the Community Rating System score and use of property buyouts, are only weakly related to whether or not the community has experienced concentrated floodplain development.

As sea levels rise and storms become more intense, there is increasing urgency to understand how to effectively channel development away from flood-prone areas. Local governments, with their zoning and permitting authorities, play a critical role in reducing risk, yet our results illustrate substantially different floodplain development patterns across communities. Identifying best practices based on empirical results can strengthen flood risk management and reduce future losses across the United States.

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Key Words: natural hazards, land use, climate risk

#### **DOES SUBSIDY REMOVAL REDUCE COASTAL DEVELOPMENT? MEASURING THE EFFECT OF THE U.S. COASTAL BARRIER RESOURCES ACT**

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Abstract within Pre-Organized Session 69

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Substantial evidence documents how public subsidies shape urban development patterns, with particular emphasis on their role stimulating the conversion of peripheral agricultural land into sprawling, low-density development. While most land use policies are crafted by state and local governments, subsidies provided by the federal government play a consequential role in shaping urban development. This is especially true for development in

coastal areas, which relies on a number of federal subsidies to be viable, including risk reduction measures (e.g., shoreline armoring), subsidized flood insurance (National Flood Insurance Program; NFIP), and post-disaster assistance.

In this paper, we explore how coastal development responds to the removal of federal subsidies. Specifically, we measure the long-term impact of subsidy removal on development rates in coastal areas through an examination of the U.S. Coastal Barrier Resources Act (“CBRA”; 16 U.S.C. 3501 et seq), which designated “undeveloped coastal barriers” (called “CBRA units”) to be: 1) ineligible for federal financial assistance for critical infrastructure (roads, bridges, water supply, etc.) and post-disaster assistance, and 2) unable to participate in the federally-subsidized NFIP.

We measure the effect of CBRA on development using a novel building structure dataset and a regression discontinuity design, comparing development rates along either side of CBRA boundaries. We focus our analysis on CBRA units in five states – Alabama, Delaware, Florida, North Carolina, and Texas – chosen for their wide variety of geographies, coastal hazard risk, development policies, and economic growth. Examining development at the borders of CBRA units (n=90), we compare the density of built structures inside and outside CBRA in 1980 (pre-CBRA) and 2016 using 500m grid cells (n = 1316), documenting the change in development densities across this 36-year time period. We use a paired t-test to measure the effect and significance of CBRA on development rates and a sensitivity analysis of CBRA boundaries to explore the importance of CBRA boundary location.

Our findings demonstrate that CBRA has a significant effect reducing development activity, and that this effect is caused by the delineation of CBRA boundaries. Specifically, grid cells in CBRA experience development growth at about one quarter of the rate of non-CBRA areas. The majority of grid cells in CBRA (87%) exhibit no new development from 1980-2016, compared to 52% of grid cells outside CBRA. These differences are highly sensitive to shifts in the location of CBRA unit boundaries, suggesting a strong causal role of CBRA’s subsidy removal that cannot be explained by underlying land characteristics.

Federal subsidies in coastal areas, such as NFIP and risk reduction measures, artificially depress the financial risks of building in hazardous areas, incentivizing development. This study demonstrates that in the absence of these subsidies, increased financial risk and infrastructure provision costs makes development prohibitively expensive, leading to substantially lower rates of development. This finding underscores the important role of federal subsidies in facilitating coastal development and illustrates how subsidy removal is an effective growth management strategy. More importantly, as the impacts of climate change increasingly afflict coastal areas, subsidy removal by federal, state, and local governments (particularly if coordinated) may hold promise as a climate-oriented policy that encourages the avoidance of hazardous areas.

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Key Words: Coastal Barrier Resources Act (CBRA), coastal development, subsidy removal, climate adaptation, hazard mitigation

## **HOW THE LAW CONSIDERS (OR DOESN'T) INCREASED FLOODING DRIVEN BY CLIMATE CHANGE AND SEA-LEVEL RISE**

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Abstract within Pre-Organized Session 69

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With the impacts of climate change and sea-level rise, we increasingly see that our past environmental and climatic records do not adequately reflect what we expect in the future. But our legal system, laws, jurisprudence, and rules have been developed under our earlier notions of climate and environmental "stability." [1] Thus, just as local governments see an increasing need to plan far more proactively and carefully for a changing future, these local governments confront a legal system that itself still needs to adapt to the facts of climate change and sea-level rise. This worsens an already serious issue: Local governments and floodplain managers often have serious concerns about potential legal liability for enacting regulations that would protect people and property from flooding impacts.[2] This fear of legal liability can lead to a lack of effective floodplain management and greater harm from flooding events. This session will provide an overview of the U.S. Constitution's property rights protections in the context of floodplain management as well as an introduction to potential civil (tort) liability of government for failure to adequately protect citizens and property from known flood risks. This will culminate in some general "legal lessons learned" and sharing of planning and legal resources with participants, including suggested actions, such as providing notice/disclosure of hazards,[3] permitting conditions, modifying comprehensive plans and ordinances related to infrastructure services, requiring additional building elevation, increasing tailwater elevations for stormwater design, liability for roads impacted by climate change and/or sea-level,[4] planning for cleanup of abandoned properties,[5] and other suggestions. Failure to understand where the law is, how it developed, and how to push the law to adapt will prevent planners from effectively assisting local governments in adapting to a changing future and nudging the law towards increased recognition of the challenges of climate change and sea-level rise.

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Key Words: Law, Climate change, sea-level rise, planning, infrastructure

## **ROUNDTABLES**

### **4.20 ROUNDTABLE - GREEN NEW DEALS AS CATALYSTS FOR URBAN CLIMATE JUSTICE?**

Abstract ID: 20

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How can the recent proliferation of efforts in the US, Europe and elsewhere to create green new deals be translated into climate justice for cities? Programs are being developed around the notion of generating a transition toward a greener economy. However, the ultimate implementation of these programs as they will manifest in cities remains fairly non-specific. How can planning steer these initiatives toward climate justice by learning from recent experiences with environmental justice, green building, urban sustainability, and resilience initiatives? What types of infrastructure are the most important to target from a climate justice perspective? What types of intellectual, political and institutional shifts are needed within the planning profession in order to advance urban climate justice through the green new deal policy paradigm? Members of this roundtable will engage the audience in a discussion of what the green new deal means for planning's role in simultaneously addressing climate change and social justice.

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Key Words: Green New Deal, Climate Justice, Climate Change, Social Justice, Green Economy

### **4.100 ROUNDTABLE - BUILDING A BETTER BUILDING POLICY: COMMUNITY COLLABORATION TO ACHIEVE CLIMATE RESILIENCY OF THE BUILT ENVIRONMENT**

Abstract ID: 100

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Buildings in the United States – our homes and offices, schools and shops – contribute 40 percent of the country's total carbon emissions. We cannot achieve a carbon-neutral future without addressing our existing building stock, nearly two-thirds of which will also exist in 2050 (Architecture 2030, 2021). Such actions include implementing low-carbon retrofits as well as adopting deconstruction – rather than demolition – as a more sustainable way to address the waste of non-renewable resources such as old-growth wood and other building materials that currently go to landfills (Fraanje, 1997). In addition to positive environmental impacts, such actions can provide socio-economic

benefits such as green job creation and enhanced skills training, historic preservation opportunities, and wider availability of valuable building materials (Bertino, 2021). They can help the extractive construction sector move toward a more sustainable circular economy based on maintenance, repair, adaptation and reuse of our built environment (Huuhka, 2019).

However, municipalities cannot rely solely on market mechanisms (such as those found in the real estate sector) to create an environment suitable for thoughtful treatment of the existing built environment and the resulting creation of a circular economy (Hassler, 2009). Instead, legal and institutional interventions are often necessary, such as adoption of local ordinances bolstered by active community education and engagement efforts targeted at building owners and occupants.

With this in mind, university educators and community leaders in central New York have come together to encourage municipal adoption of practices and policies to create a more equitable and resilient built environment. Through the sharing of research, resources and networks, collaborators are working to promote the adoption of low-carbon retrofits, methods to address building material waste, the development of a circular economy, and the creation of equitable green jobs. The collaboration is focused on four areas: (1) education and community engagement, (2) research and resource development, (3) policy and practice recommendations, (4) equitable green jobs creation and skills training.

Roundtable participants, including two educators and two community leaders in the fields of planning, preservation and architecture, will discuss methods of university-community partnership to involve students and community groups in efforts to strengthen resilience of the built environment. Participants will discuss their experiences working together to promote municipal practices and policies to employ low-carbon retrofits appropriate for historic resources, encourage deconstruction and a circular construction economy, and create racially and socially just green jobs. They will draw on their efforts as members of CROWD (Circularity, Reuse, Zero Waste Development), a collaborative, multi-disciplinary task force that works with New York State communities to promote sustainability of the built environment.

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Key Words: built environment, climate resiliency, deconstruction, circular economy, green jobs

#### 4.203 ROUNDTABLE - EXTREME HEAT AND CLIMATE JUSTICE

Abstract ID: 203

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Climate change, in combination with the urban heat island effect, is increasing risks of extreme heat worldwide (Stone & Rodgers, 2001). While other climate hazards garner more media attention in the US, extreme heat is the deadliest (Hondula et al., 2015). It also causes declines in quality of life, increases in mental health and behavioral disorders, declines in economic productivity, and strains water and energy infrastructure and ecosystems. Extreme heat is a climate justice issue with risk inequitably distributed across cities and populations, such as higher heat severity in historically redlined neighborhoods (Hoffman et al. 2020, Wilson 2020). Despite increasing recognition of the threat extreme heat poses, heat policy and planning remains underdeveloped in comparison to other natural hazards (Keith et al. 2020). An assessment of over 3,500 climate adaptation resources in the U.S. found that only 4% focused on heat (Nordgren et al. 2016) and even fewer consider social justice (Lambrou and Loukaitou-Sideris in press). This session will explore diverse perspectives in the current state and innovations in planning research and practice for extreme heat.

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Key Words: heat, justice, climate, resilience, hazards

#### 4.279 ROUNDTABLE - WHAT (AND WHO) IS EQUITABLE RESILIENCE FOR?

Abstract ID: 279

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Communities around the world are facing the conjoined crises of mounting inequality and increasing threats from climate change. From landslides in hillside favelas in South American megacities to wildfires in mobile home parks in the USA to floods in booming coastal cities of south and east Asia, the communities that are most vulnerable to climate change are often home to people without the economic and political resources necessary to prepare or recover from major disruptions (Shi et al. 2016). Many early efforts to adapt cities to climate change have actually exacerbated pre-existing inequalities, displacing or otherwise harming already disadvantaged residents while benefiting those with the political power and financial resources to shape adaptation plans and policies (Anguelovski

et al. 2016).

The concept of 'climate resilience' has been critiqued on several fronts, including that it is insufficiently precise (Meerow and Stults 2016), that it is used to justify returning to pre-disruption unjust status quo conditions, and that, by celebrating the self-sufficiency of the poor, it excuses neoliberal state retrenchment (Davoudi et al. 2012). Nonetheless, the concept has been widely embraced by grassroots and other advocates, leading some scholars to embrace the 'resilience' of urban areas, but only when the concept is framed as explicitly advancing 'progressive' or 'equitable' goals that address the underlying drivers of uneven vulnerability (Vale 2014).

Planners and designers seeking to advance equitable resilience face two important questions. First, what counts as equitable resilience? And second, where can we look for cases of realized projects, programs, and plans that exemplify this equity-centered vision of resilience?

This roundtable addresses these questions by inviting researchers to consider how selected international cases advance equitable resilience by addressing the underlying causes of uneven vulnerability. Participants will consider how their chosen cases go beyond reducing geophysical hazard vulnerability to improve conditions for urban poor residents by: 1) improving environmental safety and vitality; 2) enhancing access to livelihoods; 3) increasing self-governance; and 4) strengthening security, both from displacement and from violence (Vale et al. 2014). Undergirding this discussion is the foundational principle that cities cannot be resilient, and resilience cannot be truly 'urban,' unless equity is a central concern.

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Key Words: Resilience, Hazards, Equity, Climate Change, Housing

#### **4.406 ROUNDTABLE - TRANSFORMATIVE CLIMATE PLANNING: INCORPORATING, MEASURING AND ACTUALIZING EQUITY**

Abstract ID: 406

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Climate change and planning responses to it often disproportionately harm individuals and communities that are already culturally, socially, economically, and/or environmentally vulnerable. Those most impacted by climate change are also often the least responsible for causing this global crisis, a fact commonly labeled "climate injustice."

This term initially referred to the uneven responsibilities and risks borne by different countries, but increasingly is used to describe differential vulnerability and uneven climate mitigation and adaptation manifesting at the regional, city, and even neighborhood scales. The field of planning is inherently implicated in the historical and ongoing processes of industrialization and development that are responsible for causing anthropogenic climate change and has also played a direct role in creating and maintaining social and ecological vulnerabilities that are exacerbated by climate change. Thus, this roundtable invites conversation to contribute to collective knowledge about how planners can better incorporate, measure, and actualize equity considerations in practice.

While planning seeks to create healthy, thriving communities, the field has intentionally and unintentionally produced and reinforced many social, environmental, and economic disparities. Planning has historically been embedded within the dominant capitalist economic model of growth, driving planners to consider economic growth as their primary goal, under the assumption that it will lead to greater equity and environmental health. In both overt and subtle ways, planning has perpetuated spatial inequities related to access to resources and quality of life. As an overwhelmingly white profession, planning has perpetuated racial segregation through explicitly racist practices, such as racial covenants and redlining, as well as more discretely through processes of suburbanization that Laura Pulido identifies as instances of white privilege (Pulido, 2000).

Climate change adds new urgency to long-standing efforts to advance equity in planning by reproducing existing disparities and creating new manifestations of inequities. Demands for greater attention to justice in climate action from multi-scalar and diverse social movements has led to an increase in equity-oriented climate scholarship and action. In 2019 Providence, Rhode Island adopted a Climate Justice Action Plan. Within planning this work brings together theories about the just city with research on social vulnerability and movement work and research on environmental justice to animate visions of the just climate city (Goh, 2020; Granberg & Glover, 2021; Ranganathan & Bratman, 2019; Steele et al., 2012). As planners attempt to address issues of inequity, fundamental questions arise around how phenomena like ‘vulnerability’ and ‘resilience’ are measured in practice, and how outcomes might be investigated and improved over time.

In this roundtable we will discuss the growing attention to equity and justice in climate planning practice with specific focus on on-the-ground implementation. Participants will share their thoughts on the opportunities and challenges associated with operationalizing and actualizing equity in climate planning. We will draw on examples of how cities and communities are integrating equity consideration into climate mitigation and adaptation plans and discuss the extent to which and potential best practices for evaluating the effectiveness of different approaches. Broadly, how do climate change and growing demands for justice require us to rethink planning goals, processes and outcomes?

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Key Words: climate justice, equity, planning



#### 4.412 ROUNDTABLE - JUST GREEN INFRASTRUCTURE? TOWARDS ACCOUNTABLE AND JUSTICE-CENTERED GREEN INFRASTRUCTURE PLANNING IN A CHANGING CLIMATE

Abstract ID: 412

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Cities are increasingly focused on implementing green infrastructure as a strategy for managing stormwater and adapting to climate change more broadly (Shi 2020). Different forms of green infrastructure, such as rain gardens, green roofs, or even street trees, can provide many benefits to surrounding communities, but if not carefully planned and maintained, these developments will likely reinforce existing patterns of environmental injustice (Heck 2021; Hoover and Lim 2020). For example, green infrastructure may not be prioritized in areas that lack green space due to long-term disinvestment, and even if it is developed in those neighborhoods, it may cause green gentrification (Anguelovski et al. 2020; Meerow 2020). In this roundtable, we invite participants and attendees to engage in a rich discussion on whether, how, and where green infrastructure planning processes meaningfully engage justice. The participants include five scholars from different institutions who have recently published research on the topic of justice and green infrastructure planning. They will begin the session by reflecting on the current state of knowledge on this emerging topic. Questions we hope to discuss in this roundtable session include: What does a just green infrastructure planning process look like? Who do these processes engage? What are the biggest barriers to more just green infrastructure planning? How might we move green infrastructure planning towards a community collective model?

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Key Words: green infrastructure, Environmental justice, Climate justice, social equity, urban resilience

#### 4.457 ROUNDTABLE - FROM CLIMATE JUSTICE TO CLIMATE FINANCE: HOW TO BRIDGE PLANNING'S NORMATIVE AND TECHNOCRATIC IDENTITIES?

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This year's conference theme – Planning for Climate Justice – encapsulates a fundamental tension between efforts to radically reconstruct planning on the one hand and rapidly scale-up existing technical planning tools and practices to effect change in policy and the built environment realm on the other. The catastrophic impacts of climate change necessitate deep introspection and reform to ensure that concerted efforts move in the right direction. However, there are clear dialogical divides among academics whose incisive structural critiques are often disconnected from implementation, action-oriented community activists who typically focus on local scales, and technical professionals whose fields have systemic impacts on the urban environment but whose communities of practice care naught for social equity, racial justice, much less decolonization and land back.

Increasingly, activists, academics, and practitioners, especially in the United States, are calling for a sea change in urban planning that centers racial, social, and environmental justice. In the area of climate change, green or climate gentrification, real estate speculation, insurance and lending reforms, and inequitable resource allocation, are recapitulating historic rounds of economic and spatial marginalization. The need for societal transformation has never been greater (Ajibade & Adams, 2019; Anguelovski et al., 2020; Fazey et al., 2018; Henrique & Tschakert, 2020). Meanwhile, the influencers of national land policy, among them the financial, insurance, and real estate community and the engineering-led disaster mitigation policies and projects are piloting, researching, and scaling up reforms that will dramatically change the envelope of urban fiscal, housing, and infrastructure options (Shi and Moser, 2021).

This roundtable session asks participants from the scholarly and professional circles to reflect on the tensions, gaps, and prospects for urban planning at this critical moment of national reckoning with racial justice and administrative realignment behind climate action. These debates reflect the tensions that have long existed within planning's normative and technocratic branches. What are the implications of decolonization and racial justice for policy levers like property rights, insurance, disaster relief, and infrastructure finance? What mechanisms and platforms exist for justice advocacy and concepts to enter these professional and policy realms? What are the implications for planning, as a diffuse and conflicted field, as it tries to mobilize a coherent response to planning for climate justice?

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Key Words: planning theory, planning epistemology, decolonization, racial justice, planning practice

## **INDIVIDUAL PAPER SUBMISSIONS**

### **MAINSTREAMING CITY CLIMATE ACTION: UNLOCKING THE BARRIERS TO IMPLEMENTATION**

Abstract ID: 7

Individual Paper Submission

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Despite the increasing engagement of cities around the world in planning for climate change, urban areas are not transitioning fast enough to meet the Paris Agreement (2015). The 2018 IPCC report emphasizes the peril of our current global pace of curbing emissions and preparing for unavoidable consequences, estimating a 1.5°C increase in global temperature by 2030 to 2052. In other words, we must move faster on both fronts, GHG emissions reduction and adaptation to unavoidable impacts. This places focus and pressure on urban areas. Cities consume nearly 3/4<sup>th</sup> of the world's energy, emit roughly 80% of greenhouse gases, and hold populations and assets at high risk from climate-exacerbated hazards (Newman, Beatley, & Boyer 2009). For planners, this calls for more effective implementation and mainstreaming of city climate strategies.

Mainstreaming has not been effective due to the slow pace of the integration of climate strategy considerations into all aspects of city finance and decision-making (Oulahen et al 2018, Reckien et al 2019). In addition, infrastructure and land use tend to change slowly, even when climate-oriented, which speaks to factors internal and external to cities, such as institutional and financial capacity. Land use has long been the focus of the field of planning, but climate change demands a wholesale shift in the world's portfolio of urban assets, and the scale and pace required would suggest that planners devote more attention to infrastructure planning, design, finance, and climate implications. The IPCC describes the need for a wholesale redirection of financial flows toward low-emission investments, and large scale increases in investment in buildings and infrastructure (IPCC 2018). Economists specializing in climate change urge cities to avoid the pitfalls of focusing only on the low-hanging fruit of projects with significant financial returns and instead prevent lock-in to carbon intensive sources of energy, even if that means investing in capital intensive infrastructure (Vogt-Schlib et al. 2018; Hallegatte et al. 2007). For cities, this generally means that barriers to climate action also are nested more broadly within barriers to infrastructure investment and development (Granoff et al. 2016). The challenge for cities is to unlock and dedicate global capital resources to decarbonized, climate-smart infrastructure.

This article reviews the recent history of city climate finance, as well as the literature from planning and the built environment to identify impediments, offer remedies, and highlight the transformative potential of city planning for climate change. City climate plans create opportunities by setting targets, suggesting the design, re-design, retrofit land use and infrastructure, often aiming for compact city forms with climate in mind. This article steps beyond research on the content of plans, to ascertain the institutional and organizational conditions for implementing strategies to make cities climate-smart. Incorporating climate measures, for example, into fiscal policy and capital investment plans could have the effect of mainstreaming climate action for city infrastructure with each budget cycle (Whittington and Lynch 2015; Whittington and Young 2013). The demands of climate change create a gap in

planning research and practice for the Global North and South that this article describes. The article combines existing literature with empirical evidence from implementing climate-smart capital investment plans for cities in Sub-Saharan Africa, India, Turkey, and the United States. The contours of this challenge encompass fundamental relationships between planning and physical infrastructure, the multidisciplinary nature of infrastructure development for governmental and non-governmental actors, and the underappreciated role of planning in the financial well-being of cities and the communities they serve.

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Key Words: Climate change, adaptation, climate mitigation, infrastructure, capital budgeting

#### FACTORS INFLUENCING CITIES TO IMPLEMENT CLIMATE ADAPTATION PLANNING

Abstract ID: 34

Individual Paper Submission

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This paper will examine the factors influencing cities to implement climate adaptation planning. Despite the imminent threat of climate change, few U.S. cities are implementing climate adaptation planning. A 2011 survey of 248 U.S. cities engaged in sustainable development found out that 55% were discussing climate adaptation activities. Yet, in 2020, only 41 cities from the 2011 sample had a plan addressing adaptation. What factors enabled these cities to implement adaptation planning? How can the success of these cities be replicated in other places? It is essential to identify the conditions that allowed those cities to complete a plan addressing climate adaptation.

The research uses the 2011 survey of cities developed by Dr. JoAnn Carmin in MIT (Massachusetts Institute of Technology) in partnership with ICLEI (Local Governments for Sustainability), augmented with new complementary secondary data from sources as Yale Climate Opinion, FEMA, Georgetown Climate Center, and the Census. Carmin's research group identified the general stage of adaptation efforts in cities worldwide and factors that contributed and hindered cities from engaging in climate adaptation. However, it focused on the first step of the policy process, agenda-setting, when an issue becomes a priority for action. Having a plan is the first step of implementing urban policies. Assessing the 2011 sample, I found out that only 16% of cities previously engaged in sustainable

development have a plan addressing climate adaptation despite a time frame of ten years. Why? The current state of knowledge concerning what factors influence cities to implement climate adaptation planning is unknown.

Climate adaptation is a prime example of urban innovation, defined as new ideas designed and implemented. Cities identified climate change as a problem and, spontaneously, are trying to address the issue. There is no requirement from the state or Federal government that cities must adapt; they did it independently. According to the diffusion of innovation, in a sample, innovators and early adopters represent 16%. In the sample of 248 US cities, 41 cities (16%) have a plan addressing adaptation. Therefore, using the theory of innovation to study climate adaptation will help identify what factors influence cities to implement adaptation planning. In this study, implement adaptation planning is measured by a city having a plan towards adaptation (which can be a stand-alone plan or a chapter addressing adaptation in other city plans).

Innovation is influenced by motivation, perception of need, resources, and engagement in learning networks. Using logistic analysis, we assess how these factors influenced a city to engage in adaptation and implementing it. Preliminary results suggest that the factors that influence a city to discuss climate adaptation are not the same that affect the city to develop the plan. While perception of need and learning networks are relevant for cities to engage in adaptation, having a plan is more dependent on resources and leadership.

As organizations successfully innovate, others are more inclined to adopt it since the risks are lower. But when a plan is the "innovative product," just follow a similar document structure will not ensure success. It is necessary to consider the process and underlying factors that led the early adopter to their innovation. Thus, there is a critical need to determine why some cities take action to adapt to a changing climate. Without this knowledge, nurturing climate adaptation in the broader community will be challenging.

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Key Words: climate adaptation, urban innovation, plan implementation, climate change, urban planning

#### **PATTERN AND PROCESS: EXPLORING SOCIO-SPATIAL (IN)EQUALITY OF ACCESS TO URBAN GREEN SPACE IN BEIJING**

Abstract ID: 35

Individual Paper Submission

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Urban green spaces have multiple ecological and socioeconomic benefits and are often implemented as an effective approach fighting against environmental issues including air pollution, flooding, urban heat island, and more. However, green spaces are not always evenly available among different socioeconomic groups, which is often criticized as an environmental injustice by many scholars. Despite the emerging concerns on urban green space

inequality, most studies focus on examining the distributional pattern of such inequality. There are few studies that explore the driving factors causing such (un)equal patterns particularly in developing countries such as China. This paper investigates how different socio-economic groups access urban green space at a finer scale in Beijing. A further historical review elucidates how potential determinants including geographical characteristics, historical layout of the old city, urban planning and land use decisions, afforestation policies and projects, and public financial stresses influence the development of socio-spatial patterns of access to urban green spaces in Beijing. The results indicate a bi-fold outcome in that urban green spaces proxied by vegetation coverage tend to better serve marginalized groups, while advantaged socio-economic groups are well served by parks. The Geographically Weighted Regression output mappings pinpoint the abnormal cases of the inconsistent relationships between access to green spaces and the socio-economic status of residents. The result of this analysis identified locations allowing decision makers and planners to accurately invest in afforestation projects for the purpose of promoting social equality of urban green space, while highlighting potential factors in the distribution process that might harbor unequal outcomes.

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Key Words: Urban Green Space, Environmental Justice, Driving Factors, Accessibility, Urban Planning

#### STATE POLICIES FOR INTEGRATING CLIMATE CHANGE RESILIENCE IN LOCAL PLANNING: IMPLICATIONS FOR SMALL JURISDICTIONS

Abstract ID: 47

Individual Paper Submission

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High losses due to climate induced extreme natural events have increased the urgency for incorporating climate change impact in local planning. In the absence of federal regulations, some states have adopted, or are in the process of adopting, policies for integrating climate change resilience in local planning exercises. States, like California and Washington, are focusing on including climate change in local comprehensive planning (SB 379 and HB 1099- proposed), using their state legislations for developing general plans at the local level. On the other hand, Massachusetts has adopted a program (MVP- Municipal Vulnerability Preparedness program under EO 569) to incentivize resilience planning through a new and separate local planning exercise. It is unclear how these states consider a jurisdiction's character and its capacity to plan for climate change impact in their policies. In case of small jurisdictions (cities and towns with population of 25,000 or less) these considerations determine whether the jurisdiction will be able to follow through on the state's requirements. Moreover, the state mandates in California and Washington are unfunded, placing the complete financial and technical burden of climate resilience planning on

the local jurisdictions. In Washington, local jurisdictions have voiced their concerns regarding the lack of financial support for fulfilling the state's proposed climate change element requirements (AWC, 2021). Levying additional taxes or reallocating local budget for planning and implementation of climate adaptation actions may not be possible for some jurisdictions because of their political and socio-economic environment. Such jurisdictions may also be highly vulnerable to climate change impacts. The lack of provisions in these blanket rules has brought up an equity debate regarding which jurisdictions will be able to plan for climate resilience in these states.

This research focuses on determining how state policies can foster climate change resilience in small local jurisdictions. The author will discuss implications of existing climate resilience state policies for small jurisdictions in CA, WA, and MA. She will present her assessment on different perspectives regarding the impact of current policies on these jurisdictions, and the support they need to develop climate resilience. Perspectives will be gathered using interviews and case studies. Key outcomes from interviews with local planners, administrators, and consultants from small jurisdictions of these states regarding the (potential) impact of the state policies on their community will be shared. Also, examples of small jurisdictions who planned for climate resilience based on their state's policies will be discussed. Based on the results of this analysis, the author will present her recommendations for developing a support structure that facilitates integration of climate resilience in local planning of small jurisdictions. These recommendations can be used to repurpose legislation in states that have adopted climate resilience policies, to reduce the burdens imposed on small jurisdictions by their regulations. This may increase adoption of these policies by small communities. States who are currently deliberating on similar legislation can use these recommendations for developing climate resilience policies that also focus on equity across jurisdictions.

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Key Words: Equity, Climate Change Resilience, Local Planning, Small Jurisdictions, State Policies

## **DO BUYOUTS MITIGATE HOUSEHOLD RISK? COMPARISONS BETWEEN BUYOUTS AND POST-DISASTER MIGRATION**

Abstract ID: 55

Individual Paper Submission

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Government-funded property acquisitions and demolitions (frequently called “buyouts”) are one of the most common tools used to reduce vulnerability to flooding and storms in the United States. With few exceptions, these programs require voluntary participation on the part of homeowners and take place in the aftermath of storm events. Buyout programs typically work by paying homeowners the pre-flood value of their home, demolishing the damaged property, and permanently returning the property to open space. Theoretically, this facilitates disaster recovery and community resilience, lowering aggregate flood risks nationally. However, the success of buyout programs is a subject of academic debate.

This uncertainty of the value of buyouts as a recovery mechanism is caused by two features of the process. First, buyouts, as they are currently conceptualized, do not comprehensively incentivize the reduction of household risk. Rather, they provide households with funds indexed to the pre-disaster value of the homes and assume that individual choice and market forces will lead to more resilient resettlement. This is far from certain; one of the only studies analyzing post-buyout vulnerability found that 20% of participants of the 323 participants moved to areas at least as vulnerable to flooding as their pre-buyout properties. Second, the Federal government has only patch-work documentation on buyout processes and outcomes, affording limited opportunities for researchers to study these programs.

To better understand buyout outcomes, our work creates a comprehensive database of the 629 buyouts that have been completed in Harris County, Texas since Hurricane Harvey struck in August 2017, as well as the thousands of households that have moved from floodplains during this period. This is primarily created using two data sources: (1) publicly-available property data from Harris County, and (2) address history information acquired from the credit agency, TransUnion. This dataset includes household-level moves, allowing us to track migration patterns and post-program outcomes. These data allow us to circumvent the dearth of documentation at the Federal level.

We use this data to undertake a quasi-experimental analysis comparing buyout properties to similar households that also moved in the aftermath of Hurricane Harvey. We use a matching technique to create paired observations (buyout and non-buyout relocations) based on multiple criteria, including locations within the same contiguous floodplains and census tracts, house characteristics, and neighborhood traits. We then test whether buyouts are successful at mitigating household-level flood risk while supporting household recovery. Initial findings show that participating in buyouts only has a marginal effect on the outcomes of participating households. In other words, buyouts do not appear to dramatically reduce physical vulnerability compared to the control groups. This brings into question the utility of buyouts for household-level recovery.

Finally, we end this paper with a comparison of the post-disaster buyout program to other Federal housing relocation programs, such as HOPE VI and Moving to Opportunity. Compared to the buyout programs, Moving to Opportunity was designed as an experimental intervention, with the intention of helping families move from at-risk areas to “opportunity” neighborhoods. We argue that buyout programs are analogous to these programs, but with at-risk neighborhoods transformed from high-poverty to high flood-risk. This contextualizes the buyout program, which has shown little evidence of improvement in policy designs or outcomes over time, in the lessons of other past relocation programs, providing paths forward for improving buyout implementation. This background is used to provide suggestions for policy improvements rooted in housing research and prior programs.

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Key Words: buyout, recovery, disaster, housing, relocation



## HOW DO LOCAL OFFICIALS CONCEPTUALIZE SUSTAINABILITY AS PRACTICED IN THEIR COMMUNITIES? AN EXAMINATION OF U.S. CITIES

Abstract ID: 56

Individual Paper Submission

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Sustainability has become an umbrella concept under which discourse over environmental quality, resource conservation, equity, climate mitigation, economic health and environmental justice all occur (Zeemering 2012; Purvis et al. 2017). Although sometimes criticized as overly broad and ambiguous, how planners think about and define sustainability is critical as it guides their operationalization of its objectives. Scholars have sought to develop a robust conceptualization of sustainability to determine measurements by which to assess success and gain deeper understanding of how local officials come together in a web of relationships at many levels of policy (Lorr 2012; Purvis et al. 2017). We add to this research aim by evaluating municipal government officials' definitions of sustainability, based on how it is practiced locally.

Cities have emerged as particularly important units of government in advancing sustainability-related policy, but they display considerable variation in their policies and the foci of their related programs and objectives (Krause and Hawkins 2021). Understanding patterns in their definitions thus have implications for scholarship and planning practice. This research provides a descriptive analysis of how US cities define and determine their sustainability practices, and how these unique operationalizations might be categorically understood among all cities. We ask, and empirically respond to the following questions: How do city officials conceptualize sustainability? What patterns emerge around how sustainability is characterized across different "types" of cities?

This research leverages original data collected in late 2020 and early 2021. A survey was administered to all cities in the US with populations over 20,000 (n=1,850) and included a range of questions about local sustainability planning, policy, and administration practices. It also included an open-ended question where respondents were invited to "define sustainability as it is practiced in their city or town". Three-hundred sixty-seven respondents completed this question. We use Atlas.Ti software to identify frequently used words, clusters frequently used together, and connections between definition and reported sustainability programming. Atlas.Ti also enables categorical coding to uncover distinct themes in how cities think of sustainability for themselves in comparison to other cities across the United States.

Preliminary results suggest a relatively comprehensive conceptualization of sustainability, which pairs with reports about the politicization of sustainability efforts. Results also point toward the role of formal collaborations and planning in local operationalizations of sustainability. The results ultimately add dimension to the existing understanding of how sustainability is practiced, and the similarities and differences across cities.

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Key Words: sustainability, sustainability conceptualization, city government, cluster analysis

## LOCAL CLIMATE ACTION PLANNING AS A TOOL TO HARNESS THE GREENHOUSE GAS EMISSIONS MITIGATION AND EQUITY POTENTIAL OF AUTONOMOUS VEHICLES AND ON-DEMAND MOBILITY

Abstract ID: 65

Individual Paper Submission

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This research focuses on how cities can use climate action plans (CAPs) to ensure that on-demand mobility and autonomous vehicles (AVs) help reduce, rather than increase, greenhouse gas (GHG) emissions and inequitable impacts from the transportation system. We employed a three-pronged research strategy involving: 1) an analysis of the current literature on on-demand mobility and AVs; 2) a systematic content analysis of 23 CAPs and general plans developed by municipalities in California; and 3) a comparison of findings from the literature and content analysis of plans to identify opportunities for GHG emissions reduction and mobility equity. Findings indicate that policy and planning discussions should consider the synergies between AVs and on-demand mobility as two closely related emerging mobility trends, as well as the key factors (e.g. vehicle electrification, fuel efficiency, use and ownership, access and distribution, etc.) that determine whether deployment of AVs would help reduce GHG emissions from transportation. Additionally, AVs and on-demand mobility can potentially contribute to a more equitable transportation system by improving independence and quality of life for individuals with disabilities and the elderly, enhancing access to transit, and helping alleviate the geographic gap in public transportation services. Although municipal CAPs and general plans in California have adopted several strategies and programs relevant to AVs and on-demand mobility, several untapped opportunities exist to harness the GHG emissions reduction and social benefits potential of AVs and on-demand mobility.

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Key Words: Autonomous Vehicles, Climate Action Plans, On-demand Mobility, Ridehailing, Greenhouse Gas Emissions

# ASSESSING THE EFFECTIVENESS OF NATURAL HERITAGE SYSTEMS IN PROTECTING ECOLOGICALLY IMPORTANT LANDCOVER TYPES TO RESPOND TO CLIMATE CHANGE: A CASE STUDY ANALYSIS IN HALTON REGION, ONTARIO CANADA

Abstract ID: 70

Individual Paper Submission

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The effectiveness of a Natural Heritage System is assessed through analyzing land cover classes in Halton Region Ontario, Canada. A review of the literature of concludes a lack of transparency exists in current approaches to NHS planning regarding various landcover classifications that are incorporated within these systems, as well as rationale as to why specific choices were made. An overview of ecosystem scales and nomenclature is presented to contextualize NHS planning in Ontario today. The identification and implementation of the Natural Heritage System in Halton Region is explored. Landcover classifications from 2002 (Southern Ontario Land Resource Information System 1.2) and 2011 (Southern Ontario Land Resource Information System 2.0) are assessed in order to evaluate landcover changes in Halton Region, both within and outside the NHS delineated within the Region as part of the 2009 Official Plan review which incorporated the first ever Natural Heritage System within the Regional Official Plan. This research suggests that NHS is an effective tool for protection of high conservation value features; more than 90% of forests and wetlands areas are captured in Halton's NHS, comprising 22,800 ha out of the total 49,990 ha designated within the system. This work provides novel insight into changes that have occurred within the NHS in the early years of its existence in Halton, which in turn can help inform broader strategies designed to maintain ecosystem function at the landscape level. This research quantifies ecosystem services associated with the Natural Heritage System in Halton Region, Ontario. Ecosystem services are directly linked to the achievement of increased human wellbeing across the planet, and can be divided into provisioning, regulating, cultural, and supporting services. Literature values for specific ecosystem services are identified for different landcover classifications across southern Ontario. Using this data and previous assessments of landcover classifications across Halton Region, the ability of Halton's NHS to capture and maintain ecosystem services is assessed. Slight changes in ecosystem values over time suggest that regulating services are declining. The assessment tool developed in this study can help identify where changes in ecosystem services are occurring, and provide guidance to stakeholder groups in informing updates to planning decisions related to Halton's NHS. Incorporating ecosystem services into Natural Heritage Planning for use as a tool for municipalities to respond to climate change is examined.

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Key Words: ecosystems, landcover, protected areas, ecosystem services, climate change

## TAKING MEASURES OF CHINESE NATIONAL NEW AREAS' LANDSCAPE

Abstract ID: 72

Individual Paper Submission

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In the 2010s, China's central government designated 17 National New Areas (NNAs) to redistribute resources spatially and cultivate regional centers. These projects extend the existing concerns of whether China needs more new towns as the population stops increasing and whether these projects could avoid the past new town movement's issues. Regardless of these large-scale new town projects' social and economic obstacles and achievements, scholars and practitioners criticized their ecological performance. However, most of the research claimed the new towns' environmental degradation through individual case studies, lacking quantitative analysis answering the question of these new towns' designation impacted the country's ecology.

Therefore, this research measures the altered ecology in all the NNAs in China, based on the Ecosystem Service Value (ESV) theory. It focuses on each NNA's ESV changes, using two global longitudinal land cover datasets in Google Earth Engine. This paper first argues that the coarse 20-year MODIS data is acceptable at the national scale, verified by the fine 5-year Copernicus data. It then traces each NNA's ESV from 2001 to 2019 and calculates the designation impact, the difference of ESV change before and after designation by the central government. The results show that, while some new towns' ESV decreased after being designated as NNAs, others' ESV did not reveal apparent declination. The research also shows that some NNAs' ESV even increased recently. Furthermore, this paper suggests that policy-makers formulate environmental policies case by case rather than adopt one national standard since ecological degradation is not prevalent in all the NNAs.

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Key Words: China, National New Area, new town, ecology, ecosystem service value

## STUDY THE INTERACTIONAL EFFECT OF VEGETATION IN MITIGATING EXTREME HEAT IN CITIES

Abstract ID: 84

Individual Paper Submission

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Climate change is now one of the most well-known environmental phenomena of the 21<sup>st</sup> century. Sea level rise, floods, droughts, and wildfires are increasingly attributable to this phenomenon, which threatens the life and well-

being of humans, as well as other species worldwide. Within cities, urban heat islands, and extreme heat events such as heatwaves, are some of the most tangible outcomes of climate change that pose direct and indirect effects on citizen's quality of life. Unfavorable thermal conditions and excessive heat-related mortality, especially among racial minorities and vulnerable groups, are some inevitable outcomes of those situations. Albeit the severity and magnitude of the problem might not be the same in different places, extreme heat exposure is a major issue in the era of climate and environmental change in most crowded cities (Luber & McGeehin, 2008). However, the impacts of contributing factors of extreme heat can be alleviated through planning strategies. This notion makes the study of the contributing factors and strategies relevant to the urban planners who are responsible for providing healthy and safe environments for all residents.

One of the most familiar planning strategies for controlling extreme heat in cities is promoting trees and vegetation in urban environments. Although this heat mitigation strategy advocated by many studies, it appears the cooling effect of trees is largely controlled by background meteorological and morphological conditions. For example, it has been shown that trees and vegetation have a higher cooling impact in sites with taller buildings, higher temperature, and lower relative humidity (Perini & Magliocco, 2014). There is also evidence that trees with high trunk and low canopy density are most influential in improving daytime thermal comfort in deeper canyons, while trees with low trunk and high canopy density are more effective for shallow canyons and open areas (Morakinyo et al., 2017). The cooling performance of trees is also dependent on the orientations and surface materials of streets (Ali-Toudert & Mayer, 2007). If those interactions and background circumstances are not considered, it could result in performance that is much lower than expected. Moreover, due to cities' limited capacity for new greenings and other physical changes, we need tailored decisions on quantity, type, and spatial configuration of vegetation (Zhou et al., 2017). Therefore, a better understanding of true causal relationships and magnitudes of interactive effects of vegetation under a variety of contexts is necessary to ensure mitigation strategies result in observable improvements in thermal conditions in urban environments.

Microclimate models are useful tools to test the relative impacts of influential parameters such as vegetation in changing temperatures and the important interactions. For example, ENVI-met, a popular microclimate computational fluid dynamic (CFD) model, has the capacity to simulate surface-plant-air interactions. In this study, through implementing the ENVI-met model, we evaluated the effectiveness of vegetation-related heat mitigation strategies under different combinations of contexts. For this purpose, we simulated different types of trees with different densities and tested their cooling performance in street canyons with different surface materials, geometries, and orientations under an extreme heat situation. Our results confirmed that vegetation under various circumstances would exhibit different cooling performances, and no one-size-fits-all vegetation-related strategy exists for mitigating extreme heat in cities. In our study, the maximum cooling effect of vegetation achieved through dense evergreen trees in deep canyons covered with concrete pavement material and oriented perpendicularly to the prevalent wind. From the planning perspective, this study's findings highlight the necessity of prioritized interventions based on the physical characteristics and landscape features of the site and avoiding generic strategies for all types of urban environments.

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Key Words: Extreme heat, Vegetation, Mitigation strategies, ENVI-met

## PLANNING FOR CLIMATE CHANGE: AN “ALL-OF-THE-ABOVE” APPROACH TO FUTURE WATER SCARCITY

Abstract ID: 106

Individual Paper Submission

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Urban centers around the world are grappling with the challenges associated with population increases, drought, and projected water shortages. With a substantial global shortfall between water supply and demand expected by 2030, water planning strategies must adapt to a new reality characterized by higher temperatures and less precipitation, requiring new ways of thinking about water management, use, and governance. Commonplace strategies such as water conservation and non-potable water reuse might not be sufficient to adequately stretch water supplies in water-scarce parts of the industrialized world. In the US, planned potable water reuse (i.e., purification of domestic wastewater for reuse as drinking water) is emerging as the way forward to mitigate water shortages without significant changes to lifestyle, behavior, or infrastructure. But potable reuse is not the only solution: paradigm shifting and disruptive options that more holistically address water scarcity, such as composting toilets, water recycling at the household or building scale, and market-based approaches to water use, are also gaining traction, and they could be pursued alongside or instead of potable water reuse. However, these options would require more significant changes to lifestyles, behavior, policy, and infrastructure. While all of the options considered offer advantages, they each come with new concerns and challenges related to cost, public perception, and social norms. The goal of this conceptual work is to consider a number of plausible solutions to water scarcity – partial and complete, traditional and disruptive – to stimulate forward-looking thinking about the increasingly common global problem of water scarcity. We base the recommendations on a combination of our original research results on potable water reuse and the broader literature on water scarcity and interventions to combat the effects of climate change. The latest projections for climate change and water shortage indicate that it’s time to rethink the status quo for water management and use. We need design and development to be more holistic, producing more adaptive and resilient solutions, and accounting for our new climate reality. Communities will need to transition to multiple options from the suite of those that are feasible – considering societal costs, benefits, and risks of potential solutions – to create a future that draws from all available options to better manage and conserve water.

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Key Words: Water scarcity, climate change, water reuse, water planning, environmental governance

## THE ROLE OF VALUE ORIENTATION IN GREEN INFRASTRUCTURE PRIORITIZATION: A SURVEY OF STORMWATER MANAGERS IN CLEVELAND, OHIO AND DENVER, COLORADO

Abstract ID: 122

Individual Paper Submission

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Stormwater management has become an entry-point for enhancing green infrastructure in cities. Green stormwater infrastructure governance is highly influenced by federal policy, but ultimately enacted by local stormwater management professionals (Hopkins et al. 2018, Johns 2019). The paper compares green infrastructure priorities and environmental concerns, values, and norms among stormwater managers in two metro-regions that have recently implemented regional stormwater programs, but under different conditions. Cleveland, Ohio must reduce combined sewer overflows in response to an Environmental Protection Agency (EPA) consent decree and Denver, Colorado must improve water quality to comply with EPA MS4 permit requirements. Both specify a minimum amount of improvement that must be achieved via green infrastructure; any additional implementation of gray infrastructure alternatives is discretionary. Studies have shown that the extent to which individuals hold relatively eco- versus anthropocentric environmental concerns, values, and social norms, can influence the adoption of pro-environmental behaviors, especially when those behaviors are voluntary (Brown et al. 2016). Less is known about the relationship between the nature of environmental concern and behavior in the professional realm (Brown et al. 2005, Keeley et al. 2013). Through a survey of stormwater management professionals (n=185), this study asks: To what extent do stormwater professionals' environmental concern influence green infrastructure prioritization beyond regional context? The results of chi-squared difference tests and k-means cluster analysis revealed that stormwater management priorities differed based on respondent's region--Cleveland and Denver respondents prioritized quantity and quality goals, respectively--but individuals holding eco- and anthropocentric environmental concerns, values, and social norms were equally abundant in both regions. The nature of individual environmental concern did influence priorities: anthropocentric managers were significantly more likely to prioritize human-centered stormwater management goals with reservations about cost and private property rights and ecocentric managers were significantly more likely to prioritize environment-centered goals, regardless of cost. Overall, human and environment-centered stormwater management priorities were given equal weight in both regions, likely due to equal abundance of manager-types, suggesting that differences in regional priorities mostly align with legal context.

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Key Words: Stormwater, Greening, Infrastructure, Values, Management

## PLANNING TOWARDS DEEP DECARBONIZATION ACROSS THE U.S.

Abstract ID: 155

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The UNIPCC (2018) states that in order for the planet to avoid the most catastrophic effects of climate change, a broad global transition to zero carbon energy sources must be well underway by 2030, and humanity must achieve no new anthropogenic carbon emissions by 2050. An increasing number of cities, states, and countries have therefore committed to this goal, known as deep decarbonization. Deep decarbonization will require sweeping and fundamental changes in energy systems that are deeply embedded throughout societies, economies, and communities.

While there is great enthusiasm for local climate action and initiatives by leading cities such as C40, there are profound knowledge gaps between current planning knowledge and immediate needs to begin deep decarbonization. This gap exists in both directions. All deep decarbonization plans call for national, economy-wide transformation in five major categories: the electric power sector, buildings, transportation, industrial processes, land-based carbon sinks, and consumption and waste. However, as presently constituted, planning for land use and the built environment in the U.S. operates across multiple scales with competing authorities and jurisdictions; and either must anticipate or react to dynamic changes in society, technology, markets, and federal policy.

This article reviews the existing planning literature, seeking to answer four interrelated questions about planning in relation to the goal of deep decarbonization. First, what are the existing opportunities for planning to enable beginning steps towards deep decarbonization in the United States? Second, how does planning – in practice and its powers – need to change in order to enable deep decarbonization? Third, what new planning knowledge is required to achieve deep decarbonization? Fourth, what do ‘minimum’ needs for deep decarbonization imply for other planning concerns such as justice, equity, resilience, conservation, and growth? Answering these four interrelated questions provide the initial outline of a practice and research agenda for planning towards deep decarbonization.

Multiple recent deep decarbonization plans are listed below in the references.

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Key Words: climate, decarbonization

## **BEYOND AIR POLLUTION AT HOME: DYNAMIC ASSESSMENT OF PERSONAL EXPOSURE TO AIR POLLUTION USING INDIVIDUAL DAILY MOVEMENT PATTERN DATA AND LOW-COST AIR SENSOR NETWORK DATA**

Abstract ID: 171

Individual Paper Submission

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Human exposure to air pollution occurs through dynamic spatiotemporal interactions between humans and air pollutants. However, assessing personal exposure to air pollution poses challenges due to the limited availability of human movement data and the complexity of modeling air pollution at high spatiotemporal resolution (Nyhan et al., 2019; Park, 2020). This study addresses this gap by integrating 100,784 individual movement patterns with hourly air pollutant (PM<sub>2.5</sub>) concentrations at a 500-meter resolution that are derived from a low-cost air sensor network. It examined the impact of individual's mobility on their estimated exposures (to PM<sub>2.5</sub>) through a case study of Los Angeles.

In this study, spatiotemporal PM<sub>2.5</sub> concentrations are predicted using a random forest model based on low-cost air sensor network data (Lu et al., 2021). Air pollution exposures of individual subjects are assigned considering modeled PM<sub>2.5</sub> levels at their homes, workplaces, and free time activity locations. These exposures are then compared to the residence-only exposure metric, which does not consider daily mobility. The results suggest that subjects' exposure levels were usually underestimated when their movement patterns were not considered. Bias for the residence-based exposures was 0.87, relative to the exposure metric considering the movement pattern, which means that the exposure being underestimated by 13%. Exposure classification error increased for subjects that exhibited higher mobility levels, especially for full-time workers with longer commute distant. Overall, the personal exposures of workers were underestimated by 22% relative to the residence-based exposures to air pollution. For workers who commute more than 20 miles, their exposure levels can be at most underestimated by 55%. Additionally, we find the exposure classification error caused by ignoring the subject's movement pattern is also related to the variance of activity locations. Omitting mobility could result in underestimating exposures to air pollution for people who reside in suburban areas and work in urban areas, and tend to overestimate exposures for people residing in urban areas and work in suburban areas.

In this study, we find that ignoring daily mobility potentially leads to misclassification in health effect estimates. This study contributes to the environmental health literature by demonstrating that considering both the spatiotemporal variability of air pollution and human daily movement patterns is vitally important for accurate exposure and health risk assessments. It helps planners and policymakers identify the disadvantaged populations in air pollution exposure and entails targeted policy and planning implications.

### Citations

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Key Words: Air pollution, Personal exposure, Human mobility, PM2.5

## IMPROVING SUSTAINABLE WATER MANAGEMENT IN MAFATE, LA RÉUNION: THE CHALLENGE OF INSTITUTIONAL INERTIA

Abstract ID: 198

Individual Paper Submission

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Characterizing trajectories of Socio-Ecological Systems (SES) is increasingly necessary to evaluate development policies and their sustainability. Using a case study of water management we analyzed the resilience trajectory of Mafate (Reunion Island) to address the following research question: To what extent do institutional analysis and the capability approach explain territorial resilience trajectories?

Institutional analysis is largely used to evaluate the sustainability of practices in SESs. These works show that management practices and rules are determined by the ecosystems as much as by the social, political and cultural human systems, and that they are formalized by institutions.

Here an institution is defined as a « set of rules actually used (the rule-in-use) by a set of individuals to organize repetitive activities that produce outcomes affecting those individuals and potentially affecting others » (Ostrom, 2010, p.68).

Therefore, we argue that resilience trajectories are determined by the capacities of agents to induce change in the rule-in-use. To test this hypothesis, we link the capability approach (Sen, 2001) and the SES Institutional Analysis and Development Framework (McGinnis and Ostrom, 2014) to characterize the real opportunities of agents to improve resource management.

In terms of methods, we spent two years following the collective work of a group of agents (local administrative authorities, inhabitants and private companies) involved in a water management project. Based on qualitative data collected via in situ observations and interviews, we built an exploratory tool to explore quantitatively the link between the definition of rule-in-use and the expression of collective capabilities. This approach also gives us insight into power relations and inequality trends to exert fundamental rights in Mafate.

The results show that it is close to impossible for local agents to bring about sustainable practices due to current constitutional rules. Indeed, even if agents clearly identify that moving beyond the status quo is necessary to bring about sustainability, to address injustice and to foster decent living conditions, their action is bound and therefore limited by national laws. Moreover, administrative agents, via their rigid vs. flexible interpretation of the law, impact the sustainability of water management at the local level.

The panarchy model (Gunderson and Holling, 2002) indicates that smaller systems adapt and change more quickly than higher systems, which are slower and present higher inertia. In our study this plays a key role in explaining the impossibility to quickly advance resource sustainable management projects in an SES that is strongly characterized by cascading connections between legal texts that condition the ability of the whole system to act.

In addition, whereas administrative agents rely on the know-how of Mafate inhabitants, the latter cannot be recognized as resource-managers in the formal sphere. Indeed, we find that legal vagueness, due to the specific situation of this inhabited national park core, plagues Mafate's water management.

This historical non-recognition of Mafate's human settlements and its translation into planning documents is the major variable explaining the impossibility of a formal contract to recognize inhabitants as water-management workers.

Consequently, coping strategies are the only way to ensure access to water. Those coping strategies induce overexploitation of the resource and the impossibility to enforce the right to the environment since, according to local arguments, human beings come first. This happens as the SES of Mafate is in an extremely vulnerable state (UICN, 2017).

The case of Mafate shows that formalization of fundamental rights and their translation into legal codes (here, the code of the environment, of urban planning and of public health) not only does not guarantee the enforcement of these rights but also may limit the possibilities of concrete improvement of living conditions for individuals.

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Key Words: water management, capability approach, institutional analysis, Reunion Island

## STUDY ON THE EVOLUTION TREND AND SPATIAL CHARACTERISTICS OF URBAN FLOOD RESILIENCE IN CHINA

Abstract ID: 206

Individual Paper Submission

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With the continuous aggravation of urbanization and climate change, many cities around the world are affected by flood disasters. As a potential measure to tackle this problem, flood resilience has gradually gained more and more attention in urban studies. In this study, based on Pressure-State-Response model, an urban flood resilience evaluation system was constructed by analyzing the process of urban response to flood disturbance. Then it was used to measure the flood resilience of 29 representative cities in China from 2009 to 2018. The results showed that: (1) although Chinese cities became more and more resilient to flood, their overall resilience levels were low and most cities were faced with increasing flood pressure; (2) in different regions in China, the overall flood resilience was highly different and showed a "high in the north and low in the south, high in the west and low in the east" pattern, which was similar to that of the pressure index, while the interregional divergence of state index was relatively low and regions with developed economy and active innovation had a higher response index. In addition, by identifying the influential indexes, three measures are proposed to improve urban flood resilience: (1) facing up

to "pressure": exploring urban planning and construction method to achieve symbiosis with flood; (2) enhancing the "state": improve the flood carrying capacity of gray and green stormwater infrastructure; (3) "responding" actively: improve the construction of flood disaster emergency management system and pay more attention to undeveloped cities with high flood pressure.

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Key Words: Urban flood resilience, Spatial Characteristics, Pressure-State-Response model, Resilience improvement

#### A COMPARATIVE ANALYSIS OF SOCIAL VULNERABILITY AND PROXIMITY TO COAL-FIRED POWER PLANTS AND WINDMILL FARMS

Abstract ID: 221

Individual Paper Submission

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The Environmental Protection Agency (EPA) defines environmental justice as, “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (EPA, 2020, para. 1). Cutter (1995) dates the beginning of the environmental justice movement back to 1982 when a predominately African-American, rural, and poor area in Warren County, North Carolina was selected as the site to host a hazardous waste landfill. Residents, national civil rights groups, environmental groups, clergy, and members of the Black Congressional Caucus demonstrated, and although they were unsuccessful in hampering the project, the demonstrations set the stage for the environmental justice movement (Cutter, 1995). Five years after the Warren County demonstrations, the United Church of Christ (UCC) published a report that concluded that active hazardous waste management facilities and uncontrolled toxic sites were disproportionately located in African American and socioeconomically disadvantaged communities across the United States (United Church of Christ, 1987). The environmental justice literature often incorporates the concept of social vulnerability as it relates to hazard exposure (Chakraborty et al., 2020). However, Fatemi et al. (2017) found that a large proportion of studies identify indicators of social vulnerability to natural hazards, but there is a lack of studies that examine if these indicators also measure social vulnerability to technological hazards. The siting of technological hazards raises concerns pertaining to environmental justice and social vulnerability. More specifically, coal-fired power plants continue to raise concerns in regards to the environmental justice of the neighboring residents.

This research examines if there are differences in the social vulnerability of U.S. residents living near a coal-fired power plant compared to residents living near a wind mill farm for facilities in operation as of April 2020. To address the research question, the buffer tool was used in ArcGIS to create a database of U.S. census tracts located either within a five-mile radius of a coal-fired power plant or a wind mill farm (N = 5,776). Two binary logistic regression models were then created with demographic data for 2020 and 2010 to account for the decline of the coal power industry and rise of the wind power industry. The dependent variable was binary, and a value of 1 was assigned to

all census tracts in the U.S. that are located within a five-mile radius of a coal power facility, and a value of 0 was assigned to all U.S. census tracts that are located within a five-mile radius of a wind power facility. The independent variables represented socially vulnerable populations that were commonly discussed in the literature as well as the control variables of population density and the percent of the population employed in the utilities sector. Results suggest that U.S. census tracts with higher percentages of populations aged 25 and over with a Bachelor's degree, living in poverty, minorities, and employed in the utilities sector were significantly more likely to live within a five-mile radius of a coal power facility than a wind power facility for both the 2020 and 2010 models. The only major discrepancy between the two models involved the percentage of owner-occupied housing as the variable was only a significant predictor for the 2010 model. Census tracts with higher percentages of owner-occupied housing were less likely to be located near a coal power facility than a windmill farm. The presentation will conclude with a discussion that links the above-described findings to planning practice and education. This includes a description of hazard mitigation planning recommendations for socially vulnerable populations living near toxic sites.

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Key Words: social vulnerability, environmental justice, coal power, wind power

#### **REBUILDING FOR RESILIENCE – REEXAMINING A 10-YEAR PLANNING PROCESSES AFTER THE GREAT EAST JAPAN EARTHQUAKE AND TSUNAMI**

Abstract ID: 242

Individual Paper Submission

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A classic model of disaster recovery suggests four phases: emergency, restoration, reconstruction I and II (Haas, Bowden, & Kates, 1977; Johnson & Olshansky, 2016). Various reconstruction activities develop during this time, a phenomenon theorized as the “processes compressed in time (Olshansky, Hopkins, & Johnson, 2012).” Recovery governance also develops in a sequence. At the initial stage, rebuilding plans and programs develop, and coordination bodies emerge to initiate the process. Recovery activities then roll out with stakeholders and funds allocated. When recovery approaches its ending, affected regions are anticipated to be reconstructed with a better economy (Haas et al., 1977). Recently, resilience is increasingly used to explain the outcomes (Sou, 2019).

This paper aims to critically review a decade of the recovery process in the Tohoku region, where the idea of resilience was included in rebuilding. This examination is important to revisit the existing recovery theory and provide new insights and understandings to better recover from the disasters. I moved to Tohoku after the earthquake in 2013, to closely observe the reconstruction effort, and have conducted various research projects, served on national and prefectural research committees, and engaged in the planning efforts in the affected regions. While this paper examines Tohoku's overall rebuilding with an ethnographic approach, two fishing communities in Kamaishi City (Iwate prefecture) and Kesenuma City (Miyagi prefecture) where information has been collected via interviews and locally available documents are also highlighted.

In many ways, recovering from the tsunami has been distinctive from other past recoveries in Japan – first, an unprecedented amount of funding (USD 320 billion) was secured, 40 percent of which was used for building infrastructure, for the region facing the fastest population decline. Second, the funding secured at the national level was allocated to local governments through a bottom-up recovery mechanism (Iuchi, Maly, & Johnson, 2015). This reflected the national vision that local governments to take leadership in the recovery. Third, all stakeholders, including governments, communities, and individuals, shared a notion to rebuild robust, so that the affected areas will be safe from future tsunamis. Lastly, at the 10th year after the tsunami, infrastructure projects are about to finish without major modifications from the original plan.

Almost all the affected local governments envisioned rebuilding robust by reorganizing spatial layouts of the affected regions. Available program options to do so, among several others, included elevating the land, relocation to higher grounds, and levee construction. Since various stakeholders owned these programs, local governments had to coordinate in the center without them knowing the best way to approach the “robust” rebuilding. This was also the case for Kamaishi City and Kesenuma City governments.

Interestingly, however, two communities in their jurisdictions had unique rebuilding processes to result in different physical forms and higher levels of satisfaction, distinctive from others in the affected region. The research found that rebuilding processes are the key factors making such differences, including: i) recurrent community initiatives towards their defined goals; ii) search on professional helps to reflect community ideas in the plans and implementation; and iii) preserving their ways of living to carry over to the reestablished livings. Two communities examined successfully redefined their ways of living in the process and owned the process to make vision materialized. Having the recovering communities own their processes to reflect their views of resilient living is essential, especially at this age when resilience is underscored while interpretations are varied beside strong infrastructure and developed economy.

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Key Words: recovery process, the Great East Japan Earthquake and Tsunami, recovery theory, recovery governance, resilience

#### **BETTER THE SECOND TIME AROUND? A LONGITUDINAL ANALYSIS OF THE QUALITY OF MANDATED PLANS**

Abstract ID: 254

Individual Paper Submission

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Since the 1990s, attention to the myriad ways plans can be evaluated has exploded, particularly in the realm of systematic analysis of the content of plan documents by scholars. Plan quality evaluation studies have covered a lot of conceptual, topical, and spatial territory. This range includes analyzing the fact base and policy content, the communicative characteristics, the process dimensions and more; analyzing plans dealing with natural hazards, environmental conservation, affordable housing, transportation, and more; and analyzing plans from Australia, Europe, the Americas, and more (Lyles and Stevens 2014). Analysis of plan documents has even moved beyond looking at lone plans in isolation to looking at networks of inter-related plans (Berke et al. 2015). Yet, temporal comparisons of plans remains severely under-developed as only two studies exist that assess changes in plan quality over time (Brody 2003 and Lukasiewicz et al. 2020). Longitudinal analyses are crucial for answering questions such as: Does the quality of plans change over time as they are updated? If plan quality does change, how do the changes vary across different components of plans? And, what factors, such as state or federal mandates for regular plan updating, explain variations in changes in quality?

We help answer these questions using a comparative, longitudinal research design. We apply systematic plan quality content analysis methods (Lyles and Stevens 2014) to a sample hazard mitigation plans from 84 counties and cities in Florida, Georgia and North Carolina. These three states share exposure to similar hazards and similar recent disaster experiences, while varying in terms of their state planning frameworks. Two plans were coded for each jurisdiction, one from the first wave of adoption between 2005 and 2010, coded as part of a Department of Homeland Security-funded study (c.f. Lyles, Berke, and Smith 2014) and from the second wave between 2010 and 2015, coded as part of an ongoing National Science Funded study (#1760183). Specific components of the plan that we assessed include 1) aspects of the planning process, 2) integration of the coded plan with other planning initiatives, 3) inclusion of a wide array of risk reduction policies, and 4) general characteristics of the plan document. All of the plans in our sample were adopted in compliance with the mandates of the federal Disaster Mitigation Act of 2000.

Our findings demonstrate a mix of statistically significant differences in plan quality over time and across the states, as well as notable patterns of no statistically detectable difference in quality. The pattern of variations in the differences point to the influence of state-level approaches to supporting local mitigation planning, including both patterns of difference that remained the same in the two waves as well as patterns of difference that changed over time. Also, the differences in quality are far from uniformly positive; that is, some aspects of plans improved in quality and others aspects declined. Given the low baseline of hazard mitigation plan quality found in prior studies, this result is discouraging.

We discuss practical implications for federal policy, state coordination of local planning, and local planning processes to reduce risks from natural hazards in a changing climate. An example of these implications is the tradeoffs that arise if states encourage multi-county regional planning instead of plans developed at the single-county level. We also discuss the implications for planning scholarship about if and how developing planning functions as a form of group learning and challenges to assumptions about plan monitoring and implementation.

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Key Words: plan evaluation, plan quality, hazard mitigation, planning process

## EVALUATING THE TOTAL COSTS OF FLOODPLAIN BUYOUTS

Abstract ID: 257

Individual Paper Submission

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Average annual, hurricane-related damages in the U.S. have increased significantly over the past century. This trend, combined with population growth patterns and a variety of negative predicted effects of climate change, has contributed to a growing consensus that managed retreat will be a necessary component of flood mitigation strategies going forward. To date, floodplain buyouts have constituted the primary federally-funded approach to managed retreat in the US. In buyout programs, governments purchase flood-prone properties from willing sellers, usually restoring the land to some sort of open space. However, efforts to assess the effectiveness of floodplain buyouts, and to identify opportunities to improve the design of buyout programs, require an understanding of their full costs across the different levels of government involved. Further, delineating and quantifying transaction costs may enable better implementation and more robust evaluation of the effectiveness of buyouts.

Using a transaction cost framework, we analyze the costs of activities that comprise floodplain buyouts. Federal data do not distinguish transaction costs, but they do suggest that the cost of acquiring properties often accounts for 80% or less of total project costs. Through a systematic review (n = 1,103 publications) and an analysis of government budgets (across n = 859 jurisdiction-years), we find limited sources with relevant cost information, none of which report transaction costs. While we are able to use this literature to identify which activities incur transaction and production costs, the absence of transaction cost data inhibits more targeted policy reform and adoption of best practices. More detailed data collection and reporting can inform more impactful and equitable buyout policy.

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Key Words: Floodplain buyouts, climate adaptation, hazard mitigation, environmental finance, flood policy



## PLANNING IN THE PHASE FOG: INTEGRATING MITIGATION AND RECOVERY PLANNING IN THE MIDST OF REPETITIVE DISASTER EVENTS

Abstract ID: 258

Individual Paper Submission

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Communities around the globe now experience repeated major disaster events in quick succession as anthropogenic climate change exacerbates existing risks from natural hazards like hurricanes, floods, and fires (Collins et al. 2019). In the United States, coastal areas of the Southeastern states exemplify the new normal consisting of a perpetual process by states, counties, and municipalities of preparing for a major disaster, recovering from one, and preparing for another close on the heels of the first (National Climate Assessment 2018). For instance, Matthew and Florence flooded North and South Carolina in 2016 and 2018. Irma and Maria, which brought winds and water to Florida, were separated by just weeks in 2017 and were followed by the Category 5 Michael in 2018. In 2020, the Hurricane season exhausted the list of names pre-approved for the year, with 30 total named storms, of which Laura, Marco, Sally, Beta, and Delta all hit land in the east Texas to West Florida stretch of the Gulf. The conventional Disaster Mitigation-Preparedness-Response-Recovery cycle was never as linear as it sounded Randolph. But now that model is bordering on farcical. For planning scholars and practitioners, this 'phase fog' dynamic raises myriad questions about the role of discrete planning processes and documents intended to have long-range horizons but, in reality, needing to be updated before they are completed. It also raises questions important for the emerging scholarship on networks of plans (Berke et al. 2015, Bacău, Grădinaru, and Hersperger, 2020). Here, we tackle questions including: 1) to what extent are hazard mitigation and recovery plan documents integrated? 2) to what extent are hazard mitigation and recovery planning processes integrated? And 3) what state and local factors explain variation in the integrated of mitigation and recovery efforts?

We answer these questions using a comparative case study research design as part of an ongoing National Science Funded study (#1760183). We apply systematic plan quality content analysis methods (Lyles and Stevens 2014) to a sample hazard mitigation plans and recovery plans to a sample of nine counties in Florida, Georgia and North Carolina. We also conduct digital surveys and semi-structured interviews with key stakeholders in hazards planning in each jurisdiction. These three states share exposure to similar hazards and similar recent disaster experiences, while varying in terms of their state planning frameworks. The particular counties are an availability sample because very few counties in the region have disaster recovery plans, although virtually all have hazard mitigation plans in compliance with the mandates of the federal Disaster Mitigation Act of 2000. Specific themes we explored across each data set include 1) integration across the plan documents, with particular attention to the policies and actions in each plan; 2) the connections (or lack thereof) in the network of stakeholders in each planning process; and 3) connections to long-term land use planning and other planning processes (e.g. transportation, climate change, housing, etc.).

Our findings demonstrate variations across all themes at the state and local levels. The patterns of variation provide insight into different historical state-level approaches to coordinating planning, as well as ongoing changes occurring within states. Variations in local context also appear to explain differences in local planning. Two findings speak to broader challenges facing planning in the 'phase fog:' 1) federally mandated hazard mitigation plan quality remains low and 2) most jurisdictions do not have robust recovery planning process, much less integration of recovery planning with mitigation planning. We conclude with practical implications of this new normal of hazards planning for federal policy, state coordination of local planning, and local planning processes to reduce risks from natural hazards in a changing climate.

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Key Words: plan evaluation, hazard mitigation, disaster recovery, planning networks, phase fog

## WHAT DOES NEIGHBOURHOOD CLIMATE ACTION LOOK LIKE?

Abstract ID: 272

Individual Paper Submission

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Cities are recognized as an important scale for framing and implementing plans and policies for action on climate change (Bulkeley et al., 2011; Wolfram and Frantzeskaki, 2016). Within the structure of cities, it is in urban neighbourhoods that climate action gets 'contested, deconstructed and reconstructed' (Wittmayer et al., 2014). Further, the neighbourhood scale is easily recognized by urban residents as a place for participation and experimentation around climate action (Rohe, 2009). Concepts like low-carbon localism are beginning to define and create an imaginary for bottom-up climate action in urban neighbourhoods (Brownill and Bradley, 2017). Despite its importance, scholarly literature has played limited attention to the scale of the neighbourhood as a site for climate action. The objective of our paper is to provide an overview of the role of neighbourhoods in leading bottom-up climate action and its implications for urban planning.

We conducted a qualitative scoping review of 79 scholarly articles published between 2000 and 2020 identified through three academic databases (Scopus, Web of Science and Google Scholar) addressing neighbourhood climate action. Our objective was to establish the existing conceptualization and positions of neighbourhoods in leading climate action, focus of climate action efforts (adaptation or mitigation), actors involved (residents, local organizations, city governments and academics), theories and concepts guiding neighbourhood climate action, methods and tools of engagement, governance models in place, challenges and future avenues of research and action. Our scope was limited to English language literature emerging from cities of the Global North that involved neighbourhood residents as key-actors.

Our findings indicate that while neighbourhoods have historically engaged with issues of social and environmental sustainability and in turn contributed to address them, climate change adaptation is a nascent area of participation. A majority of papers on neighbourhood climate action involved local academic institutions, neighbourhood associations and non-governmental agencies. Authors engaged with a wide range of concepts like social mobilization to establish practice oriented models like LEED for Neighborhood Development (LEED-ND). We also found that the presence of existing governance structures like neighbourhood organizations or residents

associations help design, implement and anchor climate action at the neighbourhood scale.

As cities plan and prepare for transformative urban change to address the wicked problem of climate change, the scale of the neighbourhood emerges as an important site for research and practice. Our findings provide a vocabulary for rethinking neighbourhood level planning and stress the need to build upon the tools available for it in light of engaging neighbourhoods for urban climate action.

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Key Words: Neighbourhoods, Climate Action, bottom-up planning, Mitigation, Adaptation

## FOOD SECURITY AND CLIMATE CHANGE: DISTINCT IMPACTS ON RURAL COMMUNITIES IN THE GLOBAL SOUTH AND NORTH COUNTRIES AND IMPLICATIONS FOR ADAPTATION EFFORTS

Abstract ID: 273

Individual Paper Submission

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The determinants of food security in the Global South and North countries differ and hence we hypothesize that unique strategies for adaptation, beyond a focus on food production, are required. Globally, 805 million people are chronically hungry. Meeting future food needs must consider not only global population increase and changing diet preferences that will increase resource demand but also climate change impacts on food security. Research shows climate change will exacerbate food security through multiple pathways, including increasing the total number of food insecure people globally. Climatic factors that negatively affect food production vary by region and include: increasing heat stress, drought, flooding, and increased weed, disease, and insect pest pressure. Many low latitude regions are particularly vulnerable because high temperatures already constrain crop and livestock production, while some high latitude regions could potentially benefit from longer, warmer growing seasons. To understand climate impacts on the food systems, scholars need to look beyond food production, and consider the food access and capacity for utilization as well. The extent to which climate change will affect food security and human health will ultimately depend on the degree to which our food and production systems have been adapted.

In this paper, we review unique climate, agricultural, demographic, and socio-economic aspects of rural populations in developed and developing regions, to elucidate an array of climate change adaptation interventions necessary to bolster food security in different regions. We focus on two case studies on the determinants of food insecurity in rural communities in the United States and India. Our review indicates that while there are overlaps in effective strategies for improving food security for rural populations in a changing climate, the “one-size-fits-all” approach

suggested in much of the adaptation literature lacks the nuance needed for planning strategic and cost-effective interventions. Emphasis on agricultural production in developing regions where a majority of individuals living in rural areas are smallholder subsistence farmers will benefit the majority of the population. In the Global north, an emphasis on food access and availability is necessary to improve food security among the populous.

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Key Words: climate change, food security, adaptation, rural communities, Global south and north

#### PLANNING FOR URBAN CLIMATE EQUITY: AN EVALUATION OF US CITY-LEVEL CLIMATE ACTION PLANS

Abstract ID: 280

Individual Paper Submission

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As US cities propose ambitious climate plans, many question if and how they can be implemented equitably. The Biden administration has proposed sweeping climate goals and funding mechanisms that will likely provoke renewed interest from state and local governments as they seize a window of opportunity to implement projects. While the impacts of climate change will disproportionately affect vulnerable populations, planning solutions like mega infrastructure projects, managed retreat, and other large-scale projects have potential to displace marginalized communities or protect others at their expense. Additionally, equity and vulnerability considerations are likely to differ in scope and scale for affected population(s) across adaptation and mitigation strategies.

This paper asks three central research questions: 1) How do US cities integrate equity considerations into their climate mitigation and adaptation plans; 2) how do plans prioritize and reconcile equity across adaptation and mitigation efforts, and 3) do these equity considerations include measurable metrics for evaluation? Answering these questions will update knowledge on equity in local climate and sustainability plans, as Schrock et al. (2015) found few city climate plans that incorporated social equity goals and Hurlimann et al. (2021) found limited integration of adaptation and mitigation efforts in urban planning documents. This paper will provide an updated review of city-level climate action plans and address a gap in the literature by investigating how equity goals might be measured and evaluated.

Social equity in the US urban planning context traces back to the “social progressive era” of the late 19<sup>th</sup> and early

20<sup>th</sup> century, gaining popularity during the 1970s. These themes have evolved and diversified in contemporary planning contexts with Fainstein’s conception of ‘just cities’ or in conflict with growth and environmental preservation objectives in Campbell’s ‘triangular model’ of sustainable development (Campbell, 1996; Fainstein, 2000). Today, persistent environmental injustices and systemic racism push planners to further scrutinize equity implications in all aspects of practice. American Planning Association (APA) guidelines assert that “planning for equity is intended to challenge those planning processes that result in policies, programs, and regulations that disproportionately impact and stymie the progress of certain segments of the population more than others”. With specific attention to climate planning, the APA calls on planners to move beyond concepts of resilience, where everyone endures, to climate equity, with awareness of impacts specific to marginalized and vulnerable populations.

We focus on climate action plans of cities in the United States with populations greater than 300,000. Among 66 cities that fit this criteria, 49 cities have a publicly available climate action plan. Our preliminary research revealed that about 75% of these plans were published or updated within the past five years. This project proposes to analyze these plans using APA’s guidelines, coding for the presence of equity considerations and equity outcomes that can be measured, quantified, or otherwise evaluated. Our findings will not only reveal the best practices among these plans, but also illuminate their shortcomings and yield recommendations for planners to prioritize equity in climate solutions.

To prioritize just urban climate action, we argue that in addition to including end goals to enhance equity in their plans, cities must provide measurable targets that can be monitored for evaluating equity goals. As climate plans can potentially result in socio-spatial inequities, planners should build in opportunities for equity checks as plans are crafted and leverage emerging policy tools to meet these goals (Hughes, 2020).

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Key Words: climate planning, planning equity, climate justice

#### **SAY IT LOUD AND CLEAR: UNDERSTANDING NATURAL HAZARD RISK COMMUNICATION IN CANADIAN MUNICIPALITIES**

Abstract ID: 295

Individual Paper Submission

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One of the key challenges for cities across Canada is coping with future threats from natural hazards and environmental risks. Recent disaster events in Canada – Quebec's 2019 spring floods, British Columbia's 2018 wildfires, and Fort McMurray's 2016 wildfires – have impacted residential communities and raise questions about how municipalities understand and manage risk.

In recent times, risk communication has emerged as an important risk-reduction and resilience-building strategy used by multiple actors to deal with future risks to communities (Kar & Cochran, 2019). Risk communication can play an essential role in increasing risk perception and mobilizing adaptation action among communities and individuals, ultimately helping all impacted stakeholders – homeowners, municipal and provincial governments, and developers – prepare for future disaster events (Henstra et al., 2019). Risk knowledge can be acquired, perceived, and used in different ways by different actors depending upon their developmental priorities (Nathan, 2008).

Municipalities in Alberta, Canada, are at risk from multiple hazards, such as wildfires and flooding, which have increased in frequency and intensity as a result of climate change (Sauchyn et al., 2020). According to the Insurance Bureau of Canada (2021), Alberta experienced the most frequent and costliest disasters in the last decade. As a result, municipalities in Alberta are beginning to develop adaptation plans using existing regulatory strategies and legislation to reduce the exposure of new developments to these hazards. Recent literature notes that, throughout all stages of Alberta's provincial disaster recovery process, impacted individuals and communities are not engaged or empowered to reduce their vulnerability to future risks (Bogdan et al., 2018).

In the above context, the linkages between municipalities' risk communication approaches and existing developmental priorities remain underexplored. The main research question we ask is: In what ways do risk communication and urban development processes interact in municipalities in Alberta?

Using a multi-method approach, we explored the above question taking five municipalities of varying sizes in Alberta as case studies – Calgary, Canmore, High River, Fort Vermilion, and Fort McMurray. We analyzed the existing regulatory framework, as well as relevant municipal plans, policies, and programs for risk communication in the study areas. We built on this by conducting semi-structured interviews with stakeholders (municipal officials, developers, insurance agencies, and homeowners).

We present two key findings from the study. First, risk communication in Alberta's municipalities is practiced through four main approaches — strategic actions (institutional changes); public engagement (creating risk awareness); localized planning (updating regulations and development permit processes); and social media marketing. Second, our interviews reveal that risk communication in Alberta's municipalities is shaped by technical risk knowledge as well as multiple, often conflicting, developmental priorities at the provincial, municipal and individual levels. Risk communication is a layered process involving a complex interdependence between actors within a multi-level governance framework.

We highlight that recent extreme weather events in Alberta have provided a 'window of opportunity' for reviewing existing risk information — and its communication — changing key perceptions around risk, building trust between communities and institutions, and creating opportunities for participatory forms of risk communication in the future. The outcomes of this study will inform short and long-term municipal risk management approaches and improve regulatory mechanisms for risk-sharing in future developments across Alberta. Further, research findings will facilitate the creation of guidelines for effective risk communication during the development approval process.

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Key Words: Risk communication, Risk knowledge, Climate change, Adaptation, Mitigation

## INEQUITY IN STORMWATER INFRASTRUCTURE PERFORMANCE IN HOUSTON: A MULTILEVEL ANALYSIS

Abstract ID: 296

Individual Paper Submission

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Stormwater infrastructure is an important physical element that can be used to deter extensive localized flooding in an area by controlling stormwater runoff during rainfall events. Stormwater infrastructure performance is normally decided by the local government's stormwater management project allocation within a limited budget. Based on the decisions on stormwater management, the design capacity and maintenance condition of infrastructure elements in an area are determined, which in turn influence the overall infrastructure performance and the extent of floods during and after rainfall events.

To understand the distribution of impacts from localized flooding, it is important to examine whether stormwater infrastructure management is equitably allocated for adequate stormwater infrastructure performance across a municipality. A growing number of recent studies have examined the uneven distribution of stormwater infrastructure capacity across neighborhoods within a municipality using an environmental justice framework (Hendricks, 2017; Mandarano, et al., 2017; Porse, 2018). However, such studies are limited by infrastructure types and measurement, while considering the macro-scale design capacities of one or two types of infrastructure only at the neighborhood level, such as census block group, tract, or watershed level. The neighborhood level analysis has a higher group heterogeneity than the smaller units, and the aggregated data cannot represent the overall infrastructure performance of the neighborhoods. To reduce the group heterogeneity, measurements at the micro-scale level should be considered.

Using a city-wide cross-sectional multilevel analysis, this study addresses the gaps by examining the distribution of micro-scale stormwater infrastructure performance across diverse neighborhoods in the city of Houston, Texas. Specifically, this study explains how the design capacity and maintenance condition of stormwater infrastructure at the road segment level are associated with the socio-economic compositions of the adjacent parcels and neighborhoods where the road segments are located. Road segment is the smallest unit in which infrastructure elements tend to have similar characteristics. Results presented here are from secondary data analyses of public stormwater infrastructure spatial data, which is merged with public road segment and adjacent parcel data, Census block group data, as well as impervious surface data of the city of Houston. This study uses multilevel analysis to relate stormwater infrastructure performance (i.e., total volume of conveyance systems normalized by imperviousness and age of sewers) to the socio-economic characteristics of people who will be influenced by the infrastructure performance (i.e., property values of parcels adjacent to road segments, as well as income and race/ethnicity of neighborhoods where the road segments are located).

The preliminary results support the hypotheses based on the findings from environmental justice and hazard vulnerability literature that people of color and low-income have insufficient access to public resources and capital investment because of persisting economic and racial segregation across the US. Specifically, socially vulnerable people, residing in neighborhoods with a higher percentage of Black or Hispanic people and lower median household income, as well as properties with lower values, live in areas with more roadside ditches and less storm sewers, as well as less total volume of conveyance systems for stormwater management when controlling for density and imperviousness. Socially vulnerable people reside in areas having more deteriorated storm sewers when controlling for density and imperviousness. The findings of this study have substantial implications when developing land use plans and Capital Improvement Plans (CIP) to reduce the impacts from localized flooding and make them more equitable.

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Key Words: Equitable stormwater management, Stormwater infrastructure performance, Environmental justice, Hazard vulnerability, Flood mitigation

#### **URBAN ENVIRONMENTAL FACTORS ASSOCIATED WITH SPATIAL DISTRIBUTION OF PARTICULATE MATTER CONCENTRATIONS : THE CASE STUDY OF SEOUL, KOREA**

Abstract ID: 316

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#### Backgrounds

Particulate matter (PM) in the air is a serious threat to public health in many urban areas in Asia. Developing air quality management strategies is an important but a difficult task because the distribution of air pollutants in cities are complicated and sensitive to large number of factors related to urban environment. The relationship between air pollution and urban environmental factors has been studied in recent years. The results of these studies showed that the distribution of air pollutants is dependent on temporal and spatial variability such as traffic volume, human activity, land use, and the amount of vegetation. Although previous studies have discussed the characteristics of pollutant distribution in urban areas by using sensor-based data, detailed analysis was limited due to sparse monitoring sampling. This study investigates the influence of urban environmental factors on air quality with fine-grained air quality data acquisition to determine main contributors of air pollution both on regional and local scales in Seoul.



## Methodology

This study analyzes PM concentration from fine-grained monitoring sensors, which are installed at 850 locations in the city of Seoul. The concentration of PM was measured from April 2020 to January 2021. Whereas the conventional land use regression model has been used to simulate pollutants' concentration in previous studies, this study applies geographically weighted regression (GWR) to detect non-stationary relationships between the urban environment features and the distribution of PM. Potential urban environmental variables including both macro and microscopic factors are considered. At macro scale, traffic volume and network accessibility are assessed. Ordinary kriging is used for spatial interpolation of 135 values of annual average daily traffic volume, whereas Space Syntax was used to assess relative accessibility of a region. At micro scale, urban environment features around the monitoring sensors are measured by ArcGIS and extracted as three categories: transportation infrastructure, land use, and building densities. The buffer radius of local scale variables ranges from 100m to 1km.

## Results

First, the results of the study show that the spatial scope of environmental factors that affect PM concentration are different. On one hand, the variables of building densities such as floor area ratio, lot coverage, and building height show positive associations with higher concentration of PM at the range of 300m around monitoring sensor. Similarly, the variables of mixed land use show a positive association at the scope of 300m buffer. On the other hand, the variables of transportation infrastructure are significant with larger buffer sizes. The arterial segment length has a positive association with PM concentration at the scope of 500m, whereas the number of subway stations and length of highway segments show positive association at the scope of 1km around monitoring sensor. Second, the study demonstrates that GWR models show better performance than global multivariate regression models with lower AICc. The results show that there is a spatial heterogeneity. The determinants of PM concentration are different by areas. PM concentration is highly influenced by width of the road where the monitoring sensor is installed especially in the case of old downtown compared to the case of new business district of Seoul.

## Implications

Findings of the study helps to give us a better understanding of how PM concentrations are affected by different urban environment factors and how spatial scope of influence differs among these factors. The results indicate that implementation related to air quality management should be more targeted to reduce personal exposure to PM according to the geographical context. The study has potentially far-reaching implications for urban planning and design practices with air pollution management strategies.

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Key Words: air pollution, urban environmental factors, particulate matter, urban planning, public health

## SOURCE WATER PROTECTION PLANNING IN OHIO: ASSESSING THE INTEGRATION OF LAND USE PLANNING AND WATER MANAGEMENT

Abstract ID: 324

Individual Paper Submission

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Amendments to the U.S. Safe Drinking Water Act in 1986 and 1996 highlight a shift in relying solely on treatment technology and responses to contaminants to a focus on incorporating the proactive protection of public drinking water resources at the source. Through direction from state-level source water protection (SWP) programs, public water systems create protection plans for drinking water sources. While these protection plans and related implementation programs rely on land use-based data, policies, and decision making, including regulatory and non-regulatory interventions, they have received limited attention in planning literature (Lindsey & Schoedel, 1997).

Recognizing a divide between land use planning and water resources management, there is increased momentum in planning practice and research to integrate the two (Dyckman & Paulsen, 2012; Cesanek et al, 2017). Yet such an integrated approach involves more than collaboration between planners and water managers. Coordinated land and water management occurs at scales beyond political jurisdictions, involves the incorporation of both scientific and place-based knowledge into planning and management processes, and focuses on increasing economic and social benefits while ensuring environmental protections (Grigg, 2016). However, barriers exist in collaboration and decision-making across jurisdictions for shared water resources and protection areas. Further, challenges may also include creating institutions that support the integration of historically separate planning and management sectors and activities. Literature suggests that effective governance is key to overcoming such challenges. I argue that SWP plans and programs provide an opportunity for examining an integrated approach to land and water governance and management. As such, my research addresses the following question: How do governance arrangements impact the management and integration of land and water resources for SWP?

Using a multiple case study approach, I examined five SWP plans/programs in Ohio (3 using groundwater and 2 using surface water sources). Data collection included document review of SWP plans, related water management plans, and land use plans and policies, as well as semi-structured interviews with public water system representatives, planners, zoning managers, and other relevant actors involved in SWP planning and management. For each case, I analyzed if and how the five plans/programs incorporated elements of integrated land and water management for SWP. I draw from collaborative planning, governance, and integrated water management literatures to assess the five cases. While source water protection in Ohio is administered by a single state agency (Ohio Environmental Protection Agency), the case analyses highlight variation among protection plan implementation efforts, collaborative structures for protection, and scope.

This paper focuses on two main themes that emerged in the comparison of the five cases: (1) the importance of boundary spanners for SWP efforts, and (2) the variation in the framing of the role and scale of SWP across cases and sectors. The results suggest that moving from a protection plan to implementing a SWP program involves continued inter-governmental and cross-sector collaboration, as well as sustained capacity for SWP. The planning process and subsequent protection efforts also provide a means of establishing collaborative governance arrangements to protect the quality of drinking water resources. Results from this paper are expected to inform planning practice and theory through identifying points of planning intervention into local and regional SWP efforts. Implications for practice from a pragmatic perspective also include the necessity of understanding what integration means for and in practice for planners and water suppliers alike.

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Key Words: source water protection, governance, water management, collaboration, integrated resource management

## UNDERSTANDING PLACE THROUGH ENVIRONMENTAL HISTORY: ADAPTIVE CYCLES AND GOVERNANCE

Abstract ID: 328

Individual Paper Submission

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This research extends prior work based in resilience theory to understand the evolution of governance of a watershed as a social-ecological system (SES) (Kellogg and Samanta 2017). The current work developed an environmental history of the Chagrin River watershed in NE Ohio, extending the period of change backward to the creation of the Connecticut Western Reserve in 1795. Research objectives were to 1) understand how changes in landscape over 200 years impacted water quality and quantity in the river and altered its broader biophysical status; and 2) to understand the resilience of the social – ecological system to disturbances, disruptions, and thresholds (Folke 2006) through different time periods of natural history, socio-economic change, and perceptual (political/ideological) shifts (Hughes 2008). How did management, planning and governance systems change through several major historic periods in the social-ecological system to reflect changing perceptions of actors (DuPlessis 2009)? Can incorporation of resilience theory with environmental history more effectively identify the evolutionary change (the adaptive cycle) of a watershed, including the attributes of nested and cross scale interactions and of multiple equilibria which relate directly to the variations in biophysical conditions in sub-watersheds?

Primary and secondary sources were used to identify historic change to landscape from settlement, resource extraction and political institutions (e.g., surveyor notes from 1796, land sales maps, tax records, Sanborn maps, and state and county aerial photos). Data for changes to the river (e.g., water quality, changes to stream morphology, and water quantity) were obtained from 19<sup>th</sup> and 20<sup>th</sup> century newspaper accounts, and local, state and federal agency testing databases. Timelines of disruptions and trends for these attributes knit data from disparate times, scales, and sources together and were compared to discover key social or biophysical thresholds and ecological regime changes indicating evolution of the system across scale and time.

The timelines indicate critical disruptions to the SES, some internal and periodic (such as flooding) and some external (e.g. opening of the Erie Canal in NY state), interspersed with longer term landscape change. Settlers and entrepreneurs shifted their subsistence and economic exchange behavior to substitute for declining ecosystem services, which in turn often initiated a secondary round of landscape change, causing further degradation of ecosystem services over two hundred years. A counter trend to restore ecosystem services began in the late 19<sup>th</sup> century and accelerated after passage of the CWA, resulting in a new governance structure, one explicitly focused on restoration. Sub-watersheds experienced different drivers and changes to landscape and ecosystem services across differing time scales, and adaptation in these watersheds reflected the perceptions of actors who dominate governance in these smaller geographies.

Relevance of this approach stems from planning as primarily a place-based enterprise. One of the outcomes of developing the environmental history was a deeper appreciation of the value of the Chagrin River to its residents

and leaders that was discovered in earlier studies. The history of the place frames decision making up to this day as actors seek to address changing climate conditions. A resilience framework combined with an understanding of historic disruptions and trends provides a deeper foundation for decision making.

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Key Words: watershed, governance, environmental history, social-ecological systems

### **PLANNING FOR SEAWATER INTRUSION INTO FRESHWATER SUPPLIES: RISK AND ADAPTATION IN THE SOUTHEASTERN UNITED STATES**

Abstract ID: 335

Individual Paper Submission

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The drinking water intakes of many coastal communities are located in freshwater sources just upstream or inland from the ocean. As sea levels rise, many of these surface water and groundwater sources will be contaminated by ocean salts (van den Brink, Huismans et al. 2019, Befus, Barnard et al. 2020). This study evaluates sea level rise-driven salinization of drinking water in the southeastern United States, from New Jersey through Texas. The study asks three questions: (1) To what extent does sea level rise pose a risk to public drinking water supply systems in the southeastern U.S.? (2) How are state and local governments in the southeastern U.S. planning for salinization? (3) Are there regions with high risk and little planning?

First, we map risk of drinking water salinization. We relate the location of public surface water and groundwater drinking water intakes to the U.S. National Oceanographic and Atmospheric Administration (NOAA) three-foot sea level rise scenario, NOAA's projected medium-high scenario for 2050. Across the study area, we find 260 drinking water intakes owned by 165 unique public water suppliers serving 13.2 million people are expected to be inundated at three feet of sea level rise, putting these water sources at very high risk of salinization. An additional 4,876 drinking water intakes owned by 1,579 unique public water suppliers serving 27.5 million people are within 1500 meters of the three-foot scenario, putting them at a lower, but still substantial risk of salinization. Regional risk evaluation is for planning purposes and certainty of salinization will require watershed-by-watershed modeling. To refine the risk mapping, however, we spatially locate desalination facilities and shoreline hardening as infrastructure that mitigates salinization risk.

Next, we evaluate salinity planning following methods of plan quality review demonstrated by Burke and Godschalk (2009) and Woodruff et al. (2018). We review sixteen adopted and draft state Coastal Zone Management Program Assessment & Strategy plans in the study area. We also review 148 state, regional, or local adaptation plans related to climate change, sea level rise, and hazard mitigation and preparedness topics that may affect drinking water infrastructure planning. To assess these 164 documents, we use a deductive coding approach. We search for keywords related to salinity (e.g. salt, saline, intrusion) in each plan and identify salinity control strategies, if any. We score plans both for quantity and quality of salinization planning. We find forty-one plans discuss salinity control

strategies to mitigate seawater intrusion into drinking water sources, taking a total of fifty-eight types of salinity management actions. We find the primary focus of these actions is on monitoring, not adaptation.

Finally, we overlay the maps of salinization risk and the salinity planning scores. We find that planning is likely inadequate for protection from NOAA's projected 2050 sea level rise scenario. Further, planning is inconsistent and not commensurate with risk. Many areas with the highest risk of salinization have thus far demonstrated the lowest degree of planning at state and municipality levels. We do not observe planning that is happening within many water agencies, since we do not examine planning documents from each of the 1,744 public water suppliers at risk in the service area. One thousand six hundred and fifty-eight of these water suppliers, however, serve small to medium populations (<100,000) and are likely to be less resourced and have lower planning capacity. Already, socioeconomically disadvantaged populations often have lower quality source water and poorer quality water infrastructure (Switzer, Teodoro 2018). Left to individual water suppliers, widespread salinization combined with differential capacity for salinization planning has the potential to exacerbate existing inequities in drinking water provision.

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Key Words: drinking water, sea level rise, climate adaptation, salinity

#### HOW HAS COVID-19 IMPACTED LOCAL GOVERNMENTS' CLIMATE PROTECTION AND SUSTAINABILITY EFFORTS? AN EXAMINATION OF INITIAL EFFECTS

Abstract ID: 342

Individual Paper Submission

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Although many local US governments have adopted climate protection and community sustainability as an explicit objective, it is not a core local government responsibility. As a result, compared to policies and programs focused around traditional functions, those related to sustainability may be at greater risk of retrenchment or change in times of crisis (Yi et al. 2017).

The global COVID-19 pandemic has disrupted society in a manner not experienced in generations and required communities to adapt to meet new sets of needs—often while simultaneously facing reductions in their overall financial and human capacities. Local governments have been particularly hard hit, with many facing considerable declines in sales tax-base revenue (Sheiner and Campbell 2020). In this context, it is unclear how policy objectives, like greenhouse gas mitigation and sustainability that are often considered “extra,” may be impacted (Krause and

Hawkins 2021). At the same time, certain organizational and community characteristics—including whether sustainability objectives have been formally incorporated into a municipality’s strategic or comprehensive plans—may strengthen its durability as an actively pursued policy aim.

This research examines how COVID-19 has impacted local governments’ climate and sustainability efforts approximately one year into the crisis. It empirically assesses factors associated with substantive planning and programmatic changes including in the relative prioritization of local social equity, environmental, and economic efforts. It also considers factors that influence logistics related to implementation, resource allocation and collaboration around these efforts.

We explore these dynamics using a series of logistic and ordinal logistic regressions applied to new data collected from 515 US cities. This data was collected via an online survey, an invitation to which was emailed directly to the person in each city government pre-identified as “most responsible” for sustainability-related efforts. Invitations were sent to all US cities with populations over 20,000 (n=1,850) and a 28% response rate was obtained. Data was collected between December 2020 and February 2021, approximately 1 year after COVID was first found in the US. Thus, although the situation remains dynamic, enough time had passed for its initial effects to be felt. Archival data indicating the financial and public health impacts of the crisis as well as political leanings round out the dataset. Preliminary results suggest that smaller cities and those without institutionalized sustainability or climate protection objectives in a formally adopted plan are most likely to have engaged in policy retrenchment. However, the presence of broad public backing for their sustainability initiatives may reduce this dynamic, indicating the importance of stakeholder support in sustaining policy initiatives.

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Key Words: climate policy, sustainability planning, retrenchment, COVID-19

#### **MAPPING GAPS AND OPPORTUNITIES IN URBAN ENVIRONMENTAL STEWARDSHIP FOR THE METRO DENVER REGION**

Abstract ID: 355

Individual Paper Submission

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Urban environmental stewardship is increasingly extending beyond traditional public sector actors, like Parks Departments, to include diverse networks of public and private groups that are critical to maintaining urban ecosystem services (Connolly et al 2014). These “civic ecology groups” can be small and self-organized, such as “friends of parks” groups, or well-established agencies or non-profits, but ultimately their impact comes from their

responsiveness to local needs and their ability to successfully partner (Krasny 2012). Ultimately, such partnerships and networks have been critical to the successful stewardship and maintenance of nature in cities (Pickett et al 2016).

Stewardship mapping has been utilized to understand who is doing this type of stewardship in urban areas and how and where they are doing it down to a granular level (Connolly et al 2014; Svendsen et al 2016). STEW-MAP is a specific type of stewardship mapping framework designed by the US Forest Service Field Station system for this purpose (Romolini et al 2016) that has been applied to over a dozen communities. One of the newest regions to implement the STEW-MAP framework is the greater Denver region, as part of the Forest Service's new Denver Urban Field Station, which the authors are affiliated with. Denver STEW-MAP is a survey of hundreds of regional stewardship organizations, from agencies to nonprofits, asking numerous questions about the type of work they do, who they work with, where they get their information, and where they work. The information on "where" is elicited through an interactive online mapping interface that allows respondents to draw service areas.

Through this interface, and our follow-up mapping efforts that sought to improve geographic coverage by manually mapping additional stewardship footprints, we have built an increasingly comprehensive geographic database of stewardship areas in the greater Denver metro area. This database shows us where groups are actively working, where there are overlaps in group activities and, most importantly, where there are gaps. To date little coverage exists on the topic of using stewardship mapping to detect and remedy such gaps. Another innovation of Denver STEW-MAP is that it includes a new category of stewardship organization not present in previous STEW-MAP implementations, but critical to open space management in the Western US: Homeowners' Associations (HOAs). Some of the nation's largest HOAs are found in the Colorado Front Range and many of these manage hundreds or thousands of acres of open space or park land, yet their role in urban environmental stewardship is still poorly studied.

In summarizing our key results, based on our extensive GIS and statistical analysis, this presentation will address the following questions:

Where do geographic gaps exist in regional stewardship coverage in greater Metro Denver?

Are there critical environmental assets that lack stewardship coverage, like riparian corridors, regional greenways, etc., and where are they?

Is there overlap between stewardship organizations that could be coordinated to provide capacity for nearby gap areas?

Are there systematic disparities in geographic stewardship coverage that correlate with socio-economic status, environmental liabilities or community vulnerability and what are the ramifications for environmental justice?

What proportion of open spaces and other urban environmental asset areas receive stewardship from HOAs, and do they partner with other stewardship organizations in managing these lands?

What proportion of these HOA lands are restricted vs. public in access?

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Key Words: Stewardship mapping, Urban ecology, Urban environment, Urban ecosystem services, GIS

## THE CHALLENGE OF INTEGRATING RESILIENCE IN PLANNING: LESSONS LEARNED, GUIDING PRINCIPLES, AND FUTURE DIRECTIONS

Abstract ID: 362

Individual Paper Submission

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Flooding is the most common natural hazard in the United States, and it poses the greatest threat to property and human safety. Vulnerability to flooding is growing as a result of continued development in flood-prone areas and a lack of coordinated land use and hazard mitigation planning. The resilience of the built and natural environments is strongly influenced by the development and growth management guidance provided by a community's network of plans, which often includes land use, hazard mitigation, and transportation plans, among others. These plans guide development, including in flood-prone areas. The ways these independent plans interact can significantly impact community vulnerability (Berke et al., 2018). A well-integrated network of plans can aid in building resilient communities and reducing losses from flood events. However, few methodological tools exist to examine the level of integration among plans.

To address this gap, Berke et al. (2015) proposed the Plan Integration for Resilience Scorecard (PIRS), a method to identify inconsistencies between plan policies that may exacerbate flood vulnerability by, for instance, encouraging development in risky locations. Since its inception, the PIRS had been applied in research and practice, and employed to evaluate hundreds of neighborhoods in over 15 cities around the world (Berke et al., 2018; Malecha et al., 2018; Yu et al., 2020). As the method is used more widely – especially in light of recent endorsement by the American Planning Association – it is important to consider the different methodological decisions made when applying PIRS in a given community. These decisions may affect replicability and the interpretation of results. The goal of this paper is to outline these various decisions and their permutations, and to provide guidance on when certain decisions are most appropriate, based on a review of the existing PIRS studies and guidance documents. The research questions are:

- (1) How can the replicability of the Plan Integration for Resilience Scorecard method be improved?
- (2) How can the integration of community networks of plans to address resilience be improved?
- (3) What are future directions for integrating resilience in planning?

This paper examines several important aspects of the Plan Integration for Resilience Scorecard method, focusing on issues arising during the policy selection (Berke et al., 2019), policy scoring (Berke et al., 2018), and spatial allocation (Malecha et al., 2018) stages, as well as questions of inter-coder reliability, replicability between studies, and



context-specific adjustments. Illustrating and comparing the application of the method across various case studies, we discuss best practices and lessons learned to facilitate the application of the PIRS and improve the integration of community networks of plans to address resilience in both planning practice and research. We explore future directions for the PIRS method and for integrating resilience in planning, including but not limited to: providing greater analytical nuance by weighting policies by impact; enlarging the scope of possible evaluations to include additional hazards (e.g. urban heat, wildfire) and other urban concerns (e.g. public health, transit-oriented development); and targeting the integration of resilience across multiple scales (Yu et al., 2020).

This research explores theoretical and practical problems at the nexus of climate change and justice, and seeks to contribute to their resolution by reevaluating and exploring the future of the novel Plan Integration for Resilience Scorecard method. Coordinating plans is particularly important to confront “wicked problems” (Rittel and Webber, 1973) like climate change, racial justice, and public health, which require collective and coordinated action across government departments. Deeper knowledge about the principles and future directions of plan integration for resilience can inform more effective approaches as practitioners evaluate their plans and work to foster a more coordinated strategy.

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Key Words: Plan integration for resilience scorecard, Flood resilience, Network of plans, Hazard vulnerability

#### **A SYSTEM DYNAMICS APPROACH OF URBAN DECENTRALIZED ENERGY SYSTEMS INTEGRATION INTO THE CURRENT ENERGY MARKET**

Abstract ID: 366

Individual Paper Submission

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The energy market is changing. After many years of stagnation and being relatively static, the vertical top-down structure no longer exists as a single energy management option. Many changes like access to new renewable energy sources, improved quality of the data, including access to the real-time data from smart meters and other sensors, cheapening effective storage systems, and overall decentralization of the grid make systems much more complex from the one side, but much more flexible and adaptable from the other. The main benefit of these changes and opportunities is that they address the climate crisis's pressure and create a brand-new energy industry appearance that helps communities cut pollution and advance environmental justice.

Energy systems are critical systems that provide the energy that is needed for almost all everyday activities. Today's energy infrastructure is a vast and complicated system that primarily relies on fossil fuels and simultaneously

interrelates with various subsystems. It interacts in a technical way with cities, roads, and buildings, and the more action-based way in terms of interactions with private and public organizations, individuals, utilities, legislators, and regulators. It creates a linkage where social and legal values influence technical outcomes, and technical characteristics have social effects. While the engineering and design perspective for these changes is understandable and had been well-studied for more than a decade (Guerrero et al. 2010), little has been done from a policy and urban planning perspective.

The alternative to the traditional energy grid is decentralized energy systems (DES), including modular and more flexible technologies, distributed energy resources, which are located close to the consumer. A DES application may include renewable sources for power generation that are combined with power storage and conversion, including batteries and various local- and regional-scale distribution technologies. Several examples of these technologies include microgrids, energy hubs, smart grids, or district heating/cooling networks.

This paper explores the consequences of the transition from huge, centralized power systems to smaller distributed sources. Social science in general and urban planning, in particular, are just beginning to investigate the potential role of actors involved in the new paradigm of decentralized urban energy systems. Therefore, the main goal of this study is to analyze and evaluate the potential impact of different strategies related to the transitioning to DESs for all stakeholders: utilities, policymakers, and consumers enhanced by a data-driven modeling framework. Causal Loop Diagrams (CLD) were used to observe an electricity-development nexus and identify the dynamic complexities and further propose a simulation model based on the System Dynamics approach to understand, describe and simulate complexities identified in CLD over time (Ford 1999).

A stock and flow diagram is in the core of the model; it consists of the process of quantification of the components of CLD. The model investigates the relationships between the policy, environmental, and economic side of the DES in the urban environment expanding the existing knowledge that mainly focused on the traditional energy systems. System Dynamics is widely used as a decision support method in the energy sector, and Momodu et al. (2017) look at the market perspective, Aslani et al. (2014) look at the role of renewable energy in energy dependency and security, and Riva et al. (2018) review the interactions between electricity and development. Different aspects of the interrelations between energy and urban systems from a unique perspective by adding decentralized energy components to the existing systems were studied. The paper concludes with a discussion on how new energy components affect policies and planning strategies in urban areas and how small-scale (neighborhood level) factors are connected to the large-scale (regional and power grid level) factors.

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Key Words: system dynamics, complex systems, energy planning

## LANDSCAPE PATTERS AND THEIR EFFECT ON STORMWATER RUNOFF IN COASTAL ALABAMA AND MISSISSIPPI REGION

Abstract ID: 369

Individual Paper Submission

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Regional ecosystems in coastal areas are increasingly at risk of being damaged by rapid urbanization, which will likely lead to the conversion of undeveloped land into impervious surfaces, degrading ecosystems, and increasing flood risks. In order to minimize these negative impacts, local and regional governments will benefit from the knowledge about the type of macro-scale “green infrastructure” and landscape patterns that should be conserved, including natural resources, such as greenways, wetlands, and open spaces that should be protected at the regional scale. This will help towards the goal of creating more resilient communities that can respond effectively to flooding events. At the macro/regional scale, green infrastructure focuses on connecting greenways and protecting wetlands. In this research, we identify landscape patterns that should be protected to help reduce stormwater runoff and mitigate flooding. The expectation is to find that desirable landscape pattern consist of larger patches, more connected and unfragmented patches and corridors, wide corridors, and heterogeneous areas of nature throughout human-developed areas.

This research uses GIS and quantitative methods in order to examine current green infrastructure planning practices and their outcomes in the Mississippi-Alabama coastal region. Specifically, regional and local landscape patterns are analyzed for 1290 sub-basins in the Mobile, Foley, and Mississippi watersheds of the Gulf Coast region. GIS tools of ArcPro and Fragstats are used to undertake regional landscape pattern analysis for each of the sub-basins. Since there are ungauged basins in the watersheds, the Soil and Water Assessment Tool (ArcSWAT) is used for discharge modelling to estimate the amount of stormwater runoff using inputs of DEM, land use data, soil type data, weather data, and observed discharge data. Finally, the impacts of landscape patterns on the variations in the mean annual peak runoff depth is determined using ordinary least squares (OLS) regression, while controlling for the effects of precipitation, slope, soil permeability, floodplain area, natural drainage density, wetlands, and impervious rate.

Preliminary findings explain some of the impacts of green infrastructure land uses in terms of their size, shape, isolation or cluster, and connectivity on local flooding, while controlling for other environmental conditions. Specifically, we find that average precipitation and natural drainage density are very significant and the strongest predictors of runoff quantity. Percentage of wetlands and more connected wetlands are significantly associated with a reduction in runoff. An increased proportion and more connected vegetation are also significant and associated with reduced runoff. On the other hand, barren lands have negligible effect on runoff, but proximity of development has a significant positive association with runoff.

This research aims to identify open spaces/greenspaces/floodplains/landscape patterns that should be protected with the intent of transferring this knowledge to Mississippi-Alabama coastal communities, so that they become more resilient to flood damages, and also facilitate connected habitats. It offers a new approach to framing the role of open spaces/greenspaces/floodplains/landscape patterns within a multifunctional green infrastructure in a regional setting.

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Key Words: Green infrastructure, Landscape pattern analysis, Stormwater runoff

## **ROBUST ADAPTIVE PLANS: INTEGRATING SEA LEVEL RISE AND TSUNAMI INUNDATION SCENARIOS AT THE COMMUNITY LEVEL IN WASHINGTON STATE**

Abstract ID: 373

Individual Paper Submission

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Hazard mitigation planning is rarely incorporated into comprehensive planning (FEMA, 2013). Mitigation is typically hazard-specific and correlates poorly with the goals of community development that underpin most comprehensive plans. Formulating robust strategies to cope with multiple types of hazard scenarios may be a useful step towards reconciling conflicts between mitigation and development, especially if the different time horizons, frequencies/probabilities, and suddenness of onset associated with the hazards can be accounted for. This paper reports on community workshop-based action research in coastal Washington State to consider multi-hazard mitigation in updating local comprehensive plans, and to identify opportunities for more robust strategies than is typical in singular “worst-case” hazards planning. Community stakeholders and a University of Washington team used weTable participatory GIS originally developed for sea level rise (SLR) planning only (Yusuf et al, 2018), to consider localized probabilistic scenarios of both SLR and more sudden, existentially threatening change: near-source megaquake tsunamis and associated co-seismic land subsidence – a rare combination of hazard information in local planning (Dall'Oso et al, 2014). The participating community, Westport/South Beach, faces an estimated 10-17% chance of a major earthquake occurring along the Cascadia Subduction Zone (CSZ) within 50 years. Although rare -- with recurrence intervals of 250-500 years to approximately 2,500 years, depending on the magnitude – a CSZ megaquake could resemble the 2004 Sumatran and 2011 East Japan events, killing more than 10,000 people and injuring over 30,000 throughout the region (CREW, 2013). Given its low average household income and precarious housing conditions, Westport/South Beach had already demonstrated remarkable political will and community cohesion by self-funding and constructing North America's first tsunami vertical evacuation structure (VES) at its local school. Incorporating hazard resilience into its Comprehensive Plan Update is helping the City apply for funding to build additional VES's. To generate longer-term, more comprehensive resiliency and pre-disaster recovery plans including gradual relocation of critical facilities and preparation for possible resettlement on less vulnerable sites, the university-community partnership adopted a values-driven, asset-based participatory workshop protocol (Freitag et al, 2014). Stakeholder participants discussed two scenarios of earthquake-subsidence-tsunami as well as two SLR scenarios – all with different probabilities of occurrence and severities of impact. In this case, the long-term projections for land loss due to SLR happened to resemble the projected land loss due to sudden subsidence of the coastline in a CSZ earthquake, further prompting workshop participants to discuss strategies for relocation of critical facilities and, given time, housing and business assets. However, since an earthquake and tsunami may occur much sooner than the worst case of SLR, further development of the workshop protocol should include combined scenarios of both earthquake-subsidence-tsunami and SLR impacts, at different time horizons. Framing hazard information with local-historical geo-narratives of environmental and developmental change may further encourage generation of robust strategies. Processes that focus only on community vulnerability to severe (but low-probability) existential threats, by contrast, tend to generate primarily immediate life-safety strategies, and provide less useful information to long-term comprehensive planning.

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Key Words: hazards resilience

## **BENCHMARKING PROGRESS TOWARDS SOCIAL EQUITY-FOCUSED CLIMATE ADAPTATION PLANNING IN U.S. CITIES**

Abstract ID: 383

Individual Paper Submission

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Cities across the U.S. are planning for climate change impacts such as heat, drought, sea level rise, and other extreme hazards. Although researchers have long sought to understand the drivers of more aggressive local climate action – which range from rising public awareness to different regulatory incentives and stronger political leadership (Shi et al. 2015) – we have yet to develop consistent and coherent indicators to assess climate change planning outcomes (Woodruff and Stults 2016). The prevailing assumption is that evaluating planning outcomes, especially in the context of adaptation to climate impacts, is challenging because implementation depends on local resource incentives, capacity constraints, and different policy opportunities (Ford and Berrang-Ford 2016). Emerging work on social equity seeks to reorient climate adaptation action around more normative goals such as broader inclusion and consideration of interests from historically disadvantaged communities (Meerow et al. 2019), although again, there are no ways to benchmark the extent or degree to which equity-oriented adaptation actions are (or can be) implemented on the ground. As a result, we have no idea whether climate adaptation plans that are currently being implemented actually lead to more environmentally resilient or socially just outcomes.

This paper addresses the need to benchmark climate adaptation progress through evaluating emerging strategies taken by larger cities across the U.S. to monitor and evaluate their own efforts in designing and implementing more equitable climate actions. Our research seeks to inductively uncover ongoing experiments and innovations in adaptation action in cities, with the aim of articulating general categories of equity-focused interventions that can then be scaled-up to other cities. Our approach draws on a document analysis methodology, focusing on the 24 largest U.S. cities that have published standalone climate adaptation and resilience plans. The plans are coded according to the frequency and degree to which planning actions tackle widely-accepted dimensions of social equity, namely through procedure, (re)distribution, and recognition. This database of equity-focused actions is then sorted according to substantive themes to inform both the type of action and any potential evaluative criteria applied to ensure that planning intentions are met.

Our results indicate that – across the 24 cities included in the analysis – equity-focused climate adaptation actions

fall into three main categories: (1) actions to reduce exposure of and manage risks in vulnerable or historically disadvantaged neighborhoods; (2) actions to legitimize decision-making through inclusive, transparent, and accountable institutions; and (3) actions to tackle root causes of vulnerability, including addressing systematic racism, compounding and cascading risks, and intergenerational disadvantage. Within these three categories, we also identify emerging metrics to benchmark progress in meeting planning objectives, including those targeting specific demographic and age groups or those that qualitatively delineate between ‘surface-level’ and co-productive participatory approaches.

Our findings point to emerging strategies and, most surprisingly, a growing consensus on ‘what counts?’ as social equity-focused climate adaptation action in cities. Despite the diversity of urban contexts, such actions typically range from equitably managing heightened exposures to climate impacts to recognizing historic forms of exclusion in adaptation interventions. Although these efforts are nascent, we are also seeing parallel efforts to benchmark and evaluate these actions against effectiveness, inclusiveness, accountability, and feasibility criteria. Our results therefore help to make sense of ongoing equity-focused adaptation actions in U.S. cities and can inform the types and potential approaches to catalyze more equity-focused actions in other cities. Conceptually, our results chart a new domain of potential metrics and indicators to evaluate planning outcomes in view of the increasing urgency to address climate change impacts nationwide.

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Key Words: Climate change adaptation, Social equity, Monitoring and evaluation, Climate justice

#### **DOES COLLABORATION IMPROVE RESILIENCE PLANNING? EXPLORING THE RELATIONSHIP BETWEEN GOVERNANCE NETWORKS, PLAN NETWORKS, AND FLOOD RESILIENCE IN FOUR COASTAL CITIES**

Abstract ID: 407

Individual Paper Submission

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The risks and costs of flood damages for coastal cities are increasing. Resilience planning is an increasingly popular framework for coordinating hazard mitigation and planning more generally. Research suggests that the concept’s malleable meaning allows resilience to function usefully as a “boundary object.” As such, resilience planning is theorized to help increase collaboration and avoid counterproductive outcomes that arise from treating interrelated problems in isolation (Woodruff et al., 2018). Many cities are now ostensibly engaged in resilience planning, however the extent to which resilience is actually transforming planning processes, stakeholder collaboration, or

mitigation of long-term flood risks is unclear. There is a significant body of literature on governance networks and collaborative planning (Dempwolf & Lyles, 2012; Sayles & Baggio, 2017) and a growing literature on the qualities of networks of plans (e.g. comprehensive plans, hazard mitigation plans, and infrastructure plans) that shape vulnerability to hazards (Yu et al., 2020). These literatures often imply that there is a relationship – with collaboration thought to improve planning and better planning to enhance resilience – but empirical studies of the relationship between governance networks and networks of plans are lacking. This study contributes to the urban resilience, collaborative governance, and planning literature by examining the relationship between collaboration structures and the integration of flood mitigation information, goals, and policies across plans in four coastal U.S. cities (Fort Lauderdale, FL, Baltimore, MD, Boston, MA, and Seattle, WA).

To understand collaboration in each city, we surveyed organizations involved in flood resilience planning about how they work together. We used social network analysis to assess collaboration across this governance network. We also analyzed the content of all current plans shaping development and physical vulnerability to flooding in each city using four different approaches: 1) plan quality evaluation; 2) analysis of the network of organizations listed as participants in plan development; 3) analysis of which plans cross reference each other; and 4) the spatial distribution and impact of the policies outlined in the plans using the Plan Integration for Resilience Scorecard methodology (Berke et al., 2015). We looked at the relationship between these different plan analysis approaches. These plan-level results suggest that higher quality plans and those that include flood information are more likely to have policies that reduce vulnerability to flooding and less likely to have policies that could exacerbate vulnerability. Plans that are more connected to other plans in the network also tend to have higher plan quality scores and are better at integrating flood information. At the city level, the relationship between indicators of collaboration across the governance network and aggregate plan quality and policy scorecard results for the network of plans are not as clear. We compare the four cities' planning network profiles and discuss key differences that likely complicate the relationship between governance network structures and planning outcomes. As one of the first studies to assess the coordination of organizations engaged in resilience planning and to explore the influence of that coordination on plan network quality and integration, these results highlight important avenues for future research.

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Key Words: urban resilience, flooding, network of plans, collaborative planning, hazards

#### PLANNING IN THE PLANTATIONOCENE: CLIMATE JUSTICE MEANS DECOLONIZATION

Abstract ID: 419

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How should planners approach the ideal of climate justice? To frame the question of “climate,” I engage scholarly discussions around the Anthropocene (a putative geological epoch achieved by anthropos, Man) and its critical others (Capitalocene, Chthulucene, and Plantationocene). These conversations foreground the fact that “climate” and the “climate crisis” are, at best, synecdoches—and at worst, obfuscating euphemisms—for broader naturecultural crises of modernity, coloniality and supremacy (Whyte 2018). Planning’s very ability to decouple “climate” from the broader multicrisis is a symptom of “climate”’s epistemic framing as a technical question of quantifiable greenhouse gas concentrations. This decoupling flows from the specious separation of “things” (in this case, “climate”) from their more-than-human entanglements: a false partition which extends throughout modern planning (Jon 2020). In truth, “climate” is inseparable from mass extinction, geo-ecological upheaval and collapse, sociopolitical inequality and instability, and ideologies and histories of coloniality and supremacy (Davis et al. 2019). I therefore argue for the lens of the Plantationocene over other “-cenes,” because it decenters Man; and emphasizes more-than-human “plantation relations” thus far marked by ordering, exploitation, and racial domination.

In response to this unprecedented conjuncture, I first interrogate the basic etymological overlap between “planning” and “plantation.” I then use the example of transportation planning and related technologies (technologies of transportation, technologies of planning) to examine ways in which planning has produced “climate” and related Plantationocene crises. Looking to the near future, I consider ways in which planning practices (a) risk exacerbating the Plantationocene multicrisis, and (b) could potentially respond to this multicrisis in a generative and liberatory fashion. To better understand the latter, I center Indigenous, Black, feminist and decolonial perspectives—voices of and for those who have been the most marginalized in “climate” discussions, and who have thus far endured and continue to risk the worst consequences from the Plantationocene multicrisis. Many of these voices argue that we must radically unlearn, reunderstand and restructure our more-than-human and more-than-Euro-modern relations (Liboiron 2021), and engage radical decolonial futurities (McKittrick 2013).

I close with a set of suggestions for planning: approaches to diversify our knowledges and ways of knowing; ideas for reshaping our inter-human and more-than-human relations; methodologies for planning research and practice; and specific examples applied to transportation planning. My suggestions for planning include:

- Pluralizing planning epistemologies by centering Indigenous, Black radical, feminist, queer, more-than-human and anti-colonial ways of knowing
- Reforming planning’s land relations by centering local, more-than-human lived experiences and historicities; supporting land back; and refusing to plan on stolen land without permission from people Indigenous to the land being planned
- Developing a culture of humility and care wherein we continually and reflexively question not only expertise and objectivity; but the very value of attempting to overdetermine futures rather than adopting a continuous praxis of care for land and radical love for all people

Specific examples applied to transportation planning include:

- Transportation as epistemology: Knowing through movement
- Reverting transportation infrastructures (as land) to Indigenous stewardship
- Pluralizing meanings and values of transportation: Axiologies beyond safe and efficient travel to preconceived destinations

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Key Words: Anthropocene, Plantationocene, Climate justice, Decolonization, Radical planning

## MOVING GOODS SUSTAINABLY: HOW DO PRACTITIONERS CONSIDER ENVIRONMENTAL SCIENCE ACROSS NETWORKS OF PLANS?

Abstract ID: 447

Individual Paper Submission

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Campbell's (2016) sustainability planning framework presents a system of governing relationships between social, environmental, and economic risks through on-going planning processes. The on-going nature of sustainable planning is, in part, a result of both individual and institutional capabilities to incorporate uncertain and continuously evolving scientific evidence into the environmental governance of conflict between economic development and environmental protection (Campbell, 2016; Renn et al., 2011). This paper uses three cases to demonstrate how networks of plans in the New York metropolitan area manage this on-going resource conflict relationship in the context of planning for freight-related land uses.

The tension between economic development and environmental protection is particularly salient for freight-related land uses. Warehouses, fulfillment centers, and other freight-related land uses are sprawling in urban areas, exhibiting both the environmental nuisance characteristics of locally unwanted land uses (LULUs) and the job gains sought after by economic development officials (Yuan, 2019). Planning practitioners and public officials use 'networks' of plans to balance future employment gains with concerns about climate resilience, job quality, transportation emissions, and other risks unevenly distributed by growing logistics-related land use (Berke et al., 2019). I propose that both individual attributes and institutional level governance structures influence practitioners' choices for incorporating environmental sciences within networks of plans (Renn and Rohrmann, 2000). In this study, I analyze how these individual and institutional influences can serve as barriers or enablers for including scientific information. I develop a more explicit focus on environmental science related to incorporating climate change in planning processes and how practitioners both observe and act upon perceived environmental risk.

I used semi-structured interviews and archival document review to understand how institutional settings and personal values influence participants' perceptions of economic, social, and environmental risks related to freight-related land uses, and the participants' uses of environmental science to analyze their perceived risks. First, I conducted a content analysis of past planning documents using existing risk management and sustainability theory to develop an initial coding scheme related to managing trade-offs in economic, social, and environmental risk. Then, I conducted hour-long semi-structured in-person or teleconference interviews, followed by focus groups convened among the regional participants to reflect on the participation in the networked planning processes. Study participants include local and regional planners, engineers, public health officials, emergency managers, and other participants in the 'networks of plans' that include long-range transportation, comprehensive land-use, and hazard mitigation planning processes (Berke et al., 2019). I use the interviews and focus groups build on themes reflecting

participants' thoughts on institutional arrangements, personal values, available reference knowledge, and other correlates of risk perception outcomes.

I find evidence that participants' capabilities to take action on environmental science in planning decisions vary based on institutional and individual capacities and frameworks for incorporating scientific information into planning decisions. In particular, participants discussed trade-offs between short-term and long-term planning horizons and inconsistent methods for dealing with presenting and managing the inherent uncertainty in environmental sciences (Renn et al., 2011). Incorporating climate change science consistently across networks of plans was especially challenging across all cases. For planners, these findings demonstrate the continued importance of understanding how and where concepts of uncertainty play a role in planning decisions, and the implications for incorporating evolving science into a complex set of social, environmental, and economic risks during planning processes. Moreover, engaging in participatory co-production strategies between scientific disciplines and planning institutions can develop trust and encourage a more robust scientific base for planning decisions.

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Key Words: Economic Development, Risk, Freight, E-commerce, Sustainability

#### LANDOWNERS' INCENTIVES TO PLACE CONSERVATION EASEMENTS IN EXURBAN AREAS

Abstract ID: 456

Individual Paper Submission

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Private land conservation in the U.S. is increasingly necessary in order to address sprawl, biome shifts, and other forms of habitat loss (both human and climate-driven). The conservation easement (CE), a negative easement in gross, is one of the most ubiquitous yet under-studied forms of private land conservation. Several scholars have been trying to isolate the landowner motivations to engage in CE placement. Ernst and Wallace (2008) showed that tax incentives, while not the primary reason for CE utilization, certainly facilitated the Larimer County, CO property owners' decision-making processes. Farmer et al. (2011) affirmed this finding with a slightly larger geographic sample of donors to land trusts in seven Midwestern states, using both a survey and interviews to show that place

attachment was the primary reason for CE donation. Farmer et al. (2011) asserted that, while the lowest ranked of their motivations, “potentially one-third less land [would be] under conservation easements without financial incentives” (p. 833). Rissman et al.’s (2007) landowner survey in eight states focused on the conservation purposes within CEs held by The Nature Conservancy, assessing conservation targets and threats to biodiversity, as well as basic CE purpose, rather than donor motivation. Influenced by Kabii and Horowitz (2006)’s conceptual model for landowner motivations to conserve land, Brenner et al. (2013) used a pre- rather than post-test approach to study landowner’s motivations to prospectively place a CE in central upstate New York. Their results revealed that land uses, particularly “recreation and wild food prospecting, are among the most powerful and significant predictors of landowners’ willingness to consider conservation easements” (p. 30), as well as owning a large parcel of land. However, this study was extremely localized. The results of these studies, among others, suggest that owner motivations are complex and potentially conflicting, with no clear prioritization. These findings, in part, may be attributed to the limited scope of the study areas and/or the intent of the original survey, suggesting the need for a broader-based and regionally representative national survey.

To ascertain the motivations for CE use (especially the fiscal policy that promotes public subsidy on private land), as well as the potential effect on other landowners and on the biological value of the conserved lands held by all kinds of land trusts, we built on the work by Kabii and Horowitz (2006), Rissman et al. (2007), Ernst and Wallace (2008), Farmer et al. (2011), and Brenner et al. (2013), among others. We located the property owners in twelve counties in the eco-regionally representative and rapidly growing exurban areas of six states across the U.S. We generated a post-test survey instrument for dissemination via mailed invitation to respond on-line, followed by a mailed hard copy (Dillman et al., 2014) to a stratified, representative sample of the property owners with CEs placed between 1997 and 2008/2009 in each county.

The survey results reveal the effect of federal and state tax incentives on CE placement (Farmer et al., 2011; Ernst & Wallace, 2008; Sundberg & Dye, 2006) and the potential differences in donation motivation based on income or education (Brenner et al., 2013). They also explicate the role of ideology and biological knowledge in individual decision-making regarding CE use. With results from a more expansive and geographically-representative survey, we are able to inform the planning community of the individual motivations influencing CE placement in growing exurban areas. The results may influence future policy changes at multiple governance scales (local to federal) and should give greater insight into how an individual’s landholdings drive the choice and location of a CE, which can impact other land uses within the jurisdiction.

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Key Words: conservation easements, individual motivations, tax incentives

**DISPLACEMENT ON BOTH FRONTS: A SCORECARD APPROACH EXAMINING MITIGATION OF COASTAL AND INLAND DISPLACEMENT FROM SEA LEVEL RISE**

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It has been well documented that sea level rise (SLR) impacts from climate change will affect communities throughout the world, displacing populations from coastal areas. What is less studied, however, is the sea level rise impacts on lower-income inland communities which are less vulnerable to flooding but may see secondary housing effects. Without protection measures, these areas may see displacement pressures from the increased desirability of land and incoming investment rather than sea level rise inundation. This study seeks to understand how and at what scale governments are planning to mitigate sea level rise displacement in coastal communities and its effects on inland communities through analysis of plans in coastal Florida cities.

Climate change adaptation initiatives in wealthier communities should be measured relationally to initiatives in lower socio-economic communities (Anguelovski et al., 2016). Since inland areas on higher ground are often home to lower income populations, this incoming investment and rising land values may result in gentrification without proper protections. However, the current literature on climate gentrification focuses primarily on the market-level effects of land values and sales rather than how inland communities are planning for it (Keenan et al., 2018; Keys & Mulder, 2020).

In measuring how plan documents increase or decrease vulnerability, many have turned to the resilience scorecard approach championed by Berke et al., (2015). This approach scores plan language across different jurisdictional levels to determine a level of focus on vulnerability reduction in specific places. Malecha et al., (2019) used a similar approach to measure place specificity, effect on vulnerability, and whether plan language included a recognizable policy tool. Using a modified resilience scorecard approach drawing on these two approaches, this paper analyzes plan language at different scales to determine 1) where plans aim to reduce coastal displacement through SLR protection and 2) where neighborhood stabilization and affordable housing protection policies may reduce displacement pressures in low-income inland communities.

We have scored a network of plans in Miami-Dade County and Pinellas County at the neighborhood, municipal, county, and regional levels. These two counties represent large metropolitan areas that are extremely vulnerable to sea level rise inundation and are susceptible to climate gentrification. For coastal areas, plan language is analyzed for: acknowledgement of sea level rise, level of commitment based on specific policy language, and further specification of protection up to the 1-foot SLR inundation level. For inland communities, anti-displacement language is measured for: acknowledgement of the need for neighborhood stabilization and affordable housing protection, specific policy language, and further recognition of the policy tool as a strategy to slow the process of gentrification or mitigate the effects of displacement.

By expanding on the resilience scorecard methodology, this paper adds new elements to the scorecard approach by incorporating commitment levels and extending the analysis to inland populations with gentrification risks to protect affordable housing and stabilize neighborhoods. This analysis will also help understand the scalar nature of how coastal communities are dealing with these two displacement threats at differing jurisdictional levels. Emerging results indicate that acknowledgement levels are high, but commitment levels are low. Additionally, results show that regional direction setting is high, however specificity and commitment is lower at the regional level compared to the city and neighborhood levels.

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Key Words: Climate Gentrification, Sea Level Rise, Climate Change, Resiliency, Plan Scorecard

## THE USE OF A COMMUNITY DISTRESS INDEX AND GEODESIGN FRAMEWORK IN EXTREME WEATHER EVENT PLANNING

Abstract ID: 496

Individual Paper Submission

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This paper addresses the design and implementation of a proactive planning response to the potential physical impacts of extreme events. Extreme events are generally defined as disasters or catastrophes where the risk is a function of an area's hazards and the levels of susceptibility – human, economic, environmental - to harm or vulnerabilities of those exposures. Climate change has worsened the frequency, intensity, and impacts of extreme weather events, including sea level rise increases and the impacts of major hurricanes in coastal areas. A healthy and sustainable community ensures the availability of safe, decent, and affordable housing. Safe and decent housing supports the health of its occupants and provides shelter from the elements, especially during and after natural disasters. This is especially important for lower income populations who do not have the financial wherewithal to control for these necessities. The structural damage and devastation of human settlements caused by these more frequent and intense extreme events is well documented. Following Hurricane Katrina, more than 400,000 individuals were displaced from their homes in New Orleans. The dearth of housing options for lower-income residents following Hurricane Katrina resulted in many residents not returning to New Orleans. In South Miami-Dade County, Hurricane Andrew highlighted the vulnerability of Florida's building standards at that time. The Category 5 hurricane damaged or destroyed more than 125,000 homes and left an estimated 250,000 people homeless.

This paper describes the research to locate Miami-Dade County's most vulnerable housing structures and at risk populations. Vulnerable housing structures were defined as structures built prior to the 2002 Florida Building Code which included standards to ensure structures would withstand major hurricane-level winds, the appraised value of the structures, and evidence of structural upgrades. The research methodology applied a Community Distress Index (CDI) supported by ArcGIS Pro geocoding and visualization to establish and visualize the concentrations of unsafe housing structures and pair them with communities and populations in distress, including COVID-related socioeconomic vulnerabilities. The analysis found the highest concentrations of older, unsafe housing structures in Miami-Dade County located in less affluent communities already experiencing the health and economic impacts of the COVID-19 pandemic including, Homestead, Little Haiti, and Liberty City. Most of these structures were constructed using the same building methods and materials for homes constructed in the path of Hurricane Andrew.

The research findings provide a foundation for strategic targeting of high risk structures and economically distressed geographical areas and policy direction for creating a more resilient housing supply for the most vulnerable populations. The potential impact of the geodesign framework provides a more holistic and integrated view of affordable housing, public health, safety, and extreme weather events. This lens enables local governments to develop more accurate risk and capacity assessments (VCAs) by categorizing residential structures according to wind and flood vulnerability; determining whether the existing housing supply is adequate to house the displaced; plan for temporary housing needs; and providing plans for assisting local governments in conducting more rapid analysis to justify investments in housing rehabilitation.

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Key Words: extreme events, vulnerability, community distress, geodesign, disaster planning

### LEADING WITH LOCAL KNOWLEDGE: CO-CREATING A TOOL AND PROCESS FOR INTEGRATING LIVED EXPERIENCE INTO CLIMATE PLANNING

Abstract ID: 535

Individual Paper Submission

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This article seeks to address the following research question: how can residents, researchers, a community-serving organization, and municipal staff co-design a technological system and planning process to better incorporate local knowledge into climate planning?

Local communities, and the people who live within them, experience firsthand the effects of climate events, such as flooding, heat, and wildfire. Marginalized populations see these impacts further magnified by chronic stressors such as poverty and poor health. As a result, researchers and practitioners must pay attention to equity and justice implications of climate adaptation and mitigation so that planning does not exacerbate existing harms. One pathway towards climate justice includes creating planning processes that better incorporate local knowledge and participation in development of climate strategies. In addition, residents on the frontline of climate events often have critical knowledge about the characteristics of these challenges, the harms they cause, and potential solutions. In response, local agencies, nonprofit organizations, researchers, and communities have identified the urgent need to better link everyday knowledge about people's experiences of and responses to climate events to the larger-scale planning and preparation work conducted by municipalities and their partners—both as a way to improve planning outcomes as well as address climate justice.

In this article, we present a case study of a community-based participatory approach to co-designing a data portal and planning process focused on incorporating local knowledge into climate planning. The neighborhood of Dove Springs (Austin, Texas) is a diverse, socially vibrant, and economically challenged neighborhood experiencing repeated and intense flooding and increasing urban heat. After a severe flood that resulted in loss of life and extensive property damage, residents and a community-serving organization, Go Austin!, Vamos Austin! (GAVA) identified the need for a safe and secure online portal where residents can both share knowledge about their community, climate events, and other chronic stressors as well as find information needed to prepare for and respond to climate events. UT Austin researchers partnered with residents, GAVA, and the City of Austin to secure a three-year National Science Foundation grant to support the development of a portal and planning process to meet this community-identified need.

Our community-based participatory approach centers around the Dove Springs Climate Navigators program, co-developed by neighborhood residents, the City of Austin, GAVA, and UT Austin. The Climate Navigators program uses a “train the trainer” approach adapted from public health to build a network of community members who gather and disseminate climate-related local knowledge. Neighborhood-based Climate Navigators, who receive payment for their participation, use cell phones and program-distributed tablets to upload climate-related local knowledge into a secure online data portal. Researchers, city staff, and community-serving organizations then analyze these data, link them to existing information about climate and social risk, and use them to develop local and regional climate planning and implementation.

This article describes the community-based participatory approach used for portal and program development, shares findings from an interview-based assessment of community resilience conducted to inform portal design, and outlines next steps for community-driven ideas about how to most effectively link information from the data portal to municipal and household-scaled climate-related decision making. Our findings are relevant for planning scholars and practitioners considering how to integrate local knowledge into climate planning, as well as for residents seeking tools and structures that can be used to increase climate preparedness and response—at the household as well as municipal scale. In addition, the models, information framework, online data portal, community engagement processes, policy-making process, and data security protections created for this project can be adapted by other communities experiencing climate events and chronic stressors.

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Key Words: climate planning, local knowledge, community-based participatory research, climate justice, co-design

#### CLIMATE JUSTICE AND RESILIENT DESIGN FOR KOREAN COASTAL CITIES

Abstract ID: 541

Individual Paper Submission

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South Korea has distinct geographical and socioeconomic characteristics, especially on its coasts. Coastal cities have undergone a variety of urban development processes. Therefore, it is difficult to fully grasp the urgent need for repairs and other community support, simply through national-scale indexes and survey data. This research reveals practical ways of enhancing South Korea's coastal resilience, answering the main research question driving this research: "What interventions would be best for Korea's coastal communities?" This work examines actual coastal conditions and local communities in Busan and Gangneung to connect national research and policy to those communities, in the hopes of proposing better policies and coastal designs.

This research included two field studies in South Korea, from March 5 through June 6, 2019 and September 22 through October 15, 2019. This fieldwork augmented the analysis of geospatial and physical conditions and assisted with identifying specific issues that these communities would encounter in response to climate change. The interview includes interviews with 93 people, including experts in national research centers, government officials (city government, district office, and community service centers), and local community members familiar with the area and who had experienced the physical and financial damage caused by natural disasters.

There were certain urgent issues with regards to municipal policies and projects preparing for climate change and the intensified natural disasters seen in coastal cities in South Korea. First, current top-down standardized policies and programs do not reflect local diversity and frequently ignore local conditions, resulting in a disconnection from local cultures and increased damage. Coastal communities have experienced both small and large natural disasters every year, and there has been no practical long-term policy or project working to prevent this (Rye et al. 2015). Second, water disaster prevention projects in South Korea rely heavily on engineering methods and construction. All coastal areas and riversides are artificially maintained. Concrete blocks and walls surround natural revetments, destroying shoreline habitats. Local residents feel safe behind concrete structures, however, and regularly request more subsidies from local or national government institutions to install more breakwaters and higher seawalls. Third, current policies do not have differentiated programs for more vulnerable populations, even though most victims of natural hazards are old, economically disadvantaged, and isolated from the media (Rye et al. 2015). In particular, socioeconomic factors were found to be more influential than environmental and physical conditions in the minority communities. As revealed in the interviews conducted for this research, many citizens and public officials are aware of this, but no countermeasures have been taken to assist more vulnerable populations.

This study discusses important points currently missing from national policies and city projects, taking a close look at local conditions and communities. The qualitative research carefully identifies ways of connecting national policies to local conditions and community needs, filling gaps in current national strategies for dealing with climate change.

A new planning system should embrace local community participation. Local communities have been excluded from policy-making and the urban design process. However, native people have great insights into their region due to their long experience and wisdom. Comprehensive systematic plans and urban designs will allow for effective preparation for climate change and future uncertainty while also accommodating local characteristics and regional diversity. Through this bottom-up analysis, this study will facilitate community-driven resilience designs for future climate change preparation.

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Key Words: Climate Justice, Climate Change, Vulnerable Coastal Community, Resilient Design, South Korea

## ESTIMATION AND PREDICTION OF URBAN HEAT ISLAND (UHI) MAGNITUDE IN THE CITIES: CASE OF SAN FRANCISCO AND TORONTO

Abstract ID: 558

Individual Paper Submission

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Increased urbanization has deteriorated the thermal environment of cities by creating urban heat islands (UHIs), which have caused extreme heat events. For the past few years, the level of UHIs in major cities has increased rapidly and become a significant issue in cities, leading to severe health and environmental problems for city dwellers. Cities often perform metabolic energy activities, but studies have various interpretations of these activities. For example, cities can calculate their energy budget based on the weather conditions people are exposed to and what clothing they wear. Each urban form has an energy budget that can hold or emit energy. The energy budget takes into account the specific seasonal or climatic conditions and the urban geometry conditions. Although it is possible to conduct an in-depth study of UHIs to calculate and analyze the urban energy budget, few UHI studies have considered these computational methods. The internal heat sources for a building are the overall energy use rates, including those required to maintain the optimal thermal environment within buildings. The internal heat source for humans is metabolic heat, which adjusts to maintain a constant core temperature in the body. For both buildings and humans, the total amount of energy for each mechanism is generally explained as a budget for the component, a flux for one element, and a flux per unit volume for the building. Using these measurements, it is necessary to describe the total amount of heat and energy balance that is incoming, generated, and stored within the urban system, in terms of the heat per volume unit ( $\text{W}/\text{m}^3$ ).

The primary strategy for this task is to determine which urban geometry and elements of weather data affect the magnitude of UHIs and to calculate the weight of the influence of each factor on the temporal and spatial variations. For a more in-depth estimation and prediction in this study, neural networks were used for the development and validation process utilizing three neural network models in this phase. This study utilized the prediction performance of the recurrence neural network (RNN), convolutional neural network (CNN), and long short-term memory (LSTM) network models with historical weather data collected from Toronto and San Francisco weather databases. For meteorological data, these three network models were chosen because the trend of the data change over time is the most critical factor, and it is essential to utilize a time series neural network.

This urban heat magnitude index (UHMI) will help researchers and city officials calculate the heat magnitude with three-dimensional perspectives of each UHI status and predict the pattern of the magnitude change in a given period in the summer (i.e., in one day or on extreme hot event days). In addition, the results of this UHMI development will provide meaningful evidence for cities that have implemented planning codes to confront extreme heat events. It may also encourage cities to refine their codes and/or decisions with specific guidelines using a useful tool to estimate and predict the magnitude of UHIs within the urban boundaries.

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Key Words: urban heat island (UHI), magnitude, estimation, prediction, neural network

## RAINWATER HARVESTING POLICIES AND PRACTICES: WHAT CAN THE UNITED STATES LEARN FROM AUSTRALIA?

Abstract ID: 566

Individual Paper Submission

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The increase in the world demand of water runs concurrently with factors that reduce its supply. These factors include water pollution/stormwater runoff, water use/extraction trends, population growth, and climate change. Rainwater harvesting is practiced throughout the world as an alternative water source and a way of reducing the usage of surface and groundwater. American rainwater harvesting practices are in a primordial state with most examples in the drought-prone Western United States. In the United States rainwater harvesting is primarily conducted at the local government levels with some guidance provided by the U.S. EPA, state government, and non-profit organizations.

In contrast, Australia has successfully implemented policies, regulations and programs that facilitated rainwater harvesting throughout the country, responding to the severe Millennium Drought of 2001-2009. Most of the impetus has come from the territorial (state) government. For example, local governments in Australia followed territorial mandates which included the Building Sustainability Index (BASIX) program in New South Wales which set a target for local governments of reducing home water usage by 40%.

This research examines whether certain Australian rainwater harvesting approaches can serve as a model for implementation in the United States. Most comparative studies focus on a limited number of cities. This research expands the scope of analysis with two data sources: A survey of Rainwater Harvesting Policy practices sent to government officials in the United States comprising of 117 responses, and interviews and surveys of 13 Australian officials at the local, territorial, and federal level. Four climate zones of the Australian continent were represented in the sample. Using the same survey questions for both American and Australian officials, this study examined differences between the United States and Australia in terms of intergovernmental coordination, implementation and regulation, policy guidelines, consistency in standards and technical support.

Findings suggest better inter-governmental coordination in Australia, especially between local and territorial government. Under BASIX, territorial government sets water reduction standards for local government. Local governments develop approaches to attain these standards. Territorial governments also adopt Integrated Water Management Plans with water utility participation. This ensures that government, water sector and community work together on water supply and conservation issues.

Implementation of water conservation measures in Australia is also more proactive. Most surveyed Australian cities noted that under BASIX a rainwater harvesting system is included as part of the building permit requirement for a

new unit.

Australian municipalities also reduce water consumption by considering both rainwater and alternative water sources. Stormwater serves as an alternative source for irrigating sports fields, parks, and gardens. “Smart Tanks” linked to Bureau of Meteorology with telemetry adjust levels of tanks per rainfall for irrigation. Municipalities have also adopted plans for desalination as a supplementary source.

In Australia local governments also utilize strategic planning and a Development Control Plan (DCP). The DCP contains detailed planning and design guidelines in concert with the Local Environmental Plan and the strategic plan.

Australian governmental agencies also strive for consistency in standards. In contrast to American municipalities following guidelines from state-to-state, Australian agencies promote consistency in standards by following Australian Standards (AS) which are related to the International Organization for Standardization (ISO).

Operating at the national level, the Commonwealth Scientific and Industrial Research Organization (CSIRO), a statutory body, also provides technical support and consulting services to local, territorial, and federal government agencies. This includes monitoring of rainwater harvesting activity, cost-benefit analysis, and scientific and technical publications.

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Key Words: Rainwater Harvesting, United States, Australia, Governance, Policies

#### MITIGATING COMPOUND WATER HAZARDS IN EASTERN NORTH CAROLINA: PERSPECTIVES OF PLANNERS AND EMERGENCY MANAGERS

Abstract ID: 578

Individual Paper Submission

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Eastern North Carolina (ENC), a predominantly rural region, often experiences the intersection of fluvial, pluvial, and tidal flooding, which lead to complex and impactful outcomes, such as morbidity, mortality, economic disruption and loss of livelihood. Managing these connected hazards is challenging, especially as climate change drivers such as sea level rise and wetter storms will likely lead to a greater incidence of compound coastal water events (CCWE). The combination of multiple hazards that contribute to societal, environmental or health risk is known as a compound event (Zscheischler et al. 2018). Little is known about the nature of CCWEs in ENC and whether they are recognized and accounted for by planners, emergency managers, and engineers. Furthermore, risks, vulnerabilities and pathways to resilience in rural regions such as ENC are less well studied and understood as compared to their urban counterparts (Cheng, Ganapati & Ganapati, 2015), even as rural communities tend to be disproportionately affected (Jerolleman, 2021) by CCWE. Funded by a 2019 NOAA Coastal and Ocean Climate Applications (COCA)/Sectoral Applications Research Program (SARP) grant, a key objective of this research is to assess the perceived risks and needs of the hazard management and planning community in eastern North Carolina. In this paper we focus on the mitigation tools used by hazard management communities in ENC and the barriers they face in coordinating mitigation efforts.

The project focuses on rural counties in eastern North Carolina located along the coast and those adjacent to it that share estuarine environments or linked riverine systems. Data was obtained through focus group interviews conducted with 41 planners and emergency managers during a flood workshop held at East Carolina University campus on February 26, 2020. The recorded interviews were transcribed and analyzed using first cycle (i.e., descriptive coding) and second cycle (i.e., pattern coding) coding techniques (Saldana 2009). Initial findings show that ENC planners and emergency managers use a combination of community education, regulations, and floodplain planning and management to minimize exposure to floods and to protect their vulnerable populations. Communities also actively seek funding to clear streams and channels, to implement buyouts and elevation projects, and for infrastructure maintenance. At the same time, ENC communities face several barriers to mitigation including lack of adequate funding to meet their needs, challenges related to land use planning, and conflicting priorities among governmental entities.

The findings of this study would be of interest to local communities vulnerable to CCWEs in North Carolina and beyond, and to decision makers looking to understand local mitigation needs and challenges.

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Key Words: Compound Events, Coastal Hazards, Flood Mitigation

#### **BUILDING COMMUNITY FOR COMMUNITY-LED RETREAT: LESSONS FROM STATEN ISLAND'S BUYOUT GROUPS**

Abstract ID: 583

Individual Paper Submission

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In July 2020, the Government Accountability Office released a report on climate migration planning in the United States (US GAO 2020). The report noted the likely inevitability of retreat (also known as managed retreat or planned relocation) from coastal areas exposed to sea-level rise, as well as from areas subject to repeat disasters and other risks posed by climate change. It acknowledged that federal support for retreat is limited, with existing programs such as home buyouts focused on unbuilding at the individual scale after disasters rather than facilitating more collective, less reactive community-wide adaptive movement. Stressing the importance of community-led retreat planning, the report aligned with a growing consensus among planners and policymakers that decisions about where and when to retreat should not be made unilaterally from the top down. However, as with community-based climate change adaptation and disaster risk reduction efforts generally, who “community” entails and how they come to act in this context remain vague (Faas and Marino 2020).

This paper examines how a community comes to embrace—and define itself in relation to—retreat through an ethnographic analysis of Staten Island’s home buyout process after Hurricane Sandy. Contrary to the typical depiction of buyouts as highly individualized economic transactions, with offers issuing from government to be taken up by willing sellers, Staten Island’s buyouts came about through grassroots collective action. In the weeks following Sandy, resident-led “buyout groups” formed in multiple waterfront neighborhoods to lobby first for the creation of a state buyout program and then for inclusion in it. Drawing on fieldwork and interviews over a four-year period, I show how the mobilization for buyouts emerged and spread, focusing on the role of buyout groups in assembling retreat-ready communities that were willing and able to participate in the state’s program. In particular, I explore how these groups negotiated their boundaries and worked to achieve consensus in ways that reinforced existing lines of social and spatial difference, while also inscribing new ones.

Retreat is controversial, in part, because it implies the dismantling of a set of social relations as well as a physical place. On Staten Island, however, retreat entailed a process of community formation as much as dissolution. I compare the conceptions of “community” that emerged through the buyout process—whose advocates and participants were predominantly white, working- and middle-class, politically conservative homeowners—to how community is being defined and contested in other cases of community-organized retreat that are occurring in radically different contexts, including Alaska Native villages and among tribal nations in coastal Louisiana (Jessee 2020). In so doing, I add to a body of planning scholarship that seeks to understand the potential for retreat to reconfigure urban spaces, communities, power relations, and governance; where retreat fits in the broader push for climate justice; and what a process of more just retreat would entail (Ajibade 2019; Yarina, Mazereeuw, and Ovalles 2019).

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Key Words: managed retreat, climate change, adaptation, disaster, community

#### WHERE ARE STREET TREES PLANTED? URBAN FORESTRY AND ENVIRONMENTAL EQUITY

Abstract ID: 593

## Individual Paper Submission

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This paper addresses two fundamental questions about urban forestry, a key dimension of environmental policy, in American cities: (i) how do cities decide where to plant street trees; and (ii) do they distribute new trees in a way that is socially equitable? Previous research has shown a disconnect between environmental amenities (such as tree canopy) and socioeconomic status: low-income neighborhoods do not receive the same level of attention as their high-income counterparts and experience negative environmental consequences (Schwarz et al. 2015). By looking at street trees—specifically, which are trees mostly planted in the public right of way— this paper directly addresses the matter of social equity in the context of urban environmental planning. Previous research has looked into specific street tree planting programs and measured their outcomes in terms of spatial equity (Garrison 2018). There is some evidence that previous street tree planting programs, such as MillionTreesNYC, may not have prioritized disadvantaged neighborhoods (Garrison 2018) which leads to the broader questions of social welfare that motivate this work.

Few studies have conducted longitudinal studies specifically on street tree planting activities—in particular, on how cities decide when and where to plant them. Koo et al. (2019) discovered the changing relationships between tree canopy and changes in socioeconomic/demographic status in Atlanta during the first decade of the 2000s, but their findings are based on an analysis of the city’s the whole tree canopy (which includes not only street trees) using remotely sensed data. Young (2011) investigated stakeholder perspectives on the successes and failures of green infrastructure planning, but did not look into the decision-making process of street tree planting. Recognizing that greater numbers of American cities are implementing street tree planting programs, this study seeks to answers that will inform urban forestry practices that promote social equity and improve quality of life for all residents.

As a first step, this study identifies several metropolitan areas notable for being at different stages of street tree coverage with intensive street tree planting programs—including Seattle, New York City, Los Angeles, and Atlanta—in order to determine whether or not neighborhoods that have historically lacked environmental amenities are getting any greener compared to others in different time periods. This step is based on a variety of panel data, including street tree inventories, measures of urban form and the built environment, and various neighborhood characteristics. Next, this study takes a closer look at street tree planting by using Seattle as an example, a city currently with the highest street tree coverage among these areas, to further investigate how this process works. This step will be based on policy documents and geospatial analysis (Wei et al 2021). In this step, this study will also focus on the areas that have historically lacked environmental amenities.

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Key Words: Street tree planting, Environmental Equity, Urban Forestry Policy

## EDUCATION AND CLIMATE CHANGE AWARENESS: CASE STUDY OF HURRICANE HARVEY

Abstract ID: 598

Individual Paper Submission

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This study examines the nexus between educational awareness and climate change through the lens of catastrophic floods. It attempts to address various concerns regarding floods to shed a light on the climate change implications. Urban green infrastructures are one of the best locations to assess such implications. Having three flood events since opening, including Hurricane Harvey, Buffalo Bayou Park in Houston, Texas became an ideal case study for research on climate change awareness through public education. Hurricane Harvey resulted in massive damage to both the natural and built-environment in 2017 and the implications still affect residents from various aspects. Since hurricanes generally hit areas near coasts, coastal regions, that are more flood-prone, should be designed to respond to the adverse impacts of disasters. In addition, to design and engineering solutions, public awareness and education are important factors in establishing more resilient urban environments and communities.

The study applied a mixed-method approach including a survey with park visitors and analysis of secondary data such as archival and digital tools. It also analyzed individuals' experience of educational activities and perceptions of educational strategies. The mixed-method helped to examine educational awareness of climate change, in this case, flood mitigations, from two sides, residents and data. Findings show that the park somehow contributed to educating the public on climate change and flood control strategies. Although participants were not aware of all flood mitigation strategies used in Buffalo Bayou Park they recognized the importance of planting native and local plants and natural curves of the bayou in flood control. They also cherished the importance of educating the public on climate change, flood control strategies, and the role of urban parks to enhance resiliency. The participants highlighted the role of social media and non-profit organizations in educating the public on flood control strategies and controlling climate change implications. The results of this study highlight a number of efficient strategies to improve public awareness on climate change and also making them familiar with the implemented policies and strategies, and the role of green infrastructure in creating resilient communities. Urban planners, landscape architects, designers, and experts can use the results of this study to plan for future steps toward improving education on the subject and involving residents in the planning, design, and implementation of flood mitigation strategies.

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Key Words: Climate Change, Flood Mitigation, Education, Public Awareness

## DID THE COVID-19 PANDEMIC AFFECT FLOOD CASES? A SELF-REPORT BASED ASSESSMENT

Abstract ID: 607

Individual Paper Submission

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This study aims to contribute to the nexus between climate change and the COVID-19 pandemic contexts. The COVID-19 pandemic has changed urban life dramatically with various health, social and economic implications that threaten individuals globally. The environmental implication of the pandemic, however, was slightly on the positive side. Reported data shows a reduction in noise and air pollutions in 2020 compared to previous years (Yildirim and Arefi, 2021). While air and noise pollutions reduced since lockdowns started around the world in March 2020, climate change-related problems continue to exacerbate. Combining the effects of climate change with the pandemic, the costs on societies are potentially doubled. For example, floods are one of the consequences of climate change that have caused economic loss, social deprivation, and threatened public health at various scales. While health advisors and authorities encourage individuals to follow social distance and stay-at-home regulations for controlling the pandemic, floods force evacuees to leave their residence, stay with friends and family, or in public shelters. So, the pandemic and floods operate specifically opposite, even though their implications are accumulated and threaten individuals with a combined risk. Hence, considering the specific climate and temporal aspects of floods in the U.S., communities tend to be more vulnerable to this risk.

To our knowledge, this study is the first to examine the nexus between the COVID-19 pandemic and flood effects, specifically based on residents' self-reports floods that were obtained from the City's database. To establish this research, the study first identifies the flooding locations based on a unique method of residents' self-reported data and compares the flood reports before and during the pandemic. In the next step, it incorporates the socio-demographic characteristics of flood reported communities at the census block group. The study performed various statistical analyses including t-tests, ANOVA tests, principal component analysis (PCA), and digital mapping by using ArcGIS tools. The research studies the changes in self-reported floods before and during the COVID-19 pandemic in Dallas, Texas. The findings reveal that flood concerns continue threatening the individuals during the COVID-19 pandemic, although there is a slight decrease (almost 10%) in the reported cases. The results, based on our census block group assessments, also show that vulnerable populations are still critically exposed to those damages. Finally, local authorities require formulating better policies covering both the pandemic and climate change-related concerns, especially for the vulnerable communities. Eventually, the study draws a picture to establish a policy framework at the community level.

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Key Words: Climate Change, COVID-19, Flood, Pandemic

## IDENTIFYING LOCAL CLIMATE ZONES IN US MIDWESTERN CITIES: A COMPARISON OF METHODS.

Abstract ID: 633

Individual Paper Submission

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In the United States, the majority of the population lives in cities and as populations shift from rural to urban settings, more people will be exposed to higher near surface air temperatures as a result of the Urban Heat Island (UHI) effect. It is important for governments to be able to identify areas in cities that are exposed to unhealthy high temperatures and to understand the built environment drivers that directly enhance near surface air temperature. One tool that can be used to identify communities vulnerable to extreme heat are Local climate Zones (LCZs). Since the urban landscape varies dramatically within and between cities, the local climate zones were developed to more accurately describe the surrounding physical landscape by using a set of physical characteristics to classify the urban form into specific typologies.

In this paper, we classify local climate zones for two Midwestern cities, Bloomington and Indianapolis Indiana and compare different classification approaches. We compare a commonly used remote-sensing classification method developed by the World Urban Database and Access Portal Tools (WUDAPT) program. The WUDAPT method inputs free, open-source Landsat data into a random forest (RF) machine learning model to classify urban areas into LCZs. We compare the WUDAPT method, which relies solely on freely available satellite data, to a method that uses high resolution urban morphological data that include features such as building footprint, building height, and aspect ratio. To further validate the methods, we compare the LCZ typologies using satellite land surface temperatures taken during an extreme heat event.

Our research highlights limitations of both the WUDAPT method and the challenges of using WUDAPT to classify LCZs for Midwestern American cities. We specifically uncover a variety of challenges of using these classification schemes for small-size cities. We identify feature importance for different built environment metrics when classifying LCZs and investigate the transferability of training sites for classifying other cities. We also examine the potential of using LCZs to identify areas within these cities that are more prone to experiencing extreme heat events.

Our work aims to help cities become more resilient to our changing climate by enabling improved classification of the built environment thus increasing planners' understanding of the characteristics of the built environment that are driving local climate change. LCZs are an incredibly useful tool for environmental planners enabling them to identify microclimates throughout the urban fabric that can help them appropriately target policy and resources when it comes to resiliency planning.

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Key Words: Local Climate Zones, Urban Heat Islands, Extreme Heat, Urban Form

## OPTIMIZING PLANTING STRATEGIES FOR URBAN HEAT ISLAND MITIGATION IN HIGH-RISE RESIDENTIAL COMPLEXES

Abstract ID: 639

Individual Paper Submission

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Urban areas are more vulnerable to natural hazards, due to the concentrated population and wealth. The risk of climate changes, therefore, are also expected to larger in those areas (IPCC, 2014). In the region of 30 degrees north latitude - at least 17 countries including Canada, the United States, Europe, Japan, and Korea - extreme heatwave occurred frequently in summer seasons in recent years. The record-high heat waves in Western Europe in 2019 was one of the severe examples of those extreme weather events. Urban areas with a large portion of hard surface pavements as well as the higher density of buildings, urban heat island effect - a phenomenon that the temperature in urban areas is higher than that of the suburbs - has threatened the health of city dwellers, causing heat related diseases.

South Korea is one of the countries that have undergone rapid urbanization. 91.8% of the population is concentrated in the urbanized areas (Minister of Land, Infrastructure and Transport, 2016). The dominant housing type - 62.3% - is high-rise residential complex to accommodate those excessive density (called apartment complex in Korea) (Korea Population and Housing Census, 2019). Over the past 30 years, the average number of tropical nights (the minimum temperature at night is above 25 °C) all over the country was 5.3 days, while that of the major cities in South Korea records 11 days, more than twice of that. The temperature difference between urban and suburban areas has continued to widen. To mitigate the urban heat island effect, landscape design has been used. Vegetation, especially trees, can contribute to city-scale heat reduction in terms of blocking solar radiation, reducing surface and air temperatures, and altering wind patterns. Various studies have analyzed the mitigation of heat island effects in urban areas through landscape design, but only few cases have been modeled on actual sites, especially high-density and high-rise residential complexes, and used time-series data of the weather.

In this backdrop, this study aims to investigate the optimal tree planting scenarios to mitigate urban heat island effect and improve thermal comfort in high-rise residential complex. We selected one apartment complex in Gwanggyo new town - The complex consists of a total of 22 buildings, with average 84.95-meter high. (The lowest apartment building is 30.5m, and the highest one is 114.6m)- that has representative characteristics of large housing development projects in Korea. We then designed six planning schemes and conducted simulation to measure the mitigation effects for a typical summer day in 2018. The criteria for planting schemes were two - the location and quantity. First we selected the two types of locations; planting around the building and planting mainly in open space. Then for each scenario, we set the three cases by the quantity; 10%, 20%, and 30% of the entire complex area based on the local rule for housing constructions. We used a CFD (Computational Fluid Dynamics) program ENVI-met 4.4.5, which is suitable for microclimate analysis. To organize simulation, digital topographic map provided by the National Geographic Information Institute was used for site domain, and AWS data provided by the Meteorological Administration's Weather Data Opening Portal was used for weather data. The findings of this study will suggest design guidelines to ameliorate thermal comfort in environmental planning.

## Acknowledgement

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Key Words: Urban heat island, Thermal comfort, Tree planting guideline, ENVI-met simulations

## **WHITE SPACE, GREENSPACES: RACIAL HOUSING COVENANTS, ENVIRONMENTAL INEQUALITY, AND IMPLICATIONS FOR PLANNING FOR ENVIRONMENTAL JUSTICE TODAY.**

Abstract ID: 671

Individual Paper Submission

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Racially restrictive housing covenants were key tools by which racial segregation was stamped onto the landscapes of American cities.<sup>1</sup> Although enacted by private individuals, they were widely advocated for by urban planners as a tool for producing “racially harmonious” (i.e., homogenous) neighborhoods following the 1917 *Buchanan v. Warley* U.S. Supreme Court decision that ruled that racial zoning unconstitutional.<sup>2</sup> Contemporary patterns of urban environmental inequality have been linked to other mechanisms of racial segregation, such as “redlining,”<sup>3</sup> but due to a lack of spatialized data on covenant location, the impact of racial covenants on contemporary environmental inequality has previously gone unexamined. Here we utilize a novel data set, produced by the Mapping Prejudice Project, of every racial covenant in a metropolitan area to understand the legacy impact of these legal designations of White space on environmental quality today. Using Mapping Prejudice’s digitized covenants map for Minneapolis, MN and its suburbs, we quantify intra-urban patterns of heat, tree canopy cover, and impervious surface cover relative to the location of racial covenants, identifying strong correlations between the historic location of covenants and spaces of high environmental quality (i.e., lower heat exposure, high tree canopy cover, low impervious surface cover) today. The presence of a racial covenant today is correlated with reduced heat exposure, conferring a 1.05°C (1.87°F) cooling effect in comparison to the study area average. To understand how the impact of covenants compares to other mechanisms of racial segregation, we compare covenants to “redlining” maps, considering how the environmental quality of covenanted areas compares to that of areas rated as A (“Best”) through D (“Hazardous” or “redlined”) by the Home Owners’ Loan Corporation. This analysis finds covenants confer environmental benefits comparable to an A or B rating from HOLC. Together these results show that racially restrictive housing covenants, despite being ruled legally unenforceable for more than half a century, continue to confer deep environmental privilege today.

Using archival sources, we point to planning decisions made by city park planners in collaboration with the real estate developers of racially restricted developments during the first half of the twentieth century that led to

disproportionate investment in green amenities in segregated White neighborhoods of Minneapolis.

Finally, using a reparative planning framework,<sup>4</sup> we conclude by considering the implications of this research for planning for more just environmental futures. As conceptualized by Williams et al. (2020), reparative planning points to the way in which, since the origins of professionalized urban planning, planning has served to produce urban landscapes that enable and reinforce White supremacy. Given this history, a reparative framework argues that, if planning is to play a role in bringing forth a more just future, it must make decisions that explicitly seek to ameliorate the harm caused by historic racial planning. We argue that, to bring forth more just environmental futures, environmental planners must make decisions that are explicitly in conversation with the legacy of White supremacist planning that produced the spatial inequality in American cities today, and use strategic planning decisions as a tool for enacting environmental reparations.

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Key Words: Racial Covenants, Urban Heat Island, Reparative Planning, Environmental Justice, Urban Tree Canopy

#### ***POSTNORMAL ECOLOGICAL PLANNING: HOW PLACE-BASED ECOLOGICAL CONCEPTS STIMULATE RADICAL PRACTICE***

Abstract ID: 673

Individual Paper Submission

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Urban planning's long history of Enlightenment thinking is well known and documented. In the same vein, the environmental subfield of ecological planning has adhered with equal vigor to Western scientific ideals, confined to instrumental and quantitative methods to guide decision-making and vision. Epistemologically, ecological planning's strict rationalist approach has kept the discipline largely removed from the communicative and collaborative revolutions, missing out on practical synergies and social-ecological advancements. Over a similar period, the field of ecology itself has gradually developed an interdisciplinary systems approach that acknowledges the inseparability of

social and ecological systems (Walker and Salt, 2012). This reality has been slowly realized by the broader conservation community, exemplified by large environmental nonprofits such as The Nature Conservancy. This paper pulls together socio-ecological literature to examine the conflict and balance between rational ecological approaches and place-based ecological identities and narratives, focusing specifically on ecological citizenship and eco-region as lenses. By juxtaposing disparate ecological literatures, this research begins to understand the social, political, and ecological implications of ecological citizenship and eco-region, their influence upon regional landscape and land use patterns, and how environmental actors may help broaden citizens' ecological imaginaries and increase the presence of 'Othered' ecological identities (Gilbert, Sandberg, & Wekerle, 2009).

From a rational perspective, ecological citizenship and eco-region are the result of standard ecological measurement processed through quantitative analysis. Through the postmodern disillusionment of rationality and modernism has, however, effectively undermined scientific objectivity and universality, as posited by Actor-Network Theorists (ANT) and Science and Technology Studies (STS) scholars (Law, 2008). Their theories portray modern science as a non-neutral Westernized product, imbued with political bias, cultural conditioning, and personal judgments, thereby guilty of reproducing a limited scientific reality. Likewise, an ecological planning anchored solely in normative science faces limited potentials and exclusionary practices, 'Othering' other ecological realities. Despite the past success of rationalist ecology, ecological standards alone overlook the historical legacies and sociocultural elements that overlay ecological regions. Additionally, rational ecology by itself may ignore the collaborative rationalities and systems thinking advocated more recently by planning and ecology, respectively. This literature review delves into how ecological planning continues to uphold rational ecology while beginning to integrate (reluctantly, at times) new ecological realities and identities beyond that of conventional science. Insights into this phenomenon may spur unforeseen opportunities for both urban and ecological planning, and proffer greater social and environmental justice benefits.

Within this theme, I explore the role of environmental organizations and their potential to facilitate, build, shape, and define regional concepts of ecological citizenship and eco-region (Agrawal and Bauer, 2005). Diverging from Agrawal, however, I frame this process as recursive and cyclical, conducted through collaborative, co-creative channels. Furthermore, I examine the impacts upon regional ecological landscape planning and the latent radical potential, asking "How do environmental organizations help integrate place-based knowledges and histories, cultural practices, and modern urbanities?" alongside their own ecological ideals of citizenship and region. In sum, I posit that an integrated, non-normative ecological planning increases ecological democracy by listening to and infusing subaltern imaginaries of Feminist theory, Indigenous planning, and traditional ecological knowledges (TEK) (Neves, 2019), and how they inform place-based versions of ecological citizenship and eco-region. Re-envisioned ecological imaginaries for a postmodern ecological planning encapsulate the spirits of Sandercock's mongrel cities and Lefebvre's right to the city and have the potential to transcend the hegemonic scientific and cultural order of the day, transforming orthodoxies of land use and ecological landscape planning for the improvement of all.

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Key Words: ecological planning, ecological citizenship, ecoregionalism, socio-ecological landscape, postnormal science

## DETERMINANTS OF URBAN HEAT-HEALTH RISK: A RE-EXPLORATION ON DIMENSIONALITY USING LATENT VARIABLE ANALYTICS

Abstract ID: 678

Individual Paper Submission

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**Introduction.** Extreme heat events have rapidly increased over the last several decades and is a leading cause of health threats in cities and communities worldwide. Despite the seriousness of this situation, urban planning scholars have yet to sufficiently examine the multidimensional nature of health risk to extreme heat in the scope of the built environment. Furthermore, the extant studies that explores the health risk or health vulnerability to extreme heat ended up with a composite index to represent this concept (e.g., Hua et al., 2021; Johnson et al., 2012; Reid, et al., 2009; Wilson & Chakraborty, 2018). More meaningful representation of the complex characteristics needs to be developed.

**Methods.** The study applied latent variable analysis analytics to explore the dimensionality of health risk associated with extreme heat by integrating a wide range of data sets from multiple disciplines, including but not limited to public health, applied geography, environmental science, and urban planning. Socioeconomic and socioenvironmental variables related to extreme heat are examined altogether with human behavioral risk variables and heat-induced health outcomes variables were collected and aggregated to the census tract in Maryland. The following research questions will be addressed. First, what are the major dimensions of the heat-health risk in a multidisciplinary dataset? Second, which counties in Maryland are most salient in heat-health risk dimensionality? Third, what are the common characteristics of the census tracts and counties in Maryland? Last, which socio-environmental determinants make a difference in county heat-health risk dimensionality? Principal component analysis coupled with factor scoring were used to generate representative dimensions of the heat-related health risk. An oblique rotation method—Velicer’s Minimum Average Partial (MAP) was applied which allowed the extracted components correlated. This is a reasonable assumption in the social science. Cluster analytics was used to sort out the common profiles across the extracted dimensions for all census tracts in Maryland.

**Results.** According to MAP’s rule, this study generated 5 components that accounted for 68.22% of the total variance of the original 27 variables, namely air temperature sensitivity and mortality, social isolation and socio-environmental vulnerability, heat-related morbidity, Hispanic and socio-economic vulnerability, and land use and adaptive capacity. Spatial visualization of extracted component score by census tract showed different spatial variations. Moreover, cluster analytic showed the majority of Maryland’s census tracts share similar characteristics across 5 dimensions. However, both intra-county variation and inter-county variation were observed. For example, census tracts in Baltimore City clustered differently from the other census tracts. The root causes were discussed as well.

**Conclusion.** This study is the first attempt to utilize latent variable analysis technique in a more sophisticated way to explore the dimensionality of health risk to extreme heat. The improved accuracy in reconceptualizing heat-health risk help better understand the underlying factors of the health risk disparity in times of extreme heat events. Creating a cluster profile based on dimensional information for health risk associated with extreme heat to present the differences among census tracts is a more thoughtful reconceptualization framework in the dimensionality analysis. This warrants a better understanding of the natural, social, and environmental factors that contribute to heat-health risk. Doing so also helps planners identify the root causes of vulnerability to heat.

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Key Words: Health Risk, Social Vulnerability, Extreme Heat, Latent Variable Analysis, Spatial Mapping

## A LONGITUDINAL ASSESSMENT OF URBAN GREEN INFRASTRUCTURE CONDITIONS ACROSS COASTAL TEXAN CITIES

Abstract ID: 690

Individual Paper Submission

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Flood events are a chronic and growing issue in urban areas globally, causing both property damage and mortality. From 1984 to 2013, in the US, floods resulted in \$238 billion of property damages, excluding coastal hurricanes. The Gulf of Mexico region has suffered the largest portion of flood events in the U.S., accompanied by an increasing number of residents and impervious development (Kim & Newman, 2020; Michel-Kerjan, et al., 2012). To mitigate urban flood effects, the quantity and quality of green infrastructure (GI) has received much attention for helping prevent significant economic losses from floods (Coutu & Vega, 2007). Brody et al. (2017) examined coastal counties along the Gulf of Mexico, demonstrating that the size of open spaces and wetlands have significant effects on flood damage reduction. Lewellyn, et al. (2016) assessed Philadelphia from 2012 to 2014, revealing that GI captured around 59 percent of the storm water volume. It was found that amount of seized water could increase up to 93 percent by proper GI designation. Although many prior studies have demonstrated the role of GI in mitigating flood damage, the assessment of longitudinal change in GI land configuration has been several neglected. For guidance of future land use and long-term GI management, research must be conducted on how well coastal cities have managed GI over time, related to various environmental and socio-economic factors.

This research assesses the GI land configuration across sixty-eight coastal Texan cities (with a population of over 10,000 residents) by statistically examining changes from 2001 to 2016. As a measure of GI landscape patterns, multiple land configuration indices were considered including size, shape, isolation, and connectivity. As a methodological approach, the research applies spatial panel data models developed in 5-year intervals to assess the longitudinal effects of GI while controlling for a set of socio-economic, climate/biophysical, and development factors. Results indicate that GI conditions, especially the amount of GI and its connectivity levels, appear to be improving in cities with a relatively small percentage of the 100-year floodplain (low risk) while worsening in cities that have a relatively high percentage of the floodplain within the city's area (high risk). In terms of the GI shape, the value decreased significantly, indicating that the shape of GI has become simpler over time due to increased development. For control variables, a reduction in imperviousness was found to be more effective in managing GI quantity and landscape conditions. These results suggest that planners should enhance efforts to improve current GI conditions, specifically in cities with high flood risk. Additionally, conservation planning and development rights should be examined together with imperviousness regulations to help increase current GI related landscape quantity and quality.

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Key Words: flood mitigation, low impact development, panel modeling, FRAGSTATS

## QUANTIFYING HIGHWAY AGENCY ROADSIDE TREE REMOVAL USING HIGH-RESOLUTION SATELLITE DATA

Abstract ID: 693

Individual Paper Submission

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In 2017, the Georgia Department of Transportation began a new tree removal program, clear-cutting trees on all highway agency property across the state (Hurt, 2018). Far from an isolated case, large-scale tree removal is common along roadsides across the country. Since 2015, for example, public outcry against tree clearing along highways has been documented in parts of California, Connecticut, Florida, Maine, Pennsylvania, and South Carolina. These actions are often classified as maintenance projects, which carry no requirements for environmental review or public input, unlike new highway construction that must abide by NEPA regulations. As justification for roadside tree clearing, highway agencies most often cite safety, pointing to the potential for run-off-the-road crashes with trees. AASHTO encourages a roadside kept free of fixed objects such as trees, called the clear zone, in its Roadside Design Guide, though the dimension is not meant to be uniform (AASHTO, 2012). While this idea of a roadside clear zone has been maintained as an absolute rule for over 50 years, its relationship to road safety is still disputed (Wolf & Bratton, 2006; NCHRP, 2000).

Few states track vegetation management practices along the roadside, and thus the impacts of highway agency tree removal are unknown (FHWA & Volpe, 2010). Without knowledge of the spatial extent of clearing, highway agencies cannot assess the environmental trade-offs of their actions. In this study, I address the research question:

What are the impacts of large-scale roadside tree removal by highway agencies in states that have increased this practice in recent years?

Using the USDA Farm Service Agency's National Agriculture Imagery Program (NAIP) one-meter imagery and machine learning image analysis in ArcGIS, I analyze the before and after tree canopy cover along roadsides in Georgia. Roadside dimensions can be narrow, so high-resolution satellite imagery is necessary for capturing change at this scale. NAIP data captures leaf-on vegetation conditions every two to three years. After classifying the images, I reclassify into a binary tree canopy/ non-tree canopy raster. Then, I compare the before/after target years, with a resulting tree canopy change raster (change/ no change). My goal is twofold: 1) to quantify the acreage of cleared land and 2) to produce a map depicting the spatial distribution of cleared roadsides.

Results are intended for both applied and theoretical contexts. Understanding the spatial distribution of tree removal is the first step necessary to assess impacts and evaluate trade-offs. Impacts may include removal of sequestered carbon, soil loss, increased erosion, increased sedimentation to nearby streams, habitat loss, degradation of the visual environment, and loss of enclosure from tree canopy. Findings can be utilized by both state highway agencies and the Federal Highway Administration, which is currently updating its roadside tree management guidance and best practices for training and distribution to state highway agencies.



For theory, results from this study point to how certain epistemologies are privileged over others in a highway agency decision-making context. Results illustrate how application of a single engineering practice, devolved from federal guidance and applied as a uniform rule instead of a contextual guideline, can result in drastic changes to the roadside landscape.

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Key Words: trees, environmental impacts, spatial analysis, transportation, transportation policy

#### **SPATIAL ANALYSIS OF STRUCTURAL BIASES IN FEMA DISTRIBUTIONS TO COASTAL PROPERTY**

Abstract ID: 695

Individual Paper Submission

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Climate justice requires both micro-analysis of the lived experience of socially vulnerable populations, and macro-analysis of social, economic, political, and institutional systems that shape those experiences (Emrich et al., 2020). This paper builds off an emerging literature that examines systemic, structural biases in the U.S. disaster aid system, with a focus on FEMA's Hazard Mitigation Grant Program (HMGP) (Siders, 2019; Elliott et al., 2020). Exploratory empirical evidence suggests that HMGP distributions have resulted in disparate impacts. Given these findings, how can spatial analysis help us further understand the distribution of HMGP buyouts and property elevations, the relative importance of social vulnerability in explaining this spatial distribution, and the planning and policy implications?

Hazard mitigation for flood risk has historically focused on the exposure of physical assets, their structural vulnerability to current risk, and loss estimates in terms of property damage in dollar values (Highfield et al., 2014). Social vulnerability and social equity research provide more holistic paradigms for understanding disasters and evaluating disaster aid programs. Social vulnerability emphasizes that socioeconomic characteristics are an important and understudied component of risk. Population characteristics like income, race/ethnicity, tenure, and language ability impact the capacity of a household to prepare for, cope with, and recover from hazardous events (Highfield et al., 2014). Past policy and planning practices have resulted in socially-stratified landscapes and power structures where some populations are more vulnerable to disaster than others (Emrich et al., 2020).

Social equity in disaster recovery has been defined as an ideal state where "all people have full and equal access to resource distribution and opportunities that enable them to meet their needs" (Emrich et al., 2020). Social equity may be thought of as a moral yardstick against which we can evaluate programs and policies. A growing literature

seeks to empirically evaluate federal disaster aid programs using social equity metrics. These include efforts to develop social vulnerability indices based on socioeconomic characteristics (Flanagan et al., 2011), integrate social vulnerability considerations in flood risk management (Cutter et al., 2013), and evaluate disparities in disaster recovery and hazard mitigation efforts (Siders, 2019; Elliott et al., 2020; Emrich et al., 2020).

Papers evaluating FEMA's HMGP program have focused on the distribution of buyouts and their social justice implications (Siders, 2019; Elliott et al., 2020). This paper extends this analysis to consider other property actions funded by FEMA besides buyouts, like property elevations. The sample includes more than 15,000 HMGP-funded properties in the coastal zone. Due to competing pressures, the coastal zone is a dynamic area to study coastal adaptation and hazard mitigation policy implementation. Preliminary findings indicate that there are statistically significant differences in the socio-demographic composition of ZIP Codes where elevations occur compared to where acquisitions occur. Compared to ZIP Codes with buyouts, ZIP Codes with property elevations have on average significantly more White people, wealthier populations, higher home values, increased rates of homeownership, and greater proximity to the shoreline. These findings deepen concerns that the HMGP may be exacerbating patterns of spatial inequality.

The purpose of this paper is to apply spatial analytic techniques to better understand regional patterns of HMGP distributions, the principal factors explaining that distribution, and the planning and policy implications. This paper uses enhanced social equity criteria, superior exposure and flood risk metrics, and improved damage estimates to extend previous work in the area. The paper applies k-means clustering, principal components analysis, and spatial regression techniques to further explore HMGP distributions and their implications for climate justice. This paper contributes to a literature advancing the application of social equity criteria in program evaluation, with broad implications for hazard mitigation planning and policy.

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Key Words: Hazard Mitigation, Coastal Adaptation, Social Equity, Structural Bias, Spatial Analytics

#### **BRIDGING THE SCIENCE-STAKEHOLDER DIVIDE IN ENVIRONMENTAL POLICY & PLANNING: A CONVERGENT APPROACH TO ADDRESSING FRESHWATER SALINIZATION**

Abstract ID: 722

Individual Paper Submission

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The salinization of freshwater bodies across the United States and around the world—referred to as the *freshwater salinization syndrome (FSS)*—represents a major threat to both ecological and human health, with salt concentrations significantly increasing in watersheds across very diverse regions (Kaushal et al. 2018). FSS threatens human health directly as concentrations approach or exceed World Health Organization and U.S. Environmental Protection Agency thresholds for drinking water, posing particular risks to individuals on sodium restricted diets (Bhide et al. forthcoming). Human health (and other species) can be further impacted as salts mobilize previously sequestered nutrients and heavy metals, including in drinking water supply infrastructure. Ecosystems are threatened through declines in pollution-intolerant invertebrates and the loss of habitat. There are many sources of increasing salt concentrations—with their relative prominence varying by region—including road salts, agricultural and other land use activities, and wastewater from industrial and residential sources, and treatment processes (Kaushal et al. 2018).

FSS is particularly problematic for water utilities, potentially necessitating the widespread adoption of desalinization technologies with significant cost and environmental consequences; the cost estimate for Fairfax Water alone is \$1B, not including operational costs (Bhide et al. forthcoming). Given the salt contributions from wastewater, the problem is particularly acute when indirect potable reuse is being practiced, such as with the Occoquan Reservoir in Northern Virginia. In such situations, FSS represents a wicked problem requiring coordinated responses involving a wide range of stakeholders, including potable water and wastewater utilities, local officials, state regulatory officials, key emitters, and scientific and technical experts.

The NSF-funded *Growing Convergence Research (GCR): Common Pool Resource Theory as a Scalable Framework for Catalyzing Stakeholder-Driven Solutions to the Freshwater Salinization Syndrome* project is testing a potentially generalizable ‘bottom-up’ approach to reversing FSS that involves bringing stakeholders together to build a shared understanding of the problem and how it can be addressed in a coordinated, collaborative fashion (NSF 2020). The project team is testing this approach to tackling FSS in the Occoquan Reservoir, which serves as the drinking water supply for almost two million people in Northern Virginia. Through convergence research, education, and outreach the project team is developing mechanisms to facilitate collaboration among stakeholders to address FSS.

A core component of our GCR project is convening key local stakeholders and scientific and technical experts from the associated research universities—through a mechanism called the Executive Committee on the Occoquan Sewershed—to develop a shared understanding of FSS and possible implications of various potential interventions. The team is employing *joint fact-finding* techniques to facilitate the collaborative identification of research needs, development of research questions and methods, research process, and subsequent interpretation of findings (Matsuura & Schenk 2017). The ultimate goal is to bridge the science-policy divide by producing boundary objects that are salient, credible and legitimate to all stakeholders.

We are employing a novel approach—*fuzzy cognitive mapping (FCM)*—to track convergence among stakeholders and the researchers involved with the project over time. FCM is a technique for understanding stakeholders’ mental models of complex socio-ecological systems, and lessons can be learned through looking at both individual and aggregated models (Aminpour et al. 2020). We are applying this approach to assess how individual and collective models change over time as learning and deliberation occurs, and if/how the models can serve as useful artifacts or heuristics for facilitating shared understanding and ultimately consensus on how to tackle the freshwater salinization syndrome.

This paper will introduce the GCR project as an initiative exploring how we can better foster shared learning and collaboration around environmental policy and planning challenges and share initial findings.

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Key Words: Freshwater Salinization, Convergence, Joint Fact-Finding, Science, Fuzzy Cognitive Mapping

## FROM PLANNING TO ACTIONS: HOW PLAN QUALITY INFLUENCE THE IMPLEMENTATION OUTCOMES

Abstract ID: 723

Individual Paper Submission

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Making a stringent plan is the first step of action in climate change and sustainability. But how to turn the ambitious planning vision into actual actions might be the greatest challenge for governments at various levels. Tang et al. (2010) evaluates 40 local climate change plans in the United States and find that most plans have a high-level of awareness of the climate change risk, but relatively limited action approaches to address the problem. Millard-Ball (2012)'s research examines 478 climate action plans in California and find little causal evidence that climate plans influence environmental performance. More recently, Liao et al. (2020)'s research tracks the sustainability actions of 651 US local governments and finds that the impact of the sustainability plans on actions is short-term and declines over time. In general, the local governments are more likely to pick the "low-hanging fruit" of sustainability actions, and tend to design policies that yield short-term benefits and requires little investment and fundamental changes (Ji and Darnall, 2018). Although some studies start to examine the implementation of the plans, most research only focuses on whether localities have adopted a plan but fall short of examining how the plan quality influence the environmental outcomes.

This paper addresses this gap by examining how plan at different quality level influence the environmental outcomes in 104 jurisdictions within the Bay Area Air Quality Management District (BAAQM) in California. The authors compile plan and environmental performance data from various sources, including the local government climate action plan database from BAAQM, and Greenhouse gas emission from CoolClimate Network of UC Berkeley. Among the 104 jurisdictions, 82 of them have adopted a climate action plan, while 22 of them are without a climate action plan. This allows us to compare the environmental performance of cities with and without a plan. The authors manually read the implementation and monitoring sections of these plans, and coded the plans according to year of adoption, whether the plan specifies responsibility among departments and staff, plan update and adjustment, funding strategy and sources, implementation timeline, requiring monitoring reports, etc. Then quantitatively examine the heterogenous impact of plans on environmental outcomes using these variables. The initial results show that whether the localities have a climate action plan does not causally reduce greenhouse gas emission. Among all implementation variables, clearly specified funding sources and responsibility distribution are the most important factors that influence plan implementation.

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Key Words: Implementation, Plan quality, Climate Action Plan, Local Governments

## COMMUNITY RESILIENCE IN THE 'NEW NORMAL' – INSTITUTIONALIZING RELOCATION AS ADAPTATION IN NEW YORK'S SOUTHERN TIER

Abstract ID: 724

Individual Paper Submission

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The COVID-19 pandemic and climate-induced events are radically and rapidly restructuring city governance. Traumatic events lead many to seek a 'return to normal,' but entrepreneurial agents might use disasters as an opportunity to imagine new possibilities for a more inclusive and sustainable society. While a 'great reset' might offer platitudes that global economic, political, and social systems will revisit their relationships with the effects of capitalism that created today's crises, the hard work of such transformations will be at the local-level, and city planners face significant challenges to assert relocation as a strategy for climate justice within community planning efforts. The provisions to deal with COVID19 in the United States hardly signal a dramatic shift away from the austerity measures that have weakened local governments' abilities to maintain and manage essential services. Millions of homes may soon become uninhabitable due to sea level rise, shoreline erosion, floods and wildfires, and many inhabitants do not possess viable options for permanent shelter or rebuilding, so where will they resettle, and what will become of their homes after natural and political forces disassemble their communities?

Managed retreat is the strategic relocation of structures or abandonment of land to manage natural hazard risk." (Hino, Field, and Mach., 2017; Neal, Bush, & Pilkey, 2005) Governments are at the very nascent stages of considering managed retreat to relocate those at risk, and pilot communities are still grappling with full implementation of community-scaled relocation (Scott et al., 2020). This paper evaluates contrasting approaches to community relocation through a comparative case study of the Village of Sidney and Town of Union, two municipalities along the Susquehanna River in New York State devastated by Tropical Storm Lee and Hurricane Irene in 2011. The Village of Sidney attempted a community-scaled, collective relocation and participated in the New York State Buyout and Acquisition Program, while the Town of Union has worked to dissolve four target neighborhoods over a gradual period of time and did not opt for collective relocation projects or participate in the NY State Buyout and Acquisition Program. From April 2018 to December 2020, I conducted semi-structured interviews and conversations with county planners, went on site visits, and completed coding procedures for plans, policies, and reports to analyze processes and outcomes in the two municipalities.

Neither municipality has completed a full community-relocation, but both effectively demonstrated how to utilize flood buyouts for community stabilization and offer lessons for planners in overcoming the external and internal forces that complicate the processes of institutionalizing relocation as adaptation. Local planners effectively instrumentalized practices of bricolage to compensate for insufficiencies in disaster recovery policies. As crises are compounding, however, overlapping recovery periods are constraining their abilities to transform exigencies into innovations. Further, both communities have encountered a paradox, which is that effective community planning has required flexibility in approaches to dealing with flood risks, including accommodating ad hoc and micro-

adaptations, which counter the commitments necessary for effectively institutionalizing retreat.

I conclude that in the absence of substantive federal action to address climate change and economic inequality, local governments must have the imagination and audacity to adopt incremental approaches of adaptation, which aim to preserve existing communities, while simultaneously experimenting with transformational and ambitious plans for retreat that will attempt to improve the lives of individuals in new communities.

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Key Words: managed retreat, community relocation, flood mitigation, disaster recovery, climate adaptation

#### **GREEN SPACE AND URBAN HEAT ISLAND: FOCUSED ON THE EFFECTS OF URBAN STREET TREES IN SEOUL, KOREA**

Abstract ID: 725

Individual Paper Submission

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Recently, the urban heat island phenomenon has become a hot research topic along with the issue of climate change because the temperature in urban areas with high population density is gradually increasing all over the world. This urban heat island phenomenon causes severe heat waves during an extremely hot summer, which increases energy consumption and thus causes higher level of ozone. These simultaneous effects may have a negative influence on human lives, so that various studies have been conducted to reduce urban heat island effects. One way to mitigate extreme temperature during the summer is to increase urban green space. A number of previous studies have empirically shown that green space can alleviate the urban heat island phenomenon by increasing the cooling effect. However, some scholars have argued that green space simply created by a park cannot be a perfect solution because creating an urban park is not easy but complicated due to the limited space and complex individual interests in urban areas. Nevertheless, since green space reduces local air and ground temperature as well as have a natural ability to filter air pollution, it is necessary to expand urban green space for citizens' quality of life. Alternatively, scholars have argued that street trees have a positive effect on the mitigation of urban heat island phenomenon by blocking sunlight, and thus street trees can lower the temperature of the urban land surface. However, empirical studies on the cooling effects of street trees have not much conducted so far, especially in Seoul, Korea.

With this perspective, we attempt to empirically examine whether street trees reduce urban heat island phenomenon by lowering temperature of the urban surface in Seoul, Korea. For doing this, we collect detailed street tree data that contain information on the exact locations and tree size, satellite image data for measuring urban temperature, and spatial data including buildings, roads, streams, and land use types. Particularly, we (1) investigate how the street trees reduce urban temperature using a hierarchical linear model, and then (2) compare the effects of street trees on the urban temperature of the central business district where has the highest surface temperature and those of other places in Seoul. After controlling for other variables, our empirical analysis results show that the vegetation of street trees has a significant cooling effect on lowering the surface temperature of the surrounding area, and this effect is much larger in areas with large living population, such as commercial areas, especially in the central business district. Our findings suggest that the cooling effects of street trees are clear, so

that urban policy for planting more street trees needs to be considered as an alternative to creating more urban parks. Particularly, planting more street trees in commercial business districts as well as areas with high density commercial development would be more efficient in reducing urban heat island phenomenon.

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Key Words: Urban Heat Island, Street Trees, Green Space, Climate Change

#### SCENARIO PLANNING AS A TOOL FOR EMERGING WATERSHED MANAGEMENT PROGRAMS

Abstract ID: 728

Individual Paper Submission

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Watershed management as a means to reduce hazard risk has emerged as a priority for government agencies as they develop and update strategies to address increasing climate change impacts. This is driven by rising costs for disaster recovery and growing recognition that communities are increasingly vulnerable to environmental impacts that exceed local capacities. However, these efforts are confounded by the mismatch between changing economic, social, and environmental conditions (Folke et al., 2007) and relatively inflexible governance and planning structures. It is widely recognized that within multi-jurisdictional regions, planning is highly fragmented across community decision-making bodies with different goals. Each has authority to determine its own land uses, development practices, and management strategies to achieve locally-determined objectives, often to the detriment of adjacent watersheds. This incongruity between dynamic systems, and static and fragmented governance, suggests barriers exist to implementing resource and risk reduction policies necessary to limit impacts and improve regional resilience (Lipiec et al. 2018).

Regional planning requires consideration of complex issues spanning diverse landscapes, coordination across a range of management units with disparate interests, and trans-disciplinary communication and coordination (Trammell et al. 2018). It is no surprise then, that these large-scale shifts in resource management are costly and difficult to implement. A range of tools have been developed to help facilitate these transitions. In particular, scenario planning has shown promise as an effective way to address the complexities of regional systems by presenting diverse issues within a small set of alternative 'visions' for how the future may unfold. These processes are often oriented toward influencing collective decision-making (Wollenberg et al. 2000), which means they can have a wide range of implications for a diverse set of stakeholders.

In 2016, Louisiana experienced two catastrophic inland floods that highlighted weaknesses in regional water management and risk reduction. In response, the Louisiana Watershed Initiative (LWI) was created to coordinate long-term recovery response and resource management by state, regional, and local agencies. LWI divided the state into eight watershed units, and early efforts have worked to generate regional governance structures, data, and public support. But where do we go from here? Questions remain on how the state can turn data into visions,

policies, and investments that overcome the challenges of a dynamic natural systems and disjointed local land use practices. To better understand the challenges facing LWI implementation, the LSU Coastal Sustainability Studio held a series of scenario planning workshops bringing design professionals, public officials (both elected and agency representatives), and national experts together to discuss the future of Baton Rouge and the Amite River Watershed. The workshops took place in two distinct parts. The first included multi-day participatory design exercises centering around multiple future scenarios developed using the FUTURES framework (Meentemeyer et al 2013). Participants included resources agencies, university researchers, as well as design professionals who are often left out of the resource management conversation. The second set of workshops presented the outcomes of these design-driven efforts, and focused on consensus building between designers, agency representatives, researchers and elected officials around potential implementation strategies, legal/policy frameworks, and best management practices. These trans-disciplinary teams expanded upon the State's watershed approach to consider long-term visions for local and regional multi-functional infrastructure networks that can provide stormwater management, multi-modal transportation, and regional recreational benefits. Results of the workshop indicate that there are opportunities for coordination when regional economic benefit and infrastructure investment are the focal point. This talk will focus on the processes and results of these workshops, successes, challenges, and next steps. Work is supported by the National Academies of Sciences Gulf Research Program and the Robert Wood Johnson Foundation under award number 2000008299.

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Key Words: Scenario planning, Watershed management, Resource collaboration, Community resilience, Climate adaptation

#### **PUBLIC PERCEPTION TOWARD GREEN INFRASTRUCTURE ON STREETS FOR STORMWATER MANAGEMENT**

Abstract ID: 730

Individual Paper Submission

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Cities are increasingly implementing green infrastructure for stormwater management with expectations of cost-effectiveness and co-benefits. One of the popular implementation strategies is retrofitting streets where stormwater runoff occurs. In addition to managing stormwater, green infrastructure provides co-benefits, including neighborhood beautification, air quality improvement, urban heat island effect mitigation, and walkability enhancement (Meerow 2020). Unlike traditional gray infrastructure, such as sewers, green infrastructure is visible and may affect public support for green infrastructure policies or programs (Everett et al. 2018; Finewood, Matsler, and Zivkovich 2019). Although research has demonstrated the benefits of green infrastructure in urban areas, few



studies have evaluated whether the public also perceives such benefits and what factors may influence their perception (Miller and Montalto 2019; Gao et al. 2018).

This paper investigates how residents perceive green infrastructure on streets and analyzes whether their perceptions are related to environmental awareness and satisfaction with neighborhoods. I surveyed residents living in zip codes where the Philadelphia Water Department (PWD) or New York City Department of Environmental Protection (NYCDEP) implemented various types of green infrastructure on streets. The online survey asked four sets of questions to 300 residents. The first set queried the residents' awareness, preferences and concerns regarding green infrastructure. The second set inquired if residents agreed that green infrastructure constructed in their neighborhoods provides well-known benefits. The third set questioned the residents' awareness of environmental issues, such as the water quality of local rivers and the impact of climate change. The last set assessed residents' satisfaction with their cities and neighborhoods.

Statistically analyzed survey data advances an understanding of public perception of green infrastructure. The findings of this study contribute to our grasp of potential relationships between public perceptions, environmental awareness, and neighborhood satisfaction. By investigating these public perspectives, this research provides insight into how cities can enhance new and existing green infrastructure policies and programs in the public realm to achieve stronger public support.

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Key Words: green infrastructure, stormwater management, environmental awareness, urban planning

#### **RACIAL EQUITY PLANNING IN THE FACE OF A CHANGING CLIMATE**

Abstract ID: 745

Individual Paper Submission

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As the impacts of climate change intensify, a growing number of cities are developing climate adaptation plans and projects (Aaros et al., 2016; Lyles, Berke, & Overstreet, 2018). How cities address existing racial inequalities in their planning efforts varies widely, raising concerns that climate adaptation actions may continue patterns of disparate risk for communities of color (Anguelovski et al., 2016; Shi et al., 2016). Simultaneously, growing public attention to anti-Black violence in the United States has prompted a resurgence in racial equity approaches to urban planning (Solis, 2020). Limited research examines the confluence of these two areas of planning, with little scholarship on how racial equity climate adaptation planning processes are designed, managed, and perceived (Schrock, Bassett, &

Green, 2015; Solis, 2020). This case study contributes to this body of research through examining how the cities of San Antonio and Houston developed racial equity approaches to the San Antonio Climate Action and Adaptation Plan (2019) and the Houston Resilience Plan (2020). Through interviews with city planners, community activists, and technical professionals I detail the tensions between city commitments to racial equity and community expectations for participatory justice.

This paper engages with theories of governmentality and the racial state (Cooke & Kothari, 2001; Kurtz, 2009; Taylor, 2007) to draw out three implications for planning practice and theory. First, I describe how community organizations frame their decisions to engage with the climate plan development process as a harm reduction strategy. I detail how few organizers expected city-led racial equity planning approaches to fundamentally change the material realities for communities of color or their protection from climate risks. Instead, they strategically decided to participate in these processes to minimize harms that could result from them not being at the table. Second, I contrast organizers' harm reduction strategies with city staff's beliefs that racial equity approaches to climate planning hold the potential to address racial and climate inequalities in their cities. Third, I bring these divergent perspectives into larger conversations on the politics of reform strategies to discuss the ways participatory planning can conscribe planners and community activists into racialized systems that allow for incremental progress but limit the potential for fundamental challenges to the logics of environmental racism (Pulido, Kohl, & Cotton, 2016; Cooke & Kothari, 2001). This case study contributes to our understanding of how emerging urban planning responses to climate change and anti-Black violence represent a shift in traditional planning practices and how planners and communities navigate the potentials and limitations of this evolving terrain.

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Key Words: climate adaptation, racial equity planning, racial state, environmental racism, climate justice

#### **APPLYING NETWORK ANALYSIS AND PLAN EVALUATION (NAPE) METHODOLOGIES FOR REGIONAL INSTITUTION BUILDING WITHIN THE LOUISIANA WATERSHED INITIATIVE**

Abstract ID: 766

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Regional problems related to planning involve integrating multi-scalar and multi-jurisdictional processes. In the case of watershed hazards, this involves local floodplain management practices, environmental processes and ecosystems, regulations, and infrastructural strategies. These are often governed by their own domain specific planning and regulatory approaches, which materialize as intermediary documents such as ordinances and plans,

but in a piecemeal, fragmented, fashion (Bodin 2017, Bacau et al 2020, Berke et al 2019). Existing planning efforts, such as Local Hazard Mitigation Plans, transportation planning, and storm water and non-point source plans, are all crucial for regional planning for watershed hazards, but do not exist as a discretely defined system. Instead there is a need to derive the relevant issue-specific planning network from this complex interaction of diverse governance efforts. In doing this, many planning efforts involve assessment and incorporation of local and regional planning efforts, using plan evaluation methods (e.g., Lyles and Stevens (2014) and Brody (2008)), and more recently incorporating network methodologies (e.g., Berke 2019 et al, Bacau 2020).

We have developed a uniform methodology for extracting relational data from planning documents for the purposes of complimenting established regional plan evaluation methods Network Analysis in Plan Evaluation (NAPE). NAPE is currently being used to assist the Louisiana Watershed Initiative, Region 7, and Capital Regional Planning Commission, in its efforts to create a regional watershed coalition structure. These methods allow for the initial visualization of the regional planning network (derived from planning documents), as well as answering questions around fragmentation in local, state, and federal objectives around water quality and adaptation (e.g., concurrence between current activities, planning goals, and current programs.), stakeholder, and key broker identification. These methods also allow for initial understandings of existing multi-jurisdictional collaboration around watershed issues, and if existing patterns of collaboration can be explained by attributes of the network's constituent organizations, plans, and jurisdictions. Measures involved include centrality, clique analysis, brokerage, and multi-level visualization techniques. We will provide a GIT-Hub repository for this analysis, and use the network and scorecard attributes for testing hypotheses around the questions posed above.

Our paper will discuss the utility of NAPE in terms of creating practitioner-relevant knowledge about the regional planning system, as well as discuss findings related to fragmentation and the structural properties of collaboration within the informal watershed planning network in LWI Region 7.

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Key Words: Networks, Watershed, Regional, Plan Evaluation, Hazards

#### EVALUATING THE LAND USE IMPACTS OF UTILITY-SCALE SOLAR ENERGY DEVELOPMENT IN VIRGINIA

Abstract ID: 767

Individual Paper Submission

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Like many other states, Virginia is experiencing a rapid increase in utility-scale solar energy capacity. Declining costs, combined with supportive state legislation, indicate that this rapid development will increase for the foreseeable

future. While utility-scale solar provides many benefits related to climate change mitigation, pollution reduction, and tax revenue for the impacted localities, it also has its share of limitations, controversies, and detractors. Of particular concern are the land use impacts of utility-scale solar, specifically the possible loss of high-value farm or forest land or sensitive ecosystems (Hernandez, et al., 2014; Kaza and Curtis, 2014) and the potential environmental justice implications from concentrating these facilities in low-income and/or minority communities (Mulvaney, 2019).

Local planners and policymakers have an important role in understanding the impacts of utility-scale solar, and mitigating them through siting agreements, local regulations, and other policy innovations. One promising method for maximizing the net benefits of utility-scale solar is to use GIS methods to assess the impacts of existing or proposed solar facilities, or to identify ideal sites for future solar energy development (Dias, et al., 2019; Poggi, Firmino, and Amado, 2018). Such analyses can help planners guide the future location of utility-scale solar projects through their zoning codes, comprehensive plans, and other policy tools.

This research examines the land use impacts of utility-scale solar facilities in Virginia, in order to inform recommendations for sustainable solar energy development in the Commonwealth. The key research questions are as follows:

- ❑ What is the total acreage of land dedicated to utility-scale solar development in Virginia thus far, and the average acreage per megawatt (MW) of installed utility-scale solar generation capacity?
- ❑ What types of land uses are most often converted to utility-scale solar development (agricultural, forested, open lands, etc.), and do these patterns vary significantly by region?
- ❑ To what extent is utility-scale solar development impacting “high value” agricultural and forest lands, vs. more marginal land within those categories (e.g., forest land with higher vs. lower conservation values)?
- ❑ Does utility-scale solar development occur disproportionately in counties that are lower-income and/or have high minority populations compared to the statewide average? To answer these questions, we built a new Geographic Information Systems (GIS) database of the 38 utility-scale solar facilities currently operating in Virginia. This required meticulous cross-referencing of information from aerial photos, site maps (e.g., from county-level special use permit applications), and other sources to geo-reference the actual impacted site areas for each project. This includes the solar panel footprints as well as additional land converted around the panel area, but not any undisturbed land on the applicable parcels. After geo-referencing the individual project sites, we overlaid those project footprints with the Virginia Land Cover Dataset to identify the previous land uses at those locations. Preliminary results show that over 80% of the impacted acreage has been former forest (58%) and cropland (25%). Additional datasets from the U.S. Census Bureau and other sources are being used to answer the subsequent research questions.

This research will inform policy recommendations to support the further development of utility-scale solar while mitigating potential negative land use impacts. It will also identify new best practices for data management and analysis to track the impacts of utility-scale solar in a given state or community. Finally, it will contribute to the evolving body of research on the impacts of utility-scale solar on forest and agricultural use as well as potential equity concerns stemming from utility-scale solar development.

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Key Words: Solar energy, energy policy, geo-spatial analysis, land use, agriculture

## **"BOUNCING BACK" TO LONGSTANDING URBAN ALLIANCES IN THE FACE OF THE CLIMATE CRISIS? EVIDENCE FROM METRO-BOSTON**

Abstract ID: 773

Individual Paper Submission

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This paper uses a prism of urban theories to unpack rationales, research agendas, and ongoing planning efforts by exploring mechanisms of mobilization of resources and collaboration of urban actors around climate adaptation strategies in Metro-Boston. The paper reviews the literature on urban growth and regime theories and connects these with more recent theoretical strains in climate justice to analyze why and how urban actors cluster to face climate change challenges through adaptation.

Urban growth theory (Molotch, 1976) builds on the assumption that any locality is the physical expression of land-based elites who compete to mobilize resources to promote their interests through physical and economic growth. Urban regime theory (Stone, 1993) offers a critical heuristic device to explore how the capacity to govern is profoundly conditioned by the type of alliances that government bodies established with non-government actors. On the one hand, these strains of literature point to the need to look at the content of urban development proposals related to their proponents to unpack rationales and logic underpinning advanced growth imperatives and powerful elites alliances. On the other hand, recent theorizations on degrowth alternatives and mass mobilization of grass-roots organizations have been questioning longstanding urban development logics by conceptualizing a plea for new governance arrangements for degrowth agendas and a reawakening of the "democratic political" to perform staging and acting of equality in the face of instituted "democratic order" (Swyngedouw, 2014, p. 123).

Growth/degrowth and regime/post-political longitudinal developing theories are instrumental in navigating contemporary challenges posed by climate change and inquiring about existing and construct different climate change politics. Two decades of climate justice literature have, in fact, demonstrated how processes and pathways of adaptation strategies have been continuously reinforcing the elitarian status quo by re-proposing dispossession cycles. Underpinnings of this conclusion stand on the large body of research inquiring about the connection between climate action and social justice (Fitzgerald, 2020), and pointing to the need for innovative roadmaps to reorient research toward the social dimension of adaptation (Shi et al., 2016).

By using stakeholder network mapping analysis and in-depth key-informant interviews, this paper explores how climate justice issues are strictly dependent on the social processes embedded in existing urban regimes whose mainstream climate adaptation agendas are set and maintained by prominent urban actors. More specifically, this research's empirical component analyzes a stakeholder network of 148 people, spanning public, private, non-profit, and academic sectors, and operating in Boston, Brookline, Cambridge, Chelsea, Everett, and Somerville (Massachusetts). The paper offers critical insights on the controversial nature of the content of these agendas in Metro-Boston and opens an arena to discuss both contents and social processes that could lead to more just efforts. It points out how existing small forms of diversity, inclusion, and participation alone are insufficient to intervene in the existing powerful alliances in the climate adaptation field and advocates for a more drastic re-imagination of the

existing stakeholders' network if just outcomes are desired.

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Key Words: Stakeholder Network Mapping, Climate Adaptation, Urban Growth, Urban Regime, Boston

### **ADAPTING TO CLIMATE CHANGE IN THE STATE OF NEW YORK: WHAT DOES SUCCESS REALLY MEAN FOR MUNICIPALITIES?**

Abstract ID: 800

Individual Paper Submission

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The State of New York State is emerging as a strong subnational actor in the climate change policy arena. The State's ambitious Climate Leadership and Community Protection Act (Climate Act) demonstrates how to confront a rapidly changing climate to the rest of the world. While the state's policy declarations and initial spell of activities are impressive, it remains to be seen to what extent the climate action goals will be successful at the level of the municipalities. This paper examines Kingston and Beacon, two metropolitan areas in New York that have made significant progress in adopting and implementing climate action plans. It asks, what adaptation strategies are being used by the cities? What barriers and challenges did they overcome? And what implications do they hold for other cities in the State? The study finds that these cities progressed quickly by implementing actions that achieved significant economic benefits and great cost-savings. They also involved the business community in the implementation of the plans. However, this achievements comes at the expense of actions that were more effective, equitable and could have led to more sustainable changes in the long run. The results are distilled into 5 lessons for planning practitioners and establish a basis for future research on municipalities in managing competing environmental, societal, and economic claims in planning for climate change.

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Key Words: Climate adaptation, Environmental Governance, Social Justice, Cities and Municipalities

## COVID-19 PANDEMIC: EFFECT ON BUILT ENVIRONMENT PREFERENCES

Abstract ID: 827

Individual Paper Submission

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Historically, public health crises have played an important role in shaping our modern cities. For example, mid-19th century urban sanitation systems, developed in response to cholera outbreaks. Current COVID-19 outbreak is also forcing us to reassess our built-environment especially in dense areas. During this outbreak, public health concerns have forced residents to practice social/ physical distancing, avoid public places, and reduce reliance of public transportation systems. Dense urban environments such as Seattle and New York have become the epicenters of this pandemic. Therefore, it is expected that there is likely to be an increase in perception of public health risks associate dense urban environments (Andersen et al. 2021; Sharifi and Khavarian-Garmsir 2020). Continued public support is critical for future formulation and implementation of policies to create sustainable built environments. Past research on public policy support suggests that risk perception plays a critical role in influencing support for local development (Glasbergen, Biermann, and Mol 2007; Macnaghten and Jacobs 1997; Taylor 2003). Similar relationship has also been identified in related disaster research studies wherein risk perception is often identified as a key determinant of household adjustments to reduce risk from extreme natural events including pandemics (Adame and Miller 2016; Frank and Engelke 2001; Kent and Thompson 2012; Lindell and Perry 2012; Strahan and Watson 2019; Youssef 2018). These risk reduction adjustments can range from lack of support for policies perceived to exacerbate the risk to behavioral changes such as decreased use of public transit systems.

This timely research aims to capture the change in public support for common sustainable development policies that promote higher housing densities, increased reliance on public transportation, and use of public spaces. Superficially, the following three key questions are addressed in this research: 1) How has the present pandemic influenced public preference for dense urban development, housing choice, transit preferences, and use of public places? 2) What challenges are faced by people with respect to their built environment in practicing physical isolation while continuing to address their daily needs? 3) What is the impact on public perception of existing built environment regulations and growth management policies?

This research focuses on Seattle–Tacoma–Bellevue Metropolitan Statistical Area, which was the first epicenter of the coronavirus outbreak and continues to be one of the severely affected areas in the US. Till now it has experienced 2,972 positive COVID-19 cases and 153 deaths (Jan 2021). Its average population density is 648 people/sq mile (2018), which is roughly three times the US average population density in Metro and Micropolitan Statistical Areas. Further, a number of state and local policies including the Washington state’s Growth Management Act has played an important role in shaping the dense urban environment in this region. This region thus represents an ideal location to assess the changes (if any) in local preferences for sustainable development policies that have traditionally enjoyed significant support in this region. Presently, survey data is being collected through an online survey (data collection period ends on July 15th, 2021). The results of the survey and analytical outcomes will be available in time for final paper submission.

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Key Words: Risk Perception, Public Health, Built Environment, Public Policy

## ON THE EFFICIENCY AND EQUITY OF A STORMWATER FEE

Abstract ID: 832

Individual Paper Submission

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Many cities worldwide face the converging challenges of aging stormwater management infrastructure and the uncertainties posed by climate change. Inadequate stormwater management and infrastructure results in public health and safety threats, water quality issues for receiving waterbodies, and equity issues in resource allocation, accrued benefits, and adverse impacts. Concepts that re-envision stormwater as a resource rather than a hazard incorporate multi-purpose solutions built on closed-loop stormwater management systems (Cesane et al., 2017). However, funding and capacity issues are a significant barrier to implementing forward-looking solutions in stormwater management. Even though pollution from stormwater runoff is the leading cause of water quality issues in the U.S., investment in stormwater management often lags behind drinking water purveyance and wastewater management (Stormwater Infrastructure Finance Task Force, 2020). Unlike drinking water and wastewater, which are conventionally governed as utilities, stormwater management programs have often competed with other municipal public works programs for funding and prioritization when there is no dedicated stormwater enterprise fund.

In response, municipalities have adopted stormwater utilities (SWU) or stormwater fees, which create a designated revenue source specifically for use on stormwater-related infrastructure, management, or maintenance. Having a dedicated fund for stormwater systems ensures that property owners directly pay to address a ubiquitous issue, raising awareness of the problem. Moreover, incentives or credit systems can encourage specific behaviors and technologies toward practices that reduce runoff by individual landowners. By-and-large, stormwater fees are assessed by total impervious area (TIA), a fee structure that has been upheld through several U.S. court cases. However, TIA alone may not be the best predictor of stormwater runoff (Lim, 2016).

In this study, I explore both concepts of efficiency and equity in implementing a stormwater fee. In the implementation of stormwater fees, equity and efficiency are considered to go hand-in-hand (Lindsey, 1990). However, such a framing with roots in economic epistemologies may serve to perpetuate underlying inequity (Finewood, 2016). Issues of "fairness" have frequently been raised during community meetings exploring options for implementing a SWU in the City and County of Honolulu. Unfairness is often associated with variable rainfall patterns in Honolulu and whether precipitation should be considered in the stormwater fee. To understand whether underlying spatial patterns emerge between demographics and potential stormwater runoff drivers, I first conduct a socioeconomic correlation analysis. I find there is only a slight positive correlation between median income and precipitation ( $r = 0.18$ ), slope ( $r = 0.25$ ), and building area ( $r = 0.15$ ) for residential parcels. Second, I consider whether a "fair" fee should be based on slope, soil, and rainfall rather than TIA. I use the U.S. Environmental Protection Agency's National Stormwater Calculator rainfall-runoff methodology to conduct a spatial comparison of runoff generated from impervious and bare ground land cover. I suggest that a stormwater fee based on pricing the potential infiltration loss (PIL) creates greater efficiency than TIA. Finally, I examine whether there are uneven burdens of payment for a fee based on TIA compared to PIL.

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Key Words: water governance, stormwater utility, spatial analysis, rainfall-runoff, socioeconomic analysis

## SPATIAL RESILIENCE IN THE CHENGDU PLAIN: NEW PLANNING VALUES OF AN ANCIENT COUPLED HUMAN-NATURAL SYSTEM

Abstract ID: 833

Individual Paper Submission

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This paper reports on agrarian communities and agroecosystems in the Chengdu Plain, southwest China. It focuses on the spatial distribution of a unique agricultural landscape element, linpan (wooded lots), which combines forest, farmland and farmers' dwellings in a patchy, biodiverse and remarkably scattered pattern across a densely populated and exceptionally productive region. For more than two millennia, this landscape has demonstrated long-term productivity and resiliency, and supported sustainably some of China's earliest and most stable urban centers with very few major disturbances, due to the nourishment and flood control provided by the ancient Dujiangyan Irrigation System (Abramson 2020). Over the past two decades, urbanization and expansion of the central city of Chengdu has put pressure on farming communities to spatially consolidate habitation, according to conventional planning wisdom that correlates compact settlement footprints with more sustainable modern development (Ye and LeGates 2013). However, as modern development evolves to include new forms of building and infrastructure and new ways of achieving livelihood, health and well-being, time-tested indicators of spatial resilience in the landscape may accrue new value. Building on previous efforts to identify and measure resilience-related features of the linpan landscape (Tippins 2014), we present new findings on the spatial distribution of linpan and its implications for rural development planning in this and other densely populated, richly productive agricultural regions. Using GIS, land ecology metrics, and historic maps and remote imaging of the landscape before and during rapid urbanization, we quantify the distribution of linpan patches (i.e. patch size, patch shape, patch density) in five 4km-by-4km sample study areas, and correlate the result with the density of the waterways, the age of the irrigation system, and social survey and interview data on residents' livelihoods and response to the COVID-19 pandemic. The oldest and most central sections of the irrigation system correlate with the highest number of linpan, which are smaller but separated by shorter distances, distributing the agrarian population more evenly across the landscape even though these areas are closest to the urban center; in newer and more peripheral sections of the irrigation system, individual linpan become bigger and more distantly separated, and habitation is more concentrated, the further settlements are from the center. The correlation of the spatial pattern of settlement with the age of the irrigation system's expansion suggest important functions of dispersed dwelling for land and water use and management. Patch sizes, population density and dwelling dispersion help maintain an equilibrium of carrying capacity in this coupled human-natural system. The dispersed pattern of dwelling and the spatially intimate relation of habitation to productive land and water has demonstrated continued relevance to the ability of residents to adapt to unpredicted disruptions, such as changing market conditions and pandemic restrictions, despite many changes in material and economic life in recent decades.

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Key Words: Resilience, Coupled human-natural systems, Spatial analysis, Landscape ecology, Chengdu Plain

## DISENTANGLING THE RELATIONS BETWEEN URBAN FORM AND URBAN ACCESSIBILITY, A DISASTER RESILIENCE PERSPECTIVE

Abstract ID: 834

Individual Paper Submission

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Form-based codes have dominated the municipal planning for few decades. For example, the Growth Management projects promote compact urban developments while the New Urbanism initiatives, though initially proposed to improve civility and residents' livability, are ended with form-based planning practices such as mixed land use and compacity. The recent COVID-19 pandemic has exposed the risks of these streamlined planning practices (Grant, 2020) that the city planning should consider the locally social, geographic, and climatic contexts. This study examined the relations between three popular urban form characteristics, i.e., compacity, polycentricity, and mixed land use, and urban accessibility in the context of disasters. The hidden reasoning is that urban forms that provide sufficient and equitable access to essential facilities (e.g., groceries, healthcare, and gas station) can better accommodate city residents during disasters and avoid exacerbated disaster impacts (Logan & Guikema, 2020; Paton, 2017). In particular, this research uncovers what types of urban forms (e.g., compactness, mixed land uses, and polycentricity) are associated with higher accessibility levels under disaster impacts and to which extent could urban form changes improve existing accessibility levels in the community.

The study used an integrated method that coupled Cellular Automata (CA) and agent-based modeling (ABM). Specifically, we used CA to create four artificial cities displaying the disparate urban form characteristics referring to the land-use patterns of the city of Tallahassee in Florida. We simulated human agents that seek resources/services in these artificial cities under three designed scenarios, i.e., business-as-usual (BAU), limited resource provision (LRP), and built environment disruption (BED) scenarios. The impacts of disaster perturbations and urban forms on accessibility are measured with the varying traveling distances (i.e., median values and cumulative distribution functions) of human agents.

The implications of this research are as the following: 1). the analysis results provide quantitative validations to previous semantic and ontological studies that relating urban form and accessibilities; 2). the research findings inform future retrofitting and resettlement projects that help hazard-prone communities adapt to recurring extreme events; 3). the study implies the advantage of computer-aided approaches, e.g., CA and ABM, in assisting scenario planning that considers the cities' social, geographic, and climatic contexts.

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Key Words: disaster resilience, land-use modeling, urban form, urban accessibility

## THE IMPACT OF AIR POLLUTION ON HOUSING PRICES AND THE EFFECT ANALYSIS OF ENVIRONMENTAL POLICIES: A CASE STUDY OF HOUSTON, USA

Abstract ID: 837

Individual Paper Submission

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In the past few decades, the United States has been committed to improving air quality by empowering the Environmental Protection Agency (EPA) and has achieved excellent results nationwide. However, many large metropolitan areas still experience serious air pollutions. The majority environmental studies often emphasize on environmental justice, fewer studies have involved quantitative methods to assess the effectiveness of existing environmental policies. Take the Houston region as an empirical case, this study discusses the impact of air pollution on local housing prices and racial distributions, as well as examines the impact of government environmental policies on housing prices. This study adopts the Hedonic price model and uses housing prices in the Houston area to quantify the impact of urban ozone (O3) pollution on local communities and populations, and to test the responses of housing market to existing policies. First, the study found that the housing prices follow the general market law that housing prices are negatively correlated with house age and positively correlated with variables such as floor area, school district quality, transportation accessibility, and household income. Second, accessibility analysis shows that housing prices are inversely related to the urban centers, which reflects the special pattern of urban development in the United States. As cities sprawl and people are pursuing spacious living environment and open courtyard country life, most of the family-based populations live in the suburbs. Most urban centers are dominated by businesses and financial entities and long commutes become a part of people's daily norms. In addition, this study found that air pollution has an unbalanced impact on communities where ethnic minorities gather. Finally, the evaluation of government environmental standards shows that existing environmental policies have two major impacts. First, the policies have lagged effects on housing prices; Second, environmental policies, in general, have positive significance for local housing prices. This study explored the relationship between air pollution and the housing market in the Houston area for the first time and explained the relationship between urban development and the urban environment in the United States by taking Houston metropolitan area as an example.

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Key Words: air pollution, housing prices, environmental policies, population distribution, urban centers

## **EFFECT OF CONTEXTUAL FACTORS ON GREEN INFRASTRUCTURE IMPLEMENTATION LIKELIHOOD: A STUDY OF STORMWATER MANAGEMENT IN FAST-GROWING, ARID-CLIMATE UTAH CITIES AND TOWNS**

Abstract ID: 856

Individual Paper Submission

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Urbanization dramatically affects water quality, given impervious surfaces and stormwater. Thus, alternative means of managing stormwater to prevent nutrient overloading and pollution of streams and waterbodies are crucial in the twenty-first century. Green infrastructure [GI] represents an umbrella of alternative approaches that infiltrate, evapo-transpire, or reuse water to address existing problems.

In the context of sustainability and urban planning green infrastructure has gained the attention of academics and practitioners as a promising concept to enhance sustainable spatial planning. Although advocacy for GI to manage urban stormwater is on the rise, the actual adoption rate is still low. While ‘cognitive barriers’ have been identified as a major roadblock to GI adoption behavior (Dhakal & Chevalier, 2017), it is clear that local fiscal, institutional, and biophysical contexts are also important (Shandas et al., 2020).

While some municipalities might indeed face funding and staffing constraints, it is important to realize that local stormwater managers so called ‘resistance and negative attitude’ (Carlet, 2015) towards GI might be grounded in negative experiences with poorly performing GI in their municipalities. Thus it is important to understand the factors that shape their attitude and perception towards GI. Since municipalities vary in their resource base, bio-physical environment, and public support, the performance of different types of stormwater GI can vary widely (Armstrong & Jackson-Smith, 2019).

The purpose of this paper is to assess variation in municipal managers’ intentions to recommend use of different forms of GI across diverse Utah municipalities. We test whether key social psychological drivers of behavioral intentions are mediated by characteristics of the municipality and specific attributes of different GI technologies. Taking advantage of the theory of planned behavior (Ajzen, 2019) we hypothesize that it is important to account for the variability in the biophysical and built environment of different communities as it effects decision-making by local stormwater managers regarding GI adoption. The specific research question is how do biophysical and built environments influence intentions to use different types of GI among storm water managers in Utah.

We use data from a survey of 67 stormwater program managers from a wide range of municipalities in Utah to develop a structural equation model. Background factors like size of municipality, built form [population density], growth rate, soil and groundwater condition, existing stormwater issues in the municipalities, extent of past GI implementation in a municipality, and years of experience working in stormwater management form the exogenous variables in the model. The endogenous variables in the model include attitude, social approval and perceived usefulness of GI. The intention to use GI is the outcome variable. Data on background factors are collected from secondary sources [USDA, NRCS, US census, etc.] and questionnaire survey. The model helps to determine the best predictors of intentions to use GI among stormwater managers in Utah.

Our findings expand our understanding of the factors affecting local stormwater managers’ attitudes and intentions toward adoption of an innovation. The results in particular illustrates that in addition to characteristics of

municipalities, the decision to implement GI hinges on the perceived effectiveness of GI in their locality, sources of funding, the scale of implementation, cost of implementation and maintenance, and levels of public acceptance of GI in each location. Thus with the variation in specific contextual factors which propel a community to consider GI varies, it directly affects the pace, extent, and diversity of these facilities. The relevance of this study lies in highlighting these opportunities and challenges perceived by local municipal stormwater managers, thus paving a way to improve efforts to disseminate and implement GI technologies through future research, policy, and community interventions.

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Key Words: Green infrastructure, GI adoption barriers, Sustainable spatial planning, Urban stormwater management, Innovation adoption

### URBAN CONNECTIVITY IN MONTRÉAL: A BIOPHILIC URBANISM APPROACH TO CITY DESIGN AND PLANNING

Abstract ID: 863

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Natural environments, habitat, and biodiversity around the world are under continued threat from urbanization, population growth, resource exploitation and the effects of climate change. Cities have a significant ecological impact on the urban environment, extending far beyond their boundaries. Biophilic design principles have been applied in several cities to mitigate this impact. The City of Montréal recognizes the connection between nature and environmental health and has been taking steps to expand green infrastructure in neighbourhoods throughout the city.

This paper argues that a biophilic approach to city planning can reduce negative ecological impacts of heavily built-up urban areas and contribute to the success of local biodiversity, urban resilience, and sustainability. The innate affiliation we humans have with nature can be nurtured and developed, even in urban environments. The benefits of contact with nature often depend on repeated experience so, urbanites should have a constant connection with the natural world; however, having abundant nature and biodiversity in and around a city is not enough. Biophilic design provides residents opportunities to engage, enjoy, and celebrate nature and biodiversity, including direct and indirect experiences of nature. In addition, the natural qualities of a biophilic city have important benefits not only for humans, but all life in urban environments.

A review of the literature reveals two aspects of biophilic design that are pertinent to urban planning. First, from an environmental perspective, the survival of wildlife populations depends on their ability to move between habitat

fragments, and this movement is directly related to connectivity of the landscape; thus, preserving habitat connectivity is important to ensure the survival of urban species. Biophilic design can increase connectivity within urban ecosystems, allowing fragmented patches of urban green spaces to be linked together and supporting a rich diversity of species. Second, from a human perspective, exposure to nature provides a wide range of physical, mental, and social benefits, and is essential to human well-being. Studies have shown that when people are in contact (direct or indirect) with nature, recovery rates go up, performance improves, creativity increases, stress levels decrease, and cognitive function and psychological restoration improves. Entire communities benefit from biophilic environments; there is a stronger sense of neighborliness and a stronger sense of place in biophilic communities compared to communities with lower-quality environments.

The specific case exemplifying the virtues of biophilic design discussed in this paper is the City of Montréal, where a planned urban biodiversity corridor will be developed over the next 20 years and, once completed, will cover 450 hectares in residential, commercial, and industrial areas. The project includes flowering meadows, pedestrian trails, and bike paths and will expand local biodiversity by connecting currently fragmented green patches created during several decades. The most notable of these are the ones created by the green alley (“ruelle verte”) program. There are currently over 400 green alleys in the city, covering a length of over 69km across a number of boroughs. We use geographic and spatial analysis in conjunction with biophilic design principles to determine the connectivity potential of different areas with the purpose of creating a continuous green corridor between the planned biodiversity corridor and the existing green alleys.

This work is relevant to urban planners, ecologists, urban designers, and landscape architects, particularly in light of recent debates around climate justice and the role of cities in mitigating the adverse effects of climate change. If we are to make our cities livable, just, and sustainable places that offer decent quality of life for all, we will need to discuss ways to increase environmental stewardship of the natural systems that contain and sustain our cities.

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Key Words: biophilic urbanism, biophilic design, environmental benefits, social benefits, sustainability

#### **ASSESSING THE COOLING POTENTIAL OF TREE CANOPY AND COOL ROOFING ON INDOOR HEAT EXPOSURE IN CONCURRENT HEAT WAVE AND BLACKOUT EVENTS**

Abstract ID: 922

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Extreme temperatures pose a significant risk to human health, and are projected to worsen in a warming climate with increased intensity, duration and frequency of heat waves in the coming decades. The frequency of regional electrical grid failures is also rising in recent decades, resulting in a growing number of blackouts during periods of extreme heat. As mechanical air conditioning is a primary adaptive technology for managing personal heat exposure, we examine in this paper the impact of a prolonged blackout on interior temperatures in residential structures during heat wave conditions, when air conditioning is most critical to human health. It is all the more important we understand interior temperature extremes as people spend more time at home due to the COVID-19 crisis. Passive cooling strategies such as light-colored "cool" roofing or direct shading from nearby tree canopy can provide benefits without the need for an active power grid. This study seeks to answer: to what extent can cool roofing and direct tree shading reduce indoor heat exposure for residential structures during a concurrent heat wave and blackout event, as compared to conventional roofing?

#### Data & Methods

Our research approach combines a coupled global and regional climate modeling system with a building energy performance model to simulate how a concurrent heat wave and grid failure event would impact residential building interior temperatures in Atlanta, Detroit, and Phoenix. Historic heat wave conditions are simulated across the three cities using Weather Research & Forecasting (WRF) regional climate models. These conditions drive interior temperatures in typical building prototypes generated by EnergyPlus in dense urban and sparse suburban environments, with simulated tree shading, cool roofing, and conventional roofing materials, with and without air conditioning.

#### Results

We find building interior temperatures as high as 114°F for single-family structures during the late afternoon of the simulated heat wave and blackout event in Phoenix. Furthermore, we find a substantial increase in heat exposure across residential buildings of up to 21.6°F in response to the loss of electrical power and mechanical cooling systems. Despite substantially higher outdoor temperatures due to the urban heat island, we find high density residential zones to experience only marginally elevated building interior temperatures during blackouts relative to lower density zones. Our simulation of temperatures for three common residential structures with cool roofs finds only a modest impact on building interior climates. When averaged over the three building types, the benefits of cool roofs during blackout conditions was found to be less than 2°F, while tree shading was found to provide cooling over 4°F, though the results varied widely by location due to varying urban heat island intensity.

#### Significance

This study is the first of its kind to analyze linked indoor and outdoor temperature models during a concurrent heat wave and blackout event across multiple climate zones. For populations lacking access to continuous mechanical air conditioning on a routine basis, building interior temperatures represent a significant health risk even when electrical grid systems are fully operational. The marginal thermal benefits of tree shading and cool roofing found in this study imply that it should be only one part of a comprehensive heat mitigation plan. Planners should look to a combination of policies such as vulnerability assessments targeting heat-sensitive populations to better locate cooling centers. The importance of mechanical air conditioning found in this study further implies that planners should encourage greater local grid resilience through district energy or local renewables while also promoting energy security programs like the Low-Income Home Energy Assistance Program (LIHEAP) and distributing AC units to heat-sensitive populations to enhance adaptive capacity during extreme heat events.

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Key Words: Urban Heat Islands, Public Health, Heat Mitigation, Climate Change, Infrastructure

## **GREEN URBANISM AND SUSTAINABILITY PLANNING: LEARNING FROM MUNICIPAL PRACTICES**

Abstract ID: 923

Individual Paper Submission

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Since the 1990s, communities across the United States have been developing sustainability plans and identifying other ways to develop green communities. Green urbanism aims to create communities that are environmentally sustainable, with strategies that target reduced carbon emissions and ecological footprints of communities as well as the integration of nature within urban areas to benefit humans, wildlife, and plants (Beatley, 2000; Lehmann, 2011). The devastating impacts of the changing climate have exacerbated the need to plan our communities using green urbanism principles.

While there has been significant study of who plans for sustainability and the quality of these plans in general (Conroy and Berke, 2000; Jepson, 2004; Svara et al., 2013), we do not know the extent to which a holistic set of green urbanism principles are integrated in these plans. This paper will help address this gap in the literature.

This paper investigates forty municipal plans for the extent of integration of eleven green urbanism principles identified by Lehmann (2011). The municipal plans included in this assessment were selected based on the findings from a recent nationwide survey of local governments, which found that 586 local governments, representing approximately one-third of the surveyed governments, have completed a sustainability plan (ICMA, 2016). The sample selected for this paper is a random sample of municipalities with over 10,000 population that had indicated that they completed a sustainability plan in ICMA's survey.

Preliminary findings suggest that overall communities have prioritized certain green urbanism principles over others and the strength and the extent of integration of green urbanism principles in municipal sustainability plans differ among communities. I expect to find these differences to be based on the characteristics of the communities (e.g., population size) and environmental stressors that these communities have (e.g., being prone to sea level rise).

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Key Words: Green urbanism, Sustainability, Municipal plans, Climate change, Renewable energy

## WHAT DETERMINES GREEN CONSUMERISM? A CASE STUDY OF KATHMANDU MUNICIPALITY, NEPAL

Abstract ID: 925

Individual Paper Submission

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Consumption habits are vital determinants of sustainability. Cities are often being criticized for wasteful consumption and unsustainable practices. They are also the pioneer of innovations to promote sustainable behaviors. One such habit is green consumerism. It is the behavior of considering the environment while making purchasing and non-purchasing decisions (Sharma & Joshi, 2017). Previous scholarship has used social, environmental, demographic, and economic factors as the determinants of green consumerism. Research also identified green consumerism as a process that includes the values, norms, and habits of the consumers (Peattie, 2010). Some studies have noticed a significant role of education and gender in green consumerism (Chekima, Syed Khalid Wafa, Igau, Chekima, & Sondoh, 2016). But there lies a research gap on how the historical background of individuals, economic and social situations, and the availability of goods and services influence the practices of green consumerism. Specifically, there is no research on how migration, access to products and services, and social stratification can change sustainable consumption behaviors. Using the case study of Kathmandu Metropolitan City in Nepal, this research strives to explore the role of migration patterns, socioeconomic characteristics, economic stresses created by COVID-19, and market access in determining the behavior of green consumerism.

Using stratified simple random sampling, a survey among ten wards of the Kathmandu Metropolitan City was administered. A total of 300 questionnaires were carried out at 20 shopping malls in those Wards. Survey questions focused on understanding green consumerism, individual purchasing behaviors, household consumption practices, availability of goods and services, socioeconomic characteristics, the individuals' migration pattern, and change in behaviors during social and economic stresses due to COVID-19. The data was organized and analyzed using statistical analysis software (SPSS 14.0). Besides inferential statistics, multiple regression models were built to identify the relationship between the habits of green consumerism and migration history, access to goods and services, household consumption habits, and socioeconomic variables. Based on the results, it was found that there is a significant relationship between the practices of green consumerism and education, income, migration history, and access to goods and services. Social status and gender do not have a significant role in the behavior of green consumerism. COVID-19 has created challenges to practice green consumerism among consumers who want to continue environmental friend behaviors. This research's contributions are: 1) urban residents who have some migration history tend to practice sustainable consumption behaviors, and 2) The fear of scarcity of goods and services hinders the practices of green consumerism. In the case of Kathmandu, the uncertainty of the availability of certain household goods negatively influenced the practices of green consumerism.

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Key Words: Sustainability, green consumerism, COVID-19, Nepal

## JUSTICE FRAMEWORK FOR NATURE-BASED SOLUTIONS AND IMPLICATIONS FOR CLIMATE JUSTICE PLANNING

Abstract ID: 927

Individual Paper Submission

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Nature-based Solutions (NbS) is a recent concept developed to promote nature as a means for providing solutions for societal challenges. The concept has been widely adopted for environmental science and policies addressing issues such as water security, food security, disaster risk management, human health, economic and social development, and climate change (IUCN 2016). While NbS operate under ecological principles, the social systems that NbS are being operated within and the potential negative impacts that NbS perpetuate in communities (e.g., green gentrification) have brought justice concerns. NbS including green infrastructures have been integrated into spatial climate justice planning through identifying social-ecological-technological systems vulnerability to climate change (Cheng 2016). As policies and resources are becoming available in support of implementing NbS in communities for addressing climate change challenges (e.g., EU's European Green Deal, US's The Green New Deal), cautions and inquiries are requested to ensure equity is addressed while systemic injustice are rectified in the politics of planning (Goh, 2020). Just NbS include opportunities to transform systemic injustice associated with race and class, meaningful participatory process for transformative co-production, and using value articulation to prioritize resources, measure successes, and create culture shifts to address issues of environmental justice (Cousins 2019).

The Nature-based solutions for Urban Resilience in the Anthropocene (NATURA) is a global network of networks linking researchers and practitioners working on NbS. The NATURA Design for Justice thematic group focuses on understanding how NbS projects achieve justice goals. We aim to answer the question: what are the fundamental grounding of justice principles within NbS for climate actions? Drawing upon an expert review from the network and existing literature related to social and environmental justice, we propose a justice framework integrating five concepts: 1) Restorative Justice recognizes the harms and damages that the institutional and systemic injustice caused to historically disadvantaged and minority groups and the inequitable outcomes that exist in institutional policies and that shaped our built environment today. Thus the NbS shall seek to restore just systems by recognizing and acknowledging the injustice, repairing and mitigating the damages in communities, providing space for community to heal and regenerate. 2) Procedural Justice focuses on fairness in the decision-making process to ensure equitable access to power and voice concerns from all groups, especially from the less heard, to address injustice issues, environmental policies, and distribution of resources and assets through meaningful engagement and ultimately allowing the process to empower communities for self-determination. 3) Transformational Justice demands that inequitable systems of decision making and power imbalances are addressed and fundamentally restructured so that past harms may not be perpetuated 4) Distributive Justice is outcome-based justice and focuses on fairness in the distribution of environmental quality, ecosystem services, amenities, and resources while in the meantime aims to avoid disproportionate exposure to environmental hazards and pollution or climate change impacts. 5) Generational Justice considers dynamics over time and thus decisions made today shall consider the impacts of plans and projects over generations.

Comparing the theoretical framework to the results from a separate NATURA survey study that aims to gauge the network partners' perceptions and current practices on achieving justice goals, a discussion on the gap between theory and practice shed some light on the need for a holistic view of justice in NbS. The justice framework for NbS project has implication for climate justice planning through integration of all five justice principles that allow systemic inequity to be identified and rectified, prioritize NbS resources toward vulnerable communities via climate justiscescape assessment (Cheng 2019), establish measures for making NbS projects accountable for equity outcomes, and enhance coping capacity of communities and stewardship for sustainable development goals.

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Key Words: Nature-based Solutions, Climate Justice, Environmental Justice

#### COVID-19, FINE DUST AND THE USE OF URBAN PARKS IN SEOUL, KOREA

Abstract ID: 948

Individual Paper Submission

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The spread of COVID-19 pandemic and fine dust are causing significant changes in the outdoor activities of urban residents. The COVID-19 pandemic has undoubtedly affected their behavior, and the fine dust problem was a major concern in Korea prior to the COVID-19 outbreak. The risk of fine dust tends to attract urban residents to a more pleasant indoor spaces rather than outdoor activities (Sexton, 2012). There are, however, some variations in findings of empirical studies that incorporates the mobility constraints due to the spread of COVID-19 pandemic in recent years. Specifically, there are conflicting results concerning the effects of the COVID-19 on the use of urban parks. Some studies indicate that the number of visitors to open spaces has increased relative to the period prior to the pandemic (Frima et al., 2020), while others point out that it has decreased with an overall decline of movements in all urban spaces (Ugolini et al., 2020).

Urban parks might function as an important public space at the city level, since these are easily accessible to all, as well as can replace indoor sport facilities, which involve high levels of interpersonal contacts. Therefore, it is important to precisely understand people's behavior of park use in the context of health risk factors of COVID-19 and fine dust. In particular, if we understand how the effects of these health risk factors vary depending on the features and locations of parks and the surrounding environment, this could suggest important implications for the planning and design of urban parks.

This paper aims to investigate the seasonal changes in movement patterns of urban park visitors according to the risks of the COVID-19 pandemic and the fine dust that occurred in Seoul, Korea for the period from 2019 to 2020 and to identify the characteristics of parks that influence the use of parks under the health risks. For this study, we first build a panel dataset that includes the number of visitors to urban parks based on the cell phone signals from base stations located in Seoul, Korea as a dependent variable, and independent variables involve the seasonal factors, such as the level of fine dust and temperature. Also, the characteristic of parks, such as their location, green coverage ratio, shape and size and amenities are added to the model to explore the effects of attractive factors.

The findings will be as follows. First, the number of park visitors sharply declined due to the shock at the beginning of the pandemic, but as time passed, this number has gradually increased because of pandemic fatigue with social distancing driven by a prolonged COVID-19. Also, many would not have chosen to go out on days when the risk of fine dust is high. Second, park visitors are more likely to use parks with a high green coverage ratio, outdoor sports facilities and large in scale due to concerns about the fine dust and infectious diseases impacts. In terms of land use in the surrounding areas near parks, there would be more visitors in parks near the residential areas than parks near the commercial areas since it often requires a relatively long distance to avoid closed spaces, crowded places and closed-contact setting. These findings suggest some implications for planning urban parks under these health risks of COVID-19 pandemic and fine dust.

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Key Words: Urban Parks, COVID-19, Fine Dust, Out-door Activities, Panel Analysis

## THE SOCIAL NATURE OF INFRASTRUCTURE: RACISM, JUSTICE, AND URBAN CLIMATE CHANGE PLANNING

Abstract ID: 958

Individual Paper Submission

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The urgency of climate change and the emergence of a political-environmental movement should change the way planners understand and plan urban infrastructure. In 2019, the US Congress announced the Green New Deal (GND), a set of policies to drive renewable energy and the low-carbon economy and eradicate poverty while protecting against climate change. Large-scale infrastructure, such as transportation, energy, and water management, was a prominent part of the original 1930s New Deal. Such infrastructures are now a critical part of any broad effort to reduce greenhouse gas emissions and protect against climate change impacts. To what extent do we understand the potential of the GND, with its environmental and social goals, to remake our cities and regions?

Accomplishing the GND's goals depend on whether planners are able to understand the contested social and spatial conditions of the present and envision more sustainable and just urban futures (Goh 2020a). This paper focuses on one aspect of this contestation: historical racism in planning, community participation and protest against infrastructural plans, and large-scale urban climate change response infrastructure. While initiatives such as the GND promise renewed public investment and coordination of infrastructure, large-scale environmental plans have

encountered opposition in cities in the US and beyond. Plans to “green” or protect once neglected sites can often displace residents and cause gentrification, further excluding poor residents, often communities of color, pushed to vulnerable sites by prior waves of racist urban development and exclusionary land policies (Gould and Lewis 2017; Anguelovski et al. 2019).

Researchers have asserted that the most promising approaches to resisting both the impacts of climate change and unjust actions in response are those that are politically organized from “below” – from the viewpoint of systemically marginalized groups – and coordinated across a broader range of activists, sites, constituents, and collaborators (Routledge et al. 2018; Agyeman et al. 2019; also Goh 2020b). This is particularly important when making claims of justice against structural oppression, while the coordination is essential if such struggles are to extend beyond specific places and threats to challenge broader systemic social, political, and environmental inequities. But such community-based organizing is more often in opposition to environmental infrastructural development, citing racist and unjust development. How do we understand these oppositional histories and present dynamics, in order to plan better? This paper analyzes the politics of contemporary climate change plans and community-based responses through the author’s mixed-methods empirical from sites in Boyle Heights, Los Angeles, and the Lower East Side and Red Hook, New York City. It is based on spatial ethnography, mapping, interviews, and field observations. The paper illustrates the histories of racist and exclusionary development, and the contemporary dynamics of grassroots and community organized responses.

Climate mitigative and protective initiatives such as those promised by a GND offer alluring glimpses of better ways to imagine more sustainable urban futures. But they also bring up the intractability of particular structures of urban governance and the continual injustices of dominant modes of urban development. The paper concludes by proposing a new framework of urban climate development, a “marginalized first” model that, from the start, systemically prioritizes historically vulnerable people and places on questions about who, where, and how to implement plans. Such a model would break historically oppositional dynamics of “big plans” and community engagement, and build and maintain trust in new urban climate infrastructural development when we need it most, the very near future.

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Key Words: climate change planning, urban politics, infrastructure planning, community participation and protest, green new deal

**LOCATING THE CITIZEN (WASTE GENERATOR) AS A FOCAL ACTOR IN THE WASTE MANAGEMENT: A CASE STUDY OF PATNA, BIHAR**

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Today, Solid Waste Management (SWM) is a relatively new concept for most Indian cities, more so for a city growing and urbanizing exponentially (Sudhir and Gururaja, 2012). To make the situation worse, most of India's cities are unplanned and urban service delivery is collapsing, and the most significant causality has been solid waste management. Indian cities generate approximately 62 million tons of Municipal Solid Waste (MSW) annually, and by 2031 the total waste generated will be 165 million tons (Planning Commission Report, 2014). Currently, only 20 per cent of the solid waste is processed, and the remaining 80 per cent is dumped untreated every day in the landfill sites (India Today, 2019). Managing these mammoth quantities of waste rests solely with the local Municipalities. SWM is by no means an easy task for any government and requires coordination between many local and State departments and private bodies. In most cities, the current practice of disposing of MSW is either dumping or burning the trash in designated lower-lying areas. The principles of sanitary landfilling are rarely followed. This daunting problem is amplified in unplanned cities. Unfortunately, most of the Indian towns and especially Patna falls in this category. Patna, India's dirtiest capital city, is facing the enormous problem of untreated waste (Panday, 2014). Undoubtedly, municipalities and local bodies are putting their best foot forward to tackle this critical issue. However, acute density and congestion exacerbate the matter.

It is paradoxical that, in many cases, solutions for these mammoth challenges already exist. Innumerable scientifically proven waste recycling technologies are available for most components of solid waste. For instance, hundreds of technologies exist to recycle organic (biodegradable) waste by households. They can be adopted at the most decentralized level - even by waste generators (families, institutions, office etc.) themselves. In India, nearly 70% of all Municipal Solid Waste and almost 90% of all household waste are easily recyclable. The availability of these recycling options implies that waste generators can be made responsible for recycling their own waste and for the State to take responsibility for the remaining 10% of household waste (the non-recyclable component). This would lead to tremendous savings for Municipalities to take care of other infrastructure and service-related issues, lead to substantial environmental and economic gains and take cities towards long-term, environmentally sustainable economic growth.

Studies have shown that apart from the awareness-driven sustainability and waste management practices, the incentives given to households have also helped reduce waste. Many specific approaches such as weight-based billing approach, fair allocation of the costs depending on the amount of waste generated, an overall reduction in waste generation, increased quality of recyclables, and encouraging composting household level have proved to be quite successful (Dahlen, 2007; Houtven & Morris, 1999; Linderhof, Kooreman, Allers, & Wiersma, 2001; Noehammer & Byer, 1997).

With this background, the present paper seeks to explore the possibility of locating the citizen (waste generator) as the focal actor in the waste management system, with the agency to recycle their waste and pursue the support of other actors (including the State and NGOs) as and when required. The study utilizes 500 household survey data collected from 5 wards in Patna to understand the waste management systems and practices and their implications. Their level of satisfaction/dissatisfaction with existing processes and finally to measure citizens' willingness to adopt and pay for waste recycling. The survey data is supplemented with 20 focused-group discussions and 25 in-depth interviews with stakeholders (including government officers, NGO personnel, University Professors) and several case studies of households recycling their organic- waste.

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Key Words: Solid Waste Management, Unplanned urbanization, Urban Resource Management, Environment, Incentive-based program

## **ADAPTATION PLANNING FOR CLIMATE CHANGE IN MEGACITIES: A CASE STUDY BETWEEN NEW YORK, SHANGHAI, AND LONDON**

Abstract ID: 963

Individual Paper Submission

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As global temperatures continue to rise, climate change has become one of the most significant, persistent and highly dynamic challenges facing society (Birchall & Bonnett, 2021). Cities are seen as particularly vulnerable to climate change because of the concentration of people and wealth in limited space (UN General Assembly, 2015). Although mitigation and adaptation are two parallel lines of coping to climate change in UNFCCC, mitigation has traditionally received much greater attention in the climate change community than adaptation, both scientifically and from a policy perspective (Füssel, 2007). However, there is increasing evidence that the climate will continue to change for the foreseeable future. And the global cities will increasingly need to be prepared well to adapt to the following climate change (Betsill & Bulkeley, 2003). Due to the coastal megacities facing similar climate change risks and apparent in vulnerability, we select different cities in global areas, including New York in North America, Shanghai in Asia and London in Europe as the research objects. Therefore, we plan to answer the research questions: 1) Who is adapting to climate change in megacity planning? 2) In what way should the megacities adapt to climate change in urban planning? 3) What are the driving power and barriers of climate adaptation planning in megacities?

To evaluate and compare the state of urban adaptation, systematic data collection and analysis methods are used in this paper. We used web-based urban planning documents on climate adaptation as a proxy for identifying and characterizing the occurrence of adaptation (Araos et al., 2016). By using the search engine Google, we collected the following documents of the three megacities to extract information on urban adaptation to climate change: 1) urban master plans; 2) Strategic planning of climate change adaptation; 3) Decision documents for the departments of urban development, built environment and infrastructure. Firstly, we developed a coding system to conduct the content analysis of the planning documents. The coding system classified the content based on the climate impact and affected sector, as well as its policy type. Secondly, the types of planning models for climate change adaptation in megacities under different development stages are summarized. Finally, we used the dynamic mechanism framework of institutional, political and social technologies to compare the driving power and barriers of climate change in megacity (Betsill & Bulkeley, 2003).

The result shows that the adaptation planning of the three megacities is all led by the local government. Besides, the departments of urban planning and development, built environment, and infrastructure are involved the most. Adaptation in London's adaptation is the self-made model of managing government action; Adaptation in Shanghai is the supply model of products with adaptive ability; Adaptation in New York is an enabling model that promotes other participants through collaboration. In general, our findings suggest that the adaptation of megacities in

developing countries (Shanghai) will also take place at the policy level, rather than at the community-based level as is normally believed. The megacities in the developed countries (London and New York) have improved in the course of long-term adaptation planning, which is instructive for other cities.

The findings in this study may help cities to learn from each other and encourages planners to think about how cities in different stages of development and different social contexts can design and implement adaptation planning for climate change. The methodology in this paper will also provide a framework combining objects, models, and mechanisms for evaluating and comparing climate change adaptation planning between cities.

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Key Words: climate change, adaptation planning, megacities, model comparison, enlightenment

#### A PROBABILISTIC FRAMEWORK TO MODEL THE EFFECTIVENESS OF EMISSIONS REDUCTION POLICIES

Abstract ID: 964

Individual Paper Submission

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Communities throughout the United States are consistently or incongruously experiencing unhealthy levels of air pollution (US EPA, 2019). The regulatory frameworks designed to curb local or state-wide air pollution issues address the industrial and domestic forces behind the pollution while not always being able to account for sudden natural disasters that prompt drastic measures (Kioumourtzoglou et al., 2016). The two major pollutants that our study focuses on are Sulfur Dioxide and Carbon Dioxide, gases emitted in millions of metric tons from the consumption of fossil fuels.

Sulfur Dioxide is the component of the greatest concern among the larger group of Sulfur Oxides. Control measures around SO<sub>2</sub> are normally expected to control people's exposure to all gaseous SO<sub>x</sub> (US EPA, 2019). High concentrations turn into Particulate Matter that have long term health and environmental issues, some of them being creation of haze (reduced visibility) and respiratory issues. The largest source of emission is burning of fossil fuels by power plants and other industrial facilities. Smaller sources of SO<sub>2</sub> emissions include: industrial processes such as extracting metal from ore; natural sources such as volcanoes; and locomotives, ships and other vehicles and heavy equipment that burn fuel with a high sulfur content (EPA, 2019). While there has been an 82% reduction in the emission of SO<sub>2</sub> in the past 10 years, the upper Midwest and Southwest regions of the country are way above the national average (US EPA, 2020).



The regulatory frameworks designed to curb local or state-wide air pollution issues address the industrial and domestic forces behind the pollution while not always being able to account for sudden natural disasters that prompt drastic measures. This is probably why SO<sub>2</sub> is managed in some parts of the country and CO<sub>2</sub> is comparatively a lot more unpredictable.

In this paper, we create an air quality heat map across a 10-year timeline along with a comparative policy evolution heat map. The objective is to compare the policy around pollution from natural disasters with the policies around industrial sources of pollution. We create a probabilistic understanding around the air quality and devise a resource allocation framework for planning purposes. The heat map provides a view of the current policies around both the pollutants. Under the world's largest cap-and-trade system or allowance trading system for SO<sub>2</sub>, benefits have been reaped in multiple regions around the country yet not all (Chan et al., 2012). Similarly, spurred by the 2018 IPCC Special Report on Global Warming 1.5 degrees Celsius, net zero emission targets or Carbon Dioxide Removal (CDR) have emerged as a new organizing principle of climate policy (Schenuit et. al., 2021).

The framework aims to explore the costs and risks associated with these policies. For SO<sub>2</sub>, we create a dynamic programming allocation model to investigate the allowance trading and for CO<sub>2</sub> in the context of natural disasters, we create a model to optimize resource allocation for containment and the minimization of emissions. The framework works around stringent climate goals while accounting for the difference between the larger issue of climate change and local or state-wide air quality index.

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Key Words: emissions, climate change, modeling

## USING GOOGLE STREET CAR SENSOR DATA TO IMPROVE AIR POLLUTION MODELING FOR PLANNING

Abstract ID: 992

Individual Paper Submission

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Air pollution is a leading cause of premature death worldwide. Planners have many tools to help abate air pollution in the city (e.g., tree canopy cover, greenspace, etc.), however modeling high resolution data to inform the use of those tools is challenging (Abhijith et al., 2017). Without high-resolution pollution measurements, street-level planning decisions to abate air pollution exposure to citizens is difficult if not impossible (Gurram et al., 2019). Current air pollution models require data from spatially references sensor readings. The most common sensors used are those operated by the EPA or other public organization, of which there are typically less than 10 reliable sensors in each major city (Hu et al., 2017). In this study, we used a novel air pollution dataset in tandem with open-source

software to create a high-resolution air pollution grid: data gathered by sensors affixed to Google street cars. The data, which is available for use by the public with Google's approval, was measured in Los Angeles between May 2016 and September 2017. Other studies have verified the efficacy of this large data set (with more than 10 million sensor readings of PM2.5 during the study period), however none have evaluated it in context of planning decision making (Messier et al., 2018).

We used Land Use Regression (LUR) predictive modeling to create gridded surfaces of estimated air pollution across all of Los Angeles County. Modeling was performed using the utilizing open-source XLUR software and used both Google street car and stationary EPA sensor data (Molter, 2020). XLUR is an open-source ArcGIS Pro package is free and easy to use and could be easily used by planning offices. In addition to sensor data, we used various geographic co-variables in our model (e.g., sum of building footprint, road width). We found that the coefficient of determination ( $R^2$ ) value for our model is substantially higher when incorporating the non-stationary Google street car data. This suggests that the gathering of air pollution data from mobile sources should be encouraged by planning departments to develop higher quality air pollution models to inform planning decisions.

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Key Words: air pollution, land use regression, urban climate modelling, open-source software

#### **ANALYZING IMPACT OF URBAN FORM AND NEIGHBORHOOD CHARACTERISTICS TO BUILDING ENERGY USAGE: A CASE OF SEOUL METROPOLITAN AREA, SOUTH KOREA**

Abstract ID: 994

Individual Paper Submission

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Creating sustainable urban form is an imperative task in climate change planning because urban form would affect energy use in transportation residential and non-residential building. Reducing building energy use is imperative in urban planning because building energy consumption is either the largest or larger than industrial-transportation consumption in many developed counties in these days. According to Rattie et al (2005), building energy use is a function of urban form, building design, energy system efficiency and occupant behavior. Building design, energy efficiency, and occupant behavior undoubtedly have direct impact on energy use at building scale; however, whether planning variables associated with urban form would have significant impact on building energy use or not

is still unclear.

In this study, we examine the relationship between building energy consumption and urban built environment characteristics related to urban form by obtaining building scale energy consumption Bigdata in Seoul Metropolitan Area, South Korea. This study focuses on answering following questions: (1) “Would urban form or community neighborhood characteristic have impact on building energy use?” : (2) “How can we effectively identify and visualize the hotspots of building energy use based on built environment and community neighborhood characteristics?”

In order to answer these questions, we employed multiple statistical models using the annual building energy consumption big data (electricity and natural gas) between January 2018 and December 2018 in Seoul. This bigdata were derived from governmental billing database and incorporated to Geographic Information Systems (GIS) to analyze the spatial pattern of energy consumption varied by neighborhood types. In order to assess the association between energy consumption and physical built environment characteristics of different neighborhood types, we performed spatial join with the annual energy consumption data and individual building features. We also created a 100x100-meter-grid spatial layer covering Seoul, which includes physical built environment attributes and energy consumption data. The main variables representing physical conditions of community neighborhood characteristics are land use type, house type, size of building floor space area, compactness, population/dwelling unit density, street configuration, building weatherization, building configuration, vegetation, and surface coverage.

Preliminary result shows that building energy consumption would be affected by main urban form variables and neighborhood types variables such as a size of building floor space area, dwelling unit density, building weatherization, vegetation, and housing types. We also found that hotspots analysis or local Moran's I (Anselin, 1995) is useful in visualizing certain pattern of high/low clusters of electricity and natural gas usage, which varies by cohort characteristics and building weatherization.

Until recent days, the effects of different urban forms on energy saving and consumption have not been rigorously discussed due to lack of rich energy database available to public. This study demonstrates the methods how energy big data can be incorporated into GIS and be utilized to understand building energy consumption pattern varied by neighborhood types. Most importantly, this research supports the proposition that the energy savings regulations and strategies should include incentives not only building by building design principles approach but at community-neighborhood-district scale.

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Key Words: GIS and Energy Big Data, Urban Form, Hotspot analysis

#### **FROM NATIONAL INTEREST TO LOCAL BENEFIT: CHANGES IN AMERICAN NATIONAL WATER RESOURCES POLICY AND ITS IMPLICATION FOR LOCALIZED WATER PLANNING**

Abstract ID: 995

Individual Paper Submission

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Conflicts surrounding water is nothing new. Since the Colonial Era in American history, there has been ongoing debates regarding how populations and geographies should engage with water that often run along differing -and at times, opposing- ideological lines. Controversial water projects as products of wider, national water planning practices, have been recognized as sites of contestation, particularly between Indigenous communities and the non-indigenous. These controversies exemplify the commitment between Tribes and the Federal Government where respective values are brought to the forefront and oftentimes communicated in explicit terms. Projects like the Dakota Access Pipeline and the Pick-Sloan Plan serve as reminders of ongoing value-based clashes when it comes to Water Resources Planning, and the degree to which certain values are prioritized within the water planning process (Lawson 2009).

One of the goals of water resources planning is to seek a balance between values put forward in the planning process and aims to serve a broad public interest. The Federal government is deeply involved in water resources planning and thus, does not operate as a value-free bureaucracy but instead aims to achieve national goals through localized project plans, most notably through federal funds (Griggs 1985). Given that it both produces legislation and helps implement project plans, it is imperative to be critical about the underlying values imbedded within water-related laws because local water projects become physical manifestations of value-based stances that promote national interests. As the activities at the Dakota Access Pipeline have shown, sites of development can become sites of contested values. It will be key for policy makers and planners to begin to recognize what ideological components they may be reproducing through their work to strive for a form of water planning that more holistically understands differing worldviews.

This paper analyzes significant legislation related to water resources to understand changes in national values from the 19<sup>th</sup> Century to the present. Using scholarship on ideological frameworks, a discourse analysis is used to distill conceptual components that constitute value-based positions which, depending on their combinations, indicate a given ideological background (Freeden 2013). A history of American water resource policy is constructed to illustrate where certain values take priority within the legislation from which generalizable ideological trends can emerge. Preliminary findings suggest that values like efficiency and productivity have been historically durable within federal legislation whereas concepts related to environmentalism continue to struggle against economic interests. The paper concludes with recommendations to how water resource planners can become more involved with the federal legislative process and the importance of local water entities to forming holistic water policies.

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Key Words: Water Resources Planning, Values, Ideologies, Legislation

## **USING SCENARIO DEVELOPMENT FOR WATER DEMAND FORECASTING UNDER COMPOUNDING PRESSURES OF POPULATION GROWTH AND CLIMATE CHANGE**

Abstract ID: 1086

Individual Paper Submission

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Communities face increasing uncertainty with looming climate change impacts, population migration and growth, posing new challenges for long range community planning. Preparing for these challenges requires discernments of these foreseeable futures in terms of the needs of human and natural resource sustainability (Agarwal, 2002). There

has never been a more important time for applying resilience planning frameworks to navigate the complexity, uncertainty and transformation across scales to persist, self-organize, and innovate (Berkes et al., 2003; Folke, 2016; Olsson et al., 2014, Berkes, 2017), against climate impacts. Resilience requires the preservation of the core function of cities, while increasing the capacity to absorb and bounce forward from a disturbance.

To adequately address the impending complexities and needed capacity to maintain a community's core in the face of dramatically changing circumstances (Zolli & Healy, 2012), greatly benefits from forecasting multiple conceivable futures (Bishop et al., 2007; Quay, 2010; Van der Heijden, 2011). This study presents a new approach to scenario planning for future residential water demand projected to the year 2050. The study area is the City of Aurora, CO, located in the Denver metro area of Colorado's Front Range. Like most communities in the area, Aurora faces compounded pressures of intense growth and climate impacts on available water supply. Additionally, Aurora predominantly holds junior water rights, which leaves the community vulnerable to priority calls on the Colorado River, in times of drought; aggravating the challenge to secure a water resilience future. This study provides better insights for possible trajectories of future water demand and offers planners a tool to prioritize policy changes to meet water adequacy goals.

Scenario planning helps create transformations in problem solving (Ramirez & Wilkinson, 2016), by identifying various options for a decision-making process (Van der Heijden, 2011). By creating and comparing plausible future conditions and assessing different outcomes, scenario planning can improve policies for possible futures (Kim & Newman, 2020). Various sectors of community planning employ scenario planning tools, including transportation, economic development, land use, natural resources and ecological systems and resilience planning (Goodspeed, 2017). This research contributes to other notable efforts in improving scenario development processes, tools, and evaluation, reaching beyond the limitations of the more stochastic "predict and plan" approach, to foresee future uncertainties (Chakraborty et al., 2011). By combining both the typical predeterminants and plausible complexities stemming from climate change and population relocation dynamics, the scenarios improve the ability to rank levels of impacts and uncertainties (Kim & Newman, 2020; Postma & Liebl, 2005).

This study applies a strategic approach to planning for water scarcity, using a compilation of tools, frameworks and technologies (Ringland & Schwartz, 1998) to help Aurora best manage future water uncertainties. Using 50 distinct future growth planning scenarios projected to the year 2050, the scenarios forecast outdoor water demand defined by variations of 6 factors: predicted development extent, pervious lot area, home value, climate change severity, plant composition, and irrigation efficiency. The forecasts are based on a housing typology developed in a previous study, which distinguishes 8 distinct housing types by yard size, home value and current outdoor water demand. By using improved synergies for water and land-use scenarios (Couclelis, 2005) this research simulates development beyond the currently approved Master Planned developments for Aurora. The collection of insights for growth strategies (Schwartz, 2012) that can influence planning decisions based on combinations of changes in land use zoning, ordinances and technologies to address climate and population impacts (Bowman, 2016; Bunn & Salo, 1993; Phadnis et al., 2016; Van der Heijden, 2011). This study supports the notion that creating strong land use planning regulations can foster greater long-term water sustainability and resilience.

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Key Words: Scenario Planning, Water, Land Use, Resilience, Climate Change

## **BUILDING COMMUNITY EXTREME HEAT RESILIENCE THROUGH SCIENCE ENGAGEMENT WITH MIDDLE SCHOOL STUDENTS**

Abstract ID: 1095

Individual Paper Submission

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Extreme heat events pose a growing threat to human health and urban infrastructure and are a major consequence of climate change. Extreme heat is exacerbated in cities, where temperatures can range from 10°C to 15°C hotter than in rural areas. In the US, the historical effects of residential segregation and disinvestment in Black neighborhoods persist today and are reflected in higher temperatures in these neighborhoods (Wilson, 2020). In addition, fatalities and hospitalizations due to heat exposure disproportionately impact low-income communities of color. However, community-based extreme heat resilience planning remains an infrequent planning activity (a notable exception includes Guardado et al., 2020).

In this research, we explore the potential of science engagement with middle school students as a way to increase community thermal landscape legibility and improve extreme heat resilience. Through a partnership with Roanoke City Public Schools which will take place in the summer of 2021, the project team will deliver a two-week summer curriculum around sensing of urban thermal environments. Students will receive background information on the physical phenomena of urban heat island effect, urban microclimates and the effects of specific landscape elements; as well as the social factors that have shaped the spatial distribution of infrastructure, vegetation, and housing stock. Using handheld air temperature sensors, and an infrared camera mounted on an Unmanned Aerial Vehicle (drone), students will map their own school grounds and make observations about spatial correlations between types of urban surfaces, surface temperatures, and air temperature. The project team will collect students and resident perception of their neighborhoods' thermal environments, specifically noting if and how participation in the summer curriculum and data collection activities changes perceptions of the thermal landscape in the community.

This research aims to fill a gap in the current understanding of what kinds of data—what resolutions, what experiences, and what sources—are needed to support neighborhood heat resilience planning. This question is important because science-action interface research shows that data and models used in decision-making, policy, and action contexts need to be evaluated differently than those used in pure scientific inquiry. In decision-making contexts, data should be evaluated by their ability to contribute to: improved communication of the problem through creating shared representations of reality, improved learning about environmental management practices, and creating perceptions among stakeholders of credibility, validity, and trust.

The concept of “landscape legibility” in research-action projects frames our study through connecting questions of what kinds of data can both (1) increase what we know about urban social-environmental phenomenon and (2) lead to increased citizen engagement. Coupled with urban histories and collections of personal experiences of the landscape, citizen data collection helped make visible the histories of the place that were otherwise hidden from sight (Spirn, 2005). Although urban planning for resilience—increasing a city's capacity to adapt in the face of shocks and stress—is a goal of many cities, residents often remain excluded from meaningful engagement in planning processes (Meerow and Mitchell, 2017). Data collection techniques in which residents map their experiences and impressions of place spatially are an effective way to enrich and contextualize physical environment data collection (Lynch, 1960), which is integral to resilience planning. We will share preliminary results of our project, focusing on evaluating the extent to which student perceptions of their neighborhoods changed after participating in science engagement activities.

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Key Words: Urban Heat Island, Extreme Heat, Resilience, Citizen Science, Urban Sensing

## **LIVING DURING COVID-19 WITHOUT TOILET FACILITIES: EMPIRICAL EVIDENCE FROM TWO SETTLEMENTS IN THE GLOBAL SOUTH AND NORTH**

Abstract ID: 1112

Individual Paper Submission

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As an infectious disease, one of the mediums of transmission of COVID-19 is touching contaminated surfaces. When there is a lack of sanitation and washing services, people tend to not washing their hands, thus transmitting easily the virus. It is worth noting that some recent research shows that there may be a fecal-oral transmission Hindson (2020). Given the relationship between health vulnerability and the existence of sanitation services from the literature review, this study will focus on a specific and contemporary health threat: COVID-19. As a consequence, the research question is framed into: how does the lack of sanitation services relate to the initial impact of COVID-19 in urban settlements?

To uncover evidence that might explain the exacerbated initial impact of COVID-19, I will focus on two geographies: Belen, Peru, and the Southwest of Texas, US. The initial impact will be measured using 6 indicators, which are the result of analyzing 3 periods (30, 60, and 90 days), and 2 measurements (morbidity and mortality). The methodology consists of an explanatory sequential design comprised of two quantitative methods followed by a qualitative one. The first method will show the descriptive statistics, and visually explore spatial descriptive patterns in a longitudinal and disaggregated analysis using the neighborhood level as the unit of observation. We will calculate the spatial dependence of toilet access and COVID-19 cases using spatial autocorrelation and Getis-Ord  $G_i^*$  analysis to identify the hotspots. The second will test whether there are differences in sanitation services between the neighborhoods to identify which ones are statistically distinct and perform spatial regressions. This step will focus on compare neighborhoods with different sanitation levels using a test of differences of means for the six indicators. This analysis will serve to determine whether those areas with higher sanitation levels had a lower, similar, or higher impact on each of the six indicators. Finally, I will run a spatial regression to measure the relationship between the indicators statistically significant from the previous step, the level of sanitation, and the level of spatial dependency of each settlement. The third will integrate the results from both settlements and compare the strength of the relationships between the two settlements.

Preliminary results in Belen show that according to the number of cases, the lack of sanitation infrastructure does not have considerable relationships with COVID-19 impact. However, since the number of tests during the first 30 days was extremely scarce, this measurement is not a reliable one. . This implies that the characteristics of the neighborhood, where sanitation services are one, made Belen the most vulnerable place to live since it was the first one to collapse. It is uncertain whether the initial terrible impact had an awareness effect on lowering the impacts after 30 days or whether there is another reason (like the herd immunity cited by the local expert). As a

consequence, we can conclude that the lack of sanitation services is related to higher COVID-19 impacts in Belen, but only during the first periods of the pandemic.

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Key Words: sanitation, COVID-19, spatial dependency, water insecurity

#### CLARIFYING THE IMPACTS OF ARIDIFICATION AND WATER CONSERVATION

Abstract ID: 1116

Individual Paper Submission

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Faced with dwindling resources and burgeoning populations, political leaders and environmental planners are grappling with how to reduce water consumption in the face of pressing climate concerns. In the western United States, a legacy of water availability has created green cities, towns, and agricultural fields in otherwise dry regions, yet there is growing awareness this level of greenness is not sustainable. Outdoor water use is the majority of urban water consumption and identifying landscapes where irrigation can be reduced or removed is one conservation program being pursued across scales and geographies (Gage & Cooper, 2015; Mini et al., 2014; Pincetl et al., 2019; Wheeler et al., 2020). 'Reclaiming the desert' has become relinquishing green areas back to the desert. Donald Worster wrote in *Rivers of Empire* "...one cannot have a life both ways - cannot maximize wealth and empire and maximize democracy and freedom too" and encourages the desert to emerge as it wants to be in order to re-balance life in the arid US (Worster, 1992, 334). At a time of reckoning with issues of systematic racism and environmental injustices, the re-emergence of the desert brings Worster's call to center equity and justice into the process of planned aridification.

The desert is also re-emerging on its own terms. Often mislabeled as increasing frequency of drought, the western US is undergoing overall aridification (Overpeck & Udall, 2020). Without fore fronting equity and justice in planning this next phase, climate-induced aridification and water conservation efforts may amplify the deleterious effects of aridity on vulnerable communities. To understand how increased aridification due to climate change and water conservation measures are going to interact, there needs to be a better understanding of where the driest areas of the city are currently and how they overlap with other risks. Through Land Surface Temperature, vegetation coverage, and socio-economic data, areas where heat mitigation might be needed can be identified. Geospatial tools can also positively identify areas where water conservation might be appropriate. However, if these two processes are not considered together, a strict focus on water conservation measures may amplify neighborhood vulnerabilities. This research investigates how the effects of increased aridification coupled with water conservation programs might complicate heat vulnerability mitigation. Do water conservation projects put communities already at risk of heat vulnerability at greater risk by removing potential cooling sources?



This research project uses geospatial methods and measures of association to determine how arid land covers, heat risk indicators, and water conservation programs are related to socio-economic status in Denver, Colorado. Research is conducted at two units of analysis: the city neighborhood scale and the park scale (Nesbitt et al., 2019). Neighborhoods rather than block groups are used to more closely align with city planning efforts on equity and green space. Neighborhood scale is evaluated to assess the context of arid land cover and relate this information to socio-economic status. The park scale is evaluated to determine how management of park land might contribute to overall aridity, or how park land management might serve as cooling source for the area (Voelkel et al., 2018). This research contributes to the literature by developing a method for detecting urban areas where long-term arid conditions put communities more at risk for environmental injustices related to water conservation programs and climate change. Community leaders and professional planners will find this research helpful in their water conservation policy and program decision-making processes.

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Key Words: equity, aridity, water conservation, heat vulnerability

## **POSTERS**

### **THE IMPACT OF CLIMATE CHANGE IN THE DYNAMICS OF ALABAMA’S LANDSCAPE**

Abstract ID: 588

Poster

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The paper aims to through light on the “Climate change” in the magnificent Mobile Bay and adjacent areas in Alabama and the low impact development as a strategy to mitigate the future risk. Climate change has become the most severe and challenging global concern today that is threatening public health, ecological and biological systems, and the economy of the world simultaneously. The complexity of climate change and natural hazards makes it difficult for most people to recognize the short- and long-term consequences, which prevent people from understanding the seriousness and the urgency of the issue. Keep in line with the other parts of the world, Alabama’s coastal areas face the impact of climate change, including repeated tornados, land erosion, and marshland sinking. The effect of repeated tornados and sea-level increase for the mobile bay in recent times will engender the possibility to submerge wetlands, marshland, and drylands and erodes beaches, and amplify the coastal flooding. Which later exacerbates tropical storms and hurricanes that affect the other portion of Alabama

eventually. The combined effect of rising sea levels and coastal storms has a significant impact on cities, infrastructure, and amenities around Mobile Bay. The Vulnerable community of this area later provokes climate migration that creates an effect in the more significant job sector, support, and other Alabama cities. The urgency to address the impact of tornados and rising sea levels on the vegetation and aquatic life of coastal bay has become vital to conserve those state assets. Alabama and Mobile Bay themselves house thousands of endangered species, and small climate changes would significantly impact the extinction of those unique species. This paper will focus on researching the rising natural hazards due to climate change of the mobile bay area and Alabama and its effect on the landscape, species, humans, and coastal landscape dynamics. The research also sheds light on low-impact development and materials strategies to enhance the economy, ecotourism and slowing down climate change risk. Analyzing maps and data is the primary methodology to execute the research. This ongoing research is an opportunity for designers, policymakers, and conservationists to work together toward future sustainable management practices, integrated planning, and adaptation strategies to mitigate future climate change risk in Alabama's landscape.

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Key Words: Climate change, Tornados, Landscape, Coastal Ecosystem, Environment

#### THE EFFECTS OF URBAN COMPACTNESS ON DISASTER VULNERABILITY

Abstract ID: 632

Poster

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As urbanization has progressed over the centuries around the world, the decline in population decline, environmental pollution and economic crises are frequently occurring. These problems threaten the safety and daily life of people living in cities and are creating new uncertainties and challenges. Among various solutions, the need for a sustainable urban spatial structure is being suggested.

At the UN Conference on Environmental Development (UNCED) held in Rio, Brazil in 1992, the concept of sustainable development emerged and compact cities were discussed as a feasible urban spatial structure. The concept of a compact city can be said to promote high-density development and mixed land use, increase direct accessibility, and activate public transportation commuting rates and pedestrian activities. Research results are accumulating that the function of the compact city is directly or indirectly interpreted as a positive factor in

sustainable development.

On the other hand, there are also issues of concerns and criticisms about compact cities. Claims that low-density urban spaces improve welfare more than high-density spaces, and claims that high-density urban spaces are not desirable from the perspective of residents due to low park and green area ratios and that an increase in crime levels in a negative aspect to safety, etc. In addition, the Thesis on the disaster vulnerability of dense spaces is also being presented. The claim that the higher density made urban area disaster risk, the claim that the denser city causes inappropriate housing conditions and excess capacity, and that it causes conditions that are vulnerable to floods, landslides, and fire disasters. The rationale for the vulnerability is supported by the assertion that the densified metropolitan city has a disaster risk during the disaster risk identification process.

Nevertheless, it is regrettable that research on the characteristics of compact city planning in terms of disaster prevention has not been conducted in-depth. For example, a compact city pursuing a functionally rational approach means concentration and the creation of high-density buildings rather than the distribution of urban functions. However, this planning approach is a structure that increases vulnerability to crime and fire, as well as natural disasters. In particular, the vulnerability in a large city with a population of 10 million or more acts as a significant negative external effect. Since the side can be offset, research on this needs to be carried out.

This study aims to empirically analyze the impact of the density index of compact cities on disaster vulnerability using multiple regression and to measure the disaster prevention vulnerability of compact cities. The results show that cities with higher density were more vulnerable to disaster prevention. The significance of this study can be found in that the results of this study can be reflected in the disaster prevention plan prior to establishing the direction for building a compact city.

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Key Words: compact city, disaster prevention factors, vulnerable risk, Compressibility

#### EVALUATING MICROSCALE COOLING INTERVENTIONS THROUGH COMMUNITY ENGAGED MICROCLIMATE MODELING

Abstract ID: 906

Poster

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Exposure to extreme heat is a climate justice issue that requires a combination of urban climate science and an environmental justice framework for effective and equitable cooling solutions. More deaths are attributed to extreme heat than all other weather related disasters, meanwhile Black and Latino residents are 52% and 21% more likely to live in high heat-health risk areas (Guzman et al., 2020; Hulley et al., 2020). While local (100s-1000s meters) and regional (1000s+ meters) assessments of urban climate are well developed, they are often too coarse to inform municipal interventions that occur at micro scales (10s-100s meters), like a street segment. Thermal comfort within cities is highly heterogeneous and dependent on local vegetation, surface materials, and the form and spatial configuration of urban features (Middel et al., 2014; Stewart et al., 2014). There's a dearth of empirical data on micro and local scale dynamics and how specific design interventions influence thermal comfort. Moreover, there is little known about which land-uses create the largest pedestrian heat burden based on thermal conditions related to urban form. This project examines how urban form across three land-uses and planned cooling interventions influence thermal comfort through a community engaged microclimate modeling process in four CalEPA "disadvantaged" communities receiving funding from the Transformative Climate Change (TCC) program in California.

Using field temperature data gathered with residents from Ontario, Fresno, and Watts, and remote sensing methods, we have found that baseline conditions at these three TCC sites have low vegetation with air temperatures ranging on average between 35 to 50 celsius. Additionally, an evaluation of land surface temperature at playgrounds in elementary schools in Watts, an age where children are particularly vulnerable to extreme heat, average 51 celsius. Next steps in this study include: (1) Baseline assessment of Pacoima, (2) Building base models in the microclimate modeling software, ENVI-met, of commercial, residential, and school sub areas selected with community stakeholder input to model human thermal comfort, (3) Evaluating TCC planned cooling interventions and future scenarios selected through community stakeholder input, (4) Creating an urban form and design cooling strategy guide with community stakeholder input for cooling solutions at the street-level. This study will evaluate planned TCC and future cooling interventions, while ensuring TCC communities are empowered through participatory urban climate science and engagement throughout the microclimate modeling process. Additionally, this study will contribute empirical data on urban climate dynamics at the micro and local scales across three land-uses and for a set of specific heat mitigation design interventions.

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Key Words: Environmental Planning, Environmental Justice, Heat, Microclimate, Urban Design

#### NON-PROFIT RESPONSE TO CONCURRENT DISASTER EVENTS

Abstract ID: 1055

Poster

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Nonprofit organizations perform a crucial role in disaster recovery management. Their horizontal and adaptive structures serve as intermediaries between the government and residents in the community (Arlikatti et al., 2012; Chandrasekhar et al., 2014; Chikoto-Schultz et al., 2019). Nonprofit organizations are also better suited to promote the creation of social cognition, trust, and reciprocity, which often results in the creation of social capital (Ganapati 2006; Islam and Morgan 2012). Despite nonprofits' crucial role in disaster recovery, the literature in disaster planning policy has lacked insight as to how nonprofits deal internally with the recovery process themselves. This study examines recovery actions of nonprofits within the health and related community development sectors in response to compound and consecutive disasters. We examine how health and non-health-focused nonprofits resolve competing priorities when extreme weather and/or geohazard events or the recovery process occur simultaneously with a public health disaster? We conducted a telephone survey of 250 health and non-health sector registered nonprofits in Puerto Rico and 30 key informant interviews in the context of three consecutive and simultaneously occurring disasters in Puerto Rico, namely, the 2017 Hurricanes Irma and Maria, the 2020 Southwest Puerto Rico Earthquake sequence, and the 2020 COVID-19 pandemic. The survey asked questions about the impact of the disasters on the organization, actions are taken to cope with these impacts, and how organizations changed their operation to manage the effects of multiple disasters. Quantitative data was analyzed using descriptive statistical methods, while qualitative data were analyzed using thematic content analysis techniques. The results of this study show that health and non-health-focused nonprofits in Puerto Rico were able to use the Hurricane Maria and earthquake experiences to become more efficient at coping and managing the effects of multiple disasters while mediating between the government and residents in recovery planning efforts during the COVID-19 pandemic. Our study provides insights into the challenges faced by organizations as they adjust their mission and goals, program and activities, service provision, community engagement, advocacy efforts, etc. The findings also suggest that nonprofit organizations engaged in a variety of capacity-building strategies, including but not limited to information seeking, networking, and resource sharing. This study will help planners, emergency managers, governments, and other stakeholders to better engage with nonprofits during recovery from the compound and consecutive disaster events. This study is supported by funds from the Center for Disease Control (CDC) and the National Science Foundation (NSF) received through the Natural Hazards Center at Boulder CO.

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Key Words: Non-profits, concurrent events, disaster planning



# Track 5 – Gender & Diversity in Planning

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### 5.29 PRE-ORGANIZED SESSION - WHITE SUPREMACY AND URBAN PLANNING

Pre-Organized Session 29 - Summary

Session Includes 283, 284, 285, 286, 287

BRAND, Anna [University of California, Berkeley] annalivia@berkeley.edu, organizer

As a discipline, we have yet to confront the ways that white supremacy is connected and spatialized through urban planning. While planners often attend to racialized outcomes and metrics of racial inequality (McKittrick and Woods, 2007), our attention to the myriad ways that white supremacy is a spatial and phenomenological praxis (Lipsitz, 2011; Ahmed, 2007) is disturbingly lacking. Indeed, only recently have planning scholars begun to theorize the intrinsic connections between white supremacy and urban planning (Goetz, Williams and Damiano, 2020), including recent work to articulate reparative planning (Williams, 2020). This panel expands, more fully articulates and names (Brand, 2018) how whiteness and white supremacy appear and disappear in our discipline. Scholars on this panel highlight the methodological, temporal and theoretical entanglements of white supremacy and planning and are actively naming, enumerating and depicting these entanglements and centering frameworks of racial justice. Topics addressed on this panel include settler futurity, seeing whiteness in planning processes, planning historiography and theories of redress.

Objectives:

- Understanding the connections between white supremacy and urban planning

### SETTLER FUTURES: COLONIZING THE IMAGE IN REPRESENTATIONS OF FUTURE URBAN LANDSCAPES

Abstract ID: 283

Abstract within Pre-Organized Session 29

BRAND, Anna [University of California Berkeley] annalivia@berkeley.edu, presenting author

Urban renewal policy in the mid-20<sup>th</sup> century was premised on the dual promise of clearing blight and revitalizing urban landscapes. While communities of color were the ones who bore the brunt of modernist spatial logics and large-scale clearance (Fullilove, 2016), racism was tacitly obscured through denigrating accounts of brick and mortar. However, urban renewal narratives depicting the slums and enumerating conditions of blight were paired with images implicitly linking blackness to the problems of the city and whiteness as the remedy for the future. While urban renewal is critiqued for its devastating impacts on communities of color, less discussed are the nuanced ways that whiteness worked in the pairing of text and image.

The language of blight is circulating again in urban planning, paving the way for new forms of clearance and dispossession (Morrill & Tuck, 2016). Again, the image does racial work that texts elide. Yet now, however, tracing how race saturates representations of futurity in urban planning is complicated by the dominating paradigms of colorblindness and a post-racial development ethos. Although positivist narratives in planning processes and comprehensive plans do depict the outcomes of racial inequality in and as racial geographies (McKittrick and Woods, 2007), the descriptions and visualizations of urban futures pair this analytic with neoliberal, multicultural representations of the future (Melamed, 2006; Mele, 2013) where racial diversity appears as a normative ideal and can be seen in the diverse images of inhabited future urban landscapes. Despite these normative goals, racial inequality and racialized forms of dispossession and vulnerability persist, in part as a result of the everyday decision-making of urban planners and policy makers. How do we name and analyze the ways that racialization persists in

and through our discipline, despite normative goals of inclusion and equity? How might race work through planning futurity in contemporary processes, methodological approaches and imaginaries? This research explores the racial dimensions of futurity, asking who appears and disappears in visualizations of the future and, relatedly, who must appear and disappear in order to enact these futures. By tracking the ways that diversity operates in a normative and depoliticized sense, I examine diversity as a future elongation of the settler state through the planning imaginary. In other words, this research analyzes visions of the future via planning text and image and explores how these futures represent unexamined trajectories of racialization and whiteness. Through content and empirical analyses of planning image and text, this study focuses on planning futurity and how planning settles and colonizes the future through new forms of race and racialization.

This research posits that we have failed to interrogate how whiteness works in and through the future imaginary of urban planning. Though racial processes have shifted since the mid-20<sup>th</sup> century, the future again tacitly hinges on white presence and black dispossession. To explore how planning colonizes the future, this research explores the intersection between settler colonialism and urban planning, asking how unexamined ideas of race and whiteness saturate representations of the future. It interrogates implicit and ongoing forms of anti-blackness at work in urban planning by considering how race works through text and image in planning imaginaries. Tracing the imaginary of the future city, I analyze state-led urban planning efforts in Chicago and New Orleans across two distinct eras, Urban Renewal and the post-Civil Rights, neoliberal city. By applying settler colonial logics to urban planning futures, I interrogate how racial processes are given new life through representations of the future and examine how normative commitments to diversity conceal racialized imaginaries.

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Key Words: white supremacy, race, whiteness, anti-Blackness, planning futurity

#### **“WHITE EYES, THE ONLY REAL EYES”: MEASURING, MODELING, AND THE EPISTEMOLOGICAL FOUNDATIONS OF URBAN PLANNING**

Abstract ID: 284

Abstract within Pre-Organized Session 29

BATES, Lisa [Portland State University] lkbates@pdx.edu, presenting author

Frantz Fanon, writing of the production of “the fact of Blackness,” describes the White observational gaze as the only view considered valid in sociological study. Urban planning scholarship and practice has built on the explicitly White observations of urban sociology from the Chicago School—incorporating the ‘human ecology’ concept into its measurements and models of cities and neighborhoods. The epistemological and ontological foundation of planning is perpetuating an essentializing view of population management, even when we abjure the kind of racism that led Robert Park to describe the “Negro” as “the lady among the races.” This paper considers how we might remake Black people as subjects, rather than objects, through practices of surveillance and oppositional gazing—in other words, through Black epistemologies and empirical practices that tell planners what planning is, so that our field



might begin to address its history and present.

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Key Words: Race, Epistemology

### **ERUPTIONS OF WHITENESS: CENTERING RACIAL EQUITY IN THE PUBLIC FUNDING OF NEIGHBORHOOD ASSOCIATIONS IN MINNEAPOLIS**

Abstract ID: 285

Abstract within Pre-Organized Session 29

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The ability of the U.S. planning field to address problems of inequality, crime, housing, education, and segregation is hampered by a neglect of Whiteness and its role in shaping urban outcomes (Goetz, Williams, and Damiano, 2020). Planners need to develop a vocabulary for naming Whiteness and its role in limiting racial equity outcomes. Efforts to achieve racial equity in urban planning frequently confront the issue of Whiteness, manifest either as conscious or intentional opposition to racial equity efforts, or as more indirect expressions that erect obstacles for achieving racial equity. Examining how obstacles to racial equity are overcome in specific instances allows better theorizing about both Whiteness and its role in urban planning, and the development of practical approaches to address it. Racial equity efforts are difficult in no small measure due to the fact that they require a public conversation about race. Researchers across a range of disciplines have studied and noted the challenges of public (and private) conversations about race and the unstated rules and norms that dominate such talk (see, e.g., Feagin et al., 2001 on sincere fictions, McKinney, 2004 on the denial of white privilege; and Mills, 2017 on white ignorance). An entire nomenclature has been developed by researchers describing the dynamics of inter-racial conversation and debate. Many make reference to "race talk" as a special form of communication that involves a distinct set of rules and procedures (Sue 2013), and the difficulty that Whites have in perceiving their racial position (Foster, 2013; Hayward, 2013). In this paper we offer a case study of a racial equity initiative that was threatened by White fragility (DiAngelo 2018). In 2019 and 2020, the City of Minneapolis endeavored to change its policy of support for neighborhood associations (NAs) in the City, and to apply a racial equity framework to determine the distribution of public funds to support NAs. Despite almost universal support for the principle of racial equity, an 'eruption of Whiteness' almost stalled the process when a faction of white neighborhood organizers objected to the racial equity analysis underpinning the effort. Feeling that they were personally being called racist, they undertook a series of steps to challenge the process and to insulate themselves from taint of racism. The group was, in the end, unable to delay or derail the process. We examine the factors that led to the eruption of whiteness and to the particular form it took on in this case, as well as the factors that rendered it ineffective.

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Key Words: Whiteness, racial equity

## **TWIN CITIES, SPLIT POLITICS: REPARATIONS, THE POLITICS OF RECOGNITION AND REDISTRIBUTION**

Abstract ID: 286

Abstract within Pre-Organized Session 29

WILLIAMS, Rashad [University of Minnesota] will5638@umn.edu, presenting author

Signaling the devolution of the Black redress movement in the face of continued congressional intransigence, cities across the country have begun to experiment with municipal reparations programs. The approaches taken by cities, however, differ in that they tend to typify either a politics of recognition or a politics of redistribution. Using comparative case study analysis, I explore why two bordering cities at the center of the largest protest movement in U.S. history wound up on opposite sides of this continuum, with one city establishing a reparations commission and the other establishing a truth and reconciliation commission in the wake of urban rebellions following the murder of George Floyd.

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Key Words: Reparations, Reparative Planning, Case study

## **RELATIONS OF POWER: THE US CAPITOL INSURRECTION, WHITE SUPREMACY AND US DEMOCRACY**

Abstract ID: 287

Abstract within Pre-Organized Session 29

INWOOD, Joshua [Penn State University] jfi6@psu.edu, presenting author

Since the 6 January insurrection at the United States Capitol and the impeachment trial and subsequent acquittal of former President Donald J. Trump, new information continues to reveal how close the demonstrators came from fulfilling their goals of overturning a democratic election. Fomented over the years by a President and his allies who peddled misinformation and lies, actively courted white nationalists, and consistently tended to a politics of white injury and rage, the 6 January came astonishingly close to a coup. However, to locate white supremacy within the realm of militias, mobs, and Trumpism not only misunderstands white supremacy as a structuring relation but reinforces it by reducing it to the extraordinary and spectacular. Here I make two interrelated arguments: First, I revisit the meanings of white supremacy and challenge reductionist framings for their potential to obscure white supremacy's systemic deployments. Second, I discuss the fundamentally undemocratic nature of whiteness and white supremacy. I contend that the 6 January events have historical resonance, they signal a racial realignment and reworking of racial regimes in the context of new contradictions. This connects the events of 6 January to longer

histories within the US, even as they are grounded within present conditions.

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Key Words: White Supremacy, Democracy, Insurrection

### 5.83 PRE-ORGANIZED SESSION - QUEER SPACE: LOCATING LGBTQI+ LIBERATION IN PLANNING

Pre-Organized Session 83 - Summary

Session Includes 428, 429, 430, 475, 1060

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There has been an urgent call for planning academics and practitioners to engage with queer spaces that serve the Lesbian, Gay, Bisexual, Transgender, Queer, and Intersex (LGBTQI+) community. These historically overlooked urban spaces are critical for the LGBTQI+ community to safely live, work, and play (Doan, 2011). These locations "simultaneously engage and transgress the social, architectural, and juridical meaning attributed to the areas that they occupy by means of the subversive bodies that collectively inhabit and pass through them" (Avilez, 2011). However, the concept of queer spaces does not need to be restricted to geographical or architectural space alone but rather can transcend notions of physical space, as in the case of the blurred boundaries of virtual queer spaces (McKee, McNair & Watson, 2014). In this pre-organized session, presenters will share different ways in which to conceptualize and engage with queer spaces in an effort to advance LGBTQI+ liberation and civic engagement.

#### Objectives:

- Developing understanding of LGBTQIA+ planning issues
- Expanding knowledge and research on queer spaces

### LGBTQ+ PERSPECTIVES ON SEEKING SAFE SPACE IN CENTRAL FLORIDA

Abstract ID: 428

Abstract within Pre-Organized Session 83

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On June 12, 2016, forty-nine individuals, most Latinx of Puerto Rican background, lost their lives in the PULSE massacre in Orlando, Florida. PULSE was considered a safe space by many in Central Florida's LGBTQ+ community, and the event led to dramatic changes in the way LGBTQ+ residents perceived their surroundings, particularly considering overlapping identities that combine race, ethnicity, class, gender and sexuality (Goh, 2018; Doan, 2015). Our study seeks to explore the present-day characteristics and locations of urban spaces perceived as safe or unsafe in the Central Florida region, considering intersecting forms of discrimination faced by the LGBTQ+ population. Safety perceptions will be explored along the following gradients: public vs. private space, LGBTQ+ businesses vs. non-LGBTQ+-businesses, rural vs. urban, and seasonal (PRIDE parade, Disney Gay Days) vs. non-seasonal.

Besides identifying particular physical characteristics of an individual's surrounding that may be associated with variations in perceptions of safety, the study will explore attitudes towards the development of an LGBTQ+ district in the Central Florida region, particularly considering the construction of a PULSE memorial and museum, slated for completion by 2023 (OnePULSE FOUNDATION, 2021). We also aim to explore changes in perceptions of safety as a result of key changes in legislation affecting the LGBTQ+ population, such as the Marriage Equality Act of 2015 and a series of policies, ordinances and initiatives undertaken by the City of Orlando to support the LGBTQ+ Community (City of Orlando, 2021).

LGBTQ+ community participants will be recruited through non-profit organizations who serve the LGBTQ+ community in the area as well as City of Orlando liaisons. A racially and ethnically diverse group of participants of various age groups will be invited to participate in two focus groups to explore perceptions of safety at the individual, community and city level. Content analysis will be used to identify given code within each participant's speech, both within and between focus groups. Inferences made about the level of consensus or dissent on various themes will be validated through participant counts.

The study seeks to inform relevant government and NGOs on short- and long-term actions that will lead to the creation or maintenance of safe public spaces for LGBTQ+ individuals, explicitly considering intersecting forms of discrimination. Although physical/spatial, regulatory and enforcement recommendations will be framed considering the Orlando MSA, applicability to other US MSA's is fairly likely due to the strong influence of broader structural conditions that have led to the marginalization of the LGBTQ+ population in the United States, and the similarity in regulatory and enforcement frameworks to address the issue across the country.

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Key Words: LGBTQ+, Safe spaces, Central Florida

#### **UNDERSTANDING BARRIERS TO FULL CIVIC PARTICIPATION BY THE LGBTQ+ COMMUNITY: THE CASE OF ATLANTA**

Abstract ID: 429

Abstract within Pre-Organized Session 83

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In particular since the 1980s, we have observed the emergence and diversification of collaborative and participatory governance models as alternatives to adversarial and managerial modes of policy making and implementation (Ansell & Gash, 2007). Progressive local municipalities value diversity and broad-based participation, and have been exploring ways to be more inclusive (Doan, 2016). LGBTQ+ advisory boards and commissions are one of the actualizations of such efforts. Local LGBTQ+ advisory boards are comprised of voluntary LGBTQ+ individuals who are appointed by the mayor. Their primary role is to offer recommendations to the mayor, city council and departments to address the needs of local LGBTQ+ residents, though their efficacy has not been studied.

At the same time the queer political movement that arose in the 1990s argued that LGBTQ+ people should resist assimilation and stand against the dominant norms of society. Engaging in political efforts to gain status through a concept such as citizenship was seen as regulatory and oppressive (Phelan, 2001; Warner 2002). Queer theory's debunking of stable categories of sex, gender, and sexualities through post-structuralist deconstruction of identity also encouraged resistance to attempts to obtain full citizenship rights that were rooted in the heterosexuality. According to this queer perspective, merely gaining long denied rights for the LGBTQ+ community was not sufficient; the more pressing task was to challenge and transform the existing concepts and structures. It is thought that concerns that only demand "equality with the others" enable the possible co-optation of the movement and assimilation of the LGBTQ+ community into the values which are deeply grounded in heterosexuality (Jagose, 1996).

Within this framework, works of some voluntary LGBTQ+ groups including AIDS activists of 1990s, non-profit LGBTQ+ organizations, and strategies of local municipalities have been studied. Are they assimilating or liberating? Are they preventing the creation of autonomous spaces of queer representation rather than constituting them? (Andrucki and Elder, 2007). Are they contributing to the homonormative and/or heteronormative mainstreaming? (Duggan, 2002; Murray, 2015). But how can we read the recent involvement and participation of the LGBTQ+ community in the city politics through recently emerged Advisory Boards? Where does such a formation of civic engagement of the LGBTQ+ community stand in the discussions of assimilation and homonormative mainstreaming? To answer these questions is both theoretically and practically important. Theoretically advisory boards represent a new form of civic engagement and participation and present the possibilities of a nuanced definition of citizenship where board members blur the lines between the bureaucrats and citizens (Brown, 1994). Practically such advisory boards may help to create bridges among the LGBTQ+ community and the municipality to build healthier redistributive and recognitional policies and inclusive cities where the LGBTQ+ individuals are not seen as customer citizens or as spectacle through assimilative policy and practices (Bell & Binne, 2004).

Focusing on Atlanta LGBTQ+ Advisory Board, I research the motives and operations of the board which was established in 2018 through the utilization of a queer lens. I apply semi-structured in depth interviews with board members, Atlanta city officials including city planners, and the local LGBTQ+ community on issues about civic engagement, involvement in the city politics and decisions, urban services, LGBTQ+ inclusion, representative power of the board, queer spaces as well as researching secondary data resources such as related news reports, local LGBTQ+ magazines and blogs.

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Key Words: LGBTQ+ Advisory Boards, LGBTQ+ planning, inclusive cities, queer spaces, Atlanta

#### **LESBIAN AND OLD: COMPLICATING QUEER SPACE, SAFETY, AND HEALTH**

Abstract ID: 430

Abstract within Pre-Organized Session 83

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This examination of queer space centers the interaction between the built environment and the older lesbian, a triply subversive body in terms of age, gender identity, and sexual orientation. The changing socioeconomic context urban communities has led to shifts in the landscape of queer spaces and, specifically, lesbian spatial practices throughout the United States (Giesecking, 2021). This paper contributes to planning research that advances the liberation of a heterogeneous LGBTQ+ community by exploring the everyday spatial and safety needs outside of traditional gayborhoods (Doan & Higgins, 2011; Goh, 2018). Through a gender life course framework (Carpenter, 2010), this paper argues that older lesbians' attachment to place reveals gendered and queer pathways toward identity and community development over time. Based on the oral histories of ten lesbians aged 65 to 85 in Los Angeles County, I explore how older lesbians interact with the built environment to expand and complicate definitions of queer space, safety, and health. This paper asks: does aging change the kinds of queer spaces that lesbians need and desire? How does lesbian identity shape the spatial practices of a person over their life course? Studying the spatial practices of older lesbians demonstrates older adults' differentiated needs based on sexual orientation and gender identity so that planners, policymakers, and service providers must acknowledge how these differences influence people's access to places, resources, and services.

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Key Words: Queer planning, Aging, Gender, Community development, Health

#### **PLANNING AS A QUEER INCLUSIVE PROJECT: AN EXAMINATION OF LGBTQ+ COMMUNITY CENTERS IN THE PLANNING PROCESS AND IMPACTS ON PUBLIC HEALTH**

Abstract ID: 475

Abstract within Pre-Organized Session 83

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In general, urban planning has often been silent to the ways it reinforces notions of heterosexuality and thus then overlooks impacts of this thinking on community health (Buckley & Graves, 2016; Petra L Doan, 2011, 2015; Petra L. Doan & Higgins, 2011; Frisch, 2002; Kinahan & Ruther, 2020; Moe, 2016; Moe & Sparkman, 2015; Sen, Umemoto, Koh, & Zambonelli, 2017). In the early 1900s, urban planning and public health professionals addressed the poor living conditions of cities together, but then diverged as each profession honed their professional identities. Recently, the professions have come back together over issues related to obesity, aging, and the built environment (Checkoway, 2008; Hall, 2002; Leyden, 2003; McAndrews & Marcus, 2014; Sloane, 2006). We propose reconsideration of an early cornerstone of public health and planning; the community center (Estes, 1997; Hall, 2002; Lloyd Lawhon, 2009; Spain, 2001). However, we focus on LGBTQ+ community centers (Fish, Moody, Grossman, & Russell, 2019; Phillips li et al., 2020), the planning process, and breaking away from the "heterosexist project" of planning to an "inclusive project" (Frisch, 2002).

#### Queer Inclusive Project and Health

The success of public health initiatives relies on communication and external supports (Freimuth & Quinn, 2004). Urban planning links communication and external supports and has leaned on the public value of equity as a key

connector. Other planning researchers, particularly in the realm of sustainability have sought to find “equity” in major planning documents and have found little (Berke & Conroy, 2000; Brand, 2015; Cuthill, 2010). There is evidence that robust public participation processes result in more equity visible in resulting plans (Loh & Kim, 2020) and a focus on inclusion makes for more effective participation (Quick & Feldman, 2011). However, being able to achieve equity and inclusion is contingent on being able to acknowledge oppression in order to dismantle it.

As with any public service-oriented communication, multiple channels and techniques are necessary for success (Bernhardt, 2004; Johnson & Halegoua, 2014). In the public health communication literature, they emphasize that “deep structure” (Freimuth & Quinn, 2004; Resnicow & Braithwaite, 2001), going beyond superficial representations of culture, is necessary for reaching minority communities and improving equitable health outcomes.

An “external support” long associated with urban planning has been the community center. Community centers play significant roles in the public health of their constituencies. We examine whether planners are drawing on community centers, particularly LGBTQ+ community centers, to practice deep structure, and advance equity in public participation processes and their resulting plans.

### Methodology

We utilize a random sampling method to select 19 LGBTQ+ Community Centers listed on the CenterLink LGBTQ+ Community Center Member Directory (CenterLink: The Community of LGBT Centers, 2021) and have a physical presence within their respective city. We include the Kansas City Center for Inclusion as our case study for a total of 20 centers in an equal number of cities distributed across the four Census regions and nine Census districts in the United States. Data is collected by reviewing public planning documents and compiling a comprehensive list of each reference to a public or private organization that aided in the development of a plan with particular focus on whether the LGBTQ+ Community Center located within the city was included as part of the plan development. Understanding the importance of language in creating an inclusive environment, we also examine whether plans include LGBTQ+ terminology by searching for key words including queer, gay, lesbian, bisexual, transgender, intersex, sexual orientation, or gender identity.

### Conclusion and Results

Considering the social and cultural significance of queer-centered community spaces on LGBTQ+ public health, we try to find whether planning departments consider these organizations as major stakeholders and participants in the planning process. Our findings show planning departments did not include any LGBTQ+ centers in participant or stakeholder lists in their community-wide plans. Opportunities exist for city planning agencies to further engage with LGBTQ+ residents to create a more equitable planning process and advance the “inclusive project”. Recommendations for future research and implications to planning practice and public health are made.

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Key Words: Equity, Community Health, Communication, LGBTQ, Plans

## TRANSFORMATION AND RESISTANCE: SEATTLE'S GAYBORHOOD IN FLUX

Abstract ID: 1060

Abstract within Pre-Organized Session 83

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Seattle's traditional queer neighborhood – the Pike/Pine section of Capitol Hill - used to be a predominantly mixed-use district with numerous “grungy” establishments, social organizations and affordable housing. Its urban form, however, was mostly low-lying (1-3-stories) as a consequence of its origin as an auto row district in the early 20<sup>th</sup> century. The city upzoned Pike/Pine to NC-65/85 in 2006 to bring in more mixed uses with an emphasis on greater residential density as part of its “Center City Strategy”. Despite the slowdown from the Great Recession, the upzone transformed the urban form of Pike/Pine, dramatically increasing density. The subsequent Amazon boom brought an influx of young workers with high salaries, with Pike/Pine's proximity to Amazon headquarters and downtown making it an attractive residential choice. What emerged from these multiple trends, then, was a considerably more upscale and “sanitized” district, with numerous gay establishments dismantled or radically changed. Several attempts by the city since then to slow down the gentrifying aspects of the district's transformation have not quite yielded the intended outcomes. If anything, they have accelerated the transformation as developers see incentive-based legislation as even more attractive for locating projects there. Throughout all of this, the city has left single-family zoning—which comprises the majority of the residential land—largely untouched.

In one sense, Pike/Pine's trajectory is not unique; most “gayborhoods” in the country have in the first two decades of the 21<sup>st</sup> century become less “queer” (in multiple senses of the word) due to increasing social acceptance and a declining need to self-segregate (Bitterman & Hess, 2021; Ghaziani, 2014). However, these communities continue to serve an essential purpose for the health and well-being of GLBTQ+ populations, particularly those with less familial, economic, and social support, including many trans folk, people of color, working class queers, and immigrants. Given the rapid increase in property values and rents in Pike/Pine, however, these folks are the most likely to be priced out. The queer life that does remain, then, becomes increasingly White, cis-gender, affluent, gay-identified men. Other queer folk, even if they are able to find a way to stay in the area, see less and less of the supportive community that makes the neighborhood such a crucial safe haven (Doan, 2015).

The Pike/Pine transformation thus demonstrates the persistence of planning as a practice that, regardless of how well-meaning its intentions, continues to “reinforce repression of lesbians and gays through laws, ordinances, and regulations” (Frisch, 2002). When it does serve the needs of the queer community, it does so by privileging a narrow section of it. Gentrification is undoubtedly one of the greatest challenges that planners face, and the toolkit for ameliorating its effects on marginal communities is incomplete. However, it is also not empty, and includes multiple forms of more inclusive and equitable zoning and development than is current practice in Seattle. If they wish to avoid unwilling reinforcement of long-standing heteronormative paradigms, planners need to fully understand and take steps to address the consequences of their policies for gayborhoods on individuals and communities.

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Key Words: Seattle, Gayborhood, Queer Spaces



## **ROUNDTABLES**

### **5.319 ROUNDTABLE - SOCIAL JUSTICE PLANNING FOR US LATINX MAJORITY CITIES AND NEIGHBORHOODS**

Abstract ID: 319

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GOUVERNEUR, David [University of Pennsylvania] dgouverneur@gmail.com, participant  
ZURITA, Clara E Irazábal [University of Maryland, College Park] irazabal@umd.edu, participant  
SANDOVAL-STAUSZ, Andrew K [Penn State University] aus1050@psu.edu, participant  
ZAMBRANO-BARRAGAN, Patricio [University of Pennsylvania] pzb@upenn.edu, participant  
GONZÁLEZ, Erualdo R. [Cal State at Fullerton] egonzalez@FULLERTON.EDU, participant

As planners turn more attention toward improving the social justice perspectives of research and practice, the needs and barriers for diverse communities have become a priority. For Latinx majority cities and neighborhoods in the United States, the traditional social dynamics and research strategies may not apply. There is considerable diversity of ethnicity and culture across the Latinx identity itself and planning equity models, data, and literature often consider equity in terms of black vs white communities. Therefore, alternative approaches and mindful considerations are required for effective and reliable results when researching and planning for Latinx majority communities. The roundtable will draw on the recent empirical work of the participants to illustrate how social justice and activist planning research can best fit the unique culture, histories, and sociological considerations of the United States' Latinx majority cities and neighborhoods including; (1) What are important data and methodological considerations necessary when conducting research for these communities? (2)(a) What are the needs of varying types of Latinx majority cities and neighborhoods throughout the country? (2)(b) and how do cultural and social dynamics vary by nationality, region, and ethnicity? And (3) What are the economic, practical, cultural, and regulatory barriers to successful planning equity for these communities?

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Key Words: Social Justice, Community Outreach, Race/Ethnicity, Equity

### **5.330 ROUNDTABLE - WHITENESS AND PLANNING: UNCOVERING WHAT IS UNSPOKEN, ASSUMED, AND MISSING**

Abstract ID: 330

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LEE, C. Aujean [University of Oklahoma] aujean@ou.edu, participant  
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GOETZ, Edward G. [University of Minnesota] egoetz@umn.edu, participant  
BRAND, Anna Livia [University of California, Berkeley] annalivia@berkeley.edu, participant  
WILLIAMS, Rashad [University of Minnesota] will5638@umn.edu, participant

Whiteness and white supremacy are dominant forces in urban planning. However, planning scholarship and practice have yet to fully recognize the depths of these phenomena. How has planning perpetuated racial disparities in and across urban spaces and racist framings that problematize communities of color as the cause of inequities? Despite disciplinary neglect, white supremacy has shaped planning practice in different ways, from its emergence through regulatory frameworks such as racial zoning to forms of racial domination like settler colonialism and slavery to more recent forms of color evasiveness after the Civil Rights Movement in which race is presumed to no longer affect individual or neighborhood outcomes. This refusal to acknowledge and confront the continual role of whiteness is glaring given the historical, recent, and ongoing manifestations of racialized violence and growing inequality that we see evidenced across all scales of urbanism. Indeed, while scant progress has been made in expanding racial representation, cities continue to be shaped by racial crises and “eruptions of whiteness” that go both under-theorized and under-researched in urban planning.

To better understand whiteness and white supremacy, scholars on this roundtable have drawn from ethnic studies, sociology, geography and other fields to illuminate how race is at the center of planning and upholds white supremacy. The participants will share case studies of how to uncover and reveal the role of white supremacy in planning processes, government statements, and in pedagogy. The discussion also explores how to incorporate whiteness into an urban planning curriculum, and addressing some of the challenges educators face when teaching about whiteness.

Questions the roundtable panelists seek to address include:

1. How do planning scholars examine whiteness and white supremacy?
2. What methods might planning scholars use to analyze and critique how, where and when whiteness appears in and across the urban landscape?
3. How can whiteness be exposed, discussed, and critically engaged in urban planning curriculum?

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Key Words: whiteness, racial planning, race/ethnicity, planning research, planning pedagogy

#### 5.645 ROUNDTABLE - RACE AND DIVERSITY AMONG PLANNING FACULTIES: TESTIMONIES FROM PLANNERS OF COLOUR

THOMAS, Ren [Dalhousie University] planningutopia@gmail.com, moderator  
VAZQUEZ, Teresa [Universidad Autónoma de Ciudad Juárez] ma.tere.vazquez@gmail.com, participant  
BETANCUR, John-Jairo [University of Illinois Chicago] betancur@uic.edu, participant  
SEN, Siddhartha [Morgan State University] siddhartha.sen@morgan.edu, participant

This roundtable will explore the issues of race and ethnicity in the context of public perceptions of faculty members teaching at ACSP Member Schools. Ten years ago, planners of colour exposed the challenges and issues that diverse faculty of color face through their own testimonies in order to substantiate the Climate Survey that POCIG and ACSP carried out (2009). With that roundtable, we aimed to initiate a wider conversation about the current state of affairs for faculty of color and to generate recommendations.

Although diversity has been widely discussed in theory at ACSP conferences, included in PAB recommendations, and increasingly in planning curriculum, the reality that faculty of color face in academia is in many cases far removed from the theory advocated by our association, our planning accreditation board, and planning departments. Faculty of color face environments that do not value difference. Hiring biases and discourses that portray minority faculty of color as unqualified candidates continue to prevail in conversations about faculty and administrative searches, as well as in processes of retention, tenure, and promotion. Job descriptions are crafted to disqualify and “define out” applicants of color. Faculty of color face unfriendly environments and marginalization, lack of resources and mentoring, and uneven distribution of support, which affects their academic and professional trajectory. Prejudice, bullying, rumors, and unfriendly environments are all too common. This animosity comes not only from administrators but also from colleagues, staff and increasingly from students, regardless of the intersectionality in their identities.

We would like to compare the testimonies that we collected 10 years ago with the current ones to see if anything has changed. We would also like to collect testimonies from people of color working at Historically Black Colleges/Universities and Hispanic Serving universities to see if there is a difference, and testimonies of Whites working at such institutions to see they are treated differently.

The testimonies collected will help us to pinpoint specific challenges and lessons. Recommendations will emerge from the voices of those providing testimonies, but also from the discussion generated after the paper is presented. These recommendations could be added to the Climate Survey and will be provided to ACSP and POCIG.

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Key Words: race, diversity, education, faculty

## 5.677 ROUNDTABLE - COMMUNITY-BASED CONTRIBUTIONS OF PLURIVERSAL PLANNING SCHOLARS

Abstract ID: 677

VASUDEVAN, Raksha [Teachers College, Columbia University] rv2451@tc.columbia.edu, moderator  
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IZAR, Priscila [Institute of Human Settlements Studies] izarpris@vt.edu, participant  
UGARTE, Magdalena [Ryerson University] magdalena@ryerson.ca, participant  
CATALINA, Ortiz [University College London] catalina.ortiz@ucl.ac.uk, participant  
LEONOR, Vanik [National Coalition for Latinxs with Disabilities (CNLD)] vanik.leonor@gmail.com, participant

*\*This session is sponsored by FWIG.*

In recent years, work from the ‘southern’ and ‘south/eastern’ contexts (Bhan, 2019) has widened theoretical discussions and geographical foci of the contemporary planning debate. In what we embrace as a hopeful shift in planning, scholars working in these contexts have pushed the planning field to reevaluate the applicability and usefulness of dominant theories and methodologies to address residents’ lived inequities throughout the world (Yiftachel, 2020; Miraftab, 2009, Waston, 2012).

Inspired by Arturo Escobar’s (2018) notion of the ‘Pluriverse,’ we understand “pluriversal planning scholars” (Vasudevan and Novoa, forthcoming) as those who embrace multiplicity, coexistence, and situated knowledges in their community-centered planning work. Importantly, these scholars not only draw from other fields to highlight the everyday experiences and resistances of residents. They also actively contribute to community-based work through reciprocal theory development with community members, capacity building, and visibilizing residents’ stories when appropriate.

This session continues the important conversations that emerged from last year’s ACSP roundtable entitled “Feminist Futures of Radical and Insurgent Planning” and 2019’s ACSP roundtable entitled “Radical and Insurgent Planning: Reflecting on Concepts, Stories, Geographies, and Futures.” However, in this session we turn away from purely theorizing the possibilities of radical, insurgent, and critical planning theories to focus on planning scholars’ tangible contributions to the communities they work with. We are interested in discussing how these scholars learn from and contribute to the ongoing contemporary challenges that communities face while centering the needs and voices of community members who lead urban struggles. We also want to reflect on our roles as planners and how community-based work prompt us to occupy complex positions in our academic and pedagogical efforts (Porter, 2015).

In top planning journals we have noted a dearth of explanations, engagement with, and reflection about what it means to do community-based work. Indeed, the very same scholars who say they ground their work in the community often write more about theory and methodology than about the tough questions around community engagement, ethics, positionality, and the role of the planning scholar vis-a-vis the ‘community.’ However, centering scholars’ community-based commitments in planning has the potential to ensure that a pluriversal planning project does not “become yet one more academic endeavor” (Escobar, 2017: 216). It would lay the ground to imagine and build transnational solidarities by acknowledging historical specificities while imagining radical and (inter)connected futures beyond the modern/colonial system.

At this roundtable session we ask: How do pluriversal scholars actively engage in a reciprocity of learning and sharing with community members? What are the practical aspects of collaboration? How do we understand the relationship between community contributions and anti-colonial and anti-racist work? What is our role(s) as researchers doing this work? Are there particular methods that have been useful in the process of knowledge co-production?

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Key Words: critical planning, community-based contributions, pluriverse, decolonial, radical planning

## **INDIVIDUAL PAPER SUBMISSIONS**

### **DOWNTOWN COMMERCIAL GENTRIFICATION AND *GENTEFICATION*: USING BUSINESS DIRECTORIES TO ASSESS CHANGE AND CONTINUITY**

Abstract ID: 189

Individual Paper Submission

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Commercial gentrification is a social inequity, and a small and growing quantitative literature primarily focuses on the ways businesses that are upscale or target middle- or upper-class consumers are changing the landscape of neighborhood businesses corridors that have historically targeted black residents and now heavily market to white consumers (Freeman, 2005; Sullivan & Shaw, 2011; Zukin, 2008, 2009). We have a small but growing body of commercial gentrification work that examines additional racial and ethnic business profiles and changes (Kosta 2019). However, we lack scholarship that systematically describes changes to businesses that marketed to Latinx immigrants marketing to both second-generation Latinx Americans and White people. This research focus is essential because no scholarship quantitatively examines gentefication, a small but growing gentrification phenomenon in the Southwest whereby Mexican-American or Chicanx owned businesses are targeting middle-classes and multi-generational consumers, most of Mexican-American or Chicanx background. Our study addresses such gaps by systematically and cross-sectionally examining trends tied to business count, store types, and consumer groups that these stores target by class, race/ethnicity, and generational status and focusing on the downtown commercial core. What does commercial change and continuity look like across time in a downtown of central city undergoing gentrification? We use a reverse directory: the Haines Criss + Cross Directories to assesses changes across occupancy type and their target population in 1980, 1990, 2000, and 2011 in the inner zone of the central downtown core of the Southern California Mexican city of Santa Ana, where the city has led aggressive efforts to gentrify the retail heart, 4<sup>th</sup> Street, popularly known among Spanish speakers as La Cuatro, since the 1990s. Using Google Street View, Yelp, Facebook, and archival and personal pictures of storefronts and relying on our lived experiences in the area, we examined keywords, phrases, and statements and the products and services that were for sale. We reviewed newspapers, magazines, community development plans, city minutes, and popular and scholarly articles about gentrification in Santa Ana to help us code target consumers by ethnicity, class type and generational status. Despite widespread consensus from locals and regional residents that the area has gentrified, we found a consistent working-class, Mexican, and immigrant commercial identity across the study period, though gentrifying businesses surged from 1990 to 2011. La Cuatro went on to include a different retail landscape than had existed during the 1970s and mid-2000s. We found a small but a recognizable surge of businesses, such as art

studios and bars and restaurants, targeting middle and upper classes white people. Yet, aside from general on the ground debate about white gentrifiers, we noticed another emerging controversy referred to as gentefication (portmanteau combining “gentrification” with “gente,” Spanish for “Latinx people”). Within about five years from our last study period, 2011, five new gentefying businesses opened, including a barbershop and a café, owned by Mexican-Americans or Chicanxs, primarily children of immigrants, and their target consumers were middle-classes and multi-generational, most of Mexican-American or Chicanx background. These types of businesses will likely grow and add to our understanding of commercial gentrification. Suppose we suggest that too few commercial districts in the central city undergoing gentrification are remaining affordable and welcoming to consumers of modest means and that this is unjust. Gentrification and gentefication research questions could look at the meanings and practices of the “socially just distribution of businesses.” To what extent may gentefication represent spatial equity? To what extent does gentefication represent a combination of revanchist and affirming practices? These questions could help build a more systematic and fuller understanding of change and continuity in Latinx commercial spaces across the country.

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Key Words: Gentrification, Commercial, Immigrant, Downtown

### COMMEMORATING HISTORICALLY SIGNIFICANT GAY PLACES ACROSS THE UNITED STATES

Abstract ID: 235

Individual Paper Submission

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The stories of gay spaces across the United States are largely unrecorded, undocumented, and are not centrally collected or archived beyond informal reports and oral histories. Evidence demonstrates that the preservation of historic sites allows for future generations to benefit from intangibles related to community and identity. However, the LGBTQ+ community has been unable to gain benefits that place-based, historic sites can provide, due to an inability to commemorate spaces that have shaped LGBTQ+ history in significant ways. This study explores the disparities between the preservation and commemoration of significant LGBTQ+ spaces and the amount of funding distributed to these sites. As of 2016, LGBTQ+ sites comprised only 0.08 percent of the 2,500 U.S. National Historic Landmarks and 0.005 percent of the more than 90,000 places listed in the National Register of Historic Places. This representation is well short of the share of American adults that identify as LGBTQ+, which in 2017 was approximately five percent of the United States population. In 2010 the Administration of President Barack Obama launched the LGBTQ Heritage Initiative under the National Historic Landmarks Program. This effort underscored a broader commitment to include historically underrepresented groups, including LGBTQ+ individuals. As a result, LGBTQ+ communities became eligible to receive funding for projects through the Underrepresented Community Grant Program. An in-depth analysis of the distribution of Underrepresented Community Grant Program funds from 2014 to 2019 revealed that the LGBTQ+ community receives considerably less funding for the preservation of

historic sites compared to other underrepresented communities. The findings from this study also suggest that there is still a significant amount of work that remains to be done integrate LGBTQ+ histories into historic preservation programs that exist at various levels of programming (local, state, and federal). Based on the findings from the analysis of funding and several interviews that were conducted with professionals in the field, three takeaway messages were formulated: (1) creativity should be used in understanding and applying nomination criteria to LGBTQ+ spaces, (2) although funding is available, the mechanism to apply for funding is not widely disseminated among smaller groups or organizations, and (3) LGBTQ+ organizations are applying for funding and want to landmark significant LGBTQ+ places.

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Key Words: historic preservation, LGBTQ+ heritage, place-based identity, Underrepresented Community Grant, National Park Service

#### SOVEREIGNTY, EQUITY, AND RESERVATION GEOGRAPHY

Abstract ID: 288

Individual Paper Submission

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The establishment of Native American reservations in the United States of America was fraught with gross injustices, repeated incursions on to tribal lands, and the shrinking of reservation boundaries. The histories of these assaults on tribal land holdings are etched into the morphology of reservation borders. Tribal lands are often found in areas with the fewest agricultural resources and often at great distances from population centers established by European settlers. In particular, the size and shape of reservations may make them susceptible to being carved into different governing jurisdictions and districts including states, counties, school districts, and congressional districts, thus requiring tribal governments to negotiate with multiple, non-tribal governing bodies. This project applies a typology of border characteristics to inventory the differences in reservation geographies and boundaries with the end goal of determining how contemporary boundaries impact tribal sovereignty, tribal governance, and equity.

Two research assistants categorized the 397 reservations, off-reservation trust lands, and state-recognized American Indian reservations in the continental U.S. identified by the U.S. Census Bureau for the presence of nine, non-mutually exclusive, border characteristics. These characteristics include the presence or absence of the following: (1) a discrete land mass (discrete); (2) a portion of the border defined by natural features such as waterways (natural); (3) a compact size with a radius of 3 miles or less (compact); (4) an elongated shape

(elongated); (5) a portion of the reservation that protrudes from the main reservation land mass (prorupted); (6) a main land mass that is identifiable as a basic shape (simple); (7) a main land mass that does not have an identifiable shape (irregular); (8) a border with another reservation (shared); and (9) a portion of the tribal land that is interspersed with non-tribal land forming a checkerboard pattern (checkerboard).

Mean reservation area in square miles and mean area-to-perimeter ratio (a measure of border complexity) were calculated for each characteristic. The characteristics were then used to predict the presence of more than one of the following types of jurisdictions within the reservation borders: states, counties, school districts, and congressional districts.

Differences in mean square miles were significant for six of the nine characteristics ( $p < 0.05$ ). Differences in area were not significant for discrete, prorupted, or simple borders. Reservations with larger areas had natural borders, irregular shapes, shared borders, and/or checkerboarded land masses. Mean differences in border complexity were significant for all characteristics except for shared borders. Reservations with more complex borders had non-discrete, natural, elongated, and/or prorupted borders, and/or were less compact, had irregular shapes, and checkerboarded land masses.

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Key Words: Reservations, Tribal Planning, Indigenous Planning, Sovereignty

#### **BENEFICIAL OR DISRUPTIVE CHANGE? PERSPECTIVES OF NEIGHBORHOOD CHANGE IN SANTA ANA, CA**

Abstract ID: 408

Individual Paper Submission

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In this study, I explore opposition to increased investment to sustainable infrastructure in Santa Ana, California, a predominately low-income and Latinx community in central Orange County. My overarching goal with this study is to acquire a deeper understanding of local opposition (Devine-Wright, 2009) to sustainable urban development (i.e. compact high-density housing, transit-oriented development, light-rail transit) occurring in Santa Ana by learning how residents make sense of observed changes and how they respond to change. Opposition to change is often times dismissed as a barrier for progress by developers and public officials. However, it is important to study further why and how individuals come to oppose particular projects despite their sustainability goals to enhance planning efforts.

To study opposition, I focus on the context of increased investment of sustainable urban development in Santa Ana (a low, income, Latinx community in central Orange County, California). Diving deeper into the thought process residents undergo before responding to observed changes brought on by increased investment of sustainable urban development, I pose the following questions, (1) How do perceptions of neighborhood change vary among



stakeholders?; (2) What are the factors that influence whether stakeholders view neighborhood change as a disruption or as a benefit?; and (3) How do these perceptions and assessments of neighborhood change shape the protective actions they take? With qualitative research methods, I draw from environmental psychology and planning literature to investigate how individuals perceive change and respond to disruptions to place.

Data collected include 41 semi-structured interviews with neighborhood association (NA) and community-based organization (CBO) leaders, field notes from participant observations of city council and neighborhood organization meetings, and archival documents including local newspaper articles and city government meeting minutes. Individuals from NAs and CBOs in Santa Ana are selected for this study given their active opposition to urban development since the 1970s and because they contrast greatly by age, race/ethnicity, class, and level of education. In light of their differences, particularly related to the underlying tensions related to race and class, individuals may perceive place differently and interpret and evaluate change and disruptions distinctly, influencing how they respond to change brought on by sustainable urban development. How their perception of place attachment and change vary given these differences, is what I uncover with this research. Findings highlight the variation of perspectives that exist across race, generation, and among homeowners and renters. Findings also reveal race and class divides driving opposition to projects regardless of their sustainability goals and shed light on a history of environmental inequality. In addition, results provide detailed narratives of how residents experience neighborhood change and gentrification and help shape the response residents take towards perceived changes.

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Key Words: Neighborhood Change, Place Attachment

#### **PLANNING SCHOLARSHIP AND POPULATION WITH DISABILITY (PWD): A SYSTEMATIC REVIEW**

Abstract ID: 432

Individual Paper Submission

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One in five people in the world are said to have some type of disability, making them the largest minority population. However, most cities are far from accessible for persons with disability (PWD). The concept of disability, in relation to the built environment, is not merely about individuals' compromised capability in navigating spaces, but rather points to the 'misfit' of capabilities with how a given living environment is organized (Hamraie, 2013). Planning is largely responsible for how built and social environments are organized—therefore, it has a crucial role to play in responding to the needs of this significant population. However, consideration of persons with disability (PWD) appears to be limited to more specific realms of 'design,' and largely absent in broader planning research.

Our systematic literature review aimed to inform potential directions for planning scholarship by exploring the current and historic research investigating ways to address the needs of PWD in the planning realm. We compiled papers that focus on PWD or include PWD in their discussions from five prominent English language planning journals, some of which are long-standing (Town Planning Review, 1910–, Journal of the American Planning

Association, 1935–). We use keywords such as *disab\**, *access\**, *handicap*, *impair\**, and common medical conditions that lead to disability and impairment such as dementia, autoimmune, and stroke.

Our review confirms existing claims made by some researchers on the ‘paucity’ of attention to the topic in planning research (McCormick et al., 2019). A very limited number of papers ( $n = 20$ ) focusing on PWD of any type have been published in the five journals throughout their existence—which is, on the average, less than 2 papers per decade per journal. The papers we found encompassed subareas of planning including housing, transportation, land use, policy, and urban design. Very few papers were published until 1980s. Papers in the 1980s and 1990s started revealing challenges in legislation and policy related to PWD and accessibility—especially in the UK and the US—reflecting their early start in establishing versions of disability rights legislations. The increase in the number of papers found in recent decades is partially attributable to the increasing attention directed to topics related to population aging. Many of the papers found called for participation by PWD in the planning and decision-making processes, and some recent papers advocated for the production of evidence related to costs of creating accessible infrastructure. Overall, the concept of PWD has been largely limited to persons with mobility issues, and very few investigated the issues related to vision, hearing, cognitive, and other types of disability.

Of a few possible reasons for the small numbers of publications related to PWD in these journals, a key reason seems to do with the (mis)perception that disability needs are design needs for individuals, therefore outside of the planning realm (Staples & Essex, 2016). Some scholars cautioned the consequence of such a disciplinary divide between planning and design, reflecting that even some contemporary planning concepts such Smart Growth and New Urbanism still differentially “influence the well-being and participation of diverse groups” including PWD (Baldwin & Stafford, 2019).

Our review was limited to several prominent journals in the English-speaking world of the North and cannot be generalized to other regions. The inquiry into how the needs of PWD and disability perspectives are addressed in other regions should be a future agenda for research. A critical look at the role of planning research in accelerating creation of accessible built environment across different socio-political contexts, both globally and regionally, would be critical.

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Key Words: Persons with disability (PWD), Planning scholarship, Systematic literature review, Accessibility

#### **SITUATED METHODS IN PRESERVATION PLANNING: USING THE PAST TO REVENDICATE FEMALE EXPERIENCES AND URBAN IMAGINARIES USING *ARPILLERA URBANA***

Abstract ID: 487

Individual Paper Submission

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As historic preservation globally often continues to constrain people's voices, memories, and stories and their pasts and futures told on their behalf, this paper reflects on the critical project of decolonizing methods to contest dominant narratives and representations in preservation planning (Segalo et al, 2015). I examine how what I refer to as “situated methods” challenge the limitations of more conventional ones, including interviews, and bring about coproduced validated knowledge. The paper draws on a collaborative workshop I co-organized with 52 women in Lota, an ex-coal mining town in Chile, using the local applique textile technique of *arpillera urbana*, to create a counter-narrative of the urban history of the city from a female perspective. Despite women having a crucial role in Lota's urban past and present as community organizers, carers, and political activists, they are rarely considered in scholarship and remain invisible from official preservation narratives. Instead, these narratives highlight the capitalist development linked to the mining industry and the miners' role in the extraction of coal.

The *arpillera* workshop resulted in a sixteen feet long textile entitled *Memorias de la Mujer Lotina* (Memories of the Lotina Woman), coproduced in an accessible format for participants, residents and authorities, and that Lotinas transformed into an advocacy tool (Zaragocin & Carreto, 2020). The *arpillera*, as an “urban memory cartography” of multiple spaces-times-bodies allowed participants' to articulate multiple experiences, practices, and places through their own voices and interactions.

Feminist methodologies in planning have become increasingly useful as a response to conventional methodologies' limits to capture the experiences of women and others who have been marginalized from planning processes (Sweet & Ortiz-Escalante, 2014). With its focus on experiential knowledge, feminist thought directs attention to and recognizes a broad range of knowledges and knowers that exist beyond the experts and authorities, its traditional scientific methods, and the dominant patriarchal culture. It allows to include what Watson (2006) defines as ‘deep difference’, encouraging planning scholars and practitioners to seek alternatives to dominant methodologies for understanding urban issues and implementing change (Speak, 2020).

*Memorias de una Mujer Lotina* illustrates that research and practical agendas grounded on the cultural practices and knowledges of communities produce situated responses to complex urban histories that shape present dynamics. It fosters the exercise of memory, creativity, and coexistence, promotes diversity, and enhance participatory planning opportunities. It also suggests that integrating other epistemologies in planning theory and methodology is not sufficient, but rather that we must disrupt the structures that uphold knowledge production (Zaragocin & Carreto, 2020). *Memorias de una Mujer Lotina* highlights three main contributions of advancing situated methods in planning research and practice: 1) It helps to identify the silences in urban history that are perpetuated through planning and preservation processes 2) The use of memory-work as an activist tool to democratize the uses of the past in the present to produce new urban imaginations that may inform planning processes 3) The research ethic's impacts and its ability to empower and bring about change.

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Key Words: Situated methods, historic preservation, feminist planning, memory-work

## REDEVELOPMENT AFTER REBELLION: TRACING THE BLACK GEOGRAPHIES OF POWER IN LOS ANGELES, 1965-1992

Abstract ID: 560

Individual Paper Submission

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In Los Angeles's history, rebellion has often illustrated the ruptures between communities of color and the dominant order. For the Black population in particular, the Watts Rebellion of 1965 and the 1992 Uprisings were not only illustrative of such ruptures, but they also brought to light their spatial dimensions. That is to say that the geographic locations and arrangements of Black communities do not merely represent systems of domination and exclusion, but they are instrumental in reproducing these systems (McKittrick & Woods, 2007). In the aftermath of these rebellions, redevelopment programs were summoned as reparative measures, not only for physical destruction, but for the social and economic harms garnered by decades of exclusion, which were assessed by study after study as causal factors of these rebellions (Abu-Lughod, 2007). However, narratives concerning the efficacy of such redevelopment programs are quite contradictory. On one hand, they have been promoted as a means to stimulate economic development in historically under- and disinvested areas (Grigsby & Caltabiano, 1998). On the other hand, redevelopment has a legacy of displacing and destabilizing precarious Black communities and other communities of color (Fullilove, 2016; Thomas, 2003). Ultimately, this calls into question the extent to which redevelopment practices and their underlying goals and ideologies reinscribe racialized relations of power in new ways.

This study examines the ways in which transformations in redevelopment logics and practices illustrate changes in the dynamics of racialized relations of power in Los Angeles from 1965 to 1992 through two lines of inquiry. First, drawing on spatial analysis and archival research, the study analyzes how city agencies implemented redevelopment project areas and plans in and around Black communities by considering their geographic location and boundaries, project activities and strategies, and the broader public discourse around these projects. The latter discourse analysis particularly explores how these projects articulate a place for Black communities in the vision for the city's future. Second, the study expands on the notion of rebellion towards its broader meaning of active opposition to dominant order. Working with community archives and oral histories, this line of inquiry illustrates the continuities of rebellious spatial practices in response to or in absence of redevelopment activity in the Black communities targeted by redevelopment projects, highlighting the ways that these communities insert themselves into Los Angeles's future and create futures for themselves.

The larger contribution of this research is to add to a growing body of planning and spatial science scholarship attending to the relational production of Black space by illustrating the ways that rebellious spatial practices are heavily entangled with state processes like redevelopment. Additionally, though the formal redevelopment agency in Los Angeles—the Community Redevelopment Agency of Los Angeles—dissolved nearly a decade ago, redevelopment activity still continues today, especially in low-income communities of color. To this end, it is important to question the ways that the transformations in redevelopment activities and their underlying logics maintain systems of exclusion. Furthermore, it is important to recognize how communities look beyond normative planning practices to articulate their futures, breaking away from these systems of exclusion.

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Key Words: redevelopment, Black geographies, rebellion, planning histories

## **CONTESTED STORIES OF THE FUTURE: RHETORICAL FRAMING OF POLITICAL AND COMMUNITY NARRATIVES IN EAST BILOXI**

Abstract ID: 590

Individual Paper Submission

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In the fifteen years following devastation by Hurricane Katrina, the neighborhood of East Biloxi, Mississippi, has been variously described by political leadership as a blighted slum area, a possible model for New Urbanism, and as a casino-resort center. East Biloxi is the city's oldest neighborhood and has a history firmly attached to the traditional maritime activities of commercial fishing and seafood processing. East Biloxi is home to most of the city's immigrant communities, including Yugoslav and Vietnamese, and is home to the city's oldest African-American community. Today, the neighborhood residents' effort to withstand economic change, preserve the neighborhood's historic character, and maintain their cultural identity, is strongly contrasted by the city government's neo-liberal stance encouraging casino-resort and related development.

Forester (2009) notes that as culturally framed dispositions lead to conflict, the communicative aspects of planning become more important. Communicative planning's goal as building greater consensus through shared meaning and group intelligence is paramount to increased equity and social justice. The stories told about a place, and its future, express culturally informed, context-specific, meaning. Stories illuminate complex ideas, create community through shared experiences, and are used to build support for, or against, planning policy. Throgmorton (2003) describes planning as persuasive storytelling about the future. Storytelling is a natural process for humans; it is a compelling method of succinctly sharing information in easy-to-process ways.

Rhetoric provides the means of persuasion (Aristotle & Hobbes, 2010). Central to the study of rhetoric is the framework of ethos, logos, and pathos. Respectively, ethos, logos, and pathos describe an appeal to authority, emotion, or logic. Through characters, setting, and plot, rhetorical narratives develop a story that persuasively explains the teller's position. Politicians and special interest groups use rhetoric to create stories that selectively configure language in a way that distorts the truth and leads to an unequal distribution of social and economic benefits (Covino & Jolliffe, 1995). Conversely, shared stories build community and define a place—the rhetorics found within community narratives brim with ideas of origin, destruction, rebirth, and future possibility.

Through narrative analysis, this study analyzes the rhetorical frames used by local politicians, as well as neighborhood residents, in telling stories of the neighborhood's future. Fifty-eight public speeches delivered by Biloxi Mayors Holloway and Gilich between 2005 and 2020 and the directed interviews of thirty East Biloxi residents conducted between 2019 and 2021 are analyzed and categorized as appeals to ethos, logos, or pathos. The resulting narrative analysis specifically answers the following questions:

1. What are the dominant narratives used by political leadership concerning the planning of minority and underserved communities?
2. What are the dominant narratives concerning planning within minority and underserved communities?
3. What are the most commonly used rhetorical frames in persuasive storytelling in future development narratives?
4. How does storytelling shape community attitudes and opinions concerning planning and future development?
5. How can planners utilize rhetorical framing and storytelling in expressing the crucial ideas of social justice and equity?

The stories told about planning can define a neighborhood's past and propel citizen imagination towards new prospects. The stories told about East Biloxi reveal important insight into how planners can better communicate policy, understand community aspirations, and bridge the gap between community voices and political leadership.

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Key Words: Communicative Planning, Equity, Diversity, Rhetoric, Tourism

#### **MOVING TOWARDS SAFETY: STUDENT'S PERCEPTION AND EXPERIENCE OF UNIVERSITY TRANSIT**

Abstract ID: 595

Individual Paper Submission

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Public spaces and services are meant to be equally accessible to members of the community. The reality is that how one navigates and experiences these elements can very much be influenced by their race, gender, and/or sexual orientation. Studies which explore how public transportation service is experienced by members of the community at large commonly share one conclusion, women are less likely to feel safe in transit environments. This fear can lead women to make significant behavioral changes in hopes of reducing their risk of victimization. One common change that is made is the reduction of transit use. This decision can have adverse impacts on the quality of life of members of this segment of the population as it can significantly limit their mobility and access to essential services. Within a university environment, this decision can impact the college experience for women as it can limit both academic and social opportunities. When members of the student body do not have equal access to such opportunities, equality has not been achieved.

This study seeks to explore the female student body's experiences and perceptions towards university transit service. Particular attention is placed on examining how their perception of this service impacts their educational experience. Questions which drive this study include: 1) How do female students perceive their personal safety within university transit spaces? 2) What factors impact the perception of their personal safety? and 3) How do female students navigate these spaces as a result of their perceived safety?

Necessary data to conduct this study was collected via a university wide survey and student interviews at one major university. These methods are geared towards seeking participants' perceptions and assessments of travel on university transit services. The deployment of a university wide survey allowed the research to see how the travel behavior of members of the female student body varied from that of their male counterparts. The survey also allowed the researcher to identify any deviations in behavior which may be influenced by a respondent's race, gender, sexual orientation, or other personal characteristics.

Findings from this study will allow university transit agencies to gauge how effectively serving the needs of vulnerable members of their ridership base. This can inform planning and policy decisions that may contribute to the delivery of services that more adequately serves the needs of their patrons and expands opportunities available to women within a university environment.

This study will inform a larger study which seeks to explore the prevalence of these issues at a national level. This will see the inclusion of the experiences of members of the student body at numerous universities throughout the country.

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Key Words: Safety, Transit Service, University, Equity

#### **BARRIERS FOR THE ACTIVE USE OF PARK AMONG MARGINALIZED COMMUNITIES IN THE CITY OF ARLINGTON, TX**

Abstract ID: 667

Individual Paper Submission

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While obesity has remained the number one public health challenge in the U.S, there has been a consistent disparity by race and ethnicity in obesity (Wen & Kowaleski-Jones, 2012). On the other hand, it is well-documented that physical activity is an effective means of preventing obesity which is supported by access to parks (Hobbs et al., 2017). However, still members of racial minority groups are among those who are less attracted to use parks for being physically active (Carlson et al., 2010). The decisions on forming a healthy community are mostly driven by what literature explained as general factors that could encourage all residents to use parks. Accordingly, the needs of ethnic communities could be overshadowed by findings of general studies. The less attended but still crucial question is what are the barriers that deter members of racial minority groups from using parks which also could hold those individuals from adopting an active physical lifestyle and exacerbate the obesity disparities by race.

This study aims to address this gap and derive the factors that could constrain physical activity in parks for those who have disproportionately experienced disparities despite preceding policy, systems, and environmental changes. Such understanding could also play a key role in addressing the obesity disparities and providing healthy environments for all. Our study area is the City of Arlington where healthy urban lifestyle via green spaces is a key driver of city policies. Moreover, as Arlington becomes more racially and ethnically diverse, it is more important to understand these sub-population barriers to active use of parks.

We will draw upon a 3-step mixed-method research design to address this question. In the first step, using spatial analysis and visualization, we will identify our target communities. Our target communities will be selected from the areas that are the racial minority groups and obesity hotspots in Arlington while access to park is not a challenge. In the second step, we will draw upon community engagement activities including semi-structured interviews to define the categories of barriers that our study needs to focus on. Ultimately, these categories will be the key in designing an effective survey. While the final survey design will depend on the results of the interviews, the state-of-

preference survey design is a tentatively selected method that could result in a sufficient level of detail in our findings.

Cities are keen to support residents' healthy lifestyle and therefore direct investment in expanding and improving their park systems. However, our understanding of the public need is limited to the lack of studies that focus on the minority communities. To the best of our knowledge, this study is among the first attempts that address this gap. While our findings could enlighten the decisions in the city of Arlington and alike communities, the method of this study will be generalizable to use in empirical analyses of other cities.

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Key Words: physical activity, Obesity, health, barriers, Race/ethnicity

#### **DOES PARK SEGREGATION STILL EXIST? THE CASE OF URBAN PARKS IN MONTGOMERY, ALABAMA**

Abstract ID: 675

Individual Paper Submission

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This study investigates the contemporary connotations of segregated urban parks in the context of Montgomery, Alabama. Racial segregation of urban parks in Montgomery has been a key yet less discussed component of the civil rights movement. In the Jim Crow era, the city officials and Southern Whites segregated access to urban parks with a fear of racial mixing. Even after the 1964 Civil Rights Acts and several other laws against segregated public facilities, the government was reluctant to desegregate urban parks in Montgomery. In the 1950s, there were only four parks that African Americans were allowed to use among a total of fourteen city parks. Not just by quantity, these Black-only parks were also of inferior quality compared to their White counterparts. The White-only parks will often be located in African American neighborhoods but will deny access to the immediate residents. In the 1970s, when the city officially integrated the parks, Montgomery neighborhoods experienced a White flight to the suburbs, leaving the city parks in poor conditions for the African Americans. Today, Montgomery has a desegregated park system with sixty-four parks spread across its different neighborhoods. The question remains whether park segregation still exists in Montgomery and, if yes, in what forms?

Literature on park access and equity shows that minorities and low socio-economic groups lack access to good quality urban parks. Access to urban parks profoundly contributes to the issues of environmental justice. Nevertheless, the design and management of park facilities and amenities often indirectly affect the diversity, inclusion, and equity of park users. This study empirically examines park segregation from the perspective of park quality and access by surveying sixty-four parks in Montgomery using five quality indicators – accessibility, recreation, amenities, natural features, and incivilities. The survey involves site visits and field observations to analyze and document the quantitative and qualitative measures of the indicators for each park. The study compares the evaluations with respect to the demography of people who live within a half-mile area from the parks, assuming them as potential users. The 2019 American Community Survey data shows, thirty-six parks are located in areas with more than 60% of African Americans while White neighborhoods surround the rest.



The parks' quality assessment shows that there are some significant correlations between the potential users of the parks and their qualities. African American parks, located mainly near downtown and southwest neighborhoods of the city, have limited walkability, degraded amenities, fewer recreational facilities, and signs of incivilities. As the African American neighborhoods suffered from urban renewal plans in the 1960s, many parks in such areas are disconnected by highways and have severe noise pollution issues. The superior quality parks are mostly found in White-dominated areas and are primarily used as sports and recreational facilities. Small neighborhood parks, especially in African American neighborhoods, have minimal amenities and fewer natural features than privately maintained large recreational parks. The observations suggest that park segregation still exists in forms of quality-based inequalities for park facilities and access in Montgomery. Assessment of park quality is crucial to practice environmental justice, especially in cities with a history of racial segregation of public amenities. In 2020, Montgomery adopted the 2040 Comprehensive Plan, which aims to create a citywide parks and recreation master plan. The parks and recreation department can benefit from this study by addressing the quality-based inequality issues in the future master plan.

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Key Words: segregation, parks, environmental justice, Montgomery, Alabama

#### LOCAL BATTLES FOR PRO- AND ANTI-IMMIGRANT POLICIES: THE CASE STUDY OF ORANGE COUNTY, CALIFORNIA

Abstract ID: 716

Individual Paper Submission

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How do pro- and anti-immigrant political forces fight to enact policies across metropolitan regions? Municipalities and counties have become a central arena in battles over immigration policies. Whereas pro-immigrant groups have sought to enact an array of sanctuary policies, anti-immigrant groups have introduced a broad of policies to deter immigrants from residing within their jurisdictions. Though scholars have examined the conditions that give rise to and animate pro- and anti-immigrant battles, they study each side apart from one another and conceptualize them as unfolding within a single municipality. For instance, some have studied the anti-immigrant politics of Hazleton, Pennsylvania (Longazel 2016) and others the pro-immigrant politics of San Francisco (de Graauw 2016) or Los Angeles (Milkman 2005). This paper takes a different approach by examining the entanglements of pro- and anti-immigrant forces and taking the metropolitan region of Orange County as the unit of analysis.

The main data source for this paper consists of newspaper data that includes articles published between 2010 and 2018 on immigration issues in Orange County, CA. We located 262 newspaper articles and extracted 1,751 statements from different actors. This dataset contains information on the articles (author, title, date published,

newspaper) and all claims made in the articles (claim, actor making the claim, affiliation of the actor, location that the claim pertains to). For each claim the attitude of the actor regarding immigration was coded (negative (-1), neutral (0), positive (1)), and to what policy the claim referred (if applicable). The data was then analyzed using the political claims analysis method (Koopmans and Statham 1999). We identified who was participating in mobilizations, what their policy demands were, justifications for their demands, the locations of their battles, and the level of support elected representatives.

The paper shows that advocates on both sides were advancing policies in direct reaction to their adversaries, and these battles unfolded across jurisdictional lines. Pro-immigrant organizations consisted largely of nonprofit organizations in Los Angeles and Santa Ana. These organizations campaigned against restrictive federal immigration policies and launched a sanctuary city campaign in the city (Santa Ana) with most political opportunities. The intent of the campaign was to provide some protections for immigrants in one jurisdiction against law enforcement incursions from another (federal). Once the Santa Ana campaign succeeded, resource-rich Los Angeles organizations mounted a statewide campaign while their Orange County allies provided support. The anti-immigrant side was led by municipal elected officials. These officials used the authority of their municipalities to enact policies to restrict immigrants, express solidarity for other allied governments, and launch attacks against adversarial jurisdictions like the state of California. For both sides, friendly municipalities were used as political strongholds to attack adversarial jurisdictions and defend their own.

This study is important for the planning literature because it identifies the complex political underpinnings driving local immigration policies.

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Key Words: Immigration, Immigration Policy, Advocacy Planning, Diversity

#### **PLANNING WITH DIVERSITY IN SMALLER CITIES IN CANADA: A STUDY OF IMMIGRANT LIVED EXPERIENCES IN BROOKS, ALBERTA**

Abstract ID: 755

Individual Paper Submission

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Immigrants to Canada have predominately settled in large and medium-sized cities as compared to smaller cities. According to the 2016 Census, 91% of immigrants settled in 35 Census Metropolitan Areas, where 61% of the share were distributed between gateway cities of Toronto, Vancouver, and Montreal. This uneven settlement pattern contributes to rich research on large gateway cities, yet little is known about the lived experiences of racialized immigrants in smaller cities, the factors that attract and retain them, and the implications for planning with diversity in non-gateway contexts (Nguyen, 2020). The imbalanced settlement outcomes in various sized cities have also

triggered imperative policy issues drawing the attention of all levels of governments, as smaller cities have already faced challenges such as labour-force shortages and an aging and declining population. The uneven distribution of immigrants further marginalizes these smaller regions affecting their economic prosperity and social stability, as well as immigrants' settlement and integration experiences.

There is emerging research focusing on the effectiveness of immigration policies of various scales in facilitating the dispersion of immigrants to lesser populated areas (Carter et al., 2008; Pandey & Townshend, 2011; Shannon, 2015). However, it remains largely unknown as to what smaller cities need to consider when planning for and with diversity in order to build welcoming and inclusive communities (Fincher et al., 2014). This study differs from the previous policy approach as the facilitator of immigrant settlement in small cities. Instead, it explores the challenges and opportunities facing racialized immigrants by addressing the following research questions: 1) How do racialized immigrants experience settlement and integration in small municipalities in Canada? 2) What is the role of local municipalities in creating welcoming and inclusive environment to attract and retain immigrants?

This research adopts an ethnographic case study approach to explore the lived experiences of racialized immigrants settling in Brooks, Alberta, a small-sized city with a population of 14,451. Semi-structured interviews were conducted with racialized immigrants from Africa, Asia, and South America, as well as municipal officials and local settlement agency staff. The findings reinforce employment opportunities and family-related factors as the primary reason of immigrant settlement in small cities. But beyond these factors, the findings also point to the importance of developing a sense of belonging which can be enabled by inclusive community spaces, cultural representation, and creative placemaking. It further highlights the importance of municipal and community partnerships towards promoting diversity and cultivating place-based inclusion within a multicultural context. The research not only provides empirical learning of immigrants' lived experiences in a smaller city, but also offers place-based recommendations for smaller municipalities to leverage diversity and inclusion as an attraction and retention strategy.

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Key Words: planning with diversity, immigrant, lived experiences, small cities, Canada

#### **APPLYING DISASTER PLANNING THEORY TO UNDERSTAND RACISM AS A PUBLIC HEALTH CRISIS**

Abstract ID: 772

Individual Paper Submission

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Central Theme and Research Question:

Amidst the intersecting crises of the COVID-19 pandemic and ongoing police brutality against Black people,

jurisdictions across the United States declared racism to be a public health crisis in the summer of 2020. According to the American Public Health Association (APHA) website, 190 jurisdictions have published such declarations as of March 2021 (APHA, 2021).

What does it mean to frame racism as a public health crisis? Racism is not new to the United States. From the genocide of Indigenous peoples to the chattel slavery system and government-sanctioned Jim Crow laws and urban renewal, to the ongoing violence against Black, Indigenous, and People of Color (BIPOC) communities including the surge of violence against the Asian American/Pacific Islander (AAPI) community, white supremacy shaped the foundation of the United States and continues to shape lived experiences in this country.

The appropriate research question is not “Does racism impact health?” There is indisputable evidence that racism is a major threat to the health and lives of many in the United States (and around the world) (Orchard & Price, 2017; Wallace et al., 2017). Racism impacts health through a plethora of avenues including but not limited to chronic stress, housing, education access, policing and mass incarceration, transportation, and food access (Daniels et al., 2020; Hilbert et al., 2014; Lu et al., 2010; Wallace et al., 2017). Racism is at the foundation of the social determinants of health that result in poor health outcomes and is a fundamental cause of racial disparities in health (Jones, 2002). These social determinants of health fall within the intersection of the fields of city and regional planning and public health and are shaped by historical and current local and regional policies and practices.

Instead, the research questions addressed by this paper are as follows:

1. Given the long arc of racism in the United States, is it appropriate to categorize racism as a public health crisis?
2. What theoretical underpinnings from crisis planning research can be applied to understand racism as a public health crisis?
3. What are the planning implications of categorizing racism as a public health crisis?

#### Approach and Methodology

This paper explores and compares theoretical and practical definitions of crisis from the planning field through a review of the literature. Crisis definitions are then categorized by hazard agent and speed of onset. The applicability of various definitions to the conceptualization of racism as a public health crisis is explored.

#### Findings

The author concludes that there are streams of crisis planning in which racism can be understood as a crisis. Specifically, theoretical approaches to understanding disasters as systems failures along with the small subset of research on slow-onset disasters (Staupe-Delgado, 2019) are especially relevant. However, the existing frameworks do not provide holistic approaches for addressing this category of crisis.

#### Relevance and Implications:

The paper problematizes the current dominant crisis planning paradigm and proposes alternative planning and public health frameworks for addressing racism as a public health crisis. Implications for future research and practice include highlighting the theoretical and practical connections between the planning and public health fields (Corburn, 2012). There is value in conceptualizing racism as a public health crisis, but only if such declaration elicits appropriate action to dismantle structural racism and build empowered communities that are physically, socially, and economically resilient. Without action, the declarations only perpetuate uneven power dynamics while continuing to traumatize BIPOC communities. Planning has a unique set of theoretical and practical tools in crisis management and community development to be part of the interdisciplinary solutions needed to address racism to achieve health equity.

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Key Words: Disaster Planning, Public Health, Racism, Theory

## ACCESSIBILITY AND THE DESIGN CHARETTE: TIME, POWER AND FACILITATION

Abstract ID: 780

Individual Paper Submission

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Participatory design (PD) processes are often celebrated as a valuable way to ensure engagement, not just in the abstract, but in the details of producing and building places, policies, and practices. PD, a form of user-centered-design, includes end users (or “participants”) in the design of products and systems. The Design Charette (DC) is one methodology of PD that has become increasingly popular in disciplines from urban planning to information technology and education, likely because DCs meets many institutional goals. They are fast-paced, efficient, results-oriented processes that produce buy-in through engaging end users. However, despite their considerable uptake, there is little academic research that advances critical discussion or evaluation of DCs (Kennedy, 2017).

While participatory methods and engagement strategies are central to planning and design processes, the tools used for engagement are still evolving. Work is needed to foster the tools responsiveness, effectiveness, efficiency, and inclusiveness. Within a project using participatory methods to design an intervention for improving the accessibility of practicum educational spaces, we are reconsidering the DC from the perspective of disability related accessibility. Throughout the literature, very few studies directly address DC or charrette-like activities and participants with disabilities (Kowaltowski et al., 2015; Drain et al. 2018; Frauenberger, Good, & Keay-Bright, 2011).

The present paper documents our work to collaboratively reconsider the DC process from the perspective of disability accessibility and inclusivity. It rests on two assumptions: 1) for a process to be inclusive, it should be able to engage participants with a range of abilities, 2) Changes made with the goal of disability accessibility might also make the process more accessible for a range of participants. Our team is comprised of members with expertise in the design charette process, planning, critical disability studies and occupational science. The choices we made about the process respond to broader conversations about accessibility and simultaneously speak to key criticisms of PD processes. Our changes to the process in large part focus on considerations of time, power and facilitation.

In evaluative literature on DC, we found that the fast-paced nature of charrettes may pressure participants, exacerbating inequities and vulnerabilities (Carlson et al. 2020). Conversations about the role timing and pace play

in accessibility more broadly, also figure strongly in disability scholarship. To address these concerns from both literatures we have made interventions to the overall schedule and timeframe, as well as modifying the time for activities and deliverables in our DC.

Although DCs are typically undertaken as a method that promotes a redistribution of power towards communities, there is more to be understood about their possibilities and limitations on this front. When diverse participants are brought together (a goal of charettes), there may be internal and external power structures that restrict the voice of marginalized participants in collaborative activities (Drain et al. 2018). Modifications we made to our DC consider power more explicitly. This work draws on our teams' awareness of the ways ableism and structural inequality are embedded in a design process with mixed teams of students, instructors, and administrators, with and without disabilities.

The modified plan for the DC process is currently being finalized using both expert and experiential knowledge, and drawing on a wide range of design tools and best practices. The charrette will be conducted in the summer of 2021 and this paper will share the final modified process, how it was created, and how it was received by participants. This exploration will contribute to a growing critical literature on strengthening the accessibility, inclusion, and effectiveness of this participatory tool.

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Key Words: Accessibility, Disability, Engagement, Design Charette, Participatory Design

#### ***AGE-FRIENDLY COMMUNITIES IN A DECLINING REGION? CHALLENGES AND POSSIBILITIES IN WESTERN MANITOBA***

Abstract ID: 785

Individual Paper Submission

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Over the Winter 2021 term, a University of Manitoba planning studio examined five rural municipalities in western Manitoba, including ten settlement areas ranging in population from 80 to 1,300. We sought to understand how the region was changing and how this change had negative impacts on quality of life for older adults. Working with local age-friendly committees, studio groups studied the potential of various initiatives to improve the lives of seniors, or at least to maintain their independence as long as possible in a region that was both declining in population and, within the context of the province, aging disproportionately.

This work is part of a broader research project funded by Social Sciences and Humanities Research Council of Canada (SSHRC) that is examining the lasting contributions and sustainability of the Age-friendly Manitoba Initiative

(AFMI), that was initiated in 2008. The communities in this study were chosen because, they had expressed an eagerness to continue developing age-friendly projects. Also, any analysis of the communities required an analysis of the region, since most of the settlement areas are too small to host all the amenities and services that the older populations needs.

The planning studio conducted GIS analysis (e.g., demographics, travel distances to amenities and services) and held engagement sessions with members of the age-friendly committees that included older adults, elected officials and service providers. The initial discussions were used identify the successes that the communities had with the AFMI, to identify ongoing issues faced by older adults in their everyday lives as well as to develop a better understanding of potential threats to their quality of life as services are being withdrawn as the populations decline. As work progressed, we used precedent studies as vehicles to discuss strategies that might help stabilize communities, to explore alternative systems to deliver services, and to seek approaches to economic development that could take advantage of local and regional assets.

The final meeting (in late April) will bring all of the communities together with the hope that they will learn from each other's successes (e.g., some have implemented successful age-friendly trails, others have found ways to provide more accessible housing), and challenges that they face (e.g., threats to the renewal of town populations if the local school has to close). Others who may have expressed an interest in the work will also be invited. This includes the Manitoba Resource Team that support seniors' living, a group that has some influence on policy and the implementation of programs.

Major stakeholders from each of the communities will be invited to an early summer focus group to reflect on the experience of working with the studio, and to discuss how this type of work and engagement may increase the continuing interest in and sustainability of the Age-friendly Manitoba Initiative (<https://agefriendlymanitoba.com/>).

While many programs were initiated in response to the World Health Organizations (2007) research and publications about age-friendly cities (and the Public Health Agency of Canada's (2008) work about rural and remote age-friendly communities (2008), there has been little research about their success, or about how well they have been sustained over time. The focus of most initiatives and research has focused on individual communities, but this work starts to develop an understanding of the regional supports needed to for older adults to enjoy a good quality of life in smaller and more remote communities.

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Key Words: Age-friendly communities, social inclusion, regional planning, rural communities

#### **IMMIGRANTS' EXPANSIVE AND CONSEQUENTIAL LEARNING: THE IMPACT OF SERVING ON DECISION-MAKING BODIES ACROSS THE STATE OF OREGON**

Abstract ID: 820

Individual Paper Submission

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The research presented in this paper was specifically conducted to shed light on the unknowns related to the common government practice of including members of the public in decision-making bodies. For members from under-represented groups, such as immigrants, engaging in decision-making/planning bodies and processes can result in expansive and consequential learning (Meléndez & Parker, 2021). This is due to how under-served communities usually lack meaningful representation at all levels of government bureaucracies, be they at the state, county, or city (Ricucci, & Van Ryzin, 2017; Bradbury, & Kellough, 2011). Thus, their involvement in decision-making processes can be seen as an alternate way to have them influence policy and outcomes (Hafer, & Ran, 2016; Quick & Feldman, 2011).

With a focus on immigrants and their communities across the State of Oregon, the research presented interviewed 48 immigrants who sat on a variety of decision-making bodies to identify the layers of findings related to the objective and subjective interplay of how they made sense of their roles and engagement in decision-making bodies. We posit that public participation on these bodies represents a third and under-researched type of civic engagement that bridges more well-known forms. The more well-known forms include, on the one hand, community service and civic acts such as volunteering for community-based organizations, voting, and include more cultural forms of civic engagement that use immigrant lived experiences as a starting point, such as church activities (Meléndez & Martinez-Cosio, 2021). On the other hand, more formalized political civic acts include running for public office, volunteering for campaigns, petition drives, and other forms of policy advocacy. Between these two forms of civic engagement lies voluntary public involvement on decision-making bodies that advise and/or govern at various levels of government.

Our findings demonstrate how these groups give members of the public opportunities to develop new skills; collaboration that expand their networks; new knowledge on the intricacies of how government works; and eye-opening experiences that expand members' concepts of the possibilities and limitations of government work. Additionally, we found that for immigrants sitting on these bodies, the value of participating effectively bridges the continuum of civic engagement from local/cultural acts to more explicit political ones. In fact, sitting on these bodies is a pre-requisite experience that many elected officials share. This third type of civic engagement is less documented in the literature on immigrants, a gap this research begins to fill by framing it as a bridge that completes the civic engagement trajectory of immigrants finding a voice in and for their communities.

This paper will present findings related to what immigrant interviewees reported learning while sitting on these bodies. Indeed, there was a lot of learning that took place while serving on the boards. We were able to identify three distinct types: dispositions, professional development, and government. Learning new dispositions involved new attitudes, ways of seeing the world, or understanding people as a result of board service; while government related to new knowledge about the processes of government institutions as a result of their service; finally, professional development referred to a broad array of skills and knowledge building acquired as a result of service on the board. Regardless of the combination of the type of learning that individuals spoke about in their interviews, it is clear that the experience of serving on a board is expansive and consequential on a number of levels.

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Key Words: Immigrants, Civic Engagement, Learning, Decision-Making bodies, Oregon

## **CAN E-TRIKES IMPROVE THE MOBILITY OF OLDER ADULTS IN INNER-SUBURBAN AREAS? EXPANDING COMMUNITY-BASED TRANSPORTATION OPTIONS IN NORTH WEST TORONTO THROUGH A MICRO-MOBILITY INTERVENTION**

Abstract ID: 836

Individual Paper Submission

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Background: 80% of Canadians live in suburbs, including most older adults who have expressed a desire to age-in-place. This is problematic, as it is well-known that residing in car-dependent suburban communities can have negative impacts on the physical and mental health/wellbeing, social engagement, and mobility of older adults, more so than other populations (Kerr et al., 2013). The distances created by suburban designs pose accessibility issues for older adults, particularly those without a car, and it can take decades to change these land-use patterns. Research has shown an opportunity for micro-mobility options (e.g. e-bikes/e-trikes) to overcome these land-use barriers to expand the activity space of older adults, and enable them to age-in-community (Leger et al., 2019; Golant, 2018). However, while most research on e-bikes and older adults is promising in terms replacing car trips, this research has focused on retroactive surveys of those who already have an e-bike, or on future-based perspectives of the potential of owning an e-bike (Van Cauwenburg et al., 2018; Marincek & Rérat, 2020). The cost of a well-built e-bike/e-trike (\$1000-\$7000 CAD for a base model) is prohibitive to many older adults living on fixed-incomes and/or below the poverty line.

Research Goal: This study addresses this identified gap by examining an intervention of e-trike use with lower-income, racialized older adults living in suburban north west Toronto, in addition to understanding their narrative mobility histories. This research will also understand from the perspective of the older adults, the key characteristics of a community lending program that would enable them to continue to use the e-trikes, instead of having to purchase one.

Study Location: The inner-suburban area of north west Toronto was selected as it is home to a higher-than-average proportion of older adults living in poverty (Social Planning Toronto, 2020), and is also an area facing substantial vulnerabilities through a lack of proper infrastructure access (Young & Keil, 2014; 2010).

Methods: 10 participants will be recruited through the community partner organizations – Our Greenway Conservancy and the Toronto Council on Aging. Participants will complete an introductory interview answering life course questions about their present neighbourhood and mobility patterns and past residences and mobility patterns during their youth and middle age. They will also be asked about perceived changes since getting older, and about their mobility concerns for the future. Next, they will keep a travel diary and wear a GPS tracker for a two-week period, without the e-trike. After receiving training on how to ride and secure the e-trike, they will keep a second travel diary and wear the GPS tracker for another two-week period while using the e-trike. Finally, there will be a post-interview asking participants about their experiences with the e-trike, followed by a focus group with all participants to discuss what a community lending program should look like.

Expected Outcomes + Implications: This study will document modal changes with access to the e-trike, over a period of a month for participants. It will also measure the types of routes (and streetscape infrastructure) that participants prefer to use for diverse modes (e.g. walking, e-trike, public transport, car) by analyzing the GPS and travel diary

data. It will report on their perspectives of using these e-trikes, as well as their mobility histories and how that influences micro-mobility use. This study will explore how these older adults prefer to use e-trikes through a community lending program. The idea of building a program from the perspective of older adults upends the common ageist bias towards developing general biking programming for younger/middle age groups, who are less likely to experience accessibility issues.

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Key Words: micro-mobility, justice, older adults

#### QUEER THEME PARKS: STONEWALL NATIONAL MONUMENT AND SYMBOLIC LANDSCAPES OF EXCLUSION

Abstract ID: 840

Individual Paper Submission

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Stonewall National Monument is one of the newest monuments run by the National Park Service, where it was set up in 2016 by former President Barack Obama in Manhattan's Greenwich Village. The Stonewall National Monument is a monument to the Stonewall riots, an event that occurred over six nights in June 1969 at a gay bar called the Stonewall Inn, where LGBT patrons of the bar fought back against years of police harassment and brutality.

This monument, which commemorates a crucial and even radical moment in queer history, now exists in what is now one of the most heavily gentrified and expensive areas in the United States. I argue that Stonewall is a sort of theme park that tones down the radical history of the moment, while allowing space for a sanitized narrative about Greenwich Village. In doing so, Stonewall National Monument becomes a tool of urban biopolitics, providing amenity while also creating a place of exclusion. This idea of urban biopolitics, as proposed by Ted Rutland, allows for urban spaces to determine who does and does not belong. These urban biopolitics also allow for the expansion of revanchist politics, thereby allowing even more gentrification.

As an amenity, it creates a sort of symbolic landscape that presents a particular kind of politics. These politics allow New York City to portray liberal acceptance towards LGBT people by celebrating this moment in much the same way as liberal politics often portray figures like Martin Luther King, Jr., in a sanitized nod to radical politics. The flip side of this is that it excludes radical politics in the present day that seeks to make life better for LGBT poor people and people of color. This is evidenced by the processes that led up to the designation of the monument, where there is evidence based on interviews and archival documents, that most of the people who were invited to and involved in the designation process were not poor people, people of color, or people involved in radical activism on their behalf.

Through in-depth interviews of people involved in the designation process of Stonewall National Monument and analysis of various contemporary news reports and other archival documents, I have found evidence that Stonewall National Monument gave voice to the elite among the LGBT community in Greenwich Village, while excluding those who were not within that elite and who engage in radical politics. This occurred primarily through the designation process, where the voices that were heard the most at public forums and meetings were not those of poor people, people of color, and radicals. Indeed, attempts at bringing those voices in were met with consternation and annoyance by proponents of the monument.

With a better understanding of urban monuments to radical activism like Stonewall National Monument, we can better understand their role in neighborhoods and how they can be interpreted and used in a way that preserves the radical history of the moment. Instead of being a symbolic landscape to sanitized activism, they can instead stand as monuments to the radical moments they represent. This may even have some effect on the neighborhoods that surround them.

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Key Words: Gentrification, Queer, Symbolic Landscapes, Monuments

### **STUDYING GENDER IN LOCAL PLANNING: A CONVERGENT ANALYSIS OF THE COLOMBIAN CONTEXT**

Abstract ID: 882

Individual Paper Submission

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How can we best understand local planning efforts to advance gender equality? Despite an influx of studies considering gender within the different planning concentrations (Gutierrez Rivera, 2020; Oliviera & Fageda, 2021), planning practice and theory is still in an early stage when it comes to framing and developing strategies in which women's interest are well served (Fainstein and Servon, 2005; Greed, 2016; Lozano-Torres, 2020). This study contributes to the literature in urban planning by offering a comprehensive empirical assessment on the need to conduct both qualitative and quantitative approach to better understand the multifaceted problem that is gender responsiveness in planning.

I used a sample of 21 city plans of Colombian municipalities to compare a quantitative measurement of Gender Responsive Planning in the plans (GRP Index) and a qualitative assessment exploring the local understanding and strategies sought to advance gender equality. This is done through a Convergent Parallel Mixed Method (CPMM). While the index assesses responsiveness towards gender equality, the qualitative analysis studies the making of it at the local level.

This analysis demonstrated convergence of qualitative and quantitative results for cities that had the highest and lowest values of GRP Index, meaning that that levels of GRP were matched to the efforts towards GE by local governments. However, divergence was found for middle ground cities that were neither excellent nor deficient in their efforts for GE. The CPMM is thus particularly helpful for cities in a gray area, as each analysis captures a different dimension of gender responsiveness for cities that are more advanced in certain aspects of gender responsiveness but less so in others.

The results imply that gender equality in local planning, like most multidimensional issues, needs to be addressed from different lenses for a complete understanding of both the situation and the actions needed to address it. The use of a mixed methods approach with a convergence analysis is then an important tool in the field to frame and approach gender responsive planning in a local context.

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Key Words: gender equality, local planning, mixed methods, Latin America, Colombia

#### **FROM 'WHAT IS GENDER' TO 'NOT MY JOB': INSTITUTIONAL BARRIERS TO GENDER MAINSTREAMING IN TRANSPORT PLANNING IN PANCHKULA, INDIA**

Abstract ID: 908

Individual Paper Submission

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Gender mainstreaming is an umbrella policy strategy to achieve gender equality. It aims to transform organizational processes and practices by eliminating gender biases in existing routines involving the regular actors and institutions. In this paper, I study the aspirations of gender mainstreaming and the readiness of local transport planning institutions in cities of the global South. The specific questions this study addresses are: How do policymakers and transport planners understand and approach gender mainstreaming in cities in the global South? How does integrating 'gender' as an analytical category fundamentally challenge and alter the existing planning institutions and methodologies? Can transport planning institutions escape their existing gendered structure and practices to influence long-term change? I use gender planning frameworks (Levy, 1996; Moser, 1993) and scholarship on sociological institutionalism (Sorensen, 2017) to examine and identify the institutional difficulties in seeking to transition towards gender-sensitive planning approaches. I investigate these questions in the case of Panchkula, a medium-sized city in northern India.

The article draws on a collaborative research study undertaken between 2017-19 for the Panchkula Municipal Corporation (or the PMC) that aimed to understand and address women's concerns in transport access and use in its jurisdiction. PMC is the primary planning body that is responsible for city-level urban transport functions. Additionally, the research study was also conceptualized, carried out, and executed in the PMC office, making it an appropriate choice for institutional analysis. I use findings from on-site observations, document analysis, and in-depth interviews conducted with diverse planning actors and stakeholders to ascertain the current level of gender mainstreaming in PMC with a focus on identifying institutional challenges.

The case findings reveal that transportation planning practice in Panchkula is essentially an 'informal institution' encompassing a set of formal rules and informally agreed-upon practices (Martens, 2017) that collectively shape

and influence city-level transport infrastructure investments. Without any overarching policy commitment to inclusive and equitable transport planning, I argue that the existing institutions and inequalities remain unchanged. From conceptual ambivalence around 'what is gender' to 'not my job,' interviews of transport planners and actors highlight a host of problematizing attitudes/beliefs that underpin daily transport planning practices. The everyday practices of transport planning actors are embedded in their own socio-cultural lived realities just as they are within the gender blind organizational practices and transport methodologies. My analysis thus expounds continued discussions around how gender mainstreaming requires a polycentric approach involving interventions across multiple scales of governance.

The study calls for a need to bring gender issues into focus in daily planning practices by highlighting the genderedness of the existing institutions and practices. The findings would be of particular interest to planners and policymakers interested in realizing an effective transition from a gender-neutral to gender-sensitive transport planning paradigm.

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Key Words: Gender mainstreaming, Transport Planning, Planning Practice, Gender-responsive planning, Women's needs in transportation

#### **BUILDING THE RELATIONSHIP BETWEEN LAND USE AND SOCIAL SATISFACTION: A COVID-19 STUD**

Abstract ID: 956

Individual Paper Submission

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Linkages between neighborhood and life satisfaction offer evidence that planning makes a difference in people's connectedness (Cao, 2016). In particular, social interactions can be improved through accessible and communal spaces (Raman, 2010), with some places offering improvement to health and well-being, such as with outdoor spaces (Kruize, 2020). However, there are limited studies that offer insight into how the evidence relate to people living with disabilities.

Unfortunately, people with disabilities already deal with a combination of social disadvantages which can lead to vulnerability and disproportionate effects relative to people without disabilities (Armitage & Nellums, 2020; Constantino et al., 2020; Pineda & Corburn, 2020). All the knowledge around planning and community design

reveals limited information about how activities of daily community living (ADCL) differ between the groups (those with and without disabilities). This leads to a gap in evidence-based decision-making and policies to facilitate land use planning and policy to create a more equitable place to live for people with disabilities.

This study aims to understand how COVID-19 impacted people with disabilities, particularly focusing on social satisfaction and the relationship to this satisfaction and various land uses. Here, land use is defined more specifically associated with specific types of facilities that are associated with ADCLs, including: home, workplace, grocery stores, restaurants, retails, recreation (indoor and outdoor), community centers, healthcare facilities and others. To answer those questions, we conducted a web survey using Qualtrics' online panel data. The final sample includes 161 people with disabilities and 232 people without disabilities across the United States.

Each participant was asked to estimate their activities "pre-COVID" (2019), "during COVID" (2020 after the COVID-19 outbreaks), and "post-COVID" (the time when COVID-19 is no longer a concern in the U.S.). We ran bivariate inferential statistics such as t-test and Chi-square test of independence to see if the mean differences are statistically significant. Then, multiple regression models were developed for different hypotheses that explain travel behavior outcomes by internal and external factors. To model moderating effects of socio-demographic factors, interaction terms were added between disability status and personal income variable.

Our survey produced a number of confirmatory knowledge about COVID-19, as well as some unique findings associated with the different study groups. We found that across adult demographics, that those who are older rated their overall social satisfaction lower than younger populations. Interestingly, for our regression model, we found that workers (part and full-time) had an increase in social satisfaction, but this was due because of the overall increase was associated with men, whereas for women satisfaction dropped when comparing pre- and during-COVID-19. While neighborhoods offer a connection to community, it was apparent from our data that individuals associate social satisfaction with online activities, their home, workplaces and other place types. While it was clear that the association between social satisfaction and restaurants and retail dropped, this was not the case for outdoor recreation opportunities – for people without disabilities. However, for people with disabilities, there was a significant drop in the connection with outdoor spaces and social relationships, as well as with health care facilities.

As we look toward planning activities to facilitate engagement and equity across the range of people living with and without disabilities, it is important to understand the mechanisms that create disadvantages. The reason for the drop in relying on outdoor recreation places to facilitate social satisfaction needs additional study. In particular, because these places have a well-defined body of literature suggesting multiple health and well-being benefits.

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Key Words: individuals with disabilities, disability, activities of daily community living, pandemic, social relationships

#### ARE WE COMPLICIT? INTERROGATING THE NOTION OF TRAVELING THEORIES AND RACE TALK FOR PLANNERS

Abstract ID: 959

Individual Paper Submission

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There is an acknowledged resistance in Mexico to engage with race dialogues, which has stunted the study and theorizing about Blackness and Nativeness in Mexico. The common response from academics is “we don’t have racism here like in the US.” “No one ever had to sit in the back of a bus because they had dark skin.” But based on my more than 25 years of working in Mexico, I have seen/experienced it and heard many stories about how it is impacting peoples’ everyday life. With that context, I have recently written about the erasure of Blackness and Nativness in Mexico (Sweet 2021). I used a combination of Latin American scholars’ work on colonialism and scholarships from Black feminist geographers from Canada and the U.S. to think about race and gendered race in Mexico to help build a path toward better understanding race and gendered race in U.S. Mexican communities, that would presumably lead to more equitable planning. One goal was to engage with Mexicans as much more than immigrant communities by seeing the complexity of race in Mexico: historically, territorially, and viscerally. I make the case for understanding the legacies of colonialism, slavery and genocide to better comprehend contemporary experiences of Mexicans in US white settler domination.

As a U.S. based Native American cis woman, I am interested in interrogating my role as an outsider studying and theorizing about Blackness and Nativeness in Mexico. Is my thinking and writing another expression of colonization? Is applying/using Black feminist geographies as a framework in combination with Latin American/Mexican scholarship to help think about Blackness and Nativeness in Mexico an act of imperialism? How do ideas and theories of race and gendered race travel? In what ways does the author validate or invalidate these experiences? How can these types of analysis be used in cultivating conversations and ideas about race, and gendered race in Mexico and the U.S.? Are there boundaries that prelude traveling ideas from North to South and back because of the risk of theoretical colonization/imperialism that would lead to practices of the same?

Based on 25 years of work in Mexico and with Mexican communities in the U.S., I use a series of three auto-ethnographic essays (Sweet et al. 2029) to grapple with these important considerations for planning as it slowly and gingerly embraces a broad mandate to move toward feminist, anti-racist, and decolonial theory, pedagogy, and practice. My goal is to advance multiple conversations important to the discipline’s aspirations toward diversity equity and inclusion (Córdova 1994). Specifically, I want to provide critical insights about global planning education, add to theories of feminist, anti-racist, and decolonial practice (Cordova 1998), and engage with culturally humble self-reflection about my and planning’s possible continued collusion with imperialism. Each of the three autoethnographic essays will address one of these concerns. My conclusions will document the overlapping spaces of global education, planning equity, and cultural humility (Sweet 2018) in planning theory.

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Key Words: Coloniality, Cultural Humility, Blackness, Nativness, gendered race

#### **(DE)CENTERING WHITENESS: LESSONS FROM COMMUNITY DIALOGUES ABOUT POLICING PROBLEMS AND SOLUTIONS**

Abstract ID: 991

Individual Paper Submission

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What happens to problem and solution pathways when race is prominent in a public management issue, efforts are made to facilitate constructive dialogue among stakeholders, and the majority of dialogue participants are White? This paper is an ethnographic case study of community deliberations about policing, race, and safety. I explore the effects of process design features and facilitation practices that were intended to alleviate commonly observed problems in community participation, namely domination, suppression of voice and influence of systemically marginalized groups, and the fragility of White participants. In addition, the deliberations were designed to de-center White participants' assumptions, values, and expectations about safety, inclusion, and community-police relationships.

The location of the study is Falcon Heights, Minnesota, where the killing of Philando Castile by a police officer in 2016 was a watershed moment in the international Black Lives Matter movement. Castile's death was met by a mixture of shock, grief, rage as well as by recognition of the necessity to reform policing and re-set community relationships. Community leaders described the circumstances of his death and the community upheaval that followed as "a microcosm of what vexes America."

As a scholar specializing in participatory planning and deliberation, I worked closely with Falcon Heights residents for four years to design and facilitate extensive community dialogues on race, policing, and healing. My approach to this product of my engaged scholarship is ethnographic, drawing upon over 225 hours of participant observation, minutes and fieldnotes of 23 dialogues (13 task force meetings, 5 community conversations, and 5 city council meetings), surveys completed by 60 of the total 180 participants in the dialogues, 4 focus groups with community conversation facilitators and participants, and 7 interviews with key stakeholders. Because of my involvement in the deliberations, other researchers conducted and analyzed the survey, focus groups, and interviews with participants about their experience of the deliberation. Through longitudinal, ethnographic analysis, I trace how the deliberative process rendered White complicity in racism visible.

Participants began with divergent points of view about safety, policing, and race issues, and the differences frequently aligned with race and class identities. Over the process of deliberation, they came to reframe their priorities to be less focused on disciplining a bad police officer and his department and more oriented towards creating safety and welcome for everyone through reducing profiling, strengthening relationships across the community, and addressing White privilege. Their problem redefinition process led to a consensus commitment to embrace the necessity of broad-based equity and inclusion, alongside the initial, narrower focus on policing reform. Many participants attributed their change in view to the duration and pacing of the process, which allowed them to get to build trust, discover new perspectives, and discuss issues in depth. They also credited a circle process design in community conversations with reducing domination, which they found allowed them to express or to hear and take in non-White perspectives without as much silencing, judgment, or censure as they felt in other settings. However, White residents did not mobilize their learning into sustained, effective advocacy to reciprocate BIPOC residents' labor to activate and educate them.

The concerns and questions that Falcon Heights is grappling with – racial inclusion/ exclusion in cities, safety, community identity, and power relations in community engagement – are of critical relevance to planners in communities everywhere. Specifically, the learning and labor imbalance in this case resembles the Whiteness of many planning and other public decision- making spaces - particularly, but not exclusively about policing - so I conclude with suggestions for more constructive deliberative processes to advance equity and anti-racism

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Key Words: Whiteness, Policing, Anti-racist community action, Deliberative democratic processes, Problem definition through a race and equity lens

## THE PREFERENCE OF DIFFERENT ELDERLY GENERATIONS FOR ENTERING A NURSING HOME: FROM THE PERSPECTIVE OF FAMILY INTERGENERATIONAL RELATIONSHIP

Abstract ID: 993

Individual Paper Submission

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Background: Shanghai's household registered population is highly aged. The baby boomer generation born in the 1950s-60s with generally only one child because of the One-child Policy since the 1980s has been becoming the elderly recently. Compared with the older multi-children elderly, the one-child parents' eldercare preferences show some new characteristics.

Purpose: This study aims to examine the preference for and influential factors of entering a nursing home for the different elderly generations, especially from the perspective of intergenerational relationship of elderly people's family.

Data and method: Data was collected by in-depth interviews based on a semi-structured question list in Shanghai, 2016. Both household registered elderly people living in nursing home and at home were surveyed. The main content of interview included the family intergenerational relationship, the preference for or decision-making process of entering a nursing home, and demographic information.

Findings: First, as the traditional care-by-child is not as feasible as before due to the smaller size of family, heavier life pressure, and longer parent-child geographical distance in modern China, younger elderly with only one child is more open to enter a nursing home. Second, the main influential factors of entering a nursing home for the elderly include the family's inability of care provision, the limitation of their house for elderly people, the condition of nursing homes, and financial factor. Third, the Confusion Filial Piety still has great effect on eldercare in Chinese society, but elderly people tend to not regard the choice of entering a nursing home as a symbol of child's unfilial piety. They choose the alternatives of care-not-by-child to meet the care demands, meanwhile, they show stronger dependence on mental intimacy with their children. The findings of this study is expected to provide suggestions for the planning of nursing homes.

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Key Words: elderly people, nursing home, preference, family intergenerational relationship, Shanghai

## **WORSHIPPING ON THE MARGINS: DISPLACEMENT, DISPOSSESSION, AND BLACK SPIRITUAL LANDSCAPES IN BRAZIL**

Abstract ID: 996

Individual Paper Submission

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Brazil has long been celebrated for its supposed fusion of Indigenous, Black, and European culture. The perceived exoticism of the “cosmic race” has enticed countless tourists and adventure-seekers to its tropical climate and lush locales. Even international pop star Beyoncé was inspired by the cultural landscape of Brazil, releasing the 2016 best-selling visual album, *Lemonade*, that included frequent references to the diasporic nation. Despite the cultural fascination it engenders, in recent years, scholars have written intensely about increasing spatial inequalities, environmental concerns, and human rights abuses in Brazil. Yet, scant literature centers the experiences of Brazilian women enduring and resisting racialized and gendered spatial injustice. This research explores Yoruba-based spiritual practices as expressions of Blackness, particularly Candomblé, and its cultural and physical erasure from Brazil’s urban landscapes via state-sanctioned evictions and increasingly frequent acts of civil violence amid global celebrations of Brazilian history and culture.

Employing the case study method, Crenshaw’s intersectionality theory as the analytical lens, and Beyoncé’s “*Lemonade*” as a cultural artifact, this paper reveals how the challenges faced by Candomblé mães (mothers) are in fact, layered and compounded as a result of their gender, class, and race resulting in a state-driven patriarchal whitewashing of Brazil’s urban and cultural landscapes. Interrogating the dispossession and displacement of Candomblé mães provides a timely opportunity to revisit Crenshaw’s assertion that intersecting marginalized identities can render an individual or population invisible in policy-making considerations and justice-centered action, explaining the absence of their narratives in mainstream public discourse regarding Brazilian favela evictions. Beyoncé’s visual album “*Lemonade*” illustrates the vibrant world of Candomblé and other syncretic religions and created an international platform for Yoruba-inspired imagery selling well over 2 million copies and garnering numerous industry awards including a Grammy nomination for Album of the Year. The researcher uses the convergence point of *Lemonade*’s release and state-sanctioned evictions and dispossession in Brazil as a revelatory point of examination, asserting that the critical acclaim and commercial success of Beyoncé’s album is a stark reminder and testament that amid Eurocentricity and *Latinidade*, Black cultural products are often praised while Black bodies are reviled.

Further, the author details the historical context and stigmatization of Yoruba-based spirituality in Brazil, the trajectory of state policy regarding its practice, and the dispossession and evictions experienced by Candomblé mães. The author suggests the demolition of Candomblé temples are not coincidental but disguised by the state as favela evictions, a new phase in state’s intentional violence towards mães and their spiritual practices which were historically outlawed in Brazil. Essentially, Brazilian women engaged in Candomblé have been hidden in the analytical shuffle of the Brazilian state’s campaign to erase Blackness from the urban landscape while simultaneously commodifying the exoticism of Blackness for a global audience of consumers. State policy has not gone unnoticed and empowers the worst elements in civil society in their efforts to violently target mães, most of whom are Black and mixed-race.

The author concludes with thoughts on the dangers of cultural co-option and appropriation as it pertains to

Blackness. Contributing to the body of literature examining the experiences of Blackness in Latin American generally and Brazil specifically, this paper adds nuance to scholarly discourse regarding the intersection of cultural suppression, dispossession, and spatial injustice in the African Diaspora.

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Key Words: intersectionality, Candomble, dispossession, Brazil, racism

#### **EQUITY AND INCLUSION IN REGIONAL CLIMATE CHANGE COLLABORATION: A COMPARATIVE STUDY**

Abstract ID: 1083

Individual Paper Submission

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Collaboration has been increasingly used to address complex regional problems that cross political boundaries and jurisdictions. (Forester, 2013; Healey, 1997; Innes & Booher, 2009; Koppenjan, 2008; Margerum, 2011). In particular, across the United States stakeholder-based collaboration efforts have emerged to address climate change mitigation and adaption. These action plans have been initiated by a range of different parties at the local level due to the absence of state and federal leadership. However, there has been mixed attention to addressing the socioeconomic dimensions of climate change that often differentially affect lower income communities and in particular BIPOC communities.

Planning has long incorporated public and stakeholder engagement in planning processes, but these efforts have often been dominated by those with more power and income while excluding less powerful communities (Arnstein 1969). It is common practice in participatory process design to consider mechanisms for engaging diversity productively and managing power dynamics (Bryson, Quick, Schively Slotterback, & Crosby, 2013). Meléndez & Martinez-Cosio (2019) call for the use of design thinking when engaging diverse communities in local planning arenas. Rongerude & Sandoval (2016) critique the very notion of the “table” in collaboration theory, asserting that collaboration processes around the metaphorical table reflect institutions of power and privilege that continuously exclude and marginalize groups whose “very right to occupy space” is contested (319). Additionally, discussions about power are often divorced from broader systems of privilege, access, and oppression. Without a unified approach for understanding and addressing systemic power, collaborative groups will likely miss opportunities to advance equity within group processes and in society.

This paper examines six groups across the United States engaged in a regional climate collaborative. Three groups were selected based on their forefronting of equity and inclusion efforts. These were then paired with comparable cases in which there were less explicit equity and inclusion strategies employed. The project is using semi-structured interviews with conveners and stakeholder participants in order to better understand what kinds of power dynamics are at play within each group and collect strategies for promoting equitable participation. We also analyzed the plans, documents, and proposed policies in each region to catalog where they are focusing their efforts, and extent

to which they have incorporated equity and inclusion. In each case, we also interviewed community groups who were included and not included in these efforts to understand how these efforts related to (or failed to address) their concerns.

The case analysis identifies a range of strategies employed to better incorporate diverse perspectives, including explicit recruitment, compensation for participation, careful facilitation, principled leadership, and other strategies. A comparison of policies and approaches in each approach is currently underway across all of the cases, and it is revealing differences in how different regions are tackling these efforts and the kind of issues that are being raised in each region. However, all of the regions face a number of significant barriers, including historic mistrust, community capacity, lack of diversity among existing organizations, and resources to fully support an inclusive effort. This research will identify strategies for more inclusive processes and potential ways to better incorporate concerns related to equity and inclusion.

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Key Words: Climate Adaptation, Social Justice, Collaboration, Regional Governance, Community Engagement

#### **EMBRACING NEWCOMERS IN THE GREATER TORONTO AREA: MUNICIPAL RESPONSIVENESS TO MIGRANTS AND THEIR ENGAGEMENT IN PUBLIC PLANNING**

Abstract ID: 1088

Individual Paper Submission

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As the Greater Toronto Area (GTA) continues to welcome over a third of all migrants and refugees within Canada, more than the next four cities combined, its experience provides considerable insight into how newcomers are accommodated into Canadian urban life. The relocation and integration of migrants and refugees into Canadian society depends in large part on the policies and programs pursued by their local governments, which can serve to embrace newcomers and the ideals of multiculturalism or, either inadvertently or purposefully, undermine their successful settlement. This paper focuses on three municipalities in the GTA, namely: the City of Brampton, the Town of Markham, and the City of Toronto. In one influential study on municipal responsiveness to migration and cultural diversity across Canada, the three selected cities were categorized as ‘unresponsive’, ‘semi-responsive’, and ‘very responsive’, respectively (Good, 2009; also supported in part by Tossutti, 2012). The present research begins by offering an in-depth content analysis of each of these local governments’ public records to examine the extent to which city policies and programs can foster a multicultural environment aimed at facilitating migrant settlement. In line with Fourot’s (2015) findings with respect to the need for a longitudinal dimension to inform mechanisms that assess how policy trajectories are established and change over time, an initial conclusion of the present study is that

the categorizations of responsiveness associated with the selected municipalities are not static and that local governments are able to adjust course within only a few years to adopt a more welcoming attitude toward newcomers.

Based on an analysis of interviews with municipal planners and representatives of locally based migrant-serving civil society organizations, the research then pivots to an exploration of how municipal governments can integrate newcomers through more-effective techniques of inclusion in processes of public collective decision-making. The results of research on this understudied theme indicate that such processes should strive to utilize creative participation techniques to engage not one, but multiple ‘publics’ (Nguyen et al., 2015) and that planners must accept that they are uniquely positioned to facilitate marginalized groups’ access in taking their rightful seat at the table in decision-making within planning (Rios, 2015). The present study finds that while planning practitioners in the GTA have demonstrated some degree of innovation in engaging newcomers in public participation activities, there is still considerable room for improvement in this regard, even as planners seek to navigate the barriers to entry inherent to the top-down planning logic informing most local governments’ development practices. To conclude, recommendations are offered concerning how municipalities can shape their policy frameworks to better embrace their increasingly-diverse populations and how public planning decision-making exercises can be designed in such a way to meaningfully engage newcomers and best accommodate their strengths and adapt to their particular needs.

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Key Words: Migration, Multiculturalism, Diversity, Municipal Government, Public Participation

## **INTERSECTIONAL SPACES DURING THE TIME OF COVID: CONFLICT AND SOLIDARITY BETWEEN THE HOUSELESS AND IMMIGRANT RENTER COMMUNITY**

Abstract ID: 1092

Individual Paper Submission

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Institutional and governmental failures to address the particular needs of communities including undocumented migrants and houseless individuals who are made especially vulnerable by the pandemic have treated these communities as dispensable. These communities have experienced the impacts of the pandemic differently as a consequence of multiple intersectional and relational factors. This research seeks to better understand the spaces that are at the intersections of these diverse experiences, needs and inequalities, and examines the changing nature of public and private space as communities that have largely been left out of relief efforts struggle to survive this economic and health crisis.

Theoretical foundations help us understand intersectionality and the ways the state addresses diversity in terms of income inequality, housing, and race. Intersectionality considers mutually constitutive forms of identity and social oppression, where power relations and inequality are compounded with factors like gender, race, employment status, ethnicity, and health (Crenshaw, 1991; Sweet 2016). In terms of space, previous research on the democratic possibility of space to express difference and diversity recognizes the coming together of various interests in its development (Mitchell 1995; Lees 2003). Most recently, Mitchell points out that the struggle over public space by homeless communities is an illustration of the limits of capital. As part of his argument, homelessness is not an attribute of individuals but rather a class and a condition necessary for capital circulation. Not having shelter is just another form of housing (or lack of) in a capitalist society.

The paper examines the role of planning and the state in shaping these intersectional spaces where various needs around health and housing come together. It asks how the state shapes community mobility and immobility by managing public and private spaces and services during a pandemic; and in what ways community based efforts develop and at what cost. In order to examine these questions, the research takes place in the Willard neighborhood in the City of Santa Ana, in Orange County, California. The Willard neighborhood experienced some of the highest pre-pandemic eviction rates in the city and some of the highest COVID infection rates in the county. The Willard neighborhood has also increasingly become a space where both renters and houseless individuals are increasingly concentrated due to the housing crisis and more recently due to the pandemic. This research analyzes interviews with community based organizations, residents, city staff, as well as field notes taken at the site of a cultural center that has become the center of conflict and home to over forty houseless individuals. The case illustrates the conflicts and solidarities that emerge at the intersections of immigrant and shelterless community members, and the role of the state in either providing relief or contributing to criminalization and displacement.

The case demonstrates the limits of capital in addressing the needs of those who have largely gone under the radar of not only pandemic relief efforts but of accessible and decent housing, stable jobs, and health care. It also demonstrates the role of planners in concentrating these conditions in specific areas in a time when inequality influences the ability of community members to not only move in terms of finding homes, but also move in and out of their homes due to specific health risks. The research also illustrates relations of solidarity that transcend the effects fear and instead enact some hopeful alternatives between communities. The research concludes with how planners can develop approaches that do not replicate the harm and violence already experienced by these communities but rather build on actions that enhance care and well-being and consider our interdependence and mutuality.

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Key Words: homeless, immigrant, diversity, intersectionality

#### THE GREEN SPACE PARADOX: WHO BENEFITS AND WHO SUFFERS FROM URBAN GREEN SPACE IN NEW YORK CITY?

Abstract ID: 1101

Individual Paper Submission

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Urban green spaces have been a key component of cities around the world, as they bring a variety of benefits related to aesthetic and recreational opportunities, and environmental and economic advantages. Given the links between green spaces and such benefits, an emerging concern is whether green spaces and amenities are equitably distributed across different groups of the society on the basis of their socio-economic conditions. Scholars and practitioners have pointed out and agreed upon inequities in green space provision and distribution between different socioeconomic groups: minorities and low-income populations have poorer green space accessibility in general. Such geographically uneven distribution of urban green spaces and amenities has increasingly been recognized as a significant indicator of environmental justice issues exacerbating social inequality in low socioeconomic status communities (Anguelovski et al., 2018; Jennings et al., 2019; Rigolon & Németh, 2020; Wolch et al., 2014).

Adopting urban greening initiatives or green space planning strategies in underserved communities to address such environmental injustice problems, however, could also cause paradoxical results – the green space paradox. As housing and land value increases resulting from improved attractiveness and environmental conditions, it could potentially lead to the influx of new residents and businesses and the displacement or marginalization of existing populations whom the green space was intentionally meant to benefit, commonly described as green or environmental gentrification (Anguelovski et al., 2018; Rigolon & Németh, 2020).

As such, not all parks and green spaces are designed equal and bring about uniform outcomes – not necessarily advantaging or disadvantaging certain social groups, but differently influencing a wide group of populations depending on their historical, political, social, or geographical contexts. Although previous studies on the topic of sustainable development and environmental justice have identified parks and green space inequities across different socioeconomic groups or their gentrifying effects, little research has examined the diversity of neighborhood types in which green spaces are either concentrated or scarcely distributed and the characteristics of the neighborhoods.

This study thus asks: Whether equitably, and if not, how are urban green spaces located and spatially distributed across a geographically diverse collection of neighborhoods in New York City? First, the paper adopts an exploratory spatial data analysis to examine the spatial distribution and clustering patterns of urban green space provisions in New York City. Second, using a latent profile model, the study classifies neighborhoods into different typologies based on their socioeconomic characteristics as well as green space provision indexes. The main datasets in the study are 1) the map and records of New York City's green space properties, which are obtained from the Planning and Development Division of the New York City Department of Parks and Recreation, and 2) U.S. demographic and socioeconomic data in New York City from the 2000 U.S. Census and the American Community Survey (ACS) 2015-2019 five-year estimates at the census tract level.

Findings from this study could yield valuable reference data for policymakers and urban planners to establish appropriate policies and strategies for green space development across different segments of society that might need different actions, in a more equitable and sustainable way.

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Key Words: Urban green space, Environmental justice, Green gentrification, Exploratory spatial data analysis, Latent profile analysis



# Track 6 – Housing

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### 6.24 PRE-ORGANIZED SESSION - COLLEGE AND UNIVERSITY STUDENT HOUSING I: THE BIG PICTURE

Pre-Organized Session 24 - Summary

Session Includes 173, 174, 175, 176

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Large-scale, student-oriented housing developments are (re)shaping neighborhoods around college campuses, with implications for municipalities, neighborhood residents, universities, and students. This housing development trend is emerging in the context of growth in post-secondary enrollments, a decline in the share of state aid to public higher education institutions, and interest from investors (especially REITs) and developers in student housing as an asset class. In a multi-session series, we examine the global trends and implications of student housing, including perspectives from North America, Europe, and South Asia. In this session, authors explore the “big picture” of student housing, interrogating the role of student housing in the post-industrial city and broad concerns related to large-scale rental development, gentrification, and regulatory approaches in a US context.

Objectives:

- Attendees will become familiar with contemporary trends in student-oriented housing development in an array of settings.
- Attendees will understand how large-scale, student-oriented housing development impacts campus-adjacent neighborhoods.
- Attendees will learn about a range of planning approaches and community responses to student-oriented housing development.

### STUDENT HOUSING AND THE POST-INDUSTRIAL CITY

Abstract ID: 173

Abstract within Pre-Organized Session 24

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This paper situates student housing in the context of the dynamics shaping post-industrial cities. It analyzes the surge of interest in student housing, the actors that support its development and their differential rationales for doing so, and the impact of this development on places and people. The objective is to frame the significance of the growth of student housing in the broader processes shaping the urban and to reconsider the place of the “eds” in the post-industrial city. It does this by exploring: (1) the reduction in financial support for public higher education institutions that coincided with their growth and the emergence of an increasingly competitive higher education market place where institutions compete for students by offering upgraded amenities such as luxury housing; (2) the logics and practices of entrepreneurial city and state decision making logics and processes. This includes a focus on the resources, tools, and techniques states and cities use to support higher educational institutional growth as an economic development strategy. It also includes an intersecting set of programs that are targeted at reviving urban communities and to supporting transit-oriented development including tax credits, municipal debt products and markets, land use regulations, and alternative local taxing schemes such as payments in lieu of taxes; (3) the expanded use of public private partnerships (PPP) to produce student housing, and the institutional, financial, and legal relationships that make this partnership viable, and (4) the increased use of finance in everyday life and the financialized products and processes that have made investing in student housing possible and attractive. This

includes the ability of students to take on increased debt, a shift towards multifamily investment in the wake of the financial crisis of 2008, and the use of real estate investment trusts (REITs) to fund student housing.

The paper is a work of synthesis, integrating separate literatures on student housing, entrepreneurial city and state logics, programs, and processes, and the ways in which the financialized turn has enabled the expansion of student and other multi-family housing. It considers the implications for students, the places where student housing is located, higher education institutions, and the local and state governments that have supported these developments. Risk and debt are considered throughout. Student housing is often viewed as counter cyclical in that institutions of higher education have increasing enrollments during economic downturns, but the pandemic introduced an entirely new set of logics to the mix and magnifies the challenges associated with risk and debt.

Finally, though student housing is often discussed in monolithic terms, it is varied in practice. Context and contingency matter in understanding what housing is categorized as student housing, who develops it, who owns it, where it is located, how it is paid for, governs its production and allocation, and who absorbs the risk/benefit profile associated with it. The paper focuses on what student housing can tell us about the place of educational institutions in governance and they everyday reality of life in the post-industrial city.

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Key Words: Studentification, Governance, Housing, Development

#### **STUDENT HOUSING, GENTRIFICATION AND AFFORDABILITY: THE CASE OF URBAN UNIVERSITIES IN THE US**

Abstract ID: 174

Abstract within Pre-Organized Session 24

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Constraints to on-campus university student housing abound amid marked growth in student enrollment across the US over the past few decades (Ong et al, 2013). This tendency has been exacerbated by limited land capacity, strict zoning regulations and privatization of university housing. Meanwhile, there has been considerable gentrification of low-income neighborhoods in several US urban areas where college graduates and college students are seen as important players of this process (McKinnish et al 2010). This paper seeks to determine the impact of changes in student housing patterns on local housing markets and urban development as well as how these changes have contributed to affordability around gentrified university neighborhoods in major metropolitan areas. We merge data from National Center for Education Statistics, US Census Bureau and US Department of Housing and Urban Development (HUD) over the period 2000 to 2019 in order to examine the relationship between student housing and affordability in neighborhoods around urban universities. This data set allows us to explore school characteristics, affordability and neighborhood characteristics at a granular level. We utilize panel regressions and difference-in-difference techniques to study how changes in student housing affect affordability in gentrified neighborhoods relative to non-gentrified neighborhoods. Our a priori expectations are that having detailed information on enrollment, student housing supply, neighborhood characteristics, local economy and enrollment

status (part-time versus full-time and graduate versus undergraduate) will allow us to better identify and measure the impacts of the changes in demand and supply of student housing on affordability.

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Key Words: student housing, affordability, gentrification

### STUDENT-ORIENTED HOUSING DEVELOPMENT AND SHIFTING RENTAL MARKETS IN UNIVERSITY NEIGHBORHOODS

Abstract ID: 175

Abstract within Pre-Organized Session 24

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University neighborhoods are increasingly experiencing an influx of large, student-oriented housing development projects. Several factors have contributed to this trend. Enrollments expanded rapidly and outpaced dorm expansions (Arbury, 2012). Housing demand remained strong in campus-adjacent neighborhoods throughout the 2008 foreclosure crisis, as well as the subsequent recession and recovery. This stimulated new investments in multi-family housing marketed towards students and young adults, coinciding with commercial lending trends that supported large rental projects (Gallun, 2016). Emerging research offers insights into the dynamics of student-oriented housing construction in neighborhood contexts (Revington and August, 2019; Revington et al., 2018; Smith et al., 2014), yet the wider scope of this development—and its impact on local rental markets—remains underexplored.

Student-oriented, rental superblocks have the potential to shift local rental markets, in terms of housing supply, prices, and affordability. In this paper, we investigate how recent large-scale residential projects have impacted the US housing landscape in campus-adjacent neighborhoods. We ask three questions: (1) What was the scale of large rental development in campus-adjacent neighborhoods?; (2) What contextual and institutional factors are associated with these development trends?; and (3) Is more intense student-oriented housing development associated with campus-adjacent shifts in the rental housing stock, rental prices, and housing affordability? We use the Integrated Postsecondary Education Data System (IPEDS) to identify an analytic sample of doctoral institutions with full-time enrollments above 10,000 (n=176). We couple IPEDS data on enrollments and dorm capacity with neighborhood-level estimates of recent large-scale rental development, derived from 2000 and 2010 Census and 2014-2018 ACS data.

We find that large-scale rental construction in campus-adjacent neighborhoods is both widespread—not limited to one type of place or university type—and idiosyncratic, shaped by multiple local factors. The local and regional housing market context helps inform campus-adjacent development trends. Large-scale developments were more intense in some places than others: more than 75% of rental units in large-scale developments occurred in just 25% of campus neighborhoods; meanwhile, 50% of campus neighborhoods accounted for just 9% of the large-scale rental units. Collectively, these findings have implications for the residential fabric around campuses, including shifting housing demand from small-scale rentals to superblocks, ongoing rental affordability problems, and new challenges related to an emergent “luxury” apartment market.

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Key Words: Student housing, Real estate development, Higher educational institutions, Housing affordability, Neighborhood change

## HOUSING STUDENTS: LAND USE REGULATORY SYSTEMS IN LA AND BOSTON

Abstract ID: 176

Abstract within Pre-Organized Session 24

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As major urban centers contend with tight housing markets, attention has turned to the role of off-campus student housing in issues of affordability and displacement. These concerns go beyond the traditional town-gown tensions of nuisance, congestion, poor building maintenance, and a concentration of retail serving young adults.

This research examines how Boston, MA, and Los Angeles, CA, have used regulatory authority to monitor and control the forms and amounts of student housing within their borders. Drawing from a content analysis of plans, regulations, and permits, and interviews with regulatory staff, this research compares the tools adopted to manage the adverse effects of student housing while embracing the contributing features of institutions of higher education (IHE).

Boston and Los Angeles are selected as cases because of their meaningful similarities and differences. Both cities have strong local housing markets with similar 2019 rental vacancy rates, 4.6% in LA and 3.9% in Boston. They also have large, comparable numbers of IHEs and student populations, with accompanying concerns for residential displacement. However, the two contexts show substantial differences from each other regarding the regulatory tools adopted.

The approaches pioneered by Boston and Los Angeles are assessed along the dimensions of rationales, tools, community involvement, and outcomes. Provisions such as institutional master plans, off-campus student data collection, community benefit/development agreements, neighborhood stabilization districts, student fair housing protections, and more, are reviewed. Boston and Los Angeles highlight how the local market conditions, authority, community group involvement, and nature of IHE, can shape the regulatory response communities choose.

Comparing and contrasting these two urban centers, reveals unique features and common foundations to managing student housing. This research provides a better understanding of municipal initiatives for managing the traditional

and emerging concerns with student housing in strong urban housing markets, where the issue has become a flashpoint.

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Key Words: studentification, student housing, institutional zoning, displacement, off-campus housing

### **6.41 PRE-ORGANIZED SESSION - COLLEGE AND UNIVERSITY STUDENT HOUSING II: STUDENT HOUSING PERSPECTIVES IN NEIGHBORHOODS**

Pre-Organized Session 41 - Summary

Session Includes 177, 178, 179, 180

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Large-scale, student-oriented housing developments are (re)shaping neighborhoods around college campuses, with implications for municipalities, neighborhood residents, universities, and students. This housing development trend is emerging in the context of growth in post-secondary enrollments, a decline in the share of state aid to public higher education institutions, and interest from investors (especially REITs) and developers in student housing as an asset class. In a multi-session series, we examine the global trends and implications of student housing, including perspectives from North America, Europe, and South Asia. In this session, authors examine student housing perspectives at the neighborhood level, assessing variations in student housing demand and development models in Germany, Vienna, Portugal, and the US.

#### Objectives:

- Attendees will become familiar with contemporary trends in student-oriented housing development in an array of settings.
- Attendees will understand how large-scale, student-oriented housing development impacts campus-adjacent neighborhoods.
- Attendees will learn about a range of planning approaches and community responses to student-oriented housing development.

### **UNIVERSITY-STUDENT ADAPTATIONS ON HOUSING IN GERMANY DURING COVID-19**

Abstract ID: 177

Abstract within Pre-Organized Session 41

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The COVID-19 pandemic has led to the new normal that changes our perceptions of living and working at home. This debate continues to be held globally and the effects of the pandemic crisis on student housing is no exception. The corona pandemic has also shaken up the student accommodation and private housing market in Germany. This is clearly supported by the recent trend of less supply and demand in the student housing sector that include public student accommodations, private (student) apartments and shared housing. Many international students had to leave; other students stayed in their hometowns due to the online semester; both university and students aware that no one can reliably predict how long a remote education substitutes on-site campus teaching and learning. Therefore, this study aims at analyzing how have universities and students adapted to the new normal and what the profound impacts of new university-student adaptations on student housing in the future. Different types of secondary sources were taken into account in review including journal articles, books, technical reports, policy documents and statistical sources and interviews with key informants, including stakeholder in varying sectors. The evidence showed that fewer applications for public student accommodations were made and thus the unoccupancy rates, conversely, were increased in 2020 compared to the previous year. As a result, a couple of ad-hoc administrations to avoid room vacancies have been widely adopted by the student union (studentenwerk). Moreover, there were around 30 percent fewer offers and decline in the demand for both private apartments and shared housing than in the same time in 2019. What remains unclear, however, is whether the less demands on housing in the market are related to decline in the number of students during the pandemic.

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Key Words: student housing, COVID-19, university-student adaptation, housing policy

#### STUDENT HOMES IN VIENNA. SHIFTING FROM A 'BASIC NEED' TO AN 'ASSET CLASS'?

Abstract ID: 178

Abstract within Pre-Organized Session 41

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Student homes represent an important residential market segment to provide affordable accommodation in European university towns and cities. Depending on the national and local context, the provision of student homes ranges from historical social welfare ideologies to purpose-built accommodation in neoliberal and financialized housing contexts. In the last decade, the landscape of student homes provided was observed to become more diversified due to an increasing involvement of commercial student home developers and the international expansion of not-for-profit developers. Even in countries with traditional social welfare-oriented housing provision,

new (partly luxury) types of student homes in different price segments are emerging. The paper stems from research conducted in the city of Vienna, where in the last two decades, a pluralistic mix of student home providers (national and international) entered the market. While traditional providers still widely follow the logic of providing affordable living spaces to students, for (private) investment groups, the student housing market is further an opportunity for financial investment. This paper draws on qualitative research results and expands theoretical debates on studentification and the financialization of student housing embedded in a local housing market context. The following research questions have guided our study: (1) What current developments are observed in Vienna concerning the supply and demand of student housing. What are the market interests of the different providers? (2) Which role does the city have in the development of new student housing and their location (e.g. in urban development areas)? (3) Which lifestyle characteristics and student's demands shape current student home offers? The paper concludes on the recent patterns of change in student home provision in Vienna and presents wider implications, both for the context of Vienna as a university city as well as for new research foci on financializing housing (sub-)markets.

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Key Words: PBSA, studentification, affordability

#### **AN ANALYSIS OF THE UNIVERSITY DEVELOPER EQUITY MODEL: THE CASE OF BOSTON**

Abstract ID: 179

Abstract within Pre-Organized Session 41

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Recent popular and scholarly work has drawn attention to the issue of the lack of affordable housing in urban America in large, dense urban centers like Boston (Bluestone and Huessey, 2017). In particular, a growing body of literature has focused on the causes and consequences of neoliberal housing policies on longtime residents of urban neighborhoods (Shaw, 2018). However, fewer scholars have examined the role that anchor institutions such as universities play in the production of housing. This paper presents an exploratory study on the evolution of the policy and planning challenges of housing the nation's largest student population in Boston. We ask the following questions: 1) What are the characteristics shaping the problem of affordable housing in Boston?; 2) What is the impact of the university developer equity model on the production of housing?; and 3) What lessons can be drawn for urban planners and policymakers? We begin with a synthesis of the literature on the role of anchor institutions in community and economic development, and we find that key themes emerge around the ideas of the incentivizing the innovation economy, creating livable communities, fostering social inclusion, and advocating for collaborative governance (Perry and Wiewel, 2015; Rodin, 2007; and Trani and Holsworth, 2010). Then, we draw on an in-depth case study of a novel housing development project to examine the impact of the university developer model. We identify the Columbus Avenue Student Project at Northeastern University, a \$160 million housing project in the Roxbury neighborhood of Boston as the case study. Drawing on archival analysis of public documents and key informant interviews with university officials, local planners and policymakers, developers, community organizers, and other stakeholders, we find that the university as an anchor institution facilitated the production of new housing by partnering with a private developer, American Campus Communities, through an innovative public-

private partnership. Through a ground lease to the developer, 812 new housing units will be created. Our results identify the tensions of this development model: 1) university-driven development that expands into a historically low-income urban neighborhood; 2) the impact on the production of affordable housing; and 3) public and transparent nature of housing development. We conclude by reflecting on the consequences of the developer equity model on the local housing market by considering the roles of anchor institutions, local government, and private developers.

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Key Words: Community development, economic development, housing, university planning

## STUDENT RENTAL DIGITAL PLATFORMS AND LOCAL HOUSING MARKETS IN LISBON, PORTUGAL

Abstract ID: 180

Abstract within Pre-Organized Session 41

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Taking Lisbon, Portugal, as a case study, this paper explores the rise of student accommodation digital platforms as a new disrupting element of the private rental market. In the Portuguese capital, the demand for student housing has been fed by the growing arrival of international students. This growth is the result of the recent political effort to put Lisbon on the map of global tourist destinations, confirming the student mobility literature suggestion that international students are often pulled by leisure possibilities in their hosting cities. However, the development of purpose-built student accommodation has been scarce and, instead, new digital platforms have emerged that connect landlords with international students, fueling a process of conversion of the private rental market into mid-term rentals for these transnational users. We will explore here the different actors involved in the development of student accommodation for the last 10 years, including Uniplaces, a digital platform created in 2012 and that like Airbnb has growth aggressively backed by venture capital to secure a monopolistic position. Drawing on the analysis of annual real estate consulting reports on student housing in Lisbon and in-depth interviews with international students and staff from student associations, the paper will show (i) that the geography of student housing in Lisbon reaches the entire central district, meaning that they add further housing pressures on areas experiencing gentrification and touristification; and (ii) that international students are privileged consumers of housing that are feeding a growing disconnection between local salaries and housing prices, with serious consequences on the access to housing for the local population, including Portuguese students. As a conceptual contribution, we will put into conversation the literatures on platform real estate and student housing to argue that in a Southern European destination the arrival of international students strengthens a broader process of rental gentrification in which the private rental market increasingly caters to transnational and transient populations.

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Key Words: students, housing, Lisbon, platform-economy

## **6.42 PRE-ORGANIZED SESSION - COLLEGE AND UNIVERSITY STUDENT HOUSING III: NEIGHBORHOOD PERSPECTIVES ON STUDENT HOUSING**

Pre-Organized Session 42 - Summary

Session Includes 181, 182, 183, 184

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Large-scale, student-oriented housing developments are (re)shaping neighborhoods around college campuses, with implications for municipalities, neighborhood residents, universities, and students. This housing development trend is emerging in the context of growth in post-secondary enrollments, a decline in the share of state aid to public higher education institutions, and interest from investors (especially REITs) and developers in student housing as an asset class. In a multi-session series, we examine the global trends and implications of student housing, including perspectives from North America, Europe, and South Asia. In this session, authors consider neighborhood perspectives on student housing, exploring neighborhood changes influenced by student housing and municipal responses/approaches in Canada, the US, and India.

Objectives:

- Attendees will become familiar with contemporary trends in student-oriented housing development in an array of settings.
- Attendees will understand how large-scale, student-oriented housing development impacts campus-adjacent neighborhoods.
- Attendees will learn about a range of planning approaches and community responses to student-oriented housing development.

## **LOCAL POLICY APPROACHES TO NEAR-CAMPUS NEIGHBOURHOODS AND STUDENT HOUSING DEVELOPMENT TRAJECTORIES IN ONTARIO, CANADA**

Abstract ID: 181

Abstract within Pre-Organized Session 42

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Many near-campus neighbourhoods across North America have experienced rapid change in recent decades with increasing post-secondary enrolment, and changes in housing needs and expectations among students. In general, Canadian post-secondary institutions have taken a more passive role in student housing and local community development relative to their American counterparts. As a result, development in near-campus neighbourhoods is left largely to private sector actors. Development pressure and concentrations of students in near-campus neighbourhoods – or “studentification” – have caused considerable conflict between local communities and their institutions (Frierson, 2005). Resident concerns include a range of behavioural issues, such as excessive noise,

partying, public drinking, littering, petty vandalism, and parking issues (Munro & Livingston, 2012; Woldoff & Weiss, 2018). To date, however, most research regarding local government policy concerning student housing has taken a single-city case study approach (e.g., Hubbard, 2008; Revington et al., 2020).

We present an analysis of official plans, policy statements, and bylaws in all 15 Ontario municipalities with a primary campus of the province's 20 public universities. We conducted a qualitative document analysis to investigate how these jurisdictions manage student housing development in near-campus neighbourhoods, with an overarching aim of identifying common elements across cities and major departures from widely adopted approaches. This sample represents varied urban contexts – from downtown Toronto to surrounding mid-sized cities and far-flung regional centres, with differing patterns of urban growth and stagnation – and a diversity of institutions, including smaller undergraduate-oriented regional universities and large, nationally and internationally significant research universities, allowing us to consider how local contextual factors may influence the policy approach adopted.

We identify three broad policy approaches from our analysis. The first approach, residential conversion, guides student housing development to previously non-residential spaces such as greenfield and brownfield sites, while the second approach, residential intensification, permits redevelopment of existing residential areas. The third – and most common – approach, restricted growth, strongly limits development in near-campus neighbourhoods. We turn to exemplars of each approach to illustrate their impacts on student housing development trajectories in local communities. These case studies are Niagara Region (Brock University, residential conversion), Waterloo (University of Waterloo and Wilfrid Laurier University, residential intensification), and London (Western University, restricted growth). These communities have adopted very different planning approaches for near-campus neighbourhoods despite geographic proximity and similar urban form and size. We demonstrate the role of local policy in producing different trajectories of student housing development within a common provincial policy context. In addition to local growth machine dynamics, local policy approaches in Ontario are equally influenced by provincial growth management policies and by the community-institutional relationship.

While the specific policy choices available to Ontario municipalities may differ from those of other jurisdictions, we believe the three broad approaches we identify will be of wider applicability in research, practice and policymaking. For instance, given their generality, these categories may allow for more meaningful international comparative research on planning for student housing than a focus on locally specific regulations, or a useful starting frame for regulating student housing from which planners and policymakers can then identify suitable mechanisms to match the chosen approach. Most importantly, by considering policy approaches and student housing development patterns in tandem, our research points to the potential implications of such a choice for near-campus neighbourhoods and urban development more generally. Surely these implications ought to be carefully considered to ensure an appropriate resolution to local town and gown conflicts.

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Key Words: student housing, studentification, universities, land-use policy, near-campus neighbourhoods

## WHO DRINKS BUBBLE-TEA? HIGH-RISE STUDENT GATED COMMUNITIES IN TORONTO'S WEST CHINATOWN

Abstract ID: 182

Abstract within Pre-Organized Session 42

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Chinatowns have traditionally offered cheap rents, affordable retail, central locations and diverse housing typologies (e.g., rooming houses and family associations) to both, those in the Chinese diaspora and non-Chinese populations, including students. However, Chinatowns are at present facing development pressures and displacement (Acolin & Vitiello 2018). In the case of Toronto's West Chinatown, the distinctive mechanisms of the current wave of neighborhood change are tied to new-build gentrification where inwardly moving students cause indirect displacement of older Chinatown residents and lifestyles. At a larger scale, such process has been driven by the expansion of urban Higher Education Institutions (HEIs), the growing intake of international students—particularly from Asia, and the recent involvement of private developers and investors in Purpose Built Student Accommodations (PBSAs) (Pillai, Vieta & Sotomayor, forthcoming). Neighborhood change in West Chinatown has been further characterized by the rapid establishment of international Chinese chain restaurants and bubble-tea shops, and the loss of long-time and family-owned businesses and buildings with cultural and community significance.

In this paper, we build on recent global debates about urban planning, universities and the role of students in neighborhood change (e.g. Smith & Hubbard 2014; Kinton et. al. 2018; Holton & Mouat 2020) to examine the politics of studentification in Toronto's West Chinatown. The paper also contributes to highlight the interconnected nature between HEIs and their locality, and the volatility of student-focused neighborhoods to urban politics by shedding light on the transnational dimension and global linkages of studentification, such as the internationalization and marketization of higher education, the global financialization of student housing, and the immigration trajectories and housing aspirations of South Asian students in Toronto.

Using a mixed-method design (including descriptive statistics, spatial analysis and interview data), we first establish three recent waves of gentrification, the most recent one characterized by new build vertical studentification. We then zoom in to examine the tensions and controversies caused by recent PBSA projects in the West Chinatown, contrasting diverse perspectives, including those of residents, stakeholders and students.

Our findings indicate that PBSAs further town and gown disparities and contribute to the financial exploitation and social isolation of students in what can be characterized as high-rise student gated communities. At the same time, the growing intake of international students—particularly from China in proximity to the West Chinatown creates new narratives, tensions and organized reactions around neighborhood change and the future of the area that are strongly mediated by class-based urban visions and aspirations within the Chinese community. While some entrepreneurial community members are pro-growth and support PBSA development, other long-term residents are concerned about older residents' displacement and play out their politics to strategize and contest PBSAs. Overall, responses from long-term Chinese residents and other members of the Chinese diaspora raise an important question on the future of Chinatown, who is Chinatown for, and how might a historically working class and marginalized neighborhood be preserved in a rapidly gentrifying city.

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Key Words: Student housing, Studentification, Chinatowns, urban universities, Gentrification

## DO NEW STUDENT RENTALS AFFECT OTHER HOUSING SUBMARKETS? EVIDENCE FROM CHAMPAIGN-URBANA

Abstract ID: 183

Abstract within Pre-Organized Session 42

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This paper explores the relationship between student rental housing and other submarkets. We use Champaign-Urbana, Illinois as our case study area — home to the flagship University of Illinois campus. We examine university enrollment data from 1980 to 2018 to track demographic changes in the student population. Then we use decennial census and American Community Survey 5-year estimates from 1990 on to determine the spatial distribution of student renters over time. Finally, we examine shifts in the distribution of rents to determine how the movement of students has affected what Champaign-Urbana's landlords charge across the metropolitan area. We find evidence that a highly visible expansion of luxury student housing since 2008 in Champaign's university adjacent Campustown area has thus far accommodated student growth without spillover to other neighborhoods. Over the past four decades, enrollment at the University has increased rapidly, with much of that growth due to international and out-of-state students, and particularly students from Asia. This occurred parallel to substantial tuition increases — a reaction to decreasing state appropriations for higher education. Because international and out-of-state students pay higher tuition rates and are less likely to receive financial aid, we infer we that they also have access to enough income to afford high rents. As enrollment skyrocketed, decades of public investments and regulatory decisions by the City of Champaign enabled the development of new, high-rise housing in Campustown. This included infrastructure upgrades that nullified the risk of flooding in the area, which lessened risk for developers seeking to build large-scale projects. In addition, the City routinely eliminated parking minimums and eased open space requirements, first through its Planned Unit Development process and later through rezoning. Together, this incentivized denser development near campus. Areas of Champaign-Urbana with more constrained land use regulations did not see a similar increase in student renter populations, although the neighborhood just north of Campustown has begun to attract more students than in the past.

As Campustown has absorbed higher densities of student renters, we also find areas near campus contain disproportionate numbers of housing units in the top rent quartile for Champaign County. Rents in the area often top \$1,000. We conclude that the student housing boom that began around 2008 and continues today is a direct builder response to the University's courtship of upper-income students from the U.S. and abroad. This boom has added a new segment to the metropolitan housing market, essentially making room for new students close to campus with little spillover into surrounding areas. As this boom occurred, the City's regulatory, infrastructure, and placemaking actions funneled growth to one neighborhood.

Because student demographic changes have an impact on housing demand, planners in college towns may benefit from increased coordination with University administrations. In addition, flexible land use regulations, along with strategic investments in infrastructure, can make certain neighborhoods favorable for student housing

development, thereby shielding nearby residential areas from the effects of studentification. That said, planners should be mindful of which boundaries to student neighborhoods are most porous, especially since luxury student housing can push rents upward — something that could have negative effects for existing residents.

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Key Words: studentification, submarkets, zoning, student housing, real estate development

### **CHALLENGES OF OFF-CAMPUS STUDENT HOUSING IN INDIAN CITY PRAYAGRAJ AND THE POTENTIALS OF PURPOSE BUILT STUDENT ACCOMMODATION (PBSA)**

Abstract ID: 184

Abstract within Pre-Organized Session 42

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Prayagraj city (formerly known as Allahabad) is the home of the third oldest university of modern India that attracts students largely from the eastern Uttar Pradesh, Bihar, Madhya Pradesh, and Jharkhand among others. For most students, it is a hotbed of selection in the provincial and union public services. As per various estimates, there are 600 thousand students in the city, out of which 35 thousands are enrolled in the University of Allahabad. Even after the large number of students, the university provides on campus accommodation only to 8.5% students, while the rest are compelled to live in off campus informal student housing. Unlike Delhi, Pune, Bengaluru and many other metropolitan cities of India, Prayagraj lacks any sort of Purpose built student accommodation (PBSA). So, drawing on 30 interviews with the students living in the various localities of Prayagraj we conclude that these students do not have any legal contracts with the landlords, there is no rent control, and students are the victim of arbitrary attitudes of landlords. These informal student accommodation provides just the living space without any associated housing features such as common hall and openspaces. Majority of the students cook, read and sleep in the same rooms that are not well ventilated. Most of the students also complained regarding the affordability of such houses. In such a scenario, we recommend planning for an adequate number of PBSAs in the proximity of the university campus in compliance with the proposed National Urban Rental Housing Policy 2015 that has special provisions for Affordable Rental Housing Complex (ARHC), and Need Based Rental Housing (NBRH).

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Key Words: Student Housing, Purpose built student accommodation (PBSA), Affordable Rental Housing Complex (ARHC), Need Based Rental Housing (NBRH), Prayagraj, India

## **ROUNDTABLES**

### **6.499 ROUNDTABLE - A GLOBAL PERSPECTIVE ON LAND USE REGULATIONS AND HOUSING OUTCOMES**

Abstract ID: 499

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Housing affordability is a challenge for urban planners throughout the world. It is not always clear, however, what the nexus is between land use regulations and housing outcomes. In this roundtable session, active scholars in this field will engage the audience in an exploration of the underlying issues. Examples of questions to be addressed include:

\* To what extent do overly restrictive land use regulations contribute to the prevalence of informal housing (including homelessness)?

\* Are there notable and significant regional variations, globally, in housing affordability and land use regulations, including enforcement thereof?

If yes, what might explain such regional "fixed effects"?

\* To what extent do land use regulations, in practice, exacerbate prevailing patterns of social inequality?

\* What is the role of basic services (water, sanitation, etc.) infrastructure planning in housing affordability?

\* Under what conditions is it more effective to:

-- accommodate more housing closer to employment centers, versus

-- invest in transportation infrastructure that eases access to employment centers?

#### Citations

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Key Words: housing, affordability, international, regulation

## **INDIVIDUAL PAPER SUBMISSIONS**

### **BUILDING A NATIONAL COMMUNITY TYPOLOGY OF REGULATIONS FOR ACCESSORY DWELLING UNITS (ADUS), MOBILE, RV, AND TINY HOMES**

Abstract ID: 8

Individual Paper Submission

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Over the past several years, many communities and many residents have been affected by a housing affordability crisis in the U.S. (Anacker, 2019). Most planners and policymakers have difficulties addressing the demand for housing as there is freedom of movement. Housing policymakers have directly addressed the housing supply through public housing for renters and the Section 8 New Construction and Substantial Rehabilitation for builders. Housing finance policymakers have indirectly addressed the housing supply through Low Income Housing Tax Credits (LIHTCs), Community Development Block Grants (CDBGs), the HOME Investment Partnership program, federal, state, and local housing trust funds, and grants to Community Development Corporations (CDCs). Recent discussions of affordable housing supply have focused on Accessory Dwelling Units (ADUs; Anacker and Niedt, forthcoming) and converted garages (Brown et al., forthcoming). Interestingly, not much work has been undertaken on mobile, RV, and tiny homes in connection with the housing affordability crisis (Sullivan, 2018). This study fills this cap.

I utilize the National Longitudinal Land Use Survey (NLLUS), conducted by Pendall in 1994, by Pendall, Wegman, and Martin in 2003, and by the Urban Institute and Pendall in 2019 (Urban Institute, n.d.). The NLLUS 1994 Land Use Dataset includes data on jurisdictions in the 25 most populous metropolitan statistical areas (MSAs) or Combined Metropolitan Statistical Areas (CMSAs) as of 1990 ( $n = 1,168$ ). The NLLUS 2003 Land Use Dataset contains data on jurisdictions with populations over 10,000 in the 50 most populous MSAs and CMAs as of 2000 and 50 additional jurisdictions with fewer than 10,000 residents in metropolitan areas where jurisdictions with more than 10,000 people covered less than 60 percent of the total MSA land area ( $n = 1,845$ ). The NLLUS 2019 Land Use Dataset includes data on jurisdictions with populations over 10,000 with the top 50 Core Based Statistical Areas (CBSA) and a sample of land use planning empowered jurisdictions with populations under 10,000 in select CBSAs ( $n = 1,703$ ). For the combined three data sets there are 446 repeat respondents. I also utilize data from the decennial 1990, 2000, and 2010 Censuses and the American Community Survey (ACS; 2000s and 2010s).

I analyze demographic, socioeconomic, and housing characteristics in connection with regulations for Accessory Dwelling Units (ADUs), mobile, RV, and tiny homes through descriptive statistics and t-tests to build typologies for the 1994, 2003, 2019 data sets, and for the longitudinal data set. Preliminary results indicate that more communities regulate mobile homes compared to tiny homes, RVs, and ADUs and that there are statistically significant differences in terms of demographic, socioeconomic, and housing characteristics.

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Key Words: Housing affordability, Accessory Dwelling Units (ADUs), mobile homes, tiny homes, RVs

## THE EFFICACY OF ALLOCATING HOUSING GROWTH IN THE LOS ANGELES REGION (2006-2014)

Abstract ID: 11

Individual Paper Submission

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California is known for home values that eclipse U.S. housing prices. To increase housing inventory, California has implemented a regional housing needs allocation (RHNA) to transmit shares of housing growth to cities. However, no study has established RHNA's efficacy. After examining the 4<sup>th</sup> RHNA cycle (i.e., 2006-2014) for 185 Los Angeles region cities, this study determined that RHNA directed housing growth to the city of Los Angeles and the region's outlying cities as opposed to increasing density in the central and coastal cities. Second, RHNA directed 62% of housing growth to the region's unaffordable cities. Third, the sample suffered a 34% shortfall in housing growth due to the Great Recession but garnered an average achievement of roughly 93% due to RHNA's transmission of minimal housing growth shares. Lastly, RHNA maintained statistically significant associations with increased housing inventory, housing affordability, and housing growth rates—indicating that RHNA may influence housing development.

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Key Words: Cities, Los Angeles, Regions, Housing Needs, California

## IT TAKES A TINY HOUSE VILLAGE: A MIXED METHODS ASSESSMENT OF BARRIERS, STRATEGIES, AND STAKEHOLDER PREFERENCES FOR TINY HOUSE VILLAGES FOR THE HOMELESS IN MISSOURI

Abstract ID: 15

Individual Paper Submission



There is increased interest in using tiny house villages to confront the growing issue of homelessness in the United States (U.S.) (Heben 2014; Segel 2015; Jackson et. al 2020). A recent inventory found that there are at least 115 tiny house villages for the homeless in the U.S. that are currently in operation, slated to open in the future, where efforts have been abandoned, or where the operational status of the villages is unknown (Evans, 2020). Although interest in addressing homelessness with tiny house villages continues to grow, these villages face numerous barriers, from restrictive land use laws to resident concerns about homeless populations. This research examines such barriers, strategies for urban integration, and stakeholder perceptions of various visual, physical, and social elements pertaining to these developments.

This mixed methods research involves a comparative case study of two tiny house villages for the homeless recently constructed and opened in Missouri: Eden Village, located in Springfield, and Veterans Community Project (VCP), in Kansas City. The comparative case study research was performed to answer the following questions: What are the challenges to integrating tiny house villages for the homeless and how have/are such challenges being addressed? What are strategies for the successful integration of these villages into communities? The comparative case study explores barriers and challenges faced by each tiny house village, in addition to strategies that allowed for the successful integration of the villages into urban communities. The study also involved a survey (including an embedded visual preference survey) of stakeholders in each community in order to understand if various visual, physical, and social elements related to tiny houses for the homeless influence community perceptions of these developments. Understanding community perceptions and preferences is important, as stakeholders are key actors in the development of land use policy. It is hypothesized that integrating stakeholder preferences for tiny house villages for the homeless may result in greater community support.

The study finds that NIMBYism (Not-in-my-backyard) is the greatest deterrent to villages. This is in compliance with the literature that finds NIMBYism to be a significant deterrent to both the integration of affordable housing and facilities to serve the homeless (Tighe 2010; Scally and Tighe 2015). However, the survey also finds that stakeholders have distinct preferences for several visual elements related to tiny house villages for the homeless, as well as for specific physical and social factors. For example, survey results indicate that stakeholders have a distinct and higher preference for tiny homes built in a traditional (vernacular) architectural style, over non-traditional (modern) architecture. The survey also finds that stakeholders perceptions of tiny house villages for the homeless are positively impacted by physical and social elements such as indoor plumbing, heating/air-conditioning, and the provision of mental health services, though many villages do not offer such amenities. Integrating stakeholder perceptions and preferences into plans and designs for tiny house villages for the homeless may result in less NIMBYism and greater community acceptance.

The research has resulted in a better understanding of the barriers to, and stakeholder preferences for, tiny house villages for the homeless. It is hoped that this research will aid those aiming to address homelessness through the integration of tiny house villages. The study contributes to a greater understanding of how tiny house villages for the homeless might be not only accommodated, but in a way that is perceived positively among communities.

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Key Words: tiny house villages, homelessness, NIMBYism, mixed methods research

## UNCOVERING THE EXTENT AND IMPACTS OF RENT GAPS IN LOS ANGELES

Abstract ID: 105

Individual Paper Submission

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This paper seeks to determine whether and how household outcomes and conditions change based on a household's rent gap (Smith, 1979)—the difference between the actual rent that households pay and the market rate for the unit that landlords could otherwise receive. Housing market pressures have driven an increase in rents and rent burden, or the percentage of income that households spend on housing costs. This shift has placed enormous impacts on renter households. Prior research (such as Porter, 2013; Darling, 2005; Bourassa, 1993) has discussed the existence, extent and impacts of the rent gap. By preventing actual rents from rising alongside market rents, rent control is one factor creating and widening rent gaps. Research has shown how rent control-driven rent gaps can produce deleterious outcomes for renters, including less building maintenance (Sims, 2007). Furthermore, Diamond and McQuade (2018) establish how greater rent gaps, achieved through rent control, drive landlords to engage in harmful behaviors to tenants such as removing tenants or removing units from the rental market through converting units to condominiums.

This work contributes to prior research by drawing from two interconnected datasets to uniquely trace the relationship between the rent gap and the household's social, economic, and emotional outcomes, examined across different neighborhood change contexts. This research will lend valuable insight into the dynamics and cumulative impacts of housing market conditions and neighborhood change. We undertake this novel research by relying on two unique datasets: 1) primary collected data from a door-to-door randomized neighborhood survey of renter households (n=800) completed in 2019 across two Los Angeles neighborhoods; and 2) multi-family and single-family residential rental market data scraped from the real estate companies Rentometer and Zillow, which track market-rate housing prices, including rents and rental estimates.

We surveyed 794 residents across two Los Angeles neighborhoods, Central and South Los Angeles, through a 2-stage random block sampling design and a door-to-door, in-person approach. This methodology utilizes a geographically-based approach that covers all Census tracts within each area and employs random sampling of street blocks as well as households within street blocks to achieve a robust and valid sample. Surveys generally lasted between 40 minutes to 1 hour. We use these survey data to deepen our understanding of the nuanced and far-reaching effects of rent burden. We find strong differences in how residents and families cope with rent burden, including the trade-offs residents make, their duration and impacts, as well as differences across groups.

Uniquely, by linking our survey data with rental market estimates, we are able to trace the rent gap: the difference at the household level between market rents and the actual rents paid by each household. With the rent gap thus established, we examine not just the geographic and socioeconomic variation in rent gap across Los Angeles, but we also observe its relationship to the household's economic, social and emotional well-being. We examine these dimensions through survey measures on income, wealth, social support, stress, housing unit maintenance and harassment. By combining these unique datasets, we are able to study dynamics of neighborhood change, housing and household impacts in new and important ways.

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Key Words: rent gap, housing, affordability, rent burden, rent control

## THE INFLUENCE OF ADU POLICY ON THE CONTRIBUTING FACTORS TO ADU DEVELOPMENT: A CASE OF LOS ANGELES

Abstract ID: 110

Individual Paper Submission

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The shortage of housing inventory has become a significant urban issue. From 2000 to 2015, 23 states in the U.S under-produced 7.3 million housing units in total, which is roughly equivalent to 5.4% of the total housing stock of the U.S (Baron et al., 2018). The lack of housing that meets people's needs disparately impacts renters and low-income families by impacting affordability and increasing average housing costs (CAHCD, 2020). Accessory dwelling unit (ADU) has emerged as a policy alternative to increase housing stock and provide affordable options for areas impacted by housing shortages. ADU refers to a completely independent living facility on a lot with a proposed or existing primary residence. In the case of the State of California, the state passed Assembly Bill 2299 in coordination with Senate Bill 1069, which significantly eases restrictions on building ADUs (Bennett et al., 2019). Previous research has discussed the diverse aspects of ADU policies including communities' perspective on the policies, their compliance with zoning, and their impacts on informal housing (Ramsey-Musolf, 2018; Gabbe, 2019).

However, there has not been much research done on where ADU developments likely occur. It is also reasonable to hypothesize that new ADU policies intervene in the relationship between characteristics of parcel and neighborhood and ADU development, but limited research tested this hypothesis. Employing multilevel logit regression, this paper attempts to identify the factors at neighborhood and property levels contributing to ADU developments in the City of Los Angeles. This paper also examines how the city's new ADU ordinance alters the relationship between the contributing factors and ADU developments by constructing two multilevel logistic regression models that test the relationships before and after the implementation of the ordinance. The models indicate that the physical features of the property are more significant determinants of ADU development than neighborhood characteristics. ADU development likely occurred in small-size parcels with smaller, older housing before the new ordinance was adopted. ADU development tended to occur in areas with low population density and homogeneous land use patterns (predominantly single-family residential areas). The models also suggest that ADU developments in the city have been spread to diverse types of properties and areas since the adoption of the new ADU ordinance. These findings will help planners take appropriate actions and regulations that increase affordable housing production by promoting ADU developments.

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Key Words: Accessory Dwelling Unit, Policy impacts, Contributing factors, Multilevel Modeling

## HOW SMALL IS TOO SMALL? ASSESSING THE WELL-BEING IMPACTS OF NANO-HOUSING ON UNIVERSITY STUDENTS

Abstract ID: 152

Individual Paper Submission

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As cities densify and more residents move into smaller apartments, there are questions about the well-being impacts of living in tiny spaces under 300 ft<sup>2</sup>. Nano-flats and tiny homes have gained popularity around the world as a more affordable housing alternative. To understand the well-being impacts of tiny living, we surveyed residents of new nano-suites (140 ft<sup>2</sup>) built for students at a Canadian university. Using a pre-post survey design, we measured the changes to social and subjective well-being, environmental attitudes and expectations about ideal housing type. After seven months living in a nano-unit, we find no negative impacts on subjective and social well-being and unexpected reductions in environmental concern. We also find that tiny living may change expectations about where residents would like to live in the future, making them more open to the idea of living in an apartment instead of a single family detached home. This finding is particularly relevant in a North American context in which single family detached homes are the norm and the demand for these homes is a barrier to densification and sustainable land use planning. Overall residents were highly satisfied with the nano-suite and motivated to live there because of its affordability. A prolonged housing affordability crisis, in spite of the pandemic related economic downturn, may make tiny units increasingly a part of the housing mix in the city of the future.

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Key Words: environmental concern, housing expectations, well-being, tiny homes, nano-flats

## ORANGES ARE NOT THE ONLY FRUIT: VARIETIES OF HOUSING LAND TRUSTS?

Abstract ID: 159

Individual Paper Submission

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Community land trusts (CLTs) offer the promise of permanently securing tenure, and reducing speculation and gentrification-related displacement. Having spread globally, CLTs are defined as non-profit organizations which own land in trust, typically for a group of housing unit owners (Davis, 2010; Davis et al., 2020). They usually stipulate limits to units' price appreciation, household incomes, or both. Among alternative tenure models, they are argued to be comparatively more flexible than cooperatives, as they can readily be used to own and govern one or more multi-family or single-family structures, with variable unit types (Bunce, 2016; Angotti with Jagu, 2007), including in suburban or less dense settings. Cities have created programs to enable wider CLT use (Moore and McKee, 2012), while scholars have examined purported benefits and limits. Meanwhile, interest in CLTs has continued to grow, particularly in high-cost urban areas. Beyond the traditional CLT, there are other types of land trusts for housing. There is the public land trust (PLT), largely ignored in peer-reviewed literature. Various forms of PLTs are in use in multiple cities, including Canada's two highest housing-cost cities, Vancouver and Toronto, as well as in US cities such as Flagstaff and Irvine (DeFilippis et al., 2018). CLTs have been cast as an orange that is the only fruit, to borrow from the title of Jeannette Winterson's prize-winning 1985 novel, *Oranges Are Not the Only Fruit*. But traditional CLTs are not the only type of housing land trust; they are not the only fruit. Contrasting a PLT in Toronto, a hybrid model in Vancouver, and traditional CLTs in New York, we identify benefits and drawbacks associated with varying public vs. community roles in land trusts.

By directly reducing market exposure and obviating the need to finance a land sale by holding it as a public asset, our research suggests that PLTs can readily leverage the power of the state and publicly controlled land, potentially at greater scale. Toronto's PLT houses ~40x more people than the Parkdale CLT, the city's only CLT to have successfully acquired and converted existing market housing stock<sup>1</sup>. Vancouver's PLT shows similar promise, as its rapid, recent scale-up to 2,600 units attests. Further, as the New York case shows, even when CLTs achieve some measure of success, they may have directly relied on the state to do so. CLTs operating independently of the state can also struggle to find sites to acquire in the market, let alone any at scale, particularly in today's high cost urban centres, as new CLTs in New York are experiencing. They may also require direct technical assistance, grants, and lending from government to be financially viable in high-cost cities. CLTs may also lack the ability to maintain organizational capacity, as has also occurred at one New York CLT, leaving public agencies responsible to cure default or maintenance challenges. PLTs, however, may come with drawbacks reflecting their more direct relationship to the state. Specifically, PLTs may require particular and rare political circumstances to enact, as in Toronto, and may be at risk of privatization, loss of community control, or experience loss of government support as political winds change. Indeed, even their indirect relationship to the government has caused New York CLT resident-owners to express concerns regarding political independence, resulting in resistance when municipal agencies seek to enforce regulatory oversight. Nonetheless, in practice, policymakers and planners might wish to consider the PLT, or a hybrid public-community model, particularly in high-cost cities where viable public land can be leveraged for housing, and where political climates enable such models' consideration.

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Key Words: community land trusts, public land, public housing, affordable housing, community control

## **IS BACK TO THE NEST A GOOD DECISION? THE EFFECT OF RETURNING TO PARENTAL HOME ON THE INDIVIDUAL ECONOMIC OUTCOMES AMONG YOUNG ADULTS**

Abstract ID: 165

Individual Paper Submission

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Young adults who achieved independent living, one of the key markers of the transition to adulthood, often go back to their parents because they cannot afford to maintain independence. According to the National Longitudinal Survey of Youth 1997 Cohort (NLSY 97), about 58% of respondents who have experience of independent living, move back to their parents' home or someone else's household at some point.

Poverty level, employment status, race/ethnicity, student debt, and college completion are the drivers of returning home at the individual level (Houle and Warner, 2017; Mykyta and Macartney, 2012; Wiemers, 2014). The high unemployment rate during the recent recession and the rising cost of living since then have been found to be factors driving young people to give up their independent life since the Great Recession (Lee and Painter, 2013; Newman, 2012; Pilkauskas et al., 2014). The increase in the number of young adults living with parents by about 2.6 million which accounts for 5 percent of young adults in a year during the pandemic, demonstrates the huge impact of the economic shock on the decision of living arrangement (Pew Research Center, 2021).

While much attention has been paid to the factors related to giving up independent living, the lives of young people after returning to parental homes are unknown. Dependent living – living in parental home or someone else's household – helps them reduce housing and living expenses, but it can increase commuting costs or reduce job opportunities by moving them to a weak labor market. This study, using data from 2003-2017 waves of the National Longitudinal Survey of Youth 1997 Cohort (NLSY 97) which tracks nearly 9,000 individuals born between 1980 and 1984, examines the various outcomes of young people who have returned to dependent living. Unlike household-based panel data that stops tracking when an individual becomes independent of the existing household, NLSY 97 surveys on an individual basis, so it has the advantage of obtaining a complete set of data regardless of the living arrangement. However, it does not include information about expenditures on housing or other goods.

This study answers the following two questions: (1) Do young adults returning to dependent living get more benefits than they were independent? (2) Do young adults returning to dependent living get more benefits than others who remain independent? The benefit used in the two questions above is measured by 4 variables – (1) employment status (2) job stability measured by whether youth employed for a full year (3) income (4) asset. In the first question, it compares year t-1 and t+1 on the basis of the year (t) the youth decide to return. In the second question, the impact of dependent living on economic outcomes is investigated using the different age points when an individual is 20, 25, 30, or 35 years old. The key independent variable is the duration of dependent living (months). NLSY 97 provides rich information on demographics, parental relationships, and various personal traits (e.g., financial risk tolerance and educational performance) as used for control variables in the model. Preliminary findings suggest that the impact of returning to dependent living on the outcomes varies depending on race and educational attainment.

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Key Words: Living arrangement, Economic outcome, Young adults

## AN ECOLOGICAL MAP OF IMPLICIT RACIAL BIAS IN LOCAL HOUSING DELIBERATIONS

Abstract ID: 170

Individual Paper Submission

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Racism in U.S. housing markets has evolved from the explicit exclusion of racial and ethnic groups to more implicit forms of bias (Lopez 2014) that have disparate impacts on racial and ethnic groups' access to housing and neighborhoods. One example of implicit bias is the use of "code words" for racial and ethnic groups in deliberations about rezoning and other decisions affecting housing planning and development, such as denying a request to rezone a subdivision for higher density (i.e., greater affordability) on the premise that the rezoning will lead to "too many cars parked on the lawn" – coded language for Latinxs. However, comprehensive knowledge on how these code words link to racial and ethnic groups and are used in housing deliberations and decisions is lacking.

This research helps to fill this gap by using a mixed method qualitative approach to 1) identify racial and ethnic code words in the 2000s and 2) contextualize their use in local housing-related deliberations in the Phoenix and Tucson metropolitan regions. First, we explore the range of racial and ethnic code words and how their use varies across diverse geographic and temporal contexts through a systematic review (Xiao & Watson 2019) of empirical evidence on code words in cross-disciplinary peer-reviewed research published in the 2000s. Second, we investigate the use of these code words by stakeholders in housing-related zoning deliberations and decisions in communities with divergent socioeconomic and housing market conditions in the Phoenix and Tucson regions through content analysis of public meeting transcripts and relevant traditional and social media. Finally, we triangulate the systematic review and content analysis findings to create a locally anchored, ecological map of racial and ethnic code words relevant to housing planning.

The broader impacts of this research are twofold. First, our findings contribute to existing and new theories about how planning deliberations and decisions further white supremacy (e.g., Goetz, Williams, & Damiano 2020; Whittemore & BenDor 2019; Tighe 2011). Second, our findings inform efforts to provide racial and ethnic bias training to planning practitioners and adjudicate disparate impact claims under the Fair Housing Act.

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Key Words: housing, race/ethnicity, zoning, social inequality, public meetings

## **CLASS MONOPOLY RENT, PROPERTY RELATIONS, AND PORTLAND'S HOMELESS CRISIS**

Abstract ID: 172

Individual Paper Submission

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This study deepens our understanding of the political-economic drivers of contemporary homelessness by bringing scholarly literature on land rent theory and the political economy of homelessness into closer dialogue. We interrogate the tactics by which the actors that comprise urban growth machines collaboratively work to control the spatiality of the homeless as a means of preserving their investments (and acceptable rates of return) in urban space. The scholarly literature on homelessness is now massive and transcends disciplinary boundaries. However, comparatively few scholars have examined homelessness in relation to property, which is curious because homelessness is defined, following Blomley (2009), as a condition of being excluded from, and produced by (and with), property. It is in this context that this study is situated, by extending Blomley's (2009) insights on property law further with respect to the role of rent in the contemporary neoliberal city. In the process, we hypothesize that it is not just the mobilization of property toward rent-enhancement that both produces and spatially manages homeless populations, but in the neoliberal era, it is specifically the mobilization of property toward one particular category of rent: class monopoly rent.

Based on a case study of Portland's Pearl District and Oldtown/Chinatown, the study empirically illustrates the conceptual value of class monopoly rent in illuminating the specific economic relationships that have underpinned the past four decades of homelessness in urban America. In doing so, the pursuit of class monopoly rent – the proportion of rent attributable to rent-seekers (e.g., developers, investors, landlords, the local state) collaborating rather than competing to simultaneously limit supply and enhance demand in particular housing submarkets – is shown to be notably more prevalent and varied in its manifestations than previously acknowledged. The study identifies certain governing coalitions and disciplinary mechanisms centered on such collaborative strategies in the context of redeveloping the Pearl District, what we hypothesize as a homeless-producing and managing form of class monopoly rent.

In conjunction with investors and local government, the pursuit of class monopoly rent by rent-seekers is shown to be directly implicated in driving-up property values to premium levels, and exacerbating the city's homeless crisis, ironically, in the very prime spaces of redevelopment most threatened by the visible presence of this crisis. It is in this context that the study implicates class monopoly rent as a strategy of controlling where (visible) homeless bodies can and cannot be in the city. Drawing on the case of the struggle to relocate the "Right Too Dream Too" homeless encampment from its long-time location in Portland's Oldtown/Chinatown, developers have routinely pooled their resources to strong-arm the city government with threats of legal action as a means of controlling the outcome of the relocation process. We conceptualize the revenue that is saved by doing this (i.e., the funds sunk into the lawsuits being treated as an investment) as a particular form of class monopoly rent.

In the process, the study widens the scope of land rent theory by deepening our understanding of the underlying causes of homelessness in the USA and beyond, particularly in a neoliberalized land market system structured by the restless pursuit of class monopoly rent. It also indicts the decisions of private sector actors as culpable in the worsening plight of the homeless at a time when such actors are frequently revered by civic elites as benevolent



saviors. The study concludes by discussing the implications of this analysis for property law and housing policy.

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Key Words: Capitalism, Neoliberalism, Growth machine, Governance, Political economy

#### HOUSING SUPPLY AND PRICE IMPACTS OF UPZONING IN SEATTLE, WA

Abstract ID: 186

Individual Paper Submission

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Strict land use regulations in cities across the United States have perpetuated supply constraints and high housing costs. Many cities have recently begun a process of upzoning, increasing allowable densities for housing, with the goal of boosting supply and reducing costs. This paper examines the nature and strength of upzoning’s impacts on housing supply and prices across different kinds of neighborhoods in Seattle, WA.

An ongoing debate surrounds the impacts of upzoning on housing supply and affordability. A recent study in Portland found that upzoning in the early 2000’s led to increased development density and housing supply (Dong 2021). Many scholars believe that new market-rate construction will ease housing prices in the long run (Been et al. 2019). On the other hand, research in the short-term found that upzoning in Chicago resulted in increases in land values and little new construction in its first five years (Freemark 2019). Some scholars note that the context in which upzoning occurs has important implications for its impacts (Manville et al. 2020). Others have advocated for universal upzonings, which would likely shift development to hotter markets with higher rents and house prices (Wegmann 2020). The exact nature and strength of upzoning’s impacts in different parts of a city remains an open question.

This paper uses the case of Seattle to examine the effects of upzoning on property values and housing supply, across different neighborhood types. In the 1990s, the City of Seattle began to target new multi-family housing development to over 30 designated “Urban Villages” across the city. Seattle provides a useful site for this research, as it allows examination of the impacts of upzoning over a relatively long time horizon and across different types of neighborhoods. I use a combination of spatial and econometric analysis to examine the impacts of Urban Village rezoning policies on housing prices and supply. The combination of longitudinal data and clearly defined treatment areas allows me to use econometric methods to assess the effects of upzonings on housing supply and prices at both the parcel and neighborhood levels, using cluster analysis to distinguish different neighborhood types.

This research holds significant implications for the understanding of housing availability in US cities and trends in inequality. As the housing affordability crisis continues to grow, an increasing number of cities are looking to upzone

neighborhoods. This research contributes to the discussion by providing new insight into the impacts of upzoning on housing supply and prices.

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Key Words: Upzoning, Housing development, Affordable housing, Zoning, Housing policy

#### **NEW YORK CITY'S LIHTC YEAR-15 PRESERVATION PROGRAM: WHO, WHERE, AND WHY**

Abstract ID: 223

Individual Paper Submission

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Year 2020 was a somber year, not only because of the COVID pandemic, but also, as the dawning of a Low-Income Housing Tax Credit (LIHTC) expiration crisis. Since 1990, LIHTC properties have been under a 30-year affordability restriction period (15 years of compliance period and 15 years of extended-use period), making year 2020 the first year in which some LIHTC properties will be released from this affordability restriction. The increasing affordability expiration of LIHTC units will further challenge state and local governments to balance limited resources between preservation and new construction of affordable housing (Reina, 2018; Schwartz and Meléndez, 2008). Faced with this challenge, it is important to better understand who and where to direct assistance to yield the most out of limited funds. By examining New York City's LIHTC Year-15 Preservation Program, this paper answers three questions: Who are the participating owners? Where are the participating properties located? And why do these owners participate?

There has been rising interest in the preservation of subsidized housing, many specifically focusing on LIHTC (Aurand et al. 2018; Black 2017; Deng 2020; Schwartz and Meléndez 2008). Deng (2020) recently looked into the case of Detroit and pointed out the various actors playing roles in the preservation of LIHTC properties, of which, the City of Detroit was one. Building upon this study, my paper will further shed light on the impact city governments have in preserving LIHTC properties through the examination of NYC's LIHTC Year-15 Preservation Program.

LIHTC was first introduced in 1986 as a dollar-for-dollar tax reduction program with an affordability restriction of 15 years. In 1990, federal law mandated an additional 15 years, extending the affordability period to a total of 30 years, with some states enforcing longer mandatory restriction periods. Although the mandatory affordability restriction period is extended to 30 years, the tax credit benefits are fully collected by year-15, making it common for ownership restructuring to occur at this time, often requiring capital improvements (Deng 2020; Schwartz and Meléndez 2008). Year-15 has been well recognized by many scholars as a critical point that has long-lasting impacts on the future viability of LIHTC properties (Aurand et al. 2018; Black 2017; Deng 2020; Schwartz and Meléndez 2008). In line with this recognition, NYC has implemented LIHTC Year-15 Preservation Program since 2008, which assists financial repositioning and physical improvements for LIHTC properties reaching its year-15. However,

because this is a voluntary program, not all LIHTC properties opt-in.

The focus of this study is to compare owners who do and don't participate in NYC's LIHTC Year-15 Preservation program; identify where participating and not participating properties are located; and understand the factors that contributed to the owners' decisions. By using data from the National Housing Preservation Database, CoreData.nyc's Subsidized Housing Database, American Community Survey (ACS), and New York City Housing and Vacancy Survey, I compare owner profiles, local housing markets, and neighborhood characteristics, using descriptive statistics. I then map the locations of the properties using GIS software, showing the spatial distribution of participating and nonparticipating properties. Finally, I analyze the factors contributing to the opt-in decisions using logistic regression. Through spatial and statistical analyses, the strengths and limitations of the NYC LIHTC Year-15 Preservation program are identified, and I propose recommendations for a more effective low-income housing preservation policy.

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Key Words: Affordable housing preservation, LIHTC, City government, Housing policy, Subsidized housing

## THE ROLE OF INDIVIDUAL LIFE-CYCLE, PARENTAL, AND NEIGHBORHOOD FACTORS IN MILLENNIAL HOUSING TRAJECTORIES

Abstract ID: 236

Individual Paper Submission

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Millennial homeownership is a topic that has attracted extensive attention but has left many questions remaining, perpetuating widespread confusion and misunderstanding. The stereotypical image of Millennials as urban renters has been prevalent in public discourses, ignoring the fact that they are comprised of diverse backgrounds (Frey 2018; Moos, Pfeiffer, and Vinodrai 2018). Also, the fixation on Millennials as a fixed age group has distracted from their true life-cycle advancement. While the financial crisis of 2007–2008 and its subsequent recessions had delayed the Millennial generation's transition into adulthood, new evidence suggests that their advancement into homeownership and a suburban life accelerated in recent years (Myers, Lee, and Simmons 2020; Lee 2021). Although these studies have contributed to debunk the myth of Millennials' avoidance of homeownership and their permanent urban preference, the diverse and uneven pathways of Millennials in their housing career and potentially associated factors have been less investigated.

Key questions to address are the privilege divisions within Millennials, and how that shapes their outcomes in their

30s. This includes differences by race/ethnicity, educational attainment, and marital status, and according to their parental economic resources. We also seek more qualitative detail about their residential mobility and neighborhood destinations than simply city/suburb, a major limitation of previous literature.

To address this research gap, this paper first analyzes trajectories of Millennials in their housing career using various data including American Community Survey (ACS) and Panel Study of Income Dynamics (PSID). In doing so, we measure housing the status of Millennials not only by conventional quantity measures (e.g., household formation, homeownership) but also by additionally considering qualitative measures (e.g., short- and long-distance moves, single-family rentals, neighborhood quality). With broad contours identified, we then examine the role of individual life-cycle, parental, and neighborhood factors in those pathways using the confidential version of the PSID data from 1999 to 2019. Among individual factors, particular emphasis is given to the lagged effects of life-cycle events such as getting married and having children as these can substantially change the demand for housing immediately or later. Also, the response to the changing housing demand can differ across people with their different backgrounds and capacities, and parental resources can be one of the major determinants of their housing choice, potentially leading to growing inequality among Millennials (Charles and Hurst 2002). From this perspective, we examine how parental wealth, educational attainment, and homeownership are associated with children's housing trajectories in terms of homeownership and neighborhood quality.

Using nationally representative and longitudinal data, the findings of this paper will complement previous literature and deepen our understanding of the association between Millennial housing achievements and individual, parental, and neighborhood factors. The findings ultimately provide insights for making better policy decisions addressing issues related to Millennial homeownership.

There are three features of the research that may hold particular interest for planners. First, the influences of local housing market conditions are examined by using key housing market metrics such as housing affordability and price indices. Second, the study will explore how key associations vary across different metropolitan areas and/or across different periods, and, thirdly, the study examines the perpetuated or expanding inequality of Millennials with particular access (or lack thereof) to key resources that shape Millennial housing trajectories.

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Key Words: Millennials, Homeownership, Residential Mobility, Locational Choices, Cohort Trajectory

#### ACCESSIBILITY AND SPATIAL EQUITY OF EMERGENCY MEDICAL SERVICES FOR SUBSIDIZED HOUSEHOLDS IN SEOUL, KOREA

Abstract ID: 244

Individual Paper Submission

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Beyond the creation of affordable housing units, the provision of suitable living environments for marginalized households has been a significant consideration among planners and policymakers. Despite many studies exploring various socioeconomic environments, particularly in terms of education, job, and transportation opportunities, for subsidized households living in public housing, we have a limited understanding of whether subsidized households have suitable environments for accessing adequate medical services in the neighborhoods. Since medical services have a direct impact on individual quality of health life (Arcury et al., 2005; Dai, 2010; Doeksen, 1998), the Korean government has implemented various welfare policies such as medical expense support, health insurance fee reduction, and free health check-ups for vulnerable households. Although there is a growing concern regarding various health issues (e.g., physical activity, walkability, etc.) for neighborhoods where subsidized households are located (Osypuk and Acevedo-Garcia, 2010; Woo & Kim, 2016), there are still limitations and knowledge gaps related to the associations between the spatial location of subsidized households and medical service accessibility.

This study explores the accessibility and spatial equity of Emergency Medical Services (EMS) for subsidized households in Seoul, Korea. We employed a binomial logistic regression model to empirically examine the relationships between the location of public housing and emergency medical services accessibility in Seoul, Korea. Additionally, this research stratified public housing into the long-term rental public housing (e.g., housing units for extremely low-income households) and the short-term rental housing (e.g., housing units for young people, newlyweds, and single-family household) to specify how the EMS accessibility in neighborhoods differs across housing types. Based on a real-time route guidance API service, we estimated the EMS accessibility by calculating the travel time from the centroids of the census block to each emergency medical facility and employing the modified 2-step floating catchment area model. The findings showed that the location of public housing has limited access to medical service opportunities, particularly in terms of the accessibility of primary medical and the EMS services. Furthermore, we found that the relationships between the location of public housing and medical services accessibility varied across the types of public housing. There was difficulty in accessing primary medical facilities and public transit systems for subsidized households living in the long-term public housing units. On the other hand, the short-term rental housing was located in neighborhoods where subsidized households have limited access to EMS services and walkable amenities. The results of this study may be helpful in empirically grasping the spatial accessibility of primary and emergency medical services for subsidized households. Furthermore, our findings may shed light on developing tailored policies for residential location selection and neighborhood built environment improvement for the realization of spatial equity for the vulnerable.

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Key Words: Public Housing, Emergency Medical Services, Accessibility, Modified Two-Step Floating Catchment Area

#### ETHNORACIAL HOUSING STABILITY DURING COVID-19

Abstract ID: 308

## Individual Paper Submission

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Our research explores the implications of the coronavirus pandemic (COVID-19) for ethnoracial homeowners' precarious road to housing stability in the United States. We analyzed data from the U.S. Census Bureau's Household Pulse Survey, which collects information regarding COVID-19. We analyzed data from the U.S. Census Bureau's Household Pulse Survey, which collects information regarding COVID-19. We pooled 6 weeks of data for the nation, which produces a sample of 719,387 homeowners who either owned their home or apartment free and clear or owned with a mortgage or loan. We constructed logistic regression models for three groups of homeowners to assess factors contributing to their housing stability or ability to pay their mortgage. Our results indicated that an average of 8% of homeowners struggled to pay their mortgage. An average of 41% of homeowners deferred their last month's mortgage, and 62% were concerned about their next mortgage payment. We found that Blacks and Hispanics had a greater likelihood of struggling to pay their mortgage and deferring payment. These groups, in addition to Asians, had a greater likelihood of being concerned about their ability to pay their next month's mortgage. These alarmingly high numbers foreshadow another housing crisis, and similar to the Great Recession, communities of color will be disproportionately affected.

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Key Words: COVID-19, systemic racial inequality, homeownership

## REDUCING LOCAL IMPEDIMENTS TO ESSENTIAL HOUSING CONSTRUCTION: A MULTI-METHODS ANALYSIS

Abstract ID: 322

Individual Paper Submission

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This paper, the first of a two-paper set prepared for the Lincoln Institute of Land Policy, takes a multi-methods approach to identifying key impediments to essential new home production among all U.S. metropolitan areas with more than a half-million residents. The paper makes new contributions in four related areas. First, it measures the sufficiency of new home production as the ratio of new homes constructed in each metropolitan area between 2000 and 2019 to metro area job growth during the same period. This housing unit change-to-job change (HCJC)

ratio serves to normalize the flow of new supply by the principal source of metropolitan-level housing demand: job growth. Nationally, this ratio stands at 1.14, but among individual metro areas it ranges between 137 in Birmingham and 0.3 in Fresno. Metro areas in which this ratio exceeds 1.5 are identified as relative “over-producers,” and those in which it is less than 0.8 are identified as relative “under-producers.” Second, using the HCJC ratios identified above, it develops a series of regression models which are used to identify key factors associated with leading and lagging housing production levels. These include local land supply constraints, excessively stringent planning and development regulations, construction cost differentials, hyper economic activity, and demographic-based housing market segmentation. Third, building on the results of the statistical models, this paper reports on the results of a national Qualtrics survey conducted in early 2021 that asked respondents to identify the sources and severity to housing construction in their metropolitan areas. Uniquely among such efforts, the same survey was administered to a local homebuilding associations and to the primary public planning agency in each metro area. This innovative sample frame allows us to identify the housing construction impediment areas in which local producers and regulators agree and disagree. Last, this paper reports on the results of a series of focus groups composed of the survey respondents (above) that enabled them to react and respond to the survey results, and to provide further clarification regarding the importance of particular impediments and to suggest potential ways they might be productively removed. Among the key impediments to expanded housing production identified by the statistical analysis are: (i) the existence of an inconsistent and easily interrupt-able land supply “pipeline,” especially in metro areas experiencing continuous and high-end job growth; (ii) the existence of too many small local governments, creating a sort of “tragedy of the commons” when it comes to not accommodating additional housing supply; and (iii) and an overly discretionary entitlements process which allows anti-development actors excessive influence in the development permitting process. Among the significant impediments to suburban housing construction identified by the survey respondents are difficulties rezoning land for multi-family projects, and process rather than performance-based environmental impact assessment procedures. In addition to difficulties getting variances to allow for multi-family and higher-density housing projects, among the significant impediments to infill housing identified by the survey respondents are getting community and neighborhood groups to sign-off on any project they regard as too large or different.

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Key Words: housing, supply, constraints

#### VALUE OF COMPACT AND ACCESSIBLE BUILT ENVIRONMENT: A COMPARISON OF TRANSPORTATION EXPENDITURE BETWEEN ASSISTED RENTER HOUSEHOLDS AND UNASSISTED LOW-INCOME HOUSEHOLDS

Abstract ID: 359

Individual Paper Submission

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Housing and transportation are the first- and second-largest budget items for most American families in metropolitan areas (Lipman, 2006). Previous evidence suggests that there is a tradeoff between housing costs and transportation expenditures (Lipman, 2006). Many families that live in lower-cost housing are likely to spend more

on transportation than housing. Housing assistance reduces the rent burden of assisted tenants. In this case, the impact of housing assistance on household travel decisions is still unknown and it is uncertain whether assisted renter households increase household transportation budget. This uncertainty can cast doubt on the issue that to what extent the documented benefits of a compact and accessible built environment, including reduced driving, increased transit use, and decreased energy consumption (Cao, Handy, & Mokhtarian, 2006; Ewing & Cervero, 2017), apply to assisted renter households. This study aims to examine whether the trade-off between transportation and housing expenditure holds true among assisted renter households by examining empirical evidence regarding the impacts of neighborhood built environment on assisted renter households' transportation cost.

This study derives variables mainly from American Housing Survey (AHS) 2013, and focuses on the national sample that was assigned the topical module on public transportation and walkability and was living in the urban areas. AHS is the only data source that surveys subjective observation of housing and neighborhood, as well as household transportation expenditures, in HUD's largest rental assistance programs. Assisted renter households refer to HUD-assisted households, living in public housing and privately owned subsidized housing, or receiving housing vouchers. Unassisted renter households are defined as income-eligible households for HUD housing subsidies, having household income less than HUD's low-income limit, yet were not subsidized at the time of the survey. Means and proportions comparisons, as well as effect size, are introduced to examine the discrepancies between assisted and unassisted low-income renter households on neighborhood and regional built environment, and transportation expenditure. Additionally, a series of multilevel models are designed to assess the impacts of regional and neighborhood built environment on household transportation expenditures, as well as its differences between assisted and unassisted low-income renter households, after accounting for the influence of household socio-demographic characteristics and housing unit features. The results will suggest the connection between compact development and transportation expenditures of assisted renter households. More importantly, the results will imply whether built environment elements have different impacts on household travel costs, given the distinctions in housing assistance status between households. The study will highlight built environment elements of significance for assisted and unassisted households.

The findings are expected to improve our understanding of assisted low-income renter households, especially the influences of locational outcomes on household transportation expenditures. The findings will have some implications on affordable housing policies: it will be discussed whether the current policy initiatives for the physical planning of affordable housing development are consistent with our findings, and have a priority on the elements of significance. In addition, through the analysis of differential effects of built environment elements on household travel costs between assisted and unassisted households, the findings will contribute to an understanding of the possible changes in household travel expenditure as a result of housing subsidies. These findings will provide a basis for affordable housing and transportation planning practitioners to better address the issue of locational affordability, which considers both housing and transportation expenditures, and to improve the overall well-being of disadvantaged populations.

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development, hybrid and transit-adjacent development station typologies. *Housing Policy Debate*, 26(4-5), 819-834.

Key Words: affordable housing, assisted households, transportation expenditure, transportation affordability

## **IS TRANSIT-ORIENTED DEVELOPMENT AFFORDABLE FOR LOW AND MODERATE INCOME HOUSEHOLDS (IN TERMS OF H+T)?**

Abstract ID: 376

Individual Paper Submission

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When it comes to affordability, what counts is not housing costs alone but the combination of housing plus transportation costs (H+T). If transit-oriented developments (TODs) do, in fact, command higher rents due to increased transit accessibility, this creates an issue of social equity, especially if higher housing costs are not offset by transportation-related cost savings.

No study, to our knowledge, has quantified the effect of transit-oriented developments on location affordability using the H+T framework. Further, only a few studies have examined housing prices for TODs while controlling for transit-proximity effects (Duncan, 2011; Mathur and Ferrell, 2013). No one has sorted out these two countervailing effects in the context of TOD to determine (1) which effect is dominant and (2) whether the two together meet standards of affordability for H (30% of household income), T (15% of income), and H+T together (45% of income). In this study, we intend to fill this gap in the literature.

We first compiled a complete (100%) inventory of free-standing TODs adjacent to rail stations (i.e., commuter rail, heavy rail, and light rail stations – excluding regions with only one single rail line) in the U.S. This is the first such compilation since the Cervero and coauthors produced their TCRP 102 report back in 2004, which was incomplete. We contacted all transit operators, metropolitan planning organizations, and major cities in rail-served metropolitan areas to get a list of potential TODs based on eight criteria: (1) adjacent or nearly adjacent to rail stations, (2) dense and multistory, (3) mixed-use with residential and commercial, (4) pedestrian-friendly with public space, (5) built after rail opened, (6) largely built out, (7) with their own parking facilities, and (8) master-planned. We created a list of 187 TODs in 26 regions across the U.S. To verify our initial list of potential TOD projects, we then reviewed candidate projects to see if they meet the criteria using Google imagery. Overall, among 187 potential developments, we identified 85 TODs across the country that clearly meet our criteria. More than half of the developments in our list were excluded as being under construction.

We then identified all apartment projects by name, checked websites for rent levels, interviewed property managers, and established rent levels for market-rate and below-market-rate affordable housing (if available) for all apartments within these TODs. Our results show that rent levels for market-rate housing are generally affordable for moderate-income households (i.e., households earning 80% of the area median income), but not affordable for low-income households (i.e., households earning 50% of the AMI).

Interestingly, more than 35 TODs have at least a subset of below-market-rate housing units. We conducted semi-structured interviews with property managers to learn what public policy instruments (regulations and subsidies) were used to induce developers to provide affordable housing for low-income households. We found that various mechanisms have been used to provide affordable housing, including inclusionary zoning, density bonuses, local

subsidies, and development agreements.

We then, for seven selected TODs, conducted late-night parking counts and intercept surveys of apartment dwellers coming to and from their buildings to determine T costs. In principle, the T costs are estimated from auto ownership, estimated miles driven per day, standard auto operating costs, and transit fare and utilization levels. Our results show that the transportation costs are less than 15% of household income for low-income households. Summing H and T costs, we found that TODs providing market-rate rents are still affordable only for moderate-income households. Thus, if TODs are to be affordable for low-income households, some mechanism must be in place to lower rent levels to low-income standards.

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Key Words: Transit-Oriented Development, Affordability, H+T, TOD Inventory

## **AN AFFORDABLE HOUSING POLICY THAT WORKS A REVIEW OF THE ACCESSORY DWELLING UNIT ORDINANCES IN SOUTHERN CALIFORNIA**

Abstract ID: 377

Individual Paper Submission

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Southern California requires at least 1.3 million new homes within the next decade (Southern California Association of Governments, 2020). One housing type that offers potential for more affordable housing is the accessory dwelling unit (ADU). An accessory dwelling unit is a detached or attached independent housing unit with a kitchen and bathroom usually sited on a lot behind a primary dwelling unit. While these have existed in the form of garage conversions and other types before, ADUs are expanding across Southern California due to state support with Assembly Bill 2299 and Senate Bill 1069 (Bennett et al., 2019). ADU building permits increased from 6,000 in 2018 to 15,000 in 2019 (Chapple et al., 2020a). However, the academic literature on accessory dwelling units remains scant.

This paper represents a three part inquiry including a literature and best practices review, a collection and analysis of ordinances for ADUs to determine restrictions and opportunities in the individual member city of the local metropolitan planning organization (MPO), Southern California Association of Governments (SCAG) and then finally a geographic case study approach that measures ordinances against census data and ADU permits to gauge their effectiveness at promoting ADU delivery.

A literature review identified key factors in ADU affordability, including the pre-existing ownership of land and inexpensive construction costs for small wood housing units. However, a lack of financing and loan models for ADU type construction currently exists. We determined from the literature review three main strategic categories to address to increase ADU production including, greater leniency in urban design requirements including setbacks, increasing planning aid through professional expertise and financial aid that caters for small projects like ADUs.

From a search through 192 SCAG municipal members we collected 96 updated municipal ordinances and performed a thorough analysis of 68 local ADU ordinances to determine key regulatory restrictions that could be modified for greater ADU construction. While it was found that most municipalities of the SCAG adhere closely to the state prescription, we identified several urban design restrictions that could be reduced, including parking requirements, setbacks and providing ADUs in additional land use zones.

We measured these more lenient scenarios found with census data and ADU permit issuance across a sample of the SCAG members to determine how the ordinance design compares with the ADU production. Sample cases were determined based on permit issuance and previous case study research on ADUs in California (Chapple et al., 2020b). A mixed-methods model for gauging the impacts of ordinances is suggested and provided in this paper. Ordinance design was found to be part of a greater context of socio-economics that promote or discourage ADU delivery.

Southern California's ADU proliferation was found to be more egalitarian than other Californian regions, with construction occurring across a middle income geography (Chapple et al., 2020a). However, this must be supported and maintained in order to provide people with housing in places they want to live. This paper provides an understanding of ADU delivery for greater affordable housing provision across California. California's struggles are not unique and the conclusions of this paper offer insights for other places to design ordinances that work to deliver affordable housing.

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Key Words: ADU, Housing, SCAG, Affordable, Mixed-Methods

#### **TENSIONS BETWEEN STATE HOUSING LAW & LOCAL IMPLEMENTATION IN ORANGE COUNTY, CALIFORNIA**

Abstract ID: 384

Individual Paper Submission

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Particularly in suburban areas, local land use controls throughout the United States have historically hindered multi-family and rental housing production, leading to pressing issues, such as unaffordability and segregation (Pendall, 2000; Freund, 2007). Recognizing this, California passed the Housing Element Law (HE) in 1969, mandating that all counties, cities, and towns plan for the housing needs of all residents. Local governments must thus assess local

housing needs and develop inventories of available sites for housing development, analyses of public and private constraints hindering housing development, and programs to reduce such constraints. Nonetheless, they rarely meet their Regional Housing Needs Allocations (RHNA). Furthermore, in the 2010s, 42% of the state's affordable housing units were built in high-poverty and highly segregated census tracts, while only 6% of them were built on the highest resourced census tracts. Within Southern California, Orange County is a diverse but segregated region; coastal and southern jurisdictions are significantly more affluent than northern and inland ones. Yet housing is generally unaffordable throughout the county – even more so than in Los Angeles County. Only 25.6% of OC households can afford a median priced home, compared to 31.4% in the state. Likewise, of the RHNA goals set for the 5<sup>th</sup> (2013-2021) HE cycle, OC has only met 6.5% of its very low-income housing goal, 17.2% of its low-income housing goal, 18.4% of its moderate-income housing goal, and 150.6% of its above moderate-income housing goal.

Given important differences between OC jurisdictions, this research 1) evaluates their efficiency to promote affordable housing production during the current HE cycle, and 2) gauges the influence that recent state and assembly bills have had in the revision process of HEs for the upcoming 8-year cycle. In 2017, SB-35 created consequences for failing to meet local housing targets and AB-1397 now requires localities and counties to ensure that proposed development sites have a demonstrated potential for development. Since 2019, AB-686 also pushes local governments to site low-income housing in high-opportunity neighborhoods and grants the California Department of Housing and Community Development increased oversight capacity. Also since 2019, SB 330 limits some jurisdictions' abilities to restrict housing development due to their failure to meet their RHNA goals. Most jurisdictions in Southern California fit such description.

To address the first research query, this research is contrasting OC jurisdictions' 1) 5<sup>th</sup> cycle RHNA goals by income category, 2) applications received for residential development by income category, 3) permits granted per income category, 4) site inventories to accommodate shortfall housing need, 5) socioeconomic, ethnic, and racial shifts, and 6) shifts in housing costs and burdens for owners and renters. Site inventories are not readily available. Thus, this analysis includes the search or request of 1) 5<sup>th</sup> cycle HE sites for OC's 34 jurisdictions; examines 2) whether they have been developed or approved for development, and 3) their development suitability; and will compare 4) 5<sup>th</sup> to 6<sup>th</sup> cycle sites when they are published later this year. Housing advocates in other California regions are using similar strategies to assess sites' development potential. This research is also partnering with local housing advocates, such as the Kennedy Commission and People for Housing OC, to document HE town hall meetings, strategies, and procedures throughout Orange County. The practical goal of this research is to elucidate best and worst practices in promoting affordable housing production in suburban Southern California to inform future policy and decision-making.

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Key Words: Housing, California, Land use, Governance

#### **ENFORCING UNEQUAL EXCHANGE IN RENTAL HOUSING SUBMARKETS: AN INVESTIGATION OF HOUSING QUALITY, RETALIATORY EVICTION, AND REGULATORY PREEMPTION IN MADISON, WISCONSIN**

Abstract ID: 397

Individual Paper Submission

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Recent scholarship on eviction has raised important questions regarding the generative forces that produce eviction-based displacement. For example, while it is understood that most evictions occur due to non-payment of rent, research has shown that other factors such as race, household composition, and proximity to development are additional sources of discriminatory and spatialized causality. A smaller subset of the emergent eviction literature argues that eviction may also serve the strategic interests of specific types of property owners and management companies who use eviction filings to enforce various forms of insecurity and, in particular, lower quality housing conditions. We investigate this question through a parcel-level analysis (n=1024) of eviction filings between 2010 and 2017 and housing quality data in the form of registered complaints to code enforcement and follow-up inspections resulting in short-term, intermediate, and long-term corrective orders and abatement procedures that were opened by the City of Madison between March 2010 and May 2017. After controlling for factors commonly associated with housing insecurity, we use a series of negative binomial regression models to show that within the universe of housing units with complaints that were originated by residents, eviction filings are a consistent, statistically significant predictor of corrective orders and specific housing conditions such as mold and infestation that are known epidemiological threats to health. Second, through logistic regression models and time series analysis we show that the probability of an eviction filing increases progressively after complaints are registered and corrective orders are issued. Together, the findings demonstrate the existence of conditions of unequal exchange in rental housing submarkets where housing quality is reduced through the threat or effect of retaliatory eviction. Lastly, we argue that renters in Madison are not ignorant of their collective vulnerability as demonstrated in a measurable reduction in resident-originated complaints following the commencement of legislation that preempted local municipalities in Wisconsin from conducting routine code enforcement inspections of residential housing units.

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Key Words: eviction, retaliatory eviction, housing quality, housing regulation, preemption

#### MOVING AWAY FROM EXTREME HOUSING COST, WHERE DO PEOPLE GO? THE CASE OF THE BAY AREA REGION

Abstract ID: 409

Individual Paper Submission

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Increasing housing cost in expensive cities around the globe has caused higher rates of houselessness, crowding, and unhealthy housing environments. A logical outcome, in the absence of protections like rent control and investments in affordable housing, is migration to less expensive housing markets, if displacement does not force

that decision (Diamond et al., 2019). Where people move to, however, is crucial to understanding the long term welfare implications of high housing cost and residential mobility (Goetz & Chapple, 2010). Economic insecurity will only follow if people face higher commute times, have fewer job opportunities, and move to neighborhoods that are declining or outpricing them again.

In this paper, we analyze migration patterns within and out of the Bay Area, the region with the highest median housing cost in the United States. The analysis focuses on the relationship between the Zip Code rate of out-migration and the characteristics of movers' origin and destination places. While the causes of moves are challenging to measure, the characteristics of the neighborhoods producing high levels of moves shed light on the possible underlying processes (Zuk et al., 2018). Migrants' attributes provide further clues that give the migration patterns greater substantive implications, from increased inequality and segregation in the sending and receiving communities to longer commutes (Schafran, 2018).

We combine data from the Census Bureau and California Franchise Tax Board (FTB) for the 11-county Bay Area region to examine the characteristics of Zip Codes with the highest number of filers who moved out relative to the resident population. The FTB data includes information on location (Zip Code), adjusted gross income, number of dependents, and age for all residents of the Bay Area counties who filed at least once between 1995 and 2015 and continued to file regardless of location. This allows us to identify when filers moved from the Bay Area to anywhere else in the country. We use this information to classify the types of moves (e.g. high vs low income, intra-municipal vs inter-regional move). We then match those patterns to the characteristics of the sending and receiving Zip Code using the Census Zip Code Tabulation Area data for 2000 and 2010.

We find that as the income of Bay Area residents increased, an growing share of movers out of the region were lower income. We also show that despite the high cost of housing, most moves are local. Residents in the neighborhoods labelled as gentrifying tend to move to an adjacent Zip Code rather than outside the region. In addition to local pressures on moving, the existence of a viable alternative appears to drive migration. This produces clear pairings between high-cost cities and the cities directly connected to them via freeways, even when those cities are far away.

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Key Words: regional migration, residential mobility, housing affordability, income inequality

#### HOUSING MARKET RESILIENCE IN LARGE AMERICAN METROPOLITAN AREAS: A COMPARISON OF HOUSING MARKET PERFORMANCE IN THE 2008 GREAT RECESSION AND THE COVID-19 PANDEMIC

Abstract ID: 443

Individual Paper Submission

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In the past 15 years, the housing markets in the United States experienced two major external shocks: the 2008 Great Recession and the COVID-19 pandemic. The housing markets behaved very differently. Housing prices dropped sharply in the 2008 Great Recession and millions of homeowners lost their homes to foreclosure sales. The COVID-19 outbreak spurred the fears that the pandemic and the economic shutdowns would cause another housing recession in American cities. In the first few months after the coronavirus outbreak, there were numerous news stories that housing prices in large American cities such as New York and San Francisco plunged (Kadet, 2020; Paybarah, Bloch, and Reinhard, 2020). A few months later, however, the housing markets quickly emerged from its pandemic-driven freeze in spring and kept heating up in the second half of 2020 (Romen, 2020; Zillow Research, 2020).

The purpose of this research project is to measure local housing market resilience at the neighborhood (zip-code) and metropolitan levels and evaluate the geographic variations of the housing market resilience in the two shocks within and across large American metropolitan areas. The three research questions that this project attempts to address include: 1) What are the geographic patterns of housing market resilience at the neighborhood and metropolitan levels in the two shocks? 2) Are the geographic patterns consistent between the two shocks? and 3) What are the factors that explain housing market resilience in the two shocks?

To address these three research questions, we will utilize the Zillow Home Value Index (ZHVI) to measure housing market resilience in the local and regional housing markets. ZHVI is a smoothed, seasonally adjusted measure of the typical home value across a given region and housing type. The ZHVI is available in the majority of Zip codes in large American metropolitan areas since 1996, allowing us to evaluate housing market resilience in the two shocks.

We will first map the geographic patterns of market resilience in each shock and compare them. At the Zip code level, the analysis explores whether the housing markets in certain locations within a metropolitan area are more resilient. At the metropolitan level, our analysis explores whether certain types of metropolitan areas are more resilient. We will then build spatial regression models to explain what factors predict market resilience in the two shocks. The models will include explanatory variables at both the Zip code and metropolitan levels. The variables at each spatial level represent the locational and built environmental characteristics and the socio-demographic components of each local and regional housing market.

The results of this study will reveal whether housing market resilience is associated with certain locational and neighborhood characteristics, after control for other variables. We are particularly interested in examining whether local housing markets in urban and suburban areas demonstrate different levels of resilience to economic and non-economic shocks. We are also interested in testing whether the housing markets in disadvantaged communities are less resilient than the markets in well-off communities. In addition, we would like to test whether the same factors predict market resilience in the two shocks. This results of this study will help housing and real estate professionals and urban planners to understand housing market resilience and plan for future economic and non-economic shocks.

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Key Words: housing market resilience, economic recession, COVID-19 pandemic

## MOBILITY PATHWAYS TO SUBURBAN POVERTY

Abstract ID: 446

Individual Paper Submission

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Many urban regions have witnessed inner-city gentrification and growing concentrations of poverty in the suburbs over the past several decades (Ehrenhalt, 2012). These trends have led to concerns of polarization and segregation of urban space by class and income (Hulchanski, 2010), negative impacts caused by gentrification and displacement on individual well-being (Elliott-Cooper, Hubbard, & Lees, 2020), poor quality of low-income housing in the suburbs (August & Walks, 2018), and that living in auto-oriented suburban environments can reduce accessibility and the ability to travel to daily activities, which can further compound poverty in suburban areas (Lucas, 2012).

Existing research has described trends of suburbanization of poverty at regional and neighbourhood levels (e.g. by mapping neighbourhood changes in income or poverty rates, and showing how poverty is increasing in some suburban areas). However, it remains relatively unknown how lower-income households have agglomerated in more peripheral auto-oriented environments in recent history. Is suburban poverty primarily a result of 1) residential sorting within cities of low-income residents from central to suburban neighbourhoods (e.g. gentrification and displacement), 2) patterns of immigrant settlement in cities directed towards the suburbs, or 3) becoming and remaining poor while living in the suburbs? Understanding the propensity of these pathways would provide important knowledge regarding the urban dynamics leading to contemporary peripheral geographies of poverty concentration.

The objective of this paper is to uncover the predominant geographic pathways of being poor and living in the suburbs. We first provide a background and conceptual framework of different individual geographic pathways leading to suburban poverty. We then conduct an empirical analysis of land-use data linked with micro-data to analyze whether and how different pathways are observed within the context of major Canadian cities from 2006 to 2016. Specifically, we use a combination of census and transportation network data to create a typology of suburbanization via a hierarchical k-means cluster analysis. We then link this typology to panel data representing 20% of tax filers across Canada to examine immigrant settlement patterns and residential mobility trajectories of low-income households, grouped by typologies of suburbanization. This allows us to quantify to what extent suburban poverty stems from intra-urban residential mobility, external immigration, and remaining poor in-place. Overall, this research provides insight into the changing structure of urban neighbourhoods while also providing pertinent information to aid preventative policy aimed at reducing suburban poverty in Canada.

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Key Words: suburbs, poverty, residential mobility, immigration, panel data



## LOOKING AT ONE SIDE OF THE COIN: CRITICAL ANALYSIS OF NEIGHBORHOOD DISPLACEMENT RESEARCH IN THE CONTEXT OF DISINVESTMENT

Abstract ID: 460

Individual Paper Submission

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This paper seeks to expand the scholarly conversation on neighborhood change and neighborhood displacement to include how the process of disinvestment and decline potentially leads to neighborhood displacement.

Neighborhood displacement in the context of this project is defined as the process direct or indirect forces leading to the exit of a neighborhood by a resident or household. Previous research on this topic is often contextualized in rapidly appreciating housing markets or sub-markets. There is little previous research examining ways urban shrinkage or decline and the constituent neighborhood-level events and processes that follow contribute to neighborhood displacement (Marcuse, 1985; Tighe & Ganning, 2015).

This paper intends to add necessary nuance to the neighborhood change discussion through a critical meta-analysis of recent neighborhood displacement research. Specifically grounding the analysis through the lens of disinvestment and abandonment, to discern the extent to which processes of abandonment or disinvestment-induced displacement are present in the existing literature. This research lays the foundation for a more nuanced discussion of the complex ways neighborhoods change and can assist in framing a meaningful policy discussion around ways to plan for intentional and equitable redevelopment of systemically disinvested communities.

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Key Words: Neighborhood Change, Urban Displacement, Urban Disinvestment

## HOUSING AFFORDABILITY AND SELF-RATED HEALTH OF MIGRANT WORKERS IN CHINESE CITIES

Abstract ID: 489

Individual Paper Submission

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Due to institutional discrimination embedded in the hukou system, migrants in China are more likely to experience housing affordability problems than their local counterparts (Huang & Tao, 2015; Wang et al., 2010; Zheng et al., 2009). Housing affordability problems such as a high housing cost burden and a lack of homeownership can lead to adverse physical and mental health outcomes (Burgard et al., 2012; Frank et al., 2006; Joint Center for Housing Studies, 2019; Manturuk, 2012; Meltzer & Schwartz, 2016). Empirical studies on migration and health show that migrant workers, on average, have better health than their local counterparts due to self-selection in the migration process (Fennelly, 2007; Chen, 2011). However, migrants' health advantage tends to diminish over time due to acculturation to the local lifestyle, continuous exposure to poverty, and inadequate access to health care and other social services (ibid.).

While the deteriorating health of the migrant population is of great policy concern, few studies have investigated how financial stress related to housing contributes to migrants' worsening health conditions as they stay longer in the host cities. Using data from the 2017 Internal Migrant Dynamic Monitoring Survey (IMDMS), this paper bridges the gap by answering the following research questions: (1) Do financial housing stress (measured by housing cost burden and homeownership) affect migrant workers' self-rated health (SRH)? If so, to what extent? (2) Does longer stay in the host city result in deteriorating health for both homeowners and non-homeowners?

Logistic regression analyses of 78,047 migrant workers in the 50 most populous Chinese cities suggest that, in general, migrant workers with higher housing cost burden tend to have worse SRH. The association is statistically significant after adjusting for work-related stressors, migration patterns, and other demographic factors. The results also show that migrant workers who are non-homeowners, on average, have better health than those who are homeowners. Further group comparison finds that the negative association between length of stay and SRH is statistically significant only for migrants who are non-homeowners. The finding implies that the lack of access to homeownership among the migrant population might have contributed to their diminishing health advantage over time. The paper calls for policy approaches that promote housing affordability and expand access to homeownership for migrant workers in Chinese cities.

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Key Words: housing and health, housing cost burden, homeownership, migrants, China

#### **GROWING GRIDLOCK IN RESIDENTIAL MOBILITY: A NEW WARNING SIGN ABOUT HOUSING SHORTAGES IN U.S. METROPOLITAN AREA?**

Abstract ID: 494

Individual Paper Submission

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Housing shortages following the global financial crisis have been accompanied by a new, sharp downturn in rates of residential mobility, largely among renters. The Great Recession is long over (and a COVID recession is a new handicap) but it precipitated major, lingering housing disruptions. A little recognized consequence is that local mobility declined by one-third in the U.S. from 2010 to 2019. Scholars have been very slow to address the causes and consequences of declining mobility, but in this paper the authors will draw on a three-year study that has measured shortages, observed impacts of growing housing demand by Millennials, and that has resulted in rising prices, reduced household formation and a slowdown in mobility of people adjusting their residence to meet

changing needs.

This paper proposes a new indicator of the housing crisis, mobility constriction, that measures declining housing opportunity for lack of adequate supply to make desired housing adjustments. We rank the metropolitan areas with the greatest declines in renter mobility. We also address the offsetting, small effects of rising owner mobility in the period following the Great Recession. We develop a set of metropolitan typologies to display patterns of urban area decline and we assess how these may be related to vacancy rates, new construction, growing demand, and affordability.

Analysis is performed with American Community Survey (ACS) 1-year microdata for years between 2012 and 2019, based on the question asked in the ACS on place of residence one year ago. Research is designed as an aggregated metropolitan-level analysis for the 100 most populous metropolitan areas in the U.S. Renter mobility is defined as movers within the metro who end in rental units, divided by a denominator of all local renters, exclusive of migrants from outside. That works best for analysis of the behavioral factors shaping mobility. However, for comparisons of renter and owner local movers, and to measure offsetting effects, we divide movers of each tenure by a common denominator, the number of households in the metro, exclusive of migrants.

Preliminary results find substantial differences in the metropolitan patterns of renter mobility constriction, with California and Florida metros top-ranked above the 100-metro average of  $-4.9$ . Evidence shows a strong role of diminished multifamily housing construction relative to job growth in explaining metropolitan patterns of mobility constriction. A greater prevalence of rent-burdened households in 2012 has a linkage with sharper declines in mobility in metros such as LA with 58.2% of renters cost-burdened followed by mobility decline of  $-5.5\%$  points, as well as Miami (60.2%,  $-5.5\%$  points) and Riverside-San Bernardino (59.1%,  $-10.3\%$  points).

The findings for homeownership are often opposite those for renting and suggest a substantial substitution effect between the two in metros, such as Atlanta with owner mobility increase of 1.5% points (double of the 100-metro average of 0.7%) while renter mobility decline of  $-8.8\%$ . However, greater decline in renter mobility is found when homeowner mobility is also reduced ( $r = 0.63$ ). Greater housing affordability problems appear to affect both types of movers. And mobility is more constricted in urban areas with larger concentrations of Millennials, likely due to the added competition for rentals.

Planners would do well to emphasize how the different types of housing demand are all linked together in a common fate, which is key to building support for the necessary broad housing solutions. Our findings of the sharp mobility decline at the local level, and the connections of renters and owners, both call for greater research attention to local mobility constriction. It is not only affordability that burdens households, but also the inability to move to a new home of any kind.

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Key Words: Residential mobility, housing shortage, Millennials, affordability

#### COLLABORATIVE APPROACHES TO EVICTION PREVENTION: THREE FLORIDA CASES

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Research question: How have communities used cross-sectoral collaborative processes to stand up emergency eviction prevention efforts during the COVID-19 pandemic? Cases from three Florida metro areas (Orlando, Miami and Tampa) will be examined.

Background: Evictions are a common experience of low income renters in the US, a problem recently elevated by the work of Matthew Desmond (2017). The COVID-19 pandemic pushed the problem of residential evictions to center stage: widespread and sudden job loss made households vulnerable to eviction. The usual desperation survival strategies of dispossessed households (doubling up with friends or moving to a congregate shelter) could not be done without considerable health risk.

Community/government efforts to avoid evictions during this public health crisis have taken two primary forms. The first has been the imposition of eviction moratoriums, adopted by some states and municipalities and eventually the federal government. (There are differences between moratorium orders, some are more restrictive than others). Next has been the creation of emergency rental assistance funds, also found at state and local levels but largely dependent on significant federal contributions through a series of rescue packages. These emergency funds are meant to pay rent (as well as, in some cases, utility bills and mortgages) for those who have suffered income loss linked to the pandemic (Benfer et al 2020).

While these interventions may seem straightforward, in fact they require local governments, including courts, sheriffs departments, and government agencies across sectors and municipal boundaries, to act with alacrity, creating new court processes, social service programs and application/payment systems. This requires collaboration between agencies and civic groups that may have had minimal previous contact, to be carried out while most offices were closed. This research studies three Florida communities and how they have sought to encourage cross-sector collaboration toward the goal of preventing evictions.

Methods: Qualitative research includes: Participant-observation study of regional eviction-prevention gatherings; semi-structured interviews with key stakeholders in each community across sectors (local government; social services; courts and law enforcement; tenant advocacy; landlords, etc). Written documents and media coverage will also be analyzed.

Preliminary Findings: Rapid cross sector collaboration has been facilitated when “conveners” viewed as trustworthy, credible and well-resourced take the lead. Where collaborative efforts have emerged quickly, working groups have been able to take concrete steps toward preventing evictions, with coordination between courts and social service agencies and heightened capacity for legislative advocacy. But absent appropriate “conveners” communities struggle to forge cross-sector collaboration when faced with an emergency.

Relevance to the field: This research touches on two areas of interest to planners. First, planners have become increasingly concerned with residential evictions (Immergluck 2020; Teresa and Howell 2020), not only as a feature of gentrifying neighborhoods but more generally as a marker of neighborhood instability and racial inequity. Efforts to work cross-sectorally and regionally, especially in emergencies, is a key concern in emergency/disaster planning research (van Zandt 2019).

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Key Words: Eviction, COVID-19, Collaborative governance

## **MORTGAGE LENDING AND THE CONTEMPORARY REINFORCEMENT OF SEGREGATION IN THE KANSAS CITY REGION**

Abstract ID: 532

Individual Paper Submission

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Structural forces have intentionally and profoundly shaped spatial, racial, and economic access in metropolitan regions. These phenomena are broadly displayed through the effects of single-family residential zoning. Historically, municipal land use planning has played a key role in the development of exclusionary single-family residential zones. The contemporary single-family zone invokes the discriminatory legacy of redlining, blockbusting, racial covenants, and exclusionary planning policy. These origins carry residual effects that continue to impact communities today (Rothstein 2017). In recent years, planning efforts and policy instruments have attempted to rectify these disparate outcomes (Manville, Monkkonen and Lens 2020). Most residential areas in the greater Kansas City region exist under single-family zoning. This begs the question, what other factors limit access to single-family homes in specific geographies?

A multitude of developmental actors and cultural ethics support single-family residential districts. Undoubtedly, the home mortgage industry is one key institutional gatekeeper to middle-class wealth-building. Does the home mortgage industry lend without discrimination? Older scholarship shows that while racial discrimination may explain disparities in the home mortgage market, homebuyer credit ratings and wealth account for larger differences in mortgage lending decisions (Munnell et.al. 1996). However, structural racism and exclusionary policies have limited wealth and credit-building effects for black homebuyers (Rothstein 2017).

Using the Home Mortgage Disclosure Act dataset for 2017-2019, we explore the impacts of mortgage lending in the Kansas City MSA on maintaining neighborhoods of exclusion. Specifically, what are the geographic patterns of regional mortgage lending by race and ethnicity? How do these patterns reinforce or break down exclusivity in residential locations? We hypothesize that mortgage lending patterns maintain patterns of segregation in Kansas City (Faber 2018, Hauptert 2019). Visualizing the geography of residential lending will assist decision-makers in supporting inclusive communities.

We limit our analysis to mortgages provided for owner-occupied homes. Not only is black homeownership much less than average in the region, but current lending rates in the Metro will lead to even lower levels of homeownership in the future. In an analysis of loans by defined financial institution “classes” (community credit union, savings bank, regional bank, national bank), we find distinct differences in lending patterns by race and geography through the time period. We find evidence of improved minority mortgage lending as well as slippage by various institutions. We find extreme differences by race and ethnicity in lending for second mortgages and home equity loans. These high rates of denial to black homeowners of home improvement capital are the visible hands of disinvestment.

This evidence suggests it is possible to break down racial barriers to residential housing capital. However, planning inclusive residential communities requires bringing mortgage lenders to the table. Building inclusive communities

requires change and accountability to both urban planning and mortgage lending decision-making.

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Key Words: Housing, Mortgage lending, Inclusive neighborhoods, Race, Homeownership

#### **FINTECH'S IMPACT ON SUBPRIME LENDING IN IMMIGRANT GATEWAY METROPOLITAN AREAS**

Abstract ID: 570

Individual Paper Submission

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In recent years, a subset of the mortgage lending industry has been redefined by technological advances culminating in what is today known as fintech – short for financial technology – lending. Traditional mortgage lenders' application processes involve face-to-face interaction between applicants and loan officers and a set of industry-standard underwriting criteria including the prominent use of FICO credit scores, applicant incomes, and loan-to-value ratios. In contrast, fintech lenders offer all-online applications and underwrite loans by analyzing both standard borrower metrics and a vast array of 'big data' sources that undergo machine-learning algorithmic assessments designed to offer additional insights regarding applicant creditworthiness (Buchak, Matvos, Piskorski, & Seru, 2018).

Evidence suggests fintech lenders, like traditional lenders, distribute subprime loans to minority borrowers (Bartlett, Morse, Stanton, & Wallace, 2019) and neighborhoods (Hauptert, 2020) at higher rates than to white borrowers and neighborhoods. However, much of the literature measuring racial patterns in fintech lending focuses on national patterns, which precludes the identification of potential regional differences by race, ethnicity and nativity. Existing literature on metropolitan immigration patterns have revealed greater housing market volatility in established immigrant gateways relative to regions with smaller immigrant populations (Anacker, 2013) and found that race and nativity play a role in mediating credit risk across immigrant gateways (Lee & Greenlee, 2020). Building on these studies, we answer the research question: how do neighborhood-level fintech and traditional subprime lending rates vary across U.S. immigrant gateway metropolitan areas? Using 2015-2017 Home Mortgage Disclosure Act (HMDA) data, we find immigrant gateways are associated with higher rates of subprime lending than low immigration metropolitan areas. Results suggest neighborhood levels of Asian and Latinx residents mediate the relationship between subprime lending and immigrant gateways. There are also notable differences between fintech and traditional lenders. For example, traditional lenders appear more sensitive to increases in neighborhood-level Asian population in immigrant gateways than fintech lenders. Findings suggest fintech and traditional lenders assess risk differently across metropolitan areas depending on their historical patterns of immigration and shed light on the continuing importance of regional patterns of race and ethnicity in the modern mortgage market's distribution of subprime credit.

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Key Words: Fintech, Mortgages, Subprime Lending, Immigrant Gateways

## PREPAREDNESS FOR POST-DISASTER REHOUSING OF PUBLIC HOUSING RESIDENTS (CASE-STUDY: SALT LAKE COUNTY AND PORTLAND)

Abstract ID: 596

Individual Paper Submission

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Public housing recovery lags behind the other residential units in the aftermath of disasters since its recovery depends on local disaster housing plans and policies. Policies decide how, when, and where public housing residents may be rehoused in the event of disasters. Research has shown that previous disaster experience is essential to recovery policymaking because it provides institutional learning in managing disasters and preparedness. However, there is not enough research examining pre-disaster recovery planning in communities in high hazard risk regions with no recent disaster experience.

There is a need for research on how at-risk but inexperienced communities prepare for the public housing recovery. This study fills this gap by examining the status of pre-disaster planning for the post-disaster public housing recovery in Salt Lake County (SL Co), Utah, and Portland, Oregon. These two regions are in two fault zones that have a high chance of being hit by a major earthquake in the next 50 years. The Wasatch region, which includes SL Co, one of the fastest-growing areas of the country, currently has a 1 in 7 chance of being hit by a 7.0 magnitude earthquake within the next 50 years. Similarly, The Cascadia Subduction Zone, which includes Portland, has a 37 percent chance of an earthquake with 7.0 magnitude in the next 50 years. According to earthquake scenario reports in each region, thousands of residential units may get affected and resulted in large numbers of the population who search for shelter immediately. Based on these scenarios, nearly 263,300 individuals in the Wasatch region and 500,000 in Oregon will be displaced in the event of an earthquake. These numbers show a requirement of a massive rehousing effort by various governmental agencies, including the Salt Lake Housing Authority, which currently manages 2,576 active housing vouchers, and the Portland Housing Authority that manages more than 3,000 public housing units and Housing Choice Vouchers (HCV).

Using Salt Lake County and Portland as case studies of unexperienced at-risk communities in terms of disasters, this study investigates how well these two at-risk communities are prepared to rehouse their public housing residents and what challenges and opportunities are to promote pre-disaster planning for the post-disaster public housing recovery in these regions. Data collection is done through a review of public housing, disaster mitigation, disaster preparedness, and disaster response plans adopted by Portland and SL Co and its constituent cities, and through 20 semi-structured, open-ended key informant interviews with local emergency management, city planning and

housing officials. Data is analyzed using Atlas.ti software to identify themes related to the motivations, challenges, and opportunities of pre-disaster planning for the post-disaster public housing recovery. Preliminary findings show that these cities are generally not prepared to provide housing to public housing residents after disasters which could result in the high number of public housing families being displaced and staying displaced in the event of an earthquake. They also have not a standalone plan for their public housing recovery. These findings call for action in at-risk communities to conduct pre-disaster planning for the post-disaster public housing recovery and to build a network with communities with experience of recent disasters to prepare joint plans with their city and county in terms of rehousing their public housing residents.

A part of this study is sponsored by the Natural Hazards Center's Mitigation Matters program, which is supported by the National Science Foundation through supplemental funding from the Federal Emergency Management Agency (FEMA).

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Key Words: Post-Disaster Housing Policies, Disaster preparedness, Public Housing Residents, Earthquake

### **HAS THE COVID-19 PANDEMIC CHANGED PEOPLE'S ATTITUDES ABOUT WHERE TO LIVE? SOME PRELIMINARY ANSWERS FROM A STUDY OF THE ATLANTA HOUSING MARKET**

Abstract ID: 611

Individual Paper Submission

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In March 2020, the national lockdowns and social distancing mandates to contain the COVID-19 pandemic abruptly disrupted all aspects of urban life, requiring people to conduct daily activities including work, shopping, learning, schooling, and socializing, from home using online tools. These lockdowns and stay-at-home orders sharply increased unemployment and hindered active transactions in the housing market (Liu & Su, 2021). While the high unemployment rate was a serious economic and social concern affecting housing demand, monetary easing and low interest rates increased liquidity and flow of money into the housing market (Zhao, 2020). There is a growing body of work examining the overall vitality of the housing market in response to the disruptions caused by the pandemic (D'Lima et al., 2020; Liu & Su, 2021; Yoruk, 2020; Zhao, 2020). In addition, reports in popular media have highlighted trends in cities like New York and San Francisco where many households were giving up expensive central city residences for low-density suburban houses with large yards. The implication of this finding was that cities were losing their appeal given the reduction in need for commuting in a work-from-home culture and the desire for security and open space in a low-density environment in the suburbs. Despite anecdotal evidence, we know very little about how the preferences for housing in different locations are changing in response to the COVID-19



pandemic.

To address the research gap, this study explores whether and how the pandemic affected the housing preferences in the Atlanta single-family housing market. The focus lies on the impacts of accessibility-related locational characteristics on housing prices including the accessibility to the rail transit system, accessibility to freeway systems, and walkability, each of which reflect the housing market participants' attitudes toward the associated travel mode and expected travel behavior. In addition, the impacts of other locational characteristics such as the school quality and whether a house is in the inner city, inner-ring suburb, or outer-ring suburb are also examined.

The main findings from the comparison of the descriptive statistics and hedonic price models for 2018, 2019, and 2020 are as follows. First, even though the number of transactions plummeted during the second quarter of 2020, both the number of transactions and median housing price in the third and fourth quarters far surpassed those before the pandemic. Second, the price per square foot of floor area decreased holding all else constant, while the premiums for parcel size and pool increased since the pandemic. Third, the preference for inner city locations as observed pre-pandemic seem to be less pronounced. Fourth, the pandemic did not significantly reduce the premium for accessibility to the freeway and rail transit systems, *ceteris paribus*. Fifth, the premiums for population density and school quality have been on a downward trend and this was not affected by the pandemic.

Above findings suggested that the pandemic affected not only macroeconomic situations but also the preferences of housing market participants in Atlanta. However, follow up studies will be required to monitor whether these changes will last for an extended period. Purchasing a house entails deliberate consideration of the long-term expectations regarding the permanent income (Olsen, 1987), lifestyle, travel pattern, and telecommuting status of a household; keeping track of the modifications of these long-term expectations, if any, is essential in building well-informed housing, land-use, and transportation plans.

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Key Words: COVID-19, Housing Market, Locational Characteristics, Attitudes, Preference

#### DOES HOUSING INEQUALITY AFFECT SOCIAL MOBILITY? EMPIRICAL EVIDENCE FROM SEOUL, KOREA

Abstract ID: 615

Individual Paper Submission

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## Abstract

Growing income inequality is one of the important issues all over the world. As Thomas Piketty (2014) have argued that the income inequality will increase much faster in the near future because of a rise of wealth inequality, scholars have worried that the inequality due to the rise of housing prices in a large city may negatively affect social mobility, especially upward and intergenerational mobility. For the past several decades, upward mobility has been explored by focusing on the relationship between socio-economic status of parents and labor market outcomes of their children in the field of economics, public policy, education, and sociology (Rothwell and Massey, 2015; Musterd and Andersson, 2006). However, this topic has not been much explored in planning field. Only a few studies that investigate the relationship between upward mobility and neighborhood characteristics have been conducted so far with a planning perspective (Ewing, et al., 2016).

Hence, we aim to explore how the inequality of property values affects social mobility focusing on the city of Seoul, Korea. After the 1997 financial crisis, polarization and income inequality have been much discussed as important social issues in Korea because it is believed that inequality may have a negative influence on the expectation of upward mobility for individual workers. Although several previous studies that explore the relationship between the perception of social class and inequality have been conducted, our understanding of the relationship between inequality and social mobility is still limited. Like San Francisco, New York, and London, housing prices in Seoul have soared in the 2010s, which causes an increase in the level of wealth inequality. Consequently, people began to believe that the income generated by rising real estate prices is much larger than the income earned by working. Therefore, more recently growing attention has been paid to this topic, the relationship between inequality and social mobility, in Korea.

In order to investigate the relationship between inequality and social mobility, we first measure property inequality using individual housing price data of 2011-2019. Particularly, we employ the GINI index to calculate the spatial inequality of the housing prices by 25 administrative districts in Seoul. For measuring individual social mobility, we use 2011-2019 Seoul Survey Data that contain the information on the individual perception of the social mobility. To obtain a better estimation result of the effects of housing price inequality on social mobility, we employ the ordered probit panel model framework with fixed-effects of region and time. After controlling for other factors, our results show that inequality of housing prices negatively affects the perception of social mobility in Seoul. Particularly, the Seoul citizens' perception of the social mobility has decreased whereas the inequality of housing prices has increased between 2011 and 2019. In addition, findings provide evidence that female, elderly, and low-income people feel lower possibility of social mobility when they recognize the higher inequality of housing prices in their regions. Our results suggest important planning implications that housing and land use planners should mitigate the spatial inequality of housing values by adjusting land use planning as well as social housing supply. We also suggest that more empirical analysis with detailed surveys and housing prices data should be followed for resolving social inequality problems in our society.

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Key Words: Social Mobility, Inequality, Housing Prices, GINI Index

## REVISITING SPATIAL IMPACTS OF WALKABLE ENVIRONMENTS ON SINGLE-FAMILY HOUSING PRICES : A BIG DATA APPROACH WITH GOOGLE STREET VIEW AND DEEP LEARNING TECHNIQUE

Abstract ID: 616

Individual Paper Submission

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There is a growing consensus among planners and policymakers that walkable built-environments primarily affect the individual quality of life. Walkable design features encouraging pedestrian walking behavior may provide multifaceted advantages, particularly in terms of social, environmental, and public health benefits for residents in neighborhoods. Residents in walkable neighborhoods are significantly related with more physical activity, lower transportation cost, better public health, and higher social capital, whereas those in auto-oriented settings are associated with unhealthier physical and social conditions (Frank, Schmid, Sallis, Chapman, & Saelens, 2005; McCormack & Shiell, 2011). The increasing appeal of neighborhood walkability, along with the pursuit of smart growth and sustainable developments, has contributed toward a growing demand for pedestrian-friendly design features in both developed and developing countries.

In response to various benefits of walkable environments, many previous studies have examined the associations between neighborhood walkability and surrounding property values as multifaceted advantages of walkable features may be positively capitalized into neighboring property values. Despite many studies addressing the economic impacts of walkable environments, we still have a limited understanding of how neighborhood walkability and walkable environments may be empirically measured in multiple disciplines. Elements of the 3Ds (i.e., density, diversity, and design) and the Street Smart Walk Score represented by walking accessibility to neighborhood amenities have often been essential components to empirically identify neighborhood walkability (Ewing & Cervero, 2010; Talen & Koschinsky, 2014). However, such measures of neighborhood walkability focusing on two-dimensional indicators may not account for pedestrians' visual attention to the surrounding built environments that may affect individual perception of walkability at the street level (Zhou, He, Cai, Wang, & Su, 2019). Our research addresses this gap by empirically estimating specific walkable design features along street at the eye-level that affect surrounding property values based on the deep learning approach. In that vein, this study addresses a simple question: Do walkable environments positively affect neighboring property values?

Most existing studies on the spatial impacts of neighborhood walkability on nearby housing prices are limited in terms of identifying the quality of walkable environments at the street level. This study addresses these shortcomings by exploring the impacts of walkable environments in Seoul, Korea. Based on single-family housing transaction data from 2017 to 2019, we use a spatial hedonic price method to examine the associations between neighborhood walkability and neighboring housing prices. Additionally, our analyses take account of housing submarkets to explore how spatial impacts of walkable environments differ across neighborhoods stratified by household income levels. This study specifies street walkability at the eye-level by employing deep learning approaches based on Google Street View (GSV) and semantic segmentation. We define a neighborhood as a half-mile concentric ring buffer identifying the walkable distance around each property. Based on 20 meters interval points along street networks within the neighborhoods, GSV 360° panorama images for each point through the GSV metadata Application Programming Interface (API) are obtained to analyze street-level walkability around each property. Our findings will inform planners and policymakers on how to improve walkable environments across neighborhood heterogeneity and maximize the economic benefits of neighborhood walkability.

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Key Words: walkability, single-family housing prices, deep learning, semantic segmentation

## THE CHANGING ORDER OF HOUSING INEQUALITY AFTER FOUR DECADES OF MARKET TRANSITION IN URBAN CHINA: A REAPPRAISAL USING MICRO-LEVEL NATIONAL POPULATION CENSUS DATA

Abstract ID: 634

Individual Paper Submission

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The forty years of market reform since 1978 have profoundly changed the residential landscape in Chinese cities, with dramatic improvement of housing conditions and yet also the rise of housing inequality (Fang, Liu, Chen, 2020). In the numerous housing literature on Chinese cities, one dominant theoretical foundation has been the market transition debate regarding the changing order of social stratification during the transition from a centrally-planned economy to a market economy. Nee (1989, 1996) proposes the market transition theory that predicts shifts of power, opportunity, and incentives towards market players, whereas others scholars (Logan and Bian 1993) argued for the persistence of redistributive power that determines housing access and outcomes.

Empirical studies of housing inequality inspired by this debate have largely focused on the relative predicting effects of political privilege vis-à-vis individual affordability and preference. The evidence has rather been limited to the time period until the early 2000s, when the housing market was only emerging in most Chinese cities. More recent studies, have been limited to single-city case studies, particularly a few mega-cities, due to the lack of nationwide data.

In this paper, taking advantage of unique access to micro-data sets of most recent population census (2000, 2010) and mini-census (2015), we aim to offer a reappraisal of the changing order of housing inequality in Chinese cities since the emergence of the urban housing market. First, we aim to test whether political privilege gradually lost its predictive power in housing inequality (measured by access to homeownership and housing space) during 2000-2015. Second, we focus on the dynamic shifts of market opportunities and incentives in a market transition process, and investigate whether heterogenous effects of political privilege in different cities that vary in the share of the state sectors and the development of the commodity housing market.

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Key Words: Housing inequality, Housing reform, Housing policies, Market transition, China

## LOCATION CHOICE IN THE HOUSING CHOICE VOUCHER PROGRAM: DO PORTABILITY AND SOURCE OF INCOME PROTECTIONS MATTER?

Abstract ID: 658

Individual Paper Submission

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The Housing Choice Voucher (HCV) program allows recipients to find rental homes in the private market, with the goal of deconcentrating poverty among low-income households. Despite this goal, research demonstrates that HCV holders tend to concentrate in more racially and economically segregated neighborhoods, even with the support of a voucher. Two policy interventions may improve the degree to which voucher recipients can relocate to less segregated areas: portability and source of income protection laws. Portability enables recipients to move from one housing market to another by “porting” their voucher from one PHA to another. Source of Income Discrimination (SOI) protections as an element of local fair housing legislation prevents local landlords from using HCV receipt as a basis for refusing to rent to HCV holders.

To understand the impact of both portability and source of income protections, we examine the location outcomes for all the voucher holders in Ohio, where voucher holders port and a subset of local communities have SOI laws. We hypothesize that voucher holders who move using use portability to areas with SOI protections will live in less racially and economically segregated neighborhoods. We use a discrete choice model to understand the interaction of place-level and individual level factors associated with living in such locations. To measure racial and economic neighborhood segregation we use a multiscalar method that delineates varying patterns of homogeneity and spatial proximity of surrounding neighborhoods.

This study will reveal barriers in HCV usage with a particular focus on the outcomes of residential mobility of HCV recipients. We conclude by providing possible policy interventions for advancing the residential mobility of the HCV recipients with a particular focus on portability and SOI protections.

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Key Words: Housing Choice Vouchers, Residential Mobility, Portability, Source of Income Protection, Concentrated Poverty

## **HEALTH, FEDERAL HOUSING ASSISTANCE, AND ECONOMIC “SELF-SUFFICIENCY”**

Abstract ID: 661

Individual Paper Submission

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The Department of Housing and Urban Development (HUD) has long supported “economic self-sufficiency” initiatives that aim to improve the employment outcomes of households who receive HUD rent assistance (Boland et al., 2000). Some have suggested, however, that these initiatives overlook the barriers to employment facing assisted households (Shroder, 2002). In particular, recent studies have emphasized that poor-health may be a major barrier to employment that is overlooked by these initiatives (Fischer, 2018; Frescoln et al., 2018; Jaramillo et al., 2020).

Limited research, however, has directly analyzed whether health is a significant predictor of employment among HUD assisted households. Thus, this paper aims to answer two research questions:

1. Is health status a significant predictor of employment among HUD-assisted households compared to other key explanatory variables?
2. After controlling for health status and other key explanatory variables, are HUD-assisted households at a significantly different odds for employment compared to non-assisted low-income adults?

To answer these questions, I will utilize a novel longitudinal dataset that combines HUD administrative data with data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) – a cohort study that has tracked a nationally representative sample of adolescents as they age into adulthood. I will specifically use data from Wave IV of the Add Health study, which was carried out from 2008 to 2009. At this time, Add Health study participants were between 24 and 32 years old. This study will only focus on the low-income sub-sample of Add Health study participants, which includes 397 low-income Add Health participants who received HUD rent assistance and roughly 1,000 low-income participants who did not.

Using these data, I will answer the first research question by using the Random Forest Algorithm. Specifically, I will use this algorithm to determine whether a variety of health variables (e.g., diabetes, mental health status) are significant predictors of employment among HUD-assisted participants compared to other factors that may impact employment, such as access to a personal vehicle, education, and age. The Random Forest Algorithm will support this analysis by measuring the importance of different variables in predicting employment across multiple, randomly specified regression models.

I will then answer the second question by estimating a weighted regression that tests whether receipt of HUD rent assistance is a significant predictor of employment among all low-income Add Health Study participants. The key explanatory variable for this regression is a binary variable that indicates whether a low-income adult resides in HUD-assisted housing. The control variables will include those identified by the Random Forest Algorithm as important factors predicting employment. This regression will also utilize cross-sectional survey weights to adjust estimates so that they are nationally representative. Through these specifications, this regression model will allow me to produce nationally representative estimates of how, if at all, receipt of HUD rent assistance is associated with the employment outcomes of low-income adults.

Combined, these stages of analysis will contribute to the literature by using rigorous methods and nationally representative data to estimate how receipt of HUD-housing is associated with employment after controlling health status and other employment-related factors.

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Key Words: Housing policy, Health, Employment

### **AFFORDABLE RENTAL HOUSING FOR INTERNAL MIGRANTS: A CRITIQUE OF THE AFFORDABLE RENTAL HOUSING COMPLEXES PROGRAMME IN INDIA**

Abstract ID: 669

Individual Paper Submission

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Housing policy in most countries, be it in the global North or the global South, have been biased towards facilitating and promoting home ownership through tax relief on mortgages, help with securing down payments, stamp duty exceptions and so on. Home ownership has been linked to accumulation of wealth through rising property prices; options to leverage ownership as a bankable asset; possibilities of income supplements to pensions; security against evictions by landlords and claims to a general sense of a stake in wider social issues. The ownership bias has been challenged more recently by scholars pointing to rental housing as a preferred mode for certain population segments such as the young who prefer a certain degree of mobility in their lives as they may not have decided on settling in a job or a place; migrant workers who own a house elsewhere but spend a substantial part of their lives in different locations depending on available work; those who cannot yet access mortgages and so on (Gilbert, 2016, Kumar 2011).

The Government of India, since the distressing images of migrant's return migration during the COVID-19 crisis, and following increased scrutiny from the media, academics and human rights activists, has awoken to the need for providing safe and secure affordable housing for internal migrants. A new Affordable Rental Housing Complexes scheme (ARHC scheme) was consequently launched in July 2020 aiming to provide affordable rental housing through partnerships with the private sector (MOHUA, 2020). This presentation provides a critical evaluation of the ARHC scheme.

Research on the scheme was undertaken as part of a Rapid Response Policy Engagement project on rental housing for internal migrants in Kochi, India, funded by Research England QR Strategic Fund. Mixed methods were used to evaluate the scheme. Contextual information was collected on the background of the policy and the reasons for policy formulation through secondary data. Secondary case studies of a major private sector involvement in rental

housing facilitated by Mumbai Metropolitan Regional Development Authority (Adusumili, 2021) and studies of low scale provision of rental housing taking place in the Vehras of Ludhiana, both in India, were then studied (Bannerjee, 2020). The ARHC scheme was evaluated against the experiences from the above case studies and the policy landscape.

The findings from the evaluation show that whilst some of the major issues around private sector involvement that arose in Mumbai have been addressed in the new policy many questions around the efficacy of adopting a centrally directed single pronged strategy for addressing the complex issue of affordable rental housing for migrant workers remain. The presentation will conclude with recommendations on how the policy can be made more diverse and sensitive to the multiple local contexts in India.

The case studies discussed and the findings from the evaluation of the ARHC scheme will contribute to better understandings of issues related to the delivery of affordable rental housing in the global South. In particular it will highlight the limitations of private sector involvement in producing housing for the target populations, why this is so and what alternatives there might be.

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Key Words: affordable rental housing, internal migrants, public-private partnerships, India

#### **RACIAL DIFFERENCES AMONG THE OWNERS OF SMALL RENTAL PROPERTIES: GEOGRAPHIC PATTERNS AND IMPLICATIONS FOR MANAGEMENT**

Abstract ID: 676

Individual Paper Submission

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A very large portion of the rental housing stock in the US is held by individuals, not corporations, and there is substantial racial and ethnic diversity among these owners. This is particularly true among the owners of small rental properties of 1- to 4-units, which comprise about half of the total rental housing in the US. Millions of units in this part of the stock are owned by racial and ethnic minorities. The Census Bureau found that, in the mid-1990s, about 24% of units in 1- to 4-unit rental properties were owned by non-Hispanic White owners. It is likely that the racial composition of owners is uneven across geographies, with some neighborhoods having much higher concentrations of non-White ownership. For example, 40% of rental property owners in a large study of Baltimore, Dallas, and Cleveland were Black (Garboden, Rosen, DeLuca, & Edin, 2018).

Very little research has been conducted on the owners of rental properties in general and small rental properties in particular. Özogul & Tasan-Kok (2020), in a comprehensive review of contemporary scholarship on the



categorization of rental property owners, find that scholars have used various categories to analyze owners, but do not mention race as one of them. This may be a missed opportunity. Scholars in the 1960s and 1970s found substantial differences in the racial patterns of ownership by geography and differences in management practices as well (Stegman, 1972; Sternlieb, 1966). There are reasons to suspect that differences still exist. The wealth-building power of homeownership has been found to be different depending on the race of the homeowner. Housing stability and eviction rates have been found to be different depending on the race of the tenant. But the differences in outcomes related to the race of the owners of rental properties are currently under-studied, despite their implications for wealth generation for the owners and the housing stability of the tenants.

The objective of this paper is to (i) examine the patterns of small rental property investment by race, particularly whether non-white owners tend to invest closer to their home or in declining markets, and (ii) examine whether owners of different races manage their properties in different ways. This could include differences in providing below-market rents and demonstrating greater leniency with rent delinquency based on the race of their tenants as well as the race and ethnicity of the owners. I use a series of multivariate regression analyses to examine investment patterns and outcomes for tenants, interacting the race of the owner and the tenants.

One of the principal reasons for the dearth of scholarship on this topic is a lack of data on the owners of rental properties. I addressed this gap by designing and conducting a large survey of small rental property owners. The survey was quite long, asking owners and managers questions about themselves, their properties, and their tenants. The survey was conducted in two waves, in 2019 and 2021, on a random sample of about 93,000 owners of small rental properties in the top 150 metro areas in the US, stratified by portfolio size. A total of about 3,000 unique owners responded to the survey.

Contemporary debates on racial equity and housing have largely ignored the race of the owners of rental properties, despite the prevalence of Black-, Hispanic-, and Asian-owned rental properties. This paper takes some initial steps to illuminate the implications of racial differences present in this part of the housing stock.

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Key Words: single-family rentals, race, affordability, evictions, landlords

#### THE IMPACT OF VARIOUS MEASURES OF HOUSING AND UTILITY INSECURITY ON HEALTH

Abstract ID: 680

Individual Paper Submission

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Housing instability, broadly defined, is associated with myriad negative outcomes for children, adults, and communities. The importance of housing insecurity is likely to increase even more with the emergence of viruses with a high risk of infection, such as Covid-19. This pandemic can be more challenging for people with housing

insecurity, as the absolute amount of time to stay at home is prolonged. According to the Census Bureau's Household Pulse Survey, nearly 1 out of 5 adult renters were having trouble paying rent during the pandemic, and this trend is more pronounced in people of color.

There are general understandings of housing eviction and homelessness and their negative effects, but less understood is the prevalence and effects of specific types of housing instability. Of particular concern is the mental and physical health impacts of different types of housing insecurity in the short- and medium-term. Factors associated with housing instability, such as financial insecurity, exacerbate this relationship by forcing families to choose between expenses such as rent and medical care.

In this research, we examine the relationship between cost insecurity (the inability to afford rent/mortgage and utilities), housing instability (the number of moves and homelessness), and context insecurity (neighborhood opportunities) and health using Structural Equation Modeling (SEM) and data from the National Longitudinal Study of Adolescent to Adult Health (Add Health). We study a panel of 11,303 adolescents starting when they are between 11 and 21 (the average age was 15.4) through early adulthood (when they were between 24 to 34 years old, the average age was 28.3), measuring whether the respondents experienced housing insecurity in the twelve months prior to Wave III (when they were between 18 to 27 years old, the average age was 21.8) and Wave IV and their health in Wave IV. We measure health in two ways: self-reported general health and the existence of two mental health disorders (anxiety and depression).

Our preliminary results suggest cost insecurity in the short-term decrease both mental and general health. Cost insecurity in the medium-term has significant negative effects on mental health. Housing instability is also associated with poor mental health, but context insecurity is not significant. To analyze the detailed effects of each type of housing insecurity except context insecurity on mental health, we perform binomial logistic regression. We find that each measure of housing insecurity (inability to afford rent/mortgage, inability to afford utilities, homelessness, and number of moves) decrease mental health. In particular, they have significant negative effects on not only short-term but also medium-term mental health.

This research suggests policymakers and advocates need to think more broadly about housing instability. While policies aimed at reducing rent insecurity and homelessness are important for improving public health, greater emphasis should be placed on cash assistance that vulnerable populations can use to address the cause of their specific type of housing insecurity. Doing so may decrease the lasting mental health effects of housing instability.

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Key Words: Housing insecurity, Health, Housing Policy

#### **"DISPLACEABILITY" IN PUBLIC HOUSING CONVERSIONS: A CRITICAL ASSESSMENT OF TENANCY DISPARITIES IN CALIFORNIA'S RENTAL ASSISTANCE DEMONSTRATION (RAD) PROGRAM**

Abstract ID: 692

Individual Paper Submission

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In the wake of the COVID-19 crisis, keeping American households in their homes has emerged as a pressing issue for both the socio-economic well-being and public health of urban residents. Unfortunately, the housing crisis plaguing vulnerable households is not new; in recent years, scholars in planning have shed light on the eviction crisis on low-income residents (Teresa & Howell, 2020). Another emerging body of work has considered public housing redevelopment in the United States, which has dramatically transformed low-income communities while also reducing the number of deeply affordable social housing units nationwide by roughly a quarter million (Goetz, 2013). Both the eviction crisis and public housing redevelopment disproportionately impact predominantly Black and Latinx communities, where the structural racism embedded in housing systems remains pervasive.

Missing from the literature is the crucial question of how residents, or more specifically—which residents—are impacted by public housing conversions. As the nation faces a potential flood of evictions as state and federal moratoriums expire following the pandemic and the privatization of public housing management continues in cities across the country, this paper addresses this gap through a critical quantitative assessment of tenancies of the federal Rental Assistance Demonstration (RAD) program. RAD is an Obama-era-program administered by the US Department of Housing and Urban Development (HUD) that converts traditional public housing to private management while alleging protections for existing residents. The conversion provides residents with a project-based Section 8 voucher to remain in their unit while allowing a private operator to take over management and access debt for repairs of existing housing that traditional public housing authorities cannot leverage.

Early scholarly work has evaluated the program in its nascent stages and considered the financial necessities that have prompted privatization in the first place (see Schwartz, 2017, for an overview). However, little research considers RAD with a focus on existing public housing residents. Drawing on evidence from the state of California, where public housing has the highest rates of conversions to private management in the United States, this paper asks: how do socio-demographic factors such as race, gender, income, disability status, and age of existing public housing residents impact the prevalence of conversions of public housing to private management, and how do tenancies change pre- and post-conversion? Using existing HUD data, I employ descriptive statistics and conduct a difference-in-differences analysis to compare tenancies in public housing that has remained in public operation versus housing that has been converted through the RAD program, accounting for the period pre- and post-conversion.

As journalistic accounts point to potential displacement risks from converted public housing, this paper asks how race and other demographic factors impact which communities are impacted by privatization processes. As opposed to measuring displacement from converted public housing from the offset, this study will instead depart from what Yiftachel (2020) has deemed as a necessary shift from singularly measuring displacement as it occurs to a critical consideration of “displaceability,” or the factors that make communities vulnerable to dispossession of various forms in the first place. By paying attention to socio-demographic characteristics as they intersect with the privatization of a public resource, this research contributes to a growing body of literature that considers the outsized impacts of racial capitalism on planning processes (Williams, 2020). The paper also ultimately paints a more comprehensive picture of an understudied federal policy tool that is dramatically changing the form and function of public housing across the country.

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Key Words: public housing, privatization, evictions, displaceability, racial capitalism

## COMMUNITY ASSESSMENTS OF ASSISTED MULTI-FAMILY HOUSING PROGRAMS IN SUN BELT CITIES BASED ON TRANSIT SHEDS

Abstract ID: 718

Individual Paper Submission

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Sun Belt cities have substantial urban footprints with rapid population growth rates in urban areas and beyond their city limits. Some large cities like Houston, Dallas, and Oklahoma City have been accommodating growing immigrated populations, including the vulnerable, in their housing markets and expanding public transit. Nonetheless, the lack of convenient transit service in many growing Sun Belt cities has obstructed the equal accessibility of low-income families with limited personal vehicles. Particularly, many project-based affordable housing program tenants have a barrier in order to access urban amenities and essential places using the public transit system since the construction of public rental units is geographically limited.

Few studies have assessed the opportunity of the assisted multi-family housing program tenants in connection with the public transit system. This study focuses on renters in the assisted multi-family housing units and the tenants' opportunities within distances that transit service provides. In most cases, as these project-based affordable housing program tenants have limited income and vehicle ownership, public transit is a critical method to realize daily travel needs, such as jobs, education, grocery shopping, and other activities.

Some of the affordable housing programs that assist low-income populations in multi-family type properties have not been broadly assessed by previous housing scholars: Section 8 Project-Based Assistance, Section 202 Supportive Housing for the Elderly, and Section 811 Supportive Housing for Persons with Disabilities. This study focuses on the low-income and underserved tenants that live in these assisted multi-family properties in Houston, Dallas, and Oklahoma City.

With transit travel time, we evaluate neighborhood characteristics and demographic characteristics, such as job opportunity index, labor market engagement index, school proficiency index, environmental health hazard index, affordability factors, and other sociodemographic characteristics. Using the general transit feed specification (GTFS), which provides information regarding transit routes, stops, and schedules, transit sheds of assisted multi-family housing units are assessed in the three cities. Specifically, transit sheds of two travel time thresholds with 30 and 60 minutes are considered in our study.

We estimate current opportunities given to the tenants qualified for affordable housing programs and living in such units. We provide policy implications that help achieve social equity by drawing housing policymakers' attention to public housing residents' locational benefit when the connection with the transit system is considered. We further suggest recommendations for improved quality of publicly assisted housing programs in the sprawling urban development setting.

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Key Words: assisted multi-family housing programs, opportunity, neighborhood characteristics, transit sheds

## THE STATE OF AFFORDABILITY ACROSS THE U.S. HIGH-TECH ZONES

Abstract ID: 729

Individual Paper Submission

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To date, a handful of theoretical studies addressed the possible negative consequences of the economic development strategies the highly focus on empowering high-tech clusters. Even so, there is critically a need for empirical studies confirming such theoretical discourses. Housing unaffordability (Voith & Wachter, 2009), gentrification (Florida, 2017) and displacement (Moulaert et al., 2001) are examples of the impacts that are discussed to be associated with tech clusters with tangible impact on local residents. As high-tech economy driven developments and policy actions gain in popularity, empirical studies should support planners in assessing the trade-offs. This research draws upon the location and sectoral types of high-tech zones identified by Zandiatashbar (2019) and literature gathered by Zandiatashbar & Kayanan (2020) to empirically find out that to what extent high-tech clusters are associated with housing unaffordability and gentrification in the region? How does it compare to other characteristics of a region? And how does high-tech zones' impact vary by the sectoral types and location of cluster? This analysis will be done in two parts. To assess housing affordability, this study presents three sets of analysis. First, by utilizing the Propensity Score Matching methodology, this study controls for the confounding factors and measure the housing premium variation across different sectoral types of high-tech clusters in the U.S. large regions. Second, this study will model the impact of tech clusters on the changes in affordable housing accounting for their sectoral differences in three time-brackets of 1990 -2000, 2000- 2013, and 2013-2018. Change in affordable housing is measured by the change in number of subsidized affordable rental units (e.g., section 8 vouchers or low-income housing tax credit (LIHTC) units) and overall affordable units. Lastly, this study opens up questions about possible gentrification happening across the tech zones. Using a widely applied set of criteria (used in Bates (2013), Chapple & Zuk (2020) and Freeman (2005)), this study identifies the gentrified neighborhoods (census tracts) within three time-brackets of (1990 -2000, 2000- 2013, and 2013-2018). These criteria first track a neighborhood's vulnerability to gentrification and second identify the gentrified ones among the vulnerable census tracts. Lastly, the gentrification model for these three time periods will measure to what degree different sectoral types of cluster could increase the likelihood of a neighborhood to be gentrified.

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Key Words: High-tech Zone, Housing Affordability, Community Development

## **GENERATIONAL TURNOVER AND REPLACEMENT OF HOMEOWNERS IN RECESSION AND BOOM: LATINO HOMEOWNERS IN MIAMI, LOS ANGELES, AND THE UNITED STATES**

Abstract ID: 732

Individual Paper Submission

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Aging baby boomers and older homeowners are now building greater risk of heavy and prolonged sell-off, due to large numbers, as first identified in Myers and Ryu (2008). Although the exit rate of homeowners after age 75 was proportionally constant in decades since 1990 (Simmons and Myers 2018), replacements by younger home buyers are highly variable and influenced by economic conditions. The growing Latino population plays a crucial role.

Dynamics of turnover and replacement are considerably different in recession years than in expansion periods. Adverse impacts of the Great Recession were felt by homeowners in all age groups but were heavily concentrated in 30s and 40s where people were more likely to have recently purchased and little equity had been accrued. Premature exit from homeownership was disproportionately a problem among Latino homeowners.

The advent of the Census Bureau’s American Community Survey (ACS) allows researchers to customize time frames to reflect the boom-bust conditions of the economic cycle. A systematic view on the generational turnover is made possible through the newly released three, “nonoverlapping” 5-year files from the ACS, covering 2005-09, 2010-14, and 2015-19. Lessons of recession and recovery from the last cycle may shed light on changes to follow after the COVID recession.

A new method, the “ACS cohort turnover” method, developed for use with these data in the case of Los Angeles (Myers and Rosas-Moctezuma 2021) bears application and comparison to Miami, which is the third largest Hispanic region in the nation after Los Angeles and New York (Stepler and Lopez 2016). An extension of the new method to cover nativity is especially warranted in the Miami case, which is over 50% foreign born, so we will disaggregate the contributions of replacement buyers between those who are recently arrived foreign-born, those who have resided in the U.S. since before 2000, and those who are U.S.-born.

What similarities and differences in these dynamics might be found by comparing White and Latino groups of residents in Miami-Dade County to those in Los Angeles County, and in the U.S.? These are the core counties of the two largest Latino and immigrant metropolises in the nation, other than New York, and they present many interesting contrasts. LA has a large Asian component that Miami does not, but both areas have smaller-sized African American populations as well as White minorities. Although LA has more expensive housing costs, both areas rank very high on their lack of affordability relative to income levels.

Overall, given the substantial differences in population make-up, what similarities of turnover and replacement may still exist? Does Miami have as great an illusion as found in LA of surging elderly homeowner growth—when estimated by simple age group growth, compared to the cohort turnover measures as cohorts grow progressively older? Does Miami demonstrate as massive an elderly decline as Los Angeles, in both recession and recovery? Have Miami homeowners rebounded more strongly from the Great Recession than those in Los Angeles and the United

States as a whole?

Research with the new method requires simple spreadsheet calculations and is readily paired with graphic formulations from Excel to create dramatic visualizations. Further, the narrative interpretations presented in this paper help planners to construct and communicate housing problems in a manner that emphasizes interconnections of the whole, specifically linking young and old age groups and different ethnoracial groups. The cohort turnover method also helps planners assert vision on changes to be expected in the next 5 or 10 years.

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Key Words: homeownership, Latino, turnover, replacement, Miami

#### **BLACK HOMEBUYERS LOCATION DECISIONS**

Abstract ID: 734

Individual Paper Submission

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The U.S. demographic landscape is rapidly changing. The racial composition of American suburbs began to shift after 1980. While suburbs are still overwhelmingly white, all racial groups are becoming more suburbanized (Massey & Tannen, 2018). The migration of black middle- and working-class people from predominantly black and deteriorating inner-city neighborhoods to suburbs, is one major driving force of the change.

This study has two primary objectives. First, this study examines the location decisions of black homebuyers of different income levels with particular interest in low-income groups. Where and what type of neighborhoods do black homebuyers of different income levels choose to relocate to? The study further reviews some of the key implications of their location decisions on the neighborhoods.

Second, this study aims to explore how increased access for blacks to suburbs contributes towards wealth creation. The purchase of a home is the most significant investment for most American families. Home equity is the largest family wealth component. Using the measure "home value per dollar of household income," this study explores the implications of suburbanization of black families on their ability to build assets.

This study analyzes all U.S. census tracts to answer the following research questions:

- 1) Where do black homebuyers, especially low-income black homebuyers, purchase homes?
- 2) Do black homebuyers, especially low-income black homebuyers, purchase homes so as to promote racial/ethnic integration?

- 3) Do low-income black homebuyers purchase homes where assisted housing or Housing Choice Voucher households are concentrated?
- 4) Do black homebuyers, especially low-income black homebuyers, purchase homes where home values are stable or rising and poverty is low?
- 5) Do the black homebuyers buy into a strong market? How does the wealth-creating potential of homeownership differ for black homebuyers in suburbs compared to black homebuyers within cities? How does it compare to white neighbors in the same neighborhood?

This study analyzes multiple sources of data: 2012 and 2019 Home Mortgage Disclosure Act (HMDA) data for home purchase loans originated for primary residence coded to 2010 census tracts; ACS data from 2012 and 2019 describing the demographic and housing characteristics of tracts nationwide; and the U.S. Department of Housing and Urban Development (HUD) Picture of Subsidized Households (PICTURES) describing the number of households or units of assisted housing in tracts nationwide.

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Key Words: homeownership, black suburbanization, demographic landscape, home equity

## EVALUATING INCLUSIONARY HOUSING PRACTICES IN TORONTO

Abstract ID: 737

Individual Paper Submission

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With limited public sector funding available for subsidized housing production, there has been increasing reliance on the private sector to provide affordable housing. Historically, the neoliberal restructuring of Canada's welfare state in the 1990s resulted in the withdrawal of federal funding for many social and affordable housing programs and the downloading of responsibility for housing to the provinces. Ontario's provincial government then devolved responsibility for social housing to municipalities without concomitant funding tools.

The use of value capture tools, such as inclusionary zoning (IZ), has been adopted by a growing number of North American cities as a strategy to address housing affordability problems. Simply defined, IZ requires developers to set aside a percentage of their new housing units as affordable housing. In Toronto, inclusionary practices have been ad hoc, dependent on ward councillors' priorities, and largely facilitated through the use of Section 37 of the Planning Act (Mah & Hackworth, 2011). Section 37 enables municipalities to provide increases in density in exchange for community benefits. This approach has secured some affordable housing, though not enough to address the city's severe affordability problems. In 2018, legislative changes enabled Ontario municipalities to create and implement IZ, which could be used with Section 37. This research will examine the use and efficacy of value capture tools to produce affordable housing in Toronto. This study will also explore the implications of Bill 108 on Toronto's draft IZ framework. The new IZ approach is expected to produce more affordable housing as it will address the political



limitations and ad hoc nature of Section 37 practices. So, it is important to analyze Section 37 data and map where, how many, and what type of affordable units were produced under the previous affordable housing governance structure to create a baseline upon which a future approach could then be evaluated against. To inform current IZ policy debates, this research asks: How effective have value capture tools been in the development of new affordable housing in Toronto (2000-2018)? What are the implications of Bill 108 on the draft IZ framework?

There is a large literature discussing the structure of inclusionary housing programs (e.g. Calavita et al, 1997), the effectiveness of IZ (e.g. Mukhija et al, 2010), and the impacts of IZ on local housing markets (e.g. Schuetz et al, 2011). However, much of this literature is based on the U.S. experience, which represents a major gap in the literature (Mukhija et al, 2015). Very little peer-reviewed research has examined the Canadian experience. This study addresses this gap by evaluating Toronto's inclusionary housing practices. Moreover, given the increasing municipal reliance on the private market and value capture tools to produce much-needed affordable housing, it is important to assess the effectiveness of this governance approach. In other words, what has been the return of value for public sector support of these inclusionary developments?

To address these questions, I employ a mixed methods approach that involves: a spatio-temporal analysis of Section 37 data (2000-2018) from the City of Toronto; document analysis of council reports and by-laws; and qualitative interviews. I also investigate two large high-profile development cases in which affordable housing has been promised – Honest Ed's and the Galleria Mall redevelopments. These mini-case studies will be examined to better understand the planning negotiations and political circumstances and motivations that produced the affordable housing contributions.

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Key Words: Inclusionary zoning, Inclusionary housing, Density Bonusing, affordable housing

#### **THE LATINX PARADOX AND HOMELESSNESS: THE INVISIBLE HOUSING PRECARIETY OF LATINX FAMILIES**

Abstract ID: 758

Individual Paper Submission

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For decades researchers have suggested that Latinx communities are not as affected by their economic marginalization as they should be, they call this "The Hispanic Paradox" (Markides and Coreil, 1986). These studies initially focused on issues of life expectancy (Markides and Coreil, 1986; Palloni and Aria, 2004) but since then have also extended to teenage pregnancy (Gorry, 2019), asthma and other respiratory conditions (Cagney, Browning, and Wallace, 2006), and homelessness (Baker, 1996). This narrative is strong in our social imaginary and often obscures very real struggles within the community. This narrative adversely affects the public policy responses that are put in place to help this population.

Recently there has been some recognition of a surge in Latinx homelessness (Bermudez and Vives, 2017), however, there are still misunderstandings about what this looks like. This stems from issues such as language barriers, fear of deportation, and migratory labor patterns that often hide housing precarity in plain sight (Adams and Simonsen-Meehan, 2013). This also results in this population being less likely than other ethnic groups to be engaged by homeless outreach and accessing the services they need (Chinchilla, 2019). While the myth of the “Latinx paradox” in homelessness persists, there is evidence that homeless populations often reflect the racial and ethnic makeup of the communities in which they live. For example, the City of Los Angeles which has the largest Latinx population in the nation has historically had the largest number of Latinx individuals experiencing homelessness (Conroy & Heer 2003). Many times, homeless Latinx individuals get missed because they are not recognized by established count methodologies and survey methods as their housing precarity manifest itself as overcrowding, couch surfing, and living in vehicles.

This study seeks to examine how Latinx individuals and their families experience homelessness and how they navigate the homeless and housing services bureaucracy. As the housing crisis continues, it becomes increasingly important to identify how racial disparities affect housing precarity especially in an increasingly xenophobic political environment. This study will expand the knowledge we currently have about a population that largely resides in the shadows and are especially vulnerable due to an increased criminalization of homelessness and immigration. This project will examine the intersection of race and homelessness.

I will interview 30 Latinx individuals experiencing homelessness and an additional 13 front-line government and non-profit workers in Imperial County, CA and East Lansing, MI. Interviews will assess how Latinx individuals and families experience homelessness as well as how outreach is done and how services are delivered and received.

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Key Words: Homelessness, Hispanic Paradox, Street-Level Bureaucracy

#### REMOTE SHOCKS, MIGRATION, AND HOUSING SUPPLY IN INDIA

Abstract ID: 781

Individual Paper Submission

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India has the second-largest urban population in the world. Yet, very little is known about its housing markets. In this paper, we use a panel instrumental variable framework to estimate the supply elasticity of temporary, permanent, and vacant residential housing units in urban India. We use two migration-inducing exogenous events - negative

rainfall shocks and a highway upgrade program - occurring in a distant state as demand shifters for local urban housing markets. We apply the Rosen-Roback spatial equilibrium setting to show that both the negative rainfall shocks and the highway upgrade program in a distant state increase inter-state migration. Increased inter-state migration leads to higher population and household growth, and therefore, higher demand for housing in local urban markets. Our findings are three-fold. First, similar to metropolitan areas in the United States, we estimate the supply elasticity of permanent housing in urban India to be 1.64. Second, we find that the supply elasticity of temporary housing to be -0.55. Negative supply elasticity of temporary housing is consistent with urban gentrification through the demolition of slums. And finally, we estimate the elasticity of vacant residential housing unit supply to be 2.63. We posit that a relatively higher vacant housing unit elasticity indicates speculative building by developers. The implications of floor area regulations for state-level housing supply are explored.

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Key Words: Housing, Migration, Urban, India

#### THE PHYSICAL LEGACY OF RACISM: HOW REDLINING CEMENTED THE MODERN BUILT ENVIRONMENT

Abstract ID: 786

Individual Paper Submission

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Land use choices, dating back over a century ago, still powerfully shape current development patterns. Through digitization advances, scholars have started studying the long-term effects of historic federal placed-based policies like "redlining". Designated by the Home Owners' Loan Corporation in the 1930s, redlining refers to maps that grade neighborhoods based on an appraisal the housing stock, population characteristics, proximity to industry in over 170 U.S. metropolitan areas (Jackson, 1980). The population composition component of these assessment methods overtly discriminated against all forms of minority populations of the time. The presence of any African Americans was labeled as an "undesirable element" and received lower grades; neighborhoods with concentrations of African Americans were given the lowest, or "D", grades (Hillier, 2003; Jackson, 1980). Similarly, neighborhoods with "infiltrations of Jews", concentrations of Catholics and foreign-born immigrants were graded lower (Jackson, 1980). These populations tended to live in crowded rental housing in many of the appraised cities.

The neighborhood grade guided whether loans were considered safe. "A"-graded neighborhoods were considered safe and received unconstrained credit access. In "D"-graded neighborhoods, it was nearly impossible to get a conventional mortgage and construction loans were difficult to obtain (Jackson, 1980). Redlining as a policy was reversed by the Fair Housing Act in 1968.

What longterm effects did redlining have on neighborhoods? Did effects last past 1968 when it was reversed? Previous work has shown that redlining maps had large causal impacts, with "D"-graded neighborhoods having

worse labor market outcomes, higher teenage pregnancy and divorce rate, and higher incarceration rates (Aaronson et al., 2021), reduced credit access and disinvestment (Aaronson et al., forthcoming), and reduced housing supply and population density (Krimmel, 2017). These changes persist after the policy was outlawed.

What mechanisms led these changes to persist? This paper explores one such mechanism – whether redlining has shaped neighborhoods’ housing markets by fixing the location of multifamily housing, even decades after it was outlawed. We argue that redlining has shaped the geography of housing segregation, not just that of racial segregation, by delineating the predominant location of singlefamily and multifamily stock. We then hypothesize that these built environment effects persist even while redlining-related racial segregation diminished over time. Specifically, we explore how and why “D”-graded multi-family neighborhoods became locked in a continued cycle of impoverishment, with continued under-resourced and under-invested housing stock. We test this idea for ten U.S. cities for which digitized maps and 1930-2010 census data are available. By instrumenting the geography of housing segregation through the redlining policy, we demonstrate the long-term connection between the built environment and contemporary neighborhood outcomes in local housing markets.

Our two-stage least-squares model findings reveal that home values, rents, and unit growth in poorly graded census tracts remain lower than high graded tracts even three or four decades after the policy was outlawed. This highlights that redlining policy from the 1930s cemented the delineation between multifamily and singlefamily neighborhoods, discriminating against multifamily neighborhoods along racial and socioeconomic characteristics. That wedge drives the differences in housing market outcomes through today.

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Key Words: Redlining, Segregation, Housing Markets, Longterm Effects, Multifamily Housing

#### **IMPACTS OF THE COVID-19 ON LOW-INCOME TENANTS AND PUBLIC INTEREST LAW ORGANIZATIONS IN LOS ANGELES CITY**

Abstract ID: 791

Individual Paper Submission

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The COVID-19 has exacerbated the longstanding housing crisis in Los Angeles. Many low-income renters, many of them who are Latinx and African Americans, have lost their employment income and have been unable to pay their rent for most of the year 2020. In addition, the complexity of landlord-tenant regulations in the city have been obstacles when navigating their housing concerns, especially when they have to grapple with rapid changes of landlord-tenant regulations. For some tenants, the pandemic has been an opportunity for them to learn about their housing rights for the first time as well as accessing resources available to them in their communities. For others, it has been an opportunity to mobilize and join a tenants’ union, such as the Los Angeles Tenants Union. At the same,

the public interest law organizations (PILOs), have had to grapple with the increasing demand of public needs and education of tenant's legal rights, especially when they have had to move their services to virtual platforms and phone calls. This study seeks to: a) understand how the COVID-19 has impacted low-income tenants in Los Angeles; b) explore the coping mechanisms and strategies tenants utilized to address their housing concerns; and, c) identify the types of resources and strategies PILOs utilized to inform tenants of resources available to them as well as educate on their legal rights. The study uses qualitative data from semi-structured interviews with tenants, representatives of PILOs, and landlords, as well as content analysis of newspaper articles. This study will provide insights to how tenants navigated their housing issues in the private rental sector in the midst of the pandemic.

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Key Words: low-income tenants, Los Angeles, COVID-19, public interest law organizations, tenants' movement

### **DOES THE PRESENCE OF BLACK RESIDENTS VS. IMMIGRANT RESIDENTS IMPACT THE TRAJECTORY OF REDLINED NEIGHBORHOODS?**

Abstract ID: 795

Individual Paper Submission

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Research on the long-term effects of redlining has found significant impacts between grades as well as between graded and ungraded cities. Areas receiving a D grade have been shown to have lower homeownership rates and house values (Aaronson et al. 2020; Appel and Nickerson 2016) as well as essentially no growth in housing supply and declines in population density (Krimmel 2018). Findings on neighborhood level racial composition have been more mixed. Aaronson et al. (2020) find rising shares of black households on the lower graded side of C-D boundaries as well as on the lower graded side of B-C boundaries prior to 1970; however, studies including data from 1970 onwards, find no impacts of redlining on racial concentration (Appel and Nickerson 2016; Krimmel 2018). When focusing on metropolitan-wide segregation, Faber (2020) finds an overall increase in segregation for cities that were assessed by HOLC compared to cities that were not. Finally, Aaronson et al. (2021) show that the deleterious impacts of redlining persist for cohorts born as late as 1983, with individuals on the D side of a D-C boundary doing worse in outcomes measured by Chetty et al.'s Opportunity Atlas as well as having worse credit than those on the C side of the boundary.

While the long-term impacts of redlining have been established, there has been less focus on the heterogeneity of such impacts within areas receiving the same grade, and virtually no recognition of the different trajectory of immigrant, black American, and white American neighborhoods. We have utilized area description files, which accompany the HOLC maps and detail the rationale for each grade, in order to gather population-level information that goes beyond what can be found from census data at the time. Using this rich source of data allows us to identify neighborhoods that had white immigrant, black, and/or white American residents at the time of grading. In this way, we are able to move beyond the black/white dichotomy that characterizes the majority of redlining analysis in order to have a deeper understanding of the mechanisms at work in these areas over time.

Our study area includes cities from across the United States. Initial findings show that within D-graded areas, 34% of

neighborhoods mention only black residents as a reason for the designation. An additional 16% of neighborhoods can be identified as having only white immigrant populations at the time of grading. One quarter of neighborhoods mention both black and white immigrant populations, while 25% had neither. If we expand the definition of immigrant to include any mention of foreign populations (not explicitly identified as white), only 15% of neighborhoods receiving a D grade solely mention black residents living there. These results point to the importance of including immigrant groups in our understanding of the impacts of redlining.

Given the different social histories of immigrant and black American groups in the United States, identifying immigrant communities and analyzing their interaction with the practice of redlining gives us a better understanding of the heterogeneity of area trajectory over time. The next step in this study will be to assess the impact of the reason for a D-grade designation on the trajectories by investigating outcomes such as racial concentration and house values (Aaronson et al. 2020; Appel and Nickerson 2016). These results will inform future work on redlining and answer previously unanswered questions pertaining to the experience of immigrant groups with this particular federal policy. As such, it places greater emphasis on the question of intersectionality within the practice of redlining by analyzing the trajectory of areas inhabited by different racial and ethnic groups.

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Key Words: segregation, immigrants, spatial inequality, housing, redlining

#### **DISPOSSESSION AND RESISTANCE: A CASE STUDY OF THE FINANCIALIZATION OF AFFORDABLE HOUSING IN TEXAS**

Abstract ID: 796

Individual Paper Submission

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Increasingly, the financialization of affordable rental housing is impacting tenants throughout the United States, requiring them to explore new strategies to resist unsafe and precarious housing conditions. Under financialization, private equity and hedge funds targeted formerly rent-restricted and regulated multifamily housing with the clear aim of purchasing cheaper developments and selling them at a higher price to generate profits (Aalbers, 2019; Fields & Uffer, 2016). More recently, as Wijburg, Aalbers and Heeg (2018) have argued, "housing units are no longer treated as purely speculative goods but rather as long-term investment objects for investment funds. Paradoxically, the long-term investment focus of these funds enables a short-term investment focus by buying and selling shares in these funds on the stock exchange" (p.1100). With this shift in strategy, predatory landlord practices tied to increasing the investment potential of properties have proliferated, such as unfavorable lease terms, the introduction of increased fee structures, unreasonable increases in rent, and frequent evictions (Alliance of Californians for Community Empowerment Institute, Americans for Financial Freedom, & Public Advocates, 2017; Chilton, Silverman, Chaudhry, & Wang, 2018). Though not as well understood, these models of investment are further adapting to changing financial and regulatory landscapes, with public private partnerships emerging as a

component of the financialization of affordable housing.

This paper highlights the mechanisms by which rental housing is being financialized in the United States, the impact this has on tenants, and the strategies by which tenants are resisting housing dispossession. Relying on the case study of two apartment complexes, this paper explores the impact on tenants of the partnership between Related Management Corporation out of New York City, New York, and the nonprofit public housing authority, Texas Housing Foundation, out of Marble Falls, Texas. In 2018, both entities purchased two Low Income Housing Tax Credit Properties in Austin, Texas: Fairway Village apartments and Oaks on Lamar apartments. Through this public private partnership, the foundation has expanded its affordable housing portfolio and the corporation has invested in properties where it does not have to pay property taxes. However, tenants in both properties have complained about poor maintenance and recurring safety issues. The financialization of affordable housing through corporate investment in this case has harmed tenants and made them more vulnerable. Through organizing and working with a local tenants' rights organization, tenants have negotiated agreements with their landlord, guaranteeing safer housing conditions. However, in a state that is hostile to tenants and offers them limited rights, tenants and advocates are particularly constrained in their ability to counter the violations to such rights. Housing rights movements in these cities are showing alternative paths to counter the threats of financialization and protect tenants' rights. Understanding both the ways in which affordable housing is being financialized in Texas and the ways in which tenants are resisting such changes is critical to countering housing dispossession and securing safe housing for tenants.

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Key Words: Financialization, Affordable Housing, Tenants' Rights, Housing Dispossession

#### **DOES SUBSIDIZED HOUSING IMPROVE HOUSING CROWDING? AN EMPIRICAL STUDY OF LOS ANGELES**

Abstract ID: 799

Individual Paper Submission

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Efforts to integrate an equity lens into in housing policy often seek to overcome patterns of racial discrimination and segregation in housing and improve access to opportunity for the poor and for people of color. Divergent strategies have emerged for promoting equitable housing development and have become the subject of much policy debate. In particular, there has long been tension between those advocating for deconcentrating poverty and fostering racially integrated communities and those advocating for enhancing housing choices and improving living conditions in neighborhoods of concentrated poverty and segregation (Goetz 2015; 2018). While the two categories of strategies need not to be at odds with each other, strategies prioritizing the pursuit of an integration objective often

seek to achieve a preferred spatial arrangement of households. Strategies such as those discouraging or limiting the development of subsidized housing in already high poverty, segregated neighborhoods to prevent further segregation, present potential conflicts with efforts to enhance housing choice and improve living conditions in these neighborhoods.

Further complicating this debate is the lack the empirical evidence supporting each type of these strategies. Existing studies have pointed to the importance of enhancing housing choices in high-poverty, segregated neighborhoods (Chapple and Goetz 2011; Goetz 2015, 2018). Mills et al. (2006) find that tenant-based assistance reduces housing crowding and doubling up. Nonetheless, little has been done to investigate whether increased housing supply, especially subsidized housing development, would contribute to increased living conditions such as reductions in crowded households.

This study assesses the linkage between living conditions and subsidized housing development. Because subsidized housing projects are generally intended for renters, I examine the relationship between neighborhood housing crowding and subsidized housing development among renter households in the City of Los Angeles, California. Specifically, this study asks whether subsidized housing reduces crowded rental units. I examine changes in the number of crowded renter households between 2010 and 2015 and compare these trends between tracts accessible to subsidized housing that were built/rehabilitated during 2011 and 2014 and tracts that were not accessible to such housing. To estimate the changes in crowding attributed to access to new/rehabilitated subsidized housing, the statistical analysis adjusts for confounding bias through the use of propensity score weighting. Two sets of weights are constructed and facilitate the estimation the effects of subsidized housing on (1) tracts where subsidized units are typically sited (and usually high-poverty and segregated) and (2) the rest of the city.

The results will contribute to the policy debate on ways to meaningfully incorporate equity in devising housing policy, such as guiding housing development to different types of locations. In particular, if the number of crowded renter households in disadvantaged neighborhoods are reduced through adding new or rehabilitated subsidized housing, policies seeking to promote an integrated living pattern through discouraging or limiting housing development in disadvantage communities may come at the expense of access to quality housing for the residents of these communities.

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Key Words: Fair housing, Overcrowding, Subsidized housing development, Neighborhood impact

#### COVID-19 AND THE FORTUNES OF RENTERS: EVIDENCE FROM LOS ANGELES COUNTY

Abstract ID: 802

Individual Paper Submission



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We examine the condition of tenants in Los Angeles in early months of the COVID-19 emergency. Drawing on both new Census data and two rounds of an original survey of renters, we find distress along multiple dimensions, almost all of them stemming from losses of work and income. We estimate that, within the first months of the COVID-19 crisis, about 1 in 5 Los Angeles tenants were unable to pay rent in full and/or on time, and that this difficulty resulted in tenants owing over \$850 million in rental debt. Our regressions suggest that nonpayment of rent is strongly associated with lost work and sickness. Tenants of smaller landlords are both more likely to have had problems making rent, and more likely—even controlling for nonpayment—to have eviction proceedings initiated against them. Many tenants who are current on rent, furthermore, are going into various forms of debt to be so. The crucial role that lost income in renter distress is reinforced by evidence suggesting that direct assistance to renters helps prevent nonpayment.

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Key Words: housing, renters, COVID-19, redistribution, survey methods

#### **TRACKING NEIGHBORHOOD CHANGE IN GEOGRAPHIES OF OPPORTUNITY FOR POST-DISASTER LEGACY CITIES: A CASE STUDY OF SAN JUAN, PUERTO RICO**

Abstract ID: 817

Individual Paper Submission

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Underlying neighborhood conditions can be instrumental in enabling or hindering social mobility (Sampson et al., 2002), resulting in spatial inequities that lay out the geographies of opportunity (Galster & Killen, 1995). These spatial inequities translate to differing urban outcomes across neighborhoods (Lens, 2017). With the advent of climate change, specifically the devastating effects of natural disasters, underlying neighborhood inequities can be further exacerbated (Pais & Elliot, 2008; Wyczalkowski et al. 2019). In legacy cities, which have had a long struggle with deindustrialization, population loss, fiscal constraints and economic decay, many will likely need to address compounding stressors stemming from climate change, specifically the devastating effects of natural disasters. Using the San Juan Metropolitan Area (SJMA) as a case study, we provide key insights on how a post-disaster context can affect underlying tendencies in housing markets.

The SJMA has approximately one and a half million people, but it has been experiencing population loss for more than a decade, as well as a steep decline in manufacturing and other industrial activities. Suburbs and urban centers

in the SJMA have begun to hollow out, leading to a rise of vacant properties. To make matters worse, Puerto Rico was battered by Hurricane María in September of 2017. The storm caused severe damages to infrastructure and housing units, and recovery efforts have been painfully slow. In addition, post-disaster SJMA has also seen an influx of real estate investors, as well as an increase in short-term rentals throughout the main urban areas of the metro region. Moreover, the government of Puerto Rico has been aggressively proposing additional tax exemptions to potential investors as part of the federal government's Opportunity Zones program, created as part of the Tax Cuts and Jobs Act of 2017. All of these dynamics have raised concerns regarding gentrification and displacement among vulnerable populations in the region.

To determine pre- and post-disaster changes across geographies of opportunity, we performed regression analyses at the Census tract level to identify trends in socioeconomic segregation, urban decay and hollowing, housing affordability issues, and gentrification between 2016 and 2019. Results show the following overall trends regarding storm impacts and neighborhood change: (1) storm impacts are associated with higher real estate activity in certain areas; (2) they do not seem to be associated with increased socioeconomic segregation, although this could be a short-term effect that could change as real estate activity causes increased high-income concentration in some areas and poverty concentration in others; and (3) associated with increased vacancy rates.

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Key Words: Neighborhood change, Climate change, Geography of opportunity, Legacy cities, Puerto Rico

#### **SUSTAINABILITY, WATER AND ENERGY USE IN INFORMAL COMMUNITIES IN THE DALLAS-FORT WORTH METROPLEX.**

Abstract ID: 839

Individual Paper Submission

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Although informal housing development has been considered a local problem of South Texas along the US-Mexico border (Durst and Ward 2014; Durst 2019), recent research found that informal housing is taking place on the fringes of most American cities (Durst 2019) beyond the borderlands. Informal housing development occurs in unincorporated districts that poorly enforce ordinances and indirectly allow developers to subdivide lots in unsuitable land for housing development (Ward, De Souza, and Giusti 2004). Impoverished families of color, particularly Latinx communities, purchase relatively cheap lots that often lack access to basic infrastructures, such as running water and electricity. Families face predatory land transactions that may endanger their patrimony and endure poor living conditions because they do not have easy access to essential utilities. After decades of informal housing occupation, planners know little (or nothing) about how families in US cities' informal communities consolidate their homes and use energy and water in their homes (Ward and Peters 2007).

The contribution of this research is threefold. First, this research systematically identifies informal communities,

known as colonias, in the Dallas Fort Worth Metroplex using spatial and census data on housing quality and ownership, the risk to floods, access to utilities, and families' income, race, and ethnicity. The systematic identification of informal communities helps document a typology of informal communities emerging in different locations throughout the Dallas Fort-Worth Metroplex, including inner-city, suburban, peri-urban, and rural areas. This spatial analysis will also help understand the characteristics of the people that reside in informal communities. Contrary to the assumption that Latinx immigrants mostly occupy colonias, families in these communities in the Dallas Fort-Worth metroplex may be more diverse.

Second, to understand the relationship between informal housing and sustainability, we will conduct field research in two representative communities: Sand Branch and Lilian, founded in the 1990s in the Dallas Fort Worth Metroplex's outskirts. Although these communities are spatially close to public infrastructures, such as the Dallas water treatment facility, families here lack access to running water, electricity, and sewage systems (Reynolds, Upshaw, and Larson 2019). These communities are also prone to flood risks because of low-lying topographic conditions and the absence of stormwater drainage systems. Field research in Sand Branch and Lilian will allow us to document the water and energy infrastructure characteristics, the variations of housing quality, such as the characteristics of the materials, and 3) technological innovations and strategies that families use in their homes to use water and energy. We will also gather life stories to develop an ethnographic understanding of water and energy use.

Third, field research will further examine the potential of technological innovations, such as solar panels and rainwater harvesting systems, to help families in informal communities to improve household economies while supporting sustainability (Elder and Gerlak 2019). More broadly, we will compare our sustainability, water, and energy use findings associated with informal communities in Dallas Fort-Worth Metroplex with previous research in Latin America (Collado and Wang 2020; Adegun 2017). This comparative analysis will reveal urban informality's role as a strategy for supporting sustainability and urban equity in low-income communities of color in the US cities.

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Key Words: Informal housing, sustainability, energy and water, Dallas Fort-Worth Metroplex, housing policy

#### THE IMPACT OF AN INVOLUNTARY MOVE ON JOB LOSS AMONG LOW- AND MODERATE-INCOME HOUSEHOLDS

Abstract ID: 855

Individual Paper Submission

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This paper examines the impact of forced moves on job loss among low- and moderate-income households. According to data from the Bureau of Labor Statistics, an average of 1.8 million workers were discharged each

month in 2019. Understanding what makes workers susceptible to job loss is important, as losing a job can result in financial hardship, poor physical and emotional wellbeing, and housing instability. Indeed, the impact of losing a job on one's ability to make rent or mortgage payments is clear. Yet, there is also emerging evidence of a reverse relationship—that housing instability impacts employment insecurity. Desmond and Gershenson (2019) describe the interrelationship between housing instability and job instability among the working poor as one of “double precarity.” Using data from a survey of low-income renters in Milwaukee, they found that workers who experienced a preceding eviction or forced move were more likely to be laid off from a job than observationally identical workers who did not. An eviction or foreclosure has been linked to poorer physical and mental health outcomes (Rohe & Lindblad, 2013; Vasquez-Vera et al., 2017), which, combined with stress and time away from work to address a move, are believed to adversely affect worker performance. Forced moves can also result in longer and more precarious commutes, increasing the likelihood of tardiness or missed workdays (Kruger, 1998; Loong et al., 2017).

Using a six-year panel survey of low- and moderate-income households, this paper examines whether a preceding involuntary move (defined as an eviction or foreclosure) increases the likelihood of job loss. It employs random-effects panel regression, controlling for relevant worker and household characteristics. It expands on Desmond and Gershenson's work in three ways: by using panel data; by using data from a wider geography; and by examining forced moves among both homeowners and renters. This paper's findings will contribute to the emerging discussion about the role of housing policy in promoting employment stability. Efforts to increase labor force opportunity have historically focused on human capital development and wage growth. Initiatives that increase housing stability among precariously employed workers may have positive impacts on employment stability, worker wellbeing, and wealth-building among vulnerable workers.

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Key Words: housing instability, job loss, eviction, foreclosure

#### INNOVATIONS TO EXPAND ACCESS TO OPPORTUNITY NEIGHBORHOODS FOR LOW-INCOME FAMILIES IN GREATER BOSTON

Abstract ID: 860

Individual Paper Submission

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Despite strong evidence that neighborhoods matter for the long-term outcomes of low-income children, policymakers have largely failed to identify low-cost policies that can enable families to access opportunity neighborhoods at scale. I evaluate and compare three strategies of varying cost to increase access to opportunity for Housing Choice Voucher holders in Greater Boston: changes in rental payment subsidies set by ZIP Code instead

of by region through Small Area Fair Market Rents; a housing mobility counseling program; and a housing search tool that provides customized neighborhood information on schools, public safety, and public transportation. I study whether these three interventions encouraged more families to move to opportunity areas. I use data on the ZIP Codes of voucher holder moves and measures of opportunity as defined by the School-Violence-Poverty (SVP) Index. I employ a pre-post analysis of subsidy-changes, a randomized controlled trial of the housing mobility counseling program, and a randomized controlled trial of the housing search tool. First, I find that the introduction of rental payment subsidy changes by ZIP Code is correlated with an increase in school quality of the destination neighborhoods of voucher holders, and an increase in the percentage of families moving to areas with high performing schools and very low rates of violent crime and poverty. Second, I find that the housing counseling program had a statistically significant impact on families moving to lower crime areas. Third, I find that while the housing search tool did not affect moves for the full population, it had a large, statistically significant impact on destination neighborhoods' opportunity scores of those who indicated an interest in moving to a high-opportunity suburb. This research suggests that low-cost digital search tools can help facilitate moves for families already interested in high opportunity areas but have less impact on families without those preferences.

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Key Words: Housing, opportunity, technology, randomized controlled trial, transportation

#### IDENTIFYING HOUSING VULNERABILITY IN COASTAL AREAS OF YUCATÁN, MEXICO

Abstract ID: 864

Individual Paper Submission

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More than 40 percent of the Earth's population lives in close proximity to the coast and, as the tragic consequences of Hurricane Maria (2017) reveal, coastal populations are increasingly vulnerable to the effects of natural hazards and global climate change. The more than 700 million people living in low-lying coastal communities face especially elevated risk. Beyond the threats to personal safety, coastal dwellers in vulnerable communities confront the potential loss of livelihoods and property. In the case of Mexico, with a coastline of more than 11,000 km, about 16 percent of the country's population lives in communities (municipios) directly on the coast. Some of the most vulnerable low-lying coastal areas in the country are located along the Gulf of Mexico and Caribbean; the Mexican government has classified nearly one-third of these locations as having high or very high levels of marginality based on educational outcomes, income, and quality of housing.

This study is part of a larger interdisciplinary project focusing on the living conditions, perceptions, experiences, and

adaptation strategies of households in seven coastal communities along the crown of Mexico's Yucatán Peninsula. Based on the results of a large household survey, this paper assesses the vulnerability of housing in study locations. Conceptualizing vulnerability as multifaceted and place-specific, this research identifies twelve relevant indicators, representing three discrete dimensions of housing vulnerability (structural, environmental/location, and socio-economic), which serve to create an index of housing vulnerability.

The index reveals that a relatively small share of households in coastal areas of Yucatán confronts inadequate housing conditions (structural vulnerability); however, socio-economic and environmental/location vulnerability are considerably more pervasive. Indeed, environmental and locational factors, including proximity to the coast and/or mangrove swamps, are an especially important component of vulnerability. Overall, the index indicates that more than 40 percent of households in the study area (more than 11,000 residents) face high or extreme vulnerability to natural disasters and global climate change. These results suggest that the extent of vulnerability among households in coastal areas of Yucatán is significantly greater than the levels of marginality found in official government reports.

Viable strategies to address vulnerability to global climate change and natural hazards are sorely lacking in Yucatán and other coastal communities, both in Mexico and elsewhere. Based on the insights gleaned from this study, potential interventions must wrestle with the multifaceted nature of vulnerability and the issue of place. Ultimately, the index of housing vulnerability described in this paper can serve as a useful tool and integral component of a more comprehensive strategy of coastal planning to promote greater resilience at household and community scales.

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Key Words: housing, vulnerability, index, coastal areas, Mexico

#### THE SOCIO-SPATIAL ECOLOGY OF POVERTY AND BEDBUGS IN SUBSIDIZED HOUSING

Abstract ID: 868

Individual Paper Submission

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Bed bug infestations are an emerging cause of health disparities in American cities, and a threat to housing security and affordability. Bed bugs, after almost 50 years of declining prevalence, began resurging across the world in the 1990's. Previous work on bed bug infestations in Chicago (Sutherland, Greenlee, and Schneider, 2020) and New York (McLafferty et al. 2020) has shown that bed bugs are not evenly distributed across the socio-economic landscape, but rather are concentrated in poorer neighborhoods. In Chicago, bed bug prevalence is higher in lower income neighborhoods with higher levels of household crowding, and eviction risk. Bed bugs appear to be a problem of

poverty (Eddy and Jones 2011), with major implications for the housing stability for low-income households.

Through ethnographic research with tenants, landlords and public housing authorities, we question how poverty and mobility are mutually reinforcing, entrenching bed bug infestations in poor neighborhoods. Because humans are the primary host of bed bugs, and housing units are the primary location of bed bug infestations, we treat the domestic environment as an integrated socio-environmental system (Liu et al 2007) in which bed bug ecology interacts with urban housing policy and landlord-tenant relationships. We focus on voucher-subsidized housing in Champaign County, Illinois administered locally by Housing Authority of Champaign County. We make use of the co-location of low-income voucher-subsidized households with higher income households to question the role of socioeconomic factors in determining the nature of prevalence of infestations, differentials in reporting, and differentials in treatment of infestations, as well as the nature of housing instability for low-income tenants. Using in-depth interviews with both voucher-subsidized and unsubsidized tenants in the same buildings, we observe the ways in which bed bug infestations alter relationships between landlords, tenants, and the state (code enforcement and housing authority officials) and examine differentials in reporting and treatment between these groups.

Understanding the relation between landlord and tenant behavior and infestation is necessary to inform best practices for policies establishing tenant and landlord rights and responsibilities for bed bug control (Schneider 2019). These relationships also point to the potential effects of housing regulation and code enforcement on overall infestation rates and their relation to poverty. Our results also inform administration of the Housing Choice Voucher Program. Given the observed precarity for low-income voucher-subsidized households, the unintended consequences of housing quality regulations and inspections may exacerbate residential instability, poverty and poor health outcomes as well as bed bug infestation risk.

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Key Words: Public Housing, Housing Instability, Bed Bugs, Political Ecology, Housing Policy

#### **COMPARING THE FACTORS OF INTERURBAN RESIDENTIAL MOBILITY CONSIDERING HOUSEHOLD LIFE CYCLE STAGE IN THE SEOUL METROPOLITAN REGION: USING THE BIG DATA OF DOMESTIC POPULATION MOVEMENT STATISTICS BETWEEN 2001 AND 2020**

Abstract ID: 874

Individual Paper Submission

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The Seoul metropolitan region (SMR) encompassing Seoul, Incheon, and Gyeonggi Province has a population of about 26 million in 2019, exceeding 50 percent of the total population of Korea. Households living in the SMR have been very active in terms of residential mobility. From 2001 to 2019, 4.6 million households moved beyond Seoul to Gyeonggi Province, and 7.85 million households moved within Seoul. At the same time, 3.57 million families moved

to Seoul beyond Gyeonggi Province, and 6.23 million families moved between municipalities within Gyeonggi Province.

From a macro perspective, residential mobility is influenced by both spatial and socioeconomic factors. It is affected by geographical factors such as distance and location, as well as socioeconomic factors such as the number of households, housing prices and educational environments (Geist & McManus, 2008; Greenlee & Wilson, 2016). Furthermore, both the migration patterns and the factors influencing residential movement vary depending on the life cycle stage of the households. Households before marriage are mainly single-person households and economic factors such as job availability and accessibilities to transport and amenities have a significant impact on their residential mobility. For households with school-age children, housing market such as housing supply, and economic and educational factors become more important (Coulter & Scott, 2015).

Residential mobility of households is an important measure representing the change in time and space in a metropolitan area. From a macro perspective, it is significant to analyze the spatial patterns of residential movement to understand changes of a region. Residential mobility is influenced by various factors, and their importance varies depending on the life cycle stage of the household. However, prior studies have mainly focused on the attributes and factors of residential movement of individuals and households from a micro perspective. From a macro perspective, there is still a lack of studies comparing the factors affecting residential mobility according to the life cycle stage of the households living in a metropolitan region.

This study aims to compare the factors that affect the residential movement of households in the SMR from 2001 to 2020. This study breaks down the life cycle into six stages according to the formation, extension, contract, and dissolution phases of the household presented by Duvall (1988). They consist of single-person households in their 20s and 30s, couples in their 20s and 30s, households in their 30s and 40s with elementary school child, households in their 30s and 50s with middle or high school child, households in their 50s and 60s with adult dependent, and households aged 65 or older. Dependent variable is set to the number of households moved between localities by year. Explanatory variables are composed of the distance between origin and destination, the number of households in both origin and destination, housing market variables, economic factors, transportation accessibilities, amenity availability, and educational factors. Extended gravity models based on quasi-panel data are estimated using the dependent and explanatory variables from 2001 to 2020. This study is significant in that it makes analysis of spatio-temporal changing patterns of residential mobility between localities using public big data of domestic population movement statistics and geographic information system techniques in the SMR.

In the preliminary results, both single-person households and couples in their 20s and 30s are greatly influenced by job availability and accessibility measures of public transit and cultural facilities. Housing market variables and educational factors become more significant for both the households with elementary school child and those with middle or high school child. However, the households with adult offspring, and households aged 65 or older are affected by accessibilities to medical and shopping centers, and housing market variables such as housing price.

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Key Words: Residential Mobility, Life Cycle Stage, Household Migration, Interurban Migration, Seoul Metropolitan Region

### **AFFIRMATIVELY FURTHERING FAIR HOUSING THROUGH CALIFORNIA'S HOUSING ELEMENT**

Abstract ID: 893

Individual Paper Submission

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This paper outlines an approach to assessing whether the location of sites suitable for affordable housing in Housing Element updates in California are Affirmatively Furthering Fair Housing (AFFH), and compares twelve cities' draft housing plans accordingly. There are multiple components to AFFH, but in this case we focus narrowly on overcoming “patterns of segregation” through the planning for and production of new affordable housing. We argue that to ascertain progress in this specific arena, advocates and the state need benchmarks and objective measures. To reverse the legacy of segregation, jurisdictions must change how they regulate housing development, and redistribute capacity for low-income housing to higher-income neighborhoods. We propose a simple and more complex approach to measuring whether cities are identifying sites for affordable housing in this manner. This narrow focus on the location of sites also allows us to reflect on inter- and intra-municipal responsibilities in a metropolitan area, as well as the differing AFFH expectations for lower-income or majority minority municipalities.

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Key Words: Affirmatively Furthering Fair Housing, Plan evaluation, segregation, California

### **COLLECTIVE HOUSING: A SOUTH/NORTH COMPARISON OF MODELS, MOTIVES, AND LITERATURES**

Abstract ID: 902

Individual Paper Submission

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Collective ownership of urban housing holds the potential to be and do many things. It can serve as a radical alternative private property, an urban commons (Huron 2015); it can be a site for empowering communities (Boonyabancha 2009; Galuszka 2021) or claiming community control (DeFilippis et al. 2019); and it can simply provide high quality affordable housing (Saegert and Benítez 2005). For all of these reasons, collective housing and land tenure have gradually gained popularity in cities throughout the world, albeit in different forms. In many countries in the Global South, governments and activists have created avenues for collective ownership through community mortgages, cooperatives, and community land title deeds, often as part and parcel of participatory slum upgrading programs. In North America and Europe, on the other hand, collective housing commonly takes the forms limited equity cooperatives, community land trusts, and cohousing. Though rich literatures exist on these different forms of collective housing independently, experiences from the Global South and Global North have rarely been put in conversation with one another. In this paper, I analyze the nature of this divide and ask what can be learned

by thinking across it with respect to the possibilities of collective housing. I look specifically at four different models of collective housing in two global regions. From the United States and Canada, I look to community land trusts and limited equity cooperatives. In Southeast Asia, I analyze the Community Mortgage Program in the Philippines and the Baan Mankong Program in Thailand. Through a critical review of policy documents and academic literature on these programs, I ask several related questions. First, what institutional forms do the different programs take? Second, how are their purposes portrayed in policy documents and reports? Finally, what theories and methodologies are commonly employed by scholars to understand the outcomes of these programs?

Conclusions suggest that although the larger-scale political and institutional contexts of the different programs vary greatly, meaningful commonalities exist that can be instructive for scholars and practitioners alike. Most importantly, though there is a general trend toward depoliticization and a focus on the pragmatic goal of affordable housing provision over time in all of these programs, their existence provides openings for more radical politics. However, taking advantage of these openings requires explicit organizing on the parts of community members and activists and cannot be thought to spring forth from the models themselves.

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Key Words: Community Development, Affordable Housing, Collective Housing, Housing Cooperatives, Community Land Trusts

#### SPATIAL HETEROGENEITY IN THE DETERMINANTS OF NEIGHBORHOOD CHANGE

Abstract ID: 909

Individual Paper Submission

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Most neighborhood change studies posit spatial independence and spatial invariance of neighborhoods. Spatial independence implies that characteristics and outcomes within one neighborhood have no association with those in nearby neighborhoods. Spatial invariance implies that the associations between neighborhood characteristics and outcomes are constant across regions. Recently, a few studies (e.g., Jun 2017; Jun 2021) find that neighborhood change is spatially dependent, which means that neighborhood change is affected not only by the internal characteristics but also by change in surrounding neighborhoods. The area understudied is if the associations between neighborhood characteristics and outcomes are spatially variable. The political and socio-economic differences by region in the US are likely to lead to spatial variability in the determinants of neighborhood change. For example, based on the contact hypothesis (Allport 1954), presence of black people may be less influential for neighborhood decline because white people, the majority group, are more tolerant toward minority presence in

neighborhoods in the south where there is a larger share of minority people and thus more chance for whites to have contact with minority people. Additionally, given finding no consensus of the effect of presence of Asian, the effect of Asian on neighborhood change may differ by region.

This study employs geographically weighted regression (GWR) that allows examining differential effects of neighborhood characteristics on neighborhood change across regions. I analyze GeoLytics Neighborhood Change Database that includes decennial census data and use neighborhood housing value change as the dependent variable and housing, demographic, and socio-economic characteristics as independent variables. The empirical analysis shows that there is spatial variability in the determinants of neighborhood change. The findings suggest that policies for preventing neighborhood decline should not be based on the assumption of spatial homogeneity but spatial heterogeneity in the determinants of neighborhood change.

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Key Words: neighborhood change, spatial heterogeneity, geographically weighted regression

#### **WHEN NATIONAL HOUSING MANDATE MEETS LOCAL STRATEGIC COMPLIANCE: A SYSTEMATIC CONTENT ANALYSIS OF FORTY-TWO CHINESE CITIES DURING 2011-2015**

Abstract ID: 911

Individual Paper Submission

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Countries of both developed and developing worlds have seen an increased shortage of affordable housing for the poor since the massive devolution of housing responsibilities from national to local governments in the 1980s. In recent years, national and subnational governments have attempted to use various forms of political or legal mandates to improve local affordable housing production (Liu, Ma, Goetz, 2021; Goetz & Wang, 2020; Karki, 2015). Existing literature has focused on the effects of these mandates on overcoming local constraints and increasing the overall stock of affordable housing. However, early observations also suggested a nuanced process in which localities adapted top-down housing mandates to local conditions, thereby leading to a diversity of compliance strategies adopted by local governments.

In China, similar affordable housing mandate was issued by the central government in 2011 to construct 36 million units of affordable housing for medium to low-income urban households within five years (2011-2015). A mass mobilization of fiscal and political resources had led to an improved level of affordable housing provision and eventual fulfillment of the five-year target by local cities. However, continuous observations of poor building quality, remote location, and inadequate accessibility related to affordable housing projects indicated an incomplete understanding of the effectiveness of the Mandate if simply concentrating on the quantity of affordable housing.

In this paper, we investigate how Chinese local governments have strategically complied with the national housing mandate, through balancing their actions among fulfilling the quantitative construction target (task fulfillment), ensuring quality and equitable distribution of affordable housing (policy outcome), and building local capacity for long-term housing solutions (capacity building). We selected 42 cities from 23 provinces that were considered best

performers in terms of annual construction targets (Liu, Ma, & Goetz, 2021), and collected all news reports related to affordable housing in local newspapers during 2011-2015. We conducted systematic content analysis of these news report to identify compliance actions adopted by each city government in three main areas: task fulfillment, policy outcome, and capacity building. We then calculated and compared the intensity and diversity of local compliance actions by year and across region, from which we developed a typology of compliance strategies of city governments adopted in the face of a top-down housing mandate. Our preliminary analysis found that there are four types of compliance strategies including low continuity- low wideness (passive compliance), low continuity – high wideness (comprehensive compliance), high continuity – low wideness (targeted compliance), high continuity- high wideness (sustainable compliance).

We believe this research contributes to the scholarly understanding of local government strategic behavior in affordable housing, and thereby enlightening future policy making toward improve local affordable housing policy performance.

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Key Words: Top-down mandate, Policy implementation, Affordable housing policy, Content analysis, China

### **SHE’S A GREAT LADY AND SHE WORKS HARD BUT I CAN’T WAIVE HER RENT: LANDLORD DECISION-MAKING DURING THE COVID-19 PANDEMIC**

Abstract ID: 936

Individual Paper Submission

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Housing is a fundamental component of the physical environment of human communities, and in places dominated by rental housing of any kind, post-disaster stability requires that landlords remain solvent. The 2020 CARES Act rental moratorium and other similar policies enabled many struggling tenants to stay housed, while shifting the cost of housing stability to individual landlords. Despite popular conceptions of wealthy landlords with deep pockets, the majority of landlords in the US own properties with a value of \$200,000 or less and about 41 percent report having debt (Rental Housing Finance Survey, 2018). The pandemic forced many to manage revenue shortfalls while trying to fulfill a range of financial obligations including mortgage payments. Even landlords sympathetic to the plight of their tenants found themselves caught between a regulatory requirement to keep tenants in place and their need to ensure their own long-term financial stability.

This paper calls attention to the existing gap in the housing and planning literature regarding residential rental property owners and explains why we need to better understand landlords, both to address the challenges of COVID and to create more housing secure cities for the future. Using qualitative data from 80 interviews in four cities with landlords who self-manage their residential rental properties, this study asks the question, “How are landlords responding to the tension between regulatory restrictions and their financial obligations in the context of rental

moratoria?” Initial analysis identifies key outcomes, most notably a desire by small landlords to leave the market altogether. The findings raise the question of whether tenant-based assistance promotes or inhibits housing stability and suggest ways that urban rental housing systems may change as a result of the pandemic.

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Key Words: rental housing, COVID-19 pandemic, Landlords, Disaster policy

### **RESIDENTIAL MOBILITY OF SUBSIDIZED HOUSEHOLDS: EVIDENCE FROM THE GEOGRAPHY OF VOUCHER HOLDERS IN THE LONG TERM**

Abstract ID: 938

Individual Paper Submission

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Housing Choice Voucher (HCV) program has served about 2.1 million low-income households with housing subsidy to promote residential mobility to solve the problem of concentration of poverty. The program aims to encourage low-income families to move to quality neighborhoods with lower poverty, good schools and services, lower crime, and better access to employment opportunities since they can choose where they live without additional housing rent burden (Varady & Walker, 2003). A large body of literature found that HCV recipients who relocated to neighborhoods with lower poverty rate have shown significant improvement in their mental health, crime, children's school performance and long-term effect on those children's income level (Sanbonmatsu et al., 2011, Chetty et al., 2016). These finding has led researchers to examine the relocation patterns of voucher holders and what factors influenced their decisions.

Geography of HCV recipients tells us that they live in neighborhoods with relatively lower poverty rate compared to control group with similar income level, although they are still living in high poverty areas compared to average families (McClure, 2013). Studies on Moving To Opportunity (MTO) program have addressed voucher recipients' long-term mobility patterns. Once MTO families relocated to quality neighborhoods, as the MTO program required participants to agree to move to low-poverty neighborhoods, researchers found that many of them move back to neighborhoods with higher poverty rate and the difference of poverty rates between experiment and control groups had been narrowed over time (Sanbonmatsu et al., 2011). These findings indicate that better neighborhood is not a sole determinant when they relocated with a voucher and there exist mixed factors which influence their decision.

However, less is known about individual HCV recipients' relocation patterns over time and whether they use the voucher to find a best location for them in the long term. This perspective views residential relocation of HCV recipients not as a one-time event. In response, this study explores the longitudinal trajectories of HCV households' relocation to examine where they move to with the voucher in long-term. The study uses data provided by the U.S Department of Housing and Urban Development (HUD) which allows to track all individual HCV households' residential locations as a panel data format over the 1995 to 2012 period in Cincinnati metropolitan area. Reviewing the longitudinal location data of 55,386 HCV recipients, this study examines the changes in neighborhood characteristics before and after relocation and addresses whether HCV program helps low-income families move to neighborhood of opportunity. This study aims to fill a gap in the literature regarding how have low-income families used HCV program to find a location which fits their needs in the long term and addressing different relocation

patterns between early and later phases of moving.

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Key Words: Housing Choice Voucher, Residential Mobility

### **CHANGING NEIGHBORHOOD RACIAL DYNAMICS AND THE FLOW OF RESIDENTIAL MORTGAGE CAPITAL: EVIDENCE FROM 40 YEARS OF HMDA DATA**

Abstract ID: 974

Individual Paper Submission

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Ever since the Home Owners Loan Corporation created their now infamous “redlining maps” in the late 1930s, access to residential mortgage credit has been shaped by the racial composition of neighborhoods and perceptions of neighborhood racial change. Throughout the mid-20<sup>th</sup> century, neighborhoods with higher proportions of minority residents and those with a small, but increasing share have been denied residential credit by lending institutions. This led to a process of dis-investment that disproportionately harmed the wealth building opportunities of African-Americans and other groups. While the Fair Housing Act of 1968 outlawed direct discrimination on the basis of race, redlining was still rampant, leading policymakers to enact the Community Reinvestment Act of 1977 and the Home Mortgage Disclosure Act (HMDA) in 1978 which forced every residential lending entity to indicate how they adjudicated each mortgage application and keep track of borrower’s race, income, and geographic location of the property. Despite the Federal legislation that aimed to undo the effects of redlining, race still plays a major role in determining who has access to mortgage financing (Avery and Buynak 1981, Munnell, Tootell et al. 1996). Recent evidence shows that African-Americans were more heavily impacted by the financial upheavals of the Great Recession as they were more likely to be offered sub-prime or predatory lending products which in turn resulted in a deeper impact of foreclosure (Raymond, Wang et al.).

Financial institutions claim that discrimination on the basis of race is minimal today, and that research using HMDA data to show disparate lending outcomes does not take into account borrowers credit worthiness (credit scores are not disclosed in HMDA) and also ignores the local market conditions (e.g. price trends) that bankers must evaluate in making loan decisions. This last factor—the dynamics of neighborhood change—is both under-researched in the mortgage discrimination literature as well as the key variable that lay at the heart of the HOLC map makers decisions. Specifically, this paper addresses how changes in neighborhood racial and income composition impact access to capital for minority borrowers.

This paper uses a dataset comprised of nearly 40 years of HMDA loan-level data to first describe and categorize all census tracts in the U.S. in terms of the racial balance of lending patterns and its change overtime. This descriptive analysis illustrates the connection between neighborhood racial change in lending mix and income dynamics (i.e. gentrification or disinvestment). Next, we test whether the rate of neighborhood racial change in the previous decade—as measured by the Modified Lillian Index (MLI) (Jaramillo and Lester 2020) affects the denial rate African-

Americans and Latinx homebuyers.

This analysis will test whether the traditional, ecological theories (Park and Burgess) of how neighborhood racial change impacts credit access is still occurring. In this scenario, as the proportion of minority residents increases banks may fear that property values will fall, as they expect, that white families with higher incomes will move away. This leads to a self-fulfilling cycle of disinvestment where even well qualified, borrowers are denied loans in neighborhoods that banks have deemed too risky. However, we also segment the analysis to focus on loan denial rates in areas which have undergone gentrification in the previous decade to test whether racial discrimination still persists, even in a context of increasing land values.

Preliminary results indicate that the proportion of tracts that maintained a stable balance of lending patterns to multiple racial/ethnic groups is low and remained so over the past three decades. Initial Results from a Probit model of denial rates in gentrifying areas indicate ongoing racial bias in access to mortgage capital for African Americans.

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Key Words: Lending discrimination, Neighborhood racial change, Gentrification, HMDA

#### HOW FINANCIAL STRESS AFFECTS PROPERTY OWNER-TENANT RELATIONSHIPS: EVIDENCE FROM THE PANDEMIC.

Abstract ID: 990

Individual Paper Submission

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We examine how residential property owners responded to tenant stress during the Covid-19 pandemic using results from a survey we administered between November 2020 and January 2021. We find associations between property owner's flexibility with their tenants and their own financial stresses. We examine two types of property owner responses: tenant-favorable policies like providing free or reduced rent and business-oriented decisions like the use of evictions and allowing tenants who have missed rent payments to break leases. Property owners who have themselves experienced stress during the pandemic, such as a missed mortgage payments or who anticipate a decline in operating cash flows, were more likely to respond to tenant issues with business-oriented rather than tenant-favorable responses. Not only does our study help researchers and policymakers understand property owner stress during the pandemic and other disasters, but it helps improve our understanding of the constraints residential property owners face and the influence these constraints have on their decision-making.

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Key Words: Covid-19, Rental Housing, Property Owners

## **DOWN AND OUT OR MOVING UP? INFORMAL RENTAL HOUSING MARKETS AND THE EXPERIENCE OF HEIRS IN SÃO PAULO**

Abstract ID: 999

Individual Paper Submission

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The topic this paper explores is the role of heirs in the production of informal rental markets that, in recent years, have risen across informal settlements in Latin America (Baqai and Ward, 2020). The aim is to show how the involvement of heirs in homebuilding processes has changed and is changing dwelling development in São Paulo, Brazil. Prior research on informal housing inheritance has focused on varying dimensions of tenure and ownership, including a mismatch between investment (often involving a protracted period of sweat equity) and demand (Ward, 2012); the challenges and opportunities of property transfer across generations (Jiménez Huerta, Cruz Solis, Ubaldo-Velázquez, 2015); and dwelling subdivision among multiple heirs (Ward, Jiménez, and DiVirgilio, 2015). One important evidence gap is bequest amid housing markets that are secured by rental. The research question I am trying to answer is: What are the dimensions of housing inheritance that heirs are using to shape where new rental markets are being established and new investment opportunities are being created? In response, my study draws on ethnographic and survey based research about the impacts of urban redevelopment on informal settlements in São Paulo (Stiphany, Ward, and Perez, 2021), with a focus on how rental is changing tenure and ownership dynamics of informal dwellings. I use a range of data sources that were collected through a combined household and post-occupancy survey of individual dwellings in two large settlements, including follow up surveys with renters, and interviews with heirs of dwellings where rental exists. From these sources, I identify four dimensions for understanding the role of heirs in rental markets: value, the location, size, occupancy, and monetary value of all bequeathed and unbequeathed dwellings where rental exists; investment, the number of additional properties acquired; mobility, the heir's primary place of residence; and livelihood, or add on investments such as higher education. Similar to previous times, heirs carry forward a legacy of housing expansion and family land retention. Today, however, heirs are less likely to invest their labor to expand the dwelling that has been bequeathed, and their prospects for selling it to live elsewhere in the city are greater. Thus, increased land values have likely raised expectations among heirs about the investment options they can entertain, while broad trends toward rental may diminish dwelling preservation. These emergent dimensions have implications for heirs who are trading spaces in neighborhoods where the option to do so was formerly limited. Inheritance is often framed as a legal issue; vis-a-vis rental it also features implications for community character and housing revitalization.

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Key Words: Informal housing, Inheritance, Rental, Latin America, Brazil

## **FROM RACE TO RISK: UNPACKING THE AFFORDABLE HOUSING DEVELOPMENT FINANCE CHAIN**

Abstract ID: 1009

Individual Paper Submission

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Building affordable rental housing is recession-proof because of over \$10 billion in public tax credit subsidies annually. Why, then, are we amidst a housing affordability crisis? This research targets the relationship between rental housing and socio-spatial inequality by explaining how community-based lenders evaluate housing loans. The most affordable non-subsidized housing stock for both owners and renters nationally are 2-49 unit buildings (Pendall, Theodos, & Hildner, 2016). Yet this is the least-studied housing sector. Community Development Financial Institutions (CDFIs) lend to those the mainstream banking sector deems 'too risky,' and evolved over the last 25 years into primary conduits of financing for 2-49 unit buildings. CDFIs exercise discretion in who gets access to financial resources in ways distinct from mainstream banks, and are understudied. Studying these successful lending institutions is important because by understanding their discretionary decision-making around risk, we can better understand how disparate impacts in mainstream lending continue to occur. In this research I ask: How do CDFIs decide who to lend to, and how do government policies impact lender risk calculations in low- and moderate-income (LMI) neighborhoods?

This qualitative multiple case study compares how four parallel Chicago CDFIs assess risk. Each case is a CDFI loan fund doing 2-49 unit housing lending. I evaluate how internal process and government policies affect lending decisions and how rating agency risk assessments affect CDFI access to capital. CDFI risk assessment procedure is evaluated through semi-structured interviews with (1) loan originators, underwriters, and portfolio managers across CDFIs, (2) analysts from national rating agencies, and (3) Chicago CDFI investors (philanthropic funds and banks). I triangulate interview data with publicly available archival documents including CDFI and investor IRS 990s, SEC 10Ks and 1Ks, municipal policy documents, loan agreements and loan committee meeting minutes from my CDFI participants, and rating methodologies and rating reports from my rating agency participants. I analyze interview transcripts, archival and participant documents using discourse and content analysis to interpret internal cultures around risk-based pricing. Using qualitative methods to understand how statistical value-at-risk (VaR) models are practically used inside financial institutions uniquely identifies the differences between 'real' risk as evaluated by lenders embedded in the communities they lend to, and the conventional 'perceived' risk that mainstream banks use in their automated underwriting models.

Emergent scholarship across information technology, computer science, planning and geography is investigating processes driving algorithmic violence, "the violence that an algorithm or automated decision-making system inflicts by preventing people from meeting their basic needs" (Safransky, 2019). Risk-based pricing is the practice of lenders charging a higher interest rate to borrowers they believe are more likely to default. Lenders calculate this from many metrics, including a borrower's credit rating. Technical systems of credit allocation constrict the production of affordable housing through limiting access to financing. I critically analyze borrower assessment metrics to identify what community benefit may be traded away in exchange for financial legibility and comparability for investors. As a specific form of algorithmic violence, this risk-based pricing research reveals how financiers limit affordable housing lending by requiring inclusion of equity and appraisal metrics with double jeopardy racial impacts in proprietary statistical models used to evaluate potential borrowers.

This research contributes to housing and policy scholarship by addressing extant gaps in urban spatial analysis

(Newman & Goetz, 2016) and “missing middle housing” literatures (An, Bostic, Jakabovics, Orlando, & Rodnyansky, 2019); as well as housing literatures that document household-level disparate impact in lending outcomes but cannot explain their upstream causes (Smith & Daniels, 2017). I explain lending practices that cannot be modeled quantitatively in order to help explain why disparate impact is reproduced despite myriad policy interventions.

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Key Words: multifamily housing, community development, risk, underwriting, algorithm

#### **A MATTER OF VALUE: ASSESSING THE SCOPE AND EFFECTS OF TANZANIA’S NATIONAL HOUSING CORPORATION’S DEVELOPMENT STRATEGY ON DAR ES SALAAM’S URBAN NEIGHBORHOODS**

Abstract ID: 1023

Individual Paper Submission

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Since the 1990s, the Tanzanian public housing authority, the National Housing Corporation (NHC), has been changing its goal, from prioritizing delivery of affordable housing, to becoming a leading commercial and residential real estate developer. This happens against a backdrop of market-based reform and the state’s growing reliance on private markets to support urban development. In this paper, we look at the impact of NHC’s new approach and its effect on housing production and every day practice in Dar es Salaam. The analysis is based on a case study of two new NHC middle to high-income development projects and housing practice in the neighbourhoods surrounding these projects. Analysis is informed by semi-structured interviews, and project and site investigation. Findings indicate that currently, NHC operates like a private corporation, prioritizing market-rate developments over low-income housing projects, and promoting segregated developments based on land value criteria, while also lacking protocols regarding its trickling down approach. High input costs and declining state subsidies are some of the factors mentioned as a challenge towards meeting the housing needs of moderate to low-income households. The paper contributes to the international debate concerning the state’s adoption of business-like approaches to housing production and the affordability crisis.

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Key Words: low- income housing, housing policy, Real estate industry, urban redevelopment, informality

## HOW IS COOPERATIVE HOUSING IN JAPAN BEING HANDED OVER TO THE NEXT GENERATION?

Abstract ID: 1037

Individual Paper Submission

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### Research question(s):

Since there are no laws regarding the establishment of housing associations for Cooperative Housing in Japan, associations are only formed during the construction period, and the buildings become Condos after construction. An appeal of this is that members form a close-knit community as they become jointly involved in the construction. This is perceived as a form of Co-housing. However, it has been thought that these buildings become the same as Condos with the passing of time as a result of the community becoming distant with changes in ownership of the units.

However, as reported by the author in 2019, it was found that there are also examples of cooperative housing where the community does not become distant.

The Research Question of this paper is how next-generation residents who were not involved with the construction came to become actively engaged with the community.

### Research target -TOJUSO series

To this end, the TOJUSO series of cooperative housing, which is found mainly in the central city area was selected as the target of this research. There are 20 buildings, mainly in the central Osaka area. The buildings are 16 to 40 years old. The reason for selecting this series of buildings is because they were built around the same time and are of the same scale, making it easy to make comparisons.

### Approach and methodology:

Of the 86 next-generation residents who were given a questionnaire, 36 (42%) provided a response. Of these respondents, 13 were interviewed.

### Meaningful and new findings.

As a result of this research, it was found that most next-generation residents are in their 40s or 50s, putting them in the age group that would have non-adult children, regard being in an environment that is close to a city center as most important, select units based on their floor area, and have made renovations to the floor plan. These are the same as the choices that are made for general homes. With that said, the TOJUSO buildings have distinctive designs, and next-generation residents are also fond of the designs. Therefore, it was found that next-generation residents are not very interested in management when they move in but come to be actively involved in management as they recognize the importance of management through their involvement.

### Citations

- Transition of Owners and Residents of Long-standing Cooperative Housing Communities Located in the City Center – Through Comparison of the “Tojuso” Series Dating from the Same Period and of the Same Scale Miyano, Junko 2019 Book of Accepted Abstracts, ACSP Annual Conference October 24-27, 2019 Greenville, South Carolina Abstract ID: 1065 Poster | Published online: 12 Oct 2008
- Who is Governing the Commons: Studying Swedish Housing Cooperatives Jonas Anund Vogel, Hans Lind & Per Lundqvist Housing, Theory and Society, Volume 33, 2016 - Issue 4 Published online: 23 May 2016
- Comparing the Satisfaction of Rural Seniors with Housing Co-Ops and Congregate Apartments Is Home Ownership Important? Deborah E. Altus & R. Mark Mathews Pages 39-50 | Published online: 12 Oct 2008

Key Words: Cooperative housing, Long-standing housing, Maintenance, Urban habitation

## **RELATIONSHIPS OF UNEMPLOYMENT INSURANCE AND STIMULUS CHECK WITH MORTGAGE PAYMENT OUTCOMES DURING THE COVID-19 PANDEMIC: IS THERE DISPARATE BENEFIT FOR PEOPLE OF COLOR IN THE U.S.?**

Abstract ID: 1065

Individual Paper Submission

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The Coronavirus Disease 2019 (COVID-19) pandemic has exacerbated the state of housing insecurity in the U.S. through unprecedentedly high unemployment and household income losses, particularly among vulnerable mortgage borrowers. Previous COVID-19 research has primarily focused on somewhat extreme scenes such as foreclosure and upsurging prevalence of forbearance, which undeniably call for urgent policy responses. Yet how numerous American borrowers who experience financial hardships directly or indirectly due to the pandemic, even if neither foreclosed nor on forbearance plan, manage to pay their monthly mortgages and are concerned about impending payments are arguably as important but are less studied. Equally important but less examined is the role of Unemployment Insurance (UI) and stimulus check that have been with many jobless and disadvantaged borrowers since the beginning of the pandemic.

This study measures and examines mortgage hardship with focus on the relationships of UI benefits and stimulus check with mortgage payment outcomes among different demographic groups. COVID-19 mortgage payment outcomes are defined by two binary measures: i) retrospective measure of last month’s mortgage delay and ii) prospective measure of next month’s payment inconfidence.

The Household Pulse Survey (HPS), our primary data, is a nationally representative survey deployed by the U.S. Census Bureau jointly with the Department of Housing and Urban Development (HUD) and other federal agencies that measures housing and socioeconomic impacts of the COVID-19 pandemic on Americans. We use the entire survey weeks of HPS (April 23, 2020 to March 1, 2021) to examine the yearlong trend in mortgage hardships. This paper builds a pooled cross-sectional data that amount to a full sample of 754,749 adult (age 18+) Americans. Multilevel logistic regression models are estimated with a set of person- and household-level (level-1) variables, all derived from the HPS, and state-level (level-2) contextual variables supplemented from multiple sources including the Federal Housing Finance Agency (FHFA)’s National Mortgage Database (NMDb), CDC’s COVID Data Tracker, Bureau of Labor Statistics (BLS)’s unemployment rate, smartphone-based outdoor mobility, and 2019 American Community Survey (ACS).

Our preliminary results show that both UI and stimulus check are positively related with mortgage payment outcomes, controlling for individual- and state-level variables. Important demographic and socioeconomic predictors of COVID-19 mortgage hardships include middle age group, male, race/ethnicity other than non-Hispanic white (most acutely non-Hispanic black), unmarried status, children in the household, greater household size, lower education, and lower household income. A series of health and socioeconomic hardships due to the pandemic, such as employment income loss, food insufficiency, and mental health problem, are also associated with a greater

mortgage hardship. UI and stimulus check recipients are more likely to pay last month's mortgage in time and have a greater confidence on the next month's payment. The positive effects, however, are unequal across different racial and ethnic populations, with commonly reduced benefits to people of color. Particularly, non-Hispanic Blacks are more likely to report a substantially reduced benefit from UI and stimulus check than non-Hispanic whites.

Our preliminary findings suggest that changes to UI benefits and stimulus check provision are important policy levers for improving mortgage payment outcomes and longstanding racial inequalities in the mortgage market. Mortgage relief policies should be race-conscious and account for the systematic and long-standing vulnerabilities experienced by people of color.

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Key Words: Coronavirus (COVID-19) pandemic, Unemployment Insurance (UI), stimulus check, mortgage, racial inequity

#### ADMINISTRATIVE BURDENS IN EMERGENCY RENTAL ASSISTANCE PROGRAMS

Abstract ID: 1080

Individual Paper Submission

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Since the onset of the COVID-19 pandemic, localities across the United States have been given unprecedented amounts of rental assistance funding for their residents and considerable flexibility in these funds' distribution. Emergency rental assistance (ERA) programs have varied widely in terms of how they conduct outreach, how tenants or landlords apply, the form the assistance takes, and to whom it is ultimately provided. The emergency nature of these programs—which are rendered urgent by the risk that unassisted tenants will be evicted during a pandemic—as well as the shallowness and temporary nature of the subsidy suggest that the administrative burden placed on participants should be lower than it is in typical housing programs such as the Housing Choice Voucher program. Yet ERA programs still face the “double take-up challenge” characteristic of programs designed to assist renters; they must engage both tenants and landlords. In addition, many ERA program regulators and administrators only have prior experience with non-emergency rental assistance, including vouchers, and may face challenges adjusting to a less burdensome model or accepting a higher risk of fraud.

This paper uses results from a national survey of over 200 ERA programs, as well as 15 case studies representing a broad cross section of ERA programs, to identify common sources of administrative burden for both tenants and landlords and to explore how these burdens relate to program outcomes, such as incomplete applications and landlord non-participation. The effects of federal funding guidelines and national and local eviction moratoria on the

allocation of administrative burden in ERA programs are considered. We then use Census and publicly available administrative data to examine whether variation in administrative burden across jurisdictions correlates with political context, racial segregation or composition, the presence of immigrants, and jurisdiction size and governmental capacity. We pay special attention to the relationship between tenant and landlord administrative burdens, and how increased burdens on one party may increase or decrease burdens for the other. Finally, drawing on case study interviews with program administrators, we discuss strategies to alleviate administrative burdens on tenants and landlords without unduly heightening the risk of fraud.

In studying the sources of ERA programs' administrative burden, its consequences, and its drivers, this paper provides information of immediate value to policymakers at the local and state levels as they continue to disburse federal rent relief funds. It also informs federal policymakers who must set parameters for future funding. More broadly, it takes advantage of a vast national experiment in the provision of rental assistance programs to shed light on how policymakers can increase equitable participation in housing programs by managing the burdens they place on both tenants and landlords.

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Key Words: Emergency rental assistance, Administrative burden

#### EARLY PUBLIC HOUSING PROJECT SITING AND RACIAL SEGREGATION IN U.S. CITIES

Abstract ID: 1099

Individual Paper Submission

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The U.S. Federal Government built and leased over 30,000 units of public housing in 71 developments in 46 cities spread across 22 states, Puerto Rico, and the U.S. Virgin Islands during the latter half the 1930s. Public housing was viewed as a mechanism to help the so-called "submerged middle class" rebound from economic distress, help inject capital into the construction industry, and clear so-called slum areas of inadequate housing (Friedman, 1966). While race was not explicitly discussed in the enabling legislation, it played a key role in early public housing. Policymakers designated most public housing developments for either White or Black residents, and existing research contends that the siting of these developments reinforced existing patterns of racial segregation (Radford, 1996). Yet, this claim remains untested outside of reviews of individual or small numbers of public housing projects (Fairbanks, 1988; Vale, 2000).

Thus, a key question related to the siting of public housing projects is the extent to which the placement of White, Black, and (the few) racially integrated public housing projects by local public housing authorities matched the racial distribution of residents in the surrounding neighborhood. This question arises because of guidance by the U.S. Housing Authority on siting public housing developments designated for a particular racial group that encouraged

local public housing authorities to exercise care in “selecting a site which will not do violence to the preferences and established habits of members of that race or to the community life of which they may be a part” (USHA, 1939: 7-8). The guidance elaborates by specifying that siting a white public housing project “in areas now occupied by Negroes [sic] or other minority racial groups is undesirable” (USHA, 1939: 8). While this guidance from the USHA did not carry the formal weight of policy, it makes clear that siting public housing should as a rule not upset existing racial segregation patterns nor displace households from a racial group not served by the new housing units.

We use a novel dataset containing data from the 1940 complete-count census on the characteristics of public housing residents and residents in neighborhoods where public housing projects had been built at the time of the census to assess how faithfully the siting of early public housing developments adhered to these guidelines. Results from spatial analysis and predictive statistical models indicate that local public housing authorities largely conformed to federal guidelines when it came to where they built public housing developments, placing projects designated for White residents in overwhelmingly White neighborhoods and projects designated for Black residents in overwhelmingly Black neighborhoods. At the same time, a number of White projects were built on the periphery of Black neighborhoods, confirming findings from previous research that suggested public housing projects were used to create a barrier to staunch a feared spread of Black, slum areas into White, middle class areas (Fairbanks, 1988). Finally, on rare occasions, the siting of a White public housing project appeared to be an attempt to displace Black households in order to jump start the reclamation of a formerly White neighborhood for White residents. Together, these research findings provide new insights into historic investments in public infrastructure by planners to reinforce patterns of racial segregation in American cities. In addition, the increasing focus on slum redevelopment as an ancillary goal of the fledgling public housing program helps to cast the public housing program as an early example of urban renewal that came to be adopted more pervasively and vigorously by urban planners in the 1950s.

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Key Words: public housing, race, New Deal, racial segregation

#### DOES LIHTC FUND AFFORDABLE HOUSING IN LEGACY CITIES?

Abstract ID: 1114

Individual Paper Submission

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The purpose of this study is to explore whether and how LIHTC serves the needs of legacy cities, and to identify differences across states in how LIHTC projects are sited in legacy cities. The LIHTC program is generally designed to produce new housing in cities with fast-growth and strong markets at an affordable price. It is an outstanding question how LIHTC may help legacy cities meet the affordability needs of residents. LIHTC is the largest affordable housing development program in the country. While the program is generally intended to promote new construction in areas of opportunity, LIHTC funds are also used for rehabilitation of older and dilapidated units,

which is an area of particular need for legacy cities.

Previous research shows that LIHTC projects are sited more often in less poor and suburban areas than other affordable housing programs, such as public housing (McClure, 2006). Research also points to the importance of state unique Qualified Action Plan (QAP) in the siting decisions for each state's LIHTC properties (Ellen & Horn, 2018).

In this study, I explore how LIHTC is used in legacy cities, defined as places that have suffered population loss and economic contraction since the mid-Twentieth Century. I'm particularly looking at the use of new construction versus preservation at the state and municipal level and how these vary across legacy cities. The research focuses on LIHTC projects in several states with legacy cities – New Jersey, Pennsylvania, Maryland, Ohio, and Michigan -- and uses a mapping and temporal approach to look at LIHTC projects in and around legacy cities, and how these have changed over time. Then, the study compares the QAPs across states, looking for how differences in QAP relate to differences on the ground, and how changes in individual state QAPs translate into changes in LIHTC siting.

Ingrid Gould Ellen & Keren Mertens Horn (2018): Points for Place: Can State Governments Shape Siting Patterns of Low-Income Housing Tax Credit Developments?, Housing Policy Debate, DOI: 10.1080/10511482.2018.1443487.

Kirk McClure, 2006. "The Low-Income Housing Tax Credit Goes Mainstream and Moves to the Suburbs," Housing Policy Debate 17 (3): 419–446.

#### Citations

- Ingrid Gould Ellen & Keren Mertens Horn (2018): Points for Place: Can State Governments Shape Siting Patterns of Low-Income Housing Tax Credit Developments?, Housing Policy Debate, DOI: 10.1080/10511482.2018.1443487.
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Key Words: affordable housing, legacy cities, rental housing, housing finance

## **POSTERS**

### **AUSTIN AI HOUSING ANALYSIS**

Abstract ID: 277

Poster

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Supported by the University of Texas at Austin Good Systems Grand Challenge, this research project aims to develop a value-driven AI system that evaluates historical housing development in Austin and helps city planners and policymakers shape equitable, inclusive and sustainable plans and regulations. Using deep learning technology and an open data repository with development, transportation, energy, and demographic data, this system links and studies 30 years of Austin housing development metrics in an effort to help analyze the spatial and demographic relationship between affordability and housing, mobility and energy policy over the past three decades. Our goal is to build an AI-supported system that can help to test different regulatory scenarios and inform residential



development policies in Austin. The techniques and findings developed from this study can also be applied to many similar cities nationally and internationally.

This study is guided by four related research questions that aim to understand the history, current state, and possible future of housing affordability in Austin:

1. What are the most and least affordable types of residential developments in Austin today?
2. How has residential affordability changed in Austin since 1990?
3. What impact have housing policies had on residential affordability since 1990?
4. What new policies may have a greater equitable impact in the future?

From 2020 to 2021 we collected and analyzed 140 million records of open land parcel appraisal data from the Travis Central Appraisal Data in Austin, Travis County, Texas. These records estimate yearly market values per property and depict granular improvement-level changes in the built environment of Travis County over the past 30 years. With this basemap data, we spatially join construction permit data, home sales data, demographic data, and other urban metrics to develop a rich temporal and spatial model of Austin's built environment history up to the present.

To date, our analysis has found that from 2000 to 2020 Austin experienced an increase in the median single-family residential market value from under \$150,000 in 2000 to over \$350,000 in 2020, an average increase of 6.6% per year. Further we found that, since 2000, Austin has seen its largest residential growth in the creation of single-family condominium properties throughout Austin's central urban neighborhoods, developments which have both contributed to and removed affordable housing in different parts of the city.

Further we have conducted research into the performance of the City of Austin's Accessory Dwelling Unit/Secondary Apartment ordinances in supporting affordably-priced housing development in Austin since 2000. We found that these ordinances have resulted in a range of affordable and unaffordable open market single-family units in different parts of the city. These results suggest that City planners should work with different neighborhood communities to determine which combination of housing ordinances may work best for each area of the city. Further, our results show that these local planning collaborations can make important equity-based judgments and decisions with the help of open government data and AI analysis methods.

In 2021 we will continue to develop neighborhood-level analyses and historical inventories of affordable housing in relation to the application of several housing policies of interest to the City of Austin: Accessory Dwelling Units/Secondary Apartment ordinances, Local Historic District zoning designations, the Austin Energy Green Building certification program, and the Transit Oriented Development incentive program. We will track where the City has implemented these City policies and programs and evaluate whether or not these programs may be supporting affordable housing in each neighborhood.

Project results and analysis tools will be hosted on our project open data portal, hosted on ArcGIS Online at [ai-housing-ut-austin.opendata.arcgis.com](https://ai-housing-ut-austin.opendata.arcgis.com).

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Key Words: Housing, Affordability, Machine Learning

## **IMPACT OF DISASTER MITIGATION PROGRAMS ON LOW- AND MID-INCOME HOMEOWNERSHIP IN COASTAL REGIONS- CASE STUDY: NYC AFTER HURRICANE SANDY, 2012**

Abstract ID: 608

Poster

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Disaster management contains four phases in its cycle, including mitigation, preparedness, response, and recovery. Among these four phases, mitigation aims to decrease the impact of hazards utilizing structural and non-structural measures. While post-disaster condition encompasses high demand and complex needs, recovery aims to reduce vulnerabilities toward future disasters. Therefore, the recovery efforts try to restore not only the pre-disaster routines but also to improve the resiliency of the community in terms of facing possible future disasters. But the concept of building back better does not work equally for the whole community.

Housing serves as a foundation for households and community resilience, both as a critical element of the built environment and a household's most significant financial investment. Housing recovery constitutes a large part of recovery efforts, and previous studies show that homeownership declines in the aftermath of disasters due to housing destructions. Some groups of the community remain displaced for a long time in the aftermath of disasters. While there are studies investigating housing issues and mitigation policies in the aftermath of disasters, few studies examine the role of recovery mitigation policies on long-term homeownership, specifically for low- and mid-income individuals.

New York City is a diverse community that has faced various disasters in its history. One of the major disasters that hit the city was Hurricane Sandy in 2012. Hence, the city has good experience in all phases of the disaster management cycle. Recently, the city shifted fundamentally to mitigation, the crucial step that can reduce the losses and break out the process of response, recovery, damages. The city has invested in many mitigation programs since 2014, and has completed 227 mitigation projects for various hazards until 2018, and has 473 existing projects. Using New York City as a case study, this research explores the impact of mitigation policies on the homeownership of low- and mid-income families in this city. This study uses secondary data from the American Community Survey (ACS- 5-year estimates) for 2014-2019, after the disaster, and Decennial Census data for 2000, before the disaster and mitigation projects conducted in the city using New York City Hazard Mitigation dataset. The study analyzes these data using a multi-level linear regression model. Level one is time observation (before and after the disaster), level two is census tract, and level three is the city where tracts are located. The analyses consider socioeconomic status using two sub-samples, including low-socioeconomic status areas and high socioeconomic status regions (based on the average values in the study area), in running the model. The model controls the results using mitigation efforts and people in-movers and out-movers data.

Study results show that areas with a low-socioeconomic status more vulnerable to significant post-disaster homeownership changes than high-socioeconomic status, and that homeownership of low- to moderate-income households has decreased in places where mitigation projects are being implemented. The study findings provide a greater understanding of how post-disaster homeownership changes are related to pre-disaster socioeconomic status and call into question whether the benefits of mitigation interventions are felt equitably.

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Key Words: Homeownership, Hazard Mitigation, New York City, Low- and Mid-income Households, Hurricane Sandy

## **MULTIFAMILY HOUSING DISASTER RECOVERY: A CONCEPTUAL FRAMEWORK FOR EXPANDING THE RESEARCH**

Abstract ID: 789

Poster

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Multifamily housing has been documented as lagging in the recovery process compared to other housing types that are impacted. What we do know comes from a limited number of studies (e.g., Comerio, 1998; Hamideh, Peacock, & Van Zandt, 2021) and anecdotal evidence. How generalizable these findings are remains unknown. Multifamily housing is significant for the rental housing market with significant heterogeneity among property owners, renters, structural characteristics, and housing quality. Multifamily-renters (16.2 percent) comprise the second highest structure-tenure combination behind single-family owner-occupants (57.0 percent) according to 2019 American Housing Survey estimates.

Current U.S. disaster policy favors single-family owner-occupied housing, especially regarding recovery finance. With disasters occurring more frequently, and increasing population in dense urban environments (Been, Ellen, & Weselcouch, 2014), this housing type necessitates further investigation. This research puts forth a conceptual framework for investigating multifamily housing disaster impacts and recovery.

The disaster recovery environment has been characterized as a market-driven process favoring stakeholders with the most political and economic power and capacity to enact and manage their own recovery process (Comerio, 1998). Considering the separate property interests related to the ownership and use of the housing structure, we distinguish between the business interests, the structure, and renter-households as separate yet interrelated units of observation in the disaster context. Emphasis is particularly placed on the business interests as providers of this housing type.

Recovery for multifamily housing involves a complex group of stakeholders and is largely dependent on the owner-manager's investment objectives, motivation, and capacity. Owners residing in the impacted area may be dealing with the recovery of their household concurrently. Additionally, an impacted property is subject to lender conditions and other property interests such as governmental agencies and community residents with NIMBY attitudes towards multifamily housing. Renter status is an important determinant of social vulnerability and correlates with other social and physical vulnerability dimensions (Lee & Van Zandt, 2018). Given the multiple property interests, recovery for one actor does not necessarily mean recovery for another; failure or success at the business-level may

not equate to non-recovery or recovery for renter-households.

The proposed research framework draws on real estate and urban economic theories to characterize the real estate market, market segments, and actors with a focus on “normal” market functioning. The real estate market is comprised of asset, space, and capital markets--each with its own processes and actors (DiPasquale & Wheaton, 1996). Housing markets are also segmented by structural and quality characteristics and by demographics. Real estate submarkets and market segments interact with each other resulting in dynamic outcomes for users and investors. Outcomes in one market can reverberate throughout the entire real estate system. We also incorporate existing applied real estate research to identify vulnerabilities during “normal” times that signal potential vulnerabilities during disaster times--specifically, literature on investment and investor performance, mortgage performance, access to financing, and propensity for redevelopment and repositioning.

We then re-examine disaster literature on housing, household, business, and community recovery, and re-examine this body of research through the lens of the proposed framework to better understand existing findings. Our primary motivation with developing this framework is to identify areas for further investigation that will be accomplished in subsequent stages of this research. This framework and subsequent research findings should be relevant to urban planners involved in community recovery, researchers interested in disasters and a housing type that has been significantly understudied, and policy-makers crafting disaster recovery policy for a housing type that has significant implications for a diverse demographic base.

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Key Words: housing, disasters, disaster recovery

#### **TRANSNATIONAL HABITUS AND SPACE SYNTAX: A CASE STUDY OF AFFORDABLE HOUSING FOR IMMIGRANTS IN LOS ANGELES**

Abstract ID: 1100

Poster

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According to the 2010 U.S. Census Bureau, the number of foreign-born immigrants has reached a record population of nearly 40 million. Data show that continued growth will have an impact on housing markets. To better understand housing design and use of immigrants in Los Angeles affordable housing markets, this study examines the roles of transnational practices and cultural change in shaping spatial forms and use in residential spaces using Space Syntax. Space syntax seeks to answer how spatial configurations express social and cultural meanings and values (Hillier et al., 1984, 1996).

In the era of globalization and transnationalism, studies in immigrant transnationalism and the experiences of immigrants explore new trends in contemporary international migration and identify social relationships between

immigrants' places of origin and their societies of settlement (Basch et al., 1994). Moreover, the nature of a group's experience creates a group's identity. Thus, every group has its own experiences and collective memory, which are distinct from those of other groups (Halbwachs, 1980). In addition, to study everyday life experience and its contribution to the built environment, Amos Rapoport's theory (2000) suggests that the shape of the built environment can be examined specifically by analyzing an activity system and a corresponding system of settings. In this regard, housing use and the built environment are tangible manifestations of culture as a way of life, and the built environment changes because of its inextricable linkages with culture (Rapoport, 2000).

In this study, participants were asked to answer questions related to contextual themes such as historic, economic, social, and cultural values to assess residential settings, daily life patterns, residential experiences, and cultural identities of immigrants. This qualitative case study of affordable housing in Los Angeles, California, and immigrant homeowners investigates three research questions: 1) What is the nature of the relationships between transnational practices and cultures of immigrants, and the spatial forms and the use of residential spaces? 2) How are perceptions of past and present places embodied in residential spaces of immigrants? 3) How do they perceive and alter these spaces?

The findings provide insights into the nature and extent of transnational practices between immigrants' home countries and the US, the socio-spatial practices and cultural activities of immigrants, and the various ways in which these immigrants actually perceive and use residential spaces according to their lifestyles and experiences in everyday life. This study uses a variety of qualitative data to illustrate the cultural practices in relation to the spatial forms and use of space in affordable housing by immigrants and thereby broaden our perspective of immigrants in American society. This study also provides a conceptual framework for culture and housing studies by introducing different dimensions such as Space Syntax.

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Key Words: Space Syntax, Transnationalism, Habitus, Spatial Practices

# Track 7 – International Development Planning

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### **7.95 PRE-ORGANIZED SESSION - EXPLORING THE CONNECTION BETWEEN HOUSING AND CLIMATE JUSTICE: A GLOBAL PERSPECTIVE**

Pre-Organized Session 95 - Summary

Session Includes 120, 477, 478, 479, 480

BALACHANDRAN, Balakrishnan [University of Illinois] bbalach2@illinois.edu, organizer

Globally, climate change will intensify vulnerability of communities living in precarious housing conditions, multiplying their displacement. Policies of resilience and adaptation that appropriate people's land also displace vulnerable communities. In such cases, the right to housing emerges as a crucial site of contention. In urban areas, systemic housing injustice forces low-income and historically disadvantaged communities to occupy risk-prone locations without municipal services and while they are coping and surviving, they face displacement pressures both ecological and policy-driven. Even when at-risk communities are relocated, they continue to be victims of housing injustice. This causal nexus between housing injustice and climate injustice and the resulting vicious cycle of housing precarity appears to be emerging as a serious global issue. In this pre-organized session, we bring together scholars researching the intersection of housing justice and climate justice in Asia, Latin America and the U.S.

Objectives:

- Explore the nexus between housing injustice and climate injustice
- Learn how policies are interconnected - housing policies and policies of adaptation to climate change
- Learn how communities respond to housing and climate injustice

### **MOVING TO "SAFETY": AN EXPLORATION OF THE IMPACTS OF RISK AND SAFETY FRAMING ON THE RELOCATION OF INFORMAL COMMUNITIES IN PUERTO RICO**

Abstract ID: 120

Abstract within Pre-Organized Session 95

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The Caribbean region is known to be particularly vulnerable to the effects of climate change and environmental hazards. To deal with the many risks impacting communities, retreat and relocation initiatives are frequently presented as potential adaptation strategies to use in mitigating the threats associated with living in these hazardous areas (Hino, Field, & Mach, 2017). However, despite the positive benefits of using these strategies to mitigate environmental threats, the relocation of communities can present additional issues. Studies note that risk exposure is not necessarily reduced by relocation and has at times been found to result in potential increases in community vulnerabilities (Nalau & Handmer, 2018). For instance, relatively higher ground areas could be considered safer than low-lying coastal lands, but as meteorological events intensify over time, they frequently become more vulnerable to tropical cyclone impacts like heavy rainfalls, wind damage, and in-land flooding. Factors such as these make it important to consider the diversity of risks impacting the decision-making process surrounding retreat and relocation initiatives.

When considering planning for informal settlements, additional challenges and concerns further complicate relocation efforts. In addition, to facing exclusion from formal planning and decision-making processes, informal communities are known to be frequently located in areas with high exposure to risk (Yarina, Mazereeuw, & Ovalles, 2019). As part of efforts towards addressing these dynamics, relocation is often presented as a planning strategy for risk management in informal communities. Relocation initiatives may be justified for a variety of reasons, including addressing inadequate housing and overcrowding, dealing with public health concerns, or as part of disaster induced displacement measures. These dynamics are well highlighted by exploring the relocation and resettlement of informal communities in Puerto Rico. Since as early as the 1970s, local municipalities in Puerto Rico have been actively involved in efforts to relocate informal communities across the island. These activities have been motivated by a variety of interests, including urban renewal, hazard exposure, public health concerns, and new development investments. Furthermore, devastation brought about by Hurricane María and more recent hurricanes have continued to highlight how climate and hazard issues impact informal areas, leading to renewed interests in advancing mitigation efforts. Thus, despite the potential benefits of this hazard mitigation approach, the relocation of these communities opens up questions surrounding the larger decision-making and resettlement process and broader risk exposure of informal communities.

In this study, we assess these dynamics through a qualitative assessment of the relocation and resettlement of informal communities in Puerto Rico. Our data collection efforts center on (1) in-depth semi-structured interviews with local public officials, planners, and other contextual experts; (2) focus groups with community leaders; and (3) hazard risk assessments. Our findings highlight the critical role risk and safety framings play in the decision-making surrounding relocation and retreat activities across the island. The results of this research aim to contribute to discussions surrounding the equitable implementation of hazard mitigation and planning efforts in informal and vulnerable communities.

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Key Words: informal communities, relocation, resettlement, managed retreat, environmental hazards

#### **REFRAMING CLIMATE JUSTICE IN SANTIAGO DE CALI: A COMPARATIVE STUDY OF RESISTANCE TO CLIMATE RELOCATIONS IN AFRO-COLOMBIAN COMMUNITIES**

Abstract ID: 477

Abstract within Pre-Organized Session 95

SARMIENTO, Hugo [University of Illinois at Urbana-Champaign] hugos@illinois.edu, presenting author

In 2012 Colombia created the Fondo Adaptacion (Adaptation Fund in English) to finance climate adaptation projects including the reinforcement of protective infrastructure and the construction of new housing for communities vulnerable to climate-related floods and landslides. The Adaptation Fund has partnered with the City of Santiago de Cali to reinforce the city's flood protection system and to construct social housing for residents at risk of displacement caused by the increasingly frequent and intense flooding. This project, called Proyecto Plan Jarillon, involves the relocation of nearly 9,000 households who live in the informal settlements which line the banks of the Cauca River. Afro-Colombian residents, who constitute over 30% of the city's population and who have historically

been racially excluded and segregated from the formal housing market, are disproportionately represented in these informal settlements.

Based on three years of fieldwork in Colombia, this comparative study considers the counter-planning efforts of two Afro-Colombian communities, Brisas del Cuaca and Playa Renaciente, to resist state-led displacement and to negotiate their participation in the relocation project. The study finds these communities strategically mobilize their Afro-Colombian identity to make claims, namely to territorial sovereignty and the capacity to adapt to the river's changing flood patterns as a consequence of climate change. This social and cultural mobilization forms the basis for demanding larger housing subsidies and certain modes of relocation such as collective, community-based relocations to more centrally located parts of the city.

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Key Words: Climate justice

### THE LIVED EXPERIENCE OF RISK AND TRAJECTORIES OF CLIMATE-INDUCED DISPLACEMENTS AND RELOCATIONS

Abstract ID: 478

Abstract within Pre-Organized Session 95

BALACHANDRAN, Balakrishnan [University of Illinois at Urbana Champaign] bbalach2@illinois.edu, presenting author

Millions of people live in risk-prone locations and their exposure is increasing with climate change. Disasters displace such people (Esnard 2014). To reduce losses in future disasters, governments frame policies to disincentivize housing in at-risk areas, and to incentivize preemptive/post-disaster relocation to safer places. Studies in planning use technical and spatial analyses to assess land use policies and relocation as a means to reduce risk (Araki, Hokugo, and Masuda 2017; Correa 2011). However, policies favoring relocation often meet with resistance and fail to achieve their objective. Researchers in anthropology, sociology, and geography have shown how relocation disrupts communities' relationship to place (Oliver-Smith 1990; Jenkins, Stukes, and Phillips 2012). Despite these close links to place, despite resistance to policies favoring relocation, despite initiatives to build resilience and adapt to climate change, displacement and relocation are ongoing phenomena in many regions experiencing significant environmental change. To explain this seeming contradiction, my paper examines multiple forms of displacement – social, economic and physical – and charts out the complex trajectories of displacement that people experience. I show that these trajectories, involving several types of displacement, unfold in the intersection between housing (in)justice and environmental (in)justice.

I carried out qualitative research in coastal Louisiana, a region exposed to hurricanes, flooding, land subsidence and ecological destruction. Here, displacement and relocation result from land loss and decline in nature-based livelihoods, within a context of historical racial injustice and wealth disparity, fuelled by oil exploration and industrial development. Thousands have already been forced to relocate. People in many at-risk communities need to move but don't have the resources to move, a result of generations of wealth disparity. In contrast, several families on the Isle de Jean Charles have a fully funded opportunity to move but don't wish to move. The history of racial discrimination has also created a trust deficit that makes people look at government-driven programs with suspicion as to their true intent.

I interviewed members of vulnerable communities including a Native American tribe to understand their lived



experience of risk. I carried out participant observation, embedded in a planning team conducting community meetings and non-participant observation in the social life of the community. Through these interviews as well as formal and informal interactions, I tease out complex trajectories of social, economic and physical displacement.

My research shows that policies related to housing, land use planning and risk reduction complicate the decision processes of affected people in terms of their perception of options available to them. In some cases, it stops them from moving to safety, trapping them in their circumstances. In other cases, they hold out till they are finally, irrevocably displaced by disaster. In yet others, they take the option of moving, either for safety or to fulfill other aspirations. Those who make the move sometimes suffer other forms of displacement such as loss of livelihood, disruption in social networks a lowered sense of well-being.

Based on the findings from my research, I make a case for a more nuanced understanding of, and approach to, processes of housing and adaptation in at-risk communities. Housing policies as well as policies for building resilience and adapting to climate change need to be sensitive to the lived experience of risk and consider how the policy impacts people in various life situations. These policies need to respond to the multiple dimensions of displacement, not just physical relocation. My findings primarily inform planning practice, specifically in relation to policy formulation for resilience, adaptation and housing for low-income vulnerable communities in at-risk locations.

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Key Words: climate-induced displacement, relocation, climate change adaptation, housing justice, environmental justice

#### THE INFORMALITY OF CLIMATE IN A GLOBAL SOUTH CITY

Abstract ID: 479

Abstract within Pre-Organized Session 95

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More than 2.2 million people, in the government's conservative estimates, endure persistent housing precarity in the informal settlements of Bangladesh (BBS, 2014). Climate-induced displacement, which has already displaced more than 6 million people in Bangladesh, will continue to push low-income communities to adapt-by-migrating to the expanding urbanizing centers where migrants make homes in hazardous and tenure-insecure settlements (Displacement Solutions, 2012). In these often low-lying settlements, low-income communities face other risks of

climate change—extreme heat or cold, and erratic rainfall leading to flooding. In the informal settlements, the demands of displaced climate "refugees" and informal settlement dwellers converge in their demand for the right to secure housing. But this converging demand is yet not recognized in the policies and governing practices that make informal settlement dwellers invisible. How do we explain this significant mismatch between urban and climate governance? The scholarly literature, to our knowledge, at the intersection of climate and housing justice is recently growing. Particularly in global south contexts, the climate/housing literature requires more in-depth engagement with urban informality in order to guide policy and interventions (Chu & Michael, 2019; Dodman, Archer & Satterthwaite, 2019). We join this conversation by building on our ongoing engaged research in the informal settlements of Dhaka, Bangladesh. Despite the Bangladeshi government's commitment to provide secure housing in the Sustainable Development Goals, informal settlement dwellers continue to face evictions. At the same time, the government has made national level plans for climate change adaptation and has taken a moral leadership in the international sphere. But the climate-displaced find little support or stability in their destination urban centers. We will argue that the same people—climate-displaced and living under regimes of evictions—fall through the cracks of policies and laws crafted at the national and urban scales. We see a gap between urban citizenship and national citizenship that is untenable on the ground, but which the government continues to leverage to abandon their responsibility towards the displaced and precariously-housed people. In Bangladesh, housing and climate injustices persist through maintaining an instrumental separation between urban and national scales across policies and legal approaches, where the state can ignore its responsibilities towards displaced climate migrants in the city while engaging in rural policies for climate adaptation and participating in an international moral discourse of sovereign victimhood. The findings of our research will propose just pathways for both climate adaptation plans as well as resettlement plans for the urban informal settlement dwellers.

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Key Words: Climate Justice, Urban Informality, Global South, Housing Justice

#### **REBUILDING COMMUNITIES: TRENDS IN AFFORDABLE HOUSING PRODUCTION THROUGH MAINSTREAM HOUSING POLICY INTERVENTIONS IN THE GULF COAST.**

Abstract ID: 480

Abstract within Pre-Organized Session 95

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Low-income and racially marginalized community groups are disproportionately affected by displacements and exacerbated housing instability in the aftermath of natural disasters (Belkhir & Charlemaïne, 2007; Durant & Sultan, 2008). Neighborhood disinvestment and fragmented housing rehabilitation strategies along with repeated onslaught of disasters lead to declining community structures and extreme economic segregation (Billiot et al., 2019). Post-disaster recovery and rehabilitation processes have their own timelines, trade-offs and political limitations (Gotham, 2014). As a result, regions at risk of climate change impact in the United States have been grappling with an acute affordable housing crisis and the inevitable reproduction of class and structural inequalities (Gotham, 2014; Rodriguez, 2019). In response, post-disaster recovery can benefit from mainstream federal and state housing programs that encourage the supply of affordable housing, enabling choice and residential mobility

for households confronting multiple risks associated with poverty, racial marginalization, place stratification and climate change induced vulnerability (Morris & Diaz, 2020). The mainstream programs along with a supportive local housing policy environment can improve vulnerable communities' chances at recreating social capital, community life and long-term socio-economic recovery. However, there is little regional research on how production of housing stock through mainstream housing policy interventions have supported community rebuilding efforts over time. This paper seeks to address this gap our knowledge.

In this study I analyze trends in production and preservation of affordable housing stock in communities at risk of sea-level rise, storm surge and inundation in the Gulf Coast of the United States. I provide a regional assessment of changing diversity of housing typologies using publicly available datasets. Using the National Housing Preservation Database (NHPD), I describe temporal changes in the production of affordable housing through the Low-Income Housing Tax Credit (LIHTC) program and nine other federally subsidized rental housing programs in the coastal and adjoining in-land communities in the five states of Texas, Louisiana, Mississippi, Alabama and Florida. I assess loss and production of housing stock in the past three decades, focusing on variations across communities with differential Social Vulnerability (Cutter et al., 2003; Cutts et al., 2018). I substantiate these assessments with an analysis of locally adopted housing programs through a study of policy documents of jurisdictions in the region. The production of affordable housing through these programs and local policy adoption serve as useful proxies for determining interest and readiness in supporting housing access for vulnerable community groups. The findings of this research contribute to the ongoing efforts in community organizing, activism and lobbying for planning interventions in the pursuit of housing justice in at-risk and receiving communities of the Gulf Coast.

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Key Words: Housing justice, Affordable housing policy, Climate change adaptation, Community development, Disaster recovery

### 7.132 PRE-ORGANIZED SESSION - INFRASTRUCTURE PLANNING AND INTERNATIONAL FINANCING IN THE GLOBAL SOUTH

Pre-Organized Session 132 - Summary  
Session Includes 823, 824, 825

CRUXEN, Isadora [Massachusetts Institute of Technology] [cruxen@mit.edu](mailto:cruxen@mit.edu), organizer

This session explores the financing and governance of infrastructure development projects in the Global South. Scholarship on the relationship between infrastructure and spatial planning in the past decade has largely been framed around problematizing neoliberal urban policies and “sustainability” in the Global North. Instead, this panel

brings together a collection of papers that seek to: 1) shift away from the debates on neoliberal governance and the legacy of economic restructuring in the 1980-90s to gain insight into emerging models of international infrastructure financing and planning in the South; 2) examine distinct spatialities of infrastructure planning; 3) draw attention to the role of state and non-state actors—not simply financing instruments—in shaping the governance of infrastructure. Networks of actors influence the spatial geography of infrastructure, access to goods and services, and the distribution of risks and benefits across projects at different scales. Papers presented address how these rationales influence environmental governance, regional planning, the financialization of utility investments, and urban governance.

Objectives:

- Understand emerging forms of infrastructure financing and its impact on planning practices in the Global South

## **RESCALING THE PLAYING FIELD: FINANCIALIZATION AND THE GOVERNANCE OF PRIVATE INFRASTRUCTURE SERVICE DELIVERY**

Abstract ID: 823

Abstract within Pre-Organized Session 132

CRUXEN, Isadora [Massachusetts Institute of Technology] cruxen@mit.edu, presenting author

Political economy scholarship on the rise of finance, both in urban governance and in international development, typically casts financial capital as a beneficiary of the risk-mitigation, institution building, or entrepreneurial efforts of other actors, especially the state. In Western cities, local government strategies to raise capital and spur growth through debt security instruments or public-private partnerships have been described as forms of financialized urban development or municipal entrepreneurialism that are re-centering urban politics around “debt-machine dynamics.”[i] Within the realm of development, scholars have noted that multilateral development institutions are working with national and local governments to “derisk” development projects for investors[ii] as part of an emerging “Wall Street Consensus”[iii] that sees global finance as central to the achievement of the Sustainable Development Goals (SDGs). Under these lenses, finance appears as both a bystander and legatee, relatively removed from the on-the-ground politics of making financialization happen.

In this paper, by contrast, I propose that financial investors can be key agents of political and institutional change in the governance of urban infrastructure development and service delivery. Through a historical analysis of private participation in water and sanitation provision in Brazilian cities, I reveal a dynamic in which financialization is occurring not simply within but across cities through changes in business organization. Within the past two decades, a handful of holding firms took control of this market, together managing nearly 90% of service contracts with the private sector. While these companies used to share a common DNA—ownership and control by family-owned, domestic business groups specialized in construction—three of the largest holdings were recently acquired by financial investors such as private equity funds. I show that these shifts in business ownership have produced a new financialized political economy of service delivery centered on side-stepping local politics and advocating for the upward rescaling of contractual and regulatory arrangements.

Under the ownership of construction business groups, private providers were highly locally embedded: they maintained close ties to public officials and afforded their subsidiaries decision-making autonomy and flexibility. These strategies were deemed necessary for handling “the follies of the mayors”—a common, I observed, and jocose way in which professionals in the sector referred to the vacillating demands of local elected officials. Once financial investors stepped in, accompanied by stricter corporate governance rules, they sought to change the playing field. To alleviate local political risk and facilitate market growth, firms centralized organizational decision-making and successfully lobbied federal policy-makers for legal and regulatory changes that standardized regulatory norms at the national level and created incentives for the development of regional service provision arrangements

encompassing several municipalities.

My analysis builds on two years of fieldwork (including two months as an intern, in 2019, at a prominent private consultancy firm), more than eighty interviews, analysis of company documents and news media, and a novel dataset I constructed on public-private contractual relationships for water and sanitation provision in Brazil between 1994–2019. The paper contributes to a still incipient literature on the inner-workings and political effects of financialization for urban infrastructure development outside of traditional investment geographies in the Global North. It also underscores the importance of disaggregating monolithic treatments of private capital to explore the role of investor heterogeneity and business politics in the governance of service delivery.

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Key Words: finance, urban governance, service delivery, sanitation, Brazil

#### **FROM INDUSTRIAL ESTATES TO SMART CITIES: REGIONAL PLANNING AND INFRASTRUCTURAL FINANCING ALONG THAILAND’S EASTERN SEABOARD**

Abstract ID: 824

Abstract within Pre-Organized Session 132

TANG, Dorothy [Massachusetts Institute of Technology] [dstang@mit.edu](mailto:dstang@mit.edu), presenting author

Global infrastructure-led development has garnered much scholarly and media attention since the financial crisis of 2008 (Dodson 2017) and the geopolitical tensions due to China’s increasing economic and political influence. The Belt and Road Initiative (BRI) is President Xi Jinping’s signature foreign policy approach and is loosely used as framework for bilateral cooperation through resource extraction and infrastructure financing. In conjunction with prior Chinese foreign policies since the early 2000s, analysts characterize the BRI as an effort to export excess capital and infrastructural capacity to maintain its own economic growth (Bach 2016). During this time, Chinese capital—in a variety of forms from state capital to private investments—have played a significant role in shaping infrastructure and urban development in Southeast Asia. However, this Chinese capital does not land on a blank slate for development and must negotiate with a long history of Japanese intervention in Southeast Asia. This paper compares two regional planning efforts along Thailand’s Eastern Seaboard: the Japanese financed Eastern Seaboard Development Plan from the 1980s and the more recent Eastern Economic Corridor Plan of 2018 which has attracted significant Chinese investments. Drawing from planning documents for the region produced by Thai and Japanese institutions since the 1970s and field observations of Chinese investments since 2019, this paper asks how competing geo-economic interests of Japan and China have influenced spatial planning efforts.

Since the 1970s, the Japanese International Cooperation Agency (JICA) has provided technical assistance and financing for the planning of Thailand’s industrial development and infrastructure with the express aim of exporting excess Japanese industrial capacity to Southeast Asia. The result of these efforts was a robust system of industrial estates and infrastructure projects throughout the country, culminating in the Eastern Seaboard Development Plan—a regional plan spanning three provinces along the Gulf of Thailand. The Eastern Seaboard Development Plan included major highways connected to Bangkok, two industrial ports, and major investments in the petrochemical industry and automobile industry. Industrial estates, both state-operated and private, are the nucleus for industrial clusters and urban development. In 2018, Thailand’s military government passed new national legislation for the

establishment of the Eastern Economic Corridor (EEC) to reinvigorate the aging industrial region. Public investment in the EEC include upgrades to a local airport, expansion of both industrial ports, highway upgrades, and the planning of various “smart city” hubs throughout the region over the course of 20 years. Chinese financing of critical infrastructure in the EEC, especially in port facilities and telecommunications, plays an important role in the future success for the region. However, my research finds that in contrast to media portrayals of geopolitical competition, Chinese financing is embedded in a larger international network of planning expertise and ambitions. Thai planners, Singaporean urban designers, Japanese Engineers and Chinese entrepreneurs all contribute to diverse and complex urban spaces and infrastructural plans for the EEC. Additionally, state and non-state Chinese actors actively collaborate with other agents, including institutions like JICA and the World Bank, to finance and implement infrastructural projects, complicating the simplistic narrative of Chinese hegemony in the region.

These findings suggest that the polarized political ideologies that produced cold-war era models of infrastructural development is no longer a viable framework to understand the geopolitics of contemporary infrastructure planning practices. By comparing the politics of the Eastern Seaboard Development Plan with the Eastern Economic Corridor in Thailand, I conclude that geopolitics is not a sufficient framework for analysis and one must consider additional agents and actors in infrastructural planning.

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Key Words: Infrastructure, Thailand, Geopolitics, Regional Planning

#### **PATTERNS IN CLIMATE FINANCE INFRASTRUCTURE PROJECTS, SAFEGUARDS, AND EMERGING MODELS OF PARTICIPATION**

Abstract ID: 825

Abstract within Pre-Organized Session 132

HARRINGTON, Elise [University of Minnesota] [eliseh@umn.edu](mailto:eliseh@umn.edu), presenting author

Since the 1990s, finance has been a critical outcome of international agreements (environmental and climate) to support environmental protection, infrastructure, and development goals. The Global Environment Facility started in 1994 with the United Nations Framework Convention on Climate Change, with subsequent funds established with Kyoto Protocol in 2001 (Special Climate Change Fund, Least Developed Countries Fund, and the Adaptation Fund), the Climate Investment Funds, and at the 2010 Conference of Parties (COP 16, Green Climate Fund). First, this paper examines distribution of climate funds to support infrastructure projects in sub-Saharan Africa using OECD DAC External Development Finance Statistics and project tracked by the Climate Funds Update. For example, the Global Environment Facility has a long history of investing in a wide range of infrastructure projects, including clean energy projects, and the newer Green Climate Fund investing in among other infrastructure projects, startups focused on new, distributed solar technologies (e.g., KawiSafi Ventures). Second, I trace what safeguards exist for environmental and social impacts associated with different financing mechanisms over time; what accountability mechanisms exist to support the implementation of funded infrastructure projects. Third, I examine the more recent approach of “devolved” climate finance that aims to incorporate more local planning and policy considerations in climate finance projects in East and West Africa. Broadly this paper examines the configuration of climate financed infrastructure projects and how effectively climate finance instruments are achieving safeguards

and promoting participation in tandem with infrastructure development.

Infrastructure provides an avenue for planning to engage in critical policy areas, such as energy, technology, and the interdependence between planning and infrastructure is a critical arena for exploring the impacts of technological change and innovation (Neuman and Smith 2010). Devolved climate finance has the potential to examine participation in climate finance infrastructure projects, aligned with conversations in the US about participation in green infrastructure policy (Goh 2020). The effort to promote devolved climate finance in the Global South has the potential to respond more effectively to local knowledge, community needs, and marginalized populations through community-based approaches (Hesse 2017) and extend infrastructure investment to not only address climate mitigation but adaptation and resilience.

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Key Words: infrastructure, clean energy, finance

## **ROUNDTABLES**

### **7.381 ROUNDTABLE - EXPANDING URBAN INFRASTRUCTURE FINANCE: A NEGLECTED FOUNDATION OF SUSTAINABLE DEVELOPMENT PLANNING**

Abstract ID: 381

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The adoption of the Sustainable Development Goals (SDGs) in 2015 and subsequent approval of the Paris Agreement, the New Urban Agenda, and the Addis Ababa Action Agenda signal a broad global commitment to sustainable development. Infrastructure is a major element for implementing many of the SDGs and for dealing with a range of pressing global agendas--climate change, energy shortages, food insecurity, and health crises (including the COVID-19 pandemic), among others. Deficiencies in infrastructure coverage and quality are particularly severe in low- and middle-income countries.]The role of urban governments and their options to secure and manage development finance has not received the level of attention it deserves, including among urban planners engaged in prioritizing infrastructure investments

The role of urban governments as key players in sustainable development and urban infrastructure and services was a primary focus of Habitat III and the New Urban Agenda. Many wealthier countries rely on cities for managing major public functions and investments to a much greater extent than middle- and low-income countries. Subnational government investment as a share of total public investment (in a sample of 99 countries across the

income spectrum) averages 36.6%, ranging from 43% in high-income countries to only 12.9% in low-income countries. Demands for infrastructure will only intensify in the coming decades as global population growth--from around 7 to more than 9 billion by 2050--will be largely absorbed in urban areas, with urbanization rates expected to approach 85% in industrialized and 64% in developing countries.

Addressing infrastructure gaps in poorer countries will require enormous planning and investment in the coming decades, much of it in sectors for which urban governments do or could bear substantial responsibility. Urban governments need to be key players in formulating and executing integrated development plans that meet the specific infrastructure and service delivery needs of their constituents and to do this in a way that promotes more inclusive decision-making and more equitable outcomes. These efforts require careful consideration of how to finance both the infrastructure investment and the operation and maintenance expenses of completed facilities.

Despite the recognized value of a stronger urban role in public investment in developing countries, progress has been slow. The challenges are well known, especially in low-income countries. Public finances, including development aid, are inadequate and volatile, and financial markets are still maturing and remain inaccessible to many urban governments. Equally important, despite official decentralization in many lower-income countries, poor linkages between planning and budgeting, underdeveloped intergovernmental fiscal systems, and governance and accountability weaknesses pose daunting challenges. Not enough cities have adopted measures they might take independently even given constraints imposed by national policies. Further, international financial institutions have no mandate to lend to local governments. Political economy realities underlie many of these weaknesses, so that careful analysis of their nature and effects is needed to determine how reform-minded actors might deal with them.

This roundtable will consider the following questions:

What is the status of efforts to better link urban planning to finance so as to support building infrastructure that supports sustainable development?

What specific types of reforms and innovations are being pursued or piloted—by international organizations, national governments and urban governments--to increase access to development finance in often challenging environments?

How can planning academics and practitioners contribute to the research and action needed to improve development finance for more effective urban planning and sustainable development?

This panel brings together planning academics and practitioners from government and major development organizations who have been working on these issues to share their ideas, findings and experiences. Brief comments from the panelists will be used to generate a robust discussion among the roundtable participants.

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Key Words: sustainable urban development, urban infrastructure, urban finance



## **INDIVIDUAL PAPER SUBMISSIONS**

### **THE ISSUE OF AFFORDABILITY IN HOUSING AND IMPLICATIONS FOR THE REGIONAL PLANNING OF DRAINAGE INFRASTRUCTURE: A CASE OF AFFORDABILITY AS PART OF INCLUSIVE DECISION MAKING**

Abstract ID: 39

Individual Paper Submission

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Cities are growing at unprecedented levels. Meanwhile, governments in the Global South are already overwhelmed by this growth and are unable to provide infrastructure proactively as expected. As a result, urban residents resort to providing their own infrastructure such as drainage systems as part of self-built housing development. Their small-scale incremental housing practices, which often represent formation of dense and diverse housing types, styles and ages, have been identified to affect planning of drainage systems at the regional-scale. Such developments reflect the varied affordable responses as part of a collective effort to curb regional problems, specifically flooding in this case. However, while some are included in this collective action, others are excluded as they are unable to afford to be included. This phenomenon, in addition to the formation of new autonomous localities, has led to challenges in mitigating flooding and has affected resilience to climate change.

Using a qualitative approach, this paper explores how the mismatch between housing development which occurs at an individual scale and drainage infrastructure which is provided at a regional scale, affects a regional effort to mitigate flooding in Tema, Ghana. It seeks to explore and reveal a relationship between affordability and inclusiveness.

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Key Words: Climate change, Affordability, Inclusivity, Equity, Regionalism

### **PLANNING PRACTICE IN MEXICO: ARE THERE SIMILARITIES WITH OTHER PLANNING SYSTEMS?**

Abstract ID: 51

Individual Paper Submission

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This study addresses two basic questions: What Mexican planners do? Is planning practice in Mexico different from other planning systems? The questions are relevant not only from a perspective of understanding planning practice in other context, but also from a comparative perspective. It is important to know whether there are commonalities in the planning practice across systems.

This comparison and reflection on planning practice has important theoretical implications. Understanding professional practice is a way not only to test theories, but also being able to assess the kind of knowledges, skills, and abilities (KSA) that the profession demands. The objective of this article is precisely to study professional practice or the demand side of planning to learn what type of KSA are more relevant, valued, and used more often. The grand debate currently in planning theory is whether communicative planning has consolidated and replaced rational planning. This article demonstrates that rational-technical or “knowledge in action” is still relevant in the Mexican case; however, “communicative work” appears to become relevant, particularly, among directors or senior planners (Healey. 1992). The planning profession valued higher general planning knowledge instead of very specialized skills. Finally, the study show that ethics, values, and social justice are dimensions of planning practice that are overlooked by Mexican planners.

The analysis of planning practice in this article is based on a survey of 141 planning practitioners in Mexico. The survey design and questions employed were based on the dimensions of what the planning profession is according to the American Institute of Certified Planners (AICP) and the Planning Accreditation Board (PAB) of the American Collegiate Schools of Planning (ACSP). These instruments provide a general and comprehensive guide of knowledge, skills, and values that define the profession and planning practice that can be used as benchmark to study other contexts. The dimensions of practice taken into consideration deal with plan making and implementation, functional areas of practice, knowledge and abilities, and ethics and values.

This study is based on a quantitative methodology using a standardized questionnaire. The questionnaire was organized into nine sections. The first section focused on gather information about the professional background and credentials of the respondent. The second section capture the work history and experience as a planner of the person. From the third to sixth section the respondent was inquired regarding the knowledge, skills, values and the field or planning specialization that practice. The last sections were more focused on evaluating the role actors or stakeholders, that in the view of the respondent, have the more influence in the elaboration and implementation of the plan; also, those whose knowledge have more input in the elaboration e implementation of the plan.

This study shows that when assessing planning practice, it is important to differentiate and understand that roles and functions vary according to the rank or position in the organization. The findings showed that when analyzing KSA between planners in a directive position versus the rest of the planning staff we obtain completely different stories. As a matter of fact, the findings demonstrated that directors or senior planners are more engaged in “communicative work” rather than “knowledge in action” functions dealing with data gathering and analysis, plan review, norms, etcetera (Healey, 1992). In other words, what planners do is dependent upon their position in the organization that determines some of the role and function that they performed; planning organizations at the end of the day are still being bureaucracies that respond to the Weberian logic of hierarchical organizations with differentiated functions among their members.

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Key Words: Planning practice, planning demand, planning supply, Planning Mexico, Planning systems

## ACHIEVING CLIMATE JUSTICE WITH FLOODPROOF DESIGN POLICIES

Abstract ID: 73

Individual Paper Submission

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As urban areas face a notable rise in flood-related casualties and economic losses due to climate change, academics and practitioners increasingly advocate applying the strategy of managed retreat. In the Global North, retreat programs typically involve the relocation of structures to areas of lower flood risk, often through buyouts, land use and zoning changes, as well as design-based techniques. However, in the Global South, national governments, development banks, and other knowledge brokers overwhelmingly employ retreat to relocate people to ostensibly lower-risk areas, which disproportionately affects informal settlers lacking legal land tenure. Over the last three decades, these relocation efforts targeted at least 1.3 million residents worldwide, often employing coercive tactics through eviction and demolition, de-prioritizing economic security, offering inadequate safeguards for resettlement, and in fact heightening the flood risks borne by the most vulnerable groups. My study therefore investigates why governments in the Global South – particularly the Philippines – favor the relocation approach to retreat, rather than a floodproof design approach.

To uncover the dominant beliefs and practices of actors involved in key state-supported relocation and community upgrade programs in the Philippines, I employ text analysis and multi-stakeholder interviews. By examining local and national agency eviction records, in addition to planning documents for approved and rejected upgrade projects, I select two project sites situated in different Metro Manila locales as case studies for examining how the retreat process plays out on the ground. I conduct roughly 30 semi-structured, virtual interviews between April and August 2021 to discuss considerations and challenges for both upgrading and relocation at selected project sites. Informants, selected through snowball sample, include: state and local planners, contracted consultants, public and private engineers and architects, community organizations, homeowner associations, and project financiers. I will also analyze text from official flood and housing project documents, land use plans, building code regulations, and media reports to inform my lines of inquiry and corroborate informant claims.

My study's initial results suggest that state and non-state institutional protocols and tools feature pro-relocation assumptions, which reinforce two dominant stakeholder views - that informally settled land should be used differently and that resettlement practices will undoubtedly improve the safety of settlers. As such, these results begin to detail the key factors and processes enabling the state to conduct mass evictions in the name of flood protection. However, the stakeholders engaged in state-supported retreat projects – who I interviewed – would likely support the adoption of land use and design-based strategies for retreat if they had more demonstrated evidence of feasibility, clearer guidance, and more targeted funding. These prerequisite elements would support strategies such as: setting back or realigning land claims, elevating structures off the ground, adding more floors, arranging rooms to accept occasional flows of water, using more durable building materials, and making vegetative landscape improvements. Planning scholars and practitioners can therefore use this study to selectively facilitate more diverse, indigenously-sourced floodproof designs as a more climate-just alternative to relocation approaches. Rather than approaching retreat as an exercise for relocating people, stakeholders throughout the Global South should consider incorporating more land use and design considerations – when feasible – to ensure that residents can safely stay-in-place as long as possible while they plan future movements.

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Key Words: Managed Retreat, Floodproof Design, Resettlement, Climate Justice, Philippines

## EVALUATING THE INDUSTRIAL AND SPATIAL INTERDEPENDENCE IN CHINA'S GREATER BAY AREA

Abstract ID: 126

Individual Paper Submission

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Although it is generally understood that industrial agglomeration has a linkage with regional economic growth, little attention was paid to the understanding of the industrial and spatial interdependence, especially measured at the city-level in a context of a megaregion that involves complex supply chains (intra-industry and inter-industry) covering both domestic and cross-border trade flows. To address this issue, this study evaluates the cross-border and intercity trade relations using the Guangdong-Hong Kong-Macau Greater Bay Area (GBA) in China as an example. The objective is to examine what are the key industrial linkages across cities and to what extent they may influence regional economic growth.

The question was investigated using a multi-regional input-output model (MRIO), which was developed based on city-level data for the year 2012 from the Eora26 database (Wang et al., 2017). The model was also expanded based on Cooper's method (Cooper, 2000), which allows us to examine the relative importance of value-added trade chains in GBA. Compared with previous studies (Polenske and Hewings, 2004; Wixted and Cooper, 2007), our analysis has the following two research highlights. First, the model helps us to identify the relative importance of various trade chains in GBA based on indirect value-added metrics. Second, given that the different relationships, such as the cross-border and intra- and inter-industrial dependency, were captured in the analytical framework, the model enables us to have a clear understanding of the impact of the GBA development strategy on industrial development disparity both within and among cities. Through the examination of the level of specialization in the indirect value-added flows of each city, our assessment reveals that during the early stage of GBA's development, cities such as Zhongshan presented a significant trade dependence with Macau and other GBA cities primarily in the first and secondary industries. Hong Kong was found to have the closest industrial connection with cities such as Foshan, Macau and Guangzhou, particularly in wholesale, retail trade, agriculture and manufacture sectors. In contrast, the industrial dependence of Shenzhen on other GBA cities was found to be relatively low, which suggests that the economic growth in Shenzhen tends to be dependent on external trade outside of the GBA. Such an outcome also confirms that Shenzhen, as the innovation and high-tech oriented city, presents a distinctive industrial feature than that of other GBA cities, which is consistent with Saxenian (2007)'s early observation on southern China.

Overall, the developed modeling framework provides an important tool for researchers to evaluate the effect of industrial and spatial interdependence on regional economic growth. It offers new insights to decision-makers to develop sound planning and policy strategies to achieve a coordinated regional development through the understanding of the potential disparity of industrial fragmentation and dependency.

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Key Words: Greater Bay Area (GBA), multi-regional input-output model (MRIO), spatial trade interdependence, industry cluster

## FROM THE MIDDLE-CLASS POINT OF VIEW AFTER FIVE YEARS: A FOCUS GROUP ANALYSIS OF THE URBAN LEGACY OF THE RIO DE JANEIRO 2016 OLYMPIC GAMES

Abstract ID: 252

Individual Paper Submission

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Since the turn of the twenty-first century, sport mega-events' legacy has become an interesting topic among tourism and sport management scholars, sociologists, political scientists, and environmentalists. Beginning with the Japan/South Korea 2002 FIFA World Cup when the hosts took advantage of the most-watched sporting event to renovate urban infrastructure and rebrand themselves as the new competitors of European/American cities, various legacies of sport mega-events have become the main reason why developing countries bid to host the Olympics Games and the FIFA World Cup. Despite the increasing importance and impacts of sport mega-events on cities and urban residents, urban planners have not paid warranted attention to the mid-and long-term legacy outcomes of the games on cities, especially in developing countries.

"Um Mundo Novo" (A New World) was the slogan of the 2016 Rio de Janeiro Olympic Games, representing a promising image of Rio to the world. While developers and business owners, authorities, and mainstream media spread an inspiring and celebratory portrait of achievements for the whole city, country, and even the continent, critics, especially journalists, political and environmental activists, and researchers have heavily questioned the utopian representation of this mega-event. Focusing on the dark consequences of the government's physical and economic interventions, namely the displacement of the poor, the critics have mostly depicted a dystopian vision of the Rio Olympic Games' tangible and intangible legacies, like those of the 2010 FIFA World Cup in South Africa.

Acknowledging the findings of several studies on the negative impacts of the 2016 Olympics on the residents of favelas and other low-income inhabitants of Rio de Janeiro, this paper aims at filling the research gap between their pessimistic narratives and the hopeful prospects represented by the authorities. Following a qualitative approach, this study interprets the arguments and discussions resulting from several focus groups that consist of the middle-class residents of Rio de Janeiro who shape most of the city's population. Moreover, while most publications are conducted before, during, and immediately after the Games, this paper opens a new perspective toward a better understanding of the urban impacts of the 2016 Olympic Games after five years. This five-year evaluation of sectoral legacies, including employment, social inequalities, urban mobility, etc., also constitutes a subjective context for a

purposeful analysis of city-event transactions in incoming mega-events like the 2022 Qatar World Cup and even the 2026 FIFA World Cup in the USA, Mexico, and Canada.

There are two alternative hypotheses for this research, each of which could demand a distinct approach toward hosting the Games in different cities. The high or acceptable level of satisfaction of the middle-class with the Games indicates that hosting sport mega-events is still a positive step toward improving the urban environment and providing advantages for most residents. However, the discrimination of the poor's right to the city remains a significant challenge that must be eliminated through inclusive strategies and urban policies. The low level of satisfaction of Rio's middle-class after five years, on the other hand, demonstrates that sporting mega-events at their current scale and apparatus are only in favor of the political interests of a few and economic goals of a limited number of international and national organizations and companies. In this case, to justify the hosting of competitions by developing and even developed cities, it is necessary to restore the existential and inherent value of these events and reconstruct their twentieth-century form when building a peaceful and better world for all was the primary goal.

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Key Words: urban legacy, mega-events, Rio de Janeiro, middle-class

#### **'WE MUST REMAIN THE PEDESTRIAN SPACE FOR THE PEOPLE TO PASS THROUGH!' URBAN DESIGN IN A SELF-HELP FASHION**

Abstract ID: 289

Individual Paper Submission

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Urban design deals with the production of public spaces, traditionally conceived as a top-down intervention tool. Its practices are often tricky and impeded in urban informal settlements, places lacking equal social rights such as essential public services and amenities due to demographical, environmental, and political instability. Nevertheless, informal settlers are also resilient and tend to stabilize the surrounding physical settings despite different challenges. In many circumstances, the migrants, who come to the cities to earn a living, have to work multiple shifts, endure culture shock, and study political climate to eventually sustain their staying or better mobilize themselves to move up in the social hierarchy. In and between such journeys, different actors formulate and polish the public spaces through their everyday activities. These interactions practically socialize these spaces into urban commons accommodating various social networks. As a result, urban design in informal settlements can be perceived through a bottom-up self-help lens, explicitly showing how public spaces have been planned, constructed, maintained, and even re-planned by the dwellers. This social movement has become the central force of urban shaping within challenging environments across the Global South settlements. We want to know more about the "internal logic" with which the settlements' landscapes have become what they are today.

Here, I ask how the spreading self-help practices along a drainage waterfront have coincided with the accumulative social norms expressed in place. Accordingly, what are the potential ways to categorize the self-help urban design exercises? What types of social norms can be thematically elaborated? How have these dimensions coordinately responded to informal urbanization achieving settlement stabilization and community enhancement? Through field observation and in-depth interviews, I study the self-help cases from an informal settlement in Accra, Ghana, to contextualize how urban design in a self-help fashion has manifested within the settlers' daily public spaces and spontaneously strengthened local social norms. My findings indicate that despite the opportunities of consolidating accessible public areas (open space, playground, and pedestrian) are random and unpredictable, the residents who have been "transformed" via different contingencies are the essential actors sustaining and enhancing the functionalities of these public spaces. The thriving settlements are featured with self-help cases of shaping, maintaining, and reshaping while displaying the divergent social norms of indifference, carefulness, and determinacy. In this vein, I argue that these environments' stabilization needs to first search for ways to ground the people, followed by establishing many small urban spaces that uphold rules, obligations, and operations. More specifically, humanizing the settlements with identity recognition and residence permit is equally essential as delivering physical interventions, including infrastructure and services provision, to provide meaningful settlement planning.

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Key Words: informal settlement, self-help, community building, urban design, Africa

#### NEOLIBERAL PLANNING AND OVERBUILDING IN CHINA: THE ROLE OF THE DETAILED DEVELOPMENT CONTROL PLAN

Abstract ID: 294

Individual Paper Submission

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Neoliberal Planning may be a critical contributor to overbuilding in both China (e.g. Su & Qian, 2020) and beyond (e.g. Kitchin et al., 2012). In China, a wide array of planning practices have been identified in promoting overbuilding, such as master plans, preferential policies, land governance, and public-private partnerships (e.g. Li, 2017; Su & Qian, 2020). Nonetheless, as an essential planning tool that shapes China's land development, the Detailed Development Control Plan (DDCP) has received inadequate attention regarding its interactions with the overbuilding phenomenon in China. Initiated by Chinese local governments, the DDCP stipulates land use types, intensity and spatial relations through detailed control indexes (e.g., building height and density, plot ratio, greening ratio, etc.) and ordinances; thus, the DDCP is a prerequisite for land leasing and significantly affects real estate development outcomes (Wu, 2015). The insufficient studies on the interactions between the DDCP and overbuilding hinder our understanding of the role of planning in shaping overbuilding and the interactions between planning and changing real estate development trajectories in the Chinese context.

This study aims to shed light on this issue. Under the conceptual framework of neoliberal planning, this study explores the interactions between the DDCP and overbuilding in Ordos City, China. Although Ordos's overbuilding and real estate boom-bust cycle have attracted tremendous attention (e.g. Woodworth, 2015), and that planning has been identified as a crucial facilitator of Ordos's overbuilding (Su & Qian, 2020), inadequate attention has been paid to the interactions between the DDCP and overbuilding in Ordos.

By employing qualitative research methods including semi-structured interviews and document analysis, this study reveals several key findings. First, the DDCP, both on macro (metropolitan) and micro (parcel) levels, has been actively promoted and deregulated by the Ordos local government to facilitate unfettered real estate development, which eventually led to overbuilding. Second, while the pro-growth and deregulated DDCP significantly promoted the real estate boom in Ordos, the real estate boom has in turn stimulated the DDCP to be more expansionist, flexible and deregulated. Moreover, the burst of the real estate bubble has stimulated more transparent and regulated practices of the DDCP. These findings suggest that the DDCP and overbuilding are mutually interactive processes.

This study also offers several theoretical implications. To begin with, it highlights the mutually reinforcing mechanism between neoliberal planning and real estate booms, and the mutually interactive mechanism between neoliberal planning and real estate boom-bust cycles. In addition, this study reveals the versatile techniques of the strong state, including a combination of proactive state intervention and strategic deregulation, to promote neoliberal planning and expeditious real estate development. Moreover, it indicates the importance of state-market relations and interactions in shaping the mechanisms and practices of neoliberal planning. Finally, this study shows that strong state intervention and rigorous regulation can also help tackle neoliberal planning. It suggests that strong state intervention may be a double-edged sword in promoting and restraining neoliberal planning.

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Key Words: Neoliberal planning, Detailed Development Control Plan, overbuilding, China, Ordos City

#### MIGRANT MOBILITY AND THE POLITICS OF SELF-RELIANCE DURING INDIA'S COVID-19 LOCKDOWN

Abstract ID: 323

Individual Paper Submission

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This paper presents empirical findings on the physical and social mobility of domestic migrants in India during the Covid-19 pandemic. Specifically, I focus on the politics of self-reliance and the web of non-government intermediaries who have worked to address the precarious existence of migrant laborers in cities for decades. In March of 2020 India went into lockdown. This sudden disruption had profound implications for India's low-income migrant workers in cities. India's urban migrant labor force is one of the largest in the world, working in service, transportation, construction, and manufacturing sectors. While the right to move freely within India's borders is



guaranteed to its citizens in the constitution, for these populations, the process of crossing state, regional, and urban geographies is fraught with barriers to inclusive or permanent resettlement (Abbas 2016).

In the cities of Gurugram and Pune, where this study is based, thousands of migrants have opted to live dual lives for much of their working life. The lives of “middle migrants” are distinct from cyclical or seasonal migrant workers (Gidwani and Ramamurthy 2018). Their realities involve earning income and raising families in the city while travelling hundreds of miles to vote, give birth, find a spouse, or access entitlement programs in one’s ancestral village. The cost of preserving ties to home is invisibility, living without local political representation or benefits in cities, sometimes for decades at a time.

India’s lockdown had devastating effects on this way of life, with millions of workers suddenly unable to earn a living. Many were held in captivity by their employers. Others decided to walk home to the same rural villages they had once left in search of economic opportunity (Balakrishnan 2020). This paper discusses the invisibility of migrants and the challenges of India’s “enumeration gap” (Naik 2020), contextualizing how the pandemic shed light on the plight of migrants and their means of survival. As central government unveiled new policies aimed at national “self-reliance”, individual migrant households were often left to rely on their own networks and informal strategies for survival without income or the means to return home. Preliminary findings from the field explore the travails of women workers, who were the first to be let go from manufacturing jobs, as well as the role of NGOs and private actors in providing emergency services, including ration kits and rent relief, in lieu of government action. The paper is informed by content analysis of news media, and interviews conducted remotely with NGO workers and migrants over the past year.

This paper contextualizes these findings within the history of India’s planning and policy debates around providing benefits to workers straddling multiple places. These debates have endured since independence, but most recently focused on the portability of rights and benefits across state and urban-rural boundaries. These approaches have tended to be people-centric but have done little to address infrastructural deficiencies in destination cities. Finally, the paper offers recommendations to planners and policy makers for future action based on the experiences of NGOs engaged in emergency response to the migrant crisis.

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Key Words: India, Migration, Covid Response, NGOs, Mobility

#### **STUDYING PEDESTRIANIZATION PROMOTING SPATIAL PLANNING EFFORTS IN MEXICAN CITY CENTERS: INTERACTION EFFECTS BETWEEN WALKABILITY AND PUBLIC SPACE DESIGN**

Abstract ID: 354

Individual Paper Submission

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Pedestrianization consists in a transformation of the urban space, through the conversion or adaptation of the vehicular road into a space of pedestrian privilege. It represents an equity and social justice urban intervention, and, spatially, main goal of this action centers in promoting an accessible, quality and walkable public space, fostering spaces for people and public life. In recent decades, design policies and spatial planning interventions promoting pedestrianization have become recurrent and key components of revitalization plans in Mexican city centers. This way, several cities have employed such approach to revitalize central cores, supporting the retail activity, as well as more pleasing commercial/historical and environmentally healthier zones, highly dominated by the automobile otherwise. But having great impact transforming the urban space and public realm of deteriorated, yet symbolic, areas of cities, only a few outcome studies of these planning and design efforts exist, and not a robust body of knowledge addressing the topic of pedestrianization has been built, especially from perspectives based on theories of urban design.

Therefore, my research studies the spatial planning and design impacts of pedestrianization in Mexican city centers, via an outcome-oriented assessment, through select case studies where such scheme has been implemented in different ways. My research targets the built environment, involving an examination of the spatial features, physical configuration and design elements that act on the outcomes of walkability and quality of public space (both physically and as promoter of social life), by asking: What combination of plan-making approaches and physical design ideas helped create successful pedestrian zones in Mexican city centers? My work aims to build a body of scholarly knowledge and design guidelines, allowing planners and decision-makers develop better and more successful pedestrianization schemes. It will contribute to the literature in the spatial/physical planning and urban design field, with well-founded and practical criteria for the conception, planning and implementation of effective pedestrianization projects, which successfully accomplish quality spaces that contribute to improve important areas' public realm, environment and circulation zones.

From an early stage of my research, I present the progress of my work, showing the results of a first preliminary field study where I carried out an extensive observation exercise in one of my three case studies: "Morelos Pedestrian Corridor", in the city of Monterrey, Nuevo Leon, Mexico. I aimed to detect the spots or areas of special concentration of activity –whether pedestrian or stationary– within the walkways of the pedestrianized zone, as well as those where the opposite happened, to perceive and document their physical/spatial characteristics, and be able to elaborate preliminary descriptions and judgements. My work consisted in walking and observing the pedestrianized zone, at different times of the day, at different days (week and weekend days), ranging from early morning to late night. This way, I was able to register the times and thus the areas of special concentration of activity, and the lesser intensity ones. From there, I focused on observing and perceiving the physical/spatial distinctive of such areas. Results clearly show certain spatial features exist in the areas of highest concentration or different type of activity. Information obtained will help me for further and more formal evaluations, once I have built a methodological tool for that end, employing relevant urban design theories and planning insights, from a qualitative approach, to capture the essence of elements that effect walkability and public space quality.

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Key Words: pedestrianization, revitalization, design, walkability, space

## **VULNERABILITY, RESISTANCE, AND COLLECTIVITY IN BRAZILIAN FAVELAS: SURVIVING THE THREATS OF THE COVID-19 PANDEMIC AND THE STATE'S NECROPOLITICS**

Abstract ID: 365

Individual Paper Submission

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The COVID-19 pandemic has deepened existing inequities and injustices in Brazil, seen in the disproportionately detrimental impacts on favelas. State policy responses to the pandemic have disregarded favela residents' experiences. Recommendations such as "shelter-in-place" ignore the reality of over 11.4 million favela residents who cannot work from home or afford to stop working, nor practice social distancing from others. Historically, policy and investment in favelas have been absent or deficient, resulting in significant urban and social inequities that aggravate the impact of the virus for favela residents. These circumstances reveal the urgent need for planning and implementation of policies that embody the unique urban and social territory of favelas aligned with existing local efforts, especially during a pandemic.

This study investigates the discourse of community organizations in favelas as they respond to the threats of the COVID-19 pandemic and the state's necropolitics. Community organizations in favelas have taken action to protect their residents from the virus, unemployment, and hunger. I assess organizations' (a) motivations to act as a collective in their communities, and (b) stances about the government's responses to the crisis. Through content analysis of social media, websites, and media appearances of eight favela organizations and collectives in São Paulo and Rio de Janeiro, this study finds three main frames through which organizations make sense of their actions: vulnerability, resistance to the state's necropolitics, and collectivity and care. More than survival strategies, the actions of favela organizations are counter-political acts as they oppose the decrepit necropolitics of the state by collectively enduring in the Brazilian context of the pandemic. Understanding favela organizations' actions in response to the pandemic is fundamental, as it gives insight into the impact of public health emergencies in the lives of informal settlements' residents, and about the governance of public health emergencies in these communities. Ultimately, this study brings favela residents' perspectives, knowledges, and experiences to the center of discussions about the realities of the current public health emergency while reflecting about the governance of the pandemic in informal settlements.

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Key Words: Informal settlements, Public health emergencies, Necropolitics, Governance

## **ENABLING LEGAL ENVIRONMENT FOR MEETING THE RATIONAL NEXUS PRINCIPLE: INSIGHTS FROM THE USE OF DEVELOPMENT CHARGES IN INDIA**

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#### Central theme

Governments at all levels—national to local—are fiscally constrained, especially in the developing countries of the Global South. The local and state governments, in particular, are in a fiscal bind in this region because among others: a) a large proportion of tax and fee revenue typically accrues to national governments and b) local and state governments have very little authority to levy new taxes. In such a scenario, these countries urgently need additional revenue sources to fund urban development projects, especially due to their rapid rate of urbanization. Development charges are a potential revenue source.

Among all the countries in the world, India is projected to increase its urban population the most—404 million between 2014 and 2050. In India, property developers typically pay development charges when seeking government approval to change/institute the use of their land parcels and/or to improve them. The revenues from these charges are used to develop the infrastructure/services needed to service the proposed development. From a legal standpoint, these charges are considered a fee, not a tax. Accordingly, like those in the US, the courts in India require these charges to meet the “nexus” and “rough proportionality” principles. The nexus principle stipulates that there should be a connection between the charges and the impacts caused by the charge-paying development. The rough proportionality principle calls for the charges to be in proportion to the cost of mitigating the impacts of the charge-paying development. Combined, these two principles constitute the “rational nexus” principle.

As India seeks to increase development charges or levy them, there is an urgent need to investigate how these charges can meet the rational nexus principle; otherwise, they can be successfully challenged in court. Indeed, the rational nexus principle was cited to legally challenge the state of Tamil Nadu’s Infrastructure and Amenity Fee. This paper seeks to begin to fill this research gap by reviewing several pieces of state-level enabling legislation to a) show how the legislation hinders or promotes the rational nexus principle and b) identify major insights that can help India and potentially other developing countries craft or amend legislation that can withstand legal challenges.

#### Approach and methodology

Using a recently published report by the Government of India, this study identifies development charge-related state-level legislation for 22 states. Next, using the strategies to promote the rational nexus principle identified in Mathur (2016), this study examines whether/how these pieces of legislation hinder or support this principle. Finally, the study findings are synthesized to highlight how legislation can support or hinder the rational nexus principle.

#### Findings and relevance of work

Through a summary and synthesis of India’s development charge-enabling state legislation, this research advances the strand of applied research that examines ways to make development charges legally defensible by showing how these charges can be designed to meet the rational nexus principle. The extant research in this line of inquiry has mainly been US-focused and calls for data-intensive studies as inputs for designing the charges. However, conducting such studies is often not feasible in many developing countries. Therefore, this study uses India as an example to examine whether: a) context-sensitive exemplars of how enabling legislation is promoting or could promote the rational nexus principle in a developing country already exist, and b) what are some of the ways these pieces of legislation hinder the rational nexus principle and how the hindrances can be removed. Finally, the study provides several key insights that jurisdictions in India and potentially in other Global South countries can use as they adopt/amend development charge-enabling legislation.

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Key Words: India, Global South, Developing Countries, Development Charges, Municipal Finance

## WHO DRIVES CHANGE? AN EVOLUTIONARY PERSPECTIVE ON THE DISCURSIVE SHIFTS ON CLIMATE GOVERNANCE IN INDIAN CITIES

Abstract ID: 421

Individual Paper Submission

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Cities are at the forefront of climate governance, action, and innovation in the global south (Bhardwaj & Khosla, 2020; Singh et al 2021). Climate risk in cities is mediated through discourses addressed through forms of governance. Yet, climate initiatives embedded within city-scaled governance frameworks remain underexplored in many geographical contexts, particularly in Indian cities. In this paper, we examine how climate governance discourses and narratives have evolved (and co-evolved) in the past decade in Indian cities, and understand their implications on future pathways for equitable climate action.

We use Evolutionary Governance Theory, or EGT (Beunen, Assche, & Duineveld, 2015) as the key theoretical lens in this paper. EGT considers co-evolution as the central feature of governance configurations. Features of governance are actors and institutions (formal and informal), power and knowledge, and discourses that constantly evolve over time and always relative to other changes within constantly evolving governance configurations.

We employ a qualitative methodological approach, based on the single case study method (we take the case of Bhubaneswar city, India). We draw on participant observation, semi-structured interviews of state and non-state actors, and relevant document analysis (of plans, policy documents, legislation, media articles, and memos) as the techniques for data collection. We use Critical Narrative Analysis (we combine Critical Discourse Analysis by Jäger & Maier, 2009, and narrative analysis) to map the wider discourses as well as local narratives on climate governance issues in Bhubaneswar city (Souto-Manning, 2014).

Our findings are three-fold. First, climate governance discourses are shifting from a centralized, bureaucratic, and hydro-meteorological risk management approach towards a hybrid model of governance that attempts to balance international commitments (adaptation focus) and local development priorities (mitigation), through institutional changes, public-private partnerships, and increased space for individual responsibility. Second, narratives around climate governance continue to be based on disaster risk discourses (disasters are ‘natural’ events, therefore to be dealt with immediately as opposed to examining systemic governance failures); and experiences of environmental marginality (of vulnerable groups such as slum dwellers). Third, climate plans are gradually incorporating issues of gender and equity through incremental change. While being a positive shift, these advances remain rhetorical for now, without significant materialization.

We contend that climate governance frameworks in southern cities suffer from problems of framing (climate

change as ‘natural’, or ‘socio-political’ issue); lack of coordination between different actors that are involved in complex interplays and interdependencies; policy integration (is limited, and causes further problems); and lack of specificity and context (ignores the role of informality). We conclude by highlighting that climate change in Indian cities remains a low priority for action, and key aspects of equity, justice, and the socio-spatial distribution of vulnerability remain ignored in the discourse. Changing the discourse around framing climate issues can help challenge historically evolved governance approaches in southern cities.

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Key Words: Climate Governance, Critical Narrative Analysis, Environmental marginality, EGT, Southern Urbanism

### **LEVERAGING MIGRANT-FRIENDLY AND CLIMATE-RESILIENT CITIES TO PROMOTE AND DECENTRALIZE ECONOMIC GROWTH IN BANGLADESH**

Abstract ID: 467

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There has been a growing concern about a potential number of climate-induced migrants flying into the already overcrowded metropolitan cities in response to the adverse impacts of climate change in the low-lying areas of developing countries. Despite the negative connotation about migration from rural to urban areas (Amrevurayire & Ojeh, 2016), experts have started to recognize this spatial movement as an adaptation strategy against climate change and an opportunity to thrive the economic growth of a country, particularly in the developing world. This study intends to articulate this opportunity of people’s movement associated with the tremendous prospects of growth by adopting migrant-friendly and climate-resilient city concept in Bangladesh; the country with a vision to become an upper-middle-income country by 2031 by thriving economic prosperity of the nation. The study recognizes the urgency of territorial development, especially, in the secondary cities and towns of the country to reduce the pressure from the capital city, Dhaka that has been a center of almost all economic and political activities of the nation and also a reservoir of 10.3 million population with a density of 41,000 inhabitants per square kilometer (World Bank Group, 2018).

The under-construction Padma bridge has opened the discussion about decentralizing the investment to formulate the development framework of the country in an inclusive manner and to leverage the economic growth of the country. Padma bridge shows a gateway towards attaining the goals of decentralization by creating economic

opportunity in other parts of the country and extends an opportunity to make Dhaka city a livable place for everyone by reducing the ever-increasing population stress. Despite the growing prospect of the Padma bridge regarding the economic growth in Bangladesh, it also offers some new challenges including accommodating the newly migrated people in different cities of the country other than Dhaka (Alam et al., 2018) and managing the natural resources (Mukul et al., 2020) to achieve sustainability. The study, therefore, aims to conceptualize migrant-friendly and climate-resilient cities in the context of Bangladesh. The study is also proposing to develop a set policy guideline to operationalize the concept on the ground. The study will integrate migration theories with theories of political ecology, political economy, resilience, power dynamics, and social-ecological system and will contextualize the integration with a view to providing a robust foundation to the conceptual framework. To do so, the study will adopt the Integrative Review technique (Snyder, 2019) and perform it in a systematic fashion focusing on the grounded question- “what are the underlying principles in conceptualizing migrant-friendly and climate-resilient cities in Bangladesh?”. The study outcome will certainly offer a conceptual framework that constitutes the principles of understanding migrant-friendly and climate-resilient cities. The intend of the development of this framework is to provide guidelines to the policymakers in adopting migrant-friendly and climate-resilient cities concept in their sustainable policy agenda to accelerate the economic development trajectory in a more comprehensive manner.

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Key Words: Climate Change, Economic Development, Migration, Regional Planning

#### **PLANNING AND ECONOMIC DEVELOPMENT IN THE GLOBAL NORTH AND SOUTH: INSTITUTIONAL AND TRANSACTION COST PERSPECTIVES**

Abstract ID: 540

Individual Paper Submission

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Research in planning commonly borrows from economic theory to explain urban growth and its connection with the allocation of infrastructure development in a given region with studies that compare planning and development between the Global North and the Global South borrow ideas from development economics. Development economics treats planning as mainly a centralized government role, aiming to support an industrious-oriented urban development, despite variations in planning practice across differing socio-economic conditions and geographies. Comparative studies in planning and infrastructure development are in need of a shift in theory and methodology.

This study builds on a meta-analysis of papers examining planning and infrastructure development in the Global North and South. The analysis consists of 263 articles systematically collected from the Web of Science with queries of ‘comparative study’ and ‘infrastructure’, ‘planning’, ‘economics’, and ‘development studies’ from the last five

years. This paper asks: 1) What are the theoretical assumptions in studies of planning and economic development? 2) How do the economic theory link with planning theory? 3) How do scholars investigate and control the effects of different institutional arrangements in the Global North and Global South? The publications were then grouped into two categories: one examining cross-country economic differences and macroeconomic conditions with respect to the state of infrastructure development and another consisting of in-country case studies focused on physical output indicators to generalize the claim of a regional typology of growth and development.

Only a handful of studies compare planning differences between countries in the Global South and Global North in ways that link to the history of colonialism, evidence of government failure, or market failure. Both groups rely on the neoclassical economic assumption that infrastructure services are a prerequisite to growth. However, the in-country case studies argue in favor of shifting attention from meta-analysis of macroeconomic indicators (e.g. GDP) towards measuring basic needs (e.g. minimum wage, poverty index) with mixed-methods approaches, to better capture the role of formal and informal institutions in managing infrastructure services. Most studies on institutions are in the Global North with limited attention to the South, where the economic history of development and associated institutions are vastly different. This suggests that the application of development economic theory in the Global South is limited and improved with economic perspectives indicative of institutional economics. It explains how institutional economic theory could be used in comparative research to analyze the state of infrastructure planning and development across the Global North and South.

The pivot from neoclassical to institutional economic theory to explain economic development has specific implications for the design of research comparing the planning and development of infrastructure. Existing studies have demonstrated the use of transaction cost economics as the theoretical complement of institutional economics for the empirical study of infrastructure planning and markets. A transaction cost economics approach explains the peculiarity of infrastructure development by comparing the associated costs needed for planning, change orders, and oversights across 'alternative governance structures' within the hierarchical contractual market models, and provides empirical observation of the micro-economic effects of institutional arrangements as they differ from one country to the next. The evidence of a mixture of formal and informal institutions in the Global South matters for understanding the role of infrastructure in economic development, and in particular the direction of institutional change needed from planning in theory and practice. A transaction cost economics approach opens the possibility of assessing the state of infrastructure development by measuring actual transaction cost differences of planning activities at the ex post stage of contractual agreements where the variable of costs are proxies for the effectiveness of institutional arrangements.

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Key Words: Transaction Cost Economics, Global South, comparative study, infrastructure development, economic growth

**BEING THERE WITHOUT BEING THERE: DECOLONIZING INTERNATIONAL DEVELOPMENT PRACTICE DURING COVID-19**



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International development projects are deeply ensconced in debates about power, intentions, and imaginaries of progress that are today also stirring discussions about what it means to decolonize international relations and projects that nominally aim for poverty reduction and improvements to the well-being of peoples living across diverse low-income countries. The notion of expertise, the criticality of contextual knowledge, the manner in which projects are evaluated, and the power dynamics of partnerships involved are all central elements of these pronounced tensions between the practice of international development and critical scholarship and local perspectives around it. In this project, we test a process for international development that is centered on community co-design, which we believe will ensure the project is community built, owned, and maintained long after the project is complete. Living Data Hubs a small-scale ICT/data community-based international development project in the informal settlement of Kibera in Nairobi, Kenya through which we explored not only how international partnerships can produce material benefits but also how they can put forward a pathway for decolonizing power relations and knowledge production.

Over the course of 2020 and into 2021, the project saw the installation of a community-based wireless internet infrastructure powered by solar panels, creating a wireless network across five public space sites. In addition, the wireless network infrastructure involved establishing a capacity to use sensors and an internet portal to ask questions and collect data that community-based organizations themselves determined were critical to their work and the well-being of neighbors and residents. The network also provides community-based organizations and their support organization the capacity to manage and direct their own data's integration and use in data centers and research networks targeting the build-up of data on informal communities like Kibera, institutionalizing data ownership at the most local level.

The project's success in the pandemic challenges the long-held notion that international partners in development projects themselves need to spend time on the ground to ascertain the viability of projects, leading and setting the terms of assessments of project progress and the address of challenges therein. The paper further describes how the travel restrictions imposed during the COVID-19 pandemic highlighted the importance of grounded partnerships in international development work, and de-emphasized the need for high-income country partners to travel internationally and spend time "on the ground" getting to know contexts at the project site themselves. Instead, by design, the project centered the ownership and leadership of local partners in Kibera in the co-production of a community wireless network and data management platform. Context matters, but we show that—in keeping with discourses around decolonizing development—contextual knowledge already exists with local partners, whose own assessments and direction need acknowledgement and power in international cooperation. What is most critical to a project's success is not the specific contextual knowledge of international partners, nor their physical presence, but the trust and dedication of project partners in a shared process of knowledge co-production and project management. In conclusion, we suggest that this project forwards a rethinking of project roles and advances decolonized power relations in development projects by correcting for the presumed hierarchical leadership of partners from the global North in the implementation of community-based improvements.

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Key Words: Co-production, Decolonizing development, ICT/wireless, Knowledge production, Data

## **FIGHT OVER RATIONALITY: LEGITIMIZING “RED ZONES” IN POST-DISASTER RECOVERY PLANNING IN INDONESIA**

Abstract ID: 635

Individual Paper Submission

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Relocation is the most significant and controversial issue in post-disaster recovery planning. After devastating disasters, such as tsunami, high risk areas are designated as “red zones” to restrict residential use, with residents of such areas relocated to safer areas. This paper explored how different types of rationalities are used by diverse stakeholders to legitimize “red zones” based on a case study of post-disaster recovery planning in Palu and the surrounding areas, Central Sulawesi, Indonesia.

In planning theory, communicative rationality has attracted researchers’ interest over the last few decades, placing increasing importance on participation in the planning process. However, idealistic assumptions of authentic communication create barriers for achieving communicative rationality in planning practices, where power differences and political decisions often prevail. Moreover, the characteristics of post-disaster recovery processes, “time compression” (Olshansky, Hopkins and Johnson, 2012) hinder communicative and collaborative rationality, despite the benefits of community participation for the recovery planning process. From a scientific approach derived from disaster science and engineering, which was once abandoned in planning theory, red zones are identified in a hazard map and relocation is suggested to reduce disaster risk and ensure the safety of the community. However, decisions regarding land use regulations, particularly relocation, are never made solely based on scientific rationality.

In the post-disaster spatial planning process in Central Sulawesi, the central government, local governments, and a bilateral donor proposed a delineation of various “red zones” based on their own perspectives and rationalities derived from value systems, organizational obligations, and political culture. In particular, the hazard map including land use policies and building regulations suggested based on the level of disaster risk, which was created and approved by the Indonesian Government, became a battleground of discussions. Stakeholders disagreed regarding how disaster risks should be understood and interpreted into land use regulations, particularly on the topic of relocation in “red zones.”

This study attempted to reveal obstacles to make collaborative rationality work in a planning practice, including significant conflicts of interests, such as relocation decision during the post-disaster recovery process. This study was based on reconstruction project activities conducted by the Government of Japan in 2019. The interdisciplinary nature of post-disaster planning and the peculiar circumstances of the aftermath of disaster place high stakes on the relocation decision and create significant barriers to stakeholders compromising to reach more acceptable and consensual decisions on land use regulations and relocation. This study revealed the role of the hazard map as a boundary object that could be used to highlight different perspectives, assumptions, and implications derived from various technical and scientific disciplines, rather than seeking collective agreement. This study poses a question of how conflicting rationalities and weak communicative and collaborative rationality affect resilience and recovery in post-disaster regions.

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Key Words: Post-disaster recovery planning, Resilience, Rationality, Indonesia

## **PLAY BEFORE THE RULES CHANGE (OR YOUR FRIEND LEAVES): BUILDING PERMIT ISSUANCE AND ADMINISTRATIVE TRANSITIONS IN MUNICIPALITIES IN METROPOLITAN GUADALAJARA**

Abstract ID: 660

Individual Paper Submission

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Anecdotally, the risk of starting a new formal construction project in Mexico and beyond responds to the stability of municipal land governance practices, but the nature and effect of the relationship has proven hard to quantify. Mexico's land governance decentralization and patterns of wholesale municipal staff turnover every three years provide an opportunity to tease apart the connection between daily land governance practices and construction activity. The "vertiginous" turnover of local officials local in Mexico is endemic and results in deep institutional "volatility and fragility" (Hernández 2013; Cabrero Mendoza 2003, 30) with clear consequences for projects and programs (Herrera 2017). Formal regulations, plans, and subsidies for urbanization, however, last longer and are not timed to coincide with administrative transitions.

Using an original database that assembles over 100,000 building permits (*licencias de construcción*) from four municipalities over multiple transitions in the metropolitan area of Guadalajara, Mexico, this project uses a regression discontinuity approach to examine building permits in the months before and after the transition of municipal officials, defined in Mexico by law as October 1<sup>st</sup>, following elections that occur the first Sunday in July every three years, for the period between 2004-2020. In line with qualitative findings, the initial analysis suggests that permits increased sharply in the months before a transition, dropped dramatically in the first month after the transition, and gradually increased over the months following. How to chart and navigate "patterning" of practices over transitions is critical for planners hoping to change outcomes in cities (Healey 2007), now more than ever (Campbell 2021). Building on the findings and fieldwork findings, the article will discuss three possible institutions mediating the permit shifts: patron-client relationships, macro-level turnover in other departments, funding or programs, and the presumed ruptures in the informal rules, or "gray institutions" governing practice that are generated and sustained by teams of municipal officials.

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Key Words: street-level bureaucracy, municipal governance, construction permits, institutional transition, peripheral urbanization

## URBAN PLANNING AND GOVERNANCE IN MIDSIZED MEXICAN CITIES: A HEURISTIC TOOL.

Abstract ID: 689

Individual Paper Submission

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Urban planning in Mexico has evolved from being a predominantly centralized and state-controlled instrument (Garza, 2003) to one forced to include a greater diversity of actors and, therefore, different visions and interests about the urban environment. This has made understanding, analyzing, and evaluating urban planning processes and its results a more complex task for which no analytical framework exists. This is a particular challenge for mid-sized Mexican cities, not only because they face increasing growth pressures, but they generally have weak institutions and limited autonomy to guide their growth (Peña, 2012). Furthermore, most of the existing research focuses on the country's largest metropolitan regions; thus, little knowledge has been generated around mid-sized cities' planning processes. These two factors motivated the creation of a heuristic tool to analyze and evaluate planning processes and practices in mid-sized cities within a context of democratic access to decision-making, which we present in this study.

We base the theoretical framework on the normative principles of governance (Graham, Plumptre & Amos, 2003; Pierre, 2011) and the right to the city (Lefebvre, 1996; Marcuse, 2009). We operationalize and apply these principles to the urban planning process, and analyze them through a mixed methods approach to understand how different actors (government, markets, and civil society) influence urban growth (whether expansive or intra-urban) through the establishment of land uses and the provision of infrastructure.

We conducted a pilot test on two cities in northern Mexico: Hermosillo, Sonora, and Tijuana, Baja California. Both cities are characterized by its rapid urban growth in the last two decades, their close interaction with the international border region, and the introduction of urban planning institutions that incorporate the public and private sectors and the participation from society at large. We use official data obtained from government sources and structured interviews with key informants, such as government officials, developers, and community representatives. We systematize the data to account for the presence or absence of legitimacy and voice, strategic vision, effectiveness and efficiency, accountability, and justice and equity.

The application of this tool has allowed us to identify the processes through which the different actors influence or favor different ends and, consequently, direct urban growth. The pilot reveals that many interests merge in planning processes, and that not all actors have the same weight. On the one hand, markets tend to impose themselves on the public sector to obtain economic ends relevant to their interests, and on the other, there is a more impoverished and only partially organized social sector whose political influence is weaker.

The tool we present here allows for the analysis of the dynamic processes that lead to different urban outcomes,

moving away from an analysis of urban planning results as static ends. The tool helps to understand the aspects that may limit or favor urban governance, and how spatial planning reflects the objectives of different interests (government, market, and the social sector). The tool also helps to verify if formal or informal mechanisms exist for society to exercise a counterweight to government and market actions. This tool will be useful for urban planners, practitioners, and academics to better guide the development of midsized cities.

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Key Words: planning evaluation, midsized cities, Mexico, urban governance

#### **SPATIAL PLANNING: AN INTERPRETIVE REVIEW**

Abstract ID: 706

Individual Paper Submission

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1. Central theme or planning issue to be addressed: In many countries, sectoral investment planning and land use planning approaches are separate and undertaken at different scales by different levels of government. They are often disconnected, and many times are in conflict. As a result, public investments may not be located where they can provide the greatest impact for human or economic development outcomes (among others). Spatial planning is used by local and national governments to better align sectoral policies, strategies and investment plans in ways that are sensitive to location and place.

Recent initiatives by multilateral advocacy and donor organizations have highlighted the potential for spatial planning to improve both the efficiency of public investments and their responsiveness to local needs. However, the definition of spatial planning remains debated and differs by country and by planning system. In addition, the potential benefits and pitfalls of the different spatial planning approaches are unclear to decision makers, and even professional planners, in many countries.

The main objective of the paper is to illustrate the significance of spatial planning in the investment planning process. Through case studies, the paper will present different interpretations of spatial planning. It will focus on the conditions and tools needed for both effective “plan-making” as well as “plan-implementation” based on lessons learnt from the analysis of spatial planning initiatives in selected cities and regions.

2. Approach and methodology: The paper draws from a literature review and analysis of case studies drawn from countries in Europe, Asia and Africa. Based on a review of these case studies and other literature, it will develop a conceptual framework to identify the common features of spatial planning in terms of

planning objectives, institutional structures for implementation and the links between prioritization and financing mechanisms.

3. Meaningful and new findings: The paper will have three main contributions: First it articulates a general definition of spatial planning and the differences between sectoral, master, land use and other planning approaches. Second it details the potential benefits or costs for adopting spatial planning approaches in contrast to traditional sectoral-led public investment planning approaches. This includes the more efficient allocation of public funds to complementary investments across sectors (such as transportation and housing, or water resource management and flood risk mitigation and so forth). Third and finally, it will identify gaps in, and outline key questions for the future research agenda on the enabling conditions for successful spatial planning practices.
4. Relevance and implications to planning scholarship, practice and or education

The paper will have direct relevance to planning practice and scholarship. It responds to a growing interest in development organizations (such as UN-Habitat and the World Bank) in improving the planning and coordinated implementation of public investments from sectoral to spatially informed through applying a spatial lens to investment prioritization and decision making. The paper will provide guidance to policy makers on the objectives and fundamental dimensions of spatial planning and its tradeoffs based on case examples from the literature. It will also contribute to scholarship by identifying gaps and avenues for future research on the topic.

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Key Words: Spatial Planning, Regional planning, Investment prioritization

## **GENERATING CHANGE: MULTI-SCALAR DIMENSIONS OF LAND ACQUISITION FOR RENEWABLE ENERGY DEVELOPMENT IN SOUTHEAST ASIA**

Abstract ID: 726

Individual Paper Submission

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In recent years, the combined challenges of energy access, energy security, and energy-related greenhouse gas emissions have led to growing support for expanding renewable energy (RE) generation across Southeast Asia. Much of this growth has occurred in the form of large-scale solar and wind facilities with extensive land requirements (Kennedy 2018). The acquisition of contiguous land for large RE projects poses significant challenges in a region with a long history of colonial intervention and land-related conflict (Hall, Hirsch, and Li 2011). While the region aims to quadruple installed RE capacity by 2025, complex permitting processes, informal tenure arrangements, and opposition due to conflicts with existing land uses have hindered land procurement and RE project development.

To accelerate RE development, national governments across Southeast Asia have sought to address land acquisition

barriers by streamlining licensing and permits and reducing land acquisition costs (Department of Energy 2017; Guild 2019). Simultaneously, multilateral institutions such as the Asia Development Bank – which provide significant financial support for RE development – have increasingly sought to standardize land acquisition practices to minimize the economic, social, and environmental risks associated with large-scale infrastructure projects, including RE (Skinner and Haas 2014). While advocates of rapid RE development view these measures as necessary to meet national and regional RE targets, the articulation between these efforts and existing land use policies and livelihood strategies remains largely unexplored, particularly from a planning perspective.

This qualitative comparative case study draws on national and regional RE policies, targets, and social and environmental assessments to analyze the multi-scalar processes and potential outcomes of land acquisition for RE development in Indonesia and the Philippines. We find that despite ADB's efforts to minimize social and environmental impacts through safeguards and standardized land acquisition practices, local land use planning and policy continue to exert considerable influence over project design and its related social and environmental impacts. While ADB safeguards have reduced reported incidences of involuntary physical displacement among existing land users, the ways in which RE development may create more subtle forms of social and economic vulnerability remain closely tied to the political economy of local land use planning and policy. These findings point to the need for greater emphasis on land use policy and planning as critical levers in mediating the social and environmental impacts associated with the continued expansion of RE infrastructure across the global South. In doing so, this work highlights land use policy as a crucial node for directing multi-scalar processes of climate transformation in ways that address rather than exacerbate existing forms of climate-related inequity and injustice.

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Key Words: Just transition, Renewable energy, Land use policy, Climate change

#### **COVID-19 THROUGH THE ETHICS OF CARE: COMMUNITY SOLIDARITY ACTION IN SQUATTER SETTLEMENTS OF RIO DE JANEIRO, BRAZIL**

Abstract ID: 736

Individual Paper Submission

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This paper explores how the urban poor are taking relief actions during the COVID-19 pandemic in five squatter settlements (favelas) of Rio de Janeiro. It analyses strategic and discursive changes of grassroots groups in order to provide short-term responses to the outbreak of the pandemic in their communities. In these new strategies, neighborhood and city-wide solidarity networks are formed to deliver emergency aid in the face of the precariousness of the built environment and the vulnerable conditions of many households. Here, we examine different formats of solidarity action: prevention measures, co-produced sanitation infrastructure, psychological

support, income relief and the distribution of basic food and hygiene items. The objective of the paper is to explore different ways in which marginalized residents organize themselves to support and care for each other. Our analysis recognizes the mobilization capacity of these groups in the face of little state action. It also adds to other existing efforts to better understand the effects of the pandemic (e.g., Duque Franco et al., 2020). Drawing on the case of five informal settlements, this article produces both theoretical and empirical contributions to planning studies. Such contributions are underpinned by normative assumptions about ethics and social justice. At the theoretical section, we approach the topic of grassroots planning through the lenses of care from women's studies (Gilligan, 1977). At the empirical section, we analyze COVID-19 responses through mixed methods. First, we map solidarity actions and networks in these territories. Our preliminary results identify dozens of initiatives that articulate with the state and civil society at different scales. Then, we introduce a qualitative analysis of the narratives attached to these actions. The choice of methods is aligned with the ethical principle of avoiding harm to both researchers and communities - hence, the choice for remote mapping and digital ethnography. This includes data collected from social networks, community-managed websites, local and mainstream media, along with other online platforms. The analysis also draws on previous ethnographic data gathered in these communities before the COVID-19 outbreak. Because this is an ongoing research, there are no definitive results and conclusions yet. However, the paper draws a few reflections which contribute to inform planning theory and practices concerned with informality. The first concerns the rapid, organized and effective relief response of communities to the crisis in light of state's neglect and disarray. This reinforces a long-standing argument that informal planners are major producers of valuable knowledge and action (McFarlane, 2009). Second, we highlight the urban poor's ability to engage in fluid and multi-scalar networks, which contributes to build a "deep democracy [and solidarity] from below" (Appadurai, 2001). Finally, we argue that the COVID-19 crisis is an entry point for looking at cities from the perspective of care, particularly in southern contexts. All the above points contribute to a broader argument: that studying and engaging with informality requires a recognition of the different ethics, rationalities and strategies that underlie urban planning and management.

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Key Words: Grassroots planning, Brazilian Favelas, COVID-19, Ethics of care, Solidarity Practices

#### URBANIZATION THROUGH CIRCULATION: THE CASE OF MUZAFFARPUR, INDIA

Abstract ID: 750

Individual Paper Submission

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Scholars generally imagine the urban transition as a massive population movement from rural areas to cities—a "depopulation of the countryside" (Davis & Golden, 1954). However, the Indian context complicates this simple model as scholars claim that the country's urbanization involves "morphing places" more than "moving people" (Mukhopadhyay et al., 2020). Throughout India's countryside, new towns are proliferating in once-rural



geographies, part of a surge in the number of small urban settlements throughout the Global South (Randolph & Deuskar, 2020). Research demonstrates that some dense agrarian regions in the country are attaining urban densities and even experiencing structural transformation in their local economies (Pradhan, 2013)—despite witnessing negative net migration (Randolph, 2021). These urban transformations in the countryside, however, may indeed be tied to people’s movements, as urbanizing rural locations seasonally “export” their surplus labor to prosperous metropolitan regions for short-term, informal casual work—leading to the concept of “urbanization through circulation” (Randolph, 2021). Not only does this phenomenon complicate the image of urbanization through mass migration to cities; it also raises questions about what it means to plan for these emergent urban environments, whose underlying conditions of growth differ markedly from the metropolitan areas where planning research and practice are concentrated.

This paper studies “urbanization through circulation” using a case study: the district of Muzaffarpur in the northern state of Bihar. Since 1990, the district has witnessed rapid growth in the share of its population living in dense agglomerations (with greater than 1500 people/km<sup>2</sup>) and a dramatic agrarian exit, with the share of workers in non-agricultural employment more than doubling to about 40 percent. These changes occurred even as the district attracted virtually no non-native migrants—its urban transformation driven entirely by natural population growth. I first examine the structural conditions that undergird Muzaffarpur’s emergent urbanization, including its historical demography and densification and the social, economic and policy factors that limit the scale of permanent out-migration. Next, I study the multi-sited livelihood strategies that individuals and households adopt in response to these structural conditions—helping to explain both the local growth in urban (non-farm) occupations and the district’s high rates of temporary out-migration. Finally, I consider the implications of this form of urbanization for planning, especially relevant as the Indian government has designated Muzaffarpur a “smart city” under its national urban infrastructure policy.

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Key Words: Urbanization, Migration, India, Smart city, Agrarian change

#### ***ASPIRING FOR JUSTICE AND EQUALITY IN CLIMATE CHANGE ADAPTATION PLANNING: CONFLICT AND CREATIVITY IN PANORAMA, COLOMBIA.***

Abstract ID: 768

Individual Paper Submission

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As planning increases its focus on the climate crisis, it is important not to lose sight of complementary fields of study and research already benefiting from decades of experience in this pressing issue. This paper takes theoretical lessons from a political ecology critique of “adaptation to climate change planning” and links them to practical learning in community-led planning, development, and adaptation. Both fields have a strong and explicit focus on

social justice and equality and challenge traditional ways of approaching planning responses to climate change-related risks (Ziervogel et al. 2017; Dodman and Mitlin 2013). This paper relies on a case study of a marginalized urban environment in the Global South, namely in Panorama, Colombia. The planning context in Colombian cities weaves a clientelist network in and out of legal and formal definitions layered over a history of colonization, civil war, and social and ethnic inequality. Recent years have seen innovative urban planning practices emerge from Colombia, and in Panorama, residents work to access the territorial plan, regularization process, relocation strategies, risk reduction and climate change adaptation plans.

The case study used an ethnographic approach, centered on semi-structured interviews and observation, to follow three groups of local actors engaged in improving the conditions for their community. The research reveals a plethora of approaches, strategies, and priorities as well as multi-actor initiatives that are at once creative, collaborative, and conflicting. The case study is not a best case example of how to plan for “climate change adaptation”, but rather, offers real-time lessons on how a diverse community struggles internally and externally where access and influence over political and natural resources are limited, manipulated and competitive. The case reveals how local leaders and urban practitioners navigate these complexities to find space for inclusion, participation, and development. It highlights the creative as much as the contested spaces central to urban production, risk reduction and community planning. Further, it shows how local inhabitants weave climate risks into other existing problematics and priorities to struggle for improvements to their environment through land tenure security, housing occupations and environmental and nature-based strategies.

Accessing and learning from these spaces—formal, informal (or both)—provides opportunity for the planner to better understand, mobilize, and integrate local knowledge in their work. The paper supports efforts to address three key challenges in local, community-led adaptation planning specifically: diversity, power and the articulation of scale (Dodman and Mitlin 2013). The research then offers insights into how these approaches can inform mainstream planning practice (Davoudi and Porter 2012) engaged in climate change adaptation on how to integrate climate change risks in places where there is already an important development deficit; how to avoid sweeping cookie-cutter solutions that benefit some and not others; how to access and support local initiatives and articulate them with broader planning strategies. These interconnected approaches are central to addressing the difficult questions linked to climate change risk, vulnerability, power, and diversity and to integrating a just and equitable planning practice.

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Key Words: Community-led planning, Adaptation, Political-ecology, Social Justice

#### PLANNING IN THE MUD: MAKING AND UNMAKING RESILIENCE IN MEXICO CITY

Abstract ID: 784

Individual Paper Submission

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While cities can anticipate an increasing frequency and severity of climate related disasters, political uncertainty and global pandemic fallout are producing crises of public capacity and accountability in state and local economies. This

convergence of crises exposes a ‘muddy politics’ that upends implicit assumptions about the existence of a functioning state and its role in addressing climate risk. In this paper, I explore how this muddiness came to the surface in Mexico City, where a recent political regime shift and pandemic pressures resulted in deep austerity measures, which have dismantled Mexico’s complex infrastructure of bonds and trusts used for disaster recovery and climate adaptation in the capital. Given Mexico City’s high disaster risk and with the clock still ticking on climate change, interest in financing adaptation persists among an emerging constellation of private actors and development finance institutions. Yet it is unclear what is motivating private interests—or what forms these new interventions might take without state support—and what the implications are for equity. Characterizing Mexico City as a case of ‘planning in the mud’ that is becoming steadily pervasive globally, this paper traces adaptation finance to explore how urban resilience is made and unmade in increasingly uncertain times.

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Key Words: Development, Disaster, Finance, Adaptation, Resilience

## IS SMART ALSO GREEN? THE ENVIRONMENTAL IMPLICATIONS OF THE SMART CITY MOVEMENT IN ASIA

Abstract ID: 793

Individual Paper Submission

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The Smart City movement is underway with full force throughout Asia, instigated by national governments intent upon driving economic growth through greater utilization of information and communication technologies. India, Indonesia, Thailand, Korea, and Vietnam all have launched nationwide Smart City efforts over the past decade typically under the umbrella of 100 Smart Cities. India’s Prime Minister Narendra Modi committed US 14 billion to underwrite the first phase of its nationwide initiative in 2015. The Indonesia government launched its own 100 Smart Cities initiative in 2017 beginning with its three largest cities, Jakarta, Bandung and Surabaya. By the end of 2019, according to an Indonesian government report, the initial three Smart Cities had grown to 97 encompassing urban place of varying sizes throughout the archipelago. In the case of Viet Nam, the Smart City initiative started with the Vietnam Sustainable Smart City Development project approved by its prime minister in 2017. They started with the four target cities of Ho Chi Minh City, Hanoi, Da Nang and Can Tho to spearhead their nationwide effort. Besides national government funds, donor agencies such as the Asian Development Bank and the World Bank developed trust funds to help fund these Smart City initiatives throughout the region.

As Joo and Tan observe, the pro-growth emphasis of national Smart City initiatives in Asia is consistent with Harvey’s (1989) neoliberal urban entrepreneurship, albeit wrapped in the rhetoric of urban sustainability. The incorporation of the sustainability rhetoric implies that bringing advanced technologies to the management of its rapidly growing cities can provide the means to enhance their livability, including attention to longstanding environmental deficits. In the case of Ahmedabad, one of the initial participants in India’s 100 Smart City initiative, the city applied

technology to improve its waste collection system and to assist in developing a long overdue city-wide recycling program, Smart cities built from the ground up, such as Songdo in the outskirts of Seoul, incorporate a pneumatic waste disposal system into its basic infrastructure. In the case of Songdo, a product of the pro-growth strategy of the national government conceived under National Strategy for Green Growth enacted in 2008, green growth was intended as the “entrepreneurial strategy” for all future development in the country.

It is at the local level where Smart City concepts are actualized and where efforts to address environmental deficits and promote sustainable development can be assessed. This is particularly relevant in the case of Indonesian cities where the most visible uses of smart technology has been to support newly implemented public transportation systems, to manage traffic, and to enhance responsiveness by government to select community needs. There has been no analysis of how these Smart Cities have applied technology to longstanding environmental deficiencies, particularly in waste management, water quality and pollution control, hazard mitigation, and energy consumption. Focusing on the three pioneering Smart Cities in Indonesia (Jakarta, Bandung, and Surabaya) but also seeking examples from the remaining 94 “self-proclaimed” Smart Cities, this paper offers a much-needed assessment of the priority given to environmental upgrading within the Smart City framework. The degree to which environmental deficiencies are addressed at the local level suggests how Smart City interventions in Indonesia affect the masses of urban residents who deal with environmental deficits on a daily basis, and whose lives are impacted directly by the environmental condition in its cities. The research for this paper extends previous published work on Indonesian urbanization including *Planning the Megacity: Jakarta in the Twentieth Century* (Routledge, 2008 and 2011) and the forthcoming *Urban Flood Risk Management: Looking at Indonesia* (Routledge 2021).

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Key Words: Smart City, sustainability, environmental management, local governance, green infrastructure

#### **TOWARDS A NEW RESEARCH AGENDA IN URBAN DEVELOPMENT AND PLANNING RESEARCH IN THE GLOBAL SOUTH: GOING BEYOND THE “CRITICAL CONSENSUS VIEW.”**

Abstract ID: 794

Individual Paper Submission

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The purpose of this paper is to make progress in crafting an appropriate research agenda for studying urban development and planning in the Global South. A consensus seems to have emerged from the work of scholars of urban development and planning in the Global South. In this view, which I will call the “critical consensus view,” (CCV) planning interventions are seen as primarily serving the interests of those in power. In the context of the last three decades, this has meant that planning interventions have supported the consolidation of neoliberal capitalism since that is the ideology espoused by economic elites. Scholars such as Ananya Roy (2009) have mounted an existential challenge to the very profession of planning in the Global South, arguing that informality is encoded in

the DNA of the state in a postcolonial country like India, which makes planning logically impossible. Given that planning interventions in countries of the Global South are viewed as either anti-people (Watson 2009, Bhan 2009) or a logical impossibility, how does progressive change happen as per the CCV? Enter “insurgents”—organizations of members of marginalized communities who push for meaningful change from the ground-up. In other words, CCV takes neoliberal capitalism as a universal, whose exclusionary effects are primarily counteracted from the bottom-up.

What do we miss if we follow the CCV? While CCV scholarship is valuable for highlighting inequality in urban regions, it suffers from three major blind spots: 1) It forecloses the possibility of desirable change resulting from state planning interventions, 2) It misses any meaningful engagement with organizational aspects of planning, and 3) there is little emphasis on developing comparative understanding of the varieties of planning outcomes in countries encountering the “neoliberal” script. In short, the CCV seldom asks questions such as: why, alongside a number of planning failures, also exist numerous of planning successes? CCV also does not engage with the question of why some insurgent groups are successful in realizing their demands but others are not.

In reality, nations of the Global South have taken markedly different paths to capitalist development. For instance, the notion of private property – an integral part of the neoliberal script – and land governance have had significantly different trajectories in developing countries. India repealed urban land ceiling laws in early 2000s and now allows private ownership of large parcels. In China, the law does not allow private property but for the last three decades, the government has allowed de facto private possession of land. Rwanda has created property rights from scratch in the last two decades. The Chinese state directly builds affordable housing while India has moved to relying on market-based incentives to spur construction of affordable housing. All three countries have also made significant progress in pulling millions of citizens out of extreme poverty. Why are these different trajectories and outcomes not a subject of serious research and academic debate?

I argue that if scholars of urban development and planning in the Global South have an interest in helping realize progressive change, we need to broaden our horizons and go beyond macro-structural critiques of capitalism. Comparative examination of planning processes and outcomes is a task with dual significance. Studying the transformation of property in comparative perspective, for instance, will not only demonstrate that transformation of property rights in the Global South, is not one thing, that is either good or bad, but also will take us from making catholic generalizations (e.g. neoliberalism perpetuates inequality) to a more nuanced understanding of how normatively desirable outcomes can indeed be realized through planning interventions involving both state actors as well as insurgents, among others.

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Key Words: planning theory, international development, globalization, public sector, interconnections

#### **FROM PEOPLE-CENTERED TO LIFE-AFFIRMING: THEORETICAL REFLECTIONS ON COMMUNITY DEVELOPMENT GROUNDED IN TWO CASE STUDIES FROM MEXICO CITY**

Abstract ID: 808

## Individual Paper Submission

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In his *Twenty theses on politics*, Enrique Dussel lays out his politics of liberation, a framework where he states that all political structure should be oriented towards the promotion, reproduction and enhancement of all life in community (2008). As an inherently political field, which in theory is increasingly concerned with building equitable and just futures, I extend this framework to planning. The main question guiding this paper is, what can we gain as planners if we shift the lens through which we approach community development from a people-centered to a life-affirming one?

To answer these questions, I draw from two case studies done in Mexico City in 2017. These two instances of community organizing explored how inhabitants were defending their place in the city, the place of particular ecosystems, as well as their own visions for public spaces. The first case looks at a group of neighbors who were organizing against attempts to “renovate” a plaza. Not only did the neighbors organized around a lack of consultation, but they also assumed an ethical position that was centered around the wildlife that already existed in the plaza, over the increasing neoliberalization of public spaces in the city.

The second case is local community space Huerto Roma Verde, a grassroots initiative, which is a multipurpose community space that operates through ideas of well-being, of just exchange, solidarity and self-organizing dynamics. While it has an explicit philosophy guiding the project, these ideas are not preached or discussed on a daily basis and are rather embodied through daily practice.

With these two cases, I examine planning and community development in two different lights. The first, as an institutional practice, often times, disconnected from people’s understanding of place, and later in Huerto Roma, as the type of community development that is possible, and which should be uplifted, acknowledged, and supported in the planning field and beyond.

The paper engages with the concepts of authors such as Enrique Dussel (life-affirming politics, Alterity) and Davina Cooper (prefigurative politics, conceptual force) to offer a theoretical discussion grounded in these cases.

The paper also suggests that, while the idea of sustainability, is in theory very close to this life-affirming politics, the discourse has diffused too much and lives somewhat comfortably under the neoliberal city. While life-affirming might be broad, this emphasis in the word life, offers less room for oppressive and extractive planning practices hiding behind incomplete ideas of sustainability. I suggest that moving from people-centered to life-affirming puts us in a better position to understand people’s relation to their environment, but also goes a step further as it asks more from planners. A life-affirming lens will likely put planners at odds with the state and the logic of the market they usually work under. The paper concludes by reading these community efforts as important windows through which alternative political horizons are being imagined and brought into being; they are opportunities for the planning field to reflect on who and what does it want to affirm.

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Key Words: life-affirming, local knowledge, grassroots organizing, community development

## HOPE DURING A PANDEMIC: CAN INSTITUTIONAL HYBRIDITY IMPROVE THE RESPONSE TO CRISIS?

Abstract ID: 932

Individual Paper Submission

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The disproportionate impact of the COVID-19 pandemic on low-income communities has been evident worldwide. The resulting government response, especially the imposition of lockdowns lasting weeks and sometimes months, has negatively affected people's livelihoods and survival, especially when they lack job security or social safety nets (Gaynor, 2020). This impact was especially problematic in India. On March 25, 2020, the Prime Minister of India announced a complete lockdown across the country to interrupt and reduce the spread of COVID 19. As a result, millions of impoverished, internal migrants found themselves unable to stay in place. Entire families, including the elderly, young children, pregnant women, started walking, using carts, bicycles, and rickshaws – were dragging themselves across thousands of kilometers in the extreme heat of the Indian summer. Approximately 100 million migrants had been directly affected, and at least 20 million of these workers were reduced to extreme desperation (Bhowmick & Khandelwal, 2020).

Alarmed by this desperate situation, a group of civil society workers, indigenous networks, and grassroots activists in the state of Jharkhand, India, worked with the state government to set up a helpline to direct aid. In the space of a week, this helpline evolved into a hybrid institution that brought together participants from the state, civil society, traditional networks (Mundari and Ho tribe), and academia (International Institute of Information Technology-Bangalore). In the first six months, this alliance had registered and directly aided more than a million migrant workers from Jharkhand and was hailed as an effective model by the local and national media.

The emergence of this unique hybrid governance arrangement, which came to be called the Jharkhand State Control Room (JSCR), leads me to ask: *How can hybrid institutions leverage networks, technology, and resources to plan for and address disasters? What do these unique arrangements tell us about the ways that planning institutions in the Global South could transform to effectively plan for – and with – indigenous populations?*

This paper will present the insights gained from a six month long participant observation (from March to September 2020), fifty semi-structured interviews with various stakeholders, and results from an impact assessment survey designed and conducted by the author. It closely looks at the plural institutions and organizations working in this hybrid institution (Sorensen & Torfing, 2009), its effect on managing an effective disaster response, and the challenges and barriers this institution faced. It also looks at the individual testimonials of the migrant workers to unpack the embedded structures of precarity that affect the everyday lives of the migrants and that exacerbated the effect of the pandemic and economic lockdown in these populations.

This paper argues that pluriversal hybrid institutions can leverage multiple worldviews, resources, and networks and create collaborative solutions (Escobar 2018). It contends that a trust-based, hybrid disaster response system leads to deeper penetration among their constituents and examines whether hybridity can negotiate embedded distrust and long-term structural conflict. This paper seeks to contribute to the emerging procedural planning literature on planning pluralism, institutional hybridity, and indigenous planning.

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Key Words: Plural institutions, Hybridity, Collaboration, Disaster response, Governance

## URBAN DESIGN, METROPOLITAN GOVERNANCE AND THE NOCTURNALIZATION OF WORK

Abstract ID: 967

Individual Paper Submission

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Today, cities are no longer constrained by local time zones. For millions of people in the Philippines, the work day now happens at night, due to changing patterns of labor caused by globalization. What are the local, socio-spatial implications of this nocturnalization of work?

In recent years, the urban night has received renewed attention in planning scholarship. This includes the emergence of 'night mayors' as a new form of urban governance (Seijas & Gelders, 2021), the temporal expansion of urban life under conditions of late capitalism and 'planetary urbanization' (Shaw, 2018) and the presumed conflicts between the 'twenty-four hour city' and urban social order (Roberts & Eldridge, 2009). Much of this work expands on previous scholarship on earlier historical moments which coincided with the expansion of the nighttime economy due to changing economic conditions and technological innovations (Melbin, 1978). This paper builds off of this growing body of scholarship to look specifically at the nocturnalization of work in 'white-collar' employment.

I focus in particular on the expansion of the Business Process Outsourcing (BPO) industry in the Philippines. BPO refers to the subcontracting of different aspects of business operations to a third party. This includes accounting, advertising, animation, health insurance claims processing, human resources, and, in particular, customer service contact centers or "call centers." Over the previous decade, the Philippines has emerged as a global hub for the BPO sector. Today, the industry is estimated to directly employ over 1.3 million people across the country, the vast majority of whom work throughout the evening to service clients located in Europe and North America. In business districts throughout the Philippines, the socio-temporal, spatial and regulatory climate of the night have been altered to accommodate the needs of American corporations and consumers. In Metropolitan Manila in particular, entire urban mega projects now function primarily on a North American time zone.

The paper draws on over one year of field research conducted in the Philippines. I focus in particular on the experience of one megacity, Metro Manila, and two mid-sized cities, Bacolod and Iloilo. I adopt a mixed methods approach, which includes spatial analysis, observational analysis, industry analysis and semi-structured interviews with business leaders, politicians, urban planners and night-time office worker.

Through this analysis, I draw attention to how the nocturnalization of work has led to unique planning challenges, ranging from increased petty crime to the need to provide affordable and reliable public transportation during the evening and early morning hours. I also show how the expansion of nighttime employment in central business districts is driving a new type of urban agglomeration, one in which issues of time – and the specific time zone(s) served – shape the organization of physical space, and influence urban design and planning practices. The paper concludes with a more generalizable discussion on the nocturnalization of work and its urban implications in a global context.

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Key Words: Globalization, Temporality, Technology, Infrastructure and Development, International and Comparative Planning

## **RURAL HERITAGE PRESERVATION UNDER THE LOGIC OF COLLECTIVE ACTION—A COMPARISON OF THE HETEROGENEOUS DEVELOPMENT OF THREE TRADITIONAL VILLAGES IN CHINA**

Abstract ID: 978

Individual Paper Submission

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The conservation and research of rural heritage has become a popular topic among the international heritage community. In China, in the context of its national strategy on cultural revival and rural revitalization, various policies alongside with funds have been developed and injected into those underdeveloped villages where the traditional ways of production and lifestyle have been relatively well preserved, aiming to safeguard rural heritage as well as to promote local economic development. These conservation actions generally as the interventions for public good and interests, however, ended up in very different ways. Some have achieved the goals of preserving heritage and benefiting the local community; some are dealt with purely as token gestures and formalities; some are even interrupted and suspended upon the resistance of local communities.

The study attempts to explain the intrinsic reasons for different results of the practices from the perspective of the action logic of the villagers. Through analyzing the relationship and conflicts between the interests of the individual, collective and public, the authors explore the possible conditions under which individual rationality is consistent with collective rationality, so as to provide new ideas and methods for effective conservation.

The article employed the "Logic of Collective Action" theory to analyze villagers' response to the interventions of historic preservation. The theory, deduced by the famous American economist Mancur Olson, demonstrates that individual rationality is not a sufficient premise for collective rationality. The reason is that Individuals who are rational and seeking self-interest will not take action to realize their common or group interests, but tend to be free-riding. Based on this theory, the study establishes a conceptual framework of rural heritage conservation to explain the internal logic of villagers' actions in the process of rural heritage preservation (regarded as some sort of public goods in this case), as well as the different results under different prerequisites.

The study introduces the cases of three adjacent traditional villages in the same underdeveloped area in China. All these three villages were inscribed into the list of National Traditional Villages in 2012, whose current development status however, are quite different: Village A is well-preserved with its tourism development in full swing; Village B has some converted a few of its traditional houses, following a preservation route of Ecological Museum; Village C has undergone a major change in its landscape with more than 90% of the traditional houses demolished and reconstructed. The three cases, which shared the same policy background and location conditions while going towards totally different directions, are approached and explained in this study with the application of the theoretical framework to comparison of the logic of villagers' actions.

The study finds that heritage conservation is collective rationality of the whole society, and the village collectively assumes the obligation and responsibility of heritage conservation as a consideration for public payment; in underdeveloped areas, the "rational" individuals are more inclined to the improvement of living conditions; while certain conditions can be made to enable the convergence of the individual rationality and collective rationality. The

research suggests that decision-making and planning should fully consider the inconsistency between individual rationality and collective rationality, and utilize individual compensation mechanisms to promote the consistency. Therefore, the research is an inspiration for the development of rural heritage conservation mechanism.

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Key Words: Rural Settlement, Historic Preservation, Logic of Collective Action, China

### **SLUM GROWTH IN TIER 2 CITIES: A CASE STUDY FROM GAYA, INDIA**

Abstract ID: 997

Individual Paper Submission

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In India, more than 70 million people live in urban slums. Most of the 53-urban agglomeration in India with a population of million or more are experiencing a rapid growth of slums (GOI). The unplanned urbanization has contributed significantly to this large expansion of slums in Indian cities. The slums population has been constantly rising since 2001, though the rate of increase has slowed down due to aggressive push by the national and the state governments to rehabilitate slum dwellers (Li et al., 2021).

However, governments at every level have been struggling in keeping up with influx of poor people in cities. The urban service delivery has taken a massive hit. At the same time, housing shortages and housing unaffordability has been increasing in most of the cities in India (Ahluwalia, 2016).

In the last 6 years, the national government has launched 6 major development projects targeting urban poor with the projected cost of more than \$200 billion. There is no doubt that this major policy push has helped slum dwellers, however, most of the impact we see has been limited to Tier 1 cities. This research focuses on the slums in Tier 2 cities, most of the previous research on slums has focused on Tier 1 cities with little or no discussion on small and medium cities.

The study aims to answer two questions: (a) Why do slums persist? and (b) How can we transform slums into better living space? The study identifies the continued persistence of slum attributes as defined by UN-HABITAT. Small city slums have been largely overlooked in the existing literature on urbanization (Marx et al., 2018). The study utilizes primary data collected from 184 households and focus group discussions conducted in nine different slums of Gaya, a tier 2 city of Bihar in India. Econometric results reveal that perceived legal ownership, prolonged stay at the same location, improved housing, income and education facilitate the dissolution of slum characteristics. Our results also suggest that while, patronage associated with corruption within the local formal governance enables reduction of slum characteristics, whereas discriminatory allocation of public resources contributes to their persistence. The paper suggests that strengthening of security of land tenure, improvement in local governance and adoption of income and human capital augmenting measures can act as a potential catalyst towards the endeavor to de-slum a city.

Understanding the effectiveness of policies aimed at informal settlements will help planners, policy makers, and civil society to formulate and implement appropriate policies for urban poor to achieve more inclusive and sustainable cities. This paper also emphasizes the importance of differentiation planning strategies. The policy aimed at Tier 1 cities are likely not to succeed in Tier 2 cities.

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Key Words: Urban slums, Informal Settlements, Inclusive Cities, Impact Evaluation

#### **MAKING THE AFFORDABLE MORE LIVABLE: BETTER HOUSING BY DESIGN**

Abstract ID: 998

Individual Paper Submission

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While affordable housing remains a daunting challenge, globally, recent years have also witnessed an uptick in creative solutions and public sector commitment towards expanding the supply of affordable housing in the Global South. Innovations ranging from land assembly to tenurial arrangements to financing mechanisms have emerged and have been spreading, boosted by the involvement of civil society, private sector, and other non-state actors. In addition to shelter interventions such as in situ slum upgrading (King et al., 2017) and ways to enable incremental development (Mukhija, 2014, Owens et al., 2018), there is also a growing recognition and push for scaling up the supply of mass housing (Woetzel et al., 2014; World Economic Forum, 2019) in emerging economies. Influenced by the broader contexts of decentralization and neoliberal policies since the 1990s, the changing dynamics of affordable housing supply in the Global South are privileging the objectives of supply expansion and efficiency over those of housing effectiveness and equity (Das, 2018), particularly from the standpoint of livability. Towards meeting the objectives of effectiveness and equity in affordable housing projects, by creating more livable environments, this paper calls for enlarging the emphasis on “design” aspects. Likely boosted by recent Pritzker prizes recognizing architecture’s contribution to social housing, as well as concerns raised by the COVID-19 pandemic, in both the North and South there is a noticeable resurgence in valuing the role of design for affordable housing (Hoyt & Schuetz, 2020). Design, here, refers to multiple considerations—including, the siting of projects, site-planning and designing of units and buildings, materials and construction techniques, institutional actors and their arrangements, as well as regulations and standards. The paper underscores the role of design by: 1) describing and analyzing the development of rusunawa projects (walk-up rental flats, Indonesia’s popular public housing product) in the city of Surabaya, spread over a period of three decades; and b) discussing effective, contextually relevant, affordable housing solutions from elsewhere in Asia that highlight exemplary design. The research involves multiple qualitative methods: semi-structured interviews with planners and architects, including designers of rusunawa projects; analyzing secondary literature and other sources; and evaluating site plans and design of structures and spaces—from drawings, site-visits, and conversations with residents. The paper finds that despite decentralization having made planning activities in Surabaya more localized, transparent, and inclusive, the process of planning and designing rusunawa has become less local and participatory than before, thereby adversely impacting livability—in terms of the spatial, sociocultural, and economic relevance of these designed spaces to their occupants. Based on the findings, this paper recommends, for Surabaya and elsewhere, that: 1) although centralization of public housing programs might be necessary for scaling-up, decentralization of individual projects is essential for effective design

inputs; 2) housing design at the local level should be decentralized further to allow multiple institutions (universities, civil society organizations, community groups) to collaborate in participatory design processes; and 3) land use regulations and building bylaws and standards need to be more flexible to allow for creative and effective solutions through incremental development and modifications of space.

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Key Words: Design, Affordable housing, Public housing, Participation, Indonesia

#### THE INCLUSIVENESS OF URBAN PUBLIC SPACES IN A GLOBAL SOUTH CITY: EVIDENCE FROM BANGKOK STREET PLAZAS

Abstract ID: 1008

Individual Paper Submission

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Planners actively endeavor to promote more inclusive urban spaces that meet the public health, recreational and social needs of an increasingly diverse urban population (Gehl, 2013). While public spaces ideally provide opportunities to socialize and interact, making all residents from a multitude of socioeconomic backgrounds feel welcome remains a planning challenge particularly in global cities of the south. This study seeks to (i) explore the measurement operationalization of inclusiveness and (ii) identify the causal relationships that exist between perceived inclusiveness and patterns of public space utilization in Bangkok, Thailand. Many of the existing studies measure the inclusiveness of public spaces using the researcher's observations (Mehta & Mahato, 2020). The role of perceived inclusiveness in the users' propensity to use public spaces, however, is not yet well understood in the context of the Global South. While there is an established literature for the developed world (see, e.g., Németh & Schmidt), the inclusiveness of urban public spaces in emerging economies remains an underexplored research area. Bangkok, in particular, is home to over 10 million people, but available urban public spaces currently fell short of the demand of its growing population. Because of such limited availability, inclusiveness is one of the top policy concerns in efforts to advance quality of life through improved utilization of public spaces.

This research aims to assess the inclusiveness of urban public spaces in Bangkok as a representative city in the Global South, focusing on users' perception of inclusiveness with the central business district as the primary study area. We collected data from over 600 respondents to a survey of users' perception of the Bangkok premier street plazas. Central to the survey are instruments designed to measure how users feel about the degree to which the street plazas they frequented were inclusive. The dimensions of their perception are the user assessments of pedestrian comfort reflected in the thermal environment, passageway condition, walking obstacles, available

shading, and physical accessibility. A methodological contribution of our study is the structural equation model that we developed to articulate the causal linkages between the latent inclusiveness and patterns of public space utilization in Bangkok. The latent variable approach is designed to incorporate distinct measures of users' perception capturing the shared meaning of inclusiveness in a theoretically-consistent framework. Structural path analyses suggest that the effect of perceived inclusion on the frequency of visits to street plazas is both direct and mediated by accessibility and thermal comfort. How often users visit public space in Bangkok thus is shaped by subjective assessment of accessibility, which in turn is influenced by perception of inclusiveness. At the same time, duration of visits is only indirectly affected by perceived inclusiveness and turns out to be significantly longer for residents with college education, suggesting a pattern of utilization that benefits the educated users of Bangkok street plazas. We also found evidence of a positive impact of street plazas on social capital through the indirect effect of perceived inclusiveness on the likelihood of a chance encounter with the user's neighbors. In parallel, users sought ease of access through plaza entrances because of its role in promoting spontaneous interactions with other community members. The results suggest the role of inclusiveness-friendly planning in promoting a public-space-friendly lifestyle that cultivates social capital and nurtures physical and mental health in the Global South.

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Key Words: Inclusiveness, Urban public space, Global South, Bangkok, Structural equation model

#### **TRADE AND EVERYDAY LIFE IN EAST AFRICAN COASTAL CITIES: THE EVOLUTION OF TWO URBAN MARKETS AND THEIR SURROUNDING COMMUNITIES IN DAR ES SALAAM, TANZANIA**

Abstract ID: 1024

Individual Paper Submission

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Open street markets (urban markets) are a quintessential feature of East African coastal cities. These sites at once represent, trade and business centres, sources of entry-level jobs for low skilled labour, and places where an array of formal and informal social, economic and spatial relationships and structures are formed and transformed. However, research has seldom focused on urban street markets as a way to understand everyday urban production and transformation in East African cities. This paper addresses this gap through a comparative analysis of the evolution of two urban markets and their surrounding territories in the fast-growing city of Dar es Salaam, Tanzania. Standing three kilometres away from each other, in the municipality of Kinondoni, near to the city centre, Tandale and Makumbusho are, respectively, the city's second largest food market and regional hub for the trade of second-hand goods, and a planned market built in 2001 that has struggled to maintain its commercial activities. The paper explores the interconnections between the two markets and the neighborhoods adjacent to them, and the relationships between development and transformation of the markets, the neighborhoods and the broader territory. Drawing from ethnographic and action research methods, the paper combines research data from informal interviews and archival analysis with on the ground knowledge of the Swahili communities in which the markets are inserted, acquired through years of social tourism and heritage preservation activities that the researchers have conducted in the area.

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Key Words: Urban markets, Global South, Everyday life, Transformation, Grounded analysis

## PROLONGED WATER WOES OF MUMBAI'S URBAN DRAINS: WHAT ARE DECISION-MAKERS MISSING?

Abstract ID: 1039

Individual Paper Submission

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The three urban rivers of Mumbai – Dahisar, Oshiwara, and Mithi – are breathing lungs of the city by regulating its urban drainage through the wet and dry seasons of the year and particularly during the extreme monsoon spells. All, while navigating through densely populated suburban development, ultimately emptying into the Arabian sea. The Mithi river was the primary cause of the intense flooding and life-loss in the city in the July 2005 deluge, while the Dahisar and Oshiwara rivers also majorly flooded, breaking down all possible urban systems. In response, for the past fifteen-plus years, the public authorities have focused on the river widening and cleanup mainly through the displacement of informal settlements along the riverbeds called “encroachment.” However, a critical look into the environmental history will reveal that other pro-development projects also contributed to the river pollution. Like the extensive land reclamation since the 1970s for the present-day financial district of Bandra Kurla Complex and the Mithi river diversion to accommodate an airport runway creating a significant choke point. There have been no mechanisms to address these developments that may seem more permanent, ultimately targeting the already vulnerable urban poor. Myriad of interventions are incessantly underway to “save,” “revive,” “restore,” “reimagine” these urban rivers, but there has not been much improvement. Most of the responses fall under the realm of either displacement or large-scale design and hard-engineering solutions. This study also aims to look at how decision-makers can go beyond these big engineering approaches to perhaps more human-centric incremental approaches like behavior in restoring these urban drains.

Like many developing cities of the global South, the challenging state of Mumbai's rivers is a barometer of an urban crisis, and a vast implementation gap becomes evident while analyzing multiple failed interventions over the years. So, what are we missing here? This study essentially aims to investigate the environmental history of Mumbai's urban rivers, identifying sites of multiple failures, and evaluate the efforts that have gone into managing and improving their conditions. Furthermore, explore behavioral opportunities and interventions by engaging a diverse range of decision-makers. Such as incentivizing positive behavior of communities, businesses, or institutions, establishing a social support network to reinforce pro-environmental behavior, recruiting change agents or role models within our communities. If recognized and scaled appropriately, these approaches could be instrumental in crafting environmental policies, programs, and significant infrastructure projects.

Along these lines, the primary research question is two-fold: (1) What does an urban environmental history of these rivers reveal regarding factors responsible for river pollution, how does it align with current pollution abatement and restoration efforts? (2) How can decision-makers and professionals in urban water management practices adopt

behavioral interventions?

This study's fundamental implication is incorporating a behavioral approach with urban environmental planning. An essential part of this research is defining this decision-making community, guided by critical frames of equity, representation, and agency. Its entities include leaders at various levels of agencies, professionals, representatives from public, private, non-profit, and residential welfare associations (RWAs), groups with specific interests, voluntary or providing expert services. This study's data is mainly from secondary sources and preliminary field visits from 2018 and early 2019.

The theoretical framework and case study analysis of the context is modeled after Ostrom's Socio-Ecological Systems approach on Governing the Commons, to understand the institutional dynamics and multitude of decision-makers in an urban setting. Additionally, while exploring behavior change as a critical tool in urban water management, the research will also build upon the Pro-environment Behavior framework, which aids in the sustainability of the natural environment, harms the environment as little as possible, and potentially benefits the environment.

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Key Words: Mumbai, urban rivers, urban water management, environmental history, behavior

#### INFORMAL WORK AND SUSTAINABLE CITIES: FROM FORMALIZATION TO REPARATION

Abstract ID: 1047

Individual Paper Submission

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Building just and sustainable cities requires reexamining how the informal is conceptualized and acted upon by mainstream development actors. Epitomizing a powerful economic commonsense, the Sustainable Development Goals (SDGs) assert that formalizing the informal economy is the route to decent work and economic growth (see also ILO 2019). Admirably, the 2015 SDGs seek to decouple decent work from ecological extraction, promoting both livelihoods and sustainability. Yet assessments like the SDGs often underestimate the economic, environmental and social value informal workers produce for cities. These assessments also elide how growth-oriented economies reproduce job scarcity, income inequality and poverty, the very conditions that impel many to informal work (Tucker and Anantharaman 2020).

While planning has a rich legacy of engaging informality in housing and human settlements, these insights have not been systematically applied to informal work. This paper draws on extended ethnographic research in Paraguay and India with street vendors and wastepickers. Based in our own research, critical informality studies and community-

produced knowledge about informal work, we argue for new ways of thinking about and engaging informal work. We challenge the persistent tendency to devalue informal work. Grassroots recyclers provide essential urban-environmental services, diverting waste from landfills and enabling recycling (Dias 2016) while street vendors support food security as they bring life, vibrancy and protection to urban spaces (Bromely 2000). Even further, formal economies rely on and appropriate this value. The deficit-based frame of informal work, we argue, is rooted in a pernicious antipoor epistemology. To counter this, we argue that thinking spatially, relationally and historically clarifies the essential role of informal work in subsidizing urban economies and ecologies.

Urban planners, policy-makers and city officials often invest formalization with supercharged powers to reduce poverty, increase productivity, clean and order urban space and produce self-reliant economic subjects. Yet, deficit-based frames of informal work tend to prescribe disempowering forms of formalization, which can dispossess workers, reduce their collective power and undercut the social and environmental value their work generates.

We propose decentering formalization as a primary goal of urban planning and initiatives like the SDGs. For formalization to address social and environmental inequities it must redistribute resources and power to informal workers and grassroots social movements. Indebted to the Black radical tradition, we argue this can be realized through an ethic and practice of reparation, which seeks to reimagine and recreate socio-ecological relations from a full acknowledgement of the injustices of the past as they live into the present (Robinson 2000). We advocate reparation over justice because dominant, liberal notions of justice center the individual, foreclose consideration of histories of harm and deny the need for collective redress.

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Key Words: Informality, Work, Sustainability, Racial Capitalism, Reparations

#### **WORSENING SOCIAL AND PSYCHOLOGICAL CHALLENGES OF NEPALI MIGRANT WORKERS DURING COVID-19**

Abstract ID: 1097

Individual Paper Submission

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Both skilled and unskilled laborers are migrating across different Asian countries in search of job opportunities and income. It is estimated that more than 15 million non-national workers are working in the United Arab Emirates, Saudi Arabia, Qatar, Oman, Kuwait, and Bahrain. Most of them are from the Indian subcontinent or South East Asia (Kronfol, Saleh, and Al-Ghafry, 2014). From Nepal, more than 4.3 million youths are staying outside of their country for employment. The majority of previous research has focused on the cost and benefits of labor export. Still, results are ambiguous and primarily targeted to the economic impacts, including contribution to the national economies, communities, and households (Goss and Lindquist, 1998). Previous studies have identified research gaps in labor migration's social, political, and cultural dimensions (Asis and Piper, 2008). These migrant workers face different challenges in destination countries, including poor living conditions, lack of health services, social discrimination, and



psychological problems. With the Novel Coronavirus outbreak (COVID-19), social and psychological issues became severe among these migrant workers. Previous research has shown that the global pandemic has become the leading cause of chronic psychological problems like anxiety, panic disorder, depression, and psychosomatic manifestations among migrant workers (Tandon, 2020). To develop a better understanding of challenges faced by migrant workers, this study examines how COVID-19 took a toll among returning Nepali workers in their social, economic, and psychological lives.

An online survey was developed focusing on the social, economic, and psychological challenges of COVID-19 among returning Nepali migrant workers. It was distributed through personal and professional networks in all 77 districts of seven provinces of Nepal. It was administered from May 10 to July 30, 2020, when the highest number of Nepali migrant workers returned to their country due to job loss or outbreak of COVID-19 in their work locations. A total of 1,107 responses were received. Using content analysis and statistical methods (Chi-square and logistic regression models), the research finds that these migrant workers faced economic, social, and psychological challenges in their own country. The majority of these workers lost job permanently. About half of the returning migrant workers faced discrimination in their village, including exclusion from social activities, ignorance from their own families, and deprivation of essential services. The research identified a greater need for immediate actions from Central, Provincial and Local Governments of Nepal to address these workers' employment needs. It also noticed an urgent need for counseling, training, and awareness campaigns to control the dogma against returning migrant workers about the COVID-19 spread.

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Key Words: migrant workers, Nepal, COVID-19, Social challenges, Psychological challenges

# Track 8 – Land Use Policy & Governance

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### **8.23 PRE-ORGANIZED SESSION - LOCATING THE SOCIAL VALUE OF LAND: THE PLANNERS' ROLE IN LAND VALUE CAPTURE - SESSION 1**

Pre-Organized Session 23 - Summary

Session Includes 127, 128, 129, 130, 131

SHIH, Mi [Rutgers, The State University of New Jersey] mi.shih@ejb.rutgers.edu, organizer

Recent scholarship on land and financialization has argued that many land value capture mechanisms have led to an urban world that is both planned and inflationary. While this body of work is analytically insightful, it leaves little direction of action and good solution to planners, a key agent in the urban landed property development. This paper session focuses on the planners' role, the social value of land and the conditions for materializing it. We have three goals: 1) Diversify the scope of discussion by bringing in international use of land value capture, 2) Examine how social value of land is framed, strategized, politicized, inserted, and materialized in planners' engagement of land-based financial tools. We recognize that planners have agency and we are interested in how planners help construct the urban world in which they practice, 3) Juxtapose a set of dissimilar cases as a method of comparison to further advance the discussion of the conditions under which the social value thrives or stagnates in land value capture. The session contributes to the planning scholarship by advancing and expanding the epistemologies of land, value, and urban development.

Objectives:

- To learn about the mechanisms, practices, processes, and politics of land value capture

### **THE GOVERNMENTALIZATION OF SPECULATION**

Abstract ID: 127

Abstract within Pre-Organized Session 23

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Land value capture strategies (LVC; often called "value uplift" or "planning gain" in countries outside the United States) require local governments to hitch their wagons to future land values to pay for public goods in the present. Those governments have assumed debt to pay for infrastructure and to subsidize private developers to invest in targeted areas. If land values in the area do not go up, the cash flows local governments have committed to repay debt are threatened and the complicated deals between public and private sectors may collapse.

Dependent on land value surpluses, LVC strategies turn local governments into and co-rent seekers and partners in speculation. Speculation is "future-oriented social action aimed at directing capital" and involves ideas about what time should be used for, "formal knowledges used to anticipate patterns in time so as to harness and direct capital," and "tools used to arrange action in time and to link its flow to capital generation and accumulation" (Bear 2020).

What kinds of ideas, knowledges, and tools are deployed in these partnerships? Does having a similar end goal (land value inflation) reconcile their respective interests or smooth over the potentially divergent means of getting there? Do municipal planners accept private predictions of land inflation at face value? Or do they push back against those predictions? How do planners and their private partners engage with the future as both an imaginary and material process of unfolding, projecting and extrapolating, as both temporal and spatial? What are the effects of this "governmentalization of speculation" (Birla 2015)?

I draw on my many years of participating in and observing publicly subsidized LVC projects in Illinois and Wisconsin from 2010-2020. In several cases, I was brought into these deals to provide advice by journalist or municipality, and so had access to the formative documents and discussions enabling them. I was interested in how professionals involved in these deals anticipated the behavior of uncertain property markets in order to extract rents from them in the present. I interviewed planners, developers, and consultants and asked them to "show me their models." This paper explores other compromises municipalities make when they enter into these Faustian bargains (i.e., private land value surpluses to pay for public goods).

Value capture schemes, and any tax- and land-based debt, rest on a foundation of expectancy and speculative future-thinking. Partners to the LVC deal must attest to the rate of land value appreciation; indeed that prediction is what gets monetized and used as security in subsequent phases of the project's financial life cycle. How parties agree to use the expected value increment is, to some extent, open to negotiation and political contestation (Wolf Powers 2020).

And yet the ability of the public and private sector to realize their speculations on the future are also unequally distributed (Szolucha 2018). Specifically, it has been argued, financial capital owns and controls the means of prediction. Indeed my previous research demonstrates how and explains why the public sector adopts "financialized" time value of money assumptions (Weber 2020). If this is the case, is it possible for municipalities (or other interest groups) to advance their future interests, and ensure that their private partners do not anticipate, colonize, or control every projection or future imaginary on which plans are based? Or is the final product of the negotiations always weighted toward private interests because their models and assumptions are designed into the process? I return to my interview and participant observation data, updated by recent developments in the projects I was tracking, to attempt to answer these questions.

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Key Words: Land value capture, tax increment financing, property, redevelopment, deal-making

#### PLANNERS' PREFERENCES FOR EMBEDDED SOCIAL VALUE IN THE ENGLISH LAND VALUE CAPTURE EXPERIENCE

Abstract ID: 128

Abstract within Pre-Organized Session 23

DUNNING, Richard [University of Liverpool] R.J.Dunning@liverpool.ac.uk, presenting author

The relationship between the land that value is captured from and the location of expenditure of that value is fraught with ethical, equity and political considerations. Some political economies resolve this tension by strictly prohibiting the removal of value from the spatial context it is generated in, whilst others permit its extraction to fund public goods separate from the site. In this paper, I explore the perspectives of planners involved in the

negotiation of developer contributions in England and their role in determining whether values are embedded within or outwith the site of extraction.

In England, the value of developer contributions is widely variable between local planning authorities, in part this is a result of different path dependent development patterns, which are partly explained by local economic conditions (Lord et al., 2019). However, different local planner behaviours and planning cultures also result in diverse negotiations with developers and differences in the value of planning gain extracted (Dunning et al., 2019).

When the Community Infrastructure Levy (a flat charge on developments to fund infrastructure anywhere in the local authority) was introduced in 2011 it changed the role of negotiations between planners and developers over contributions. The rational nexus, that any contribution required by the local authority should be clearly caused by the development, was revitalised as the guiding principle for negotiations (Crook and Whitehead, 2019). Yet, this still left some room for planners to pursue their visions of what social value should be created through the development and where.

In this paper, I will explore evidence of planners' perceptions from across studies in England conducted between 2007/08 and 2018/19. The paper will show how planners' perceptions and behaviours have engaged with concepts of spatial justice and equity, adding some nuance from diverse development contexts to Fainstein's (2012) argument for land value capture and justice. It will explore the variation in their positions and explanations of relating concepts of equity to broader social needs and the specific site of development. The findings from this research will prove fruitful in training planners in alternative approaches to negotiation in the planning process for social goals.

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Key Words: Land Value Capture, Planning, Equity, Rational Nexus, Developer Contributions

#### **EMBRACING VALUE CAPTURE FOR INCLUSIONARY HOUSING ORDINANCES: ANALYZING THE ATTITUDES AND PERCEPTIONS OF LOCAL PLANNING PRACTITIONERS IN FLORIDA**

Abstract ID: 129

Abstract within Pre-Organized Session 23

KIM, Minjee [Florida State University] m.kim@fsu.edu, presenting author

In 2019, the Florida Legislature passed House Bill 7103, adding a new statutory mandate that requires local governments to “fully offset all cost” borne by the developers complying with local Inclusionary Housing Ordinances (IHO). The Bill has had a chilling effect on local IHO practices. One county, Sarasota, went as far as to partially repeal its existing IHO to avoid potential legal challenges.

Value capture offers a particularly useful conceptual framework for securing inclusionary housing in Florida's legal context, but if and how the local governments of Florida will embrace value capture for inclusionary housing will

depend on a multitude of political, cultural, and economic factors. One such factor is the local planning culture (Dunning et al., 2019). If value capture finds no support among the local planning and economic development staff, it is unlikely that the localities will establish new IHOs in light of the statutory mandate. Some localities may even repeal existing IHOs, as Sarasota County did.

This research project aims to understand how and why some local governments might be more receptive to using value capture for affordable housing than others and for those that are reluctant, why. The efficacy and outcomes of value capture practices are known to depend on the strength of the real estate market (Kim, 2020; Crook et al., 2016), the level of practitioner expertise (McAllister et al., 2016), and the perceptions and attitudes of local government actors (Weber, 2020; Dunning et al., 2019). These explanatory frameworks serve as useful lenses to examine a locality's openness towards embracing the concept of value capture, in this case for inclusionary housing.

I will first present findings from a survey of how Florida's planning practitioners understand the new statutory mandate and if and how their locality has responded to the new mandate. I will then present the findings from investigations of the local planning culture based on interviews with planning and economic development practitioners working at local governments. I will use the existing explanatory frameworks to explain the variations that might be found in practitioner attitudes and perceptions. The findings from this research will yield valuable lessons for fostering local planning cultures that can be more receptive and bolder in harnessing the value capture concept to secure public benefits.

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Key Words: Value Capture, Inclusionary Housing Ordinance, Affordable Housing, Real Estate Development, Public Benefit

## **INTENSIFICATION, DEVELOPMENT REGULATION, AND LAND VALUE CAPTURE: CONFLICT OVER THE RULES OF THE GAME IN TORONTO**

Abstract ID: 130

Abstract within Pre-Organized Session 23

SORENSEN, Andre [University of Toronto] andre.sorensen@utoronto.ca, presenting author

This paper examines the emergence and operation of the Toronto intensification planning regime, focusing on approaches to development regulation, land value capture, and infrastructure finance, through two case studies of land development control and planning policies in areas that have seen large-scale, high-rise redevelopment in the last two decades, City Place on the edge of the downtown core, and Humber Bay Shores on the Lake Ontario shoreline. Toronto has for 70 years been one of the fastest growing city-regions in North America, and over the last two decades in particular has seen a boom of high-rise development (Filion, Leanage et al. 2020). The Toronto case is valuable, as a distinctive value-capture system has emerged, conflict over both the rules of the game and their application is intense and continuous, and detailed documentation of regulatory processes and outcomes is

available.

The sets of institutions regulating capital investment in urban property are increasingly important today, as urban property development has become the world's largest industry, most cities struggle to finance infrastructure demands related to intensification, and cities are key actors in attempts to achieve more sustainable development and better living environments. Debates and policies designed to capture a share of increases in urban property value for public benefits are longstanding, but have become more pressing in recent years as demands for and costs of necessary infrastructure grow and other sources of revenue have shrunk (Ingram and Hong 2012, Kim 2020).

In theory, as every property in a city requires a wide range of public infrastructure and services to be able to function, each should contribute its share of these costs. Further, as public actions such as development regulation and infrastructure provision are responsible for a significant share of any land value increases associated with intensification, it is widely argued that the public owns a share of the uplift of property value. The challenge is to achieve this in practice.

This paper quantifies the scale of value capture in Toronto, and details the nature of public benefits that have been realized, showing that in practice, while most municipal operating and maintenance costs are paid for with annual property taxes and user fees, capital costs are mostly paid for with levies on new development following the principle that 'growth pays for growth' (Biggar and Siemiatycki 2020, Found 2019).

But these policies have been vigorously contested. Conflict occurs in two main arenas: in the provincial legislature, where planning laws and policies have been repeatedly revised to modify value-capture mechanisms; and at the micro scale of each development where zoning, permitted height and density, infrastructure assessments, and permission fees are negotiated and contested, often through appeals to the Ontario Municipal Board (OMB), a quasi-judicial appeal body. These conflicts are revealing of the operation of the rules of the game regulating development, of key actors' positions, and of processes and mechanisms of institutional change. While Toronto has seen some success in achieving planning goals and land value capture, it is clear that the city has become increasingly reliant on exactions for density bonuses, development charges, and park land dedications as sources of infrastructure finance, and big questions remain about the legitimacy and effectiveness of current approaches, particularly as housing has become increasingly unaffordable.

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Key Words: Land value capture, intensification, development regulation, institutional change, property

#### **BUILDING SOCIAL HOUSING ON RISING LAND PRICES: TAIWAN'S TECHNOCRATIC-DEVELOPMENTAL APPROACH TO URBAN DENSITY AND LAND POLITICS**

Abstract ID: 131

SHIH, Mi [Rutgers University] mi.shih@ejb.rutgers.edu, presenting author  
CHIANG, Ying-hui [National Chengchi University] yinghui@nccu.edu.tw, co-author

Planners and land officials in Taiwan have a long history of facilitating real estate market growth by creating and changing technical rules for density use. From mundane, inconspicuous building codes exempting certain residential spaces, such as balconies, from official calculation of floor area; to regulatory experiments with transferable air rights for boosting buildable density; to a growing list of development acts deemed worthy of density bonuses, such as large-site or speedy development, Taiwan's ever expanding and increasingly complex technical intervention into density reflects the closeness of the real estate sector's financial interests, political influence, and market power to planners' regulatory minds (Chen, 2020; Shih et al, 2018). Globally, density as a form of land rent has become a popular method through which planners turn land into monetary value or capture land value (Haila, 2016; Pérez, 2020). In recent years, there is a distinct new trend in density bonusing in Taiwan: that is, fulfilling social needs or purposes, such as social housing or energy-saving building construction, through real estate property development by rewarding private developers with density rent. Taiwan's density regime is such a large collection of rules of density remission, incentives, and credits that it is a common phenomenon that one single real estate development project "stacks up" its building height from several different sources of density bonuses.

In this article, we examine how Taiwanese planners' use of density is rooted in a technocratic and development intervention to land, density, and urban politics. We argue that when planners use the same technical manner of density bonusing to address social housing as they do to boost real estate market interests, it deepens the acquisitive and speculative logic of real estate capital and ultimately worsens the problem of housing affordability. Analyzing 18 real estate development projects, we estimate the lifting effects of density bonusing on land prices. We aim to quantify the answer to the question of how much more daring developers are in their bidding for land at present in anticipation of more salable units in the future. We use the residual valuation method (also called the cost approach) that is the standard practice among real estate professionals in Taiwan and is also the basis of the financial viability test for land value capture in England (McAllister, 2017). The findings show that even after accounting for a net profit of 20% of total sale, a figure we heard consistently in our interviews with real estate agents, density bonusing still has a great potential of driving land prices up.

Our findings show that privately built social housing units are gained under the conditions of an accelerated capital switch to land acquisition, luxury property development, and rising land prices. This is an irony in which a hyper acquisitive real estate market worsens housing affordability while contributing to the stock of social housing units in the city. We conclude the article by discussing the larger implications of how such a technocratic-developmental approach to density bonusing allows planning to reproduce a symbiotic state-market relationship.

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Key Words: Social housing, Real estate market, Density bonusing, Land value capture, Taiwan

## **8.26 PRE-ORGANIZED SESSION - LOCATING THE SOCIAL VALUE OF LAND: THE PLANNERS' ROLE IN LAND VALUE CAPTURE - SESSION 2**

Pre-Organized Session 26 - Summary

Session Includes 132, 133, 134, 135

SHIH, Mi [Rutgers, The State University of New Jersey] [mi.shih@ejb.rutgers.edu](mailto:mi.shih@ejb.rutgers.edu), organizer

Recent scholarship on land and financialization has argued that many land value capture mechanisms have led to an urban world that is both planned and inflationary. While this body of work is analytically insightful, it leaves little direction of action and good solution to planners, a key agent in the urban landed property development. This paper session focuses on the planners' role, the social value of land and the conditions for materializing it. We have three goals: 1) Diversify the scope of discussion by bringing in international use of land value capture, 2) Examine how social value of land is framed, strategized, politicized, inserted, and materialized in planners' engagement of land-based financial tools. We recognize that planners have agency and we are interested in how planners help construct the urban world in which they practice, 3) Juxtapose a set of dissimilar cases as a method of comparison to further advance the discussion of the conditions under which the social value thrives or stagnates in land value capture. The session contributes to the planning scholarship by advancing and expanding the epistemologies of land, value, and urban development.

Objectives:

- To learn about the mechanisms, practices, processes, and politics of land value capture

### **LAND VALUE AND JUSTICE: INSISTING ON DECOMMODIFICATION VS. ASSENTING TO HYPER-COMMODIFICATION**

Abstract ID: 132

Abstract within Pre-Organized Session 26

WOLF-POWERS, Anna Laura [Hunter College, City University of New York] [aw2416@hunter.cuny.edu](mailto:aw2416@hunter.cuny.edu), presenting author

A rich vein of relatively recent scholarship contends that planners are complicit in the financialization of land. In relying increasingly on tools such as tax increment financing, density bonusing, and transfer of development rights (TDR) to fund public infrastructure and promote development, it is argued, planners participate in processes that inflate land prices, enable rent-seeking, and contribute to destructive property market bubbles. Advocates for reparative planning and economic justice have responded to these dynamics with calls for decommodification. Rather than reinforcing extractive logics, they argue, planners should work to remove land from the speculative marketplace using instruments of public, non-profit and cooperative ownership. An opposing impulse, however, is to repurpose land value capture tools to achieve redistributive and reparative ends. This approach implicitly assents to the construction of urban space as a commodity but strives to recover the proceeds of this process to fund disinvested public goods and reduce deeply inequitable access to urban amenities and opportunities.

This paper draws on the case of land politics in New York City in the second decade of the 21<sup>st</sup> century to examine the tension between these two approaches. Early in the decade, planners in the city used transfer of development rights and density bonusing in multiple situations to stimulate market-rate housing and Class A office and retail development, as well as pioneering density increases in conjunction with an inclusionary housing mandate. However, the housing crisis worsened as luxury development displaced working class households and as units created under the inclusionary mandate did not address the deepest need, in large part because expectations about up-zoning inflated property prices in low-income areas. Concomitantly, a boom in the "tech" industry that was deeply imbricated with the increased valuation of industrial and commercial real estate priced out industrial businesses, working artists, and low-rent commercial enterprises. Decrying the complicity of the "real estate state" in these dynamics, advocates mobilized around policies that would have the effect of decommodifying land.



Community land trusts proliferated in the city during this period, as did advocacy for reinvestment in public housing. Interest in mission-driven industrial and commercial development grew, and in 2019, an activist state legislature succeeded in shoring up residential rent regulation in the city. In the current electoral cycle, some candidates for citywide office have pledged to use city policy to put more land in social and non-profit ownership.

While decommodification efforts show promise, they have remained marginal in the policy landscape. In the meantime, advocates have seen opportunities to tap into real estate market hypertrophy, bending value capture practices, particularly air rights transfer, to redistributive purposes. In the 2019 report *Public Action, Public Value: Investing in a just and equitable Gowanus Rezoning*, the Pratt Center for Community Development and the Fifth Avenue Committee proposed to raise revenue for direly needed renovations in public housing by instituting a transferable development rights (TDR) regime in conjunction with the up-zoning of the Gowanus neighborhood in Brooklyn. Similarly, advocates for religious congregations and cultural institutions facing aging buildings and dwindling membership have proposed that the city change its zoning code so that non-profit institutions can transfer air rights more flexibly, raising funds for the mission-related work these groups do. This second approach, rather than challenge the financialization of land, seeks to capture and redistribute its gains more evenly.

Because they co-opt dominant practices and discourses, strategies to capture value within the hyper-commodification paradigm might be expected to have greater political traction. But city government has resisted efforts to use value capture for justice, perhaps demonstrating the necessity of a wholesale paradigm shift.

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Key Words: value capture, de-commodification, transfer of development rights

#### **LAND VALUE CAPTURE: WHAT AND HOW CAN WE LEARN FROM OTHER COUNTRIES?**

Abstract ID: 133

Abstract within Pre-Organized Session 26

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Capturing development value to help fund new affordable housing and infrastructure has a long history in the UK both through (less successful) taxation approaches and (more successfully) through developer contributions. There has been a similarly long history in many European, North American and other countries. This paper will consider what lessons if any, nations can learn from policies and practices in other countries including examining the success of land value capture policy in England. The paper draws on the author's long standing empirical and conceptual work in this area including most recently for UK governments and including comparative analysis. The papers will also draw on concepts related to policy transfer and to different approaches to the legal underpinning of planning especially contrasting common law with rules based legal systems. It will consider the extent to which notionally successful policies in specific countries can take root and flourish within other countries.

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Key Words: land value capture

## NEGOTIATING AIR RIGHTS TRADING AND THE SOCIAL FUTURES

Abstract ID: 134

Abstract within Pre-Organized Session 26

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This paper analyses urban policy instruments which attempt to capture land values through three forms of air rights trading, including air rights as bonus credit (i.e. density bonus), offset credits (i.e. TDR), and saleable permits (see also (Gandhi and Phatak 2016; Liong et al. 2020; Shih and Shieh 2020). Here, air rights trading is broadly identified as policy instruments that permit the uplift of buildable volumes of a land parcel upon exchanges between air rights and (non-)monetary values. In this study, I draw the links between works of literature on the land value capture scholarship and geographical critiques of urban commons and commoning (Brinkley 2020; Eidelman and Safransky 2020) and ask three interrelated questions: How do current urban policies invest in the valorization of urban air rights? How are different urban actors capturing the value from this process? Taken together, how are the social futures of ownership and control between individual property and urban commons/commoning being understood, perceived, negotiated, and practiced? Building upon four spells of fieldwork in Taipei City and New Taipei City between 2015 and 2021, this study uses comparative legal analysis, in-depth interviews with policymakers, government review committee members, planners in government, and civil society sectors, appraisers, and developers. By reviewing the air rights trading and its modes of land value capture mechanisms, this paper explores the symbiotic relationship across different urban actors. It highlights the monetary and non-monetary exchanges in different phases of negotiation processes for (mega-)urban development projects. It concludes by proposing three themes that help to identify lines between the use and abuse of air rights in the existing land value mechanisms: valuations, ownership and control, and socio-ecological futures.

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Key Words: value capture, valuation, ownership and control, urban commons, socio-ecological futures

## **WHAT IS LAND? TRANSFER OF DEVELOPMENT RIGHTS (TDRS) AND THE NEW ENCLOSURES OF THE VERTICAL CITY**

Abstract ID: 135

Abstract within Pre-Organized Session 26

BALAKRISHNAN, Sai [University of California Berkeley] sbalakrishnan@berkeley.edu, presenting author

This paper interrogates the growing popularity of a new land-use planning instrument, the transfer of development rights (TDR). Public officials in varied contexts, from New York and Boston to Mumbai to Taipei, are turning to TDR as a flexible, market-oriented instrument for regulating urban space and urban resources. The TDR program is a form of "land-based financing," where land and its appurtenant development rights becomes key sources of public finance. The TDR program is a special form of "land-based financing" because it is not the increment or surplus from terra-firma land that is in question, but the surplus from development rights which are linked to land via floor area ratios (FAR). In Mumbai, the rise of vertiginous new skyscrapers is enabled by the TDR program which allows developers to separate development rights from a specific plot of land, to transfer these development rights (or air rights) across space, and then to stack them onto different plots of land. It is this separation logic of TDR that is the crucial focus of this paper (cf. Balakrishnan and Van Maasakkers, n.d). The paper has two main aims. First, the TDR is enabled by the mundane and often-naturalized land-use instrument of the Floor Area Ratio (FAR), which became a favored mobile policy in the 1960s (traveling, for instance, from New York to Mumbai / then Bombay). What were the forces that led to urban density being codified in the form of a monetizable instrument like the FAR, which then became the basis for hyper-speculative vertical urbanization in various cities around the world? Second, how can the proliferation of TDR in varied contexts open new windows into fiscal austerity in the post-1980s era of globalization? In answering this question, I'm particularly interested in why two ideologically opposed political parties, the right-wing Shiv Sena in Mumbai and the workers-party of the PT in Sao Paulo, introduced the same land-use instrument for financing urban public services at more or less the same time? Third, how do instruments like the TDR with their logics of separation produce a-priori narrow understandings of land that disembody air / development rights from the particularities of the site? How does this foreclosure of the varied meanings of land trap planners within processes that reinforce existing urban power relations, leaving them with little or no recourse at embedding land within its social-ecological and place-based meanings.

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Key Words: Land-based financing, Transfer of development rights, urban verticality, skyscrapers, fiscal austerity

## **8.37 PRE-ORGANIZED SESSION - THE PRACTICE OF USING PLANS: ENGAGING THE FUTURE NOW**

Pre-Organized Session 37 - Summary

Session Includes 245, 246, 247, 248

HOPKINS, Lewis D. [University of Illinois at Urbana-Champaign] ldhopkins@sbcglobal.net, organizer

Plans should be useful, usable, and used. Assessing plan quality, recognizing that plans function within an ecosystem of plans, representing uncertainty in plans, and accounting for climate change adaptation will make plans more useful. Tools that support the many actors who can benefit from easier access to the ecosystem of plans and associated regulations that apply to a particular place will make plans more usable and more impactful. These papers present initial evidence that useful plans, supported by usability tools, are being used by a wide range of participants to achieve diverse interests.

Objectives:

- Innovations in making and using useful plans
- New tools for working with the many plans that apply to a place

### **DERIVING AND REPRESENTING ROBUST AND CONTINGENT PLANS**

Abstract ID: 245

Abstract within Pre-Organized Session 37

AVIN, Uri [University of Maryland] uavin@umd.edu, presenting author

One of the oft-repeated benefits of scenario planning is its potential to produce actions, strategies and even plans that can work both for specific scenarios (contingent) as well as across all scenarios (robust) (Chakraborty et al 2011). There is, however, extremely little evidence of such bona fide products (Avin and Goodspeed 2020) and those which have been developed appear overly generic (when robust) or overly granular (when contingent), limiting their utility in both cases. Moreover, their products typically exist as words rather than embedded or embodied in plans and maps, further limiting their utility. Recent additions to the scenario literature (Goodspeed 2020, Stapleton 2020) do not much change this conclusion. This presentation seeks to present advances in the practice of deriving viable robust and contingent scenarios and in their useful representation in plans.

The vehicles for demonstrating these advances are a quick survey of several current examples of such scenario planning efforts and their products with the primary focus on a scenario planning effort for updating the famous new town of Columbia, Maryland. This effort was part of a 2020 academic studio for the Columbia Association as the “client”, who were concurrently updating their own “vision”. It also occurred in parallel with a separate comprehensive plan update for the new town’s host, Howard County, using a scenario-based process. Columbia is an unincorporated entity and even though it contains 1/3 of the people and jobs in this affluent, suburban County, the Columbia Association has had a very limited say in the future of the County. This scenario-planning exercise thus also raises other interesting and obvious institutional, political and substantive questions about the use and impacts of scenario planning. Some of these questions will be addressed in the presentation.

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Key Words: plans, scenarios, plan processes, plan impacts

## IMPROVING THE QUALITY OF INDIVIDUAL PLANS AND COORDINATION OF NETWORKS OF PLANS: AN APPLICATION TO A LOW-CAPACITY COMMUNITY VULNERABLE TO DISASTERS AND CLIMATE CHANGE

Abstract ID: 246

Abstract within Pre-Organized Session 37

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A major barrier to achieving more resilient and equitable development is the lack of knowledge about the interactions between the quality of individual plans and coordination among plans. The benefits of a high-quality comprehensive plan may be compromised if the plan is poorly coordinated with other plans. For example, a high-quality comprehensive plan proposes avoidance of new construction in areas exposed to sea level rise, but a city may face pressures to create a transportation plan that supports new development in the same area. In turn, plans that are well-coordinated in the integration of climate resilience and equity policies, can be compromised if they have weak fact bases and poorly conceived implementation elements.

Against this backdrop, there is significant gap in knowledge about the interactions between the quality of individual plans and how well integrated any individual plan is with a network of plans. There is a great need to develop new innovations that can help communities both improve plan quality of individual plans and ensure coordination of a network of plans. Planning researchers only partially responded to this challenge by developing separate theories and methods for plan quality evaluation (Lyles and Stevens 2014, Masterson et al. 2015) and plan Integration (Berke et al. 2015, and Malecha et al. 2019). A critical next step is to connect these perspectives and test applications that attempt to translate them to planning practice.

In this study, we use participatory action research (PAR) to apply to urban planning practice in the context of a community's efforts to create a high-quality comprehensive plan that is coordinated with a network of local and regional plans. We engaged planning practitioners to chronicle the process and document the impacts of the application of plan quality evaluation and plan integration tools to guide the recovery of a relatively poor, low-capacity case community devastated by Hurricane Harvey that is increasingly vulnerable to floods and the effects of climate change on flooding. The case involves a cooperative partnership between the community and university experts to co-produce knowledge that improves the quality of individual plans, and identifies conflicts among plans and reveal hidden opportunities for improving coordination and implementation of plans.

We address two research questions. Can the tools be used in actual planning practice to build local capacity to improve the quality and coordination among plans and produce outcomes (e.g., changes in land use and development regulations, and public investments) that are directed toward more resilient and more equitable places? If yes, can recommendations be developed to serve as guidelines for applying the tools aimed at higher levels of government that incentive or require local planning, and local communities that most directly deal with resilience and equity issues? These questions are subject to empirical inquiry, and they guide the design, data collection, and analysis of this study.

We find that the application process enabled a team of local plan evaluators to learn about the diverse values, priorities and rules of different city agencies, and the scope and purpose of the network of plans. Plan evaluators found that local plans are not fully consistent and do not always address the geographic areas and population groups most vulnerable; moreover, some plans actually increase vulnerability to floods and sea level rise. The partnership demonstrated that planners can use the tools to generate information to inform changes in plans, regulations, and public investments to support more equitable, healthy and less vulnerable cities.

Citations

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Key Words: community resilience, climate change, disasters, plan evaluation, equity

## **PARIT: WHAT PLANS AND REGULATIONS APPLY TO THIS PLACE?**

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Abstract within Pre-Organized Session 37

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The Plans and Regulations Information Tool (PaRIT) is a computing interface that enables spatial queries to identify and access the many plans and regulations that apply to a given place. These plans and regulations are created by various government, intergovernmental, and non-governmental organizations and are created at different times with different functional, spatial, and temporal scopes. As argued elsewhere (Hopkins & Knaap, 2016), we should neither expect these plans to be consistent nor try to make them consistent. PaRIT accesses multiple plans and regulations to give decision-makers emergent information in support of several plan using tasks: plan commission staff report, affordable housing location opportunities, developer location opportunities, aggregating ideas across plans for advocacy such as bikeways or affordable housing (National Center for Smart Growth, 2019), neighborhood group advocacy/opposition, looking for consistency or contradictions related to particular goals such as hazards or climate change mitigation (Berke, Malecha, Yu, Lee, & Masterson, 2019).

We demonstrate the capabilities of PaRIT in applications to the Purple Line light rail transit project in Montgomery and Prince George’s Counties, Maryland, north of Washington, DC. This tool operationalizes concepts for creating Information Systems of Plans (Finn, Hopkins, & Wempe, 2007; Kaza & Hopkins, 2012), structured databases for collecting, indexing, and querying the many plans that typically apply and relating these plans to regulations. The tool relies on an extensive database of geo-spatially defined plans that express intentions or visions of important organizations in both counties. These plans range from traditional neighborhood level land-use plans to county-wide general plans but also include educational facility master plans and bicycle and pedestrian plans. Regulations included in the tool include legally binding rights, incentives or constraints on land development in the corridor such as zoning, impact fees, and economic development incentive zones.

Spatial queries can be defined in several ways: by street address; by drawing a point, line, or polygon; by uploading shapefiles; by allowing access to your location; by choosing a feature on the map; and a buffer can be added to any of these queries. Queries can use filters to focus on particular types of plans or regulations. Query results present important attributes of each plan or regulation that applies to that location and include links to PDFs and websites for the complete documents. A summary report can be formatted in printable format or exported as spreadsheets

or shapefiles.

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Key Words: plans, regulations, information technology, GIS

#### **CAN ONE ORGANIZATION PLAN FOR EVERYTHING? A COMPARISON OF THE NEW YORK REDC'S REGIONAL ECONOMIC DEVELOPMENT STRATEGIES AND CLEANER, GREENER COMMUNITIES PLANS**

Abstract ID: 248

Abstract within Pre-Organized Session 37

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The goals of economic development planners and sustainability planners, which have often been in conflict, have begun to overlap to considerable degree (Campbell 1996; Gibbs and Linz 2016). The well-being of present and future communities cannot be considered independent of the relationships among economic development, environmental degradation, and global climate change. Furthermore, shifts toward carbon-neutral production offer the prospect of industrial growth and development. Despite this evolution in thinking, planning practice commonly retains disciplinary and institutional boundaries between the fields of environmental/sustainability planning and economic development. While many communities engage in comprehensive planning that nominally addresses both goals, the degree of meaningful integration in such plans often remains low even as the case for broader planning grows stronger (Oseland 2019). At the regional scale in the U.S., economic development and sustainability planning (if they exist at all) are often completely separate processes and are commonly carried out at different times by completely separate organizations.

Since 2011, New York State's ten Regional Economic Development Councils (REDCs) have overseen the creation of multiple regional plans in their respective jurisdictions. Two of these planning efforts – the 2011 Regional Economic Development Strategies and the 2012 Cleaner, Greener Communities initiative – were carried out within the nominally distinct policy areas of economic development and sustainability with each of the ten REDCs developing one plan of each kind for their respective regions (Green and Finn 2020). Unlike prior episodes of regional planning in the U.S. that often attempted to influence land use in smaller jurisdictions directly, these plans seem to function more like agendas for future action (Hopkins 2001).

This flurry of regional planning creates an ideal opportunity to observe how these two types of plans are produced and used as well as the relationship (if any) between them. The research begins with a content analysis of the resulting 20 plans to determine what sorts of information they contain. This is followed by a set of case studies of

two regions where the document review is supplemented with key informant interviews to determine how the plans have been used since they were produced.

The research addresses four related questions about the ways that regional economic development planning and regional sustainability planning are related in practice:

1. Given the growing understanding of the relatedness of their goals, how similar are regional economic development plans and regional sustainability plans?
2. To what degree and in what ways do plans of one type explicitly acknowledge the existence and importance of the other?
3. To what degree and in what ways were the two planning processes in each region related, if at all?
4. How have the plans been used over the last decade, if at all, in their regions and constituent municipalities?

The results will help us to assess the degree to which the overlapping goals of economic development and sustainability are reflected in current planning practice and will highlight specific ways in which regional planning institutions support or hinder the integration of these historically distinct areas of planning.

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Key Words: Regional planning, Economic development, Sustainability, Plans

## **ROUNDTABLES**

### **8.831 ROUNDTABLE - TWENTY YEARS OF SMART GROWTH: PROGRESS AND FUTURE**

Abstract ID: 831

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Although its precise birth date remains uncertain, “smart growth” is now more than 20 years old. In this roundtable, we look back at the origins of the smart growth movement, examine the successes and failures of smart growth policies and practices, and envision what smart growth will -- and should-- look like going forward. Our roundtable summarizes our Handbook on Smart Growth which will be published by Edward Elgar in 2022.



Although definitions vary, the EPA defines smart growth as “development that serves the economy, the community, and the environment and changes the terms of the development debate away from the traditional growth/no growth question to how and where should new development be accommodated” (Smart Growth Network 2004). Before the 1990s, state and local efforts to combat sprawl and manage development were called “growth control” and “growth management” and primarily focused on slowing the rate of urban growth and regulating how growth happened. In the early 1990s, a new growth management movement emerged, focused on policies to control suburban sprawl. The smart growth movement focused on how government investments and incentives could facilitate smarter development on a regional level. This new approach aimed to change the focus from stopping or slowing growth to assuring that growth was “smarter” in location, intensity, and form.

The Smart Growth Network – a national alliance of more than thirty private sector, public sector, and non-governmental organizations – continues to advance the following ten principles, which constitute the predominant paradigm in land use planning for the last two decades:

Mix land uses

Take advantage of compact building design

Create a wide range of housing opportunities and choices

Create walkable neighborhoods

Foster distinctive, attractive communities with a strong sense of place

Preserve open space, farmland, natural beauty, and critical environmental areas

Strengthen and direct development toward existing communities

Provide a variety of transportation choices

Make development decisions predictable, fair, and cost effective

Encourage community and stakeholder collaboration in development decisions

More recently, however, smart growth advocates have begun to address contemporary challenges such as climate change and social equity. The popularity of the term “smart growth” has faded in favor of the terms “sustainable development” and “urban resilience.” These new vocabularies connote many of the principles of smart growth, but they also represent a change in focus and a recognition of new challenges, raising questions around the validity of the 10 principles; whether smart growth achieved goals; failures and omissions from smart growth; updated principles; and the future of smart growth.

The roundtable will describe the key findings of the book, including an overview of the history of smart growth & role of smart growth. Then, we address the original principles of smart growth such as mixing land uses, promoting walkability, providing housing opportunities, providing transportation alternatives, and more. Finally, we examine issues that were not addressed in the original smart growth principles but have ostensibly been added to the smart growth agenda. These include climate change, social equity, public health, workforce development, smart cities, and more. Then we offer remarks about how smart growth has succeeded or fallen short, and what smart growth version 2.0 might look like going forward. We consider a smart growth policy agenda for addressing social equity and climate change through the smart growth principles.

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Key Words: Smart Growth, Land Use, Growth Management, Governance

## **INDIVIDUAL PAPER SUBMISSIONS**

### **GOVERNMENT A LA CARTE, “FEND-FOR-YOURSELF” FEDERALISM, OR LOCAL CONTROL? INTERROGATING SPECIAL DISTRICTS IN COLORADO**

Abstract ID: 9

Individual Paper Submission

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Special districts are territorially defined public or quasi-public entities that provide public services to residents on an à la carte basis. Metropolitan (metro) districts are a type of special district that provide at least two special-district services and act as developer-initiated residential associations, functioning as de facto ghost governments. There are over 3,000 special districts in Colorado and 1,520 metropolitan districts, compared with around 270 municipalities in the state. Indeed, according to the Colorado Futures Center, Colorado ranks first per capita of all U.S. States in its sheer number of public-service entities. The largest metro district in the state, Highlands Ranch, CO, is home to 96,500 people.

In this inquiry, I ask: what are the social characteristics of metro districts in the U.S. State of Colorado compared with municipalities? What are the legal, political, and normative consequences of each jurisdictional regime? I consider the first question drawing on geospatial methods joining jurisdictional boundaries with racial and income data from the U.S. Census, and couple this inquiry with an analysis of home values and property taxes paid in one pilot Colorado County. I find that special districts are whiter and wealthier than municipalities, though the scope and practical significance of my findings depend on assumptions made with regard to GIS’ Modifiable Areal Unit Problem (MAUP). Accordingly, I complement these findings with quantitative regressions that control for county and settlement size. I consider the second question through three possible normative imaginaries explaining the presence of special districts in the state, informed by theoretical literature on local government from historical, legal, and urban theory fields: (1) communities of common interest (McKenzie, 1994; Young, 1990); (2) urban entrepreneurship (Harvey, 1989; Brenner, 2004); and (3) racial capitalism through implicit fortification and fear of the ‘other’ (Caldeira and Holston, 2000; Hutson et al., 2012). Planners and the planning practice should be concerned that metro districts in particular may serve as more than a mechanism for “local control”: they further spatial exclusion, uneven development, and what Tilly (1998) calls “opportunity hoarding.” One promising policy solution may lie in “strong regionalism” (Frug, 2002), with public-service delivery more equitably shared across fragmented jurisdictional regimes.

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Key Words: Local government, special/metro districts, racial capitalism, opportunity hoarding, regionalism

## HOUSING TORONTO: EXAMINING THE DETERMINANTS OF SOFT DENSIFICATION EFFORTS IN TORONTO, CANADA

Abstract ID: 28

Individual Paper Submission

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In recent years, planners and policymakers have touted the benefits of “soft densification,” or the process in which private actors, such as small-scale developers or property owners, incrementally densify their properties through parcel or housing subdivision, home extensions, or residential additions (Dunning, Hickman & While 2020). Soft densification projects tend to take place in low-rise, single-family neighborhoods and to occur in housing markets with rising real estate values (Touati-Morel 2015). In the past few decades, an increasing number of municipalities in Europe and North America have adopted “soft densification” as an explicit policy objective, touting soft densification as an approach that can help address a host of urban challenges, but that does not dramatically alter the existing urban form (Charmes & Keil 2015). For example, cities have reasoned that soft densification will help encourage more environmental forms of urbanization, increase the housing supply in housing-scarce cities (e.g. through the addition of secondary units), and encourage greater buy-in for residential densification in areas where larger-scale upzonings are politically unpalatable (Meijer & Jonkman 2020). Although previous research has found that incremental densification can make a substantial contribution to the overall housing supply, minimal empirical research to date has examined the determinants of soft densification, including parcel, neighborhood, or regulatory characteristics that influence the likelihood that a given parcel experiences soft densification (Bibby, Henneberry & Halleux 2020).

This gap in the literature matters for several reasons. First, since private actors tend to drive soft densification efforts, additional research is needed to identify factors that motivate property owners to engage in soft densification efforts. As municipalities across the United States consider eliminating single-family zoning to allow for denser development, planners and policymakers that wish to encourage densification need additional information about factors that might motivate private actors to densify their properties. Second, previous research has found that property owners “who engage in soft densification receive higher returns on selling their land” (Touati-Morel 2015, p. 606) and that households located in higher-income areas tend to be more likely to engage in incremental property improvements, particularly if doing so requires a zoning variance (Fischer, Stahl & Baird-Zars 2018). Thus, if it is the case that more advantaged households enjoy the economic benefits of soft densification, planners and policymakers interested in incentivizing densification in less advantaged neighborhoods will need additional information about the conditions under which soft densification tends to be feasible and successful.

Aiming to help fill this gap in the literature, this research examines factors that encourage soft densification practices in Toronto, Canada, asking: “What are the factors that influence the likelihood that a property owner will seek zoning relief for incremental densification in Toronto?”. Toronto is an ideal setting to study soft densification efforts since Canada has encouraged high-density development in its suburban periphery since the 1960s and has more recently encouraged soft densification in single-family neighborhoods within Toronto (Charmes and Keil 2015; Searle and Filion 2010). In the past several years, planners and policymakers have expressed increasing interest in the city’s so-called “yellowbelt,” or the nearly 70 percent of residential areas zoned for detached and semi-detached housing (Kalinowski 2019). In order to answer this research question, I leverage data from the City of Toronto to construct a unique database reporting on the parcel, neighborhood-level, and regulatory characteristics of properties that have undergone soft densification since the early 2000s. Next, I conduct a regression analysis to understand factors associated with a higher probability of lots densifying during the time period. Findings from this research will be relevant to planners aiming to better understand the dynamics behind urban densification and identify densification priority areas.

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Key Words: Housing, Densification, Land use, Zoning, Upzoning

## EXAMINING THE MOTIVATIONS FOR THE WILLINGNESS TO OWN AUTONOMOUS VEHICLES IN THE TWIN CITIES

Abstract ID: 77

Individual Paper Submission

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Governments regard the advent of autonomous vehicles (AVs) as an important opportunity for citizens and businesses. It is widely believed that AVs will greatly improve traffic safety. However, their impacts on urban form, vehicle miles traveled, and the environment are ambiguous. Understanding the spatial correlates of people's acceptance of AVs helps policymakers know where AVs emerge firstly, predict the spatial patterns of AV trips, and better understand their environmental impacts. Previous studies have explored how built environment attributes and demographics influence people's acceptance of AVs (Jiang et al., 2020; Nodjomian and Kockelman, 2019). However, the literature has two major limitations. First, these studies seldomly examine the relative contribution of various motivations for the acceptance of AVs from a theoretical perspective. Second, few studies focus on the potential nonlinear and threshold effects of the built environment on people's acceptance of AVs. Addressing these gaps helps better understand how people are motivated to accept AVs in their daily travel and provides planning guidance for areas where AVs arise in advance.

Using the 2018 regional travel survey data in the Twin Cities, this study applies the gradient boosting decision tree approach to explore individuals' motivations for willingness to own AVs and the nonlinear effects of built environment attributes. Specifically, it tests hypotheses pertinent to three motivations (efficiency, diffusion of innovation, and transit substitution) and examines their relative importance to AV acceptance. The efficiency hypothesis posits that people who drive more and usually live far away from the city center prefer to own AVs because they would like to enjoy the efficiency provided by AVs (Nodjomian and Kockelman, 2019). The innovation-diffusion hypothesis posits that people living in urban areas are among the first group of people to accept new technologies like AVs because they tend to be better educated, more affluent, and more technology savvy (Talebian and Mishra, 2018). The hypothesis of transit substitution postulates that people treat AVs as a substitute for transit, taxi, or shared mobility because they do not need to operate AVs manually (Haboucha et al., 2017).

Our results show that the built environment attributes and demographics serving as proxies for diffusion of innovation (e.g., population density, income, education) have a total relative importance of 32.8%, larger than those related to efficiency (e.g., distance to downtown, land use mix, 18.1%) and transit substitution (e.g., transit stop density, TNC frequency, 17.4%). In addition, built environment variables collectively have a relative importance of 31.9%, with land use entropy, population density, and intersection density among the largest ones. Finally, there are salient nonlinear and threshold relationships between built environment attributes and people's willingness to own AVs.

This study contributes twofold to the literature. First, we conclude that the influences of built environment attributes and demographics on people's willingness to own AVs reflect more on diffusion of innovation, followed by efficiency and transit substitution. Second, the nonlinear and threshold effects of the built environment on the willingness suggest the locations where AVs may emerge firstly, for example, the areas with land use entropy smaller than 0.3, population density smaller than 20 per acre, and intersection density less than 80 per acre. Planners can give priority to these areas to promote AV acceptance in the long-range transportation plan. They can also use the results to predict the future travel demand of AVs and make policies to address the potential issue of congestion, especially in those already-congested areas.

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Key Words: machine learning, land use, preference of efficiency, diffusion of innovation, transit substitution

#### PEERING INTO MEGA-EVENT IMPACT CRATERS

Abstract ID: 79

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Mega-events such as World Expos and the Olympic Games, have been employed by a host of actors to reshape cities around the world (Monclús, 2009; Roche, 2017). Through time and space these events have left substantial urban footprints in host cities (Mataruna-dos-Santos & Pena, 2017). National, state and local governments, and civic and business leaders have used mega-events to achieve intangible goals such as the reshaping of urban imaginaries through “urban image construction” (Abbott & Minner, 2021; Broudehoux, 2007). The International Olympic Committee (IOC) and the Bureau of International Expositions (BIE) both require prospective local hosts to prove their ability to deliver on “legacy,” touted as a loose amalgam of intangibles and economic impacts (Cohen, 2016). Mega-events are also used by local hosts to restructure urban land and create new civic centers and public spaces, transforming the uses and users of the land (Chan and Li, 2017). Over time, mega-events have marked the shifting tides of nation-building to city-making ambitions and urban redevelopment (Monclús, 2009; Roche, 2017).

In this paper, we approach former mega-event sites, specifically International Exhibitions or World Expos, with the “meteor impact crater,” as a conceptual metaphor evocative of spatial transformation through large-scale redevelopment. The “impact crater” occurs in large-scale astro-geological events in which an object hits the land with enough velocity to create a depression. This metaphor is indicative of the ways in which an expo as a temporary event leaves a lasting physical, as well as social or cultural, impacts (Minner et al., 2021). In the case of

mega-events, these impact craters can be observed in the process of large-scale demolitions of existing urban fabric and the carving out of space for the event. After the expo, a space is created that may be repurposed as parklands, for a convention center, for urban mixed use development, or any number of new uses. Mega-events may also leave abandoned buildings and vacant lands for short to extended periods of time. Similar to the way in which geologists use stratigraphy to understand physical impacts, systematic observations of spatial and land use layers can be observed in both the physical fabric and archival record to understand the impact of mega-events like expos over time.

The civic and business elites involved in organizing expos use these events to shape the nature of public and private investments in order to achieve urban development goals (Poynter et al., 2016). Expo development can be very similar to, or incorporated as a part of, redevelopment schemes that transform downtowns and waterfronts (Abbott, 2005; Hackworth, 2007; Ribeiro & Santos Junior, 2017) and produce suburban research hubs and science parks. These goals are often proposed for attainment immediately after an expo, but change at former expo sites may be uneven and the actual uses and social and spatial impacts of expos may differ substantially from the urban development aspirations of mega-event organizers. Our primary research question centers on methods of comparing urban development in and around world expos many years after an event. We ask: How can scholars compare their social and spatial impacts and evolution of the sites over time?

We review existing scholarship on mega-events as tools of urban development and the extant literature pertaining to their longitudinal study and comparison globally. Next, we describe methods that involved geospatial tracing of the “impact craters” of 20 expo sites and means of understanding patterns in relation to each other, to change over time, and to paradigms of urban redevelopment. We conclude with recommendations for scholars and international bodies overseeing mega-events for the construction of a framework for in-depth comparisons between expo sites over time.

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Key Words: Mega-events, Urban development, World expos, Land use, Spatial planning

#### IS THERE SUCH A THING CALLED “EQUITABLE ZONING BYLAW?”

Abstract ID: 138

Individual Paper Submission

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Zoning prescribes the uses of land and the locations, types and sizes of buildings within a municipality. Since the early 20th century, zoning has been used to address conflicts between land uses, such as residential and industrial, but has also been used to control and segregate people. Zoning thus has a dual legacy: one of promoting public good, but also discrimination and exclusion.

Recognizing that planning too often places unfair burdens on certain segments of the population through zoning, planners are increasingly seeking to incorporate equity -- the "just and fair inclusion into a society in which all can participate, prosper and reach their full potential" (APA, 2019, p.3)' -- into all aspects of planning practice. Many intersectional factors, such as race, socioeconomic status, gender, religion, and ability, have an impact on equity.

Applying the relatively broad concept of equity to a legal and regulatory tool like zoning, however, is challenging. Hence, taking "a human rights perspective can provide a universal frame of reference for identifying inequitable conditions" in a regulatory environment (Braveman & Gruskin, 2003, p.540). "Substantive equality" in the Canadian jurisprudence on human rights encapsulates the idea of equity. A human rights perspective forces issues of equity into the same legal realm in which land use regulation lies (Agrawal, 2014, 2020).

To this, we added distributional, recognitional and procedural equities as three additional dimensions of equity (Krumholz, 1990; Schlosberg 2004, 2007; Bulkeley et al 2014; Meerow et al 2019) as our framework to analyze the zoning bylaw. This research uses currently ongoing Edmonton's Zoning Bylaw Renewal Initiative as a case study to examine equity considerations in zoning.

The study addresses a series of related questions: how can we apply and promote equity and substantive equality considerations in a zoning bylaw? How can we identify the inequities created by land use regulations generally, and specifically in the case of Edmonton? What human rights and equity issues should be considered when drafting land use regulations? What compromises may be necessary when addressing equity using such tools?

We have conducted a thorough review of academic literature, best practices, and relevant case law to explore the intersections of equity, human rights, and land use regulation. We interviewed key actors -- local stakeholders both within and outside of the City bureaucracy -- to gain insight into how equity can be embedded into municipal regulations. We also analyzed close to twenty years of minor and major variances, zoning amendments, and appeals to the City's Subdivision and Development Appeals Board to ascertain how zoning tools have caused or helped improve inequity within the city in the past.

Our research develops an equity test that cities could use to gauge how equitable their zoning bylaws are. Our research results not only guide how the City of Edmonton can best apply equity and human rights considerations in its new zoning bylaw but are also useful for planners and policymakers across Canada and beyond seeking equity and human rights considerations in land use regulations.

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Key Words: zoning bylaw, equity, human rights, Edmonton, Canada

## **AGING PLANNING BEYOND THE BRICK-AND-MORTAR: THE EVOLUTION OF AGING POLICY AND GOVERNANCE IN SINGAPORE**

Abstract ID: 197

Individual Paper Submission

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Planning for aging is a foremost policy concern given that one in four Singaporeans will be aged 65 years and above by 2030. Through archival work, interviews and a discourse analysis of secondary material, I chronicle Singapore's aging policy infrastructure since the 1980s, highlighting the paradigm shifts in policymaking as Singapore adapts to evolving demographic needs, social practices and governance considerations.

The paper examines the interventions in the built environment, housing and ageing-in-place policies Singapore has undertaken over the years, excavating the governance rationalities that have undergirded policies through the decades. In doing so, I highlight the challenges faced, and the nimbleness required to tweak policies and build institutional capacities to meet the desires and diversity of the aging populace. In particular, I suggest that the recent initiative by the Housing and Development Board (HDB) and the Ministry of Health (MOH) to jointly develop a public housing concept of Assisted Living piloted in February 2021, signals a turn from the neoliberal market-driven direction that had previously marked senior housing developments in Singapore towards public-sector efforts with the government taking the lead to provide affordable senior housing options across the eldercare needs spectrum. Concomitantly, the paper also attends to the growing concerns on the mental well-being and stresses of aging in global city Singapore. I emphasize how Singapore's aging policies have sought to but will increasingly need to be attentive to strategies that move beyond the immediacy of physicalist and design-centric measures to a more comprehensive place-based ethics of care approach that forges capacities of 'heartware' to complement the hardware measures already in place towards aging well.

In providing an overview of Singapore's aging planning and policy experience, I offer a perspective outside the Euro-American canon that can bring helpful takeaways for cities everywhere enabling possibilities for better planning and making of age-friendly cities.

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Key Words: age-friendly cities, public policy and governance, seniors housing, mental health, Singapore

## **ARE WE THERE YET? REVISITING "PLANNING FOR SUSTAINABLE DEVELOPMENT" 20 YEARS LATER**

Abstract ID: 199

Individual Paper Submission

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More than 20 years ago, Berke and Conroy (2000) set out to answer whether planning practice had responded to the UNECD Rio Conference directive to plan for sustainable development. The authors established six sustainability principles (livable built environment, harmony with nature, place-based economy, equity, polluters pay, and responsible regionalism) and used those principles to evaluate plan policies of 30 high quality and sustainability-focused plans across the United States. The overall findings set forth that plans intending to promote sustainability and those that were otherwise noted as high quality were not significantly different in how well they promoted the principles. Both sets of plans did promote one principle (livable built environment) significantly more than the other five, establishing a very unbalanced promotion of the concept for practice (Berke and Conroy, 2000).

Planning for sustainable development remains an active and promoted paradigm in the planning literature. Not only does the Berke and Conroy (2000) article have over 800 citations, most coming since 2010, searching via Academic Search Complete for “planning” and “sustainable development” (limiting to planning related journals) reveals hundreds of citations for articles published since 2015. The paradigm serves as the foundation for “best practices for comprehensive plans” (Godschalk and Rouse, 2015). However, in light of the increased attention to specialty plans addressing, for example, climate change, ecosystem services, and resilience, the planning community remains generally unaware of the integration of fundamental principles into community comprehensive plans.

Berke and Conroy (2000) did not measure plan quality itself. Instead, the work evaluated the strength with which plan policies promoted sustainability principles. However, it remains a component of the plan evaluation literature (Berke and Godschalk, 2009). That literature has developed in the intervening years to capture communicative processes (Norton, 2008), detailed internal and external plan characteristics for best practices (Berke and Godschalk, 2009), as well as “anticipatory governance” (Berke, et al., 2014). Given these progressions both on the evaluative and topic foci, planning is again challenged to understand how well practice is translating sustainability considerations into primary planning documents, notably the community comprehensive plan.

This paper examines three research questions based on the original work. First, do the sustainability principles used for evaluation remain valid when considering the evolution of the sustainability paradigm to issues including, for example, resilience? Second, do the updated plans for each of the original communities promote sustainability principles more strongly and/or more balanced than their initial sustainability score? Third, do new high quality plans promote principles of sustainability similarly (strength and balance) to the updated original plans?

We examine the questions by first establishing the essential considerations of the current plan evaluation literature, including the target plans of those evaluations. Then we evaluate the ability of the Berke and Conroy (2000) framework to capture the topical and methodological evolution. Based on that assessment, we return to the 30 community comprehensive plans from the 2000 study and evaluate how well they promote sustainability principles. Finally, we then examine award winning comprehensive plans from the past decade to compare how well they promote those same principles. This study will assess the relevance of the Berke and Conroy (2000) principles in light of the literature progression and provides needed insight regarding the state of practice in promoting sustainable development.

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Key Words: Sustainable development, Plan evaluation

## **DO STAKEHOLDERS DIFFER IN THEIR PERCEPTIONS OF EMPOWERMENT IN SUCCESSFUL BROWNFIELD REDEVELOPMENT? A CASE STUDY OF THREE PROJECTS IN BIRMINGHAM, ALABAMA.**

Abstract ID: 210

Individual Paper Submission

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This research uses Arnstein's ladder to evaluate differences in stakeholder perceptions of empowerment in the brownfield redevelopment process. While environmental legislation promotes citizen participation in brownfield redevelopment, limited work exists on implementation and evaluation of stakeholder participation in these activities. We define meaningful participation in brownfield redevelopments as a process where public participation educates citizens, interacts with them, and incorporates their ideas and comments to enhance the quality of project outcomes (Rowe and Frewer, 2005). However, research has indicated that public participation in brownfield redevelopment typically occurs at lower (less than strong) levels of participation (Solitare, 2005); it is often reduced to holding workshops and disseminating information (Chess and Purcell, 1999). A successful redevelopment project may not indicate the ultimate satisfaction of all stakeholders with collaborative decision-making and the ultimate project outcome.

This work explores this issue by utilizing Arnstein's ladder as an evaluative technique that measures the extent stakeholders feel empowered in the decision-making process (Arnstein, 1969). More recently, Contreras (2019) modified and adapted Arnstein's model to research community participation in organizational post-disaster cleanup and recovery work in Haiti. Contreras' work highlighted the practicality and statistical application of Arnstein's ladder of participation as a framework to address the extent of citizen participation and to guide different applications of participation. In this manner, Contreras' approach is more relevant and useful to assess participation in brownfield redevelopment at the local scale.

A case study using a mixed methods approach evaluated participatory activities of three successful brownfield redevelopments located in Birmingham, Alabama. Stakeholders included citizens, public officials, and developers. Semi-structured interviews and surveys incorporated levels of Arnstein's ladder of participation to measure stakeholders' perspectives of empowerment in participatory processes. Stakeholders were also asked to rate their satisfaction with the outcome of the redevelopment projects. It was presumed that a high level of satisfaction would be commensurate with similar perceptions of empowerment among the stakeholder groups.

Most citizen stakeholders were highly satisfied with the redevelopment outcome. Two-tailed t-Tests and Wilcoxon tests were performed to measure significant differences in perception of empowerment in paired stakeholder categories. The perceptions of empowerment were significantly different between citizen and public officials' perceptions with  $p=0.04$ ; however, perceptions amongst citizens and developers ( $p=0.12$ ) and public officials and developers ( $p\sim 1.0$ ) were not significant. Research findings suggest that perceived meaningful decision-making amongst stakeholders can vary depending upon their roles and relationships in the redevelopment process. As these tests provided a general indication of significant differences, this research recommends further studies that examine how stakeholder categories specifically rate levels of participation, and qualitative analysis of open-ended responses.

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Key Words: Brownfield Redevelopment, Arnstein's Ladder, Citizen Participation, Public Participation, Empowerment

## THE RELATIONSHIP BETWEEN HISTORIC REDLINING AND MODERN ZONING IN MAJOR US CITIES

Abstract ID: 321

Individual Paper Submission

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At the beginning of the 20<sup>th</sup> century, two important spatial designations took place that have become foundational for current planning and zoning. Due to the historical context of these decisions, racism and bias were implicit in their creation. In recent years, interdisciplinary investigations on the lasting impacts of both the HOLC (Homeowner's Loan Corporation) maps of the 1930s and zoning regulation have risen in significance and number. Academics across fields have turned their attention to the historic maps -termed "redlining maps" - and asked questions regarding its relationship to the modern distribution of important characteristics of US cities. Similarly, questions regarding the efficacy and longevity of zoning, also largely adopted in the 1920s and 1930s, have percolated many fields.

This paper joins these two important conversations by using quantitative measurements to extrapolate on the relationship between HOLC grades and modern Euclidean zoning and social demographics. Cities in all regions of the country were subject to racially motivated HOLC and zoning categorizations during the same period. The longevity of zoning designations and their relationships to those grades nearly 100 years later may continue to inform the questions regarding the long-term impacts of both redlining and zoning.

This paper presents findings on 18 case cities distributed across the country that experienced both redlining and zoning prior to WWII. The findings include important conclusions regarding differences in city size, age, and demographics and what these factors mean for the modern distributions of zoning. These conclusions could help inform the future for comprehensive planning and land development regulation decisions as planners consider equitable solutions to longstanding concerns.

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Key Words: Social Justice, Equity, Zoning, Redlining

## BEYOND GLARE AND NUISANCE? EXPLORING HOW EIGHT US CITIES REGULATE LIGHT POLLUTION

Abstract ID: 338

Individual Paper Submission

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A growing scourge in metropolitan areas, excessive artificial outdoor light at night adversely impacts the health of humans and of nature and wildlife, threatens views of the sky, and constitutes nuisance in other ways. Sources of excessive light, or light pollution (LP), include parking lots and sports arenas, digital billboards, and entertainment districts, increasingly featuring light-emitting diode or LED technology.

Understandably, municipal policies tend to emphasize the positive functions of lighting, such as access, safety, and neighborhood quality. Related regulations typically seek to minimize glare and off-site spillover. As night-time lighting exceeds functional thresholds, planners need to educate themselves about LP and the possibilities and limits of LED technology for LP mitigation.

This exploratory study reviews zoning codes in eight US cities selected from each of the four major ecological zones. Cities were selected for expected diversity of activities enabled by outdoor light at night and capacity to enact and enforce policies to achieve desired values, including minimizing LP. Codes were analyzed using keywords such as lighting, glare, LED, and other terms commonly associated with lighting and signage. Additionally, I reviewed model ordinances developed by advocacy organizations.

The study's findings include:

1. Codes typically enumerate positive values such as public safety, access, promotion of business and entertainment, and neighborhood character; thus they tend to stipulate minimum lighting levels for streets, sidewalks, parking lots, and other public spaces.
2. All codes identify two undesirable impacts of artificial light: glare and spillover of light into residential properties or public rights-of-way. Fewer codes stipulate maximum levels or night time curfews for streetlights or other common uses.
3. Advertising signage is a growing LP threat, with some evidence of associated regulation among cities studied. Codes typically balance business-visibility with glare and spillover via standards that include distance from residential uses, directionality, and curfews. New York City's code is exceptional for its signage-related standards in special entertainment districts where lighting that LP opponents may consider excessive is encouraged.
4. No city code discusses LP's adverse public or ecological health impacts. Model ordinances, by contrast, include both rationales and standards that planners may consider adopting.
5. Beyond the zoning code, codes governing buildings, energy, ecological conservation, and sustainability also need to be addressed for LP mitigation.
6. Addressing the cumulative impact of LP originating from many diverse activities will require attention to overall lighting and spectral density as well as curfews, an approach that transcends zoning and other typical regulations.

Ultimately, LP mitigation is a political issue, with disparate, conflicting interests and unequal power. Addressing LP will require involving diverse stakeholders, and public education, dialogue, and participation. As planners build sustainable responses to climate change and associated challenges of biodiversity, public health, and energy

efficiency, we will need to understand the ways in which LP is implicated in the challenges. It is possible to minimize LP to promote human and ecological health while also permitting safe, effective urban nights.

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Key Words: Light pollution, glare, dark sky, dynamic self-illuminated signs

#### REVISITING SMART GROWTH POLICIES IN THE COVID ERA

Abstract ID: 340

Individual Paper Submission

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Since it started in the late 2019, the COVID pandemic has changed our life dramatically. Fears of disease spread have necessitated physical distancing, and raised serious questions about current land use and transportation policies. Thus, debates over the applicability of Smart Growth policies in the COVID era have emerged. Scholars began to rethink policies promoting compact development, mixed land uses, and public transportation that have been applied for decades.

The Organization for Economic Co-operation and Development (2020) argued that “Life after COVID-19” will be “life with COVID-19”, and suggested changing the focus of current planning policies from “mobility” to “accessibility to basic amenities and services.” Batty (2020) predicted a possible policy shift away from compact development and public transit. On the other hand, Hamidi and others (2020) recommended adopting dense development because of its environmental and economic benefits, and the low death rates resulting from COVID and other infectious diseases. Sharifi and Khavarian-Garmsir (2020) called for creating more pedestrian areas and open spaces within compact cities.

This research paper contributes to scholars’ efforts to explore best planning responses to recent health challenges. It investigates two major questions: what are Smart Growth policies that would address current health concerns effectively? and which Smart Growth policies would be irrelevant in the COVID era? I surveyed state, county, and city planners in the State of Maryland to investigate how COVID-19 has changed land use planning procedures, which smart growth policies helped us adapt to current health concerns and restrictions, and which smart growth policies would be irrelevant or should change to enable “Life with COVID” and other infectious diseases.

The survey findings provide important implications for policy makers and urban planners. They help improve our understanding of current planning challenges and best practices, and point to needs to adjust our land use and transportation policies to create smart growth addressing current and future health challenges.

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Key Words: Smart Growth, Land Use Policies, COVID, Infectious diseases

## SCENARIO PLANNING ENHANCEMENTS FOR SMALL- AND MID-SIZE LEGACY CITIES: A TRANSIT CORRIDOR CASE STUDY IN YOUNGSTOWN, OHIO

Abstract ID: 345

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Scenario planning has traditionally been applied in growing cities and regions to assess the sustainability implications of alternative land use plans and policies (Berke & Kaiser, 2006). These processes often use a normative framework at the metropolitan scale to build consensus around a preferred long-term vision, aided by analytical tools and metrics that measure the outcomes of alternative paths forward (Holway et al., 2012). Recently, scholars and practitioners have turned to scenario planning as a method for addressing uncertainty, in cases such as climate change or disaster resilience planning where exogenous variables demand robust or contingent planning strategies for the future (e.g., Chakraborty et al., 2011; Goodspeed, 2020). However, applications of exploratory approaches are less researched in U.S. legacy cities, where demographic and economic uncertainties present fiscal and social justice challenges in the context of postindustrial population decline or limited growth (Mallach & Brachman, 2013). This paper addresses the question of how scenario planning frameworks and tools – largely designed for contexts of regional growth – can be adapted for enhanced land use planning in small- and mid-size legacy cities such as Youngstown, Ohio.

We partnered with the City of Youngstown to engage with stakeholders and model parcel-level redevelopment scenarios in two embedded transit corridor study areas. To address demographic uncertainty and related planning challenges found in this context, we tested the utility of (1) a novel exploratory scenario planning framework and (2) an integrated use of two leading scenario planning tools (Urban Footprint and Envision Tomorrow). As part of the latter task, we developed and beta-tested new building typologies calibrated to the Youngstown context to measure their impact on the analysis results. Semi-structured interviews were then conducted with local stakeholders to collect their feedback on the strengths and weaknesses of the scenario-based approach and analysis results for informing corridor planning in Youngstown.

Our findings report on the scenario-based analysis results. Based on these results and subsequent interview responses, we discuss the integrated tool capabilities that are well-suited to inform planning efforts in Youngstown and other small- and mid-size legacy cities. We also offer recommendations for enhancing the use of scenario planning and supporting analysis tools in contexts of decline, limited growth, and demographic uncertainty. These

recommendations include the use of frameworks that include normative and exploratory components, the ability to model alternatives at multiple planning scales ranging from corridor to detailed site-level projects, and the need for enhanced fiscal and equity analysis.

This research offers implications for planning research and practice in legacy cities throughout the Midwest and Northeast regions of the U.S., nearly half of which have less than 100,000 people (City College of New York, 2015; Hollingsworth & Goebel, 2017). Our paper offers opportunities for further scholarship to investigate enhanced planning methods for addressing demographic uncertainty in contexts of decline and limited growth, an underdeveloped area of the planning literature. Our findings and recommendations also provide guidance that can help broaden the adoption of scenario planning practice in legacy cities.

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Key Words: Scenario Planning, Land Use Planning, Legacy Cities, Shrinking Cities

## TIEBOUT SORTING, ZONING, AND PROPERTY TAX RATES

Abstract ID: 352

Individual Paper Submission

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This paper examines certain implications from the literature on Tiebout's model of local government service provision, particularly Hamilton's extension of the model to include local control of land use and property taxation. Our empirical analysis focuses on the use of fiscal zoning to lower property tax rates, a topic that has not been addressed in the extensive Tiebout literature. Using data for over 100 municipalities in the Miami, Florida, metropolitan area, we specify property tax rates as a function of fiscal zoning measures, other municipal characteristics, and tax mimicking. We conclude that single-family zoning is by far the most important variable explaining municipal property tax rates.

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Key Words: Tiebout model, Fiscal zoning, Property taxation

## THE RURAL-URBAN INTERFACE AS A SOCIAL FIELD OF CONTESTING MULTIPLE VALUES OF FARMLAND: NEGOTIATED TENANCY ARRANGEMENTS IN THE JAPANESE SUBURBAN CONTEXT

Abstract ID: 372

Individual Paper Submission

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Controlling land use at urban fringes is a challenge given the inherent dynamics and ambiguities of a rural-urban interface with a wide variety of manifestations, contestations and competitions (Amirinejad, Donehue, and Baker 2018). Consequently, a fragmentation of agricultural landscapes progresses through a diversification of land use not only due to uncontrolled urban development but also resulting from failures of planning legislation and land governance (Gallent and Shaw 2007). The transitional characters of urban fringes require an appropriate and flexible coordination among different planning instruments and regulations across sectors and scales (Spyra et al. 2020). However, legislation for landscape protection often congeals certain patterns of use and falls behind faster real-world changes, leading to discontinued and disintegrated farmland use (Gant, Robinson, and Fazal 2011).

This paper explores how farmland owners as primary decision makers have interacted with other stakeholders to determine land use at urban fringes in the context of farmland liquidation policy in Japan. From multi-level perspectives, it aims to better understand what values held by owners interplay in the process of decision making on tenancy arrangements for farmland use at the rural-urban interface. Japan's farmland liquidation policy began in the 1960s, and more recently has been accelerated to generate economies of scale through larger-scale farming against agricultural abandonment. It has been promoting tenancy arrangements particularly since the mid-1970s, by which owners can secure land tenure while leasing their farmland to other farmers. In 2013, it further made new legislation that in general allows farmland banks as regional semipublic intermediary organizations to accommodate technically and economically capable tenants without the owners' consent (Act No. 101 of 2013).

The study focuses on a suburban community existing in the space between the urban planning and agricultural promotion controls to examine multiple values of farmland assigned by owners and other stakeholders. The community is located as part of the major rice producing region of Japan, exhibiting typical land-extensive, flat agricultural landscapes. A total of 28 farming and non-farming landowners in the community were interviewed in a semi-structured form. The questions to the farmers were concerned with 1) their roles and responsibilities for farmland management, 2) their engagement in tenancy arrangements, and 3) their value perspectives on farmland. Furthermore, similar semi-structured interviews were undertaken with other stakeholders at local, regional and national levels to delve into the processes and mechanisms of governing farmland and their value perspectives on farmland. The analysis of the value perspectives draws on the conceptual framework of three classes of values to nature, including instrumental, intrinsic and relational values (Himes and Muraca 2018).

Within the community, tenancy arrangements have been made progressively over half a century and been largely indifferent to the new legislation that allows for anonymous tenancy. At the same time, however, substantial amount of farmland has been abandoned even within the area designated for agricultural promotion. The findings illustrate that owners have negotiated their multiple values of farmland at the individual, family, communal and governmental levels essentially to secure their livelihoods and wellbeing through tenancy arrangements. Along with



the increased agricultural abandonment, the remaining active farmers have struggled to find alternatives to economic values of farmland and have thus become more attentive to the spiritual, aesthetic, social and constitutional aspects of farmland. The paper explicates the roles of farmers as active social agents to find meanings of land and continuously seek for workable solutions. It suggests that planning legislation could create a room for more innovation and experimentation by farmers keenly sensitive to diverse values of farmland.

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Key Words: Rural-urban interface, Land tenure, Agricultural land policy, Values, Multi-level perspectives

#### ADDRESSING BARRIERS TO THE USE OF VALUE CAPTURE TO FUND TRANSIT-ORIENTED DEVELOPMENTS IN THE US

Abstract ID: 375

Individual Paper Submission

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#### Central Theme

Transit-oriented developments (TODs) are being developed globally to provide mode choice, increase transit ridership, reduce vehicle miles traveled, and promote sustainable development. However, governments worldwide and at all levels—from federal to local—have limited financial capacity to provide or upgrade infrastructure around transit stations and incentivize real estate developers to build TODs. Therefore, any new funding mechanism, such as value capture (VC), is welcome.

The VC tools capture land value increases resulting from public improvements and actions such as the provision of infrastructure and up- or re-zoning. These tools include sale/joint development of land in or around the transit stations, lease/sale of air rights above the transit stations, special assessments, impact fees, land value taxation, and tax increment financing (TIF).

While empirical studies find that public transit and TODs are positively associated with increases in surrounding property values and VC tools have been used extensively to fund transit systems, including the metro rail systems in Japan, China, Hong Kong, and India, their use to fund TODs has been sporadic. It is primarily limited to New York City and Washington DC metropolitan area in the US and select countries such as Brazil, China, Hong Kong, Japan, and United Kingdom internationally.

#### *Research questions:*

- a) What are the major VC-related barriers to the construction of TODs in the US; and
- b) What major strategies could be used to address these barriers?

#### Methodology

First, academic and professional literature was reviewed to identify the various types of VC-related barriers to TODs and the strategies employed or those that could be used to address these barriers.

Second, two national surveys—one of the transit agencies and another of the local/city governments—were conducted. The Federal Transit Administration’s National Transit Database was used to identify the top-101 transit agencies in the US. The US Census data were used to identify the largest cities in each of these transit agencies’ service areas. The surveys identified the VC-related barriers the public agencies face in implementing TODs and how these agencies have or are planning to overcome these barriers.

Third, six in-depth case studies of recently-developed TODs were conducted to identify the VC-related barriers faced and overcome while constructing the TODs.

Finally, information obtained from all three sources—literature, surveys, and case studies—was synthesized to identify the major findings concerning the types of barriers faced and the strategies that might be used to overcome them.

#### Findings

The synthesis of the literature review, surveys, and case studies leads to several insights and recommendations, such as the need to a) consider land use, zoning, and VC in an integrated manner because many of the barriers to the use of VC are closely tied to land use and zoning; b) judiciously use eminent domain and land assembly to facilitate TODs; c) encourage transit agencies and local governments to use VC to implement TODs; d) enhance public agencies’ ability to use TIF and other VC tools; and e) transparently, systematically, and comprehensively assess land value increase.

#### Relevance of the Work

This research has great relevance and implications to planning scholarship, practice, and education because it provides updated information about the steps taken by the two public agencies at the frontline of developing TODs in the US—local governments and transit agencies—to mitigate VC-related barriers. Moreover, by synthesizing the insights from the existing research, surveys and case studies, it links planning scholarship with practice. Furthermore, educators can use this research in their planning courses on topics such as land use, zoning, public finance, sustainability, and transportation planning. Finally, planning and public transit professionals could use this research to facilitate TODs in their jurisdictions.

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Key Words: transit-oriented developments, value capture, land value capture, transportation planning, public finance

## **A CASE OF (DECREASING) AMERICAN EXCEPTIONALISM: SINGLE-FAMILY ZONING IN THE US, AUSTRALIA, AND CANADA**

Abstract ID: 438

Individual Paper Submission

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The United States (US) has not always stood alone among high-wealth countries in its copious use of exclusive zoning for single-family detached homes (SFZ). This paper examines why, despite the US, Australia, and Canada all sharing similar planning and built environment histories, SFZ has persisted to a greater extent in the US. The paper provides an illustration of the current state of residential zoning across ten large cities in each of the three countries, and seeks an explanation for the countries' divergence in a comparative history of SFZ. The paper argues that the historical racial and ethnic diversity of the US came to distinguish American residential zoning practice from that in more homogeneous Australia and Canada during the 1970s. As Australian and Canadian governments began to explore alternatives to SFZ, American planners faced suburban revanchism in the wake of civil rights gains and white flight. The persistent ability and frequent desire of US local governments to exclude impedes not only access to opportunity for those excluded, but progress on any number of fronts, including environmental and fiscal sustainability. Separating housing types and setting aside the bulk of urban land for the lowest-density type, as American zoning often does, is clearly inequitable, and more equitable land use regulation is therefore the foundation upon which more sustainable American cities can be built.

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Key Words: Exclusionary Zoning, Single-Family House, Segregation, Land Use, Planning history

## **STATE PREEMPTION FOR HOUSING AFFORDABILITY: LESSONS FROM TEXAS**

Abstract ID: 459

Individual Paper Submission

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In recent years, there have been an increasing number of state efforts to intercede in local land use and planning activities to foster the production of affordable housing (Infranca 2019). However, housing affordability is influenced by a number of disparate issues, including the ability of household to borrow money, variations in the cost of labor and material, and individual choices about spending on housing compared to other goods (Quigley and Raphael 2004). Local planning regulations like zoning, minimum lot sizes and building materials regulations have the potential to impact housing affordability by influencing the distribution of housing prices and quality in a community (Wegman 2020, Whittemore 2020, Glaeser and Gyourko 2003).

In 2019 the Texas legislature passed two bills that preempted local building regulations and plan review processes with the stated intent of increasing affordable housing. HB2439 prohibits local governments from regulating building materials for new construction, maintenance and renovations while HB3167, imposes a 30-day approval window for development plans to expedite local plan review process. Both pieces of legislation went into effect in September 2019, a few months before the COVID pandemic. This paper presents results from a focus group and a state-wide survey of municipal planning officials evaluating local responses to state preemption in Texas. The research also documents local perspectives on the impact of COVID-19 on planning processes and development activity to assess the confounding impact of a public health crisis on local planning activities.

Our preliminary findings highlight four major themes in local government response to state preemption: (1) The impact of deregulation has greater impact on medium size suburban communities than it does on central cities; (2) Local governments are relying on development agreements to enforce building materials standards that cannot regulate directly; (3) Other are encouraging local residents to use the deed restrictions (CCR; HOA) to regulate building material standards and (4) the state professional planning organization has shifted its role from a purely technical and professional development toward advocacy work. We explore these themes in more detail and provide a discussion of how these findings influence our understanding of intergovernmental policy making and state preemption in the field of urban planning.

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Key Words: Housing, Preemption, Planning Processes

#### WHY ARE US METROS CONSUMING LESS LAND? A SOCIAL-ECOLOGICAL ANALYSIS OF URBAN EXPANSION

Abstract ID: 490

Individual Paper Submission

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Few topics unite cities and natural landscapes as concretely as the conversion of undeveloped landscapes into urbanized land uses. This process, also called urban expansion, has become increasingly relevant to global biodiversity and carbon storage (Seto et al., 2012). It comes with myriad local and regional impacts such as diminished water quality, altered hydrology, urban heat island, reduced food production, etc. Yet, our understanding of the determinants of expansion remains limited. Richter (2020) demonstrates how several models

projecting expansion all grossly overestimated consumption of land in the United States. Instead, the per capita rate of expansion dropped by 60% from 2001 to 2016. Such non-linear outcomes reinforce the need for theorization of urban regions as complex social-ecological systems, not as predictable economic entities.

Despite their limitations, past attempts to model expansion provide insight into some of the determinants. Alig et al. (2004) combine econometric modelling of population and economic growth with regional dummy variables that begin to incorporate some social-ecological context. But the model is limited and fails in two regards. First, the emergence of millennials that act as amplifiers of urban concentration (Myers, 2016) is not considered in the model. Second, physical variables need to be more precise than a regional dummy variable. For example, Saiz (2010) models the availability of developable land for all US metros using land cover and topographic data, finding a significant relationship to housing prices.

The next generation of expansion models needs to build off these works to adaptively incorporate temporally and spatially relevant social and ecological data. Toward this end, this paper analyzes expansion, as identified in the 2001 to 2016 National Land Cover Database, against a wide range of demographic, economic, real estate, regional planning, and physical data. First, exploratory OLS of two time periods – 2001 to 2011 and 2011 to 2016 – examines how correlations and significance of independent variables shift over time. Next, panel regression is performed to more formally assess the longitudinal shifts in expansion determinants.

The results from this analysis highlight several important drivers for expansion. Some, like the presence of populations age 18 to 34, household size, or increases in manufacturing GDP, are consistently significant throughout the study period. Others, like population age 55 and above, the proportion of those living in high density dwelling, car usage, or the percent of those working from home, are only significant for parts of the study period, reflecting a less durable relationship with expansion trends.

This work contributes to a growing body of literature on urban social-ecological systems much needed in a world of rapid urbanization and ecological crisis. Expansion is a dynamic, rapidly changing process, one which this research provides new insight into by leveraging a variety of social and ecological data. It also attempts to be receptive to non-linear change by evaluating statistical relationships across time. Empirical findings suggest that urban expansion needs to be understood as responsive to shifting demographic trends, not just as an outcome of economic and population growth. In the United States, this means the peak and maturation of the millennial age cohort (Myers, 2016) may lead to increasing expansion trends across the United States, especially given the potential impact of COVID-19 and increased telecommuting. But region-specific physical context, such as physiographic containment, appear to have a greater impact, leading to large regional disparities in land consumption. Therefore, the findings of this study need to be interpreted in light of regional and place-based considerations such as historic and cultural landscapes, housing affordability, and regional ecosystem services.

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Key Words: Urban Expansion, Social Ecological Systems, Urban Growth

## **BETWEEN PROMOTING AND BANNING: STATE PREEMPTIONS ON INCLUSIONARY HOUSING POLICIES**

Abstract ID: 495

Individual Paper Submission

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States play an important role when it comes to influencing local policy in the US federal system [1]. Within inclusionary housing policy literature, where studies on state policies exist, they focus on states like California, New Jersey, and Massachusetts that have explicit mandates for inclusionary housing policies [2]. Together these three states constitute about 90% of approximately 900 inclusionary housing policy jurisdictions in the country – a clear indication of the importance of state-level promotion of housing policies for successful local adoption [3]. However, state policies through explicit legislative restrictions, called ‘state preemptions,’ can also negatively impact local policy implementation. But there is very little information on what state-level policy environments look like in states that are politically and ideologically opposed to inclusionary housing policies. Currently, five US states have preemptions against city inclusionary housing policies, and several other states are deliberating similar action [4]. My paper focuses on three states that had or currently have state preemptions that restrict local inclusionary housing policies, Texas, Oregon, and Tennessee. I seek answers to the following questions: Where states are generally restrictive of inclusionary housing policies, what were the reasons for the state-level restriction of inclusionary housing? What mechanisms did the states use to impose restrictions on inclusionary housing? How did inclusionary housing proponents rally against preemptions at the state level? Did the state agree to any compromise?

I used extensive document analysis of government policies, legislative hearings, memos, and press releases in addition to 54 semi-structured interviews. I conducted interviews with policymakers, the civic sector, developers, housing advocacy organizations, and officials at the state and local levels to map critical junctures in policymaking. My findings reveal varying degrees of opposition to inclusionary housing policies, even in the states with preemptions against inclusionary housing policy. These variations depend on the state’s policy position on related issues such as rent control, land use planning, dominant state political ideologies, the seriousness of the state-wide affordable housing crisis, and the strategizing and lobbying capacity of various institutions and actors at the state-level. The work of these actors - state government agencies, municipal league, homebuilder’s association, chamber of commerce, housing advocacy groups, prominent city governments, inter-city networks, and diverse coalitions can together negotiate and manipulate state position to create conditions for local policy success. While the combined sum of these forces swung in favor of overthrowing the state ban on inclusionary housing policies in Oregon, it tightened the restrictions in Tennessee. In Texas, the push and pull of these forces created microcosms of policy exceptions for specific city contexts.

Therefore, this study argues that state inclusionary housing policy positions are on a continuum between promoting and banning rather than a binary choice. These state positions can be adapted and manipulated to favor city initiatives with sufficient motivation and effort over time. The detailed cases in my study can provide guidance to housing activists and progressive local governments battling preemptions in their state contexts.

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Key Words: State preemption, inclusionary housing policy, housing advocacy

## TEMPORARY USES OF VACANT URBAN LAND: PANACEA OR PLACEBO? A COMPARATIVE STUDY ON THE NEIGHBORHOODS IN CHICAGO AND COLUMBUS

Abstract ID: 517

Individual Paper Submission

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Vacant urban parcels, especially large numbers of concentrated vacant parcels and abandoned structures, are widely considered the signals and fuels of urban decline and distress, leading to unsustainable neighborhoods (p.2, Bowman & Pagano, 2004). Repurposing vacant urban land is often considered an effective prescription to address vacant land problems and further enhance neighborhood sustainability. Vacant land is not immutable, and vacancy is a temporary condition (p.145, Németh & Langhorst, 2014; p.143, Newman et al., 2016). Vacant parcels can be turned into new residential, commercial, or industrial land uses through traditional real estate development processes. Alternatively, vacant parcels can be transformed into green infrastructure, civic facilities, or public spaces serving local communities with no permanent structural changes. The latter approach is known as the temporary urbanism approach and has gained popularity among scholars and policymakers due to its low cost and high flexibility. The supporters noted that these very short-term uses and occupations of vacant parcels could create immediate and intermediate benefits to the neighborhoods, support an incremental process of urban transformation, and improve economic and time efficiency (p.145, Németh & Langhorst, 2014; pp.1-2, Kremer & Hamstead, 2015). Although a handful of studies have shown that the temporary uses of vacant parcels could reduce the negative impacts of vacant parcels in some specific aspects (e.g., neighborhood security, environmental quality, property value, etc.), it is still not clear whether this approach can enhance neighborhood sustainability comprehensively. Moreover, the temporary uses of vacant parcels can take many forms, and whether different forms have different impacts on neighborhood sustainability remains unclear. Therefore, the main research question for this work is how the temporary uses of vacant parcels affect neighborhood sustainability. To be more specific, this research examines how the temporary uses of vacant parcels impact measures of neighborhood sustainability across the three dimensions (environment, society, and economy) and further compares the effects of different temporary use types.

The research sample is the neighborhoods in the city of Chicago, IL and the city of Columbus, OH. Both cities are in the Midwest, where urban vacancy poses a problem to sustainable urban development. Vacant land is measured by vacant land ratio (the proportion of vacant land to neighborhood territorial size). Aerial imagery and street view imagery are used to identify whether a vacant parcel is temporarily used and what type of actual use a parcel is. Neighborhood sustainability is measured by NSA (Neighborhood Sustainability Assessment) indicators, which are developed from the cross-referencing between selected NSA tools and relevant literature. A cross-sectional data analysis model is used to examine the relationship between vacant land ratio and critical sustainability indicators at the census tract scale. This model further tests whether temporary uses and the types of temporary uses influence vacant land's impacts.

The significance of this research is threefold. First, the findings can contribute to our understanding of the relationship between vacant urban land and neighborhood sustainability. More specifically, the findings of this research not only can tell whether temporary uses of vacant parcels contribute to neighborhood sustainability significantly but also can suggest which forms of temporary uses are more effective. Second, the primary outcomes

can help policymakers to develop effective strategies to address the vacant land problem. Third, governments and residents can take advantage of the conclusions and turn vacant parcels into neighborhood assets, making neighborhoods sustainable.

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Key Words: Vacant Land, Sustainability, Temporary Urbanism

## UNDERSTANDING THE GEOGRAPHIC CONCENTRATION AND CIRCULATION OF LAND USE POLICIES

Abstract ID: 557

Individual Paper Submission

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The prevalence of restrictive local land use regulations has increasingly been seen as one of the most significant barriers to making housing more affordable and creating inclusive communities in the United States. Over the last several decades, however, there have been considerable changes in the way land use is regulated by localities (Pendall et al., 2018). Inclusionary zoning ordinances have been adopted by a growing number of municipalities to expand the supply of affordable housing units, although their effectiveness (when implemented in a mandatory or voluntary form) remains unclear. More recently, efforts have also been made to destabilize traditional R1-oriented zoning practice across the nation.

In parallel, there has been considerable development of analytical frameworks that could enable one to better understand the underlying mechanisms of this complex process. The adoption of local growth control has been examined in the light of strategic interaction among local governments (Brueckner, 1998) and spatial regression models have been employed to empirically test the significance of spatial interdependence (or interjurisdictional competition). The policy transfer literature has also been expanded beyond disciplinary boundaries, offering new ways to explore the policy mobilities and dynamics at multiple scales (Benson and Jordan, 2011; McCann and Ward, 2012).

This study examines the changing geography of land use control with particular attention to the various centrifugal and centripetal forces that shape the geographic concentration (or dispersion) of land use policies. An investigation is made using data from two comprehensive nation-wide surveys: the National Longitudinal Land Use Survey (Pendall et al., 2018) and the Wharton Residential Land Use Regulation Index dataset (Gyourko et al., 2019). The analysis shows some evidence of the persistence of geographic concentration, but these patterns do not necessarily correspond to the view that often treats a region as a highly regulated (or laissez-faire) environment without consideration of internal heterogeneity.

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Key Words: Land use regulation, Local government, Policy change

## **SELF-FINANCING MECHANISM FOR THE PROTECTION OF WATER RECHARGE ZONES**

Abstract ID: 609

Individual Paper Submission

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It has been observed that the effective protection of water recharge areas involves monetary compensation to the owners or the purchase of land in favor of the state (Avendaño-Leadem et al., 2020). However, the government does not have the resources for acquisition. In this sense, it is essential to explore alternative sources of financing that provide an outlet for the state budget deficit, for example, through the mobilization of private resources.

Generating alternative resources for financing would be possible through the implementation of land use policies, which allows getting resources as a result of compensation for additional urban benefits (better building conditions and subdivision) (Borrero & Morales, 2007), for example, the density bonds in USA or CEPAC's in Brazil (Smolka & Mullahy, 2007).

In the Ecuadorian case, municipalities have exclusive competence to regulate the use of urban and rural land. However, there are state agencies that allow violating the municipal land use regulation. For example, in the municipality of Cañar, the Subsecretaría de Tierras (a dependency of the central state) has sponsored rural parcelling without authorization from the municipal government, which generated an atomization of agricultural productive units and a budgetary burden on the local government to the provision of infrastructures for dispersed dwellings derived from the subdivision.

This out of land use regulation phenomenon suppresses the potential participation of the municipality in the benefits derived from the rural subdivision of the land and building. In this sense, since the subdivision and rural occupation in Cañar, a phenomenon impossible to counteract and since there is a budget deficit for the protection of the water recharge zones, it is pertinent to explore mechanisms to make the urban regulation more flexible in the affected areas. by parcelling through land use regulation tools, so that they can mobilize private resources to finance protection (Jouravlev, 2003).

In this sense, it is worth asking whether: Are there instruments in the Ecuadorian legal framework that allow the mobilization of private resources to finance the conservation of fragile ecosystems? and Does the mobilization of private resources make the transfer of land ownership in water recharge zones economically viable in favor of the state as a protection measure?

Methodology

The Ecuadorian urban legal framework allows the mobilization of private resources to cover social charges resulting from intensive urbanization, through the participation of surpluses or extraordinary gains from real estate development in favor of the local government. However, the legislative tools have an applicability orientation towards urban land, in this sense, the first part of the research is based on establishing a legal basis for the transition of these tools to rural land, allowing the municipality to participate in the resources generated by the intensive fractionation of the rural area.

The second part of the research focuses on quantifying the potential resources of the intensive rural subdivision, in contrast to those required for the acquisition of the parcels of moorlands that provide water resources to the specific areas that the tool would apply. For which the behavior of the land market, the administrative costs of the subdivision and the costs of infrastructure provision are investigated.

#### Preliminary results

Legal instruments have been identified that allow the application of tools provided in rural areas, as well as preliminary results show that the application of the tools would allow the acquisition of 16.3 hectares for the 2008 period, since there were 97 fractionation processes, which would have generated a value of \$ 32,200.

The research aims to provide inputs to improve municipal management in response to climate change and add to the academic experience.

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Key Words: climate justice, land use, municipal management, protection areas, water

#### **GROWING SMARTER AND GREENER TOGETHER: EVALUATING THE IMPLEMENTATION AND INFLUENCE OF PENNSYLVANIA'S SMART GROWTH AGENDA**

Abstract ID: 668

Individual Paper Submission

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In 2000, Pennsylvania adopted Growing Smarter, its smart growth agenda that included a comprehensive set of initiatives to encourage sound land use planning locally. State legislation was amended to, among other things: enable tools such as locally designated growth areas, rural resources areas, and mixed-use zoning; strengthen the use of transferable development rights and impact fees, and; authorize communities to enter into intergovernmental cooperative agreements to enable multi-municipal planning and zoning. The legislation also required state agencies to consider local land use ordinances and comprehensive plans in making infrastructure permit and funding decisions. This research investigates the sustained impact of this smart growth initiative over a 20-year period, with particular attention to different impacts across urban and rural areas across the Commonwealth. Specific research questions include: Did the legislation result in an increased use of land use planning tools? Are there spatial differences in the use of tools? Has the perceived effectiveness of planning changed at the local level?

The research is based on a comprehensive survey of the 67 county planning departments and 2,510 local governments in Pennsylvania, conducted in 2020. County Planning Directors and Local Government Officials were asked to identify land use planning tools used, how plans influence decision-making, the perceived effectiveness of tools in achieving local planning goals, and obstacles to their use. The separate county and local government surveys achieved a response rate of 85% and 38%, respectively. Follow-up key person interviews were completed for a selection of rural municipalities. A similar state-wide survey was completed in 1999, with findings published in 2000. Comparison of the findings across surveys provides a basis to assess differences before and after the adoption of the state-level legislation.

Early analysis of the survey data indicates that there was been a significant increase in the use of some planning tools, including comprehensive plans, capital improvement plans, and mixed-use zoning, however other tools, such as transportation impact fees, have failed to take hold. There has also been an increase in intergovernmental planning, including multi-municipal plans and cooperative planning across county and local governments. But while the use of plans has increased, there has not been a parallel increase in zoning ordinances and other implementing tools. Other early findings suggest a shift in planning focus driven by a rising concern regarding disaster planning, hazard mitigation, and economic development. Of special interest to the funder of this research is the experience of planning in rural areas of Pennsylvania. The findings provide an interesting contrast between the nature, extent, perceived effectiveness, and barriers to planning in rural communities, compared to urban communities, in Pennsylvania.

This research contributes to the body of planning scholarship that investigates the design, implementation and effectiveness of state-level land use legislation and on-the-ground impacts of land use policies. With growing attention to climate planning and the rise of state mandates and programs for climate action, the findings can help inform best practices for effective state-level policy and regulatory design. This research also contributes to the body of scholarship on the special challenges of planning in rural communities, and the role of the state in addressing unique rural land use challenges.

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Key Words: land use, smart growth, rural, Pennsylvania, state policy

## NEIGHBORHOOD CHANGE AFTER FLOODPLAIN BUYOUTS: FINDINGS FROM HARRIS COUNTY, TEXAS

Abstract ID: 708

Individual Paper Submission

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Post-disaster property acquisition programs (e.g., buyouts) have increased in recent decades to expedite residents' relocation from hazardous areas to safer ground as well as minimize future disaster risks. Despite the growing interest in floodplain buyouts – also known as a voluntary program to mitigate flood damage by relocating residents and structures out of harm's way– limited research has focused on the long-term neighborhood change in affected areas after buyouts. Many existing studies have examined individual-level factors of residential mobility decisions after disaster events (Binder, Baker, & Barile, 2015; Cong, Nejat, Liang, Pei, & Javid, 2017), but research on buyout impacts at the community-level is scarce.

This research explores the long-term impacts of floodplain buyouts on neighborhood change. Focusing on changes from 1990 to 2015 in 2,144 block groups in Harris County, TX, we seek to examine how single-family home buyouts implemented between 2001 and 2010 have altered neighborhoods over time, especially in racial composition. Harris County was chosen as the study area due to the long historical and frequent relationship with catastrophic flooding since its major urban center, Houston, was founded in 1836. Indeed, Harris County experienced 16 major flooding events during its first 100 years. Thus, Harris County/Houston represents an excellent case for this study in that the area is perhaps the largest, most diverse, and heavily flood-exposed city in the United States.

The authors focus on buyout projects carried out by Harris County Flood Control District (HCFCD) for homeowners living in flood-prone areas. The buyout data was combined with the decennial Census data, Harris County parcel data, FEMA floodplain maps, and secondary data from the municipality to investigate the relationship between the floodplain buyouts and neighborhood change at a block group level. A mixed-method approach was used, including longitudinal multilevel analysis for the quantitative study and a phenomenological approach for the qualitative study to conduct this inquiry. Specifically, a piecewise discontinuity model was developed using STATA and compared trajectories of neighborhood change between the pre-and post-buyout phases. Questions derived from the statistical results were posed to ten buyout participants and the remaining residents through in-depth interviews. The findings support that white flight occurred in the buyout neighborhoods, shifting the white population to the Hispanic population. Also, its impact has been greater in the wealthier buyout neighborhoods.

By reviewing the local buyout practice over the long-term and analyzing its consequences in neighborhoods, this study sheds light on the neglected long-term impacts of floodplain buyouts on the remaining communities. Transcending cost-effective approaches, this study provides planning practitioners an expanded and more comprehensive view of disaster-related home buyouts in the neighborhood context. The study also suggest a better-designed floodplain buyout program to promote hazard mitigation and community resilience.

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Key Words: post-disaster buyouts, hazard mitigation, neighborhood change, floods, community resilience

## **LAND-USE REGULATION AND MOBILE HOME PARK EXCLUSION IN THE HOUSTON METROPOLITAN REGION: AN ANALYSIS OF 132 LOCAL GOVERNMENTS**

Abstract ID: 744

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Land-use policies and regulations contribute to regional housing segregation in the United States. Metropolitan regions are composed of local jurisdictions with the legal authority to regulate land-use and have grown increasingly segregated by income and race, in-part because of land-use measures that effectively exclude or limit certain housing types and tenure arrangements. Single-family zoning, which limits residential housing development to single-family, detached homes, has been at the center of recent debates about land use planning and housing affordability. Other land-use tools – like permitted densities and infrastructure requirements – have also been used by local jurisdictions to shape and manage growth and development. The fractured landscape of land-use planning within metropolitan regions is an important consideration for policy debates about regional development and equity as they can contribute to substantial inequalities of access to housing, infrastructure and services, transportation, job opportunities and natural amenities, and exposure to environmental hazards across population groups.

Mobile home parks are an important source of housing for households with low- and moderate-incomes in the United States. Mobile homes are housing units that are built in a factory and transported to a site for installation. Mobile homes are especially common in the U.S., although they can be found in other countries as well. Approximately 7 million households in the U.S. live in mobile homes generally, and a third of those in mobile home parks. Mobile home parks are privately-owned businesses that rent parcels of land for mobile homes. Mobile home parks range in-size from a handful of rented “lots” to hundreds. A combination of factors – like their density and unique tenure arrangements – make mobile home parks a uniquely affordable housing option in the U.S.

Ethnographic and case-based studies suggest that mobile home parks have become so-called ‘locally unwanted land-uses’ in many communities. Communities, in-turn, have used their land-use regulating authority to limit, or exclude altogether, the development, expansion and/or improvement of mobile home parks. The exclusion of mobile home parks under local land-use policy has potentially important equity implications, as mobile home park households will be constrained in their geographic choices and relative access to resources. Despite a surge of recent scholarly interest in mobile home parks, there are relatively few studies that have examined their location and function within metropolitan housing markets, however, or the patterns of regulatory exclusion that mobile home parks face. What kinds of communities are most likely to limit or exclude mobile home parks within their jurisdictions and what potential impacts do such regulations have on regional equity?

We explore these questions by documenting the regulation of mobile home parks across a large metropolitan region – the Houston Metropolitan Statistical Area (MSA). We collect planning documents from the 132 jurisdictions in the Houston MSA and analyze their treatment of mobile home parks using a multi-cycle coding approach. We then describe how jurisdictions that are more tolerant of mobile home parks vary from those that are less tolerant, across a range of factors that are relevant to regional equity discussions. We conclude by describing the policy implications for Houston and large urban regions across the Western United States.

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Key Words: Mobile, Manufactured, Zoning, Regulation, Exclusion

## **AMBIVALENT PLAYER IN THE REAL ESTATE GAME: MUNICIPAL LAND USE PLANNING IN A HOUSING CRISIS**

Abstract ID: 761

Individual Paper Submission

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The policy and process of re-zoning and development approval in Toronto and Vancouver open a view into the internal contradictions of an un-monolithic state. The municipal land use planner is ambivalently positioned vis a vis the 'real estate game' (Encampment Support Network, n.d.), where state and economy together bet on the financialization of housing (Stein, 2019). Zoning has emerged as a locus of negotiation to manage the contradictions of the resulting housing crisis, as development permissions are leveraged for public goods including affordable housing. As real estate has increasingly shifted to a primary circuit of capital, planning is enrolled in the commodification of housing. This commitment to land value extraction through boundary-drawing and the management of property space (Blomley, 2020) recalls planning's role in the post-contact non-consensual taking of land for property and segregating labor in the settler colonial, racial capitalist city (Dorries et al., 2019).

From interviews and a spatial policy analysis, planners seek to leverage planning permissions and density bonuses to provide underfunded public goods, including parks, infrastructure renewal, public space improvements, community centers and schools, and even affordable housing. Value capture has become the way to address fiscal gaps and the downloading of responsibility for social, life-sustaining infrastructures facing municipal governments. This bundle of goods in turn makes the continued value of neighborhood and urban amenity that is necessary for profit-making.

Even as the scope of planning has been narrowed through the neoliberal era, its remaining tools are tasked with managing multiple urban crises. Uneven re-development through upzoning mobilizes the rent gap as a force of production (Brenner & Theodore, 2002). The restructuring of urban space unfolds through local land use policy, over the existing palimpsest of exclusionary and hierarchical zoning. Accumulation is made possible with a new spatial fix of condo towers pre-sold to investors in post-industrial downtowns and in commercial centres along major arterial roads, creating new un-neighborhoods while protecting increasing property value in low-density residential zones. Rather than a compromise between the growth machine and the home voter, these interests co-constitute the production of scarcity of decommodified housing.

Planners salaries are dependent on development, in Toronto directly through rezoning application fees. Attempts to introduce democratic and progressive urban regulation of housing development are often stalled in bureaucratic loops involving multiple rounds of community consultation, legal limbo, or political opposition. Assumptions of minimum profit margins for land owners and developers are built into the analysis of inclusionary zoning, making the goal of achieving affordability through value capture Sisyphean. Even as the horizon of possibility for policy is

limited, the work for planners has increased, with development review processes expanding and intensifying with extra requirements and layers as they are rushed through multiple tokenistic consultations. Despite this, planners expressed understandable reluctance to give up the leverage of rezoning, and continued to attempt to anticipate speculation and capture land value uplift in upzoned areas towards public infrastructures.

This ambivalence of municipal land use policy vis a vis land and housing shapes an uneven distribution of vulnerability (Blomley, 2020). In contrast, the clarity of housing activism calls for a different speculative project on how to remake the state for more livable futures. If housing is the current zone of extraction, and planning permissions are required to access it, then planning holds the possibility of a generative refusal towards a life-sustaining infrastructure of decommodified housing.

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Key Words: zoning, housing policy, ambivalence, contradictions

## A COMPARATIVE PERSPECTIVE ON LAND USE REGULATIONS AND HOUSING OUTCOMES

Abstract ID: 774

Individual Paper Submission

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This paper examines the relationship between land use regulations and housing outcomes, especially housing affordability and informality. Using a unique and important database of 191 metropolitan areas from all regions of the world, it assesses whether there are consistent emergent patterns from a global perspective that may in turn be useful for informing policy on land use regulations in specific locales and contexts. The empirical results point to a number of striking conclusions. Empirical evidence from across the globe underlines the dynamic nature of the interaction between land use regulations and informality. In the long run, the evidence strongly suggests that more restrictive land use regulations lead to more rapid growth in informal settlements. This result conforms with prior literature that emphasizes the exclusionary effects of land use regulations. As more restrictive regulations are applied, households find themselves with fewer options outside the informal sector. This phenomenon is accentuated during periods of rapid urbanization. But from a static perspective, the situation looks quite different over the short run, since cities with more stringent land use regulations tend to have fewer informal settlements, and this finding is strengthened further when those land use regulations are coupled with active enforcement.

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Key Words: land use regulations, informal sector housing, housing affordability, international

## **CODIFIED PARTICULARITY: ZONING FOR DIFFERENCE IN AN ULTRA-ORTHODOX JEWISH ETHNOBURB**

Abstract ID: 782

Individual Paper Submission

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Suburban land use authorities generally work to exclude non-normative built forms and people (Fischel, 2004; Hirt, 2014; Dantzler, 2016). However, this dynamic is more complicated in “ethnoburbs.” In emerging ethnoburbs, municipal governments may control or restrict the construction of ethnic “landscapes of difference” (Lung Amam, 2017). Yet, in more established ethnoburbs, organized ethnic groups can build enough political power to force a municipality to accommodate significant changes to the built environment (Li, 2009). This paper uses content analysis to document a historical case where a municipal government acceded to claims for a landscape of difference. Through an examination of newspaper articles, I show how advocates in Monsey, New York successfully argued that ultra-Orthodox Jewish households had a unique propensity for higher density living that made them especially suited to multifamily zoning. I find that these arguments were so compelling that they ended up being incorporated into the zoning text itself. This “codified particularity” was a victory for the ultra-Orthodox community, but I argue that the theoretical implications are double-edged. The practice of codified particularity signals a willingness on the part of municipalities to engage with difference, but it may also be a strategic way to contain beneficial land use changes (like multifamily zoning) within a designated ethnic area.

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Key Words: zoning, density, ethnoburbs, difference

## **ROLE OF THE LAND TRUST IN DEFINING LAND USE AND PREVENTING SPRAWL: DO LAND TRUSTS INTERFERE WITH GOVERNMENT PLANNING PROCESSES?**

Abstract ID: 788

Individual Paper Submission

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Many interacting factors influence patterns of land development. In the United States (U.S.), low-density, non-contiguous development, termed sprawl, has long been a widespread concern. Since the 1970s, rural residential sprawl, or exurban sprawl, has grown faster in area than any other development pattern. Exurban sprawl voraciously consumes land and has implications for biological conservation, natural resource management, and agriculture. Local and regional governments have implemented growth management policies to prevent sprawl, with various levels of effectiveness. Similarly, non-profit land trusts (LTs) have proliferated and have acquired large land acreages under fee-simple ownership or conservation easements (CEs), with various conservation purposes. The degree to which these two endeavors, one of the state and one of non-governmental organizations, are related and influenced by one another is unclear and understudied (Gerber, 2012). Some scholars question the processes LTs use when placing CEs, namely the lack of public oversight in land use decisions that are contractually perpetual (Owley, 2011). Governments, in contrast, have mandated public input when implementing growth management strategies. Olmsted (2011) suggested that the LTs' CE use can interfere with government planning processes but did not present empirical evidence supporting or refuting this assertion.

The question as to whether LTs have a legitimate claim to influence land use hits at the heart of a paradigm shift in urban planning. As early as the mid-1950s, attacks on the dominant paradigm in planning, the rational planning model, began, criticizing whether decision-making processes described by the rational model were achievable in practice. Simon's critique held that no decision-making process could satisfy the requirements of normative rationality, such as complete information and the ability to consider all possible alternatives simultaneously. Furthermore, Banfield demonstrated how much the political context affects decisions. New planning approaches see planning as dialogical and reliant on consensus building, that knowledge is contextual, contingent, and fallible, that planning's scope is incremental and strategic, and the agent of change is civic society. Mirroring the paradigm shift in planning, Fairfax and Guenzler (2001) identify a "New Era" in land and resource conservation. New conservation organizations are working in partnership with or in place of government agencies. The LT movement has been described as a bottom-up, grassroots movement (McLaughlin, 2002). LTs decide what land to protect based partially on the accumulated wisdom of local inhabitants and their connections to the land, which suggests that land use decisions are made at the level closest to the people in the communities in which they operate. (McLaughlin, 2002).

To explore these ideas, this paper focuses on the perceptions of local governments and LTs about their respective roles in preventing sprawl and greenfield development, as well as their respective views on the effectiveness of government growth management policies and CEs. We completed interviews of 20 LTs in rapidly growing, exurban counties across the U.S., which informed a survey instrument that we administered to government planners and administrators in 556 incorporated places within the same counties, as well as their surrounding urban, suburban, exurban, or rural counties. The interview results provide much-needed insight into LT views on government growth management policies and the ways in which LT and government roles coincide, inter-relate, and differ in shaping future land use. The survey responds with local government viewpoints on their relationships with LTs and whether local government's view LTs and CEs as complementary or interfering with local planning. Additionally, we report upon LTs and local government's view on combating sprawl and the need to balance multiple planning objectives.

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Key Words: land use, governance, sprawl, conservation easements, growth management

## **PRIVATE OWNERSHIP OF VACANT LOTS HELPS IMPROVE VISUAL CUES FOR CARE: LAND DISPOSITION AS COMMUNITY EMPOWERMENT IN CHICAGO**

Abstract ID: 853

Individual Paper Submission

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Land vacancy is a growing concern in many post-industrial cities. High vacancy often results from government subsidies to suburbanization, systemic racism, and decade-long deindustrialization processes (Nassauer & Raskin, 2014). Issues associated with land vacancy include high maintenance costs for local governments, a low tax base, a high crime rate, and adverse health effects for residents. Specifically, marginalized groups like Black communities, over-represented in high vacancy neighborhoods, are at the receiving end of these issues (Ganning & Tighe, 2015).

In recent times, urban planners have created programs to green or repurpose vacant lots in several cities (e.g., Philadelphia, Baltimore, Chicago) to combat the issues associated with high vacancy and help re-establish neighborhood vibrancy (Crauderueff et al., 2012; Schilling & Logan, 2008). Most of the studies on these programs focus on lots that are improved and maintained by public agencies. Yet some initiatives, such as Chicago's Large Lot Program, transfer city-owned vacant lots to nearby property owners for a small fee, as low as one dollar (Crauderueff et al., 2012). Studies on such initiatives are few, including limited work on the visual condition of lots and crime reduction (Stern & Lester, 2021). There is a lack of research that compares the condition of vacant lots before and after they are sold to private owners with those that remained owned by cities. Moreover, limited work has investigated the meaning of vacant lot ownership for the racially and ethnically minoritized groups who experience the impacts of systemic racism.

Focusing on Chicago's Large Program, we ask two research questions that start to address these literature gaps: Do vacant lots sold through the Large Lot Program see greater improvements in condition-care over time compared to city-owned vacant lots? What are the personal and social meanings of ownership for new Large Lot owners?

We used a mixed-methods design including two steps. First, we used a difference-in-differences (DID) technique to compare changes in condition-care between 198 repurposed lots (sold to nearby property owners) and 594 series of control lots (city-owned) located in the Greater Englewood area of Chicago. We used a combination of field observations, photos, and Google Street View images to rate vacant lot condition-care in 2014 (before the sale), 2015 (after the sale), 2016, and 2018. Second, we drew from three focus groups with 25 Large Lot owners and conducted a content analysis of the focus group transcripts. Specifically, we purposefully looked for content that illuminated the meanings of vacant lot ownership for individuals and the community.

Our results of the DID analysis show that ownership matters. Condition-care for sold Large Lots significantly increased after the sale (2015) and continued to grow through 2018, whereas condition-care for the control lots slightly decreased in the same period. We also found that condition-care for the sold Large Lots did not differ based on whether their owner lived on the same block. Our focus group interviews demonstrated that vacant lot ownership through the Large Lot Program helped empower residents by reducing illicit and dangerous behaviors (owners had more control over their lots), fostering an ethic of care for their neighborhood (many lots hosted

community spaces), and reinstating a legacy of land tenure for Black residents.

The results of this study have at least two sets of planning implications. First, we demonstrate that vacant lot greening programs that transfer land to private owners help improve condition-care, and that such improvement does not depend on whether owners live nearby. Second, our focus group results suggest that vacant lot greening initiatives could be embedded into broader equitable development planning initiatives that empower marginalized residents.

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Key Words: Urban vacancy, Urban green space, Visual assessment, Land ownership, Chicago

#### **GATEWAY COMMUNITIES AND ZOOM TOWNS: PLANNING CHALLENGES AND THE MIGRATION IMPACTS OF THE COVID-19 PANDEMIC.**

Abstract ID: 879

Individual Paper Submission

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Small towns and cities outside of national parks, forests, rivers, ski resorts, and other natural amenities throughout the western U.S. are known to experience a range of unique planning and development challenges. However, the COVID 19 pandemic worsened these challenges because it caused a surge of migration to these “gateway communities” or “zoom towns”, as reported widely in popular media (see for example Levine 2020 or Sen 2020). When lockdowns in major cities across the country were enacted to stop the spread of the virus, many Americans decided to move to rural areas and work remotely if they could. This surge in migration likely contributed to the fact that rural communities had the highest prevalence of cumulative COVID-19 cases in the U.S. (USDA 2021) while having access to fewer medical facilities and services than larger urban areas (Peters 2020).

We present a baseline assessment of the planning and development challenges that were experienced by these communities prior to the COVID 19 pandemic. This assessment is based on a national questionnaire and in-depth interviews with practicing planners and public officials working in over 250 gateway communities (Stoker et al. 2019). Providing affordable housing, infrastructure maintenance, and a loss of community character were the most commonly reported challenges before the pandemic. This baseline assessment provides clear indication of how the pandemic will continue to impact these communities and accelerate what were previously slow trends related to a

lack of affordable housing and changing community character. We draw upon analysis of the Origin-Destination Employment Statistics database (LODES), which indicates that as many as 70% of a gateway community's workforce resides outside of the city and commutes to work in the community. This is driven by a lack of workforce housing and high population growth rates. It is clear to see how this new influx of COVID-19 migrants from urban areas, who tend to have higher incomes, will significantly alter housing markets and transportation patterns in these regions. We present strategies that are currently being implemented in gateway communities as reported in a series of webinars, organized by the Gateway and Natural Amenity Resource Initiative ([https://www.usu.edu/gnar/gnar\\_network](https://www.usu.edu/gnar/gnar_network)). These include regional affordable housing strategies, permitting of accessory dwelling units, and peer-to-peer learning networks. Our presentation seeks to inform the ACSP community of immediate research needs to better help these communities plan and adapt to the long-term impacts of the COVID-19 pandemic.

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Key Words: gateway communities, housing affordability, rural development, COVID-19

#### IT'S THE REFINERIES: EMPHASIZING INDUSTRIAL LAND WHEN UNDERSTANDING HOUSTON'S LAND GOVERNANCE

Abstract ID: 957

Individual Paper Submission

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Houston's "free market" approach to land governance is famous, yet Houston's urban development is not a free-for-all. While having many other land development controls, Houston specifically lacks the type of land-use zoning that restricts specific uses. It is the only major city in the U.S. without this. Planning scholarship on the outcomes of Houston's (lack of) zoning centers largely on housing and urban growth (Gray & Millsap, 2020; Ryberg-Webster, 2019; Qian, 2011).

This leads to one major oversight: industrial land. Unlike older U.S. metros, industry and manufacturing land uses (and their pollutants) never left Houston. Houston has the largest petrochemical manufacturing complex in the Western Hemisphere. Almost half of the entire country's petrochemical capacity goes through this complex, which contains not only refineries but plastics manufacturers, fertilizer plants, and the second biggest port in the United States. Industrial land and its externalities are ignored in planning scholarship on the city's land regulation practices, despite such land covering a large chunk of the city's eastern half.

This project addresses this oversight by performing two different analyses. I use a critical political economy lens to evaluate the role of the petrochemical industry in shaping the city's land governance practices, and also measure Houston's current industrial land uses.

First, using primary and secondary materials (Siegen, 1972; Feagin, 1988; Mixon 2010), I do historical research on the attempts to change Houston's land governance practices, centering on the 1962 and 1993 failed referenda to implement land-use zoning. I show that local land use governance does not reflect the recommendations of "rational" plans; rather, it reflects highly localized struggles which prioritize landowners' needs. In most cities this leads to frequent exemptions (Valverde, 2011); in Houston--where 40% of the economic base belongs to the petrochemical industry--these struggles led to a defeat of Euclidean zoning. I examine Houston Chronicle archives for the three months prior to each vote, examining news stories, editorials, and ads about the referenda. This helps identify the agents who influenced the referenda and the discourses they employ, centering largely on the public positions taken by the manufacturing and petrochemical sectors.

While the first phase of analysis examines how Houston developed its current land governance regime, the second phase examines its effects. Using Harris County Assessor District data (HCAD), I map the extent of industrial and residential land uses within Houston (while Houston does not have land-use zoning, the county assessor does record land uses for its records). Prior research does not consider the extent of industrial land within Houston, and in particular how in Houston industrial land uses can exist near homes. This descriptive analysis shows how land-use zoning has allowed industry to locate in unusual proximity to residential uses. I conduct a descriptive analysis on demographic, health, and socio-economic status of census tracts with predominately industrial land uses.

This research contributes to land-use planning scholarship in three ways. First, it offers a corrective to prior scholarship on a particularly famous location, emphasizing the role of the local political economy in Houston's land regulation. Second, it places the famous case in historical context, emphasizing the specific agents who shaped Houston's land regulation practices rather than using "free market ideology" as an explanatory factor. Third, it points towards new ways of assessing the impact of Houston's land regulation regime. While the dependent variables in prior research on Houston's land regulation measure the (lack of) zoning's impact on housing costs, gentrification, or urban sprawl, this project suggests newer objects of analysis, particularly cancer rates and life expectancy.

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Key Words: land-use planning, zoning, Houston, planning history

#### **WHAT IS LOST AND WHAT IS GAINED? A PARCEL-LEVEL ANALYSIS OF HOUSTON'S INFILL TOWNHOUSE BOOM BEFORE VERSUS AFTER REDEVELOPMENT, 2005-2020.**

Abstract ID: 989

Individual Paper Submission

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Suddenly, the repeal of single-family zoning and its replacement with medium-density friendly updates appears to be transitioning from a distant pipe dream to a real policy being actively pursued in specific US cities (Manville, Monkkonen, & Lens, 2020). Ironically, this gathering trend of questioning the most common form of zoning is heightening interest in the experience of Houston, famously the only large US city that never adopted zoning (Siegan, 1972). Houston's experience is relevant to that of zoned cities precisely because its reputation as an unregulated Wild West is, if not wholly unfounded, at least somewhat exaggerated (Lewyn, 2004). In the late 1990s, a full two decades before the current move away from single-family zoning became apparent across the United States, Houston acted decisively to reduce minimum lot sizes, and thus paved the way for the development of tens of thousands of "townhouses," or tall, narrow houses, sometimes attached, sometimes narrowly separated, on small lots in or near the urban core (Wegmann, 2020). To a likely greater extent than in any other large US city, many of these townhouses were developed on formerly "residential" lots, or parcels occupied by single-family houses on large lots. Houston thus experienced a more thoroughgoing and spatially widespread transformation of its everyday built fabric than perhaps any other city in the US.

A notable recent study from Gray & Millsap (2020) quantifies and maps the extent of Houston's townhouse boom, and characterizes the neighborhoods in which most of the development has taken place—generally middle-income areas with high enough land values to be attractive for development, but modest enough to be left uncovered by private landowner covenants that restrict development. In this study, I build on Gray & Millsap's efforts to reveal what got built in Houston's townhouse boom by asking what the townhouses replaced. To what extent were they built on previously residential parcels, versus commercial or industrial property? What was the net gain in housing units in cases where housing was demolished to make way for their construction? How much additional property tax revenue is being accrued as a result of the redevelopment of previously developed parcels into townhouses? How do the property values of the new townhouses compare to what they replaced? And to what extent do the racial/ethnic identities of the new townhouse homeowners differ from those of the previous homeowners that sold their homes to the developers that built them?

Taking advantage of how the Harris County Assessment District (HCAD) property tax data is organized, in which current parcels are linked to previously platted parcels that occupied the same land, this study deploys a novel method of comparing parcels before-versus-after redevelopment into townhouses completed between 2005 and 2020. Ethnic/racial identities of homeowners before-versus-after redevelopment are compared using surname analysis of names that appear in HCAD records. These analyses offer a window into what other cities contemplating reforms to single-family only zoning may expect not only in terms of the housing stock that may be gained, but existing housing stock that will be lost as redevelopment proceeds.

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Key Words: Townhouses, Redevelopment, Residential parcels, Houston

#### PROXIMITY AND VIEW PREMIUM OF WATERBODIES ON HOME VALUES -- A META-ANALYSIS

Abstract ID: 1026  
Individual Paper Submission

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This paper uses meta-analysis to analyze proximity and views related to water as an amenity in the United States (Simon and Saginor 2006). This research utilizes peer-reviewed literature from multiple disciplines with single-family residential real estate as the property of analysis. “Proximity to” in its simplest form is the distance from a house to the amenity. Past studies present that homes located close to a desirable environmental amenity frequently sell at a premium price. Similarly, “view of” in its simplest form, embodies the scenic nature of an amenity and studies show that homes with scenic views command premium prices. Past peer-reviewed studies presented varying values of premiums as capitalized in home values due to the view and proximity of water. The value premiums have varied from study to study by geographic region; general economic conditions, the type of water (river, lake, ocean) studied; the distance from the water, view of the water, a statistical method used in the research, whether the study occurred in an urban, suburban, or rural location; and other related variables (Mittal and Byahut 2016).

This study summarizes a literature review of over 20 peer-reviewed journal articles to create a dataset of observations. This includes variable such as the positive or negative impact on single-family residential real estate (the dependent variable), with the independent variables including but not limited to the statistical method used in the research, the distance from the water, the type of water (river, lake, ocean); whether the study occurred in an urban, suburban, or rural location; geographic region; general economic conditions, and other related variables. Ordinary least squares regression is used to determine the overall impact of water on residential property values. Several variables were found to be statistically significant, providing insight regarding current water-based residential development. Additionally, this research may lead to predictive impacts regarding the future development and/or redevelopment using water amenities to maximize residential property values.

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Key Words: Meta Analysis, Real Estate, Hedonic Models, Literature Review, Valuation

#### **IT TAKES A VILLAGE TO MAKE URBAN VILLAGES WORK: EFFECTS OF ZONING AND LAND USE POLICIES ON LAND VALUE AND DENSIFICATION IN THE CITY OF SEATTLE**

Abstract ID: 1050  
Individual Paper Submission

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The City of Seattle experienced an unprecedented economic expansion in recent years. Since 2015 Seattle has been one of the top 5 fastest growing cities in the US. Most of the growth has been spurred by the high-tech, biotech, health care industries led by well-known businesses such as Amazon, Google, and Facebook. The central tenet of Seattle's growth management strategies is to pursue mixed-use urban development with varying density and transit-oriented development via designated 5 Urban Centers and 20 Urban Village areas. The policy was adopted in the 1994 Seattle Comprehensive Plan, which was developed to meet the Washington State Growth Management Act (1990) requirement to reduce urban sprawl/auto-dependency and protect residents' quality-of-life and environment, among other goals. The results are astonishing growth: Seattle, for the first time since WWII, experienced a population of over 700,000 (563,374 in 2020 to 753,700 in 2019). Some say the dark side of the growth is the increasing difficulties of housing affordability.

Did the Urban Village policies stand up to the expected densification and increased housing quantity? The City changed several land-use policies, such as zone changes, upzoning, and light-rail station area designations to accommodate the growth. It means that a substantial degree of intense land conversion occurred, which results in the increased housing stock in the Urban Village areas. However, there is no research on how successful the Urban Village policies to achieve the planning goals and how it affected housing affordability with increased housing supply.

Gabb et al. examined the impact of the 2011 urban villages designation in San Jose, CA. After investigating transactions and assessing the parcels' values, large-scale development projects, residential and commercial permits, the authors found almost no effect. This outcome could result from several factors, such as sparse zone changes, complicated requirements, diversion from the real estate market conditions.

The paper examines the impact of Seattle's Urban Village strategies on densification and property values, including land values and housing values, between 2000 and 2019. We compare the land value and improvement value changes of the properties converted from single-family housing (SFH) to multi-family housing (MFH) or higher density residential developments inside the Urban Village/Urban Centers. We compare how these changes occurred in Urban Villages vs. the rest of Seattle during the two decades of the time stream. We conducted a spatial analysis using the historic property value data and performed a time-series statistical analysis of property value change on top of land use and zoning policymaking, as well as the demographic characteristics of different neighborhoods within the city.

The preliminary results show that (1) the initial land values were increased after the passage of GMA, (2) Higher land value changes occurred because of the conversion of SFH to MFH, (3) the land value changes are much more significant than the improvement value changes during the growth period; (4) mixed result of the light-rail station area (half mile buffer) property value changes; (4) densification occurred faster than outside Urban Village areas. These results could provide evidence-based syntheses of the policy implications of urban village and growth management, which local governments and planners could use to better serve the public interest.

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Key Words: land use, urban village, spatial analysis, growth management, comprehensive plan



## **PARKING BENEFIT DISTRICTS IN RESIDENTIAL NEIGHBORHOODS**

Abstract ID: 1096

Individual Paper Submission

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Free curb parking in a crowded city presents a classic commons problem: no one owns curb parking spaces and anyone can use them. As a result, drivers often cruise around searching for an open curb space, and this cruising adds to traffic congestion, air pollution, and carbon emissions. In 1954, William Vickrey proposed solving the cruising problem by charging prices for curb parking to “keep the amount of parking down sufficiently so that there will almost always be space available for those willing to pay the fee.” Cities can charge the lowest price that will leave one or two open spaces on every block, so no one will have to cruise for parking. Drivers oppose paying for parking, but some cities have built political support for demand-priced curb parking by establishing Parking Benefit Districts that spend the meter revenue to pay for added public services on the metered streets. Demand-based prices manage the curb, and the new public services show the benefits of metering curb parking. Everyone who lives, works, or owns property in a PBD can see the meter money at work repairing sidewalks, planting street trees, or providing free Wi-Fi. Cities have established PBDs mainly in commercial districts, but will they also work in residential neighborhoods? As one example, the Upper West Side of Manhattan has one curb space for every 20 residents, so no more than 5% of residents can park a car at the curb. If the curb spaces earn the same revenue as adjacent off-street spaces, the Upper West Side’s curb spaces could earn at least \$300 per resident per year for added public services. Cities that manage curb parking as valuable real estate can provide better public services and stop subsidizing congestion, pollution, and carbon emissions.

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Key Words: Parking, public finance, land use, neighborhood, equity

## **COASTAL PLANNING AND TANGLED LINES: A LEGAL EXAMINATION OF CONFLICTS AND CHALLENGES IN MASSACHUSETTS ASSOCIATED WITH INDETERMINATE SEAWARD BOUNDARIES OR OVERLAPPING JURISDICTION.**

Abstract ID: 1105

Individual Paper Submission

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The landside boundaries of municipalities in Massachusetts are well-defined and have been well documented over centuries. The seaward boundaries of Bay State municipalities are another matter.

Indeterminate and/or overlapping jurisdictional lines lead to conflicts. Examples abound along our coast:

Does one town’s efforts to facilitate aquaculture interfere with another’s interests in navigation?

Can a coastal municipality tax property miles away on a rocky ledge in Boston Harbor? Do a town's laws and regulations attach themselves to a national wildlife refuge when a stretch of town beach breaks away from the mainland and attaches to the island refuge? Some of these issues may resolve amicably, others may be contested in courts for years. The common thread among them is an incomplete understanding of the location and extent of the boundary lines and the important legal and economic interests associated with them.

As cities and towns strive to maintain, protect, and enhance healthy and productive coastal communities and the ecosystems upon which they depend, disputes related to water-borne boundaries threaten to hamper effective governance and impede productive use and stewardship. Indeterminate jurisdictional boundaries along with hierarchical legal regimes (e.g., local, state, and federal rules governing wetlands and waterways) increase murkiness at a time when stakeholders seek clarity.

This research examines gaps in understanding regarding Massachusetts' seaward boundary lines along with issues related to overlapping local/state/federal jurisdiction, and to develop and disseminate knowledge to stakeholders and policymakers eager to engage in informed coastal management. Municipalities charged with managing coastal resources, along with other stakeholders whose lives and livelihood are intricately linked to coastal ecosystems, require clear comprehensive information to guide their decisions, develop plans and implement practices and policies.

This project employs well-established methods of legal and public policy research and analysis. We examine judicial opinions, statutes, and bylaws to determine how coastal and ocean boundaries in Massachusetts have evolved and identify gaps and conflicts regarding the characterization of those boundaries. We also identify and assess coastal management issues that are subject to multiple levels (local/state/federal) of law and policy to identify existing and potential conflicts within the hierarchy of applicable law. For example, whether and how the federal Clean Water Act prohibition regarding filling wetlands or waterways might accommodate municipal or state level efforts to fashion green infrastructure (living shorelines) designed to protect coastal communities while restoring or maintaining coastal ecosystem functions.

The research is designed to provide policymakers, resource managers, nongovernmental organizations, and private stakeholders with an enhanced understanding of the rules that set the stage for claims of jurisdiction, governance, and planning..

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Key Words: law, boundaries, jurisdiction

## **POSTERS**

### **A STUDY ON THE SPATIAL STRUCTURE AND IDENTIFICATION OF URBAN CENTERS IN THE CAPITAL REGION OF SOUTH KOREA**

Abstract ID: 311

Poster

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Due to advanced technologies in transportation and telecommunications, trans-bordering commuting has increasingly taken place and mutual exchanges in freight and information among suburban cities have increased in the Seoul metropolitan area. This means that both physical and functional metropolitanization phenomena occur in the region. On the one hand, the concentration of higher value urban functions on Seoul, which is the central city of the region, generates spatial mismatch in commuting, causing a long-distance commuting problem. To combat with this problem, the long-range regional plan in the capital region and existing studies suggested the multi-center spatial structure through identifying urban centers in terms of the concentration of commuting and employment.

However, those urban centers in the plan and existing studies failed to take economies of scope into account in the process of identifying them. The economies of scope as well as the economies of scale are key characteristics of urban centers to minimize spatial mismatch. Since communities are characterized by diverse residents in terms of income and jobs with a number of industry sectors, the functions of urban centers need to be diverse as well in order to absorb nearby commuters. The economies of scope helps this commuting patterns.

In this line, the purpose of this study is to identify metropolitan centers in consideration of both economies of scale and economies of scope using non-hierarchical cluster analysis. The results show that a number of urban centers were identified throughout the region. Those centers in the southern area of Gyeonggi, which is a large administrative district outside Seoul, are characterized by high-industries, high employment density, and convenient transportation, while there is no striking urban centers in the northern part of the region, while major centers in Seoul carry out producer service businesses. This implies that policies should focus on the diverse urban functions in urban centers in suburban areas of the region to reduce spatial mismatch in commuting and foster several urban centers in the northern suburban area of the region for balanced development.

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Key Words: metropolitanization, long-distance commuting problems, urban center, economies of scale and economies of scope, non-hierarchical cluster analysis

#### **AN EXAMINATION OF MUNICIPAL EFFORTS TO MANAGE BROWNFIELDS REDEVELOPMENT IN ONTARIO, CANADA.**

Abstract ID: 483

Poster

DE SOUSA, Christopher [Ryerson University] [chris.desousa@ryerson.ca](mailto:chris.desousa@ryerson.ca), presenting author

Abstract: Since the 1990's, the reuse of brownfield sites for urban intensification has emerged as a core strategy in government efforts aimed at remediating pollution and prioritizing renewal, regeneration, and retrofitting. While upper levels of government in Canada engaged in early efforts to devise policies, programs, and funding strategies to support redevelopment, the job of overseeing it has fallen mainly to local government. This research project investigates the role of municipalities in Ontario, Canada's most populous and industrialized province, in managing and facilitating brownfields redevelopment via a so-called Community Improvement Planning (CIP) approach.

Online surveys of municipal brownfield specialists, site visitations, and data provided by the province are used to answer the following questions:

What role are Ontario municipalities playing in managing and facilitating brownfields assessment, remediation, and redevelopment activity in regulatory, financial, technical, and other relevant terms?

What barriers continue to inhibit the redevelopment of brownfields?

What redevelopment outcomes and impacts have been evidenced by municipalities?

What is the municipal relationship with other public, private, and nonprofit sector stakeholders?

Results reveal that there has been moderate growth in the number of municipalities of different sizes using CIPs and offering incentives to support brownfield redevelopment throughout the province. The CIP approach also helps standardize how municipalities perceive their role and the role of brownfields in planning for growth and urban economic development. But, while objectives and perceived roles may be common, the research reveals that municipal capacity to deliver on those objectives and roles is extremely diverse. Indeed, three groups of municipalities have emerged, with one group very experienced in how to apply a CIP and the financial tools therein, another group muddling through as opportunities and interests arise, and a group with brownfields goals and plans but little capacity to move them forward. As such, the development barriers that continue to inhibit brownfields redevelopment in Ontario are not only related to development costs, risks, and complex procedures, but are further complicated by the need to maintain and improve municipal capacity to engage in and support brownfield activities and partnerships.

Overall, the province's hope of empowering municipalities with the ability to both plan and facilitate brownfields redevelopment locally via the CIP approach seems to support a common vision, but realities are fragmented on the ground. While this may be fine for some, it doesn't provide hope for those keen on seeing brownfields achieve more to advance renewal, regeneration, and retrofitting. The research is of relevance to urban planners and policymakers interested in this domain of urban revitalization and redevelopment, as well as the strong cohort of planning scholars who have made significant contributions to this field of research over the last two decades.

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Key Words: brownfields, redevelopment, municipal, policy, management

# Track 9 – Food Systems, Community Health & Safety

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### **9.33 PRE-ORGANIZED SESSION - GROWING FOOD POLICY FROM THE GROUND UP**

Pre-Organized Session 33 - Summary

Session Includes 449, 450, 451, 452

RAMOS-GERENA, Carol [University at Buffalo] carolram@buffalo.edu, organizer

Cities are highly vulnerable to disruptions in food supply chains. Strengthening urban food systems (and urban agriculture) has drawn attention as a means of shortening the food supply chain between urban growers and consumers as well as providing the ancillary benefits of increasing access to healthy foods, reducing transportation emissions, mitigating urban heat island effects, greening urban space, and promoting public health. Leading transformational change in urban food systems are often community networks and advocates, many of whom are urban growers. However, community-driven innovation to rebuild urban food systems occurs in the face of a number of constraints, many of which are exacerbated by the ‘food-blind’ nature of local government public policy. To rebuild and foster resilient urban food systems, improved policy awareness and new models of community-driven change in urban food systems are needed. This session will bring together a transdisciplinary team of researchers and community partners who will share findings from a multi-year, participatory action research project, "Growing Food Policy from the Ground Up."

Objectives:

- Discuss (dis)connects between local government policy and urban food system networks
- Examine relationships between social networks, households’ foodsheds, and community health
- Understand ways by which systemic transformation happens in urban food systems

### **GROWING FOOD POLICY FROM THE GROUND UP IN MINNEAPOLIS: HOW ARE BIPOC AND IMMIGRANT URBAN GROWER NETWORKS ADAPTING TO DISRUPTION AND PROMOTING RACIAL JUSTICE?**

Abstract ID: 449

Abstract within Pre-Organized Session 33

BURGA, Fernando [University of Minnesota] hfburga@umn.edu, presenting author

Background:

Through a collaboration with Appetite for Change, a food advocacy nonprofit in Minneapolis MN, this paper interrogates how food systems policies in Minneapolis and urban growers adapt to a dynamic environment where existing food policies encounter the disruptions of the COVID 19 pandemic and the racial upheaval set in motion by the killing of George Floyd.

Objective(s):

This analysis examines how existing food policies concerning urban growers address racial disparities and how BIPOC and immigrant urban growers mobilize their social networks to enact policy change based on racial disparities. Local Government policies have a deep impact on the development of policies that affect urban growers (Raja, 2018; Neuner, Kelly, & Raja, 2011; Dilleuth & Hodgson, 2016; Clark et al, 2017). We interrogate how food policies address race to promote the growing practices of BIPOC and immigrant urban growers and consider how the social

networks of urban growers apply food policies during this dynamic period to promote racial justice.

#### Setting:

Over the past two decades the City of Minneapolis has heralded a robust food system policy regime focused on alleviating historical disparities disproportionately affecting BIPOC and immigrant residents. While food policies focused on urban planning scopes are emergent they remain symbolic in their approaches (Burga & Stoschcheck 2017). More recently the killing of George Floyd and the onset of the COVID 19 Pandemic continue to underline the structural disenfranchisements that affect BIPOC and immigrant residents throughout the state of Minnesota.

#### Methods:

By developing an NVIVO coding analysis of food policies focused the practices of urban growers (including formal plans, laws, regulations, programs, and fiscal incentives). And carrying out 10 interviews with food policy makers and urban growers, we identify the gaps between policy implementation and the actual practices of urban growers. We explore the challenges that urban growers face in fostering and maintaining social networks to achieve food access during the current this period of disruption.

#### Results:

We hypothesize that Minneapolis' food policy regime relied on local and state-wide networks to bring food policy innovation to the forefront. However, both formal and informal networks have been deeply impacted by the disruption brought forth by the pandemic shifting the ways in which people develop social networks to build capacity, foster policy change, carry out strategic planning and enact racial justice in the food system. The reconfiguration of these networks has dramatically impacted the inclusion of BIPOC and immigrant growers in the promotion of anti-racist food policies in the future.

#### Implications for planning practice:

Outcomes of this study will inform policy solutions to improve anti-racist food policies. As local governments consider strategies to rebuild resilient food systems, findings from this research aim to draw attention to how planners can support community-driven innovations for food security by focusing in residents who are BIPOC and immigrant residents in the city of Minneapolis.

#### Citations

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Key Words: Food systems planning, Food Security, Social Networks, Race

#### **ROLE OF COMMUNITY NETWORKS IN SHAPING URBAN AGRICULTURE THROUGH PUBLIC POLICY IN BUFFALO, NY**

Abstract ID: 450

Abstract within Pre-Organized Session 33

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BOHM, Martha [University at Buffalo] marthabo@buffalo.edu, co-author  
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Public policy adopted by local governments forms the backdrop for urban food system activities in cities and regions across the United States. A great deal of literature in the last decade has addressed the crucial role of both community advocates and local government policy in urban food systems (Raja, 2018; Neuner, Kelly, & Raja, 2011; Dilleuth & Hodgson, 2016; Clark et al, 2017). A smaller body of literature focuses on the explicit ways in which municipal policy has responded to the aspirations of, and engaged, growers of color. Scholars have argued that the failure to create inclusive planning processes has led to inequitable outcomes in the food system especially for growers of color (Clark et al, 2017).

Building on past work, this paper examines how community-led processes change/influence municipal policy discourse around urban agriculture in Buffalo, NY, especially as led by growers of color. We ask what impedes or enables community engagement in policy processes. In the case of Buffalo, NY, there is already a history of community and organization-led pressure on government policy makers for stronger food policy (Raja et al, 2013). While municipal policy has shown a gradual increase in impact within the food system, the effects are felt disproportionately throughout the city. Buffalo remains one of the most racially and economically segregated cities in the country, which impacts the extent to which food policy benefits are experienced by people and growers of color.

Empirical work for the paper relies on mixed methods. Data on policy formation processes and outcomes will be gathered through qualitative interviews of city policy officials and urban growers of color to document the extent and nature of policy tools, including formal plans, laws, regulations, programs, and fiscal incentives, available to urban growers. Additionally, policy documents will be analyzed (documents have already been searched using web and existing databases). Qualitative data--from policy officials and policy texts--will be coded using a set of a priori and emergent themes using NVivo. A comparison of qualitative interview data from policy officials with that of urban growers will yield a 'map the gap' analysis between the needs/perspectives of growers of color and the policy supports offered by local government policies.

We anticipate that, while most cities in the U.S. are not actively engaged in creating an enabling local government policy and regulatory landscape, Buffalo's steady improvement from 'food blind' to 'cautious engagement with the food system' has continued to progress as community leaders and organizations continue to apply pressure to policy makers to better support the local food system and, more specifically, urban agriculture. These results put forward an opportunity to leverage community partnerships to better address the current barriers to and challenges within urban food systems. Outcomes of this study will inform how policy makers can collaborate with community partners to identify and bridge gaps between the aspirations and needs of growers of color. The resulting paper will highlight how policy processes led by growers of color can better inform the design of equitable urban food systems.

#### Citations

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Key Words: Co-production, Food systems planning, Municipal food policy, Policy landscape analysis, Urban food system

## **SOCIO-SPATIAL FOODSHEDS: A LOOK AT THE IMPLICATIONS OF SOCIAL NETWORKS AND FOOD SPACES ON COMMUNITY HEALTH**

Abstract ID: 451

Abstract within Pre-Organized Session 33

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Background: The United States faces an unprecedented food security crisis, with low-income households and communities of color experiencing the sharpest rate of food insecurity. Increasing social and community support is one of the five main domains of the social determinants of health. Thus, rebuilding resilient community food systems in the wake of the COVID-19 pandemic calls for food system policies and practices to reflect local communities' values, resources, experiences, and priorities. Yet, there is limited empirical evidence of how local, community-driven food supports meet families' needs; where current local, state, and federal programs fall short; and the ways in which community members are leveraging their social networks to ensure families' food security and well-being.

Objective(s): This analysis examines the relationships between households' social and spatial foodsheds (i.e., the geographic scope of food acquisition) by visualizing families' social network patterns and how they affect households' overall health and access to food over space.

Setting: This study is nested within "Growing Food Policy from the Ground Up," a participatory action research project in East Buffalo, NY, where structural racism in housing, education, and economic opportunities have had lasting impacts on families' access to key resources, including nutritious food. In spite of these systemic challenges, community leaders are generating local innovations and utilizing a variety of food supports to ensure households' food security.

Methods: Using data from a cross-sectional household survey that will be administered this spring through summer 2021, we will employ geospatial and social network analysis tools to link geospatial data of households' foodsheds and social networks with other built environment variables (e.g., street length, housing density, food source density). Respondents will comprise households' main food shopper. Food security will be measured using the 18-item USDA Household Food Security Survey Module. Food procurement will be measured through recall of the past 30 days, asking about the types and locations of food sources from which food was collected (food retail, farmers markets, personal growing sites, community-based organizations, emergency sources, etc.) as well as mode of transportation used to procure food from each identified source. Socio-demographic data will be collected, including household size and composition, income level, race/ethnicity, employment status, and level of education. Using socio-spatial analyses, we will explore the extent to which low-income households' foodsheds can be explained by their social networks. We will also assess how households' foodsheds relate to overall health and well-being, and whether these relationships vary between urban grower and non-grower households.



Results: We hypothesize that more geographically clustered social networks will be associated with greater household food security, controlling for the built environment. More expansive foodsheds are also hypothesized to be associated with health and well-being; this relationship may vary between urban grower and non-grower households.

Implications for planning practice: This study will inform policy solutions to improve social determinants of health. Outcomes from this research aim to draw attention to how local government can support community-driven innovations for food security. For example, planners may consider transportation and economic development strategies to rebuild resilient food systems. Partnerships between planners and public health practitioners are also likely to advance healthy, equitable, and sustainable communities.

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Key Words: Food systems planning, Food security, Social network, Social determinants of health, Foodshed

#### CO-DESIGNING CHANGE IN URBAN FOOD SYSTEMS

Abstract ID: 452

Abstract within Pre-Organized Session 33

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The objective of this paper is to present a framework for co-created design work which can contribute to community engagement around urban food systems. The nature of the work discussed includes co-created graphic design and digital/web design underpinning community-facing communication on a multi-year, participatory action research project, "Growing Food Policy from the Ground Up (GFPGU)."

These co-produced design processes shift the role of the designer from the traditional one as actor in service of a monied patron's agenda to one in which the designer acts to initiate or advocate on behalf of a community group (Bohm, Hwang, and Printz, 2015). This further positions the practice of art and design as a means of community engagement (Miessen, 2006). This transdisciplinary team has disciplinary breadth including public health communication, art, graphic design, and architecture. The co-designing process does not give primacy to research as the only way to understand complex issues; it aspires to discover a 'third way' where designers and community partners are in dialogue to understand and visualize complex issues.

Reflecting on the co-produced process of design production, the paper explores the possibilities and limits of such

processes in serving food systems planning. Empirical content of the paper draws on an analysis of design team meeting notes, stakeholder interviews, and archival records of the planning process. The design processes discussed in this paper supports the GFPUGU project's overall capacity building work to accelerate residents' engagement in urban agriculture (UA), growers' engagement in UA policy, and ultimately, stronger, more equitable urban food systems (UFS). The first process discussed is the iterative, participatory development of a graphic identity and project name with strong resonance for community partners and participants. The second process discussed is for a digital platform of community engagement and information dissemination. These two efforts aim to create a graphic identity and digital presence that allow community participants to perceive themselves as part of the urban food systems network in their community; their co-authorship in the visual and web identity of the project facilitates this identification.

This work will have implications for the future work within this project, as well as on the education of both architecture and art / design students in seeing their work as a means for community engagement and activism in food systems planning. Lessons learned from the graphic and digital co-design processes will be applied and expanded upon in the subsequent phase of the project, which includes small scale built projects (e.g. community garden planter box, tool shed, or water collection device) situated in the community in service of community network formation. Small scale design intervention is a tool through which human action can shape the experience and physical structure of the city (Borasi and Zardini, 2008).

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Key Words: Food systems planning, Urban agriculture, Spatial practice

### **9.57 PRE-ORGANIZED SESSION - BEYOND SILOS: COLLABORATING ACROSS FIELDS TO DISMANTLE STRUCTURAL RACISM AND ACHIEVE COMMUNITY HEALTH**

Pre-Organized Session 57 - Summary  
Session Includes 261, 262, 264, 265

ANGST, Sean [University of Southern California] angst@usc.edu, organizer

Throughout history, planning and public health have sought to promote healthy communities and public good within the context of white supremacist ideologies and practices. Given the foundational nature of racism to the development of the United States, systemic racism—specifically tied to the superiority of whiteness and inferiority of Blackness—was central to each field and deeply infiltrated their policy decision making processes. As a tool for the Nation-state, planning formalizes the spatial order that produces and reproduces disparate health outcomes across different racial/ethnic groups through plans, policies, and practices. While public health has tried to address inequities in the distribution of these health outcomes, the field's gutted infrastructure has often focused on individual level outcomes that, intentionally or unintentionally, pathologize behaviors of marginalized racial/ethnic groups. As a paradigm shift towards reparative praxis emerges in both professions, in this panel, we ask how can planners and public health professionals learn from each other and work together to achieve the goals of healthy communities?

Objectives:

- Understand the relationship between planning, public health, and structural racism
- Gain strategies for addressing racial disparities in community health outcomes
- Learn across disciplines to make planning and public health interventions more effective

## **WHO WILL SURVIVE IN LOS ANGELES? PRECARIOUS HOUSING AND MECHANISMS OF STRESS, TRAUMA, AND COMMUNITY WELL-BEING**

Abstract ID: 261

Abstract within Pre-Organized Session 57

ANGST, Sean [University of Southern California] angst@usc.edu, presenting author

In the field of public health, socio-economic status is considered the ‘fundamental cause’ of health inequities because of its role in shaping social, environmental, and behavioral determinants of wellbeing (Link & Phelan, 1995). While the mechanisms that produce health inequities change across time and space, socio-economic inequality remains their underlying cause. Inequality—produced through the mutually constituted relationship between racism and capitalism—not only influences distribution of opportunity and access to care, but also determines exposure to harms and stressors (Seamster, 2018). Thus, policy aimed at improving the quality of life and health of residents must address the structures reproducing inequality as well as the new mechanisms that arise to uphold those conditions.

The on-going affordable housing crisis offers a useful entry point to study these factors given the large proportion of monthly income devoted to rent and the essential role of home in human development (Swope & Hernandez, 2019). Precarious employment and rising housing costs are compounded by development pressures that disproportionately affect communities previously targeted with disinvestment and devaluation. These conditions have translated into fewer resources, scarcer housing options, and heightened uncertainty for residents. As a result, tenants—especially those within the Black and Latinx communities—must increasingly go without essentials and grapple with consistent stress, fear, and anxiety in their attempt to find stable housing. The human body is well-designed to deal with concerns that arise throughout life. Being in a state of constant stress, though, causes long-term damage to overall wellbeing (Turner, 2013).

Using South Los Angeles as a case study, this research seeks to answer:

1. What mechanisms of stress and trauma are created by the affordable housing crisis?
2. How do these mechanisms contribute to disparate living and working conditions?
3. What types of social supports are available to buffer against the impacts of housing instability?

The study was composed of three interrelated phases. First, 17 focus group conversations were facilitated with residents consisting of a 20 minute survey followed by a 75 minute conversation. Second, a door-to-door survey was administered to 400 households using stratified randomization at the census block group level as a semi-structured interview taking roughly 45 minutes. Third, 75 hours of participant observation was conducted by walking the study neighborhoods and attending community meetings.

Results suggest that tenants employ a variety of survival tactics to maintain stability. This ranges from cramming into overcrowded homes, working around the clock, going without needed medicine, decreasing their quality of housing, enduring harassment, and moving farther from work and friends. These tactics—while life-preserving in the short-term—wear residents down over time and have the potential to impact their lives long after the initial adjustments are made (Geronimus, et al., 2006). Because adjustments do not remain contained as one-time stressors or necessarily resolve themselves quickly, they have the potential to change the way renters live and allow for the effects of the crisis to accumulate over time as conditions persist. Families, in particular, are subject to magnified

effects due to higher expenses, greater demand for space, and sensitive timing in psycho-social development. Nonetheless, residents have formed dense systems of support and resistance to remain in place. Residents' resilience offers new ways to think about interventions that are grounded in community control and local assets.

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Key Words: Housing, Racial Justice, Community Health, Community Development, Stability

#### **"TO LIVE AND DIE IN [SOUTH CENTRAL] LA": EXPLORING PLANNING IN PRODUCING TRAUMA IMAGINARIES?**

Abstract ID: 262

Abstract within Pre-Organized Session 57

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Since Hippocrates identified "sunny, breezy hillsides" as healthy places and "swamps" as unhealthy places in his foundational text, place has been instrumental in achieving good health (Frumkin 2003, 1415). But who gets access to healthy places? Scholars have found that "population [trends] of good and bad health mirror population distributions of deprivation and privilege" (Krieger 2001, 668). Hence power structures regulate access to healthy places. In the United States, access is systematically distributed along racial lines, and race is always spatialized. As a spatial process and practice, planning contributes to these health inequalities through policies and plans that uphold racialized distributions.

Many scholars have thoughtfully examined planning's contribution to health inequalities through a physical, political, and economic lens. These approaches are essential in understanding planning's complicated histories and creating greater access to healthy places. I contribute to these works by offering a psycho-socio-cultural approach. My work as a practicing planner led me to explore communal trauma, a multilayered, place-centric trauma expressed through trauma imaginaries— spatial imaginaries that carry the hallmarks of trauma. In this paper, I ask how do planning processes impact trauma imaginaries in South Central Los Angeles (SCLA)?

To analyze trauma imaginaries in SCLA, I center spatial consciousness. Spatial consciousness allows people to understand the centrality of space and place in their biographies (Harvey 2005). This work cultivates a method for exploring spatial consciousness— a method for traversing the intricate relationship between time, place, and being. Exploring this method calls for a transdisciplinary approach to knowing, so I integrate interviewing, participant observation, autoethnography, artmaking, and instinctual "street" ways of knowing methodologies (Isoke, 2018). Because spatial imaginaries are the collective consciousness of a group (Davoudi 2009), I cross-reference this spatial consciousness work with a discursive and content analysis of spatial imaginaries present in SCLA's literature and news media. In doing so, I find that communal trauma is essential to understanding the relationship between place, power (planning), and health. Examining trauma imaginaries can lead to a reparative planning praxis that aims to

redress the impacts of communal trauma.

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Key Words: race, trauma, spatial imaginaries, health, planning practice

#### **DISSED/PLACED: PARTICIPATORY PLACE-HEALTH RESEARCH AS PLACE(RE)MAKING, SOCIOSPATIAL COUNTERNARRATIVE, AND RESISTANCE**

Abstract ID: 264

Abstract within Pre-Organized Session 57

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Understanding “place” (e.g. “neighborhoods”) and health is a core focus of public health research and practice (Arcaya et al., 2016). And increasingly, many scholars and practitioners are rediscovering and revisiting historic connections between planning and public health, especially in relation to housing, built environments, and notions of “placemaking.” Much work to date, however, tends to de-place place-health relationships by not explicitly engaging local/regional social, political, and economic practices/processes that fundamentally shape (socio)spatial distributions of health opportunities/risks. That is, this work frequently ignores the manners and mechanisms through which place is actively made, unmade, and remade over time—placemaking as literal and material, as well as symbolic and social. Here, I contend that knowledge production about “place” is a critical component of placemaking—and one which public health and planning scholars/practitioners alike tend to discount or outright dismiss.

In public health, much place-health work falls within the subfield of social epidemiology. And much like traditional epidemiology, most social epi—despite its name—is not very “social” at all (Petteway et al., 2019; Smylie et al., 2012), and follows the same positivist, reductionist, settler-colonial, white-supremacist logics. Procedural and methodological norms preclude expressions of/actively mask community residents’/research participants’ agency, discounting/devaluing their knowledge/expertise while simultaneously dispossessing them of their stories/experiences (“data”). In this regard, relationships between researchers and residents/research participants represent not only the re-inscription of social hierarchy, but the reification of place-health research as (re)colonization. Conceptual and methodological modifications are thus fundamental to appropriately frame, assess, and address spatial inequalities in health. In other words, we need to reimagine and remix what it means to represent place within place-based public health and planning work, and critically interrogate the extent to which standard practices—as placemaking processes of sociospatial (mis)representation—constitute acts of epistemic and symbolic violence.

In this spirit, this presentation will discuss a collection of projects rooted in critical, critical race (Ford & Airhihenbuwa, 2010), and Black feminist theory (Parker, 2016), as well as principles of community-based participatory research and decolonizing methods, as potentially instructive expressions of procedurally and

epistemically just place-health research practice. These projects used exclusively resident-driven participatory methods to examine aspects of daily place-health experiences, exposures, risks, and opportunities. Residents' works suggest that such approaches can afford opportunities to democratize local place-based public health and planning work, and can allow for identification of local/regional placemaking mechanisms implicated in spatial health inequalities. Diversifying community health and planning assessment approaches to include community-generated data offers a process to decolonize traditional practices and co-create place-health new knowledge(s), thus affording residents opportunities to articulate sociospatial counternarratives to contest, resist, and/or enhance the pre-existing data narratives that animate local place/health and health equity discourse.

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Key Words: place and health, decolonizing, social epidemiology, participatory research, placemaking

## COVID-19 AND THE IMPACT ON ENVIRONMENTAL JUSTICE COMMUNITIES

Abstract ID: 265

Abstract within Pre-Organized Session 57

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The environmental justice literature demonstrates that Black, Latino, and low-income individuals reside in closer proximity to hazardous waste facilities and are disproportionately impacted by exposure to environmental hazards in the workplace and in their neighborhoods. Living near toxic facilities and exposure to environmental hazards have been associated with poorer health and disproportionate negative health outcomes among these populations. The COVID-19 pandemic has also disproportionately impacted Black and Latino communities across the country. These disparities which can be seen in cases, hospitalizations, and deaths are primarily due to inequities in the social determinants of health (i.e., economic stability, healthcare, education and neighborhood and environment). These same systemic inequities seen during the pandemic are those that make many of these communities most vulnerable to environmental exposures. Epidemiological research studies have shown that elevated levels of fine particulate matter (PM 2.5) are associated with increase in COVID-19 mortality. Excess environmental exposures have been associated with higher rates of a range of health effects including cancer, and respiratory and cardiovascular diseases which are associated with increased risk of severe illness and mortality from COVID-19.

This presentation seeks to discuss the impacts of COVID-19 on environmental justice communities.

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Key Words: COVID-19, Environmental Justice, Social Determinants, Systemic Inequalities

## **ROUNDTABLES**

### **9.1020 ROUNDTABLE - NATURAL EXPERIMENTS FOR INTERDISCIPLINARY PLANNING RESEARCH: PROMISES AND LESSONS FROM TWO NIH PROJECTS**

Abstract ID: 1020

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Promoting human health and wellbeing is at the core of urban planning research and practice. Despite the growing consensus on the notion that “place matters” in health, evaluating the “causal” impacts that the place has on health has been limited. It is in large part due to the methodological and ethical challenges in executing rigorous experimental research in community-based population studies, as well as limited funding opportunities to support large-scale longitudinal studies needed to assess such causal impacts.

Natural Experiments (NEs) emerged as promising ways to assess causal impacts of various community-level interventions on health, that are typically not suitable for traditional controlled experimentation. NEs refer to observational studies that examine exposures to an intervention that is not designed by the researcher, which often include changes in the environment and policies.

This roundtable session consists of two parts, with its participants representing urban/transportation planning, public health, landscape architecture, architecture, and community engagement. For the first half, the roundtable participants will provide an overview of two on-going NE projects funded by the National Institutes of Health: Active Living Austin (ALA, 2015-2021) and Active El Paso (AEP, 2018-2023). These longitudinal, case-comparison studies represent two common types of NE interventions: “relocation” in ALA (i.e. people moving to a walkable community) and “exposure” in AEP (i.e. new transit service in the neighborhood). Using both subjective (survey and travel log) and objective measures (GPS and accelerometer), these projects examine short-term and long-term casual effects of the two interventions on people’s mobility, physical activity, and social interactions. These studies also explore spatial and temporal patterns of outdoor activities to identify specific design features and policy elements associated with positive outcomes. The presentations will cover general research design and study execution strategies commonly used in NEs, followed by the specific strategies employed in ALA and AEP (e.g. propensity score matching, multiple comparison groups, multi-channel marketing, and machine learning algorithms). They will also discuss expected and unexpected challenges (e.g. baseline data collection time constraint, dynamic changes accompanying the target intervention, predatory survey takers, participant recruitment/retention, and sample bias), effective responses to those challenges, and lessons learned from implementing these projects over the past 6 years.

The second half will be devoted to facilitated audience-participant interactions. Attendees will be given the opportunity to post/raise questions throughout the roundtable session, and selected questions will be discussed during this time. We anticipate this second part to offer opportunities to further discuss challenges, lessons, and tips about designing, getting funding for, and implementing various NEs on health and mobility related topics, and to highlight the importance of interdisciplinary collaborations and partnerships with local stakeholders in NEs. The ALA and AEP teams include principal investigators from Urban Planning/Transportation, Landscape Architecture, Public Health, and Architecture, and investigators from Computer Science, Statistics, Kinesiology, Health Promotion, and Community Outreach. The teams also collaborate closely with community stakeholders such as the developer and the transit agency.

By attending this roundtable session, audience can expect to: (a) understand types of NEs and their unique challenges and opportunities with examples from two current NE projects led by the roundtable participants; (b) learn about the strategies to designing and implementing a robust NE project and getting it funded; and (c) discuss why NEs hold strong promise in research dealing with environment-health intersections.

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Key Words: Natural Experiment, Planning for Health, Interdisciplinary Research

### **INDIVIDUAL PAPER SUBMISSIONS**

#### **CAN NEIGHBORHOOD ENVIRONMENT MITIGATE THE IMPACT OF CRIME ON MENTAL HEALTH? A LONGITUDINAL STUDY OF DALLAS-FORT WORTH METROPLEX, TX**

Abstract ID: 13

Individual Paper Submission

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Mental health issues are among the biggest problems in human society (Layard, 2005). According to the recent report by the National Institute of Mental Health (2019), nearly one in five adults in the United States is living with mental health illness (a total of 51.5 million). The consequences of mental health issues affect individual well-being and challenge the welfare system at the national level (Dustmann & Fasani, 2016). Studies in environmental criminology and public health identify crime as an essential environmental stressor (Lewis & Riger, 1986; Perkins &



Taylor, 1996) because crime may distress both the physical and subjective well-being. The spatial characteristics of crime make it an important environmental factor in affecting people's mental health through both direct experience (victimization or witness) and indirect experience (fear of crime upon the knowledge of crime status).

In the field of urban planning, the neighborhood environment is recognized for its association with mental health and crimes. However, limited empirical studies have examined the relationship between crime and mental health within an environmental context. This study fills the gap in the literature by examining the potential moderating effect that neighborhood environment (built environment and social environment) could potentially have on the relationship between crime (property crime and violent crime) and mental health (the percentage of sadness, the percentage of hopelessness, the percentage of nervousness, and the percentage of restlessness). The built environment is measured through the degree of mixed land-use, the percentage of parks and recreational land-use, access to transit facilities, and alcohol-related establishments; and the social environment is measured through the concentrated disadvantage and residential instability, while controlling for the demographic structure. Using five-year longitudinal data (2015-2019) from the Dallas - Fort Worth (TX) metropolitan area and the spatial lagged modeling technique, findings from this study will provide planning and policy recommendations to build healthy and crime resilient communities in a proactive approach.

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Key Words: Crime, Mental Health, Concentrated Disadvantage, Built Environment, Environmental Equity

#### **ASSESSING THE IMPACT OF A FRESH PRODUCE DISTRIBUTION SERVICE ON COMMUNITY MULTIMODAL ACCESS TO HEALTHY FOOD: BRIGHTSIDE PRODUCE IN NATIONAL CITY, CA**

Abstract ID: 37

Individual Paper Submission

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#### Introduction

In response to calls to use local public policies to improve the food system (Pothukuchi & Kaufman, 2000), city planners increasingly consider ways to enhance access to healthy foods, particularly in communities where nutritional resources are more supportive of an unhealthy rather than healthy diet. National City, the site of this investigation, prioritizes "healthy food supplies... especially in areas where a healthy food supply... is not located within a half to quarter mile away." Access to food is often expressed in terms of distance but travel time and modal choice are less frequently considered.

Interventions that improve the nutritional quality of food offer one way to improve community health (Dillemuth & Hodgson, 2016). However, small and independently-owned stores face challenges stocking healthier products (Gittelsohn et al., 2014; Powell et al., 2019). BrightSide Produce (BrightSide) addresses the challenges faced by stores when attempting to carry fresh produce. BrightSide delivers produce to stores weekly with no minimum order requirements and manages the produce for the store by ordering, merchandising, providing training on produce handling, and pricing.

#### Research Strategy

Previously, we analyzed disparities in access to grocery stores based on multimodal travel times (Swayne & Lowery, under review). We build on this work focusing on National City, CA, a small, 9.12 mi<sup>2</sup> municipality where the majority of residents are members of minority populations, and have lower household incomes and higher poverty, unemployment and food insecurity rates than in San Diego County. Additionally, National City contains a neighborhood that has been designated a food desert.

To determine whether BrightSide improved access to food for National City residents, we examine how changes in travel distances and travel times to local fresh produce retailers changed since implementation at thirteen independently-owned stores in National City. Using our baseline food landscape of grocery stores, we add the BrightSide locations to examine how the addition of these retailers changed multimodal access to fresh produce.

#### Findings

The introduction of fresh produce into BrightSide stores reduced minimum travel time by transit to a healthy food outlet for 29 of the 54 census block groups (CBGs) in the study area. Among these CBGs, there was an average one way travel time reduction of 4.9 minutes. Twelve CBGs that previously lacked access to a store within a 10 minute transit commute now have access to at least one store. For shoppers traveling by car, minimum travel time was also reduced for just over half of the CBGs. However, these reductions in travel time were much smaller — likely due to the fact that travel times by car are shorter on average. Changes in travel time were clustered in the west and southwestern portions of National City where there is no supermarket.

#### Takeaway for Practice

Improvements to land use regulation and zoning that bolster food security are a priority for planners but may require time to obtain approvals and negotiate policy changes. Our results demonstrate that in National City, BrightSide improved access by transit to healthy foods. These results have important implications for planning practice where efforts to add brick-and-mortar grocery stores or transit routes are often met by onerous economic development processes. Instead, planners may consider smaller-scale innovations like this one to support food access. These interventions may not need to be focused on food retail outlets — opportunities exist to implement and examine similar interventions such as farmers' markets, community gardens, mobile markets, and adaptive reuse of brownfield sites to support the food environment.

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Key Words: food systems, access, mobility, transit, corner stores

## **A MIXED METHODS APPROACH TO UNDERSTANDING THE IMPACT OF GREENSPACE REDEVELOPMENT ON THE SLEEP HEALTH OF BLACK ADULTS IN SOUTHWEST ATLANTA**

Abstract ID: 62

Individual Paper Submission

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Background: African American or Black individuals disproportionately live in neighborhoods with limited access to greenspace, such as parks and walking/bike trails, due to persistent racial residential segregation [1]. Black neighborhoods undergoing greenspace redevelopment could amplify existing social environmental stressors and increase displacement vulnerability related to, for instance, moving due to concerns of not affording higher rent or being evicted, increases in financial strain [2], and social exclusion from the newly created spaces and erasure of their community likeness as well as heightened vigilance from anticipated discrimination [3]. Although these stressors may contribute to poor sleep, data are sparse.

Methods: This study used the Atlanta BeltLine, as the greenspace redevelopment project of interest, to investigate the relationship between social environmental stressors associated with residential displacement and various sleep dimensions among Black adults. The Atlanta BeltLine is a public-private greenspace redevelopment project that was initiated in 2005 and that will ultimately result in improvements to 700 acres of existing parks, the addition of 1300 acres of new and expanded greenspace, 33 miles of new multiuse trails, and a 22-mile loop of rail transit service by 2030. We employed a transformative convergent parallel mixed methods study design to analyze the data from the African American Sleep & Health Study (2019) [4]. Two census block groups, within the Atlanta BeltLine target development area, classified by a displacement risk index [5] as medium to high-risk areas of residential displacement were matched using propensity score matching to block groups within the City of Atlanta that were unexposed to the Atlanta BeltLine. Adjusting for demographic characteristics, linear regression models were used to estimate associations and 95% confidence intervals (CIs) between social environmental stressors (i.e., everyday discrimination, heightened vigilance, moving due to concerns of not affording rent or being evicted, and financial strain) and self-reported (n=66) as well as objective (n=32) measures of total sleep time (TST) in hours along with sleep disturbances (SD) (i.e., trouble falling and staying asleep). Objective TST was log-transformed to meet normality assumptions. For the one-on-one semi-structured interview data (n=20), we conducted content analysis using a constant comparative approach in NVivo 12 to identify contextual factors, themes, and relationships.

Results: Among 66 participants, 46% were 48+ years of age, 59.4% were women, and 67% had greater than high school level education. The association between moving due to concerns of being evicted and objective TST was moderated by exposure to greenspace redevelopment, after adjustment. Unexposed participants who moved due to concerns of being evicted had lower mean objective TST by 53% (CI: 35.67% - 65.86%, p<0.001) compared to those who did not move. There were no statistically significant differences among exposed participants (CI: -0.05 - 0.60, p=0.08). Participants experiencing medium financial strain was associated with a 7.68 (CI: 0.21 - 15.15, p<0.05) increase in self-reported SD compared to participants experiencing no financial strain, after adjustment. Adjusted models for everyday discrimination and heightened vigilance were associated with 0.26 (CI: 0.03 - 0.49, p<0.05) and

0.49 (CI: 0.17 - 0.81,  $p < 0.05$ ) increase in self-reported SD, respectively. Qualitative themes indicated that for exposed participants financial strain, few affordable housing options, and the “white gaze” from their new white neighbors were factors that were increasing the pressure of residential displacement and subsequently their sleep.

**Conclusions:** Our findings revealed specific social environmental stressors related to greenspace redevelopment including pressure of residential displacement influenced specific sleep dimensions (TST, SD). Future research should conduct prospective studies to examine the temporality and magnitude of associations. The findings will have implications for urban planning and public health strategies that are focused on creating healthier and more equitable communities.

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**Key Words:** Greenspace redevelopment, Sleep, Atlanta BeltLine, Black adults, Pressure of displacement

## **HOW DO HOUSING TYPOLOGIES AFFECT MENTAL HEALTH?: A CASE STUDY OF ACCESSORY DWELLING UNITS (ADUS) IN LOS ANGELES AND LONG BEACH**

Abstract ID: 66

Individual Paper Submission

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Serious mental distress is rising, and has been exacerbated by COVID19, worsening social isolation. Stable and quality housing is seen as an integral determinant of mental health, but we still know little about the influence of housing types. Where there is evidence, housing type (Evans, Wells, & Moch, 2003) and housing quality (Evans, Wells, Chan, & Saltzman, 2000) are shown to significantly affect mental health. The housing typologies however tend to be rather coarse (low-rise vs high-rise, single family vs multi-family). To address this gap, we examine the effects of a particular housing type, accessory dwelling units (or ADUs, also known as “granny flats”) in Los Angeles and Long Beach, two California cities with population size differences and mental health outcomes, but otherwise similar housing and income profiles.

ADUs are “self-contained units located on a property of a single-family home” (Been, Gross, & Infranca, 2014). Some argue that ADUs facilitate elder and child care (Liebig, Koenig, & Pynoos, 2006), potentially contributing to better mental health outcomes. Like most of the US, California’s cities are characterized by single-family zoning, and until recently most ordinances precluded ADUs. In Los Angeles, where enforcement against unpermitted ADUs is based on complaints, 10-15% of single-family houses have unpermitted ADUs. In contrast, in Long Beach, where enforcement is proactive, less than 5% of single-family houses have unpermitted ADUs based on our preliminary data.

The State of California now requires all jurisdictions to remove regulatory barriers—such as parking, setback and owner-occupancy requirements—to allow ADUs by-right on single-family-zoned lots (California Assembly Bill 2299 and Senate Bill 1069, effective January 2016, and Assembly Bills 68, 881 and Senate Bill 13, effective January 2020). However, the pace of regulatory reform has varied. Los Angeles has been at the vanguard and, in 2019, permitted over 5,600 ADUs. In contrast, Long Beach permitted 104 ADUs in 2019.

What are the potential effects of ADUs in single-family-zoned neighborhoods on mental health? We assess the likely effects of ADUs in single-family neighborhoods on mental health by (1) analyzing the prevalence of existing ADUs irrespective of their legal status (i.e., formally permitted, unpermitted, and grandfathered), and, (2) estimating the potential association of ADUs and mental health status in Los Angeles and Long Beach.

For our primary explanatory variable, we estimate the number of ADUs using publicly accessible permit data and multiple listing service (MLS) data for homes for sale for spring 2021. Our previous research indicates that in addition to information on permitted ADUs, MLS listings include clues to the presence of unpermitted ADUs through photographs, descriptions and allusions to rental opportunities (Mukhija, 2014). We check discrepancies between the advertised size of the house and its recorded size in the County Assessor's database and standardize ADU prevalence by calculating the likely percentage of single-family zoned lots with ADUs in each city.

For our primary dependent variable, we use city level mental health data, available through the Los Angeles County Public Health Department. The data suggest that though Long Beach has similar or lower poverty rates, lower housing rent burden, and higher homeownership rates, mental health is slightly worse than Los Angeles. We test the hypothesis that ADUs may be a significant factor in these mental health differences using descriptive and multivariate analysis. We use the findings to draw lessons for community design, housing, and health.

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Key Words: ADUs, mental health, zoning, enforcement

#### **GREEN SPACE AND SUICIDE ATTEMPTS: INVESTIGATING THE MODERATING ROLE OF AREA DEPRIVATION**

Abstract ID: 83

Individual Paper Submission

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Background: Spending time in green space in urban areas is a source of wellbeing, especially mental health promotion. Areas in greater proximity to more green space were found to be associated with less mental fatigue,

stress, and crime, and higher social cohesion in the neighborhoods (Beyer et al., 2014). Despite these significant psychosocial benefits of green space in urban areas, we still do not know much about their boundary conditions. For example, it is well documented that the availability of green space is not equally distributed across neighborhoods but varies along the lines of their residents' socioeconomic status thus exacerbating local health inequalities (Astell-Burt et al., 2014). Above and beyond the mere amount of available green space, the living quality and the maintenance of the green space also contribute to perceived safety (Mitchell & Popham, 2007). Less maintained and more deprived neighborhoods usually have less access to green space, and if available, the green space is of lower quality and in conjunction with more safety concerns (Astell-Burt et al., 2014). At the same time, suicides and the much higher number of oftentimes undocumented suicide attempts also concentrate in disadvantaged neighborhoods (Rehkopf & Buka, 2006). However, it remains unclear to what extent area deprivation and available urban green space, both of which indicators for mental health, help understanding the likelihood of local suicide attempts.

**Purpose:** The aim of this study is to investigate whether tree canopy cover, an indicator for urban green space, is related to the number of suicide attempts in the local area. In order to address the lack of knowledge about boundary conditions, we also explored whether the level of area deprivation moderated the association between green space and suicide attempts.

**Methods:** Focusing on the city of Cincinnati, OH, we used count data of local suicide attempts between 2015 and 2019 and analyzed for  $n = 361$  census block groups in how far the suicide attempts were related to the tree canopy cover that we calculated on 30m pixel levels for the sampled area. As a moderator, we used the Area Deprivation Index (ADI)—a composite measure of neighborhood socioeconomic disadvantage (e.g., formal education, income, poverty, and housing indicators). We controlled our models for the foreclosed properties (average length of vacancies) and local crime rates (violent/property) during the observation period, and the population density. Negative binomial regression models have been fitted to test the association of tree canopy with suicide attempts and tested the moderating role of area deprivation.

**Results:** A total of 3,442 suicide attempts was observed during the 2015-2019 timeframe in the city of Cincinnati, OH. After adjusting for our control variables (i.e., foreclosed properties, violent crime rate, and property crime rate), we found a negative association between tree canopy cover and suicide attempts ( $B = -.585$ ,  $p = .025$ ) and a positive association between area deprivation and suicide attempts ( $B = .015$ ,  $p < .001$ ). Importantly, area deprivation moderated the association between tree canopy cover and suicide attempts ( $B = .019$ ,  $p = .042$ ).

**Conclusion:** Our findings suggest that local tree canopy cover might be a useful tool to improve local mental health-related outcomes such as suicide attempts. Results also showed that the effects of tree canopy cover were stronger in less disadvantaged areas than in highly disadvantaged areas, suggesting that interventions to the local living quality and safety in conjunction with the provision of more urban green space might be most effective to reduce local suicide attempts and increase mental well-being. For environmental justice, interventions to qualitatively improve green space can be critical to disadvantaged communities.

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Key Words: Mental Health, Green Space, Tree Canopy, Suicide Attempts, Area Deprivation

## **ACKNOWLEDGING, DISMANTLING, REPAIRING, AND PREVENTING: A CONTENT ANALYSIS OF ENVIRONMENTAL JUSTICE AND HEALTH EQUITY IN CALIFORNIA GENERAL PLANS**

Abstract ID: 91

Individual Paper Submission

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This research catalogues Environmental Justice (EJ) policies that aim to reduce health disparities among historically marginalized populations caused by past and future land-use planning. Recent legislation in California (SB 1000, 2016) requires that general plans formally address EJ in new adoptions beginning January 1, 2018 in order to mitigate the environmental, health and financial burden that planning has historically placed in low-income and BIPOC communities. Environmental Justice became a federal policy in 1994 (President, Proclamation, 1994) with the aim of protecting the fundamental right to clean air, land, water, and food. California stands out as a state that is building tools and policy to include Environmental Justice in land-use planning. A better understanding of EJ policies already in use can further the transferability of successful policies while helping state agencies provide guidance based on existing planning practices. The purpose of this paper is to explore how cities are already integrating EJ into planning, with attention to the content and targets of EJ-related policies as well as the unique local demographic and geographic contexts which may shape approaches to EJ.

We used Natural Language Processing to read for EJ policies across 461 California cities. City general plans were selected for further analysis based on topic model fit for EJ. We applied qualitative content analysis to a subset of city general plan documents to understand patterns in policies as well as unique or context-specific approaches to address EJ in California. In total, seven general plans were selected for our analysis, including representatives of Northern California, Southern California and the Central Valley, as well as urban, suburban, and rural contexts. Policies within each plan were coded for both content and priority populations/areas, allowing us to identify patterns in policies with a stated focus on vulnerable groups compared to a focus on places.

Across all seven plans, there were 628 discrete EJ policies with a focus on vulnerable populations or communities. We identified policies relevant to EJ across all required elements of city general plans: Housing, Circulation, Land Use, Health, Safety, Open Space, Air Quality, and Noise. Our results show cities in California have taken initiative by enacting a broad range of EJ policies even prior to the state mandate to do so.

Housing, transportation and land-use elements contained the most EJ policies across all elements. Within housing elements, most EJ policies aimed to address the acutely chronic Californian housing crisis, which has only deepened since the 1970s. Of 141 policies focused on housing and EJ, policies most commonly included support for affordable housing and most frequently prioritized “low-income residents”, particularly in policies related to affordable housing, housing preservation, mixed-income neighborhoods, multi-family housing, public housing, and rental assistance. Within circulation elements, EJ policies were concentrated in subcategories such as active and alternative transportation, Complete Streets, transit-oriented development, and Safe Routes to School. Across land use elements, prominent EJ policy themes included siting compatibility, buffer zones or barriers, mixed-use development and infill, and renovation or modernization of buildings or properties. Our findings explore EJ in greater depth in areas of housing, circulation and land use, as well as all other elements required of cities in California.

Local policies and innovative bottom-up efforts can embolden states and other cities to establish requirements that support EJ and reduce health disparities stemming from land-use planning. We hope this review of local policies in diverse California cities will inform both guidelines for and creation of new policies that push the boundaries and fill in the gaps of the current suite of policy options.

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Key Words: environmental justice, city planning, health equity

## **AFFINITY AND USAGE OF TECHNOLOGY IN GENERAL, AND TELEHEALTH IN PARTICULAR AMONGST MICHIGAN OLDER ADULTS DURING THE COVID-19 PANDEMIC**

Abstract ID: 96

Individual Paper Submission

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Central Research Theme: The Covid-19 pandemic and the travel restrictions imposed by many states led people to resort to technology for many of their daily needs. From ordering groceries online, to communicating and staying in touch with friends and family via social media, many of the daily needs were being met through revised behaviors and dealt most often with technology. However, older adults have been known to not adopt technology with the fervor that younger generations have grown to. This puts older adults at a disadvantage during times when travel is restricted. Increasing the adoption and usage of technology for all purposes, including healthcare appointments, would particularly benefit this population cohort.

Methodology: Primary data collected through online surveys targeted to older adults, aged 60 and over, living in Michigan, is the basis of this study. The survey responses were collected through a Qualtrics panel, where they distribute a survey and collect responses as per the study's needs.

Findings: Preliminary results indicate that since this survey was an online survey, there is a bias in the use of technology. However, even with that bias, 40% of the respondents had not used zoom/skype or the like to connect with friends and family during the travel restrictions. Over 80% had not shopped for groceries online and had them delivered, over 57% had not shopped for and got their prescriptions delivered, 72% had not visited their healthcare providers' website to request an appointment, and 75% had not used telehealth. Barrier to using telehealth and factors that would encourage them to use it more are discussed. The study points to an emerging need for older adults to take more advantage of technology to overcome some of the barriers in accessing healthcare and being more socially active. Isolation has been known to be a serious issue in older adults especially during the pandemic, and although technology cannot replace having real contact with people and being able to move about in the community, it helps to a certain degree to elevate mental and overall wellbeing.

Relevance to planning scholarship: Research on the aging population has suggested that although they increasingly prefer to age-in-place, they often suffer from physical, mental and socially isolation as they do not tend to move around in their community as much as they did when they were younger. The Covid-19 pandemic has exacerbated this isolation as travel and mobility is not a personal choice but a mandated restriction during these times. Results



indicate the need for older adults to be able to adopt and use technology and devices for multiple purposes that would enable them to successfully age-in-place and remain physically, mentally, and socially active.

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Key Words: Older Adults, Health, Technology, Covid-19

### **ASSESSMENT OF SOCIODEMOGRAPHIC DISPARITIES IN ENVIRONMENTAL EXPOSURE MIGHT BE ERRONEOUS DUE TO NEIGHBORHOOD EFFECT AVERAGING: IMPLICATIONS FOR ENVIRONMENTAL INEQUALITY RESEARCH**

Abstract ID: 99

Individual Paper Submission

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In recent decades, air pollution exposure is one of the critical environmental factors that have negative impacts on people's health. Many studies have investigated sociodemographic disparities in people's air pollution exposure, which may result in disparities in their health outcomes (e.g., Chakraborty, 2009). For these studies, one of the critical tasks is to accurately assess how and to what extent people are exposed to air pollution (Diez-Roux, 2001). Most previous studies assumed that people are static and remain in their residential neighborhoods and considered a fixed administrative unit (e.g., census tracts) as the most important and relevant neighborhood where air pollution affects people (Kwan, 2018). In other words, previous studies have adopted the residence-based exposure assessment.

We argue that evaluations of the sociodemographic disparities in people's air pollution exposures obtained by residence-based assessments can exacerbate the neighborhood effect averaging problem (NEAP; Kwan, 2018). The NEAP is the methodological problem that mobility-based exposures tend towards the mean level of the population of a study area when compared to their residence-based exposures (Kim & Kwan, 2021; Kwan, 2018). As a result, the assessment of people's exposure to mobility-dependent environmental factors can be erroneous when people's mobility is ignored. Specifically, the NEAP implies that using residence-based exposure assessments might lead to erroneous evaluations of the sociodemographic disparities in such exposures. Furthermore, given that current public health policies largely rely on residence-based exposure assessments, the NEAP implies that their evaluations of sociodemographic disparities in exposures might be erroneous and lead to inefficient allocations of policy efforts and resources.

Only a few studies to date have provided an in-depth examination of the NEAP for studies that evaluate sociodemographic disparities in people's exposure to air pollution. To fill this gap, our research seeks to examine the NEAP in the evaluation of sociodemographic disparities in people's exposure to air pollution (outdoor ground-level ozone) by employing GIScience methods and a one-day activity-travel diary dataset of 3790 people collected in Los Angeles, California. Specifically, this study asks the following two research questions. RQ1. How does the NEAP affect the evaluation of sociodemographic disparities in people's air pollution exposures? RQ2. Which social groups with high residence-based exposures do not experience neighborhood effect averaging?

First, the spatial regression model results indicate that using residence-based exposure assessments (1) overestimates the disparity in exposures between African-American and White people and low- and middle-income people and (2) underestimates the disparity in air pollution exposures between workers and non-workers. This is because of the different manifestations of neighborhood effect averaging of each group. Therefore, the results imply that ignoring human daily mobility can exacerbate the NEAP when examining the sociodemographic disparities in air pollution exposures.

Second, 560 participants have a relatively high residence-based exposure level. Among them, 194 participants are doubly disadvantaged in air pollution exposures. The results of a spatial autologistic regression model indicate that, for those who live in high air pollution neighborhoods, non-workers have significantly higher odds of being doubly disadvantaged in ozone exposures than workers. Most non-workers are doubly disadvantaged people because they tend to spend most of their time in their residential neighborhoods, as the spatial entrapment hypothesis suggests (McLafferty & Preston, 1996).

This study concludes that ignoring human daily mobility can aggravate the NEAP in the evaluation of sociodemographic disparities in air pollution exposures. One important policy implication of our results is that public health policymakers should consider human daily mobility to take the NEAP into account when evaluating sociodemographic disparities in exposures. Furthermore, policymakers should pay special attention to the doubly disadvantaged group to fully mitigate sociodemographic disparities in people's air pollution exposures.

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Key Words: Air pollution, Environmental inequality, Exposure, Los Angeles, The neighborhood effect averaging problem (NEAP)

#### **EXPLORING THE MENTAL HEALTH IMPLICATIONS OF TRANSIT- AND PEDESTRIAN-ORIENTED DESIGNS AND COGNITIVE ARCHITECTURE FOR ADOLESCENTS: AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY**

Abstract ID: 169

Individual Paper Submission

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Rates of mental illness among youth continue to rise (Collishaw, 2015) with some recent estimates suggesting that 13.4% of youth are affected by a mental disorder (Polanczyk et al., 2015). As the global population is becoming increasingly urbanized, the physical, natural, and other sensescape (e.g., noise) features of such urban environments are poised to become principally important determinants of mental health for a greater share of youth populations than at any other point in history. Presently, it is understood that certain features of urban environments can either

promote or impede mental health; however, study of urban environments and youth mental health are beset by crude measures of environmental influences (e.g., residential space, level of ‘urbanicity’) which lack exactness, and larger quandaries such as the issue remaining relatively understudied when compared to adults (Bundy et al., 2018). Examining specific urban forms and architectural styles and their connection with the mental health of youth populations holds the potential to improve the understanding of this relationship, as well as enhance the concept of universal design in urban planning. To this end, a number of specific urban and architectural designs have been suggested to have salutary impacts on human mental health, including pedestrian- and transit-oriented designs (PTOD) and cognitive architecture (CA) principles. PTOD, broadly, comprise a series of urban designs such as imageability (features that create an impression; e.g., landmarks), enclosure (vertical elements; e.g., buildings), human scale (physical qualities; e.g., wayfinding signs), transparency (street-level considerations affecting visual scope; e.g., windows), and complexity (visual richness; e.g., number of architectural styles) that are intended to promote active lifestyles (Ewing, 2013). Likewise, CA principles such as biophilic design (nature in urban design), fractal patterns (repeated similar patterns), and symmetries (repeated designs) have been suggested to have distinct relationships with the human brain that may affect mental health (Salingaros, 2014). To more precisely investigate youth mental health and urban environments, the present study examines the associations between six emotional indicators (positive affect, negative affect, calm, anxious, restorative, demanding) and five PTODs (imageability, enclosure, human scale, transparency, complexity) and three CA principles (biophilic design, fractals, symmetries) in a probability-based sample of 100 adolescents (10-16 years old). The study applies an ecological momentary assessment and repeated measures survey design to explore how specific PTODs and CA concepts impact the self-reported mental health of adolescents. While completing an online survey via their mobile phones, participants traversed a predetermined 1.65 km route near downtown Kitchener, Ontario featuring six distinct urban settings (multi-modal trail, residential street, bluespace, greenspace, public transit stop, and built-up downtown street) that had been scored for the PTOD features, as well as directly observed real-world examples of each CA principle (biophilic design - urban garden; gothic church façade – fractal patterns; heritage building – symmetries). Mixed-effect models (MEMs) controlling for age, gender, subjective social status (i.e., youth-based measure of SES), household demographics (i.e., parental supervision), birth order, and physical activity levels were used to analyze the six emotional indicators across each of the distinct urban settings. MEMs with the same controls were used to investigate positive-negative affect with respect to symmetries, anxiety-calmness regarding fractal patterns, and restoration-demand in association with biophilic design to assess the implications of the CA concepts. Results of the study are forthcoming and will be discussed during the presentation. Findings from this research can inform planning practitioners on how to design more urban spaces that promote mental well-being—more particularly, which specific urban and architectural designs may be beneficial to the mental health of younger populations—and contribute to updating notions of universal design in planning.

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Key Words: built environment, ecological momentary assessment, environmental psychology, mental health, youth

## ANTICIPATED WILLINGNESS TO SHARE RESOURCES IN A DISASTER SCENARIO: THE ROLE OF SOCIAL TIES IN PLACE-BASED COMMUNITIES

Abstract ID: 237

Individual Paper Submission

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In the United States, disaster preparedness planning and outreach have historically been approached in a top-down manner that targets individual households. A one-size-fits-all approach overlooks the richness of place-specific resources and relationships that could be leveraged to support disaster resilience. It is generally understood that social ties and social infrastructure constitute critical support systems for communities during times of disaster (Aldrich 2012, Klinenberg 2015). However, clear gaps exist in the understanding of social behavioral responses to resource scarcity in a disaster scenario, including resource-sharing within communities (Thomas & Mora 2014). Furthermore, standard approaches to resilience planning tend to shift the responsibility for “being resilient” from government onto individuals and communities (Davoudi 2012). In this context, community members’ willingness to share resources becomes an important factor in disaster response given the isolating effects of many types of disasters on communities and the subsequent need for localized self-sufficiency. Emerging research on disaster sharing indicates that attitudinal factors such as trust play an important role in supporting sharing in a large-scale evacuation context (Wong, Walker, and Shaheen 2021). This study contributes to advancing that exploration by focusing on anticipated willingness to share specific types of disaster resources at the local level, within place-based communities.

Our motivation for working at the community scale is driven in large part by the anticipation of a large seismic event in the Pacific Northwest. In the case of such an event, communities will likely be on their own for an extended period of time, and they may need to rely on local resources for meeting basic needs. In a large earthquake scenario, people are likely to have limited access to – and a limited supply of – resources needed to carry out essential everyday activities. These resources range from items that provide sustenance, like food and water, to networked systems that enable transportation and communication.

In this study, we examine specifically the differences of community members’ willingness to share a range of items needed to carry out essential everyday activities and the role that strength of social ties plays in that willingness to share. Using data gathered in three characteristically different Washington State communities, we aim to better understand willingness to share so as to help inform community-based disaster preparedness efforts. By engaging community members through focus groups and a sample survey, this research explores the roles of social ties, social attitudes, and local knowledge in supporting anticipated willingness to share resources within communities. We focus on attitudes that relate to disaster preparedness, community social relationships, and relationship to place in order to better understand the potential for community-scale interventions that could help to support disaster preparedness in specific contexts.

Our findings support the development of context-specific disaster preparedness strategies and suggest that trust-building within place-based networks should be viewed as a practical measure to support resilience. We offer evidence that person-to-person and person-to-place relationships serve as critical resources for supporting community well-being in the face of disruption. These findings can be applied practically by disaster preparedness planners and community-based organizations seeking to prioritize the distribution or development of disaster preparedness resources within community settings.

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Key Words: resilience, social ties, sharing, disaster mitigation, social infrastructure

## **BUILDING ALL-AGES-FRIENDLY COMMUNITIES IN SHANGHAI: MEASUREMENT OF 15-MINUTE COMMUNITY-LIFE CIRCLES' WALKABILITY AND THE URBAN PLANNING RESPONSE.**

Abstract ID: 238

Individual Paper Submission

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**Background:** A sufficient number of studies have highlighted that walking is conducive to increasing physical activity, and a walk-friendly neighborhood reduce the risk of obesity and noncommunicable diseases (NCDs), ultimately to improve walking behavior and public health. In 2016, China promulgated the "SHANGHAI PLANNING GUIDANCE OF 15-MINUTE COMMUNITY-LIFE CIRCLE", the core of which is to build a 15-minute walkable neighborhood. The concept of community-life circle emerged in Asia and becoming global focus in the Post-COVID-19 World.

**Purpose:** Walk Score is a tool evaluates how a particular location is supportive of residents' walking, based on the distance to various public facilities. Studies with Walk Score are lacking in developing countries, and most of the current research focuses on the entire population. Therefore, this paper aims to: (1) evaluate the walkability of 15-minute community-life circle in the center area of Shanghai from the perspective of the elderly and children with the modified method based on Walk Score. (2) analyze the accessibility of specific public facilities that are frequently used by the elderly and children in Shanghai. (3) provide insightful suggestions for building healthy and all-age-friendly communities in urban China.

**Methods:** Digital geographic data, including 10484 communities and public facilities Points of Interest (POIs) with geographical coordinate (WGS84), road networks, are acquired from API of Amap. Demographic data, which are collected from the sixth national population census. The Measurement of Walk Score includes 4 main steps: (1) assigning raw weights for selected public facilities. The survey was conducted by means of a questionnaire among 846 respondents. (2) Through the API of Amap, the walking path planning function that can respond to the real-time traffic conditions is called. Considering the walking characteristics of the elderly and children, 75 m/min and 70m/min are selected to calculate the time for them to reach various facilities within the 15-minute walking range. (3) computing the total scores and modifying the scores according to decay factors; and (4) normalizing scores to 0–100.

**Results:** As for both groups, a few high walkable communities (Walk Score $\geq$ 70) are concentrated around the core area composed of 4 districts. And the farther away from the core area, the lower the score. In terms of elderly's walkability, the proportions of the communities with higher walkability (walk score $\geq$ 70) are 28%. For children, the

figure was 33%. It is worth noting that for the elderly, 30% of the districts have inferior walkability (walk score ≤ 49), while for children, the proportion is 23%.

For further research, the bivariate local Moran's I statistic was performed to capture the correlation between the proportion of a pedestrian group within one certain subdistrict and the corresponding score in GeoDa. The results revealed, the "high-high" clusters (proportion of population at a location and corresponding score at the surrounding places are both high) appeared in the core area. Both for elderly and children, the "high-low" outliers appeared in 2 subdistricts indicated mismatches of the 15-min community-life circle. The study also analyzed the walkability of a particular public facility, revealing that, in Yangpu District, the walkability of facilities such as community health centers, stadiums, parks which are frequently used by both groups of people, is lower.

**Conclusions:** Walk Score can be used to quantify the walkability of 15-minute community-life circle, and the standardized rating is helpful for horizontal comparison. There is an imbalance in Shanghai where high walkable communities are clustered in the core area and inferior are clustered on the edge. In addition, there is also a mismatch between population density and walkability. These are areas that need to be improved in the future through measures such as adjusting land use and increasing public facilities.

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**Key Words:** Walk Score, walkability, child-friendly, age-friendly, Shanghai

## THE ROLE OF LOCAL GOVERNMENTS IN PROTECTING COMMUNITY WELLBEING DURING COVID-19 IN SOUTH KOREA

Abstract ID: 240

Individual Paper Submission

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In 2020, the COVID-19 pandemic threatened the health and wellbeing of communities around the world and continues to do so. As planners and policymakers try to learn from other countries, the research thus far has been focused on national responses with national governments as the unit of analysis. Yet, local governments are critical actors of protecting and promoting community health and wellbeing.

South Korea has been considered a model case for responding to COVID-19, leading to popular use of the term "K-quarantine." However, recent research has pointed out that the success of "K-quarantine" rested on the role of local governments, the private medical and biotechnology sector, and citizens. What role did Korean local governments play in the response to COVID-19? How did citizens evaluate these responses? This paper uses policy briefs, news reports, and local government website data to explore the role of local governments. Next, the paper uses 2020 national survey data (sample size=16,555) to examine how citizens evaluated local government responses to COVID-19.

Many of the critical responses to COVID-19 in South Korea were local government initiatives. Not only were local governments in charge of implementing national-level directives, but also, they actively planned and executed local responses. For example, the widely publicized drive-through testing center was first implemented on a local district scale in the City of Goyang, South Korea that was quickly adopted by other local governments. The thorough contact tracing and rapid information sharing with the public about confirmed cases were made possible with the cooperation of local governments. Policies that are now national, such as requiring a mask on public transit or requiring a QR code check-in at public facilities, were ideas from local governments. Local governments have also led policies on economic recovery. Local government leaders argued that a COVID-19 emergency fund was necessary and distributed stimulus checks to their residents before the national government. Moreover, recognizing that COVID-19 safety measures, such as renting and using disinfection machines and installing acrylic shields, may be cost-prohibitive for business owners, some local governments have been delivering disinfectants, renting disinfection machines, and providing acrylic shields for free. Local governments have also adopted local ordinances to incentivize property owners to decrease rent for their tenants.

Another critical component of successful planning in times of crisis is citizen responses. On the one hand, culture will play an important part in following social distancing or mask regulations. Meanwhile, citizen trust in the government and local authorities and their perceptions of local measures will also shape the level of compliance. This paper will use national survey data on how citizens evaluated the danger of COVID-19, local government responses, and other citizens' responses. Finally, the paper will discuss lessons and limitations of Korea's response to COVID-19 from a local planning perspective.

The findings of this study will have practical implications for local planners responding to large-scale crises and emergencies while trying to enhance community wellbeing. Moreover, the findings will allow us to test how citizen evaluations are related to local planning responses.

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Key Words: Local government, COVID-19, Governance, Citizen evaluations, Community wellbeing

#### **TECHNOLOGY AND AGING IN PLACE: AN INVENTORY AND ASSESSMENT FOCUSING ON THE NEIGHBORHOOD, MUNICIPALITY, AND METROPOLITAN SCALES**

Abstract ID: 253

Individual Paper Submission

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#### Research Questions

Research on the potential benefits of technology for aging has been thriving since the term "Gerontechnology" was coined in 1990s (Schulz et al., 2015). While much has been written about technologies helping older people age in

place inside homes, less attention has been paid to the neighborhood and city environments they inhabit including streets, parks, transportation options, and delivery systems (Liu et al., 2016; Pu et al., 2019). Meanwhile only a small part of the smart city literature has specifically targeted older people. This paper reviews assistive technologies that operate outside buildings, responding to two questions: What new urban-scale technologies are available to support older people using their neighborhood, municipal, and metropolitan environments as they age in place? How might these technologies enable older people to use their urban environments more safely, comfortably, and autonomously?

## Methods

Reviewing both scholarly and gray literature, we compiled an inventory of urban scale aging technologies, focused on those with a physical form rather than smart-phone applications. We also adapted technology typologies or classifications developed for technologies at the person and building scale to look more specifically at technologies at the block, neighborhood, city, and metropolitan level. These identified domains of technology such as mobility, and functions including monitoring, diagnosis, and intervention. The inventory and the typology further refine each other.

## Results

We found a wide range of technologies that can potentially help older people in multiple life domains including physical and mental health, mobility, social connectedness, safety, and everyday activities and leisure. However, most technologies focus on improving mobility and safety—for example pedestrian crossing sensors, smart crossing signals, wayfinding tools, mobility support robots, vehicle access equipment, automated delivery, fall monitors, and smart streetlights. Less common were technologies for using spaces in a more static way, e. g. enhancing audio or monitoring air quality. More technologies are needed especially for supporting social encounters in neighborhoods and improving mental health. Moreover, some technologies rely on infrastructure such as streets and sidewalks which are unevenly provided.

## Implication

Given growing numbers of older people and increasing numbers who live alone (Forsyth et al., 2019), this review identified a range of cutting-edge technologies that can help older people inhabit and use urban spaces more safely, effectively, and independently. Understanding urban-scale technologies to support aging could help urban planners who target a more age-friendly environment to transform urban spaces to accommodate the emerging technologies.

## Conclusion

Technologies have great potential to help older people thrive beyond homes at the urban scale by facilitating their physical and mental health, mobility, social connectedness, safety, and everyday activities and leisure.

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Key Words: technology, aging, neighborhood, health, safety

## THE EFFECTS OF TRANSPORTATION BARRIERS ON LOSING JOB IN CANCER PATIENTS

Abstract ID: 334

Individual Paper Submission

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Continuing working is one of the most critical challenges that cancer patients face in terms of social, financial, individual, and psychological impacts on their lives (Boer et al. 2009). Approximately 26% to 53% of cancer patients meet unemployment, job loss, and quit working during or after treatment (Egmond et al. 2017). Three main domains can negatively affect losing a job in cancer patients, including 1) treatment-related factors, 2) sociodemographic characteristics, and 3) work-related factors. While the effects of health-related and work-related factors on the losing job in cancer patients have received much attention in public health, the effects from the transportation barriers in patients' work trips are still ambiguous. Although a rich set of the literature investigated cancer patients' transportation barriers (Silver, Blustein, and Weitzman 2012), the impacts of working trip burdens on cancer patients' continuing/losing their job received less attention. Only a few studies have examined the role of working travel behavior in cancer patients' employment status (Peteet 2000; Moore 1999). To address this limitation, this study aims to understand how working trips can result in losing a job or not accepting a job position by cancer patients during a treatment process. Hence, this study seeks to address the following research questions: 1) How does travel to work influence cancer patients' losing job when controlling the effects from treatment-related and sociodemographic factors? 2) Which factors contribute to cancer patients' employment status, transportation, or treatment-related burdens?

This study employs a survey conducted across the U.S. in 2019 and utilizes data from cancer patients who received radiotherapy and chemotherapy treatments. Comprehensive questions were asked to collect data related to work trips, treatment trips, and travel burden in journey to work while considering two types of treatments including radiotherapy and chemotherapy. With data collected from the survey, machine learning models are further employed to assess the factors contributing to patients' losing jobs quantitatively.

Results suggest that working trip attributes included trip mode and trip length, have a significant impact on cancer patients' job loss. Moreover, work travel burdens such as lack of access to public transportation leads to the losing job in cancer patients. The need for assistance with travel to work due to the treatment side effects is the other factor impact cancer patients regarding losing/discontinuing their jobs.

Our study results suggest that in addition to the direct effect of cancer, logistic barriers related to work can cause cancer patients to lose their jobs. Insights generated in this study have great potential to help policymakers and planners make informed decisions to enhance cancer patients' accessibility to work and improve their health outcomes.

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Key Words: Job Loss, Transportation Barriers, Cancer Patients, Accessibility

## COVID-19 AND OUTDOOR RECREATIONAL WALKING: EXAMINING THE MODERATING EFFECTS OF AREA DEPRIVATION

Abstract ID: 337

Individual Paper Submission

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**Background:** The COVID-19 pandemic has significantly constrained engagement in physical activity critical to optimal physical and mental health. Thus, outdoor walking has become increasingly popular as a safe and affordable means to stay active and fight against social isolation while following social distancing protocols. However, findings from a small body of published studies on the impacts of COVID-19 on outdoor recreational activity have been inconsistent. Some studies found negative effects of the pandemic on recreation visits and values (Landry et al., 2020), while others reporting increased outdoor recreational activities during lockdown (Venter et al., 2020).

Opportunities to engage in outdoor recreational activities depend heavily on the availability and quality of recreational locations (e.g., parks, trails, neighborhood streets), which is substantially associated with neighborhood socioeconomic circumstances. Prior studies have shown that those living in deprived neighborhoods with limited physical activity resources engaged in lower levels of physical activity and walking (Jones et al., 2009) and had poor health status (Reijneveld et al., 2000). Those living in deprived/disadvantaged neighborhoods tend to have poorer health outcomes and greater risks of COVID-19 infection, compared to their counterparts (KC et al., 2020). However, it remains unclear how and to what extent COVID-19 and area deprivation impact outdoor recreation walking.

**Purpose:** This retrospective study aims to address these research gaps by examining: 1) the effects of the COVID-19 pandemic on outdoor recreation walking (frequency and location) and 2) if such effects are moderated by neighborhood deprivation, measured with Area Deprivation Index (ADI).

**Methods:** A total of 1,046 participants living in El Paso, Texas was recruited in July 2020. Online surveys were used to measure participants' demographics, socioeconomic status, and daily life change in mobility due to the COVID-19 pandemic. ADI was used to rank the neighborhoods of the survey respondents by their socioeconomic characteristics, using the 2018 US Census American Community Survey. The neighborhoods were then categorized into those of low deprivation (ADI ≤ 57) and high deprivation (ADI score ≥ 87) according to ADI quartiles. To understand the differences of COVID-19 impacts on outdoor recreation walking, we used a difference-in-difference (DID) test to examine the pre-during COVID-19 differences in recreational walking between those living in areas of low and high deprivation.

Results: During the COVID-19 pandemic, weekly recreational walking minutes decreased significantly ( $\Delta$  mean Change=-28.28, S.E.=9.24 min/week), compared to pre-COVID-19. However, recreational walking among those living in areas of high deprivation decreased more than those in low deprivation areas. Compared to pre-COVID-19, recreational walking in neighborhood streets and green spaces increased during COVID-19 in low deprivation areas but decreased in high deprivation areas. Although recreational walking in parks decreased in both areas since COVID-19, we found steeper decreases in areas of high deprivation, compared to areas of low deprivation. ADI did not show significant moderating effects for the frequency of recreational walking. However, the DID tests indicated that the pre-during COVID-19 difference in green space visits between high and low deprivation areas was significant ( $B = -.708, p=.013$ ).

Discussion: While the COVID-19 pandemic has negatively affected engagement in overall recreational activities, disparities were found in the use of different recreational locations during COVID-19. We found that the COVID-19 impacts on recreational walking were more evident in disadvantaged neighborhoods with greater deprivation. Accessible green spaces and safe neighborhood streets appear promising for equitable promotion of outdoor recreational walking, which can help residents in deprived areas cope with negative physical and mental health impacts of such pandemic.

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Key Words: Covid-19 Pandemic, Outdoor recreational walking, Area deprivation, Health disparity

## HOW TRAVEL TO HEALTHCARE PROVIDERS INFLUENCES QUALITY OF LIFE (QOL) IN CANCER PATIENTS DURING TREATMENT?

Abstract ID: 339

Individual Paper Submission

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While advanced treatment methods and early detection have decreased cancer mortality rates, there are still deficiencies in addressing cancer patients' Quality of Life (QoL) during and after treatment. For cancer patients, in addition to physical and emotional well-being and social functioning, cancer characteristics such as type and stage of cancer and type of treatment, as well as cancer patients' access to healthcare providers (Drury et al., 2020), are among the most crucial factors to affect their QoL. Few studies have specifically examined the role of transportation in cancer patients' QoL. While the relationship between physical aspects of QoL and transportation has received inconsistent attention, the QoL's psychological, social, and financial aspects were rarely addressed (Lee & Sener, 2016). Poor accessibility and transportation barriers can limit patients' range of choices, their regular daily life, and

their social interaction opportunities, and therefore, will affect their QoL (Lee & Sener, 2016).

Although literature has investigated the health care accessibility for cancer patients (Zullig et al., 2012), impacts of transportation barriers on cancer patients' QoL have not been addressed directly. Treatment-related issues such as its schedule, duration, frequency, and side effects resulting in travel barriers can dramatically affect cancer patients' QoL life. For patients who need to travel to treatment centers; especially if they do not have access to either public transit or a car; transportation can become a real obstacle (Coughlin & King, 2010). Although travel accessibility and its effects on cancer patients' health outcomes have received ample attention in the literature, the association of travel burden with cancer patients' QoL is less considered. Therefore, this study aims to provide evidence to identify 1) To what extent transportation-related aspects may affect cancer patients' QoL? 2) How transportation-related barriers of two different treatment types (radiotherapy and chemotherapy) are associated with cancer patients' QoL?

This study uses a cross-sectional survey of cancer patients in the U.S. in 2019 diagnosed and followed radiotherapy and chemotherapy treatment (n = 750). The structural equation model is used to investigate the effects of transportation-related barriers on cancer patients' QoL. We explore the effects of key variables, such as cancer patients' sociodemographic attributes, treatment characteristics and travel behavior to health care providers; on QoL. Lack of access to appropriate transportation is considered as the travel burden factor mediates the effects from key variables on QoL during the radiotherapy and chemotherapy treatments.

The findings of this study indicate that travel behavior including trip mode, trip length and trip frequency to healthcare providers for receiving radiotherapy and chemotherapy considerably influence the QoL of patients during the treatment. Besides, lack of access to transportation mediates the effects of key variables on QoL. Moreover, the results indicate the relationships between lack of access to transportation, travel behavior factors and QoL is different for radiotherapy and chemotherapy treatments. Our results can support the studies suggest that transportation as a burden mainly affects patients who have lower socioeconomic status, those with no access to a car, and those with a lower level of social support (e.g., Zullig et al., 2012). Moreover, this study complement the findings from studies argue that more distance to the healthcare facilities is associated with lower QoL aspects among cancer patients (e.g., Ambroggi et al., 2015). Our results suggest that QoL measurement can be used as a policy tool by communities and local governments to evaluate the extent to which the mobility and built environment meet patients' needs with chronic disease.

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Key Words: Quality of Life, Travel Barrier, Cancer Treatment, Transportation

### THIRD-PARTY FOOD DELIVERY AND THE CHICKEN SANDWICH + FRIES: HOW FOOD DELIVERY PLATFORMS ARE CHANGING OUR RELATIONSHIP TO FOOD IN DENVER, COLORADO

Abstract ID: 386

Individual Paper Submission

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Worldwide revenues from third-party food delivery platforms have more than doubled between 2017 and 2020 and are expected to reach \$96,864.4 million by 2024 (Statista, 2021). Uber Eats, a behemoth in global food delivery, controls 29% of the market and is valued at \$20 billion. Its revenues in the first half of 2020 surpassed the entirety of its revenues in 2019 (Business of Apps, 2020). The dramatic expansion of food delivery revealed in these statistics reflects a seismic transformation in our food system based on convenience and contract labor. How does the rise in food delivery affect community foodways? What are the impacts on our cities and food environments? Using qualitative surveys and semi-structured interviews of restaurant owners, drivers and consumers in Denver, Colorado, this research examined how food delivery platforms change our relationship to food by territorializing culinary spaces, including restaurants, kitchens and pantries through behavioral economics and deskilling.

In *Speculative Visions and Imaginary Meals: Food and the Environment in (post-apocalyptic) Science Fiction Films*, Jean Retzinger describes the critical role of food beyond nutrition: "For food not only shapes our bodies, but it structures our lives, fashioning daily rituals and helping mark significant rites of passage. Food connects us to others both directly, through shared meals, and culturally, through shared 'tastes'" (Retzinger, 2008, p. 370). What happens when food is divorced from our daily routines and when rites of passage are marked by takeout containers rather than products of love? The explosion of third-party food delivery is transforming the diet of Denver residents in real-time, slowly diminishing our memories of food traditions and encroaching on foodways. Food delivery platforms undermine community foodways by robbing consumers of both culinary skills and taste.

The research builds on the theory of brokerage in which brokers use their central position and exclusive control to structure and regulate values, exploiting inequality (Vonderau, 2019). Food delivery platforms function as the central controls of the food delivery system, regulating platform users and their communication and influencing what foods are perceived as desirable. The research also incorporates the theory of culinary deskilling, examined in *Deskilling the domestic kitchen: national tragedy of the making of a modern myth?* (Lyon et al., 2003). Food delivery platforms enable us to bypass the development of cooking skills, undermining the reproduction of knowledge required to sustain foodways.

This research reveals how food delivery platforms in Denver, Colorado, change our relationship to food by providing convenient homogenized and idealized food choices that disconnect us from our home kitchens and pantries and rely on a highly-choreographed network of independent contractor drivers to feed us. Food identity is lost in the chicken sandwich + fries that is delivered from a dark kitchen located in an industrial area to a customer living in a high-rise downtown by a college student who lives off campus on the edge of town. As Belasco argues, "Food identifies who we are, where we came from, and what we want to be" (Belasco, 2008, p. 1). The chicken sandwich + fries tells little about who we are, but a lot about the consumers we are becoming. Policy makers, planners and designers should take note – as third-party food delivery platforms change our relationship to food, they also change the food infrastructure of our cities.

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Key Words: food delivery, foodways, deskilling, food environment, technology

## IS TRAVEL BEHAVIOR AN EQUITY ISSUE? USING GPS LOCATION DATA TO ASSESS THE EFFECTS OF INCOME AND SUPERMARKET AVAILABILITY ON TRAVEL REDUCTION DURING THE COVID-19 PANDEMIC

Abstract ID: 398

Individual Paper Submission

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With recent research identifying mobility restrictions for alleviating the spread of COVID-19, governments have implemented stay-at-home measures, which in turn produced significant changes in people's travel behaviors. Despite these orders, however, people still have to commute for work or to acquire essential goods. To better understand how these necessary trips influenced changes in individual mobility due to the pandemic, this study focused on the relationship between trip frequency and distance to median incomes, as well as between trip frequency and distance to supermarket density. We made use of the University of Maryland COVID-19 Impact Analysis Platform as our primary source for GPS travel data to study mobility changes at the county-level across the United States. Results of spatial lag regression models showed that trip frequency and distance were significantly different before the outbreak of COVID-19 and during three peak periods of COVID-19 infection. Specifically, we found both frequency and distance of trips to be negatively correlated to median income; that is, households with higher incomes were found to have reduced their frequency and distance of travel during the outbreaks. Additionally, we also found a negative correlation in frequency and distance of trips to supermarket density. Thus, we conclude that individual choice in adherence to staying-at-home is less dependent on the lockdown measures and more influenced by financial capacity and access to necessary goods and services. These findings could help inform policy development and programmatic responses to help people reduce their mobility. For example, government authorities might consider monthly stimulus or other financial support programs that would allow people greater access to delivery services. In the future, urban planners and policymakers should address the root causes that lead to such economic disparities and food insecurities, in order to build resilience in the face of possible future pandemics.

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Key Words: COVID-19, travel behavior, food insecurity, GPS, equity

## THE ROLE OF EQUITY AND CLIMATE PRIORITIZATION IN FEDERAL SUPPORT FOR LOCAL FOOD SYSTEMS EXPANSIONS

Abstract ID: 400

Individual Paper Submission

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Local and regional food systems are increasingly recognized as an avenue for enhancing local resilience and environmental sustainability, driving local economies, and mitigating food apartheid. Yet little is understood about the ability of these efforts to advance these goals concurrently. Indeed, case studies suggest that sustainability has been pursued at the expense of social justice. This paper analyzes the impacts of the federal Local Food Promotion Program administered by the United States Department of Agriculture (USDA), which aims to enhance access and availability of local and regional agricultural products, particularly in under-resourced communities. The program provides support for both planning and implementation in local and regional food systems expansions. To assess the potential impact on local economies, this paper tests for positive impacts on the number of nearby small and medium farms (a proxy for local and regional food producers) and their sales, as well as local vegetable sales, compared to communities where an organization unsuccessfully applied for funding. To assess commitments to environmental sustainability and social justice, grant applications and final outcome reports to the program are analyzed. These applications, in conjunction with context about applicant organizations and socioeconomic data on host communities, reflect the myriad of ways organizations imagine food systems interventions and provide important information regarding the extent to which sustainability and equity are centered within their work and USDA's priorities.

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Key Words: food systems, sustainability, social justice, economic development

## SOCIAL ISOLATION, MOBILITY, AND HEALTH AMONG OLDER CHINESE IMMIGRANTS IN THE GREATER TORONTO AREA, CANADA

Abstract ID: 454

Individual Paper Submission

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\*A similar abstract was submitted/accepted last year but due to the pandemic, we were unable to present this paper. However, we have adapted to the current context, and would like to present the findings at the 2021 meeting.

As older adults progress through the life course they are at higher risk of social isolation (Keefe et al., 2006), which

has been shown to be more predictive of mortality than smoking cigarettes (Pantell et al., 2013). This social isolation could be further exacerbated when coupled with international migration, which also creates barriers to social participation and senses of belonging. Social isolation is both related to and a potential cause of loneliness, and together these two phenomena have been shown to have a reciprocal relationship with worsening physical and mental health outcomes (Cacioppo & Cacioppo, 2014). Building strong social support networks is integral to supporting health among older migrant populations but built environments may pose barriers to their formation or quality (Lamanna et al., 2019). Older Chinese adults (65y+) made up 10.5 percent of the Chinese-Canadian population in 2011, but are commonly underrepresented in federal datasets and warrant further attention (Zhang, 2019).

To explore the impact of the built environment on an older immigrant population's social and physical health, this research captures data on individuals' daily mobility patterns and activities. Surveys and activity logs from 130 Mandarin-speaking Chinese immigrants over the age of 60 are collected across urban and suburban neighborhoods in and near Toronto, Canada in Spring 2021. Single-day activity logs are used to construct spatiotemporal activity spaces for each participant, providing representations of participants' shifting experiences with built environments and allowing this study to move beyond commonly used residence-based measures. Quantitative results, including descriptive statistics and estimated model results, of the surveys and activity logs will be presented with a focus on how social connections in Canada and urban mobility barriers impact levels of social isolation (frequency of social engagements), loneliness (De Jong Gierveld 6-item scale), and self-reported health (SF-12). Survey findings related to changes in social connectedness during the coronavirus pandemic are provided for context. These results will provide a comprehensive look at social isolation and inform urban planning policy aimed at improving overall levels of social and individual health among older, Chinese immigrants in an urban center of migration. As immigration continues to shape how urban landscapes are occupied and modified, understanding social relationships is key to incorporating this growing demographic into the urban fabric.

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Key Words: built environment, social isolation, time-use, older adults, immigrants

#### A LONGITUDINAL ANALYSIS BETWEEN TRANSIT INVESTMENT AND ECONOMIC HEALTH

Abstract ID: 484

Individual Paper Submission

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Transit-oriented development (TOD) has been recognized as a solution to reduce traffic congestion (Dawkins and Moeckel 2016). Because introducing a rail system may gradually improve the accessibility and provide amenities around the transit area, it could potentially act as an environmental intervention in promoting walking behaviors. The improved accessibility and amenities in the vicinity of transit areas could often be capitalized into housing values (Wessels, Pardo, and Bocarejo 2012). However, transit system may also result in negative externalities such as noise and pollution (Seo, Golub, and Kuby 2014), which could negatively impact property values.

Although several studies explored the effect of rail access on residential housing values (Seo, Golub, and Kuby 2014; Yan, Delmelle, and Duncan 2012), two limitations have not been considered. First, most studies explored the property value changes solely after the operation of a transit system, which could not comprehensively capture the dynamics between the transit investment and housing value changes. Second, most applied a hedonic price framework and did not account for the selection bias by using an intervention-control design, which may bias upwardly the effects of public transit on housing values (Yu et al. 2018).

This study applied a pre-post and intervention-control design to examine the changes in housing values before-and-after the several stages (announcement, construction, and operation) of the transit investments of SunRail in Orlando, FL. For the application of a pre-post design, this study considered several time periods to explore the changes in property values. This study conducted the pre-post comparison for the announcement (2008-2011), construction (2011-2013), and operation (2013-2016). For the intervention-control design, this study selected residential parcels within the 1-mile buffer from each transit station as the intervention group (exposed) and those located between the 1-2-mile buffer from the station as the control group (non-exposed). The data source for the parcel-level property value was from Orange county property appraiser for 2008-2016. Propensity score matching is a widely used matching procedure to create observationally similar intervention and control groups.

From the announcement to the operation (2008-2016) of SunRail, this study showed that the changes of residential property values within the 1-mile buffer around stations had no significant difference than those located in the 1-2-mile buffer. Considering the property values for different stations, three stations (Florida Hospital, Church Street, and LYNX Central) generally shared the same pattern in terms of the change of property values. During the announcement period (2008-2011) for these three stations, the residential parcels in the exposed areas were more resilient in weathering property value declines than those in the control areas. But during the operation period (2013-2016), housing values in the exposed areas increased less than those in the control areas. One of the potential explanations is the surrounding urban designs. These stations are located in areas with relatively high densities, connected sidewalk infrastructure, and walk-and-ride features, which provides a high level of accessibility and encourages more walking behaviors. Such a design cultivates a culture for public transit and could thus contribute to preferences for housing in close proximity to transit. During the operation period, however, the added noise and pollution from the rail on top of the busy traffic may lead to a lower level of willingness to pay for the house within the 1-mile buffer.

This study has provided critical implications for transportation and urban planning. The economic effects from transit investment during different time phases have informed several stakeholders such as urban planners and transportation planners to consider the built environments around transit stations. The contextual environmental characteristics could affect not only the accessibility and amenities but also the economic values manifested in housing values.

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Key Words: Health, built environment, housing values, propensity score matching

## **BUILDING SPATIO-TEMPORAL COMPARISONS: GENTRIFICATION AND HEALTH FROM THE NATIONAL TO THE NEIGHBORHOOD LEVEL**

Abstract ID: 492

Individual Paper Submission

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A substantial body of literature links neighborhood conditions to health outcomes (Diez Roux & Mair, 2010; Kawachi et al., 2009), but the relationships among gentrification, displacement and health remain unclear. This uncertainty stems, in part, from challenges to measurement: the definition and presence of gentrification, geographic scale, and time (Tulier, Reid, Mujahid, & Allen, 2019). The dynamic nature of gentrification complicates its definition although considerable scholarship exists using existing data sources (Ding, Hwang, & Divringi, 2016; Freeman, 2005). Data availability shapes the geographic scale at which many studies occur, which can present a modifiable areal unit problem. The uneven progression of gentrification and displacement confounds the linkage between exposure and health outcomes measured at the individual level. In short, despite the central roles gentrification, displacement, and health disparities play in urban policy discussions, we need considerable research to clarify relationships among these topics. In this study, we explore datasets linking gentrification and health at the national, state, city, and neighborhood level over time.

We will integrate an existing dataset with national, state, and city data with local findings on gentrification and health. Our previous work created a database linking gentrification indices at the census tract to the CDC's 500 Cities: Local Data for Better Health, and the U.S. Small-area Life Expectancy Estimates Project—USALEEP. We operationalized gentrification using approaches developed by Freeman (2005) and Ding, Hwang, and Divringi (2016). CDC's 500 Cities dataset contains data for 27 measures of chronic disease related to health behaviors, health outcomes, and use of preventive services and the USALEEP dataset (also known as the Neighborhood Life Expectancy Project) provides life expectancy at birth for most U.S. Census tracts for the period of 2010-2015.

In collaboration with Communities in Partnership, a nonprofit based in Old East Durham, and community residents, we will conduct a second round of household survey stratified by type of housing tenure (i.e., tenancy versus owner-occupied) using community based participatory methods in May 2021. The previous survey of 120 household (~12% of the neighborhood) in April 2018 will provide a pre-COVID 19 datapoint. Both surveys include questions on housing affordability, attitudes, and beliefs about displacement and/or the threat of displacement, and self-reported health status and behaviors.

By utilizing two similar but different definitions of gentrification, exploring multiple geographic scales including a sub-census tract neighborhood, and measuring health outcomes at multiple points, we hope to build on the literature linking gentrification and displacement to health and continue the dialogue between community stakeholders and decision makers on the topics on disinvestment, gentrification, and displacement and the social determinants of health.

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Key Words: social determinants of health, gentrification, community-based participatory research, displacement, housing

## ARE STATE-LEVEL FOOD SYSTEMS CHARTERS AND PLANS HELPING TO SCALE UP THE ALTERNATIVE FOOD MOVEMENT?

Abstract ID: 502

Individual Paper Submission

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The 2010 Michigan Good Food Charter was one of the first statewide visions for building a more just, green, and healthy food system. At least 18 states and multi-state collaborations now have similar food systems charters and strategic plans. Uniting these initiatives is a desire to collaborate across fragmented efforts, share knowledge and resources, and ultimately, scale up the alternative food movement. Looking at Michigan a decade later and in the midst of hundreds of stakeholders devising another 10-year plan, we ask: What impact, if any, are these ambitious, participatory planning efforts having on food systems, and in particular, on state-level food policy?

Framed around policy science theories, our methods include a content analysis of food-systems related legislative bills that were passed and attempted over the last 20 years, before and after the launch of the Charter. We also carried out interviews with over two dozen policy advocates – including lobbyists, activists, and advocacy organizations – as well as state legislators and bureaucrats who have acted as policy champions.

We discuss in our findings how food systems problems were effectively (and not so successfully) framed to have political resonance among legislators, how advocates took advantage of – or failed to leverage – strategic windows of opportunity (e.g., the launch of the Charter, shifts in the political balance across different administrations, COVID-19, etc.), and how coalitions were mobilized and utilized for policy advocacy (e.g., a short-lived, statewide food policy council, and numerous Charter-inspired food systems networks). The food systems issues that have remained blind spots, topics that have been most contentious, and the causes that have been most amenable to state-level policy change in Michigan suggests what may await advocates in other politically divided places. Ultimately, we suggest ways that state-level food systems charters and plans can be strategically leveraged to build more momentum around food systems transformation.

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Key Words: alternative food movement, food systems planning, policy advocacy, policy science

## ASSESSING THE IMPACTS OF NEIGHBORHOOD ATTRIBUTES ON EVALUATIVE, EMOTIONAL, AND EUDEMONIC SUBJECTIVE WELL-BEING IN FIVE US CITIES

Abstract ID: 518

Individual Paper Submission

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Understanding and promoting well-being has been regarded as a crucial goal in academic research and policy making, as it has long been considered key to the creation and maintenance of healthy, productive societies (Diener, 2009; Durand, 2015). The use of objective proxies of well-being, such as income, literacy, and life expectancy, as well as subjective measures, such as how life is perceived and experienced by individuals, is common across the globe. The subjective approach to measuring perceptions and life experiences is based on subjective well-being (SWB), defined as “a person feeling and thinking his or her life is desirable regardless of how others see it” (Diener, 2009). Furthermore, existing research has found that there are three distinct dimensions/components of SWB: evaluative/cognitive, affective/emotional, and eudemonic SWB (Oguz et al., 2013).

In designing and managing living environments, urban planners have the potential to enhance the well-being of residents and provide opportunities for all to flourish, making it critical for them to understand how the built environment influences well-being. The built environment exerts its influence on SWB through its physical characteristics, social environment, access to services, opportunities it affords residents, and the promotion of certain kinds of behavior. Despite the theoretical significance of connecting planning to SWB, the consideration of SWB in planning is relatively recent compared to other disciplines such as psychology and public health, leading to significant gaps in the planning literature, including inadequate research on the emotional and eudemonic aspects of SWB and the omission of key SWB determinants in analyses due to a lack of interdisciplinary perspectives. Additionally, the prominent use of techniques such as importance–performance analysis (IPA) in urban planning to identify neighborhood infrastructure investment priorities to improve residents’ well-being may have significant limitations, as they assume a linear and symmetric relationship between neighborhood attribute performance and SWB. In contrast, a growing number of studies from fields such as economics (Mikulić, 2007) and sustainability planning (Ramaswami, 2020) have suggested that the influence of neighborhood attributes on SWB may be asymmetrical and that viewing the world through a linear and symmetric lens could lead to the misallocation of resources.

In this study, we hope to fill current gaps in the literature and the analysis techniques by examining whether the influence of neighborhood environment attributes on evaluative, emotional, and eudemonic SWB is linear or asymmetrical while drawing from the interdisciplinary literature on SWB to include a comprehensive list of determinants in our analysis.

For the study, using an online survey, data is currently being collected in five US cities including Austin, Newark, New York City, Tallahassee and Los Angeles with an anticipated, overall sample size of 8000. The data being collected includes measures of evaluative, emotional, and eudemonic SWB used by the U.K. Office of National Statistics (Oguz et al., 2013), socio-demographic characteristics, home and neighborhood attribute perceptions, and other variables known to influence SWB.

Using piecewise regression, we will identify improvement priorities based on the nature of the relationship between neighborhood attribute performance and SWB (symmetrical or asymmetrical) and average attribute performance. Additionally, we will focus on highlighting ways to promote equity by exploring neighborhood improvement priorities based on income, race, and gender. Finally, incorporating data from five cities will enable comparison of determinants of SWB across diverse geographies, making it possible to explore potentially global versus localized determinants of SWB. Contributions to existing research in the field and policy implications will be discussed.

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Key Words: Subjective Well-Being, Neighborhood Planning, Happiness, Neighborhood Infrastructure, Built Environment

#### IMPACT OF THE BUILT ENVIRONMENT DURING COVID-19 ON SEATTLE FOOD BUSINESS CONTINUITY

Abstract ID: 519

Individual Paper Submission

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The physical distancing requirement implemented due to the current pandemic is reshaping our urban space with transformation of the built environment ranging from temporary changes of physical design to possibly more permanent ones. As cities attempt to recover from the economic shock of the pandemic, there is a pressing need for urban planning scholars to understand the effectiveness of this new wave of built environment transformation and its long lasting social and economic impacts. This study examines built environment and social demographic impact factors on food retail business continuity in the city of Seattle during the height of pandemic lockdown, from May 2020 to December 2020. The research questions are: 1) What are the key physical design factors that help businesses continue to operate during the pandemic? 2) How are businesses located in neighborhoods with different social demographic characteristics performing during the pandemic? 3) What are the effects of these factors during peak periods of the pandemic?

This study consists of empirical, mixed-methods research, surveying for patterns of facility design, service models,

modifications, and economic outcomes of service providers, before and during the pandemic. From May to June, 2020, the research team conducted a field survey and collected data from 926 businesses from 40 census block groups, which covers 17% of all food retail business in the city of Seattle. In November to December, 2020, the research team repeated the field study and conducted a follow-up survey of business owners through in-person and telephone interviews. The data were joined with other publicly available datasets, including food businesses permit data, Google Knowledge panel, zoning information, and census data.

For the food businesses in the sample (n=926), 25 percent of businesses (n=237) were either temporally or permanently closed by June. The analysis of the March to June data suggests that facility design was a determining factor, as businesses with parking lots, within strip malls, with drive-thru facilities and in converted homes were more often open, and storefronts were closed in the same proportion as the population as a whole, while food courts, marketplaces, and storefronts on alleys were more likely to be closed. In addition to regression analysis, this study applied a conditional inference tree analysis to identify business clusters that shared similar urban surroundings and operational status. Results show that businesses located in urban areas with less pre-pandemic employment had the highest survival rate while businesses located in urban areas with high pre-pandemic employment and large low-income population, found in parts of the downtown area, had the lowest survival rate. The same set of analyses were applied to the November/December data. The comparison between the two datasets identifies factors that help promote the economic resilience of food businesses over the course of the pandemic.

The study offers three major implications for policy and planning practice. First, while facility design and the surrounding urban space play a key role for business continuity during the pandemic, food related businesses differ in terms of the initial physical design of space available to them and can be found to mimic temporary changes observed from others in their neighborhood. Second, the extent of physical change across neighborhoods differs in relation to socio-economic characteristics, which suggests that public agencies and planners have an opportunity to mediate the effects of the pandemic through a combination of shared information, resources, and technical support. Third, the study found that neighborhoods suffering the most from the economic shock of the pandemic are those dominated by single-use office buildings. The results reemphasize the importance of mixed-use development for economic resilience and vitality during the pandemic.

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Key Words: Economic resilience, small businesses, COVID19 pandemic, design determinants

#### EXAMINING THE SPATIAL PATTERNS OF COVID-19 CASES IN AUSTIN AND HOUSTON, TEXAS.

Abstract ID: 587

Individual Paper Submission

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COVID-19, a new viral disease discovered at the end of 2019, has significantly impacted human life for the last year and half. Previous studies have investigated the spatial patterns of COVID-19 cases in high-density urban areas (Kim et al., 2021; Maiti et al., 2021; Mollalo et al., 2020). This study explores the spatial patterns of COVID-19 cases in low-density urban areas and how different spatial factors might affect their distribution over time. (Sun et al., 2021; Zhang & Schwartz, 2020).

This study focused on three research questions: What spatial patterns did COVID-19 cases have in the Austin and Houston areas? What spatial factors were associated with COVID-19 cases in these areas? Were these spatial factors similar across cities and time periods? Specifically, this paper investigated the relationships between socio-demographics and COVID-19 case distributions through the application of two models: ordinary least squares regression and geographically weighted regression. Our study area included Travis County, where Austin is located, and the combined area of Harris and Fort Bend Counties, where Houston is located. All data were captured at the zip code-level.

Our findings showed that different vulnerable groups experienced high levels of COVID-19 risk at different periods of the pandemic. The global model showed that households in poverty were at high risk during the beginning of pandemic, and African Americans were at high risk both during the beginning and post-peak stages. Locally in Harris and Fort Bend Counties, Hispanic Americans were at high risk during the post-peak stage. In Travis County, Hispanic Americans were at high risk during the beginning of the pandemic, and households in poverty were at high risk during the post-peak stage. The local models further showed that households in poverty living in the southern part of Houston were at high risk during the beginning of the pandemic, and both African American and Hispanic Americans who lived in the periphery of Harris and Fort Bend Counties were at high risk during both the beginning and post-peak stages. We also noticed travel behaviors and educational attainment level played modest roles in predicting COVID-19 outbreaks, and that their effects changed over time.

This study provides three policy implications. First, vulnerable groups experienced high levels of COVID-19 risk at all stages of the pandemic. Local governments need to be aware of this disparity so that they can allocate health services, economic relief and vaccines equitably. The southern part of Houston and the southeastern part of Travis County showed a strong spatial disparity in terms of COVID-19 infection rate, especially in neighborhoods with high percentages of African American and Hispanic American populations. Second, travel behavior variables had a modest relationship with the spread of COVID-19, at both the beginning and post-peak stages. Third, this study proved that various spatial factors have associations with COVID-19 outbreaks in different regions and at different periods of time. It is difficult to identify a common or universal indicator for governments to target, so interventions to mitigate the spread of COVID-19 must be implemented based on local situations.

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Key Words: COVID-19, Geographically Weighted Regression, Socio-demographic disparities, Neighborhood,

**MORE ACTIVE LIFESTYLE MEANS BETTER MENTAL HEALTH? EXAMINATION OF THE ASSOCIATIONS BETWEEN DAILY ACTIVITY PATTERNS AND MENTAL HEALTH FOR OLDER ADULTS IN BEIJING, CHINA**

Abstract ID: 624

Individual Paper Submission

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**Abstract:** Mental health for the elderly has attracted growing scholarly and policy attention as society continues to age. Planning scholars have focused on how residential environments (e.g., public space or greenspace/neighborhood relationships) affect the elderly's mental health, either directly or indirectly through the daily activities of elderly people. Active lifestyles with more time spent on physical and social activities are often believed to positively affect the elderly's mental health (Aihara et al., 2011; Shergold, 2019; Bhandari et al., 2020). However, elderly residents may engage in different types of "health-promoting active lifestyles," subject to the residential environment, family co-residence pattern, as well as the cultural context in which the elderly live.

In previous studies, behavioral factors are aggregated and discrete (Movahedi et al., 2016; Flores et al., 2020), and the effect of active lifestyle on mental health remains understudied on a non-aggregated and consecutive level. Considering the empirical evidence from non-western countries remains lacking, typical lifestyles of elders in developing countries warrants attention. In this study, we examine the relationships between daily activity patterns of older adults in Beijing and their mental health outcomes and explore the social and built environmental determinants of activity patterns of varying health implications.

Data used in this study include a questionnaire of socio-demographics and health and an activity diary for a typical weekday of 724 senior residents (aged 60 and above) from 14 neighborhoods in Beijing collected in November 2020. We employ a novel multi-channel sequence optimal matching method to identify typical activity patterns of older adults. This approach has a strength to analyze not only duration of activities, but also the sequential order and social contexts of those activities throughout a day. Five distinct patterns with varying levels of engagement with their families and residential neighborhoods are found: family care-giver, family pace-setter, neighborhood active participants, self-engaged groups, and care-receiver. Logistic regression models are administered to examine the relationship between those typical activity patterns and mental health outcomes, with covariates adjusted for. We further explore socio-economic and built environment factors associated with those health-promoting or health-damaging patterns of daily activities.

Results show that: (1) "family care-givers" and "neighborhood active participants" were more likely to report positive mental health, while "care-receivers" exhibited the lowest mental health scores; (2) despite a moderate proportion of physical activity, self-engaged older adults still showed relatively low scores in mental health metrics. These results highlight the health benefits of actively engaging in both household and neighborhood-based social activities for the Chinese older adults. Planning for the age-friendly city in an urban Chinese context would benefit from promoting social and physical activities in older adults' residential neighborhoods.

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Key Words: daily activity patterns, mental health, elderly, quantitative analysis, China

## EXPLORING THE NEXUS BETWEEN SOCIAL VULNERABILITY, BUILT ENVIRONMENT, AND THE PREVALENCE OF COVID-19: A CASE STUDY OF CHICAGO

Abstract ID: 628

Individual Paper Submission

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COVID-19 has significantly and unevenly impacted the United States, disproportionately affecting socially vulnerable communities. While epidemiologists and public health officials have suggested social distancing and shelter-in-place orders to halt the spread of this virus, the ability to comply with these guidelines is dependent on neighborhood, household, and individual characteristics related to social vulnerability. Considering initial spread of the virus in major urban areas, researchers have sought to understand what aspects of the built environment impact COVID-19 cases, particularly the role of urban density and social distancing (Li et al., 2021). While some studies have attributed density as the cause of COVID-19 spreading at the local level (Nguyen et al., 2020) or overcrowded housing conditions as a predictor of COVID-19 death counts (Hu et al., 2021), ongoing debates exist concerning how density and overcrowding impact transmission. In addition to built environment factors, sociodemographic characteristics were also identified to impact COVID-19 prevalence and spread (Bryan et al., 2020; Kim & Bostwick, 2020).

Given the profound and emerging social equity implications of the COVID-19 pandemic, in this study we adopted the social vulnerability framework to highlight how both built environment and socioeconomic factors contributed to the COVID-19 prevalence. We utilize structural equation modeling, and a variety of data including anonymized mobility data from SafeGraph, to examine the direct and indirect effects of social vulnerability and built environment factors on COVID-19 prevalence over two time periods. We use Chicago, Illinois as a case study and find that zip codes with low educational attainment consistently experienced higher case rates over both periods. We also find that population density is not significantly related to the prevalence in any period. However, we show the movement of people at the zip code level made a significant contribution over the longer-term period (March to November 2020), but not during the shorter-term period (March to May 2020). Our results suggest social vulnerability played a more influential role in COVID-19 prevalence than built-environment factors, highlighting the complex and intersectional nature of race and class and the built environment on airborne disease spread.

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Key Words: COVID-19, Social Vulnerability, Built Environment, Mobility, Chicago

## **#DEFUNDAPD: GRASSROOTS ORGANIZATIONS' EFFORTS TO ADDRESS OVER-POLICING IN PLANNING A CASE STUDY OF AUSTIN, TX**

Abstract ID: 691

Individual Paper Submission

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During recent years there has been a growing interest in addressing problems of policing through planning. Displacement, unequal access, and consequences of neoliberal policies have inspired a global mobilization of marginalized and low-income populations at the heart of cities (Domaradzka, 2018). Often materializing through grassroots organizations, they have begun to tackle what it would mean to address the issue of over-policing through anti-racist strategies (Sherman, 2020). In Austin, TX, on August 13th the city council unanimously voted to remove \$150 million from the Austin Police Department's budget and reinvest it in social services. This paper's objective is to explore how grassroots organizations work with and influence policy toward anti-racist planning. This is done by inquiring into how both the defunding process itself and the divestment of funds can be avenues toward justice.

The insurgent nature of Austin's grassroots organizations who mobilized toward the defunding of its police department, reflects those efforts by insurgents globally. Since this paper investigates how grassroots organizations shape anti-racist planning processes, I build my arguments off Critical Race Theory and Insurgent Planning framework by centering the research around the counterhegemonic community led initiatives responding to urban inequality. These help us examine how planning both influences and is influenced by race, as well as the understand how planning responds to the neoliberal co-option of inclusion and participation (Miraftab, 2009; Gale & Thomas, 2018). The insurgent framework emphasizes how and why these organizations use the opportunity of the police defunding movement to leverage more just planning.

Drawing from these frameworks, the questions I seek to answer include the following: How did grassroots social justice organizations shape the planning processes through policy decisions regarding police funding in Austin? What role do grassroots organizations play in these processes? What other actors play an important role in this? What relationships did the organizations develop leading to anti-racist planning demands? I employed case study methodology to best acquire a qualitative understanding of the issue at hand. This case study draws from 12 interviews with key stakeholders, newspaper articles, city council meeting minutes, primary documents such as budgets and memos, as well as social media posts utilizing hashtag #DefundAPD. The preliminary findings suggest that the networks which materialized throughout this process are necessary to study in depth to fully understand the insurgent nature of this practice.

The field of planning has been faced with unmasking its own racial implications. This study is an example of this, making connections between the grassroots mobilization efforts to defund the police and planning processes in Austin, Texas. It is a difficult task to restructure powerful systems backed by powerful interests, but it is possible. Planning offers an opportunity to redistribute the power it has willingly given to capitalism and shift it to the people. By studying the role that these grassroots organizations have undertaken to influence police defunding, it can advance knowledge between these relationships and can lead to better planning practices and policy outcomes.

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Key Words: Grassroots Organizations, Insurgent Planning, policing, anti-racist planning, social movements

## THE IMPACT OF COMMUTING ON HEALTH OUTCOMES AMONG LOW-INCOME COMMUNITIES IN DALLAS-FORT WORTH METROPOLITAN AREA

Abstract ID: 710

Individual Paper Submission

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The concerns regarding public health had increased in the past few decades in the United States. According to the Center for Diseases Control and Prevention (CDC, 2018), obesity rates have rapidly escalated in the past decade. While obesity is one of the main reasons to cause other health outcomes, including type 2 diabetes, high blood pressure, heart diseases, and some types of cancer, data shows that the obesity rate has increased among adults from 27.4 percent to 30.9% between 2011 and 2018 (CDC). Also, the rates of severe obesity have increased from 5.7% to 7.7% (CDC, 2018).

Several studies documented the difference in health outcomes in different sociodemographic and socioeconomic groups. While sociodemographic includes age, race, ethnicity, and gender, socioeconomic status includes education, income, occupation, employment, and living conditions (Institute of Medicine, 2003). Many studies found that socioeconomic status can influence obesity and diabetes among different races and sex groups. Indeed, there is a strong relationship between socioeconomic status and unhealthy behavior, including smoking, physical inactivity, a less nutritious diet, and alcohol consumption, as stated by The Institute of Medicine (2003).

Travel behavior has also significantly impacted health outcomes, especially obesity (Samimi & Mohammadian 2010). Actually, travel mode choice is an essential factor to influence physical activity, including walking and bicycling. An investigation found that regions with lower obesity rates are less likely to travel via automobile (Jacobson et al., 2011) or have better access to public transit (L. D. Frank et al., 2008). Also, research shows that a 1

percent decrease in automobile use can decrease obesity by 4 percent, and transit use had the highest impact on general health; however, auto-use had the highest impact on obesity, and people who use transit are least likely to be obese (Samimi et al., 2009).

The Dallas-Fort Worth metropolitan is an auto-dependent area where employees' commute time, which is 26.8 minutes, is 3 minutes longer than average US workers. Also, among commuters, around 89% drive to go to work, 1.32% use public transit, 1.25% walk, and 0.14% commute by bike. Moreover, 43% of DFW area households own two cars which are 3 percent higher than average US households (ACS 2018).

This research investigates how commuting to work affects health outcomes in low-income groups in the Dallas-Fort Worth Metropolitan area. Based on much research, we understand that low-income communities face a higher risk of having a chronic disease; therefore, we seek to understand if commuting and travel behavior increases the risks among the low-income groups. We will use data collected from CDC, 500 cities, and (BRFSS) for public health data, and census data for examining socioeconomic, sociodemographic. However, public health data is considered to be nested. Therefore, we use multi-level modeling as a method to answer the research question.

As a result, we expect income and race have a high impact on public health. Besides, the built environment is one of the most critical factors that affects an individual's lifestyle, causing health issues. The relationship between the built environment and public health has been widely investigated in different cases. However, each research is a different case with different scenarios. Similar to these studies, our research is unique due to the attributions of this paper.

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Key Words: Obesity, Low-Income, Health Outcomes

#### PLAY AFFORDANCES IN URBAN NEIGHBORHOODS OF KOLKATA

Abstract ID: 720

Individual Paper Submission

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Children play has been historically outdoors, and it is through these play instances that children learn about the environment, engage with other children, develop social skills, and negotiate the use of space with other users. Rapid urbanization and lack of policies for children's play spaces have increasingly marginalized outdoor play opportunities for the urban child. The case is even more critical in highly dense cities of developing countries like India. This paper addresses the lack of spatial studies in developing countries to understand children's use of outdoor spaces. The study analyzes and compares three distinct neighborhoods (from the older city and the

contemporary sprawl) in Kolkata, a major metropolitan city of India, in the light of Gibson's theory of affordances. The affordance of an environment refers to its attributes that can support different functions. While the importance of children play is realized by scholars and children-friendly organizations, the question remains how they are being realized especially in the newly built neighborhoods.

Taxonomy of affordances adapted for Indian context is used to look at the perceived affordances in the neighborhoods. Spatial analyses at macro and micro scale are employed to study the affordances in terms of urban morphology, street characteristics, block dimensions, housing typology, and diversity of open spaces. Both residential streets and fields are considered as essential play spaces in India. Open space analysis looks at the type of open space, its physical dimensions, ground cover, surrounding elements, elements on the open space itself, sense of urban room (if any), access points from nearby streets, typology of the surrounding streets and its interface with the space itself. Further, sections, and detailed mapping of the play spaces are performed to look for the negative affordances or triggers of play (or absence thereof), and label the play environments as friendly, adapted, restrained, or neglected.

The study finds limited physical affordances in the relatively newer neighborhoods of Kolkata compared to the older city neighborhood. The residential street layout of the newly built neighborhoods lacks the sense of enclosure and corner notches that can support play environments for children. The newer streets offer lesser loose spaces, diversity, and possibilities. The block dimensions of the newly built neighborhoods are longer and offer fewer streets with low traffic, thus negatively impacting the possibility of children play. The play fields or parks in different neighborhoods vary quantitatively and qualitatively. While the number of such spaces are much higher for new neighborhoods, they offer limited affordances due to sameness and lack of interactive elements. Static and dynamic interactive elements like walls, bricks, stones, pebbles, water pipes or irregular mounds are only present in the case of older city neighborhood. Newer play-spaces are more suitable for playing sports like games, however, require more equipment due to lack of enclosure or elements that can be utilized to modify the built environment. The findings also suggest over-maintenance, manicured parks, and behavior-restrictive use of play spaces can lead to sterile environments that create restrained play environments by not offering triggers of play or possibilities of shaped affordances.

The findings of the paper underscore the disconnect between scholars of children literature and city planners, emphasizing the need for urban planners to imbibe play affordances while designing urban neighborhoods. The paper reiterates the need to further research children play in contemporary neighborhoods by understanding actualized affordances of these spaces through ethnographic studies, interviews, and behavioral observations. Finally, the paper ends with some design and policy implications for residential neighborhood design that can create opportunities for outdoor play in the contemporary urban densely populated neighborhoods.

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Key Words: Children Play, Neighborhood Play Affordances, Informal Play Spaces, Neighborhood Design, Kolkata, India

### **THE E3 COLLABORATIVE: PLACE-BASED FOOD JUSTICE IN ENCINITAS, CALIFORNIA**

Abstract ID: 757

Individual Paper Submission

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“Think globally, act locally,” has become a catchphrase indicating the importance of local solutions to climate change. Environmental policy instability at the national level—best seen in the recent shift between the Trump and Biden administrations—has forced local actors to become more proactive in addressing climate change issues. One such issue receiving increased attention at the local scale is the resiliency of food systems through sustainable agriculture and food justice. Food justice and sustainable agriculture are included in the second UN Sustainable Development goal because climate change and other problems are causing increased hunger around the world (United Nations, 2018). Marginalized communities are particularly overburdened by the effects of climate change; therefore, food systems presents an opportunity to address equity issues at the local level while confronting global climate change. These realities point to the need for community-based approaches that “radically transform the global food system” (Werkheiser & Noll, 2014). This requires planners to collaborate with varying stakeholders to address the social and environmental effects of food deserts, food production, food transport, and food waste (Cabannes & Marocchino, 2018, 14). However, Born and Purcell claim that as planners become more involved in food systems work, they cannot fall into “the local trap” of assuming that work at smaller geographic scales is inherently sustainable and just (2006). Planning research, then, needs to evaluate local initiatives to highlight best strategies for producing equity and sustainability.

This paper will examine the E3 Collaborative (Encinitas Environmental Education Collaborative), a cooperative of nonprofit and public organizations in North County San Diego including the Leichtag Foundation, Encinitas Union School District, Magdalena Ecke Family YMCA, Seacrest Village Retirement Community, the San Diego Botanical Gardens, and San Dieguito Heritage Ranch. Through a place-based approach, these organizations have created an ecosystem for social and environmental equity and food systems justice by sharing knowledge and resources, creating joint programming, and increasing community knowledge and health. For instance, the Leichtag Foundation operates a 67.5-acre campus for food justice. The Leichtag Commons includes Coastal Roots Farm—a Jewish community farm; 900,000 square feet of greenhouses for sustainable agriculture research; and the Hive—a workspace for community nonprofit collaboration and development. Considering the reality of increased public-private collaboration in global neoliberalism, this case raises multiple questions. What is the impact of this collaborative model in working to transform food systems to address problems of social and environmental equity? How does the collaborative use place to overcome these issues? What policy and practices can lead to similar approaches in other localities?

Using an inductive research approach, we perform a case study of the E3 Collaborative to determine what types of systems lead to food justice on the local scale. The case study will be conducted through interviews with the organizations’ staff and leaders to understand their unique individual and collective contributions to enacting social and environmental equity in Encinitas and the broader region. Likewise, the Encinitas’ planning department will be interviewed to understand how planners are incorporating this resource into their climate action plan. Data from interviews will be supplemented with secondary data and analyzed using systems theory. Communities, nonprofits, and public organizations makeup a complex system; thus, it is important “to examine the elements of systems as they interact through stakeholders seeking to change the social” and environmental sphere (Martinez-Cosio and Rabinowitz Bussell, 2013). This study will expand the literature on local climate change and equity solutions, provide practitioners and scholars with recommendations for a place-based model for food justice, and indicate how planners can incorporate initiatives such as this in their community resiliency efforts.

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Key Words: Food Systems, Food Justice, Sustainable Agriculture, Public-Private Collaboration, Equity

## PLACE-BASED HEALTH INEQUITIES: ADVANCING CONCEPTUALIZATIONS OF HEALTHY BUILT ENVIRONMENTS FOR IMPROVED SOCIAL JUSTICE

Abstract ID: 809

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The professions of public health and urban planning emerged through a shared goal of combatting the spread of communicable diseases in over-populated and unsanitary urban areas during the mid 19th century (Barton, 2009). After a shift in focus, where public health pursued germ theory and urban planning concentrated on housing and transportation (Corburn, 2009), the two disciplines joined forces again in the late 20th century to address rising chronic disease and climate crises (Barton, 2009). This reunification was spurred by increasing recognition of the physical environment's role as a determinant of key health behaviours (e.g., physical activity, nutritious eating) (Macintyre et al., 2002). A plethora of work that is often termed 'healthy built environment' literature has since emerged, connecting practices and theories from both public health and urban planning. While much of this work recognizes the impact of the built environment on health, the health inequities of many population subgroups remain; the persistence of place-based health inequities is evident in the implementation of many healthy city initiatives, including the World Health Organization's Healthy Cities movement in the 1980s (Corburn, 2009).

Through a critical reading of the healthy built environment literature, we interrogate the state of knowledge on place-based health inequities. Our discourse analysis is guided by the two questions: 1) How has healthy built environment literature conceptualized 'health equity' over time? 2) What solutions are recommended to support practitioners addressing health inequities in their communities? Our analysis is based on key academic journal publications over the twenty-five-year period following the reunification of the public health and urban planning disciplines (i.e., 1980s-2010s). Using themes that emerged from within these texts, we discuss how the term health equity is defined and operationalized as well as illuminate the populations, areas, and scales of focus in this literature. Finally, we critique the recommendations put forward with respect to the potential of practitioners and researchers to address place-based health inequities.

Overall, this work showcases some persistent challenges in realizing health equity in place: inconsistency in definition and operationalization of health equity as well as oversight of the root causes (Marmot et al., 2008). As such, it is recommended that scholars working within the healthy built environment realm clearly outline for what, whom, and where health inequities exist in order to avoid further marginalizing vulnerable populations and for suitable interventions to be implemented in practice (Marmot et al., 2008). Researchers and practitioner should also 1) consider the impact of the physical and social neighbourhood environments on a range of populations, not just

those with low socio-economic status; 2) explore how health inequities are experienced in less populated areas, such as rural and remote locations, and peri-urban zones (Macintyre et al., 2002); and 3) compare the impact of local, regional, and national initiatives on the experience of vulnerable populations in place. Scholars have recommended the use of stakeholder collaborations and the creation of healthy public policy to assist in addressing health inequities (Marmot et al., 2008); however, strategies for practitioners to implement these recommendations are noticeably deficient, necessitating the call for increased discussion on how planners can both develop and support interventions aimed at addressing place-based health inequities, such as healthy city initiatives, especially through collaboration and policy.

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Key Words: Healthy built environments, Healthy cities, Health equity, Social determinants of health

#### **EVOLUTIONARY HISTORY OF TRANSFORMATIVE INITIATIVES IN FOOD POLICY: LANDSCAPE CONTEXT, INSTITUTIONALIZATION, AND LOCAL AGENTS IN PUBLIC FOOD PROVISION IN SOUTH KOREA**

Abstract ID: 818

Individual Paper Submission

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A broad consensus on the need for food systems transformation has globally risen in both academia and practice with deteriorating issues of climate change and vulnerabilities in food supply chains, particularly exposed during the COVID-19 pandemic. The main objective of transformative actions is to create fundamental changes in the underlying institutional structures that currently shape food practices from production, processing, distribution, consumption to waste disposal. For those actions to gain consistent momentum, it is necessary to understand the types of operations and the mechanisms in which they can permanently impact the locked-in conventional food system. With the case of public food provision policy in South Korea, this paper argues that public food procurement can play a critical role in (re)building regional food systems when democratic participation of local grassroots actors is guaranteed. This study also suggests the necessity of a spatial perspective – an effort to enhance urban-rural linkage going beyond the long-existing urban-rural dichotomy in planning practice – in establishing a long-term vision in public food policy.

Transitions are a useful lens to illustrate structural changes leading to the current food system and provide a vision for future change. The evolutionary history of public food provision in South Korea showcases how niche-level grassroots movements can scale out and become a mainstream food policy to establish economically and environmentally more sustainable local food systems. This paper draws on the theories of sustainability transition and food regime to construct a historical narrative of transformative food initiatives in the Korean context since the early 1990s. Food systems transitions in South Korea feature four stages: a) strong government regulation from the decades of dictatorship before the 1980s, b) grassroots movements for public intervention in food procurement since the 1990s against an expansion of free trade agreements and global food corporations (school food movement), c) implementation of innovative food policy since the 2010s as a result of a bottom-up breakthrough in the locked-in system (Free Universal Environment-friendly School Lunch Program), and d) a current experimenting phase of a food politics where cooperation and co-optation coexist in public-led food planning (Urban-rural



Coexistence Public Meal Program launched in 2017 as an expansion of the existing school lunch system).

Transitions in the Korean food systems delineate a possible pathway in which accumulated dynamics between local grassroots actors and the incumbent regime make a breakthrough in the paradigm of public food policy at the juncture of niche-level movements, landscape-level pressure, and institutionalization. The history of public food provision in South Korea underpins three components that some scholars find necessary to build collaborative governance in achieving sustainability transition: self-reflexivity, co-learning, and network. The (re)construction of the Korean case will contribute to inspiring emerging global food initiatives, especially facing food systems disruptions caused by COVID-19, in leveraging the pandemic as a landscape-level opportunity to create a meaningful change toward more resilient food systems.

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Key Words: Sustainability transition, Public Food Procurement, Collaborative Governance, Urban-rural Linkage

## **CRIME, SAFETY, AND PHYSICAL ACTIVITY IN DALLAS-FORT WORTH METROPOLITAN AREA**

Abstract ID: 819

Individual Paper Submission

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Over the past few decades, literature provided a better understanding of the factors affecting an individual health outcome. Scholars found that physical activity is the most influencing lifestyle behavior affecting health outcomes. Physical activity greatly impacts diseases such as obesity, heart diseases, diabetes, and some types of cancers (Stokes et al., 2008). Frank (2000) found that the rate of diseases including; coronary heart disease, diabetes, and some cancers would be reduced if physical activity increases towards the inactive population.

As some research in public health documented a strong linkage between physical activity and public health, other research documented increased public health benefits from physical activity such as walking, bicycling, and access to transit (Frank, 2000). Overall, a wealth of research found notably that pedestrian-friendly communities boost physical activity, impacting urban residents' health (Frank, 2000; Leslie et al., 2005; Stokes et al., 2008; Suminski, Poston, Petosa, Stevens, & Katzenmoyer, 2005). However, crime and safety are factors that influence physical activity.

Humpel et al. (2002) reviewed 16 studies investigating environmental correlations of adult recreational physical activity and revealed less evidence of crime related to physical activity. Also, Leslie et al. (2005) found that traffic safety from crime in high and low-walkability neighborhoods did not differ in terms of physical activity. However, Suminski et al. (2005) found that safety had the second-highest impact among women and men, where women are 4.5 times more likely to exercise in safe neighborhoods, while men are 5.9 times more likely to exercise.

In 2018 in the Dallas-Fort Worth metropolitan area, the average physical inactivity decreased to 23.7 percent than 34.9 percent in 2017 (Centers for Disease Control and Prevention). Also, there was a decrease in the total number of violent crimes from 27,204 in 2017 to 26,178 in 2018 (FBI Uniform Crime Reports). Adding to that, between 2014 to

2018, the percent of fatal motor vehicle crashes involving cyclists or pedestrians decreased to 43.6 percent than 50.56 percent (National Highway Traffic Safety Administration's Fatality Analysis Reporting System) between the years 2010 to 2014, relatively between 2010 to 2018, a 0.03 percent increase in the percentage of workers who commute by walking and a 0.01 percent decrease in workers commute by bike (American Community Survey).

This research explores the impact of crime and safety on physical activity in the DFW metropolitan area. Mixed results revealed the effect of crime and safety on physical activity; therefore, we seek to investigate if the decrease in crime and fatal motor vehicle crashes involving cyclists or pedestrians is the cause of the proliferation of physical activity DFW area. We collect our data from several resources, including FBI Crime Counts, American Community Survey, and 500 cities.

As a result, we are expecting that crime and safety are factors impacting physical activity. However, these factors may not be related to travel behavior towards commuters. In conclusion, according to the literature, crime is the least likely to impact the health of residents of urban environments.

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Key Words: Physical Activity, Crime, Safety

#### **INTEGRATING TRANSIT DATA AND TRAVEL TIME INTO FOOD SECURITY ANALYSIS: A CASE STUDY OF SAN DIEGO, CALIFORNIA**

Abstract ID: 862

Individual Paper Submission

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Spatial access to sources of food influences rates of diet-related disease experienced by food-insecure communities. Physical access to food appears to matter in a number of contexts, lending support to efforts to more meaningfully explore and address the spatial arrangement of nutritional resources like grocery stores, farmers' markets, and other components of the food system (Pothukuchi and Kaufman, 1999; Eckert & Shetty, 2011). Access, being able to financially and physically acquire food, along with the availability or the physical presence of food, and the capacity to prepare and consume food constitute the food security of neighborhoods (Jones, Ngure, Pelto & Young 2013). Food security, the ability to obtain and eat enough safe and nutritious food is often associated with hunger, malnutrition, and starvation but, increasingly it is also seen as a contributor to rising rates of non-communicable conditions associated with poor dietary quality (FAO, IFAD, UNICEF, et al., 2019). Global rates of diabetes, obesity, and heart disease give cause for alarm and suggest an important role for regional, urban, and rural planning professionals to intervene (WHO, 2017). Understanding how the location of sources of nutrition contributes to the

well-being of neighborhoods offers opportunities to improve health through physical interventions in the built environment. Investigations into the food security of communities use a variety of techniques to explore the ways that physical access to sources of food influence dietary preferences, eating habits, and health outcomes. Early research in this area focused primarily on broad measures of access, frequently defined solely by distance but more recent models incorporate factors such as mode and travel time as characteristics of the environment that influence decisions about where individuals shop for groceries. Refining techniques used to measure access to food remains an important part of understanding the relationship between the spatial arrangement of the nutritional resources, like grocery stores, and the well-being of neighborhoods. One approach for addressing this gap in our understanding of the connection between food security and transportation mode is to employ real-time travel estimates over transit and road networks to more precisely measure food access. In this paper, we employ the Google Distance Matrix API for calculating both the distance and time residents have to travel to reach nearby grocery stores and full-service supermarkets by private car or by public transit in San Diego, California. The Google Distance Matrix API uses the most common mobile phone application for wayfinding, Google Maps, to estimate multimodal access calculations based on travel mode and precise origin and destination locations. It is likely that residents needing to navigate to a local grocery store (by private car or by public transit) would rely on Google Maps to check traffic, road conditions, and transit schedules. Results suggest that distances between residents and food outlets are constant across modes of transport but travel times are highly differentiated by mode. Trips to stores by transit are on average, three times longer than trips by car. This paper offers a new understanding of the potential for incongruence between spatial proximity and true accessibility in the built environment.

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Key Words: spatial accessibility, food deserts, food access, transportation, grocery stores

## CARROTS OR DONUTS? THE INFLUENCE OF RELATIVE FOOD ACCESS ON COMMUNITY HEALTH OUTCOMES

Abstract ID: 951

Individual Paper Submission

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Food deserts, that is, areas with insufficient access to healthy and affordable food, do not have a consistent definition. Studies find them concentrated in low-income, racially disadvantaged neighborhoods and typify them as either a problem of physical access - measured in terms of the geographical proximity of resident populations to grocery stores, supermarkets and outlets selling nutritious food - or financial access - measured in terms of affordability of such foods (US Department of Agriculture, 2011; Walker et al., 2010). Implicit in these categorizations of food deserts, but absent in most studies (see Gordon et al., 2011 for an exception), is a measure of relative access to healthy and unhealthy foods.

This project investigates the influence of relative access to healthy and unhealthy foods (fast foods) on health outcomes of study areas and discusses its implications for the typification of food deserts. The need for

incorporating a measure of relative food access is hypothesized for two reasons: (i) For low-income populations who are food insecure or have insufficient transportation, consumption is not only about what foods are close and affordable but what foods are closer and more affordable; (ii) Food consumption is behavioral; shifting consumption habits towards healthier alternatives involves changing relative access. Evidence for the latter can be found in studies which show that introducing fresh food options does not significantly change consumption practices.

I define three measures of relative food access for each spatial unit in the sample dataset: (i) relative physical access, or the difference between the average distance to a healthy versus unhealthy food establishment; (ii) relative count - the ratio of the number of healthy to unhealthy food establishments; (iii) relative affordability or price difference between an average healthy meal and an average unhealthy meal.

Building on previous methodological approaches which incorporate GIS analysis (Charreire et al., 2010) and market basket studies (Short et al., 2007), I construct a sample dataset for selected census tracts in cities of Upstate New York - Syracuse, Rochester, and Buffalo – using a combination of primary and secondary data sources. Four main categories of data are included: (i) GIS data from online maps for the geographical location of large grocery stores, smaller supermarkets and five of the most common fast-food chains; (ii) Market basket data (physically collected) for prices of a standard, average, nutritious and less nutritious meal; (iii) Health outcomes at the census tract level – rates of heart disease, high cholesterol, and diabetes - from the databases of the 500 Cities project (2016-2019) conducted by the Center for Disease Control; (iv) Place-specific attributes such as income levels, racial composition, and vehicle access from the US Census and Food Access Research Atlas of the US Department of Agriculture.

Using GIS techniques, spatial statistics, and econometric analysis, the project analyses how relative access to healthy and unhealthy foods influences critical health outcomes. Findings from this research provide evidence for a more nuanced classification of food deserts: one that combines multiple access indicators and combines both healthy and unhealthy foods. An extension of this project develops a spatial kernel estimator for health outcomes in terms of food access. Policy implications for this include advancement of a statistical technique for situating and pricing food outlets to improve public health outcomes.

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Key Words: Food Deserts, Public Health, Food Security, Geographical Information Systems, Spatial Analysis

#### **“ASSESSING THE PHYSICAL FEATURES AND BARRIERS OF NEIGHBORHOOD PARKS/PLAYGROUNDS TO PROMOTE PA IN ALL AGE GROUPS – A CASE STUDY OF KARACHI, PAKISTAN.”**

Abstract ID: 952

Individual Paper Submission

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Parks and playgrounds are community assets which are considered to promote PA and leisure activities among all age groups. Neighborhood parks are not only meant to support different physical and recreational activities but also engage people in different kind of social interaction. Although neighborhood parks must function in a way to cater to the requirements of all age groups, but not all parks/playgrounds are designed to reflect this approach in practice. Previous studies confirm the strong relation between increase hour in parks/playgrounds use and the availability, quality, and safety of the design features of parks/playgrounds. The overall design of the parks/playgrounds determines how the park will be used by different age groups. One cross sectional study between US and UK parks also revealed that “innovative design” of a playground increase (double) park use and PA among various age groups. According to some studies, increase in number of play elements and structures also contributes to increase in PA in children. Park choice behavior is believed to be age dependent: for example, some studies suggest that children and youth/adults use parks/playgrounds more than older adults and senior citizens.

This comparative study intends to examine how various design approaches, facilities and features in different neighborhoods parks/playgrounds contributes to increase in PA and parks/playgrounds use in all age groups in Karachi, Pakistan using “System for Observing Play and Recreation in Communities (SOPARC)”. This study also explores barriers and missing of those design approaches, facilities and features in different neighborhoods parks/playgrounds which substantially decrease PA and parks/playgrounds use in all age groups. A random sample of approximately 50 to 60 neighborhoods parks/playgrounds in all three SES is assessed to evaluate how different age groups use parks/playgrounds based on their needs and choices, related to their age. Various categories of age include children, teenager, youth /adults, and senior citizens. A mixed method approach of data collection and analysis is used i.e., quantitative, and qualitative and ArcGIS/GEE were used to further analyzed the data spatially.

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Key Words: Built-environment Features/Barriers, Physical Activity, Parks/Playgrounds, Age-groups, SES

#### **SOCIAL CAPITAL, COMMUNITY ADAPTATION, AND FOOD SECURITY: A CASE-STUDY OF AGRI-FOOD COMMUNITIES OF UPSTATE NEW YORK**

Abstract ID: 966

Individual Paper Submission

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Overview: This paper, part of a doctoral dissertation, reports analyses from a survey of producers in Upstate New York, which aims to understand how social capital has mediated their production and marketing adaptations during the pandemic. Findings aim to forward research on community resilience, adaptation, and cooperative ownership of local economic resources.

Background: Disruptions in global food chains due to COVID-19, in tandem with the economic downturn, is exacerbating food insecurity world over; this has disproportionately affected low-income communities and racial minorities. Demand and supply distortions across agri-food processing, retail, and labor, have resulted in a paradox of food shortages on the one hand and food wastages in farms on the other, which point to a breakdown of global supply chains. This study is motivated by media reports which suggest that smallholder agriculturists within local food systems have experienced a spike in demand (Robey, 2020); and have utilized connections with other farmers and local consumers – their social capital, in other words - to develop alternative production and marketing strategies (Mohs, 2020), and consequently ensure continued food supply within the regional food system.

In academic literature, social capital – trust, cooperation, membership in groups – has been linked to food security, producer cooperatives, direct marketing, and other successes of local food networks (Cone & Myhre, 2000; Uphoff & Wijayarathna, 2000). It has also been indicated in studies of disaster mitigation and resilience (Aldrich & Meyer, 2015) although its links to adaptation in situations of economic shock are understudied.

Hypotheses: Resilience here, is hypothesized as an interplay of three factors: (i) Greater product diversity and access to social capital in small farms enable them to better respond to systemic shocks; (ii) Supply chain resilience is a tradeoff of spatial proximity between localized actors which contributes to less disruption, but fewer redundancies which results in overreliance on nodal actors; (iii) Product diversity and spatial proximity create opportunities for local food systems to adopt cooperative, closed loop, and resource efficient practices. This study thus attempts to understand the adaptive strategies that local food actors have adopted in response to the pandemic and how access to different forms of social capital has influenced their ability to adapt.

Methodology: This paper reports findings from a survey administered to producers in the agri-food industry in Upstate New York in partnership with Cornell Cooperative Extension's on-ground network of farmers. This survey covers pre-pandemic operations, adaptations to the disruptions of the pandemic, and social capital access of the respondent. Using a combination of econometric and spatial analysis, results investigate the role that social capital plays in local community adaptation in times of economic stress.

Implications: Practical implications of this study are ongoing efforts by civil society organizations and local governments (including New York State) to strengthen local food and stimulate local economies in depressed regions. Academic contributions of this project include efforts to examine the interrelations between social and spatial natures of resilience and understand its implications for economic policy.

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Key Words: Community resilience, Social capital, Economic development, Agri-food systems, COVID-19

## LOCAL INSTITUTIONS AND COMMUNITY HEALTH POLICIES: A COMPARATIVE ANALYSIS

Abstract ID: 982

Individual Paper Submission

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This research aims to understand the role of local governments in community health planning and services during public health crises. While much has been written about the need and process of local government emergency planning, there is limited knowledge on the effect of local institutions on emergency planning efforts taken by local governments, particularly in the context of community health. Crisis management policies are often shaped by local institutions and require collaborative governance as well as leadership (Kapucu and Garayev, 2011; Kapucu, 2015). Among different forms of formal local government institutions (that include Mayor-Council, Council-Manager, and Commission form of governments), studies have emphasized on the effectiveness of Council-Manager form of government in executing policy-making leadership (Zhang and Feiock, 2009; Zhang, 2014). City Managers have been found to effectively lead collaborative governance because of their managerial expertise, ability to facilitate citizen engagement; and communicate and collaborate across various agencies—factors that are instrumental in decision-making during a crisis.

We examine the effect of local institutions on community health policies among local governments in Florida (n=30) and Pennsylvania (n=70) during the COVID-19 pandemic. Based on responses provide by 100 local governments, our preliminary analysis suggests 3 major findings. First, results of Fisher's Exact Test suggest that local governments in Florida tended to be more proactive in COVID-19 response compared to Pennsylvania -i.e., rolling out public awareness campaign, providing masks, sanitizers, medical supplies, expanding services to homeless and elderly people, reaching out to businesses to take protective action, and taking community input in COVID19 response. Second, we found evidence that there is a positive association between local institutions and perceived effectiveness of public health strategies during COVID-19, i.e., compared to other forms of local governments, a council-manager form of government was more likely to report COVID-19 testing as an effective measure. While the association is positive and statistically significant, it is relatively weak (Somers' d = 0.161, p=0.068). Finally, local governments with council-manager form of government also tended to be more proactive in collaborating with other stakeholders when developing community health response strategies, for example—reaching out to private businesses during the pandemic ( $\chi^2(1, N = 100) = 2.667, p=0.10$ ).

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Key Words: Formal Institutions, COVID-19, Community health planning

## RISK COMMUNICATION AND INSTITUTIONAL RACISM: THE PROTECTIVE HEALTH EFFECT OF REFUGEE COMMUNITY ORGANIZATIONS

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The COVID-19 pandemic has had a greater health impact on ethnoracial minorities and other vulnerable socio-economic groups (Webb Hooper, Nápoles & Pérez-Stable, 2020; Antwi-Amoabeng et al, 2020). Resettled refugees and immigrants can be characterized as a vulnerable group during the pandemic, despite the absence of health data by immigration status. When resettled refugees enter the U.S., they are largely exposed to adverse social determinants of health (SDH) (Vargas, Sanchez, & Juárez, 2017). Community involvement, especially of vulnerable populations, is an essential public health response to coronavirus disease 2019 (COVID-19) (Marston, Renedo & Miles, 2020). Yet, our research demonstrates that communities of refugee background rarely belong to networks of urban governance (Gonzales Benson & Pimentel Walker, 2021). This study documents the efforts that Refugee-led Community-Based Organizations, henceforth, RCOs underwent to participate in public health responses to COVID-19 and offset its detrimental aggravation of the (SDH) in their communities.

Given the importance of community involvement in containing infectious diseases, we documented, via the Daily Summary of Activities surveys and in-depth interviews, the range of social support that RCOs provided in the early months of the pandemic. The survey was developed through a collaborative process as part of a Participatory Action Research to provide tools for creating and maintaining a record of activities that could help RCO with grant writing and record-keeping. The survey tool was developed, tested, and adapted with refugee leaders. Based on RCOs' use and access to technology, we developed a short Qualtrics survey that allowed respondents to fill a summary of their daily community and organization-related activities in under one minute. The co-developed survey recorded RCO activities to support individuals and families. We analyzed 1074 responses from 16 RCO leaders regarding their activities to serve Bhutanese and Congolese communities during March - September 2020. Remote interviews with each refugee leader took place in the first two months of the pandemic and then in the end of summer 2020. The interviews contextualized RCO leaders' involvement with the health care system and built from an ongoing Participatory Action Research that started in 2018, with three RCOs in a U.S. midwestern county.

Our study finds that the three RCOs (one of Bhutanese and two of Congolese background) played an important role protecting their community members by: 1.-providing support services to offset the pandemic shocks and, 2.-fighting institutional racio-ethnic bias in healthcare systems, social services, and labor market. In the absence of institutional support systems, RCOs became the main conduit for delivering culturally and linguistically responsive health information and in some cases, safety equipment during the pandemic. Concurrently, RCOs also educated healthcare systems about refugee needs, advocating for recognition and inclusion. Findings demonstrate the need to establish protocols for refugee community involvement prior to public emergencies, promoting mutual health literacy.

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Key Words: Refugee-led Community Organizations, Social Determinants of Health, Institutional Racism, Health Literacy, Community Participation

## **SEEDS OF RESISTANCE: COMBATING SPATIAL INEQUALITY WITH URBAN AGRICULTURE**

Abstract ID: 1002

Individual Paper Submission

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The case of Santa Ana, California provides an opportunity to investigate the relationship between food, space, and possibilities for urban agriculture as a means to acquire urban land to address food insecurity. I expect to learn about the processes involved with starting a community-owned urban farm that formed into a worker cooperative then started a community-supported agriculture (CSA) program, and seeking to scale up by acquiring more land to produce food. I propose to do a study on an urban farm organization in Santa Ana in order to examine their impact not only on local food policy but also the various networks and political actors they have ties to at varying scales (i.e., county, regional, state) and how UA can (re)shape the urban terrain. Building on Granzow and Shield's (2020) recommendation to pursue how UA tactics can be scaled up and institutionalized in ways that might better effect change (p. 295),

My case is puzzling because city-owned community gardens normally address personal food cultivation, community building, and add green spaces to the city, but are not typically started with the intention of creating systems change to the local economy, food systems, and/or policy changes. Past scholarship on urban agriculture has focused on communities that have lost gardening and farming space or the individual benefits of gardening. Not only does Santa Ana's community-owned urban farms provide residents green spaces to host events build community but they are scaling up urban agriculture in the city as part of a larger movement for racial, economic, and environmental justice that seeks to regain public lands to help combat spatial inequalities disproportionately affecting working-class, immigrant, and communities of color.

By comparing Santa Ana's city-owned community gardens and community-owned urban farms, I plan to conduct a qualitative study examining how under-resourced communities acquire and sustain resources for urban agriculture drawing on resource mobilization theory (McCarthy and Zald, 1977). Urban agriculture refers to not only intensive urban food production but also the strategies employed by advocates (Granzow and Shields, 2020) to advance a progressive food policy agenda and (re)shape the urban landscape to better meet the needs of the community. Santa Ana's community-owned urban farms seek to address spatial inequalities caused in large part by gentrification, where redevelopment projects for housing, shopping centers, and transportation have "routinely spatially alienated Latina/o, the working class, and immigrant residents" of Santa Ana and shaped the built environment we see today (Gonzalez, 2017). Recently, the COVID-19 pandemic has exacerbated an already challenging set of circumstances for working families of Santa Ana, affecting even the most basic human needs, like food, for the city's most vulnerable residents: working families, immigrants, and communities of color.

While it is not uncommon for communities to start community gardens for a variety of reasons, some of those reasons even overlap with the goals of Santa Ana's community-owned urban farms like creating green spaces that are social and foster community, community gardens do not normally (a) seek community-ownership of land (b) seek to make healthy and culturally relevant food accessible for all residents, or (c) seek to address structural inequalities through policy changes. My study aims to understand how Santa Ana's first community-owned urban farms operate compared to city-owned community gardens, as a small group of individuals has been able to harness the necessary resources to acquire unused urban land for urban farming.

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Key Words: urban agriculture, food sovereignty, social movements, urban politics, food systems

## USING ADVANCED ANALYTICS TO IMPROVE GRANULAR ACCURACY IN IDENTIFYING FOOD-INSECURE POPULATION, THEIR SOCIO-ECONOMIC CHARACTERISTICS, AND PREDICT FOOD SERVICE DEMAND AT THE NEIGHBORHOOD LEVEL

Abstract ID: 1006

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Food-insecure areas in the US metropolitan regions face substantial challenge in identifying precise locations of the vulnerable population and to accurately estimate the demand for food related services. Currently available identification methods, such as the ones used by USDA, rely on broad strokes to delineate the entire ZIP codes or Census Tracts as 'probable food deserts'. On one hand this method is less reliable in making precise demand estimates causing already resource-strapped service providers to adopt arbitrary estimation, while on the other hand a large section of the impacted population gets unnoticed or underserved. Hence, in absence of an accurate data-centric estimation method, there is substantial misalignment between the service providers' perception of demand and the actual service needs of the people in food-insecure neighborhoods. This paper focuses on using granular geospatial data and advanced analytics to identify such neighborhoods, their socio-economic characteristics, and predict the demand for food service. The outcome of this exercise is expected to provide accurate estimation for local and regional agencies - including governments, non-profits, transit authorities, etc. - to make operational decisions.

The USDA identifies Census Tracts as low-income low-access if more than 20% or more of tract population are under poverty and 33% of the tract population are more than ½ mile in urban areas (10 miles in the case of rural tracts) away from a supermarket or a large grocery store, and other measures of accessibility and income such as vehicle ownership, dependency on public transportation, participation in Federal food assistance programs, etc. (USDA, n.d.) While a broad delineation of food insecurity at the tract level is adequate for determining the amount of federal or state assistance allocated to the localities for addressing the issue, this delineation is not particularly useful for the service providers to make resource allocation decisions. The limitation of this approach is widely acknowledged in the current literature including (McEntee & Agyeman., 2010; Morton & Blanchard, 2007).

Neighborhoods with food insecurity share remarkably similar distress indicators such as poverty, blight, unemployment, high crime, diminished accessibility, poor health, homogeneity of minority races, concentrated poverty, higher population density, low performing schools, and increased reliance on supplemental nutrition programs such as SNAP and WIC (Coleman-Jensen et al, 2019; Beaulac, Kristjansson & Cummins, 2009).

The tools to address food insecurity adopted by the communities, local governments, or non-profit organizations may come in a variety of forms such as food pantries, soup kitchens, community gardens, urban farms, mobile grocery stores, etc. However, accurate delineation of food insecurity at the neighborhood or street level, granular demand projection, and better understanding of the socio-economic and cultural makeup of communities are needed in order for the tools to achieve effective outcomes.

In this paper, we present the findings from a pilot study conducted in Richmond (Va.) Metropolitan Statistical Area to show how granular geospatial data and advanced predictive analytics could be used to (1) delineate food insecurity areas at census block level, and (2) estimate food service demand (e.g. pound per week) at the household level. We use actual grocery store addresses, and network data - composed of urban roads and sidewalks - to determine grocery catchment zones. Further, we intersect demographic and socio-economic data (including household income, unemployment, family size, age groups, race and ethnicity, vehicle ownership, reliance on public transportation, etc.) from American Community Survey (ACS) with tax parcel data obtained from local government planning departments and transit service data obtained from the Greater Richmond Transit Authority (GRTC) to build our predictive models.

We conclude by identifying relevant factors needed to delineate food deserts and to conduct demand projection that can be adapted to other metropolitan regions.

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Key Words: Food insecurity, Predictive modeling, Demand forecasting, Geospatial methods

#### CONCEPTUALIZING URBANIZING FOOD SYSTEMS DIMENSIONS OF ACCESS

Abstract ID: 1051

Individual Paper Submission

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While the majority of studies are focused on objective measures of access, much less have explored the concept of food access. In a previous paper, one of our authors applied Penchansky and Thomas' (1981) concept of health access to the concept of food access. Though helpful in highlighting five critical dimensions of food access while also capturing broader themes of spatiality, temporality, objectivity and perception, our

colleague's conceptualization does not provide a way to analyze the cause-effect interactions between the five dimensions and the urbanizing food environment. In this study, we argue that expanding and modeling the dimensions of access and their interactions is critical to the analysis and decision-making initiatives of sustainable urbanizing food systems. With the use of spiderweb diagrams, we demonstrate the degree of interactions among the five dimensions with respect to the societal elements of perception and objectivity. We used the DPSIR causal framework to analyze the cause-effect relations between the five dimensions and the DPSIR components: drivers, pressures, state, impact, and response. The five dimensions are further conceptualized for spiderweb and DPSIR for low, medium and high interactivity. The conceptualizations are applied to three case studies from the literature.

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Key Words: Food Access, Drivers, Pressures, State, Impacts and Response (DPSIR), Five Dimensions of Access, Objectivity, Perception

#### **SMALLHOLDER RESISTANCE AND RESILIENCE IN A NEOLIBERAL INDIA: A STUDY OF SUB-NATIONAL AGRICULTURAL MARKET POLICY IN KERALA STATE**

Abstract ID: 1056

Individual Paper Submission

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The livelihoods of India's nearly 126 million smallholder farmers are built upon agricultural insight and innovation born from the country's long agrarian past, but face fragility in the midst of federal strides towards an evermore industrialized and commercialized future. In the wake of the Government of India's 2020 passing of three farm bills aimed at deregulating the agricultural sector, smallholder farmers are left with significant threats to food and job security. In this context, I examine past and current federal agricultural policies in India, with particular focus on how market legislation impacts smallholder farmers. Zooming in on the Indian state of Kerala, where the 2020 farm bills have yet to significantly impact farmers, I explore how state-level policy can serve as a means of resistance against neoliberal federal policies. To capture the impact of legislative activity on smallholder farmers' day-to-day experiences, I center my analysis in qualitative interview data collected in 2018 and 2020, supplemented with government documents and statistical records. I set forth several policy-based recommendations for how sub-national governments can support the retail activities of smallholder farmers to help cultivate healthier lives and livelihoods throughout the food system.

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Key Words: smallholder, agriculture, markets, globalization, resistance

## OPPORTUNITIES AND CHALLENGES OF USING CO-PRODUCED TECHNOLOGY IN FOOD SYSTEMS MAPPING & ASSESSMENTS

Abstract ID: 1078

Individual Paper Submission

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### Background:

A regional food system (FS) is the soil-to-soil system that encompasses production, processing, distribution, acquisition, consumption, and management of food-related waste in a region. A regional FS depends on resources, technologies, stakeholders, relationships, policies, laws, and information to enable food to move from farm to plate. Across Western New York (WNY), FS activity is a key driver in the regional economy with food and agriculture playing a central role in not only local economies but also the local community fabric. Despite the many strengths in Western New York's regional FS, it is also frayed.<sup>1</sup> Low nutrient, hyper-processed foods are readily and cheaply available, while high nutrition foods are hard to come by in low-income neighborhoods.<sup>2</sup> Consolidation in the food industry has shortchanged farmers and consumers. Wages and benefits for workers in the food supply chain—farmworkers, restaurant workers, grocery store workers—who harvest, pack, process, and shelve food are limited. Farming continues to be a high risk business, especially for small and medium sized farms, and those operated by farmers of color. Times of instability such as the one during the COVID-19 pandemic illuminate and exacerbate inequities in the food system, resulting in worsening crisis-related outcomes.

### Objectives:

This study extends the argument that the concept of food environments goes beyond typical food access and food desert analysis<sup>3</sup> by examining the advantages and potential challenges of using methods of co-production and participatory mapping to create a GIS-based food systems platform.

### Setting:

This paper reflects on a mapping and food systems assessment project, Community-Centered Healthy, Equitable, Ecological and Regional Food Systems Mapping Project (CHEER), in the nine-county western New York Region. The CHEER project is a participatory and mixed methods mapping project involving inclusive planning processes where stakeholders in the WNY food system co-design an informational portal that maps and monitors problems (as the stakeholders themselves articulate) and/or opportunities.

### Methods:

The paper will draw on a reflection of the process of co-production as well as mapped and visualized data. Mapping and data visualization will be produced with open source data (e.g. New York State, USDA) using ESRI mapping technology. Information gathered from community meetings and presentations will dictate the structure and content of the data portal. These methods contribute to existing research addressing the methodological gaps in food environment analysis by incorporating components that represent a broader understanding of the regional food system.<sup>3</sup>

#### Results:

We hypothesize that food systems mapping informed by community stakeholders will produce a more useful tool for stakeholders across the food value chain to visualize and understand key information and monitor change across the regional food system. It is hypothesized that aligning stakeholders across the food system using one centralized informational platform will improve transparency and promote better community and policy outcomes.<sup>4</sup>

#### Implications for Planning Practice:

The implementation of a co-produced data portal can have a profound impact on building a deeper understanding of the WNY regional food system<sup>5</sup> and on connecting stakeholders to the many networks within the food value chain. Examining the inclusive processes of a co-produced data portal provides the opportunity to develop a methodology for collaborative mapping projects that leverage the vast array of mapping tools and technologies with the local expertise of community stakeholders creating a useful informational platform to inform and guide better policy and community outcomes.

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Key Words: Food Systems Planning, Food Environments, Participatory GIS

#### A CRITICAL REVIEW OF THE CHARACTERIZATION OF CORNER STORES NUANCED IN RESEARCH

Abstract ID: 1098

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Scholarly psyche forms the foundation for how phenomena are widely perceived, explored, approached, and evaluated. The use of terminology, their meanings, and interpretations have a critical role in depicting the nature of

food issues. There is a framing problem around how corner stores are discussed in the public health literature. Failure to accurately convey the nature of corner stores allow for a habitual misuse of scholarly language that misguides education, future research, policy, and interventions designed to alleviate burdens that affect people. Nationwide Black residents are more likely to be exposed to food environments providing unhealthy food options that increase risk of diseases, reflecting their increased likelihood to acquire such diseases. The culture of corner stores in Black neighborhoods represent one of many phenomena that has been widely explored, yet existing discourse in literature misrepresents conditions and stalls strides toward appropriate solutions.

Language should be used in such ways that expose, in a forthright manner, the the historical legacy of racism that underlie conditions in neighborhoods. The current formality and standardization of research practices regarding corner stores can silence nuances that have a vital role in influencing the health and socioeconomic situation of the Black people. Further, a lack of experiential knowledge on behalf of scholars from radically different social situations than those they aim to study further hinders clear understanding of issues. Failure to acknowledge the social conditions historically imposed and unaddressed on Black people only silences the nature of their experience thus limiting authentic resolution.

This paper unpacks the way in which the corner store literature frames problems. The paper identifies and critiques themes and language emerging from the existing literature. These critiques are informed by experience, historic documentation, and analytical constructs deployed in the Black Studies literature.

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Key Words: corner store, food systems planning, food apartheid, eating behavior, Black food geography

## **POSTERS**

### **PHYSICAL AND MENTAL HEALTH DISPARITIES BETWEEN MIGRANT AND NON-MIGRANT FAMILIES: THE CASE OF DEARBORN, MICHIGAN**

Abstract ID: 156

Poster

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Studies have shown that cultural changes can positively or negatively affect psychological, behavioral, and physical outcomes when different cultures come into continuous contact (Leopoldo 2003, Berry 1992, Amer 2007). Most of the changes occur in the non-dominant group (migrants) due to the settlement in the dominant sub-group society (Berry, 1992). The majority of research done in the United States and North America has focused on these changes for larger immigrant and minority groups such as Hispanics/Latinos and Asians (Amer, 2007). However, in the United States, we have a sub-group that is largely understudied, resulting in misunderstood data in mental and physical health; Arab Americans (Amer 2007, Abuelezam 2018). Arab American's in the U.S. are categorized as "Caucasians or whites," misleading the use of data for both sub-groups, "whites" and Middle Easterners. This discrepancy leads to misidentification, identity crisis, and an overlook on a minority sub-group facing critical health problems that

omits them from receiving proper social services and appropriate healthcare (Amer 2007, Bertran 2017). Using the random sampling method, we sent out 4,000 postcards linked with an online survey to households in Dearborn, Michigan, to collect data on physical and mental health from Middle Eastern households and non-Middle Eastern households. Dearborn is characterized as being 90% white (U.S. Census 2019), when in actuality, about 30% of the residents are Arab, making it the area with one of the largest Arab concentrations in the country (U.S. Census 2003). We proceeded with an approximate 10% response return rate with a sample of 360 used to determine mental health disparities and behavioral habits (cigarette/tobacco/alcohol consumption and eating habits) before COVID-19 and since COVID-19, physical health disparities (obesity and chronic illnesses), and the role of built-environment and socio-economic status on these health indicators. Through inferential statistics and logistical regressions, our results indicate that Middle Easterners experience higher mental health problems such as greater feelings of restlessness, fear of physical health, less feeling of happiness, and other indicators of stressors before and since the COVID-19 pandemic. We also found that Middle Easterners are less likely to have healthcare coverage than non-Middle Easterners coinciding with our finding of less likelihood to visit a doctor or health facility. Further, in our sample, Middle Easterners earn much less in annual income and have much less educational attainment than non-Middle Easterners. However, our sample showed that Middle Easterners are less likely to be obese and have chronic illnesses than non-Middle Easterners, although there were no significant differences in eating habits. We examine Dearborn's built environment to discern the accessibilities to health facilities, groceries, and walkability to determine our recommendations to improve mental and physical health and accessibility to facilities.

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Key Words: health disparities, acculturation, built environment

#### HOMELESSNESS AND PERCEPTIONS OF INSECT-BORNE DISEASE RISK IN A CHANGING CLIMATE: A STUDY OF THE UNSHELTERED POPULATION IN CAMBRIDGE, MASSACHUSETTS

Abstract ID: 559

Poster

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This project examines how people experiencing homelessness manage risks posed by insect-borne diseases. Concerns over risks posed by insect-borne diseases have increased with realization that climate change is expanding the range of many insects responsible for such diseases. The rise in insect-borne illnesses is captured by the increasing number of US cases of Eastern Equine Encephalitis (EEE), which resulted in 13 fatalities in 2019. Reflecting these worries, cities are taking steps to protect residents. For example, in response to the 2019 EEE



outbreak, some municipalities placed curfews on public parks. In Cambridge, MA, the city posted warning signs in parks calling for vigilance and outlining safety measures. Such measures involve not staying in parks at night and wearing appropriate clothing and insect repellent. Nonetheless, many of these same parks are home to growing populations of unsheltered people who are particularly vulnerable to the risks posed by insect-borne diseases. This project asks if unsheltered people are aware of insect-borne disease risks, whether they take steps to protect themselves from such illnesses and, if so, what those steps involve. Furthermore it seeks to understand how cities might better protect their unsheltered populations from the growing threat to health and well-being posed by insect-borne diseases.

Homelessness is a growing challenge globally. In the United States, over 3.5 million people experienced homelessness in 2013 (Liebler et al., 2016). Broadly, the homeless population can be divided into two sub-populations: the sheltered, who reside in emergency shelters, transitional housing or safe havens, and the unsheltered, who stay in places not primarily intended for habitation, such as on the streets, and in abandoned buildings, vehicles, or parks (Solari et al., 2014). Virtually all studies of diseases in the homeless population have focused on the sheltered. For example, several studies have identified the diseases and conditions common within the sheltered homeless population, including tuberculosis (Badiaga et al., 2008). These studies have resulted in proposed and implemented interventions, such as shelter-based health screenings. However, such studies have generally failed to consider the unsheltered population, and this is also true with respect to studies of insect-borne illnesses, which have been limited to such topics as bed bugs and body lice infestations in shelters (Leibler et al., 2016).

The method of data collection for this study focuses on interviews. Eight-five unsheltered Cambridge residents who sleep out of doors were interviewed in 2019. The interviews asked where people spend time and sleep and how they do or don't manage risks from insect-borne diseases. Data analysis involved, first, coding answers to interview questions, by assigning answers to non-overlapping categories. Then, the more detailed answers to interview questions were used to contextualize patterns in these initial findings and present a nuanced picture of how the unsheltered population in Cambridge manages risks posed by insect-borne illnesses. Ultimately, the results show that these risks are of considerable concern to the interviewees and that virtually all interviewees have concerted strategies they deploy to minimize their exposure to, and risk from, insect bites. These strategies provide the basis for recommendations cities can adopt to better protect unsheltered residents and to reduce broader risks posed by insect-borne illnesses, which are expected to increase with climate change.

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Key Words: Homelessness, displacement, insects, health, climate

#### HEALTH-RELATED NONPROFIT RESPONSE TO CONCURRENT DISASTER EVENTS

Abstract ID: 612

Poster

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Disaster recovery research has historically been associated with governmental action (Pathak and Ahmad 2018; Phillips 2015) as is often assumed that governments are better positioned in providing aid in the interests of the public (Bisri 2013; Carlson et al. 2017; Davison et al. 1997; Pathak and Ahmad 2018). However, recent research has shown that hierarchical and rigid governmental structures are often not capable of meeting recovery needs (Olshansky, Hopkins, and Johnson 2012), and may lack capacity to adapt to catastrophic events (Lindell, Prater, and Perry 2006). Therefore, current disaster recovery research is often characterized by the rise of nonprofit activity (Ganapati 2009). With more horizontal and adaptive structures, nonprofit organizations are better at building social cognition, promote social trust and reciprocity which in turn fosters social capital (Ganapati 2006; Islam and Morgan 2012). This study examines recovery actions of nonprofits within the health and related community development sectors in response to compound and consecutive disasters

Despite researchers and policy practitioners commonly agreeing that nonprofits are important to recovery, we continue to lack critical insights into how these stakeholders navigate recovery themselves, the challenges they face in providing key recovery services and how they adapt to the recovery situation as it evolves. We especially lack information on how nonprofits navigate cascading, compound, and consecutive disasters which may reduce their capacity to perform recovery functions or interact with other stakeholders such as governmental agencies and local residents. This study examines nonprofit experiences with recovery service provision in the context of three consecutive and simultaneously occurring disasters in Puerto Rico, namely, the 2017 Hurricanes Irma and Maria, the 2020 Southwest Puerto Rico Earthquake Sequence, and the 2020 COVID-19 pandemic.

The study poses two main research questions: (1) how are challenges posed to nonprofits operations compounded over multiple disasters; and (2) how does a nonprofit's experience with service provision in one type of disaster event help them to prepare or respond to a different type? The proposed article focuses on these gaps in the literature in the context of Puerto Rico that has recently been impacted by multiple major disasters, including the 2017 Hurricane Maria, the 2020 Southwest Puerto Rico earthquake sequence and the ongoing COVID-19 pandemic. The study's main data collection method includes phone surveys with non-profit agencies (n=300), including those that are health-focused and/or that undertake health-focused initiatives. The surveys are supplemented with longitudinal data from Form 990 Returns filed by nonprofits (available through GuideStar) as well as with in-depth, semi-structured interviews with nonprofit agencies' leadership (e.g., executive directors) and staff most knowledgeable of these agencies' ground operations (e.g., project managers and field workers) (n=40).

Our research finds that health and non-health focused nonprofits in Puerto Rico were able to use their Hurricane Maria and earthquake experiences to become more efficient at facilitating information flow, fill resource gaps, and mediate between the government and residents in recovery planning efforts during the COVID-19 pandemic. During Hurricane Maria and 2020 earthquakes nonprofit organizations changed their missions, programs, and target populations in order to adapt to the current public health crisis. Our research also shows that in order to build capacity they engaged in a variety of capacity-building strategies, including information-seeking, networking and resource sharing. Our research can help planners, emergency managers, governments, and other stakeholders to better engage with nonprofits during recovery from compound and consecutive disaster events. This study is supported by funds from the Center for Disease Control (CDC), and the National Science Foundation (NSF) received through the Natural Hazards Center at Boulder CO.

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Key Words: Non-profits, concurrent events, disaster planning, health

## UNPACKING THE IMPACTS OF NEIGHBORHOOD ENVIRONMENTS ON INDIVIDUAL DEPRESSION BASED ON DEEP LEARNING TECHNIQUES

Abstract ID: 614

Poster

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Depression is a growing concern in Korea, in particular, due to the increasing appeal of "work-life balance" and "healthy" lifestyles. Depression reduces the individual quality of life and even leads to suicidal thoughts and behavior. Korea's suicide rate is the highest among the Organization for Economic Cooperation and Development (OECD) countries, and depression has been considered as one of the critical factors affecting suicidal thoughts and behavior in Korea (Shin et al., 2017). In response to this situation, there is a growing interest in various environmental components that may affect individual mental health and depression.

Multifaceted factors, especially in terms of socioeconomic attributes, social environments, and individual physical activity and health-related characteristics, may affect individual mental health and depression. Many public health studies point out that individual and social attributes (e.g., age, social support, etc.) are significantly associated with mental health and depression (Domènech-Abella et al., 2020). However, beyond such characteristics, neighborhoods where people live may substantially influence residents' mental health. For instance, neighborhoods with higher levels of green space may reduce individual depression, whereas distressed communities with higher noise, air pollutions, and crime rates may exacerbate residents' mental health (Miles et al., 2012). Despite many studies showing the relationships between neighborhood conditions and individual mental health, there is a limited understanding of the mediating effects of physical activity and walking behavior on individual depression level. Furthermore, most existing literature on the impacts of neighborhood conditions on mental health is limited in identifying neighborhood environments because previous studies rely heavily on surveys to measure neighborhood conditions. Our study fills this gap by examining the mediating effect of physical activity and walking behavior on depression based on deep learning techniques.

We conducted a household drop-off survey of 1,000 residents aged 19 or older in Seoul, Korea, in order to specify the relationships between neighborhood environments and individual depression. The survey questionnaires included various socioeconomic attributes, social environments, and individual physical activity and health-related characteristics. Based on the data, we used the structural equation model (SEM) to examine the mediating effect of physical activity and walking behavior on the depression level and the identified factors (e.g., neighborhood environments) related to physical activity, walking behavior, and depression level. Individual depression was measured by the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 consists of nine questions and is designed to

answer each respondent's experience and corresponding situation related to depression in the last two weeks. Physical activity and walking behavior were identified by the frequency of walking, medium-intensity and high-intensity exercises, and the average daily performance time. Notably, this study employed deep learning techniques, based on the semantic segmentation using Google Street View (GSV) panoramic images, to estimate respondents' neighborhood environments (e.g., mixed land use, green area ratio, and accessibility to amenities). This approach has the advantages of high accuracy and low cost compared to the survey to identify neighborhood environments (Ki and Lee, 2021). We also included various identified factors related to individual depression level such as socioeconomic characteristics (e.g., gender, household income, education, etc.), social supports (i.e., measured the Multidimensional Scale of Perceived Social Support Scale), and individual health-related and behavior attributes (e.g., BMI, regular meal, deep sleep, and non-smoking and drinking). The results of this study could be used as a guideline for supporting policies to identify and improve neighborhood environments alleviating individual stress and depression.

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Key Words: mental health, physical activity, neighborhood environments, deep learning, mediating effects

#### IMPACT OF COVID PANDEMIC ON UNIVERSITY FOOD PANTRY PATRONS

Abstract ID: 776

Poster

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The COVID-19 pandemic has revealed some limitations and challenges in systems established to provide food security to the neediest families and individuals. Food insecurity is defined as the feeling of having the inability to access or afford nutritious food to feed oneself or one's family (Hunger + Health, Feeding America, n.d.). Since March 2020, restrictions and social isolation have had pronounced effects on behaviors (regarding food procurement and consumption) and food security for many university students studying in the U.S. International students suffer from food insecurity due to their limited access, acculturation, and budgetary constraints while studying at US institutions (Kim & Cronley, 2020; Soldavini & Berner, 2020; Sherry, Thomas, & Chui, 2010). Stress can be categorized as physical, mental or psychological, psycho-social stress and psychospiritual stress (Friedman, W.J., 2020). While physical (Keenan, Christiansen, & Hardman, 2021) and mental stress (Martin, Maddocks, Chen, Gilman, & Colman, 2016) have been associated with food insecurity, the other two have not been linked in combination with physical and mental stresses.

Many institutions provide access to food banks on campus to help students to avail foods at no cost to them. Using logistic regressions, this research study aims to assess stress related to food insecurity during the COVID-19 pandemic for students (n=78) using a food pantry at a large research university. Out of 78 responses, 85% were students 15% were non-students, 53% were international and 80% were responsible for grocery shopping. The results indicate food insecurity is statistically significantly related to physical stress ( $p < 0.05$ ), and physical and mental

stress combined, and total stress (all four included) but not mental, psychosocial and psychospiritual stress individually. Access to food pantry is also statistically significantly related to food insecurity. Recommendations for institutions to improve ‘means of access’ for students facing food insecurity and tap into local social and cultural organizations for off-campus students to access foods are discussed.

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Key Words: Food insecurity, Access, Student

#### AIR POLLUTION AND SPATIAL HETEROGENEITY IN PNEUMONIA MORTALITY

Abstract ID: 934

Poster

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Air pollution by particulate matter has seriously threaten individual health worldwide. Particulate matters are very small and easily absorbed into the body, thereby leading to respiratory disease such as pneumonia when exposed for a long time (Kyung and Jeong, 2017). Exposure to particulate matters also affects the shortening of life expectancy (Brunekeerf, 1997). The understanding of the spatial relationship between particulate matters and health is critical in order to effectively control air pollution. Although there are a few studies using spatial analysis (e.g., Chu et al., 2015), there are a few studies analyzing spatial heterogeneity between particulate matter and pneumonia deaths (e.g., Zhang et al, 2019). However, there is no study that have been conducted across the country. Given that physical and socio-economic characteristics differ by locality, the effect of particulate matters may vary by locality. For example, the magnitude of particulate matter effect may be lower in rural areas because air ventilation is easier compared to urban areas. In this regard, this study asks the following research questions: Does the impact of particular matters on pneumonia deaths differ by geographic location?

To examine the research question, we use the Cause of Death Data in Korea and use the pneumonia mortality at the local level as a dependent variable. For the independent variable, we use the local levels of PM 2.5 and PM10, the major types of particulate matters. Additionally, we include physical environmental factors (e.g., population density, urban area ratio, green area ratio), socioeconomic factors (e.g., poverty ratio, self-reliance ratio of local finance, number of hospital), and policy factors (e.g., disaster management budget). We employ a geographically weighted regression model that can estimate spatially varying effects of particulate matters and other factors affecting local pneumonia mortality. The empirical results show that the impacts of particulate matters on local pneumonia deaths vary by locality.

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Key Words: Particulate Matter, Air Pollution, Pneumonia mortality, Spatial Analysis

## **DIAGNOSING PEDESTRIAN WALKING BEHAVIORS AND ENVIRONMENT FEATURES WITH WEARABLE SENSORS - TOWARD SAFE AND HEALTHY COMMUNITY**

Abstract ID: 1058

Poster

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Walkable environment can be facilitated or constrained by the characteristics of built environment features. Disordered and unpleasant neighborhood environment holds up physical activity of residents. Therefore the diagnosis of facilitators and barriers to walkable environment is a critical step to design active, safe and healthy community. To investigate the conditions of walkable environment, the development of a high-quality and reliable assessment framework and tool is essential. Conventional methods are perception surveys and visual audits. However, these approaches are influenced by respondents' subjectivity and do not adequately handle the differences of various population groups while the influence of barriers and facilitators of physical activity changes by age, health conditions, and the ability to perform some activities. To address the research gap, the research team proposes an innovative and noble approach to assess the built environment using physical body responses with wearable sensors. Built environment impacts human's behaviors while walking on a path, and a body response is the reaction of a body system to a surrounding environmental stimulus. Such responses can provide beneficial information that can be used to investigate the relationship between human's activities and built environments.

The research method includes a wide array of objective measures available as well as field observation methods. The team developed a reliable community assessment tool by integrating visual audits with sensing data. To assess types, levels, and locations of built environment features on a pre-defined path, visual audit forms were developed and used. To analyze walking behaviors, the team used acceleration signals of several tri-axial accelerometers fixed on the pelvis and ankles of participants. Spatial and temporal gait features were analyzed. To examine the relationship among features of built environment and walking behaviors, Machine Learning (ML) Model is applied. Study areas are the City of Lincoln's neighborhoods.

The findings clearly show that locations and types of built environment features are strongly associated with pedestrian's walking behaviors. To identify implication of our findings for policy, the paper discusses environmental strategies to promote positive neighborhood effects and reduce adverse effects.

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Key Words: Walkability, Safe and Healthy Community, Human-Environment Interaction, Wearable sensor

# Track 10 – Planning Education & Pedagogy

## ROUNDTABLES

### 10.137 ROUNDTABLE - INTERNATIONAL IMPACT OF U.S. PLANNING EDUCATION: THE CASE OF MAINLAND CHINESE STUDENTS

Abstract ID: 137

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At many U.S. planning programs, the twin conditions of financial reliance on international students and intellectual claims of global impact raise the question: do schools actually deliver transformative planning educations that catalyze students' careers, especially for those who return to their home countries? American academic planning programs face the conundrum of maintaining student enrollment at a time when global urbanization levels and rates underscore the need for urban planning. With domestic enrollment steadily declining, some programs have come to rely financially on international student enrollment, which peaked in 2014 at 956 but has since also steadily declined to 705 in 2019 (PAB, 2019). Meanwhile, many schools tout the global impact and aspire to train not only planning technicians but future change makers.

This roundtable explores how U.S. planning education impacts international students—both ideologically and professionally, using the case of students from mainland China as an entry point. America's pedagogical influence on Chinese planners has a long history (e.g., Wong, 2013), but since 2007, mainland Chinese students increasingly study planning in the U.S., even as overall international enrollment declines, accounting for nearly half of some master's planning programs' students. Yet, while studies have broadly examined international planning education broadly (ACSP, 2019), little research has focused on mainland Chinese students. How do their careers differ from domestic students? How does their U.S. education impact their careers in China?

The panel kicks off with a brief presentation sharing the results of a recent study that (a) interviewed around 40 alumni who graduated from U.S. planning programs then returned to China (aka haigui or "sea turtles") (Weingarten, 2020); (b) interviewed 15 planning faculty in the U.S. and China; and (c) surveyed mainland Chinese alumni of U.S. programs in architecture, landscape architecture, urban design, real estate, and planning to situate planning students' trajectories compared to those of allied fields. The findings:

1. Underscore the challenges that haigui confront due to differences in the scope of planning in China versus the U.S., the types of places that employ planners, and the skills needed to secure employment.
2. Suggest that China's rapidly evolving urbanization and planning policy landscape creates new opportunities for U.S. planning education to be relevant for Chinese students; and
3. Holds a mirror up to gaps in U.S. planning education that would benefit all students, domestic and international, if addressed.

We then open the session to a panel discussion with senior educators from the U.S. and China to collectively reflect



on the two-way transcultural impact of U.S. planning education. Questions for discussion include: What are the differences between planning in the two countries? What tensions exist between trends in U.S. planning education, especially as they relate to social equity, racial justice, and decolonization (Sen et al., 2017), and prospects for haigui graduates, whether in China or the U.S.? What do current debates and prospects for planning in China suggest about potential future learning and teaching at U.S. planning programs? How can U.S. planning programs better support international students' learning and career development?

The panel, while focused on the experiences of mainland Chinese students and China-U.S. exchange, shines a light on the limitations and prospects for U.S. international planning pedagogy more broadly. We invite anyone who teaches international students and is curious about these topics to join the conversation.

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Key Words: planning education, planning pedagogy, international students, China, diversity

### 10.196 ROUNDTABLE - ZONING FOR EQUITY: A NEW MULTI-CAMPUS COURSE AIMING TO UNDO EXCLUSIONARY ZONING

Abstract ID: 196

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In this roundtable, we will discuss an innovative course that will be offered for the first time in fall 2021 in eight accredited planning programs. The aim of the course is for students to identify policy and practices that could make zoning more equitable (we call these blueprints) and action plans for getting those policies and practices enacted (we call these playbooks).

We will capitalize on the instructors' broad knowledge of the origins of exclusionary zoning and past efforts to make zoning more equitable to develop lectures and other material that all students will engage asynchronously every week. Students will also meet synchronously weekly in two different formats. First, cell meetings will involve students meeting with other students on their own campuses to advance their work on assignments on (1) Origins (the history of exclusionary zoning in their host community/state), (2) Past efforts (past reform efforts in their community/state), and (3) Ending it here (proposed blueprint and playbook for their community/ state). Second, comparative learning labs will bring students together across campuses after each of these assignments is complete to reflect on intersections/divergences among the diverse place-based cell assignment outcomes. By the time of the ACSP conference, we will have completed two of the comparative learning labs and be starting on the Ending it Here

segment.

At least some instructors intend to establish relationships with advocacy groups and planners in their home communities before the class gets underway, tapping into local knowledge about the history of exclusion and reform as well as insights about Blueprints and Playbooks. In some cases, planners or advocates may have a specific goal in mind before the class begins (e.g., analyze and amend a city zoning ordinance, draft a legislative proposal). In others, practitioners may serve more as an audience or resource than as a client.

The four lead organizers of the course are proposing and will lead this workshop; we hope also to be joined by other instructors.

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Key Words: Zoning, Exclusion, Reform, Practice

### 10.251 ROUNDTABLE - PLANNING EDUCATION AND THE CLIMATE EMERGENCY: PEDAGOGY IN FIVE COUNTRIES

Abstract ID: 251

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All academics know the pace of change in program curriculums tends to be slow; unfortunately, the pace of climate change just keeps increasing. How have planning programs done in updating curricula to include climate change knowledge? In this round table, noted educators from five developed and largely English-speaking countries will briefly review their studies of the level of integration of climate into planning pedagogies, and then along with attendees, we will try to make sense of the barriers to faster change, the gaps and opportunities that different countries are finding. The studies have been designed to be internationally comparative and were organized with the United Nation's Planning for Climate Action (P4CA), which allows us to draw some broad conclusions about uptake. Similar work is planned by scholars in other global regions, and to the extent this information is available, we will present it. With this base line established, conversation will turn to the drivers for change or stasis, including student interest, accrediting and professional bodies, emerging scholars, institutional constraints and incentives, and other emergent vectors. Attendees will have the opportunity to reflect on what is working in their institution, department and country, and together we hope to draw some shared lessons on how to leverage existing resources to increase the pace of change in our curricula. We invite non-climate-specialists to attend--administrators who are seeking ways to increase climate education in their curricula, doctoral students, those who do not yet include climate issues in their own courses--alongside experienced climate change educators, to create a robust discussion of this critical issue.

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Key Words: pedagogy, climate change, international

## 10.385 ROUNDTABLE - POST-PANDEMIC TEACHING: REFLECTIONS AND INSIGHTS FROM 2020

Abstract ID: 385

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2020 changed our teaching. The abrupt switch to online learning was part of that change and in the early days of the pandemic many of us spent hours recording lectures, overhauling content, and creating new assignments. But life--and teaching--since March 2020 haven't just been about Covid-19 and technology. Among other things we've taught through a looming eviction crisis, heightened (and long overdue) attention to systemic racism, nationwide protests along with a more visible Black Lives Matter movement, contested elections and violence at the US Capitol, and economic devastation borne largely by Black and Latino women. These events, too, have pushed into our classrooms and pedagogy. They have also exacerbated the compounding issues of work, family, poverty, oppression and trauma faced by many students and faculty.

Most of us recognize that our teaching goal shouldn't be to return to our pre-pandemic normal. But without reflecting on what we have learned and experienced in the classroom (virtual or not) since last March it's difficult to understand what our new normal should be. Just as urban crises don't automatically lead to "better" or more just cities once a recovery begins, a teaching crisis like the one we've experienced since March 2020 won't automatically lead to "better" or more just courses, programs, and pedagogies, either.

The goal of this roundtable is to have a broad conversation about the lessons we might take with us from pandemic teaching. Together with our audience we will reflect on and process our experiences in the classroom and reconcile what we've lived since last March with our hopes and goals for our future instruction. Guiding questions our panelists will think about to prepare for the session include, and that we ask audience members to reflect on as well, include:

1. How did the series of events from March 2020 onwards change the pedagogy and content of our courses?
2. How do we create meaningful space for grief and processing in our classrooms?
3. Looking forward, what changes should we keep in our courses—and which should we discard?
4. How can we move towards "resilient courses," or courses built to quickly respond to events external or internal to the classroom?
5. What lessons have we learned about *\*how\** to reflect on or determine if changes to content, pedagogy, etc. are necessary in our courses?

6. What have we learned about how we relate to each other in the classroom—not just as instructor & students but as co-inhabitants in spaces of crisis?

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Key Words: education, pandemic, critical reflection

### 10.434 ROUNDTABLE - NEGOTIATION IN A POLARIZED WORLD: WHAT SHOULD WE TEACH PLANNERS?

Abstract ID: 434

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An ongoing global pandemic. Divisiveness. Partisanship. Global climate change. Sea level rise. Natural disasters. Income and wealth gaps. Tribalism. Explicit racism. These are some of the contextual challenges which planners face as they exercise their profession in communities around the country.

Do negotiations and collaborative approaches to community problems still have a place? Can divided parties come together and work out a mutually acceptable agreement? Do planners have a role here? Are they equipped with the necessary skills to foster community dialog and problem solving? Or, are collaborative decision processes obsolete and have new planning approaches and tools become necessary?

We propose that the skills of negotiation and facilitation continue to be helpful to planning professionals and have not lost their relevance despite the conflicted contexts in which planners operate. Precisely because diverse groups with competing interests and divergent values have voice and increasingly use it, planners find themselves facilitating contentious interactions while also working within constraints and mandates imposed by their own institutions. We return to a question that has been asked for several decades, but has now become more urgent: can planners facilitate protracted dialogues while also advocating for values of their profession, such as social equity, ecological sustainability and a healthy economy? How can we as planning educators help equip them for these challenging times? What are the limits to what planners can do?

Our roundtable will take on these issues; four negotiation instructors and facilitators with more than 120 years of experience between them—and different perspectives—grapple with pedagogy questions, seek consensus, and invite participants to join in the debate.

We ask:

When are negotiations appropriate/feasible/helpful in the planning context, and are there situations in which they are not?

Can negotiation techniques and skills overcome today's planning challenges? If so, how? If not, why not?

What is the role of planners in contested value spaces?

What should we teach our planning students to help them meet current community challenges and foster

deliberative processes?

What are effective methods for teaching negotiation skills?

Michael Elliott (Georgia Tech), Sanda Kaufman (Cleveland State University), Connie Ozawa (Portland State University) and Deborah Shmueli (Haifa University) will briefly present their perspectives on these questions, surfacing areas of agreement and differences among them. Then we will invite participants to join in the discussion and share their experiences and outlook. We will also discuss teaching technique, resources and examples which we have found especially enlightening and effective for students.

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Key Words: Negotiation, Facilitation, Collaborative decision processes, Analytics and decision skills, Planning tools

### **10.731 ROUNDTABLE - TRANSFORMATIVE TEACHING AND RACIAL JUSTICE: NAVIGATING POLITICS, THE PANDEMIC, AND ZOOM**

Abstract ID: 731

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From 2020 to 2021, students lived through two impeachment trials and a heavily contested Presidential election that culminated in violent riots in the nation's Capital. They are dually outraged and mobilized about police brutality, which has resulted in the unnecessary and unjust deaths of Black lives (Dave, et al., 2020; Dreyer, et al., 2020; Skoy, 2021). They are fearful, frustrated, and furious by the increased anti-Asian sentiment during the coronavirus (COVID-19) pandemic and the resulting violence and deaths (Chen et al., 2020; Gover et al., 2020; Tessler et al., 2020). Furthermore, students, their families, and their communities are dealing with economic (Blustein & Guarino, 2020; Fairlie et al., 2020; Şahin et al., 2020) and housing instability (Ong et al., 2020; Wong et al., 2020) and physical and mental health issues. Domestic violence (Boserup et al., 2020; Kofman & Garfin, 2020; Leslie & Wilson, 2020) and hate crimes (Chen et al., 2020; Gover et al., 2020) have risen during the pandemic. The cumulative effects of these traumatic events affirm our roles as educators who teach critical thinking, empowerment, equity, and justice. And all the while, students and instructors were engaging remotely.

Let's "talk story" and share our experiences, hardships, and resources (or lack of resources) about teaching in a remote/online environment. As women and/or people of color, we will discuss how developing a curriculum based on critical race theory and popular education can empower students in their academic, professional, and personal lives. We will reflect on the survival skills that we relied on as we taught in the context of our students (and ourselves) coping with the global pandemic, isolation from shelter-in-place, remote learning, teleworking, and the lessons that we can take with us as we move back to in-person teaching.

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Key Words: racial justice, transformative teaching, COVID-19, remote learning

### 10.803 ROUNDTABLE - INTERDISCIPLINARY SERVICE-LEARNING PROJECTS THAT TURN SMALL, UNDERSERVED COMMUNITIES INTO SMART CITIES

Abstract ID: 803

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 MASTERSON, Jaimie [Texas A&M University] JMasterson@arch.tamu.edu, participant  
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Smart-city technologies have shown increasing potential in addressing urbanization challenges and promoting sustainable development. While many cities around the world are seeking ways to advance a vision of becoming a smart and connected community, small and rural communities are left behind. They typically have a low population density, lack public transport services, and offer limited accessibility to daily services, making it particularly challenging for residents to fulfill their essential travel needs and access healthcare. They often lack the funding and resources to implement smart-city projects.

On the other hand, current urban planning education has yet evolved to prepare students who can adapt to rapid technological transformation and tackle real-world challenges (Grimaldi & Fernandez, 2017). In the era of smart technologies, it becomes increasingly essential for students to develop interdisciplinary study skills to synthesize the specialized in-silo knowledge and work collaboratively (Brown, Harris, & Russell, 2010; Culhane et al. 2018).

To train the urban planning students to solve real-world problems by unleashing the power of technologies, Faculty members at Texas A&M university have developed with a novel interdisciplinary service-learning pedagogical model named ENDEAVR ([www.endeavr.city](http://www.endeavr.city)). It has gained strong supports from local government and visionary leaders from the industry. Since the Fall of 2019, more than 150 students from urban planning, landscape architecture, civil engineering, computer science, visualization, and other allied disciplines have participated in this program.

The panelists will share experiences about this model and facilitate discussions that will inspire the next generation of planning education.

The roundtable panelists seek to address the following questions:

What are our student learning objectives, and how was the curriculum designed to meet these objectives?

How did we engage the community? How are we building and maintaining the long-term university-community-industry partnerships?  
What are the challenges we faced when guiding the student projects in an interdisciplinary setting?  
How do we measure students' learning outcomes?

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Key Words: Smart City, Interdisciplinary Study, Service Learning, Community Engagement

### **10.849 ROUNDTABLE - AN INCLUSIVE AND EQUITABLE APPROACH TO SUSTAINABILITY PEDAGOGY: USING THE LEED FOR CITIES AND COMMUNITIES FRAMEWORK AS A TEACHING TOOL**

Abstract ID: 849

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#### Theoretical Context

Between every growing threats from a changing climate and protests for the Black Lives Matter movement sits the important fact that climate change and justice are inextricably linked in the context of planning (Shi et al. 2016). Sustainability planning tries to address this interlinked challenge, however in practice it does not always measure up to its intentions (Agyeman, Bullard, and Evans 2002; Agyeman et al. 2016; Bulkeley et al. 2013).

Formal sustainability planning practice at the local government level in the United States began in the early 1990s (Wheeler 2013; M. J. Sirgy, Rahtz, and Swain 2006). At the time a handful of early adopter cities developed plans that specifically included the concepts of sustainability. At this time, some cities developed indicator projects to measure their progress (M. J. Sirgy, Rahtz, and Swain 2006). Specific examples include Sustainable Seattle, which was developed outside of the city government and Santa Monica, which was development by the city's Task Force on the Environment (Bertone et al. 2006). Building on this work a group of over 200 expert volunteers worked through a consensus-based process to create the STAR Communities Rating System in October of 2012 (Siew 2014).

LEED for Cities and Communities (LFC) is a sustainability framework and rating system that is built on these earlier efforts as well as incorporating elements from other rating systems and the evolving SMART Cities initiatives, of which CitiStat is a well-known example (Perez and Rushing, 2007). LFC is revolutionizing urban planning, development and operations, while also improving life for people around the world. Using the Arc performance platform, LFC projects can measure and manage their community or city's water consumption, energy use, waste, transportation and quality of life. By utilizing strategies and policies identified in credits and pre-requisites of the rating systems, cities and communities can continuously improve their performance.

Today, there are professors across the country using LEED for Cities and Communities as a pedagogical tool. However, some have noted that for any tool, it is a struggle to achieve an idealized version of sustainability that fully

integrates equity with other sustainability objectives. In this session we aim to explore this tool, discuss future directions for its integration in teaching contexts by working with cities and communities, and engage in a lively debate around areas for improvement.

#### Discussion Topics & Areas of Engagement

We have two main goals for this session. First it is to introduce others to the LEED for Cities and Community's framework (referred to as LFC below) as a pedagogical tool. Second, is to collectively explore this tool and debate its strengths and weaknesses. Therefore, this session will focus on fostering dialogue between participants and the audience. We will use the following topic areas and questions to create an open and engaging conversation:

- 1) How did you / would you use the LFC framework in your class? What preparatory learning is required to do so?
- 2) What other frameworks complement LFC? Or perform better as a teaching tool?
- 3) What benefits do you / could you see from using the framework? What draw backs did you experience from using the framework?
- 4) How could LFC address issues of equity and inclusion in the classroom and beyond the classroom walls?
- 5) How did you / could you use the framework to create an inclusive learning experience?

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Key Words: Sustainable cities and communities, equity, climate change, pedagogy



## 10.1046 ROUNDTABLE - PEDAGOGIC LESSONS FROM THE PANDEMIC FOR RESILIENT AND UNIVERSAL GISCIENCE EDUCATION

Abstract ID: 1046

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The last spring semester ended abruptly; courses were cut short with an immediate shift to remote learning. The COVID-19 pandemic has caused a reset in the way we think about teaching and learning. Although online learning was not a new discourse, the pandemic caused a forced shift to distance learning on a global scale while many educational institutions were not yet prepared for full online teaching. While the disruption and tension caused by the pandemic affect disciplines, it is more intensely felt in disciplines depending on hardware laboratories, such as Geographic Information System. A year after preparing for moving back to in-person teaching, we are left with major questions like how resilient are our education practices? Can we (i.e. educators, planners, decisions makers and learners) adapt quickly when the next unannounced disruption occurs? Is our resiliency accounting for universal teaching principles? This panel sponsored by the Center for Spatial Analytics and Visualization at San Jose State University brings in UCGIS award winner GIS educators from Hunter College and The Graduate Center of the City University of New York and San Jose State University to discuss the helpful practices for a resilient and universal GIS education, educational practices for GIS online teaching that can overcome inequities in resources and insecurities among students (e.g. unequal access to stable, GIS-appropriate devices or technical literacy), practices for achieving a resilience and universal GIS online education that meet the DEI principles, and pros, cons, nuts and bolts of GIS online education.

The panelists in this session are:

Prof. Jochen Albrecht, GISP, is a professor for computational and theoretical geography at Hunter College and The Graduate Center of the City University of New York. Having supervised the individual GIS work of over a thousand students and designed and taught more than 20 different GIS courses, he received in 2018 the University Consortium for Geographic Information Science's GIS Educator of the Year award. Dr. Albrecht currently serves on the boards of the GIS Certification Institute, the California Geographic Information Association, as well as Bay-Geo and has been on the boards of the Urban and Regional Information Systems Association, and three specialty groups of the Association of American Geographers. He is author of two books, and more than 50 refereed articles. Part of his current research is the development of a new process-oriented Body of Knowledge for GIS education that implements real-world GIS workflows derived from industrial business process models.

Prof. Rick Kos is a certified urban planner and a faculty member in the Master of Urban Planning program at San Jose State University since 2007. He serves as the department's Graduate Advisor and Practitioner-in-Residence, preparing his graduate students for professional practice in urban planning. Rick's areas of research and teaching include applications of GIS to urban analysis, community engagement in the neighborhood planning process, and transportation planning. Rick earned his bachelor's degree in environmental planning and urban design from Rutgers University and a Master of Regional Planning degree from the University of North Carolina at Chapel Hill.

Prof. Kerry Rohrmeier, AICP, is an Assistant Professor in the Department of Urban and Regional Planning at San Jose State University. Her research on arid cultural landscapes scales from regional planning, to land use planning policy, down to placemaking. As an educator she challenges students to incorporate geotechnology for data collection and GIS for spatial analysis in all her planning and methods courses.

The session will be facilitated by Ahoura Zandiatashbar, assistant professor of Urban and Regional Planning at San Jose State University.

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Key Words: GISci, Online Learning

## **INDIVIDUAL PAPER SUBMISSIONS**

### **HOW TO TEACH URBAN BIG DATA FOR TOMORROW' TOWN PLANNERS. DISCUSSION AROUND THE SYLLABI OF THE TOP RANKED AMERICAN SCHOOLS OF ARCHITECTURE.**

Abstract ID: 33

Individual Paper Submission

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Fast urbanization pace, resilience and climate change, as well as sustainability and post-COVID19 *new normal*, will represent an unprecedented mix of challenges that cities will have to face with in the coming decade. In order to be able to manage this complexity, the next generation of town planners will have to integrate their consolidate knowledge whit these new *classic* topics, aiming at enhancing a transdisciplinary and holistic approach to the urban analysis and planning process.

Alongside this evolution, and due to the development of technologies related to the Internet of Things, Artificial Intelligence, Big Data and Data Mining, our society is entered in his fourth industrial revolution. For an urban planning perspective, industrial revolutions have always represented a disruptive moment in the lives of cities. What will be the impacts of this new digital revolution on city planners university training? In answering this question, this paper aims to investigate the contribution that Urban Big Data can have within the curricula of the Schools of Architecture.

By adopting a qualitative and quantitative approach to analyse the syllabi of the top ranked American Schools of Architecture, this work aims to presents a first picture of the different approaches and contents of this promising teaching module. To design and plan smart, resilient and sustainable cities, architects and planners have to master the gathering of the urban big data and theirs use, to strength the understanding of the way in which cities lives, and dwellers habits evolves.

Syllabi reviews findings, highlight that this relative new teaching module may represent an interesting field of experimentation for shape and define the angle of attack that schools of architecture want to propose for the use of this must to have tools for all the professionals involved in the city management.

This work is intended to constitute a modest contribution to the debate on the theme of teaching urban big data in the schools of architecture. Further in-depth studies could be dedicated to the analysis of the didactic offer that other schools can provide to students involved in studies of economics and management, engineering, social studies and governance, just to name a few.

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Key Words: Urban Big Data, Urban Analysis, Urban Planning

## CLIMATE TRANSFORMATIONS THROUGH PEDAGOGICAL TRANSFORMATIONS IN PLANNING EDUCATION

Abstract ID: 103

Individual Paper Submission

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‘What does a transformative planning pedagogy for climate change look like?’

Kansas might be the last place one would think to look for the answer to this question. After all, the state is the home of the Koch brothers’ fossil fuel and libertarian enterprises that attack climate action as antithetical to ‘freedom.’ In this review, however, we synthesize interconnected streams of theory, empirical research, and practical examples that have informed our efforts at the University of Kansas to transform planning pedagogy, particularly in climate change-focused courses.

Climate transformation requires nothing short of a) addressing racism, sexism, homophobia and other forms of exclusion b) intertwined with settler colonialist and capitalist systems that c) treat land, people, living beings, and knowledge as means of production rather than inherently valuable (Johnson and Wilkinson 2020, Holthaus 2020). Simply acknowledging these daunting barriers is emotionally fraught, a point largely ignored in climate change discourse until recently. Increasingly climate scholars, educators, and activists make persuasive arguments that we must engage collectively with grief and hope, anger and joy, and other emotions if we are to understand and dismantle oppressive systems and build a sustainable and just climate future (Ray 2020, Walsh et al. 2020). Similarly, planning scholarship gradually focuses more attention on the emotional and relational dimensions of public service (Lyles and White 2019). Arguments that we must overcome our longstanding tendency to ‘plan with half a mind’ gain traction and push us to actually plan with compassion, as called for in the AICP Code of Ethics (Baum 2015). In one of the few existing pieces on climate planning pedagogy, Lyles and Stevens raise coping with emotionally taxing issues as a critical challenge for instructors (2020).

Across the globe, recent climate action developments are instructive for how to build transformational planning pedagogies. Youth-led global movements such as Fridays for Future and 350.org have harnessed righteous anger to reset the moral foundation of climate debates and inspired millions to move from concern to action. Indigenous-led direct actions center deeply relational Indigenous knowledge, wisdom, and practices as the path to a sustainable future, perhaps most visibly the NoDAPL movement in North Dakota but taking shape in thousands of locations globally (Estes and Dhillon 2019). And, the grassroots, multi-cultural Sunrise Movement prominently led by BIPOC women galvanized broad-based support for a Green New Deal grounded on principles of shared public power, distributional economic mobilization, and rectification of past injustices (Goh, 2020, Prakash and Girgenti 2020). The lessons for planning education include: 1) de-centering narrow Western, paternalistic, and hegemonic worldviews and broadening our knowledge bases, 2) empowering the voices of those who have wielded the least power historically; and 3) creating opportunities to foster shared understandings, taking time for mutual care and healing, and supporting collective action.

Our literature review spans thinkers embedded in Indigenous, Black, Feminist, Queer, and other marginalized communities, whose mediums of expression vary widely and whose ideas often challenge us to unlearn conventional, narrow, purportedly objective ways of seeing the world (c.f. Butler 2012, Gumbs 2020, Simpson 2017). We draw on conceptual insights - and point to mental and somatic practices – from contemplative spiritual lineages that elevate compassion, mindfulness, and mutual care (c.f. Armstrong 2011, Harrington et al, 2002). Further, we point to scholarship that can help us create inclusive, diverse learning environments, while paying attention to trauma-informed practices to avoid propagating harm in spite of our attentions to do the opposite (Erfan 2017, Harrison et al. 2020). Throughout, we include signposts back to the planning literature in order to locate our work in the broader network of attempts at climate transformation.

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Key Words: pedagogy, compassion, climate change, emotions, equity

### **WHAT IS GAINED AND WHAT IS LOST: MIXED-METHODS ASSESSMENT OF THE COVID-19 ON-LINE TEACHING EXPERIENCE**

Abstract ID: 222

Individual Paper Submission

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On-line teaching during the COVID-19 pandemic disrupted teaching practices in planning on an unprecedented scale. My initial focus was on loss – experiencing frames of confinement relating to losses in human connection, field work, community engagement, and group discovery. Liberating aspects of on-line teaching emerged slowly, with time and experience. This paper provides a mixed-method account of what was lost and gained in my classes, using time-series analysis of teaching evaluations and instructor self-reflection.

Pedagogy is a significant topic in the planning literature, but on-line pedagogy is less developed. Since planning involves participatory action research (e.g., Wilson 2020) at least some aspects of planning education are incompatible with on-line learning. For example, planning climate justice requires engagement with affected communities. Similarly, studio classes use group projects, tactile engagement, and group feedback to address new roles and modes of practice, all of which benefit from in-person contact (Long 2012, and Botchwey and Umemoto 2020).

The assessment reviews six courses in the undergraduate and graduate programs in Urban and Regional Planning at Cal Poly Pomona. The courses address climate change planning, theory and policy analysis, and professional practice. Prior to the pandemic, the courses were taught in-person, supported by learning management systems and some asynchronous hybrid activity (previously evaluated in Willson 2008). Data sources include two forms of class evaluations, grade performance, and qualitative reflection.

Time-series comparison of class evaluations over a five-year period show no decrease in ratings during the on-line semesters. Surveys of the on-line teaching aspects show high ratings for the classes as compared to in-person offerings (4.1/5 on Likert scale where 1 = very poor and 5 = very good). The highest preference for class structure in a post-COVID environment is hybrid (partly on-line, partly in class) offerings. These results must be interpreted with care. For example, students may have rated classes more generously because of a shared experience of gratitude – that professors and students could continue their work. Further, the students may not know what they missed in an in-person format, or prefer these classes because they ease commuting or allow more outside work.

While qualitative assessment is always justified in pedagogy questions, the visceral change in teaching modalities especially justifies it. Practices I normally relied on were disrupted - spontaneous interpersonal dynamics, teaching rituals, ability to 'read' the room, and fieldwork, and group problem solving. Disruptive visual aspects were unsettling, such as seeing oneself and experiencing students' cameras turned off. Gains include greater intentionality in course design and student socialization, democratized participation, additional discussion modalities, value-added activities through student chat, ability to call on students by name, and frictionless engagement of guest speakers and reviewers.

This research seeks to provide one professor's account that can be combined with and compared to many others to support the development of post-COVID-19 pedagogies that are true to the planning endeavor.

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Key Words: Teaching, On-line, Pedagogy, COVID-19

#### THE JOY OF MANY STORIES: ZINE-MAKING AND STORY-MAPPING IN PLANNING PEDAGOGY

Abstract ID: 500

Individual Paper Submission

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Planning education aims to actively prepare students to tackle issues of social and spatial justice. We argue that how we teach is as important as what we teach; and to that end, storytelling can play a central role in planning education. However, how storytelling can be integrated effectively in planning education remains an open question. In this paper, we reflect on our experiences of teaching two undergraduate urban planning courses centered around issues of international planning, globalization, urbanization, planning and social inequalities. They were composed of students from diverse social and cultural backgrounds, leading to tensions as well as opportunities for an enriching

classroom experience. We will critically reflect on the alternative approaches to planning education employed in these classes that centered storytelling through art-based and digital pedagogical strategies: zine-making and story-mapping. Zines allowed students to connect complex theories to their lived experiences in interesting and relevant ways. Multimedia story-mapping, incorporating audio, video, texts, and images, allowed students to collaborate through a multisensory approach in making sense of places, even those farther away from their lived realities such as engaging with faraway worlds for students from the United States.

Acknowledging the salient role of storytelling in planning is not a new turn (van Hulst, 2012). There is a slim but sustained discourse on how to use storytelling in planning pedagogy and practice. The pedagogical approaches discussed in scholarly circles have been mostly limited to using scenarios and role play in class (Meligrana & Andrew, 2003), using creative writing (Baum, 2017), critical autobiography of students with particular attention to how their social attributes have affected them (Sandercock, 2003); and using movies and reflective essays (Isserman et al, 2010). These existing pedagogical conversations around storytelling can be renewed as new generations of planning educators enter the field, and broadened to bring attention to the evolving and innovative ways in which storytelling can be centered in planning education to further students' critical thinking and collective empowerment. Continuing to intervene in planning pedagogy in order to create alternative pedagogical approaches is timely and necessary if we are to re-imagine our classrooms as spaces of transformation, hope, and joy.

We draw on the rich insights and frameworks of Critical Race Theory (CRT) and Feminist Pedagogies (FP) in sculpting the pedagogical strategies of art-based and digital story-making introduced in this paper. CRT scholars draw attention to the importance of narratives and counter-narratives in storytelling. They highlight that not all narratives are equally heard and acknowledged. Further enriching the attention to silences and running through our zine-making and story-mapping practices are three principles of feminist pedagogy—participatory learning, acknowledging and crediting personal experience, and furthering critical thinking skills, that help students to imagine alternatives towards more humane urban futures.

In our course development, we aimed to empower students to collectively take charge of the course goals, objectives and assessments, and create a caring community of learning where different perspectives can be explored. Incorporating lived experiences in the classroom at times engendered strong emotions, but the difficult conversations did not undermine the dignity of learners as we emphasized seeing the connections and disconnections between differing perspectives emerging from particular experiences. Innovating course assignments in light of insights from CRT and FP, we aimed to cultivate an imaginative and discomforting empathy in the students and a simultaneous sense of joy in seeing, hearing and telling the many stories of faraway intimate urban worlds.

In this paper, we introduce each course and the teaching methods employed, and discuss the main pedagogical strengths, limitations, and opportunities of such alternative planning coursework based on students' multimedia products, follow-up conversations, and our recollections.

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Key Words: planning pedagogies, story-mapping, zine-making, Feminist Pedagogy, Critical Race Theory

## PLANNING HETERODOXY IN THE GLOBAL SOUTH: IMPLICATIONS FOR INTERNATIONAL PLANNING EDUCATION AND DISCOURSE

Abstract ID: 542

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This paper uses the term ‘planning heterodoxy’ to depict urban planning and development models that dot the landscape of cities in the global south (Schmidt-Kallert, 2017), starting primarily at the turn of the 21st Century. Conceptually and physically, planning heterodoxy raises questions, or introduces curious dimensions to discourse, about planning orthodoxy. Planning orthodoxy implies planning theories and paradigms that emanated in the West and have dominated planning education and practice around the world since the turn of the 20<sup>th</sup> Century (UN-Habitat, 2009). Planning orthodoxy seems enduring in spite of radical shifts in the political, economic, cultural and environmental contexts in which planning occurs in cities in the West and the world over. Faludi (1996) argued that synoptic planning remains the ‘root’ of subsequent theories, while UN-Habitat (2009) stated that the post-modernist planning remains the dominant model worldwide. How do planning programs in the global south address the unique questions and dimensions posed by planning heterodoxy for the young, curious and impressionable graduate students that come largely from societies witnessing planning heterodoxy? The paper addresses this question, first by reviewing examples of the planning heterodoxy from various parts of the global south, and second by examining, as a case study, the United Arab Emirates (UAE) in particular and the Gulf Cooperation Council (GCC) countries in general. Irrefutable evidence exists to support the contention in this paper that the GCC as a geo-political region qualifies as the birthplace and laboratory of planning heterodoxy, starting during the blooming stage of neoliberal globalization in the late 1990s. Zeroing in on the most reputable professional graduate planning program in the UAE, this paper discusses examples of recurring questions that are raised about both planning orthodoxy and heterodoxy in graduate planning seminars over a 14-year period (2006-2020). The paper discusses how the questions are addressed in the curriculum and in discourse. The paper concludes that, increasingly, critical and substantive questions and challenges are being raised about planning orthodoxy by the young generation of graduate planning students in the global south, and also by young Western-educated planners from countries of the global south. The paper suggests specific principles and guidelines for addressing the contrasts and challenges in both the curriculum and in discourse.

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Key Words: Planning, Orthodoxy, Heterodoxy, Curriculum

## ROBINSON CRUSOE AND THE REMAKING OF AN UNDERGRADUATE PLANNING CURRICULUM

Abstract ID: 579

Individual Paper Submission

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Planning programs evolve, responding to changes in the field's professions, institutional pressures, and pleas for changes from within the academy. For example, recent scholarship drawing attention to the need to diversify and promote inclusivity in planning programs' faculty, students, climate, and curricula may foreshadow strengthening of curricula in these areas. This paper focuses on the project of curricular change specific to the undergraduate planning curriculum.

PAB-accredited undergraduate planning programs (UGPPs) represent a minority of PAB-accredited programs (7% in 2018) and graduates (13% in 2018). Historically, the same PAB criteria (at least through the 2017 standards) govern UGPPs as Master's programs. Undergraduate degrees include many more units than a Master's degree, but UGPPs face institutional competition for those units due to general education, acceptance of coursework from community colleges, etc.

In contrast to an evolving curriculum, where changes occur course by course, or thematically to strengthen or introduce an area, Cal Poly Pomona (CPP) completely changed both of its PAB-accredited programs. In 2013, CPP committed to converting from quarters to semesters commencing with Fall 2018. While many campus faculty saw this as a shipwrecking storm on a sea already roiled by budget cuts and labor strife, the planning faculty exploited "re-vision" resources to examine every curricular piece of our programs. With five thematic threads--planning theory, urban design, ethics, methods, and social justice—as initial signposts, veteran faculty embarked on a process requiring them to let go of all existing syllabi, write new course outlines, possibly to profoundly change their own classes, and to embrace new elements in the core. Whereas the two programs had looked similar in 2014, with the master's program offering greater depth, the two programs that emerged in 2018 are much more distinct from each other. This paper focuses only on the undergraduate curriculum.

The shipwreck metaphor captures the sense of being in a state of prolonged emergency felt by faculty from beginning this work in 2014 to showing up in August 2018 for the first term on semesters. Like Robinson Crusoe, faculty had to invent in an environment characterized by both opportunities to create something new and better, and threats: a calendar with fewer terms, retirements, and the unknowns of new faculty coming. First, this paper frames the process using Daniel Defoe's Robinson Crusoe as a metaphorical frame. Next, the paper examines evidence from the outcomes to address the central question--did we, as some say of Crusoe, reinvent our "own imaginative empire" (Erickson 1982, 68), or did we, as others argue, merely replicate the old?

Outcome evidence includes the curricular artifacts, such as syllabi and requirements for the major. In addition, since students have experienced the curriculum for three years, evidence includes empirical data about the experiences students have had overall and with new elements, in particular the specializations introduced with semesters. Students must choose one of four options: 1) Community Development and Social Justice; 2) Infrastructure and Transportation; 3) Resiliency, Sustainability and the Environment; or 4) Urban Design. Before-and-after data from 2014 and a 2021 alumni surveys, as well as from a current University-funded study of how students perceive the options may illuminate effects of the curricular change. The inquiry will pay special attention to how students learn about diversity and inclusion, which are much more explicit elements in the core. Whereas current PAB criteria place equity, diversity and social justice among values required to be learned in a planning program, these threads are woven through areas of knowledge and skills, as well.

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Key Words: curriculum revision, planning pedagogy, diversity, Robinson Crusoe, PAB criteria

## DOCTORAL EDUCATION AND THE ACADEMIC JOB MARKET IN PLANNING

Abstract ID: 646

Individual Paper Submission

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It is incontrovertible that the North American higher education system produces more PhDs than the academic job market can accommodate. Both peer-reviewed scholarship and the popular press support this view, with recent article headlines such as "Who Will Hire all the PhDs? Not Canada's Universities" (Fullick, 2013) and "For Would-Be Academics, Now is the Time to Get Serious About Plan B" (Wood, 2020). While PhDs enjoy low unemployment rates (i.e., Passretta, Trivellato, and Triventi, 2019), many work on a contingent status as adjuncts while those transitioning to industry face a steep learning curve, as many doctoral degree programs do not provide the skills necessary for non-academic careers (Edge and Munro, 2015; Larson, 2020; Main, Prenovitz, and Ehrenberg, 2019; McAlpine and Austin, 2018; Meldonado, Wiggers, and Arnold 2013). Critics argue that universities perpetuate the job market imbalance because doctoral students support faculty research and provide an inexpensive source of labor for teaching (Boulos, 2016). Scholars suggest a range of responses to the over-production of PhDs, including more transparency about the likelihood of academic job placement for graduates, non-academic skills training, and public funding to support job placement in various ways. This research basis covers various academic domains, including social science, and some disciplines within the social sciences, though not Planning specifically.

This paper reports the results of a three-year project designed to describe doctoral education and the academic job market in Planning. Data from a survey of programs enables the estimation of the rate of production of new Planning PhDs, academic job placement rates, the percentage who entered doctoral education aspiring to an academic career, and facets of their training. Job market data are used to describe market size, timing, and specializations sought. These data inform the academy on the balance between supply and demand for academic labor in Planning, enabling prospective students to be better informed, offering insights for job seekers, and prompting discussions about Planning education.

The Planning academy produces between 265-295 new PhDs per year. These graduates are competitive, having teaching experience and published or publishable research. The primary job market in Planning (effectively, the ACSP Career Center) shows considerable stability year to year in terms of size (COVID-19 notwithstanding), with 100-110 academic jobs posted per year, of which 75-100 are open to new PhDs. Though the number of jobs in any given specialization fluctuates, the relative popularity of the most commonly-sought specializations remains

consistent. Graduates face competition from assistant professors making lateral moves as well, with preliminary data suggesting this happens in about half of all opportunities open to new PhDs. The primary job market likely accommodates 50-60% of graduates finding academic employment (or about 25% of graduating cohorts), with a large share navigating the secondary (i.e., informal) job market. Survey data from program directors suggests approximately one-third of graduates do not aspire to academic careers. This paper illustrates realities of academic employment for recent graduates, and includes recommendations for programs.

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Key Words: Doctoral education, Academia, Job market, Research, Teaching

### A REFLECTIVE ACCOUNT OF INSTRUCTING REMOTE PLANNING STUDIOS IN THE TIME OF COVID-19

Abstract ID: 659

Individual Paper Submission

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This paper reflects on the author's experience of instructing two remote planning studio courses during the COVID-19 pandemic (2020-2021) and lessons learned from it. West Chester University has responded to the pandemic by switching most of its classes to be remote (online) since March 2020. The author instructed two online Planning & Design Studio courses in fall 2020 and spring 2021 for graduating seniors and master's students. Students, however, generally do not prefer online teaching and learning to the traditional face-to-face experience because of the perceived deficiencies in motivation, self-efficacy, and cognitive engagement (Aguilera-Hermida, 2020). Adopting a staged critical-thinking framework, this paper analyzes the author's teaching approaches and student learning outcomes (Németh & Long, 2012) in these courses to identify emerging challenges and opportunities of instructing planning studios during, and possibly after, the COVID-19 pandemic. Focusing on Planning Skills (The Planning Accreditation Board, 2017), the student learning outcomes were assessed via the course assignments, the student project management reports, and the author's observation, which were supplemented by the student course evaluations. The study finds that the lack of in-person coordination and cooperation between students appeared to be the biggest challenge, while utilization of multiple cloud-based teaching, learning, and practicing platforms such as Zoom, ArcGIS Online, D2L, and Google Map could create "virtually immersive" planning studio environments. Building upon the learned lessons from Alizadeh, Tomerini, & Colbran (2017), this study proposes a "blended" format for planning studio courses, particularly in the post-vaccine/pandemic era.

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Key Words: Planning Studio, Pedagogy, COVID-19, Online Learning, Technology

## **BRINGING SOCIAL JUSTICE AND COVID-19 INTO THE (VIRTUAL) CLASSROOM: LESSONS FROM PANDEMIC TEACHING**

Abstract ID: 889

Individual Paper Submission

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What research question(s) are you trying to answer?

The COVID-19 pandemic and the early-2020 murders of Ahmaud Arbery, George Floyd, and Breonna Taylor brought questions of public health and social justice to the forefront of American consciousness. Racial disparities in COVID-19 exposures and health outcomes highlighted both the strong historical roots and pervasiveness of inequity, often highlighted through connections to planning practices such as historic redlining (NCRC, 2020). While the pandemic served to bring additional attention to the consequences of social injustice, it also provided a background for perpetuating those injustices as social distancing protocols were used to disproportionately police protestors and BIPOC (Hoover & Lim, 2020).

This reality provided a backdrop for a 2020/2021 academic year in which faculty were often teaching through new modes with distanced (and often distant) students. Guided by a belief that these issues were both too important and too pervasive in our students' lives to ignore, we sought ways that we, as planning educators, could bring this historic moment meaningfully and thoughtfully into our classrooms. Ultimately, the questions we hope to answer include: 1) How can scholars in planning and related fields incorporate the twin-crises BLM and COVID-19 in the classroom?, and 2) How did these factors shape or alter general classroom dynamics even when they were not the explicit subject matter?

How will you validly address and answer the question(s)?

Our department has developed several new modules and a new course intended to explore issues of social justice as it relates to the discipline of planning. We will discuss multiple approaches to incorporating social justice and public health lenses into existing courses and newly created courses, combining stories from our department with a review of recent literature on planning pedagogy.

Meaningful and New Findings:

We will describe efforts to incorporate social justice in large and small ways into existing courses while discussing the pros and cons of approaches that incorporate it across the curriculum compared to the creation of new courses explicitly focused on these issues. Among the best practices and initiatives we will discuss are:

Developing new modules within topical courses to explicitly focus on social justice within specific dimensions of planning

Connecting social justice to the United Nation's Sustainable Development Goals

Creation of a new course on GIS and Cartography for Social Justice

Focusing on aspects of Universal Design for Learning as a means for creating a more socially just classroom

Infusing social justice into practical courses such as planning design studio courses We will additionally discuss classroom practices and approaches adopted due to the pandemic and the ways in which they both facilitated and hindered attempts to meaningfully address social justice concerns.

Relevance and implications of your research to planning scholarship, practice, and/or education

Equity, diversity, and social justice are recognized as a vital component of planning education and are recognized as such in the Planning Accreditation Board's accreditation standards (PAB, 2017). Though these topics are clearly identified and understood as a vital component of planning education, they are not widely discussed within the pedagogical planning literature (Sen et al., 2017). Our intention here is to bridge the gap between the robust planning research literature on social justice to focus more explicitly on its implications for classroom practice.

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Key Words: social justice, COVID-19, pedagogy

## **EVALUATING THE OREGON EXPERIENTIAL LEARNING MODEL: LESSONS FROM CLIENTS, STUDENTS AND ALUMNI**

Abstract ID: 1059

Individual Paper Submission

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Planning has had a long tradition of studios or workshops based on an experiential learning model, where students apply their learning to real life settings (Long, 2012; Roakes & Norris-Tirrell, 2000). Roakes & Norris-Tirrell (2000) note that service learning is a subset of experiential learning that emerged during the civil rights era. The goals of this approach were teach students about diversity and redress power imbalances of marginalized communities (Butin 2010, p. 91). While there have been some success stories (see for example Reardon, 1998), these efforts have often fallen short of their goals. Universities have often not sustained the ongoing partnerships needed to maintain community relations (Reardon 1998). Projects were sometimes taxing on community partners who were burdened with student training (Cushman 2002; Bortolin 2011). Furthermore the four months of a typical course is rarely enough time for students to learn the necessary skills to be useful to a community partner (Mihail 2006).

For over 40 years, the University of Oregon has run Community Planning Workshop (CPW) to help train graduate students in an intensive experiential learning setting. While CPW was inspired by the service learning model, it has been based on contractual relationships with clients supported by university funding. It is managed by full-time,

non-tenure track faculty who coach the students and work with the clients to ensure real learning opportunities and high quality products. This relationship has led to long-term relationships with clients, external funding for the experiential model, and research publications.

In this paper, we evaluate the learning outcomes and products of CPW over a ten year period. This study utilizes surveys of alumni and students over several years. We also interviewed clients, alumni and students to assess its community and student impact. This combination of surveys and interviews have allowed us to examine both short and long-term impacts on student learning. We also examine the benefits and qualities of the outcomes for the client organizations.

We found that students struggled with the messiness of real world practice and had difficulty reflecting on their learning during the workshop. Student experiences also varied, depending on clients, projects, and team dynamics. However, as they progressed through additional studies and their careers, students found that CPW prepared them very well for professional practice and in many cases influenced their career direction.

Clients were mostly highly satisfied with the quality of the work and the university-based, student-led efforts allowed for more experimental projects. Clients also noted that student teams combined with faculty oversight provided them with more extensive consultation efforts, data, and analysis than consultant-led projects. While projects sometimes required additional time commitments from clients, they were often energized by working with students and the University.

In exploring the findings with faculty, alumni and clients, we also noted challenges and shortcomings. First, there has been an increasing interest in work related to underrepresented and underserved communities, but these kinds of project require deeper community relations to be successful. Faculty and program staff are exploring partnership models with communities and community organizations, while maintaining the contractual model. Second, the Oregon model involves the integration of teaching, research and service, which requires a mixture of School, contract and research grant funding. This model does not fit neatly in the University's budget silos, leading to continual challenges to the funding structure. Finally, while CPW has integrated research and service into their work, it has been challenging to align client needs with faculty research interests that could lead to publishable work.

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Key Words: Experiential Learning, Service Learning, Studio teaching

**PLANNING IN THE FACE OF PAUCITY: COUNTERING THE LOSS OF INSTITUTIONAL CAPACITY IN SMALL AND MID-SIZED CITIES.**

Abstract ID: 1070

## Individual Paper Submission

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Effective, public and democratic planning is greatly needed in places where it is least present: small and mid-sized cities that have lost financial and personnel capacity as a result of population decline and state policy. Since the economic crisis of 2008, mid-sized and small cities in the mid-west have lost capacity for planning as a result of economic decline and state fiscal austerity (Dewar & Thomas 2013). The author provides a model of urban institutional decline, in which cynicism about public services leads to disinvestment in public institutions, which in turn provides justification for further disinvestment. Drawing on four years of action research in Muncie, Indiana, establishing a new public institution, a land bank, the author describes the challenges of planning in the face of institutional shrinkage. Drawing on this experience the author argues that new federal spending initiatives will not suffice for rebuilding effective planning and local governmental practice. Planning professionals working in disinvested communities will have to create new institutions and repair existing ones. The paper concludes by considering the pedagogical needs of planning students who face a paucity of effective local institutions. Planning educators must focus attention on leadership, entrepreneurialism, and state policy advocacy to equip students with the skills to build institutions that are effective, public and democratic.

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Key Words: shrinking cities, austerity, planning institutions, pedagogy

# Track 11 – Planning History

## ROUNDTABLES

### 11.185 ROUNDTABLE - PROGRESSIVE CITIES IN THE US AND EUROPE TODAY: COMBATING NEO-LIBERAL URBAN POLICIES AND POPULIST POLITICAL MOVEMENTS

Abstract ID: 185

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The Post-War II Era has been characterized by increasing dependence on private markets to distribute goods and services. This period has also been marked by significant cuts in social welfare spending and the erosion of labor rights in the United States and Europe as these regions struggle to address increasing global competition in a context of deregulating financial markets and unstable trading relationships. These trends, along with changing occupational structures within these countries, caused by a shift from manufacturing to service-based economies has led to increasing disparities in income, wealth, and power within major metropolitan regions. The disappearance of well-paying manufacturing jobs for those with limited education resulting from this transformation has pushed many working-class families into poverty while causing others to become economic migrants forced to abandon their hometowns in search of better economic opportunities elsewhere.

Feeling abandoned by mainstream politicians, many of these economically vulnerable families have embraced populist candidates who advocate market-based economic policies, smaller government, lower taxes, fewer entitlement programs, restrictive immigrant policies, deregulation of business and racist victim-blaming to address the economic and cultural concerns of working-class families. While the emergence of populist leaders such as Donald Trump, Boris Johnson, Marine LePen and Friedrich Merz has been the focus of much political analysis and debate, the growing numbers of cities pursuing redistributive economic policies and participatory planning to counter uneven patterns of metropolitan development and neo-liberal urban policies has received less scholarly attention. This session will examine the evolution, current state and future potential of what Pierre Clavel described in 1986 as The Progressive City which emerged in the late 1960s and 1970s when neighborhood residents, environmental activists, trade union officials, Civil Rights leaders and good government reformers came together to build broad-based coalitions to elect City Councilmembers and Mayors committed to improving the economic status and amplifying the political voice of non-elites in municipal policy-making.

These municipal officials and the grassroots movements that supported them sought to address the increasing economic and political marginalization of poor, working-class, and middle-income families through import substitution, First Source Hiring, planned manufacturing districts, linkage, inclusionary zoning, industrial retention, urban land banks, rent control, cooperative economic, Living Wage and participatory budgeting policies. This panel will present three compelling profiles of contemporary Progressive Cities in the United States and Europe that highlight how they have networked with other cities in order to influence state and national urban policies. Among the Progressive City case studies to be presented are the: redistributive development policies of New York City, NY, a global city; Paterson, New Jersey a former textile, apparel, and silk weaving production center; regional development plan of the Jackson Rising Movement and Lumumba Administration (Jackson, MS), and the sustainable planning and development efforts of Preston, UK. Special attention will be focused on the strengths and weaknesses on municipal reform movements, regardless of how inspired they may be to address powerful globalization forces and increasingly influential neo-liberal economic policies promoted by transnational organizations such as the World Bank, International Monetary Fund, and the United National Development Program and the international and

national economic, finance, and trade policies of the G7. The panel seeks to critically evaluate the continued effectiveness and value of the Progressive City Movement in an age in increasingly powerful global economic integration. Framed in another way, have the most successful Progressive Cities led to regional, provincial, and national reform efforts capable to mitigating and/or challenging the most destructive impacts of neo-liberal economic policies and structure adjustment strategies in the US and Europe?

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Key Words: Neo-Liberalism, Progressive Cities, Economic Democracy, Municipal Reform, Participatory Planning

## **INDIVIDUAL PAPER SUBMISSIONS**

### **NEIGHBORHOOD PLANNING AND SCHOOL SEGREGATION: HOW NEIGHBORHOOD PLANNING WAS USED TO KEEP SCHOOLS SEGREGATED IN THE POST-BROWN V. BOARD OF EDUCATION ERA**

Abstract ID: 6

Individual Paper Submission

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The research question addressed in this paper is: how was neighborhood planning in general, and the neighborhood unit theory specifically, used by urban planners in Alabama to keep schools segregated in the post-Brown v. Board of Education Era?

Clarence Perry developed the neighborhood unit theory in 1929, building on previous neighborhood planning work by others that began in colonial times. The theory provided guidelines on how to design a human-scale neighborhood, including the details on the distribution and quantity of residences, shopping areas, streets, community services, and schools. Under the theory, neighborhoods should be centered on a small school, have 5,000 to 9,000 residents, with heavy traffic kept to the exterior, well-designed streets, and at least 10 percent of the land dedicated to parkland and open space. Perry's ideas gained popularity among social reformers of the 1920s and was used as the basis for the Garden Cities movement, including Radburn, New Jersey.

Although Perry's work was primarily concerned with planning and construction on undeveloped land, the neighborhood unit idea also gained popularity in already urbanized cities. In 1957 planners in Montgomery, Alabama proposed using the neighborhood unit theory as the basis for planning. Each neighborhood would contain about 5,000 people, a school, a playground, public buildings, and shopping. Higher density neighborhoods would contain more than one school and a park. Montgomery also used the neighborhood unit theory in its 1963 plan. In both plans, the neighborhoods were also segregated by race. Other cities in Alabama used neighborhood planning to keep schools segregated, including Union Springs, Opelika, and Birmingham.

Adoption of the neighborhood unit theory was a way to keep schools segregated in response to the desegregation



of Little Rock high school 1957. By adopting the neighborhood unit theory, school officials could argue that school segregation was due to neighborhood segregation – not official school policy. In just a few years, Montgomery’s landmark school desegregation case, *Carr v. Montgomery*, would be making its way through the court system. The plaintiff in the case, Arlam Carr, Jr. and his parents Arlam and Johnnie Rebecca Carr, sought to enroll their son in a white public school, and attorneys for the school board argued that segregation of the schools was not due to an official school policy, but due to the preferences of people to live near their own race.

In this paper, I analyze plans in Alabama that use the neighborhood unit approach and how those plans would impact school desegregation. The method used in this research is an analysis of archival data on comprehensive planning and neighborhood planning in Alabama, as well as an analysis of school segregation legal cases. The paper argues that there was a close relationship between planning and school segregation in Alabama, with many plans using the neighborhood unit theory as an intentional strategy to keep schools segregated after the *Brown v. Board of Education* Decision.

The research finds a clear connection between neighborhood planning and school desegregation in at least four cities in Alabama. The Planning Commissions in Birmingham, Montgomery, Opelika, and Union Springs adopted neighborhood unit approaches to planning in order to avoid desegregating schools. In school desegregation court cases, attorneys for the school board argued that school segregation was due to neighborhood segregation. The relevance of this research is new insight about the relationship between school segregation and planning in the South during the civil rights era, which are two issues that are often not connected in planning research. The research has implications for current planning practice because schools in major cities in Alabama are largely still segregated.

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Key Words: neighborhood segregation, school segregation, neighborhood unit, Clarence Perry, Alabama

#### REVISITING THE ESSENCE AND PURPOSE OF REGIONAL PLANNING: A HISTORICAL ANALYSIS OF THE REGIONAL QUESTION

Abstract ID: 29

Individual Paper Submission

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An emerging debate on the state of regional planning focuses on the need “to reassert the purpose and values of planning by rediscovering the content, conceptualise multiple and fluid forms of planning frames, and reposition the planner as an orchestrator and enabler of planning regional futures” (Harrison et al 2021, p.6). This contention is based on the premise that regional planning discussions have for a long time been overly fixated with issues

regarding its institutional frame to the detriment of the everchanging content of the real-world picture of regional problems and opportunities. Our argument is that as regional planning turned into an institutionalised and uniform bureaucratic apparatus in most parts of the world, it moved away from being a spatially selective activity where it was needed, divorced from place specific needs and increasingly resented (ibid.).

This paper contributes to that debate by opening discussion around the rediscovery of the very essence, purpose and values of regional planning. First, we identify the hallmarks of regional planning based on punctual episodes that took place during its intellectual heyday in the interwar period. We revisit the first wave of regional thinking by addressing: (i) the rationale behind the problematisation of regional issues and questions (i.e. regional problem-framing and problem-solving from the lens of regionalism as a form of advocacy in specific contexts); (ii) the building blocks and early proposals of regional planning as well as the understanding of 'the region' both as a constructed phenomenon and as a product of the process of regionalisation; and (iii) the planning conception of the future and its ensuing implications.

We then move on to assess the historical evolution of regional planning as it became an institutionalised and professionalised activity during the post-WWII era. We open up the key debates which took place in the journal *Regional Studies* (and make links to key debates in other planning journals) during the 1960s-1970s to contend that regional planning ramified into three parallel planning paradigms. The first paradigm refers to rational procedural thought which prioritised development plans and the planning system (Kuklinski, 1970; Lichfield 1967). The second paradigm denotes early systems planning aided by the early use of computing modelling and analytics which perceived cities and regions as machines (Wilson, 1969). The third paradigm alludes to the early work of substantive theorists who focused on welfarist issues and the need of citizens and planning's outcomes as stories of unjust political intent (Mayhew, 1969).

Finally, we develop a discussion based on the premise that the resulting ramification of regional planning into divergent purposes, styles, regional constructs and time conceptions not only blurred its essence but also rendered its original spatial attributes and place-making qualities fuzzier and thereby much less perceptible. We conclude that revisiting the genesis and original purpose and values of regional planning is an important step in the quest to revive its function, namely addressing regional needs in a place-specific way through multiple, adaptive, flexible and agile forms of planning regional futures.

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Key Words: Regional planning, Planning history, Planning styles, Regions, Regional thinking

#### CREATIVE PLANNER: THE INTERDISCIPLINARY INGENUITY OF HENRY WRIGHT

Abstract ID: 275

Individual Paper Submission

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Though best known for his ten-year partnership with Clarence Stein, with whom he designed Sunnyside Gardens in Queens, New York; Radburn in New Jersey; and Chatham Village in Pittsburgh, Pennsylvania, Henry Wright's career transcended these iconic landmark communities. He moved seamlessly between the professions, advancing his design, housing, community planning, and regionalist philosophies. His writings challenge us to reassess multi-scalar, interdisciplinary approaches that acknowledge and coordinate the design and function of the built and natural environments as a comprehensively planned whole. Wright informed his designs with intrinsic environmental qualities, networks, and community needs. Further, his capacity to envision innovative solutions transcended the emerging boundaries among the professions to bridge design thinking from the scale of a single unit to an entire region.

Throughout his career, Henry Wright (1878-1936) was at the forefront of practice. While with noted landscape architect, George E. Kessler from 1902-1909, Wright characterized his work as "Landscape Engineering – Design for Parks"; then as "Town Planner" for the Emergency Fleet Corporation during World War I; and "Site Planner" for Chatham Village. He drafted a proposal for a New York State Plan in 1926 that incorporated a landscape regionalism, which anticipated layered mapping as a tool to guide land use decisions. In 1931-32, he served on the President's Conference on Homebuilding and Home Ownership to explore and promote innovations in large-scale development and then contributed to the early formulation of the PWA Housing Division, which pioneered the first federal public housing program during the Depression. As one of only two U.S. members on a task force of the newly formed National Association of Housing Officials, he examined the initial impacts of that program in 1934, breaking new ground in housing advocacy. Just before his untimely death in 1936, he operated an innovative graduate studio to educate emerging leaders in architecture, planning, and housing. Underlying these pioneering initiatives was a deep understanding of the relationship between people and the landscape, from the individual living unit to the regional level.

Using primary and secondary sources, including unpublished papers and plans, correspondence, writings, and accounts from the period, this study focuses on critical junctures during Wright's career to inform our understanding of the emergence and power of his interdisciplinary approach. It applies an interpretive-historical methodology to contextualize and critique this archival material. Wright embraced an understanding of places – their ecology, networks, hierarchies, and connections – and the role of institutions to shape these places into quality, complete communities. His practice engaged with emerging institutions – local and regional planning to coordinate land uses, transportation, and green networks; to create infrastructure efficiencies; and to ease access to services and amenities as well as federal and state policy-making to advance housing affordability. As planners are called to connect urban, regional, cultural, economic, and environmental issues, reintroducing Wright's ideas offers solutions through place-making at the interface of design for housing reform, ecological understanding, community capacity and function.

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Key Words: Planning History, New Towns, Regionalism, Housing Policy

## IDENTIFYING, CONSERVING, AND ACTIVATING CHINESE-AMERICAN CIVIL RIGHTS HERITAGE: A PROPOSAL FOR A LANDSCAPE APPROACH

Abstract ID: 276

Individual Paper Submission

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The dramatic rise in anti-Asian violence in the United States that began during the coronavirus outbreak in 2020 has deep roots in a long history of hatred directed at peoples with origins across the Pacific. The other side of this story is that Asian-American communities have an equally long history of fighting official repression and asserting their civil rights. Yet the sites of Asian-American civil rights history are hidden in urban landscapes, often unacknowledged by official designation, rendering them invisible and contributing to the othering of Asian-Americans as not truly a part of American narratives. Although the National Park Service has, in the last 20 years, undertaken studies to identify sites, progress has been slow, and the site-based approach inherently limits commemoration of this history to a few isolated locations. Moreover, the umbrella term “Asian-American” itself is a pan-ethnic category that embraces numerous communities with their own histories, such as Arab-American, Chinese-American, Filipino-American, and Indian-American, just to name a few. While there are commonalities among the struggles these groups have faced, each has interacted with place and civil rights in its own way.

This paper addresses the limitations of past work by sketching out a tailored approach that focuses on Chinese-American civil rights heritage, including but not limited to ethnic enclaves known as “Chinatowns.” One of the major difficulties to recognizing Chinese-American civil rights history in conventional ways has been that much of that history happened in some of the densest, most heavily shared and contested ground in American cities. Public approaches to heritage designation that try to carve out monuments as isolated landmarks are difficult to implement in such places and unlikely to provide more than token recognition. Further, due in part to historical experiences of repression and isolation, traditions of commemoration and remembrance undertaken by Chinese-American communities themselves have tended to be relatively private. The paper contends that by embedding civil rights heritage in the planning process, highlighting the validating districts and connections between dispersed sites, daylighting buried history, and valorizing intangible heritage, planners, preservationists, activists, and community members have the potential to successfully make Chinese-American civil rights heritage visible and signal that the struggle for civil rights happens in everyday spaces.

To develop a civil rights landscape approach for the Chinese-American experience, this study first reviews two categories of recent heritage literature—one concentrating on civil or human rights, and another that treats urban heritage as landscape-based rather than site-based. Drawing upon recent scholarly histories of Chinese-American struggles for civil rights, the study then relates these movements to preservation opportunities in selected US metropolises. It presents maps of civil rights landscapes that integrate many heretofore unrecognized spaces with existing designated landmarks. These maps acknowledge that while ethnic enclaves such as Chinatowns are important in such histories, the reality of the Chinese-American civil rights landscape goes well beyond such bounded neighborhoods to include government buildings, residential suburbs, and even cemeteries. The study concludes with an informed provocation of how an increasingly visible Chinese-American civil rights landscape could emerge over time if this civil rights landscape approach were embedded into planning and preservation.

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Key Words: Asian-Americans, civil rights, historic urban landscapes, heritage, historic preservation

## **APPLYING A CRITICAL RACE SPATIAL ANALYSIS: UNDERSTANDING THE HISTORIC AND CONTEMPORARY CONTEXT OF UMASS BOSTON'S PRESENCE ON THE HARBOR POINT PENINSULA AND ITS ROLE AS AN ANCHOR INSTITUTION**

Abstract ID: 569

Individual Paper Submission

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We apply critical race spatial analysis to situate universities as anchor institutions within minoritized urban neighborhoods. As an anchor institution on the Harbor Point peninsula, UMass Boston has an opportunity to develop impactful campus-community relationships and private-public partnerships. Dorchester Bay City (DBC) is a new multimillion dollar, 5.9 million sf development proposed on university-owned public land, which will challenge UMass Boston to reexamine its presence on the peninsula (amongst other upcoming developments). While no university or public agency is able to influence economic and social trends independently (Etienne, 2007), and the effects of the new developments are not well understood, the university could benefit from documenting its long-standing relationship with local communities, and reposition itself as a key anchor contributor in developing 21-st century sustainable public-private partnerships that will stimulate local ecosystem development while addressing racial and spatial justice issues. This pilot study will address the following questions:

What role has UMass Boston played historically as an anchor institution since it moved from downtown Boston to its campus to the peninsula in 1974?

What role has UMass Boston played as an urban developer? What role is it playing through its involvement with the DBC and its campus redevelopment?

How do these roles align with the UMass Boston's mission and vision?

How has the perception of UMass Boston changed for local stakeholders, considering these new development projects? This pilot is a mixed-methods study that builds on an exploratory study by Nora Lutz on UMass Boston's role in the DBC development. Its purpose is to situate the university as an anchor institution by expanding data sources to include historic and current perceptions of UMass Boston's role as an anchor institution. The data collection includes: interviews, archives, press releases, campus master plans and strategic planning documents, university announcements, Boston Planning and Development Agency records. These will be triangulated with GIS and Census data about the make-up of the peninsula residents and neighboring communities.

Etienne (2007) and Winling (2018) use CRSA to visually display the role of universities in gentrification and neighborhood transformation. Through mapping the racial makeup of neighborhood change, the "color-line," a term coined by W.E.B DuBois, becomes apparent and difficult to ignore. It raises questions about whose interests the campus redevelopment projects have served, and exposes the intentionality behind them. This partially explains Baldwin's (2015) warning that universities have become the second or third biggest employers and landowners, yet their role in the new knowledge and technology economy remains largely "unexamined." Contrastingly, the universities are co-dependent on the vitality of their neighboring communities (The Campus as City, 2019). As anchor institutions, they cannot reallocate their campuses without significant costs, so they must form symbiotic relationships and invest in developing strong and equitable campus-community relationships. Perry & Wiewel (2015) present case studies of the universities embracing their public good mission and spearheading transformational changes working with diverse communities.

UMass Boston has the most diverse student population of any university in the city of Boston and represents the makeup of Boston's residents (over 51% Latinx, Black, or Asian/Pacific Islander, BPDA, 2020). Over 60% of students are from marginalized backgrounds, and less than half are first generation, and Pell grants recipients. Unlike other 4-year institutions in the area, UMass Boston attracts mainly students who are local to the area. As an anchor institution, UMass Boston has played a critical role in diversifying the local ecosystem's workforce. Understanding its role in community development has become more important with the effects of the double pandemic, climate change, racial, and social justice movements, and neoliberal forces threatening the extinction of public space, citizenship, and democratic engagement.

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Key Words: Anchor institutions, Public-private partnerships, Campus-community partnerships, Spatial justice, University as an urban developer

### THREE EPISODES OF BUILDING NEW TOWNS IN INDEPENDENT INDIA

Abstract ID: 584

Individual Paper Submission

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Literature describes the building of new towns across different countries since the postwar period in substantial detail (e.g., Forsyth and Peiser 2019). This paper extends this line of scholarship by mapping and illustrating three distinct phases of new town building activity since India's independence in 1947.

Driven by post-independence fervor for nation-building and industrialization-led development, the first episode (late 1940s - until late 1970s) comprises well-known cases like the brand-new cities of Chandigarh and Bhubaneswar designed by Le Corbusier and Otto Königsberger respectively. In fact, during this period, the fast-expanding public sector undertook the state-sponsored development of more than 100 new towns for a variety of purposes (e.g., industrial townships, state capitals, education centers, rehabilitation towns and port cities) across the length and breadth of vast country (Prakash 1969).

The second episode of new town building followed the liberalization of India's trade and economic policy beginning in the late 1980s. Scholars have studied the development of new towns sponsored by state agencies promoting regional economic development as well as private players seeking profit and prestige in local places. Notable examples include the new towns of Rajarhat adjoining the eastern metropolis of Kolkata and Magarpatta near the western city of Pune (Bhagat 2011).

Not much is known, however, about the third episode of new town building activity that is currently ongoing. Based on preliminary research, we find a wide variety of sponsors (e.g., provincial governments, public sector agencies, local development authorities and private players) collectively promoting new towns both in the vicinity of expanding metropolises as well as industrializing places located in the hinterland. Prominent examples include New Dhule in central India and GIFT city in the western state of Gujarat. Country's powerful central government seems to be supportive as well. For instance, the Ministry of Housing and Urban Affairs (MoHUA) recently supported the 15th Finance Commission's recommendation for a grant of Rs 8,000 crore as aid for 'incubating' eight brand new cities, in the first-ever direct central support for new town development (Mehrotra, 2021).

By comparing and contrasting the three episodes of building new towns along pertinent dimensions (e.g., overall planning policy, project purpose, principal design ideas and concepts, plan sponsor, implementing agency and more) this paper will locate the collective significance of these distinct efforts in the long-term planning trajectory of independent India. It will conclude by drawing useful insights and lessons for planning scholars.

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Key Words: New towns, City design, Contemporary planning history, Post-independence India

#### **SOLDIER-PLANNERS IN COLONIAL MOROCCO: AGENTS OF THE “DARK SIDE OF PLANNING”**

Abstract ID: 771

Individual Paper Submission

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Planning scholars have long critiqued the use of planning as an instrument of control and domination. This “dark side of planning” (Flyvbjerg 1996) is particularly salient under colonial rule, where land use regulation and spatial (re)organization were among the tools used by colonial powers to structure systems of racial segregation and maintain control over subject populations. While the outcomes of these practices have been widely explored, lesser attention has been paid to the role played by colonial administrators—with their varying motivations, agendas, and ideological bents—in shaping planning decisions.

Using the colonial administrator as a focal point, this paper brings a more agentic lens to understanding how planning rationalities become infused with the logics and practices of security. Specifically, it examines how land use planning in protectorate-era Morocco (1912-1956) was influenced by the dual roles of French colonial administrators, who embodied the responsibilities of both planners and security agents. It suggests that a historicized understanding of planning policy requires an investigation of a set of “security dilemmas” through which administrators came to understand their role as agents tasked with the regulation of relationships between land and people in order to reduce the potential for dissidence, defection, or resistance.

The paper borrows from Vaughan's (1996, 2004) methods of historical ethnography, relying on archival documents

to elucidate the organizational cultures and structures of colonial planning, as well as the ways in which individual agents interpreted actions and events. Through an analysis of official reports, training manuals, correspondence, and personal memoirs of military and civilian administrators, the paper demonstrates how colonial agents' personal understandings of their mission and profession contributed to the infusion of planning with logics of security and control. Furthermore, building on the Bourdieusian concept of the social field, it suggests that "planning as control" (Yiftachel 1994, p. 216) is not a pre-determined outcome, but a product of an expanded security field in which inter-connected agents—both military and civilian—negotiate and perform a range of security functions over the course of their regular administrative duties.

While grounded in the Moroccan colonial experience, this paper has several important implications for planning scholarship. First, it brings a more agentic lens to understanding the processes through which the "dark side of planning" is produced and sustained. Second, it demonstrates the value of incorporating military history into our understandings of the relationship between planning and security. Finally, it highlights historical ethnography as a tool through which one may unpack the dilemmas, decisions, and debates which animate planning practice.

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Key Words: Colonialism, Land use, Security, Military, Historical ethnography

#### **PLANNING AND THE EVER EVOLVING ECOLOGICAL IMAGINATION: AN ECOLOGY-CENTRED PLANNING HISTORY OF VANCOUVER BC**

Abstract ID: 846

Individual Paper Submission

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Understanding the city, its limits, and its possibilities from an ecological perspective is a well-established and intellectually dynamic field of study. But how influential has the diversity of work on an evolving understanding of ecology and cities been on city planning and design practices? Which types of ecological principles find easy adoption and which types find resistance? And to what degree is the relationship of influence reciprocal? And how does the influence of ecology ebb and flow in relation to other emergent concerns around sustainability, urban livability and resilience?

This paper explores the relationship of ecology to planning as they both (co) evolve over time, using Vancouver (BC, Canada) as the primary case. In Vancouver, we find a city that has embraced ecological perspectives into design and planning practices and has adopted successive sustainability oriented plans, yet is typical in employing only a limited subset of an expansive ecological imagination in application. By using a historical analysis of city planning documentation and projects, further informed by the perspective of influential actors over time, the paper will present a unique perspective both of planning history and urban ecology. Further, this paper explores the translation, and the limits of such translation, on the full spectrum of planning activity (not limited to sustainability, habitat or green infrastructure planning), especially how ecology interrelates with other emergent policy concerns



relevant to the contemporary city.

The paper will present research that demonstrates that ecological thinking has been influential at key periods in the city's planning history but not often at moments of heightened policy work on urban sustainability and while frequently addressed in planning documents have rarely translated into sustained implementation. Further, despite early influence on urban form in the 1970s and 1980s, with a few important exceptions, ecologically-centred design thinking has lost influence as climate concerns became more ascendent and influential in policy development and implementation. This paper will illustrate the evolving relationship between ecology and localized planning and design movements and argue that a renewed interest in an ecological imagination as a generative force in planning and design is still underdeveloped and holds promise for meaningful evolution of the city.

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Key Words: Ecology, Planning History, Ecological Design, Policy Integration

### **RACE, RENEWAL, AND DISPLACEMENT IN CANADA: THE LEGACY OF URBAN RENEWAL**

Abstract ID: 867

Individual Paper Submission

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Urban Renewal projects in postwar America systematically displaced racialized communities to make way for commercial and civic redevelopment, road building, and public housing development. In Canada, slum clearance and urban renewal were similarly destructive, selecting low-income communities with "blighted" housing for clearance and displacement. Despite the impact of this program, there have been no studies that have explored its impacts as a whole. Over 20,000 families in 85 Urban Renewal sites were displaced between 1948-1973 through this program. This paper explores the pre-renewal racial composition of urban renewal areas, and the role of race and ethnicity in prompting revitalization initiatives, based on census data of sites and references to ethnic, racial, and religious make-up of sites in planning documents. This study of the dynamics of racialized displacement in Canadian urban planning history, through a systematic study of urban renewal sites, based on planning documents (Urban Renewal 'schemes' and plans), 1961-1971 census data, and displacement outcomes.

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Key Words: Urban Renewal, Race, Ethnicity, Redevelopment

## FROM URBAN RENEWAL TO THE BELTLINE: ATLANTA'S USE OF PUBLIC HEALTH NARRATIVES TO RESHAPE THE CITY

Abstract ID: 877

Individual Paper Submission

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Health and the protection of public health has been a common theme in city redevelopment. Dating back to the early days of planning, city neighborhoods were labeled as places of alienation and degeneration. Often the language took on a public health narrative or discourse that equated blight to a metastatic cancer infecting surrounding neighborhoods. The best remedy was to wipe out the disease through slum clearance and urban renewal. This narrative changed in the 1990s as cities across the United States saw significant shifts in demographics as middle-class white families moved back into cities. To attract these residents, cities promoted themselves with large development projects that promised healthy living for all. Through each major redevelopment initiative, government agencies promoted their plans using a specific, yet evolving dominant narrative, which justified reshaping the city as both necessary and in the best interest of all residents, especially the displaced.

The City of Atlanta followed these same patterns over the last 100 years from urban renewal through the current citywide greenway project, the BeltLine. Other scholars recognize displacement as a consequence of Atlanta's redevelopment projects but few focus on the official discourse used to sway public opinion. In relationship to that gap, this paper compares Atlanta's redevelopment narratives from urban renewal to its current citywide greenway project, the BeltLine, to understand how city officials utilized public health language to rationalize displacement. While it is vital for researchers to recognize the power embodied in dominant narratives, by amplifying only one side planners perpetuate a system that continually boosts the voice of privilege and silences others. With that understanding, this paper includes counter-narratives of residents and businesses in neighborhoods impacted by redevelopment as they pushed against expansion plans and watched their communities get restructured by outside forces. The method used for this paper is an analysis of archival data through a critical discourse analysis lens as it is concerned with the power of language on social and political contexts. Historical documents include government and community plans as well as newspaper articles.

This paper finds that Atlanta saw the redevelopment projects of urban renewal and the BeltLine as once in a lifetime opportunities for the city to rejuvenate and redefine itself. Both projects centered themselves around the language of health with urban renewal documents centered around the language of contagious disease while the Beltline instead focused on its ability to create a healthier population with better quality of life through improved access to parks and recreational facilities. As the city's redevelopment narrative did not vastly change from urban renewal to BeltLine, neither did the community's counter-narrative which recognized the city's role in creating blight while at the same time noting the city's data did not match their lived reality. Through both redevelopment projects, community organizations emphasized their desire to have control in creating their own vision for the future.

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Key Words: urban renewal, narratives, infrastructure, Atlanta BeltLine, inequality

## **RACE IN THE BUILT ENVIRONMENT: AN ANALYSIS OF TRANSPORTATION PLANNING DECISIONS AND REGIONAL SEGREGATION IN DETROIT, MICHIGAN**

Abstract ID: 947

Individual Paper Submission

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Detroit and its surrounding suburbs are the second most segregated metropolitan area in the United States. Existing research establishes that racial disparities in the built environment have been historically shaped by discriminatory processes such as redlining, predatory lending, restrictive covenants, block busting, and urban renewal. To date, no one has examined how public transportation systems have contributed to existent racial segregation in metropolitan areas. My research analyzes major transportation planning decisions in a case study of the City of Detroit between 1922 and 1970 and explores how these decisions impacted racial mobility during a period of significant racial shifts across the entire metropolitan region. This research uses case-study methodology to study Detroit, Michigan and conducts qualitative analysis of primary-source historical city documents like memos, reports, minutes, correspondence, and engineering sketches. Archives used in this research are the Burton Historical Collection (City of Detroit), Walter P. Reuther Library (Wayne State), the Bentley Historical Collection (University of Michigan), as well as State of Michigan archives, and federal archives at the Library of Congress. Findings demonstrate that beginning in 1947, City of Detroit officials directly intervened to restrict budgets, veto engineering plans, and reduce bus service to ultimately prevent public transportation route expansions into newly settled suburban areas. These actions were taken despite a state-wide referendum that permitted the city transit agency wide authority to operate bus routes into adjacent suburban areas. I argue this denial of service, although not solely responsible for segregation, significantly exacerbated racially exclusionary practices by limiting physical mobility that contributed to the black and white segregation of the city and suburb. This research is significant because it contributes an additional dimension to understanding how city planners, policy makers, and officials historically segregated cities and regions along racial lines during a period of mass suburbanization. Knowing how exclusionary processes functioned historically is critical to dismantling them in present plans and future initiatives to design equitable transportation policy that serves all residents in a metropolitan region.

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Key Words: Transportation, Planning History, Race, Segregation, Built Environment

## **AN INSTITUTIONAL ETHNOGRAPHY OF THE INDIAN 'DESIGN CELL': ANALYZING NEOLIBERAL PLANNING EDUCATION.**

Abstract ID: 975

## Individual Paper Submission

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Drawing methodologically from institutional ethnography and assemblage theory (Delanda 2016; Sorensen 2018), my paper offers a comparative case study of planning students' subjectivities in two Indian planning schools, focusing on the decades following India's neoliberal reforms in 1993. The intervening years since that turbulent shift from Soviet-era 'soft' socialism have witnessed intellectual ferment in the pedagogical design and delivery of urban and regional planning education in India, in response to new market-driven indices of 'progress' and 'success'. The pedagogical design of planning has mostly followed larger institutional shifts in planning legislation and policy. When read intellectually against an anthropology of the post-Soviet condition (see, for example, Collier 2011), therefore, my Indian example raises the compelling question: if students imagine themselves becoming professionals working in the service of the neoliberal state, in what ways do they philosophically trouble its market logic?

My paper begins by framing its case studies in a theoretical proposition: the phenomenological concept of a school of thought and its boundedness as a thing worth analyzing. The theory serves to animate my analysis of two Indian planning schools whose teaching philosophies distill schools of thought that define post-socialist market values, even as they try to combine principles of old-school welfarism and the new individualism.

The literature on schools of thought offers several critical points of departure. Cetina (2007), for example, has argued that institutions embody 'epistemic cultures' characterized by commonly-shared languages of values, aspirations and aesthetics. Cetina's proposition extends the 1930s-era ideas of Ludwik Fleck, a Polish philosopher of science who first proposed that schools of thought begin as 'thought collectives' with what he called a distinct 'style' to them. This notion of a thought collective, when applied to the history of planning education in India, suggests the phenomenological possibility of reading the 'planning school' as an epistemic entity with its own distinctive culture of thought and practice, something the educationist John Dewey had first imagined in the 1930s.

My case studies instantiate problems in how such a culture of thought might evolve. I examine the rise of private-sector individualism as a moral virtue in planning school, in an increasingly business-savvy India that discounts students' subjective self-formation while foregrounding the acquisition of 'soft skills', that is, behavioural qualities that are desirable in the neoliberal marketplace. This is the direct consequence of knowledge institutions having been corporatized, where planning ideas now increasingly intersect epistemologically with the disciplines of management studies and public policy.

My paper analyzes one curious cultural phenomenon: the 'design and research cell' in planning schools in Mumbai and Ahmedabad, India. An institutional ethnography of the 'cell' reveals a quasi-corporate, for-profit agency that serves as an academic laboratory for 'immersive' practice. My story narrativizes how the ritualized operating concepts that serve to govern corporatized planning practice complicate the subjective formation of students as moral individuals who have to navigate between the regulatory regimes of standardization and bureaucratic expectation and their human impulse to make decisions. In so doing, students find themselves sometimes at cross purposes about the moral implications of reconciling market pragmatism and *realpolitik* with outlier-dom, questioning their own place as individuals in a 21<sup>st</sup>-century nationalisation project that has begun to reward a compliant, universalizing citizenship.

The history of planning in India has as yet received no anthropological attention; historiographers have tended to cast the profession's story in largely political-economy terms (see, for example, Kumar et alia 2020). By applying an ethnographic lens, this paper's analysis will newly experiment with distilling anthropological insights on a culture of privatized planning education in an emerging economy, towards making the case for an alternative historiography of Indian planning institutions.

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Key Words: Education, Ethics, Neoliberalism, Ethnography, Institutionalisms

## FROM IDEAL TO REAL, FROM GLOBAL TO LOCAL: ERNEST HÉBRARD'S 'WORLD CENTRE OF COMMUNICATION' AND 'THESSALONIKI'S RECONSTRUCTION PLAN'

Abstract ID: 1027

Individual Paper Submission

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Utopian cities are often dismissed as unrealistic. Yet, their critical and intellectual approaches revolutionize the ways we design and shape our cities. There is a striking resemblance between Ernest Hébrard's pre-WWI ideal plan for a 'World Centre of Communication' (1913) commissioned by Hendrik Christian Andersen and post-WWI Thessaloniki's Reconstruction Plan (1918). Beyond the obvious formal analogies, the paper argues that correlations originate from a shared urban ideology that endorses people's unity.

At the outset of the 20<sup>th</sup> century visions for world-embracing unity not only set the foundations for world organizations such as the United Nations, but also initiated the discourse on the World City. Responding to growing international idealism, manifestos and design proposals emerged in search of the ideal architecture and urban form for a capital of all nations. Efforts for universalism evaporated during WWI, yet, less ambitious, both in ideology and form/image, city plans followed aspiring to implementation after recovery from war. The paper investigates the understudied reductions between Hébrard's aforementioned designs. Based on drawings and plans' descriptions, I trace the shifts in urban ideology and morphology. For the former, I argue that the ideology thins from a unification of nations to a unification of cultures, thus, there is a reduction from global to local. For the later, I argue that the form scales down from generic to specific and from pattern to module, thus, there is a reduction from ideal to real.

In terms of ideology, the paper argues that the Nations' unification is pursued in the open World Centre with its sophisticated organization of urban life and space aiming to stimulate peace and human progress. The same ideology triggers the responsive intention of cultures' in multicultural, at that time, Thessaloniki. As a utopian city, World Capital could be established at any place and time. The specific situation, both geographical and cultural, of Thessaloniki grounded Hébrard's aspirations. The paper also identifies ideologies of unity in the naming of the main axes and public spaces of both schemes. In terms of morphology, Thessaloniki's plan is directly related to World Centre's Beaux-Arts urban planning and architectural vocabulary. Both plans are strongly axial, composed of hierarchical networks of radial polygons linked by boulevards, flanking axial parkways oriented towards the waterfront. I argue that in Thessaloniki, Hébrard fractalized World Centre's pattern and articulated its typomorphological elements so as to connect the historic monuments with contemporary life. Based on plans' analysis, the paper identifies Thessaloniki's central district with the World Center's Quartier, a modular unit able to repeat itself in the city. The Quartier's attributes -scale, geometry, dimensions, topological organisation, main boulevard, street pattern, city block sizes and density of intersections - are all present in Thessaloniki's plan. Furthermore, the network of historic monuments, so far interpreted as the starting point of urban design identifies with the layer of public landmarks as found in the World Centre. When uses incompatible with the peaceful World Capital have to be

introduced, Hébrard reconditions the programmatic attributions of the design. Moreover, close-knit patterns of programmatic association as described in World book are also witnessed in Thessaloniki's plan. Pondering this, the ideal and general turns to real and site-specific.

In 21<sup>st</sup> century, a plethora of Adjective-Cities such as Smart, Green, Resilient, Healthy and Just City introduced as ideal models by recent urban theory creating a distinctive new phase in urban planning. The paper draws on the ways Hébrard shifted his ideological and spatial utopia for realisation within a less perfect social and physical context, aiming to stimulate current planning scholarship, practice and education to approach these new, ideal Adjective-Cities as working definitions, not polemic statements.

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Key Words: World City, ideal city, Ernest Hébrard, Thessaloniki plan, city planning

#### **INCLUDING PRESERVATION IN PLANNING: THE 1993 ALBINA COMMUNITY PLAN IN PORTLAND**

Abstract ID: 1091

Individual Paper Submission

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The intersection of historic preservation and urban planning has advanced over the years. Revitalization has been a central theme for this intersection, but the literature has not yet analyzed how a comprehensive plan—a crucial planning tool for growth and development—has included preservation. In this paper, I investigate how the city of Portland, Oregon, integrated historic preservation into its comprehensive plan, focusing on Albina. Portland developed a comprehensive plan considering several scales, resulting in an array of documents released over the years. Through a neo-institutional analysis, I look at these documents aiming to understand (1) the underlying institutions—such as compliance procedures, formal rules, and operating practices—that frame preservation policies within a comprehensive plan and (2) the approach to preservation implied in these policies. The findings show how the inclusion of preservation into planning is structured by different level of government, it is developed through an array of documents covering different scales, and it is part of an effort to enhance the vitality of neighborhoods. Overall, preservation is framed as a community asset, bringing attention to the history of the local community, its people, and its built and natural environments. However, historic districts, which are the major preservation efforts emerging from the plan, lack the strengths of both a comprehensive approach to planning and an urbanistic approach to preservation.

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Key Words: Albina, Historic District, Historic Preservation

## **DALLAS AND THE RISE OF BIG D: REFLECTIONS FROM CITY PLANNING AND PLACE BRANDING IN AN AMERICAN ENTREPRENEURIAL CITY IN THE 20TH CENTURY**

Abstract ID: 1104

Individual Paper Submission

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Despite its prominence as a major trade city in the South, Dallas has remained strikingly understudied. While Dallas's narratives of growth championed by city planning manifested in increasing entrepreneurial policies over time, the significance of such growth and the way it came to exist have remained mostly unknown to city planners.

This paper traces Dallas's historical lineage of growth and city planning through archival analysis and interviews with key informants to unfold the ways that the city has elevated its place as a quintessentially entrepreneurial city. Revisiting Dallas's trajectory of growth drawing on city planning, this paper unravels how Dallas has become a booster city and what specific strategies it has adopted to become a business-friendly city. The paper's historical analysis reveals that Dallas's long-standing tradition of promoting a visible city has stayed alive; although Dallas has long been struggling with the legacy of the stigma associated with the JFK assassination, the city has bolstered and expanded its business-friendly reputation in the post-Kennedy era.

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Key Words: Dallas, Place Branding, Stigma, World-class, Place-making

# Track 12 – Planning Process, Administration, Law & Dispute Resolution

## INDIVIDUAL PAPER SUBMISSIONS

### **PLANNERS' ROLE IN NON-CONTACT VISIONING PROCESS: CASE STUDY OF BUSAN, SOUTH KOREA**

Abstract ID: 241

Individual Paper Submission

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[Problems] This paper aims to present planners' role in non-contact visioning process, since COVID-19 pandemic has accelerated conversion to a non-contact society. As the application of hyperconnectivity and superintelligence of the Fourth Industrial Revolution accelerated by COVID-19, most of communication are now carried out in a new 'space' based on the information technology. These changes have also affected citizen participation visioning process of urban comprehensive plan. Therefore, it is necessary to study the change of planners' role in non-contact visioning process.

After paradigm shift of urban planning from the rationality of experts to the consideration of mutual stakeholders, citizen participation in the urban planning process has become highly important (Burby, 2003). Citizen participation process has been criticized in that the process based on communication consumes more time and cost than conventional plans (Wates, 2000). Nevertheless, citizen participation should be continuously implemented in order to minimize external effect of urban plan by securing rationality and fairness (Peltonen & Sairinen, 2010). As system and social awareness about citizen participation in the process of urban planning improved gradually, municipal governments in South Korea operated citizen planning group in visioning process of urban comprehensive plans. In particular, as the period of visioning 2040 Urban Comprehensive Plan overlapped with the spread of COVID-19, Busan Metropolitan City conducted visioning of urban comprehensive plans in a new 'space' for the first time among in South Korea.

Since offline visioning process of urban comprehensive plan was replaced by a new method, there was a need to reprioritize planners' roles in non-contact manner in comparison with offline process.

[Research Methodology] The study area of this paper covers Busan Metropolitan City in South Korea, which has operated 4 offline from 2015 to 2019 and 2 online citizen planning groups in 2020. We participated 6 citizen planning groups and played as a facilitator in helping citizen planning groups vision well.

[Findings] Compared to offline meeting, non-contact visioning process can enable more stakeholder participation in the planning by solving spatial constraints problem. However, in order to activate citizen engagement, planners should play a role in solving the following issues. Citizens in planning group pointed out the problem of communication among the participants as a disadvantage of the non-contact visioning process compared to offline manner. Also, they pointed out the inconvenience of media. In particular, issues raised by citizen groups were found to have a great influence on the digitally underprivileged. Actually, some of citizens who were not familiar with online environments or who could not afford costs for the internet were unable to participate in the citizen planning groups even though they wanted to do so. If the problems are solved, non-contact visioning process is expected to



contribute to expanding bottom-up planning process in all areas of urban planning. Therefore, planners should play a role in removing constraints so that digital vulnerable group can communicate well in the visioning process.

[Policy Implications] Non-contact visioning process of citizen participation may be further activated by increasing infrastructures to support elderly citizens and those who are vulnerable to access to the internet. Also methods for including digitally vulnerable citizens such as providing free Wi-Fi and granting data service vouchers should be considered. In addition to incorporate citizens who are not familiar with online environment, various methods should consider such as providing online conference software guidelines, pre-education for citizen group, and pre-testing of the online system.

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Key Words: Non-contact, Visioning Process, Citizen Participation, Urban Planning

## HOUSING PLAN IMPLEMENTATION IN THE UNITED STATES: A CASE STUDY APPROACH

Abstract ID: 260

Individual Paper Submission

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Housing plays a central role in connecting individual, family, and society in human life. Provide decent housing at an affordable price, in a suitable living environment is the ultimate goal of housing policy in the United States, as well as many other countries. The U.S. Department of Housing and Urban Development (HUD) creates a financial mechanism that requires the submission of a Consolidated Housing Plan to support affordable housing development and other housing-related activity in a city, as a condition of receiving funding through the formula block grants. These funds are used to support the proposed affordable housing development agenda of the local jurisdiction. The plan plays a crucial role in increasing affordable housing choice and providing quality community development activities for local people, especially for low-income households. Yet little research undertakes an evaluation of plan quality for Consolidated Housing Plans. Only two studies that tackled the housing issue in plan evaluation literature were found in a thorough literature search, and the most recent one was published a decade ago. More importantly, the quality of housing plans has never been addressed. This gap raises the concern toward how local government distributes federal resources in the areas that facing the increasing risk of natural disasters like a hurricane, flooding, and sea-level rise.

Plan implementation is a critical phase realizing plan's goals and objectives. This research uses case study approach to compares and contrasts the implementation process of Consolidated Housing Plan. Two cities are chosen from the sample of more than 70 cities across the nation. This research proposes three-level analysis including city, neighborhood, and project scale. At city-level analysis, we use the method of mapping to show the distributions of population and funding. At the neighborhood-level analysis, we use location quotient index to examine the geographic location of beneficiary neighborhoods. At the project-level analysis, we use spatial analysis methodologies such as kernel density analysis and local indicators of spatial association. Together, these approaches show the location, size, and type of the funding, then, overlaying them with the distributions of different income groups. The findings highlight the spatial mismatch between population distribution and funding allocation. They

also identify some serious issues regarding the way public dollar was spent at local level when comparing between two case studies. The study raises some significant concerns toward the implementation of a housing plan and proposes some strategies to increase the efficiency of the planning process.

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Key Words: plan implementation, affordable housing, community development, housing plan, plan evaluation

### TRACKING PLANNING DECISION MAKING PROCESS USING ELECTED OFFICIALS' SOCIAL MEDIA COMMUNICATION

Abstract ID: 368

Individual Paper Submission

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Our work focuses on how elected officials' preferences and priorities impact planning decisions and actions. At all levels of government, the formulation, adoption, and implementation of public plans and policies are inherently political processes. Impetus for change may be spearheaded by elected officials, bureaucrats, or civil society entities, and plans and policies may be prepared by planners with public input. Yet, in the end, plans and policies adoption and implementation, which typically require matching resource allocations, are decisions made by elected officials. Understanding elected officials' priorities and commitments to distinct planning issues is thus essential to understanding implementation, and therefore also to promoting implementation capacity in all planning domains, from densification, housing affordability, to bus and light rail transit (Grant, 2009; Laurian et al., 2004, 2010)

At the local level, the priorities of elected officials cannot be deduced from national partisan platforms. In previous work, we assessed those priorities by examining the campaign social media posts of candidates for office in the 2017 Calgary municipal elections vis-à-vis plan contents (using big data analytics tools). This proved to be a reliable methodology to assess candidates and elected officials priorities, for instance on topic such as taxes, downtown development, infrastructure, and specific transit lines (Han et al., 2020).

Three years have passed since those elections, and councilors and mayor are starting to prepare for the next electoral cycle. Thus, it is time to assess whether those commitments have translated into plan and policy adoption, budget allocations and actual project implementation. The planning priorities of the mayor and city councilors may have changed since the 2017 elections, as councilpeople deliberates, engage in mutual learning, and respond to public pressures, financial constraints, and regulatory mandates.

We hypothesize that elected officials' planning priorities expressed during the electoral campaign and since on social media are significant predictors of actual decisions made and implementation for key planning goals and objectives. We test this hypothesis by tracking elected officials priorities, as they evolve over time, and contrast them with votes as found in council meeting minutes to examine whether priorities translate into actual decision-making (e.g., votes on budget allocations). We manually examined the minutes of all 37 city council meetings since the election, and employed Semantic Network Analysis and Sentiment Analysis to analyze 25,624 Tweets collected from the 14 elected officials.

We are exploring the relationship between elected officials' planning priorities, as identified through their social media posts, and implementation outcomes (or lack thereof). This will be an important tool to help planners, researchers and lay residents identify the cause of the progress in planning, or of implementation gaps.

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Key Words: Plan Implementation, Social Media, Text Mining

## RESEARCH ON THE PATTERN EVOLUTION AND DEVELOPMENT TREND OF DEVELOPMENT ZONES IN CHINA

Abstract ID: 399

Individual Paper Submission

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As one of the important system designs of reform and opening up, China's practice of development zones has experienced nearly 40 years of development process since 1984. Development zones is an important institutional space for China's reform and opening up, and all kinds of development zones at all levels have become an important platform for opening up and innovative development now. The existing research about the spatial pattern of development zones often focuses on one specific type. However, there are already several different development zones at the national level and they have formed a clear system. So, it is crucial to understanding the roles of various types of national development zones which are important spatial development platforms in China. Through analyzing the evolution of the distribution of the five main national development zones, and exploring the interaction between the development zones and the national opening up policy, it is found that: (1) China's development zones are driven by national macro policies, and each type of development zones have functional and spatial complementation in the process of opening up; (2) The evolution of development zones' spatial distribution reflects the focus-change of the national opening-up policy: from the eastern coastal areas to the central and western regions; (3) At present, there are some problems in China's development zones, such as function homogeneity, transformation dilemma, and high cost of policy implementation. We should give reasonable policies according to the types and development stages of development zones, in order to promote the experimental and innovative functions of different development zones. Based on the analysis, this paper summarizes the core institutional problems existing in the current practice of China's development zones, including the deviation from the original intention, the lack of legal system, and the generalization of the institution, and then puts forward some suggestions for the future development zone governance, such as re-shaping the functions, improving the rules and regulations, and reconstructing the system of innovation region.

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Key Words: Development Zones, Spatial Pattern, Development Trend, China

## **‘RAISING THE FLOOR WHILE LOWERING THE CEILING’? EXPLORING THE IMPACT OF THE INTERNATIONAL ASSOCIATION OF PUBLIC PARTICIPATION ON PLANNING**

Abstract ID: 644

Individual Paper Submission

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Community engagement is a key component of urban planning in Western liberal democracies. Its role in planning is strengthened by efforts to create baselines and mandates for participatory practice through formal institutional and policy structures. However, existing research has revealed that an overly formal and institutionalized model can undermine the transformative potential of participation (Beebeejaun & Vanderhoven, 2010). A standardized model risks avoiding broader structural problems that produce inequality, concealing existing power differences, and focusing on the production of outcomes to serve the interests of government and project proponents rather than citizens (Brownill & Inch, 2019; Legacy, 2017; Hillier, 2003). In this paper, we examine the role of the International Association of Public Participation (IAP2) in this standardization process. IAP2 was created in 1990, with the initial goal to create a forum through which public participation practitioners could share and learn from best practices, ideas, and stories. It has since grown into an international federation with the regional bodies in the United States, Canada and Australasia being particularly active in the promotion of IAP2’s Spectrum of Participation, Code of Ethics, Core Values, and multiple training programs. These training programs include the flagship 5-day “Foundations in Public Participation” course, which covers both the planning of participatory processes and public participation techniques.

In this paper, we use the tools of critical discourse analysis to examine how IAP2 is intersecting with local government planning practices in Ontario, Canada and Victoria, Australia. We find that IAP2 is having a significant influence on how public participation is conceived and enacted in cities and towns across these two provinces/states. In Victoria, the influence is emerging at the legislative and policy scale, with the IAP2 Spectrum and Core Values having a demonstrable impact on the creation of new guidelines and standards for deliberative processes. Here, IAP2 ideals have become synonymous with the idea of a ‘best practice’, with references to IAP2 materials serving to legitimize and offer a kind of ‘gold seal’ for a wide range of government interventions. In Ontario, the scale of IAP2’s influence on municipal planning practices is slightly different. There, IAP2’s particular approach to designing and planning public participation has had uptake with many municipalities creating government-wide community engagement strategies that are intended to guide all engagements with the public, not just those that occur within the context of planning. Several municipalities have also taken the additional step to promote, if not require, IAP2 training amongst their staff, as well as consultants responding to Requests for Proposals. In this paper, we critically examine the widespread uptake of IAP2 principles and practices. The focus of our work is to consider how IAP2 seeks to improve and create guidelines for participatory practice and to critically assess the potential consequences of such standardization efforts for planning. Guiding this investigation is the

question, does the widespread uptake of IAP2 approaches “raise the floor” for participatory planning practice, while also “lowering the ceiling”?

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Key Words: public participation, standards, institutions

#### ***"NOTHING IN MY YEARS OF COMMUNITY ORGANIZING HAS AFFECTED ME AS DEEPLY AS THIS CLOSURE DID": RESIDENT PERCEPTIONS OF THE SCHOOL CLOSURE PROCESS AND IMPACTS IN ONTARIO, CANADA***

Abstract ID: 749

Individual Paper Submission

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Public schools are more than educational institutions; they are public assets that have long proven essential parts of healthy, sustainable, and complete communities (Collins, Allman & Irwin, 2019; Vincent, 2006; Gibbons & Machin, 2008). Yet, public elementary schools are being permanently closed across Canada, and particularly within urban and rural settings in Ontario. For over a decade, closure decisions by Ontario's public-school boards have been directed by the Ministry of Education's (MoE) pupil accommodation review model. This model is driven by guidelines that have been criticized for prioritizing economic efficiency, while ignoring the broader consequences that school closures have for the liveability of the communities they serve (Collins et al., 2019; Witten et al., 2001). In turn, the model has created toxic atmospheres of tension, conflict, and resentment within many affected communities, at times leading to a sense of powerlessness among residents and demonization of school board staff (Fredua-Kwarteng, 2005). A more holistic understanding of the impacts of school closure processes and outcomes are vital to a responsible planning practice in both urban and rural contexts.

In this paper, we unpack the community impacts of school closures through the lens of both process and outcome. We conducted 20 in-depth interviews with residents in four Canadian communities where school closures had occurred. The interviews explored residents' involvement in the school closure process, their experience of the mandated engagement process, and their perceptions of whether their engagement was valued by decision-makers. In terms of outcome, residents were asked how the school closure influenced their wellbeing, work-life balance, travel behaviours social connections, and feelings about their community including changes to the long-term liveability of their community. The interviews were conducted remotely via phone or Zoom due to the ongoing pandemic, and residents were sampled from a household survey which was distributed to the community. The results of the interviews were transcribed verbatim and thematically analyzed.

The results indicated that, overwhelmingly, residents did not feel that they had the chance to meaningfully participate in the school closure process, and that their voice was not heard throughout the engagement process. Many felt manipulated and betrayed by the mandated engagement process with consequences that extended beyond future engagement with the MoE. The local knowledge of the residents further shed light on the

shortcomings of current governance practices involving school closures. Further, the findings illuminated the lasting impacts of the school closure decision on the communities with outcomes related to physical, social, political and economic aspects of the local neighborhoods. Of note, even residents who were not directly involved with the school (either with children who attended the school, or through attending community events with the school) felt the sense of community in the area had decreased since the closure.

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Key Words: public school closures, collaborative planning, public engagement, community well-being

#### **THROUGH THICK AND THIN: UNDERSTANDING DENSITY NARRATIVES KEYWORDS: ZONING REGULATION, AFFORDABLE HOUSING, DENSITY, POLITICAL ECONOMY OF HOUSING, LAND-USE**

Abstract ID: 765

Individual Paper Submission

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Shortage of affordable housing in US cities is attributed to a general lack of adequate housing supply. This supply side constraint has led policy makers, planners and a host of other actors to promote changes in land use regulations that allow for higher density housing. Scholarship on up-zoning and easing density restrictions link it to increase in housing affordability and reduction in racial and income segregation (Lens & Monkkonen, 2016). On the other hand, critiques of up-zoning advice against assuming up-zoning as a panacea. They argue that dense neighborhoods do not necessarily result in affordability (Rodríguez-Pose, A., & Storper, M. 2020). However, even though a rich scholarship examines and debates the effect of density on affordability, little is known about how narratives around density are framed and how that impacts the way urban space is imagined and used.

This paper addresses this gap by conducting a systematic analysis of over 3000 public comments made to the City of Minneapolis as it became the first city in the country to ease single family zoning restrictions in favor of higher density housing. These comments were made across three phases of the plan's public engagement process which began in 2017 and continued till 2019, spanning all 83 of the city's residential neighborhoods. Through this database of public comments, this paper puts together a phenomenology of urban density that focuses on how "language and aesthetics" of density shape the contestation around space in the contemporary urban (Rao 2007, Perez 2020).

In 2018, amidst a heavily contentious public opinion, Minneapolis City Council approved a new comprehensive plan that eliminated single family zoning restriction in the city. Prior to the plan, the zoning ordinance allowed single family homes on more than 70% of the land zoned for residential purposes. This restrictive zoning, the city argued, led to a historic low vacancy rate in a growing city that caused excessive pressure on both renters and homeowners. Minneapolis 2040 plan was touted to be "bold, big and brilliant" (New York Times 2019). Amongst a plethora of other cities that were trying and failing to ease density restrictions, Minneapolis had set the stage for a big change.

In Minneapolis, as the plan was underway, two citizen-led groups, one in support and one in opposition of the plan began mobilization. ‘Neighbors for More Neighbors’ a pro-density group outlined how changes in density can help “dismantle institutional racism”(Medium, 2017); whereas ‘Minneapolis for Everyone’, an anti-density change group argued that density changes will “benefit developers at the cost of neighborhoods” (Minneapolisforeveryone2019). The narratives employed by these two groups demonstrate how density is differently experienced, perceived, negotiated, and contested.

Fusing two methods, political claims analysis (Koopmans and Statham 1999) and political discourse analysis (Gamson 1992), this paper conducts an in-depth analysis of an archive of public feedback. The public feedback database includes demands, criticisms and proposals obtained from open house community events, online comments on websites and through emails. The aim is to capture the form, range and effect of different claims made and narratives employed by residents in response to Minneapolis 2040 plan. This approach captures how residents challenge and put forth new interpretations and frames of density that redefine cultural and political norms of what cities should be.

While US cities are undergoing new geographies of densification, it is important to understand the narratives associated with these changing geographies. Although density comes across as a technical tool to enhance productive space, it is also responsible for engineering new relationships between material and people (Perez 2020). This work contributes in understanding the contradictions of density as an urban epistemology in the context of displacement and housing crisis.

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Key Words: Zoning Regulation, affordable housing, density, Political economy of housing, land-use

#### A COMPARATIVE ANALYSIS ON NOISE POLICIES IN THE UNITED STATES AND EUROPEAN UNION

Abstract ID: 910

Individual Paper Submission

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Environmental noise has long been recognized as detrimental to human health. In 2011, the World Health Organization estimated that at least one million lives were lost due to the disease burden from traffic noise pollution in Western Europe alone. Excessive or abrupt noise can lead to cardiovascular disease, sleep disturbance, annoyance, low productivity, cognitive impairment in children and hearing loss (World Health Organization, 2018). Studies from the U.S. also indicated that 9 of 10 adults in New York City are exposed to noise levels exceeding the recommended 70 dBA limit established by EPA. In the U.S., it was estimated about 72.6 million urban dwellers were exposed to excessive noise in 2010, an increase from the 66 million people nationally (both urban and rural) in 1981 (Hammer et al., 2014). While air, water and other sources of pollution are decreasing in the U.S., noise remains one of the only environmental pollutants increasing in the U.S.. In Europe, research and policy innovations on sound environments have continued to grow in recent decades. The WHO European Office has led several studies of noise regulation and control. Several EU countries, including the UK, are frequently assessing and updating guidelines for

community and environmental noise (Kang, 2007).

This study critically reviews the literature on noise control policies in the U.S. and Europe. It begins with a comparative analysis of the withdrawal of the Federal Government's role in noise regulations in the U.S. and the expansion of rigorous research and policy innovations focused on noise control in Europe. Efforts to reduce noise or prevent pollution often require intensive planning among stakeholders. Compatible land use planning, sound level limits, spatial and temporal restrictions are commonly implemented regulations. Strategies such as soundscape management is a recently emerged approach that can be integrated into the planning process (Adams et al., 2006). Findings from this study suggest that there is much to learn from planning practices in Europe, including approaches that can be adopted and modified for future noise policy in the U.S..

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Key Words: Noise policy, soundscape, urban planning

### **A NEW, ROUGHER ERA OF CONFLICT? EXPANDING THE PLANNER'S TOOLKIT FOR COLLABORATIVE PLANNING IN THE FACE OF GROWING POLARIZATION, FRAGMENTATION AND INEQUALITY**

Abstract ID: 931

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Recent research confirms our professional experiences and personal perceptions: the US has entered a new era of political sectarianism (Finkel et al 2020). Our current era is marked by contesting ideologies and an intense desire to dominate or 'own' the opposition. This dynamic demands that we draw distinct tribal boundaries, avoid interacting with our adversaries, and justify our positions and conquests as morally righteous. Every dispute, no matter how trivial, becomes an opportunity to 'know thy enemy,' reaffirm your distaste for them, and bolster your ironclad belief that your adversaries are not just wrong but evil. As a result, these forces are now far more pervasive, bleeding deeper into our civic and personal lives. One might have hoped that the unruly, dissonant national political culture would not trickle down to the municipal level, but alas there has been no firewall insulating local civic culture. Assumptions that planners once could make, walking into a public meeting, about a base level of shared values and community knowledge, mutual respect, and a willingness to listen and compromise to resolve community disputes, can no longer be taken for granted.

This paper is motivated by an ongoing effort to understand the role planners may play in deeply rooted conflicts at a time dominated by polarization. In a now receding era of American urban life (an era we might view with nostalgia



as one of resurgent urban vitality and peace sandwiched between the Urban Crisis and the Trump era), planners often faced only a subset of the larger constellation of social conflicts. Conflict, for planners, was relatively circumscribed by matters that: impacted property values, affected the health and safety of community members, and concerned the allocation of municipal funds. To address these conflicts, planners folded alternative dispute resolution techniques into their practice (Susskind and Ozawa 1984). Through role playing simulations and other pedagogical innovations, planners learned how to engage adversaries to uncover the interests and values that underlie particular positions (Innes and Booher 1999). Focusing on motivations instead of desires helped many planners work through conflict to make plans that incorporated mutually agreeable trade offs and compromises. These techniques emerged alongside the communicative and argumentative turns in planning and as such were fitted to the models of disputes with which planners were most familiar. Our unsettling concern is that these existing models of conflict have not kept up with the times, and the tools for resolving them are no longer up to the task.

Therefore, we argue that it is high time to reconsider our dispute resolution tactics in planning contexts, and to do so, we explore three alternative strategies: (1) Double down on our commitment to the practices of the past. With more experience in highly contested situations, planners can fine tune their skills to more adroitly handle future conflict. (2) Identify and expand those specific dispute resolution tactics that still work in our polarized climate. For example, joint fact finding shows promise for addressing disputes over facts and may provide an antidote to the spread of misinformation (Matsuura and Schenk 2016). (3) Jettison the old models and tools of conflict resolution and develop radical new approaches suited to the brave new post-truth world. For instance, complexity-based models could decode the nature of conflict and provide communities with new resolution tools (BenDor and Scheffran 2018). To test these three scenarios, we examine the changing characteristics of contemporary planning conflicts and planner's responses. We conclude with advice about which pathway might be preferable and outline some expectations for the ways in which planners will interface with conflict in the future.

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Key Words: Dispute Resolution, Participatory Planning, Political Polarization, Conflict, Misinformation

#### ***CITIZEN PLACE: INVESTIGATING PARTICIPATIVE PLANNING AND POLICYMAKING***

Abstract ID: 979

Individual Paper Submission

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Shared place is often an unavoidable conflict point between various political, cultural, and economic agendas. For public space to function well, stakeholders must be meaningfully and consistently engaged, rather than just called upon – or worse, demanding to be heard – only after decisions affecting their lives have been implemented by

planners and policymakers. When people are involved from the start, resilience and collaboration is greatly enhanced. If stakeholders are excluded, uncertainty about changes often creates conflict and foments lasting distrust (Gardner, et. al., 2018). The differing ways communities receive a new public good depends on “the state of the system of goods offered” (Bourdieu, 1984). Not only is the good itself important; key also is context: “Urban process implies the creation of a material physical infrastructure for production, circulation, exchange and consumption” (Harvey, 1978: 113).

Using Madrid and New York as case studies; this research explores how cities can effectively implement mechanisms for citizen participation. In 2015, Madrid’s government launched a website, *Decide Madrid* ([decide.madrid.es](http://decide.madrid.es)), that provides a single online location for public decision-making; including budgeting, citizen-led petitions, and giving feedback on proposed legislation. The city’s Office of Civic Participation built the software, *and* turned the code into an open source project called Consul that anyone can download. In 2018, it won a U.N. Public Service Award (in the category, “Making institutions inclusive and ensuring participation in decision-making”). Today, over 400,000 of three million Madrileños use the platform; anyone over sixteen years old who is a registered resident can participate. About \$110 million of projects are funded annually, making it one of the world’s largest participative processes.

Over a dozen cities in Spain, and governments in Buenos Aires, Bogota, and Lima, use Madrid’s Consul software, as does New York’s Participatory Budgeting Project, the largest civic engagement project in the U.S. In New York, the process is open to all residents, aged 11 and older, who live in one of twenty-six participating city council districts. In 2018, New York (with about thrice Madrid’s population) funded \$36.6 million of projects; 99,250 New Yorkers participated, developing hundreds of spending proposals and funding 124 community improvement projects for schools, parks, libraries, public housing, streets, and other public spaces.

Broadly, the research is guided by this primary question: How do multilateral participative mechanisms facilitate citizen engagement that produces effective and equitable planning and policymaking? To investigate, I deploy a three-fold qualitative methodology:

1. Stakeholder interviews: Asking questions that examine how citizens interpret their roles in participative processes and in their community is crucial for this research.
2. Participant observation: Observing and analyzing public (in-person and online) forums to better comprehend how these mechanisms function and to explore power dynamics between stakeholders; “by immersing themselves in the setting, the researcher is able to hear, see, and begin to experience reality as participants do” (Marshall & Rossman, 2011: 140).
3. Reviewing media coverage: Identifying key historical, social, political, and cultural issues at play. Mass media helps set the policy agenda by creating new analytical frames and introducing values or emotions that influence how people interpret and respond to policymaking processes (Stone, 2012).

The research demonstrates how multilateral public engagement makes cities better places to live. Much remains to be learned about implementing effective participative strategies; planning driven solely by political capital can never be effective, and notions of place are constantly changing and being reimagined. While outcomes will never be perfect, cities must create new processes that leverage stakeholders’ capacities to generate ideas.

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Key Words: participative process, online engagement, participative process, democracy, placemaking

## **FROM COMMUNITY CREATED TO TOP-DOWN: PARTICIPATING, RESEARCHING, AND GOVERNING FOR RACIAL EQUITY IN HOMELESSNESS**

Abstract ID: 981

Individual Paper Submission

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Participatory democracy, collaborative governance, and community based research are frequent phrases in planning scholarship and practice. Yet, what it looks like to engage in these practices while focusing on racial equity remains an open question in practice. Our work examines the question about what it means for homelessness research and evaluation practices to be centered on or rooted in racial equity and people who have or are experiencing homelessness.

A Portland Oregon health nonprofit created a flexible fund designed to help support people experiencing homelessness who are best served by permanent supportive housing. The nonprofit sought our expertise to work with people of color who had experienced homelessness and housing insecurity and/or worked with homelessness service providers, in health care, or as researchers. We reviewed relevant literature and developed a research framework by integrating several participatory evaluation and research examples of collaborative planning and community based research projects. We then interviewed 25 people in Portland, Oregon who were people of color, people who had or were experiencing homelessness, people working at houseless service providers in research areas or working at culturally specific providers, community based researchers of color, and additional health and homelessness systems research experts as needed.

Based on what we heard and read, we compiled definitions, questions, and examples about how to think about research, governance, and evaluation that considers, and ideally acts upon, the needs, experiences, and perspectives of people of color who have experienced homelessness. We start by identifying key core values that a historically white institutions (Health Share in this institution) must internally assess and externally explicate to engage ethically with people of color and people who have experienced homelessness. The institution must be able to understand the ways in which they can and will be transparent about decision making. They must state how and to what degree they are going to share power.

We then discuss how a white dominant nonprofit should engage people of color and people who have experienced homelessness to develop a community driven and racially equitable participatory process to develop a research and evaluation framework. As part of this we also discuss how the long-term governance of this framework would be created. Lastly we synthesize these recommendations into a spectrum of activities to help organizations identify whether their work is top-down, muddled consensus, community informed, community driven, or if they are supporting community centered work.

Overall this research helps planners, policy-makers, service providers, and researchers identify how their participatory processes and governance structures can better work towards racial equity, with people of color, and

with people experiencing homelessness.

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Key Words: Participatory, Collaborative, Community, Research, Homelessness

### OVERCOMING EXCLUSIVITY IN THE SINGLE-FAMILY ZONE: THE OREGON APPROACH

Abstract ID: 1079

Individual Paper Submission

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From the 1920s in the United States, the single-family zone (almost always limiting residential uses to detached dwellings) has been the norm. The characterization of apartment dwellings as a “parasite” by the Supreme Court in *Euclid v. Ambler* to justify segregation among residential uses and has since been used as a reason for preserving real estate values and “community character.” In the absence of a comprehensive plan obligation and with the complete delegation of land use regulatory power to local governments under the Standard State Zoning Enabling Act or similar legislation, courts were effectively limited to constitutional grounds to review land use regulations to assure they were not “arbitrary and capricious.” The rise of the use of the Takings Clause provided some relief from governmental overreach regarding individual properties, but did not affect the allocation of lands for residential uses under *Euclid*’s “fairly debatable” standard.

The broad acceptance of zoning in the years following *Euclid*, along with the pattern of complete delegation of land use regulatory power to municipalities and counties, has led to a national pattern of exclusion along racial and class lines, particularly in suburban areas surrounding larger cities. While there have been notable and somewhat effective efforts to respond to exclusionary zoning patterns through an interpretation of the state constitution (New Jersey), or through regional fair share requirements gleaned from state statutory law (New York, Pennsylvania, and New Hampshire), local governments resist change from a system that reenforces segregation based on the use of single-family zones that do not allow other housing types outright. The use of a “fairly debatable” standard supports this pattern and William Fischel’s Homevoter Hypothesis provides evidence of local political resistance to change in the exclusivity of the single family zone.

Oregon has dealt with housing as a state policy objective for a half-century. The state has a planning agency, the Land Conservation and Development Commission (LCDC), which formulates and assures compliance with state land use policies (called “goals”) through a process of “acknowledgment” that certifies those goals are incorporated into required comprehensive plans. Those plans bind land use regulations and actions of public and private persons. Since 1974, Oregon has had a housing goal (To provide for the housing needs of citizens of the state) that requires that buildable land for residential use be inventoried and that local governments encourage meeting housing needs for homeowners and renters. Binding administrative rules detail these obligations and the primacy of the goal and its implementing rules is assured.

Due to trends that make the state a desirable place to live, the decreasing ability of families to afford single-family housing, and the rise of homelessness, the Oregon legislature has authorized more intrusive legislation that affects local zoning. In 2019, the legislature passed HB 2001, which ends the monopoly of the single-family home in single-family zones, providing that for cities with 10,000 or more population, a duplex will be allowed as of right, and for cities of over 25,000, “middle housing” (duplexes, triplexes, quadplexes, townhouses, and cottage clusters) must be allowed in some areas as of right. At the end of 2020, LCDC adopted administrative rules to carry out this legislation.

This paper will discuss the antecedents to the 2019 legislation, other legislation that provides for a single methodology to deal with existing housing and projected needs, and the detailed rules under which the legislation is implemented. In addition to the legal analysis, the political drama that accompanied that legislation will be examined, all as an example of how beneficial change in housing policy may be realized.

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Key Words: Planning, Zoning, Housing, State Preemption, Exclusionary Land Use Regulations

## OPPORTUNITIES AND CHALLENGES OF PUBLIC PARTICIPATION IN POST-DISASTER RECOVERY PLANNING: LESSONS FROM GALVESTON, TX

Abstract ID: 1118

Individual Paper Submission

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While public participation can improve recovery planning, post-disaster environments pose unique challenges and opportunities that can enhance or undermine participation depending on the recovery policies and features of the planning process. This paper presents findings of archival research and in-depth interviews in a qualitative case study of Galveston (Texas) following Hurricane Ike to examine the challenges and successes of participatory recovery planning in Galveston and the factors that shape these outcomes. Seizing heightened participation momentum after a disaster by engaging residents in a transparent process provides optimism and an opportunity for recovery champions to gain support for their ideas. However, planning while unprepared, homogeneity of participants, and skipping deliberation may limit voices of the marginalized residents in decisions and undermine implementation of the proposals. Under-represented socially vulnerable groups should be included in all stages of recovery planning through deliberate outreach strategies tailored to their circumstances. Supported by professional planners and technical experts, involved stakeholders should engage in deliberation rather than mere input solicitation to increase the effectiveness of post-disaster participatory planning.

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Key Words: Disaster recovery planning, Public participation, Opportunities and challenges, Engagement policy

# Track 13 – Planning Theory

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### **13.15 PRE-ORGANIZED SESSION - EMOTIONS IN POST-RATIONAL PLANNING: TRAUMA, EMPATHY, AND HEALING**

Pre-Organized Session 15 - Summary

Session Includes 463, 464, 465, 914

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The Black Lives Matter and Stop AAPI Hate protests spotlighted the power of grief, anger, and love to remake cities, from public space to public policy. As urban planning evolves from the rational and technocratic paradigm towards a more post-rationalist era, there is an increasing awareness that recognizes the importance of emotions in planning (Ferreira, 2013; Hoch, 2006; Lyles and Swearingen-White, 2019; Tate, 2021). Planners are called for urgent action to construct an environment that is justice and supportive, and it is necessary for urban planners to work through emotions in the process of building justice and healing their communities. Emotion-responsive teaching promotes the awareness of emotions in learning, cultivates a safe and supportive classroom, and facilitates growth and healing (Misaka & Giffin, 2021). Building upon the “Emotions in Planning” roundtables at the 2018 and 2019 ACSP conferences, the goal of this session is to promote scholarship around the issues of equity, inclusion, legitimacy, language, privilege, and power undergird, which yield a broader call to examine diverse perspectives and approaches to “emotions in planning”.

Objectives:

- Understand the importance of addressing emotions in planning
- Learn how to work with emotions in planning practice

### **I SECOND THAT EMOTION: EXPERIENCES USING ENGAGED PEDAGOGIES AND EMOTIONAL INTELLIGENCE IN PLANNING EDUCATION**

Abstract ID: 463

Abstract within Pre-Organized Session 15

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Imagine a job announcement from agency or organization that recognizes the power of emotion, knowing that people affected by some of the most urgent issues facing cities deserve planners who have both technical skills and high levels of emotional awareness. Required qualifications:

Planners whose training includes a focus on understanding the role of emotion in planning;  
Demonstrated potential for understanding the ways in which expressions of emotion are interpreted and distorted through multiple systems of oppression;  
Demonstrated commitment to ongoing development of empathy;  
Demonstrated experience with cultural humility;  
Demonstrated potential for continuing self-reflection and growth. Planning scholars have called for compassionate planning (Lyles, White & Lavelle, 2018), sought to explain why planners resist emotion (Baum, 2015), examined ideas about loving attachment (Porter, et al, 2012), and championed cultural humility (Sweet, 2018). In line with these perspectives, there are clear opportunities for students to begin recognizing the power of emotion during their planning education. When training future planners, in what ways can we as instructors open our classes as spaces for acknowledging, validating, honoring, and encouraging emotional engagement? How can we build emotional education into the core values of planning curriculum?

My teaching is heavily influenced by bell hooks, who in her writing about engaged pedagogies describes instructors as responsible for assessing the emotional intelligence in the classroom (hooks, 2010). In this paper I detail the experience of tailoring my pedagogical strategies in a Critical Race Studies course to support students in untangling feelings from analysis, identifying complex emotions and using them to deepen critical lenses, and intentionally creating space for exploring the role of emotion in learning, class facilitation, and in planning as a field.

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Key Words: Engaged Pedagogy, Emotion, Gender, Race, Cultural Humility

#### **LOCALISM IS DETERMINATIVE AND THE EMOTIVE BACKLASH TO REOPENING CALIFORNIA**

Abstract ID: 464

Abstract within Pre-Organized Session 15

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California was one of the first states in the nation to institute statewide “shelter in place” public health orders in March 2020 in response to the COVID-19 pandemic. This bold declaration in the subsequent months evolved into the diluted “Localism is determinative. We put out the how, counties decide the when” from Governor Gavin Newsom. Emotive public backlash that erupted in the aftermath of state restrictions partly influenced this response. Some residents and public officials largely identifying on the political right argued the orders caused severe economic harm and government overreach that trampled individual rights and religious freedom. Militia and far right groups also participated offering to provide security to participants. Others harnessed the protests to gather signatures and increase awareness during the nascency of a then largely dismissed gubernatorial recall effort that currently has the potential for voter consideration in fall 2021.

Building from planning and related scholarship on emotions (e.g., Baum, 2015; Boudreau, Boucher, & Liguori, 2009; Trapenberg Frick, 2016) and conservative views (Sager, 2020; Trapenberg Frick, 2021) and drawing from field observation of Sacramento and San Francisco protests combined with online communications and news sources review, I first examine key opposition actors and their emotive narratives and organizing strategies, online and in person. Most striking were protests of varying sizes in public spaces including the state capitol of Sacramento where people rejected social distancing protections purposely interacting at close distances and shunning facial masks, which some called “muzzles”. I then consider the potential galvanizing effect of these protests and activities including increased skepticism of government, public process and science.

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Key Words: Emotions, Protest, Conservative Views, COVID-19 Pandemic

## EMOTION AND PLANNING: ANXIETY AND FEAR

Abstract ID: 465

Abstract within Pre-Organized Session 15

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This review article builds on an emerging array of planning literature examining emotion as crucial planning knowledge (Baum, 2015; Ferreira, 2013; Hoch, 2006; Lyles and White, 2019; Rodriguez et al, 2019; Tate, 2021; and Trapenberg-Frick, 2016). Emotional knowledge is important in its own right. In addition, improved emotional understanding may further help planners respond to a parallel buildup of events, all sparking significant fear and anxiety, building over the last decade and more.

Globally, such events have included simmering fears about consequences of, and lifestyle changes associated with, climate change. They have been exacerbated by the recent pandemic. Moreover, in both the US and Canada, fear-related events such as protests against police shootings have triggered (and produced backlash to) social justice movements for Black Americans and Black Canadians, and others experiencing systemic oppression. Anxiety and fear about basic survival issues may have similarly played a role in efforts to confront colonialism’s legacy among Indigenous peoples, including Native Americans and Canadian First Nations. As American and Canadian planners with Indigenous, South Asian, and European backgrounds advocating for social justice, we believe our profession must now deepen its understanding of anxiety and its influences on decision making. This could ultimately help us both in advising elected officials and in advising activists or taking on activist roles in planning.

The article conducts a thematic and interdisciplinary literature review on the potential impact of anxiety / fear in supporting or complicating decision-making and activism. Such decisions can include those made by decision-makers, people in advocacy roles, and professional planners/ bureaucrats themselves.

In focusing on anxiety, we appreciate that it can occur at a range of scales (e.g. from the individual to the societal) while also co-existing with wellness and protective characteristics (building from Manderscheid et al, 2010). In short, even when a person or society experiences anxiety, this does not mean they are automatically unwell. Wellness encompasses positive life experiences along with “the capacity to manage one’s feelings and related behaviours, including the realistic assessment of one’s limitations, development of autonomy, and ability to cope effectively...” (Manderscheid et al:1). Thus, anxiety may create chronic challenges; yet those individuals and societies confronting it can also process, and cope with, it effectively while also enjoying a robust quality of life and perhaps even growing from the experience. We describe this as a wellness-informed response to anxiety.

Direct practice-based payoffs emerge from embracing planning's emotional side. One example arises through the public engagement process (Lyles & Swearingen White, 2019; see also Trapenberg-Frick, 2016). During engagement, various emotions directly impact dialogue activity, emerging among community members and among professional planners themselves. In response, Lyles and Swearingen White urge planners to more consciously develop and enhance their emotional literacy. They have traced the broad lines of a conceptual model for planners to use. Their deeply empathic model has three dimensions: planning leadership; cultural humility; and cultivating compassion. In all three dimensions, planners and the communities they serve benefit when planners can unpack how specific types of emotions impact their own perceptions and behaviours as well as those of others with whom they engage.

A second planning benefit from more emotional awareness supports the function of advising, or conveying knowledge to decision makers, to inform choices about future actions (Tate, 2021). Many emotions are impactful in this work. Yet in particular, planning professionals may not consistently or sufficiently acknowledge the decision-maker anxiety which can arise (Tate, Ch. 4). Specifically, planners may fail to acknowledge both the anxiety connected to the decision itself, and the potential anxiety arising when elected officials must learn deeply about technical information embodied in professional advice.

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Key Words: emotion, anxiety, post-rational planning

#### **ANGER AND PLANNING FOR ABOLITION: PRODUCTIVE EMOTIONS IN PUBLIC PARTICIPATION**

Abstract ID: 914

Abstract within Pre-Organized Session 15

KOH, Annette [California Polytechnic University - Pomona] akoh@cpp.edu, presenting author

Recently, planning scholars have borrowed from Iris Marion Young's work on difference and Chantal Mouffe's work on agonism, to point out that "irrationality" is not only inescapable in planning processes, it is also essential (Baum 2015; Inch 2014). Beaumont and Loopmans (2008, 98) assert that a "truly radical and plural democracy" requires "irrationalist position[s] sensitive to emotions and passions."

However, in practice, participatory planning and deliberative democracy operationalize a definition of "reasonableness" constructed by and aligned with existing power structures (Kohn 2000). Definitions of rationality/irrationality are raced, classed, gendered, and ableist in ways that reinscribe institutional inequalities and further marginalize those often defined as outside of the legitimate public. At the 2017 TransAlt Vision Zero conference, mobility justice advocate Tamika Butler spoke of their fury when bike activists deemed them a "concern troll" whose critique of the law enforcement aspect of Vision Zero policies was a "distraction" from meaningful safety.

Empirical research on planning's "rationalist" paradigm has detailed the ways that bureaucratic-technocratic professional discourse devalues informal or vernacular modes of expression that are deemed too emotional or illogical (Tauxe 1995). The influential International Association for Public Participation offers a training on "Strategies

for Dealing with Opposition and Outrage in Public Participation” that is designed to help practitioners manage and reduce public outrage through the entire process. The public is also expected to manage their own emotions. The city of Beaverton, Oregon, for example, provides tips on delivering effective testimony at a public hearing that includes the suggestion to read from a prepared script “to organize [your position] and reduce some of the emotion that you might feel about the topic or issue.”

The denial of emotion’s place in planning reduces equitable participation in two troubling ways: one, devalues input deemed as too emotional and thus irrational and, two, disregards historical wrongs and unaddressed traumas in favor of a presentist frame that brackets out other contextual issues (Drew 2012). Furthermore, emotions may have greater centrality and credibility within the public sphere than planners have typically assigned them (Miller 2011).

This paper focuses on the “defund the police” campaign in Los Angeles during the summer of 2020 as a case study of how emotions of anger and fear can be productively inserted into planning processes. In particular, the embodied traumas and affective impacts of over-policing and mass incarceration have ineluctably entered the policymaking sphere (Simpson, Steil & Mehta 2020). Drawing on transcripts of public hearings, local newspaper coverage, media statements, and online events hosted by abolitionist organizers, the paper uses a content analysis approach as a springboard for exploring how emotions can be legitimated within local policymaking and in participatory forums. Far from detracting from the efficacy or persuasiveness, these rhetorical expressions and embodiments of anger and fear recenter the lived impacts and moral realities of municipal budgets. Finally, by foregrounding the affective experiences of policing during the pandemic, community advocates have reframed definitions of “public safety” and “genuine safety” away from abstract platitudes.

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Key Words: emotions, public participation, abolition, rationality

### 13.32 PRE-ORGANIZED SESSION - THE PROGRESSIVE CITY AND REGION: AN ANTIDOTE TO CONTEMPORARY NEO-LIBERALISM?

Pre-Organized Session 32 - Summary  
Session Includes 192, 193, 194, 195

REARDON, Kenneth [University of Massachusetts, Boston] kenneth.reardon@umb.edu, organizer

This session will examine the origins, evolution, current state and future potential of what Pierre Clavel described in 1986 as The Progressive City which emerged in the late 1960s and 1970s when neighborhood residents, environmental activists, trade union officials, Civil Rights leaders and good government reformers came together to form coalitions to elect City Councilmembers and Mayors committed to improving the economic status and amplifying the political voice of non-elites in municipal policy-making. This panel will explore the impact of import

substitution, First Source Hiring, planned manufacturing districts, linkage, inclusionary zoning, industrial retention, urban land banks, rent control, cooperative economic, Living Wage and participatory budgeting policies, pioneered by Progressive Cities, on the economic stability and political influence of poor and working class families and communities in the 1980s and 1990s. After comparing and contrasting the American and European Progressive Cities, the panel will discuss the extent to which their redistributive policies have influenced regional, state and national urban planning policies.

Objectives:

- Promote a deeper understanding of the impact of neo-liberal policies in American and European cities.
- Enhance our understanding of the redistributive policies and participatory planning processes of the Progressive City.
- Encourage the evaluation of Progressive City policies and policies as an alternative the neo-liberal urban policies.

## **THE ORIGINS, EVOLUTION AND IMPACT OF THE PROGRESSIVE CITY ON CONTEMPORARY URBAN POLICY MAKING**

Abstract ID: 192

Abstract within Pre-Organized Session 32

CLAVEL, Pierre [Cornell University] pc29@umb.edu, presenting author

In the 1970s and 1980s cities like Berkeley, Madison, Hartford, Cleveland then Burlington VT, Santa Monica, Chicago and Boston elected progressive mayors and city councils. They espoused participatory government and redistributive measures tuned to counteracting inequality. Hopes rested on new policies, but also on the wholesale capture of city halls – with attendant legitimacy and resources.

Not much was heard about these cases after about 1990; and progressives were losing ground overall, as the forces of reaction mobilized in the 1970s. Conservatives launched ALEX in 1973, passed California's Proposition 13 in 1978. Union membership declined, and Republicans dominated state legislatures and governorships, increasingly through the last third of the 20th century. "Neoliberal" doctrine flourished, with proposals for deregulation, austerity, and privatization. Government was no longer the solution to social problems. Progressives resisted, but "capturing city hall" seemed a thing of the past.

This all changed in the second post-millennial decade. Neoliberalism faced new criticism. In part the remedies just weren't working. Dramatically, progressives began to take over city halls again: New York City in 2013, along with Boston, Seattle, Minneapolis, and Pittsburgh; then Newark in 2015, Jackson Mississippi in 2017 among others. There were several important books: J Phillip Thompson wrote *Double Trouble* (2006) pointing to the emergence of a new participatory style among black mayors. Steve Early described a multi-ethnic coalition in Richmond CA in *Refinery Town* (2017). Juan Gonzalez wrote *Reclaiming Gotham* (2017) that, starting with a deeply researched account of Bill de Blasio's first three years as mayor of NYC, found a basis to note that "something different has happened with the current progressive wave; its elected officials are consciously attempting to remain connected to their base of supporters in the way they govern," and rooted them generally in the previous decades of resistance to neoliberal policy that had national scope, but whose effects locally had been little reported or codified.

These events now cry out for further inquiry. How are they different – if they are – from previous attempts? One could frame them as a resurgence of post-sixties radicalism of "progressive cities in the 1970s and 1980s. Equally, the new initiatives and city hall victories got sustenance from a new political terrain. This was Gonzalez' contention.

The question now is whether and how the resistance to neoliberal "remedies" have impacted the localities – what Justice Brandeis once called the "cradle of democracy." This essay will explore this question by reviewing events leading up to the recent elections of progressive mayors: (a) what were the issues raised by the neo-liberal policies

that were tried in the decades before and after 2000, and how did progressives learn from resistance through these struggles? (b) How did coalitions form in this period – in particular, did a new force develop from ties between black and brown minorities and new urban millennials? And (c) To what extent were initial progressive mayoral victories sustained post-inauguration – e.g. in the face of challenges, re-election campaigns?

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Key Words: United States, Progressive Cities, Neoliberalism, Politics, Economic Democracy

### EUROPEAN PERSPECTIVES ON THE PROGRESSIVE CITY AND OTHER MUNICIPAL REFORM APPROACHES

Abstract ID: 193

Abstract within Pre-Organized Session 32

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Due to a more polarised and pluralist party system as well as significant periods of authoritarian/totalitarian government during the twentieth century, the experience of 'progressive city government' in continental Europe has followed a quite different path to that of the United States. Thanks to the presence of large, and electorally competitive socialist and communist parties with broadly Marxist-Leninist affiliations or sympathies, which in turn linked municipal socialist governments to their counterparts in the trade union and cooperative movements, as well as to intellectuals in a range of relevant professions including architecture, planning, housing, regional economic development and the arts and culture, it was possible to identify vibrant and self-sustaining progressive municipal and even regional polities, which defined their counter-hegemonic position as broadly anti-capitalist (Lefebvre 1970, Marcuse 2009, Mayer 2009). At its peak in the mid-1970s when Eurocommunism appeared to be seriously challenging the social democratic consensus on the left (and with echoes sometime later in the 'new municipal left' of the British Labour Party), a significant number of major European cities - especially in southern Europe - were engaging in radical experiments in social housing and community planning as well as new forms of worker self organised and self managed industries and services (Parker 2001a, 2001b). At the same time, novel forms of grassroots democracy aimed at the decentralisation of decision-making accompanied a shift to a more horizontal form of popular politics as the various urban movements that had emerged during and after '68 became interlocutors with and even provided the personnel for progressive city hall administrations in the following decades (Castells 1983).

However, after the fall of the Berlin Wall and the collapse in support for communist and social democratic parties across Europe, the domination of national governments by neoliberal conservative parties saw a shrinking political base and diminishing budgets for the remaining progressive municipalities with few resources to fight the privatisation of public services and the capture of the planning process by developers and speculators, let alone to rebuild the social movement alliances needed to tackle racial injustice and other forms of discriminatory state violence along with environmental degradation and climate change. In this paper, I draw on my previous work on the municipal left in Europe to explain why progressives have failed to win the battle of ideas over the right to the city, but also how new alliances of progressive mayors and administrations are learning from grass-roots community organising more typical of US progressive city initiatives as a way of compensating for the leadership void created in

the wake of a compromised and degraded formal left-of-centre politics in order to re-plan a more just city.

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Key Words: Europe, Progressive Cities, Neoliberalism, Right to the City, Uneven Development

#### **JUSTICE AT/BEYOND WORK: ECONOMIC JUSTICE MOVEMENTS AND URBAN POLICY CHANGE**

Abstract ID: 194

Abstract within Pre-Organized Session 32

SCHROCK, Greg [Portland State University] gschrock@pdx.edu, presenting author

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In the 2010s we witnessed a sea change in how U.S. cities engaged questions of social, economic, and racial justice. The change was overdue. Three decades of urban economic restructuring – post-Fordist deindustrialization, servitization, and financialization – had intensified class-based urban inequalities, and institutional and systemic racism (Mallach 2018). Countering the conventional wisdom that cities would be punished through capital flight if they enacted policies to promote economic justice, dozens of local governments passed – with increasing and somewhat surprising ease – progressive labor market policies that substantially raised minimum wages, and imposed numerous new regulations on private businesses to expand goals like paid time off, inclusionary hiring, and fair scheduling. Most notable is the diversity of cities and counties that passed such policies – they are not simply the tech and financial cities considered “winners” of contemporary capitalism, but also cities that have been battered and bruised by waves of economic restructuring past and present.

How did this happen? Urban scholars historically explained progressive urban governance and policy change in relation to epiphenomenal dynamics – grassroots organizing and coalition-building, and most importantly, the capture of City Hall by progressive actors (Clavel 1986; 2010). Yet the mostly disappointing track record of “progressive mayors” in achieving durable change – from Kucinich and Washington in the 1970s and 1980s to DeBlasio in the 2010s – suggests that a new analytical approach is needed, one that better specifies how power built through organizing gets deployed in the policy change process.

In *Justice at Work*, we advance two core theses about progressive policy change in cities (Doussard and Schrock 2022). First, we argue that the emergence of Economic and Racial Justice (ERJ) coalitions in cities is the critical institutional change underpinning current progressive change. ERJ coalitions represent an extension of past waves of urban organizing since the 1970s – the neighborhoods, living wage and community benefits movements – marked by an intersectional approach to organizing that centers the racialized dynamics of inequality in contemporary cities. Second, we argue that urban policy change operates through dynamics of “urban policy entrepreneurship.” This approach, adapted from Kingdon’s classic model of (federal) policy change (Kingdon 1984), focuses on the interaction of three “streams”: problems, policies, and politics. We argue that “Urban Policy Entrepreneurs” – a subset of ERJ coalitions – use public space and the intangible resources of the city to couple streams and open progressive “agenda windows,” which they populate with policy proposals incubated through networks of national-level organizations. This approach helps us to deal analytically with the structured contingency

of urban policy change, embracing agency in bounded and realistic ways.

Are these changes sufficient to usher in a new era of progressive urban governance? There is a fair basis to be skeptical. The cases of “justice at work” that we document in this book – minimum wages, targeted hiring, and fair scheduling and paid time off policies – largely operate within the context of liberal market economies, seeking to reform them incrementally but meaningful toward more distributionally-just outcomes. Yet we are most encouraged by what we call “justice beyond work” – movements to roll back institutionally-racist and classist policies that flow from the long-run scourge of urban fiscal austerity and entrepreneurialist governance. We argue that these movements build on the ERJ coalitions and successful policy-entrepreneurship tactics deployed around work-based domains. It is this movement – which holds the promise of renewed investment in public goods like education that support the capabilities of individuals, families and communities – that would truly represent transformative change in our cities and communities.

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Key Words: progressive cities, racial justice, economic justice, urban economic development, organizing

#### **THE SIMETO RIVER AGREEMENT: A CITIZENS' MOVEMENT PUSHING FOR PROGRESSIVE ADMINISTRATORS?**

Abstract ID: 195

Abstract within Pre-Organized Session 32

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The Simeto river agreement is a “regional development plan” inspired by the values of social and inter-species solidarity that has been officially adopted by 10 cities of the Simeto river Valley, in Eastern Sicily. There are at least three reasons that makes this plan worth of mention in a session reflecting on the heritage of Clavel’s progressive city concept: 1) it is the outcome of a 10-year-long popular mobilization aimed at pushing ‘administrators’ to abandon the usual ‘extractive’ development route for embracing zero waste philosophy, climate change adaptation, organic agriculture and social inclusion; 2) it contains an innovative shared governance mechanism where mayors sit at the decision making table with the University and the Simeto Participatory Presidium, i. e. an umbrella organization encompassing more than 50 civic groups and organization from all 10 Simeto towns; 3) it is not just a plan sitting on a shelf: officially endorsed in 2015, it has generated significant outcomes on the ground in terms of financial investments, institutional learning and civic progress. Key lessons from this experience will be shared by three of the people that have been involved in the planning and the implementation process.

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Key Words: participatory action-research, shared governance, community development

### **13.84 PRE-ORGANIZED SESSION - INCONVENIENT TRUTHS: THE POLITICS OF RACE, REPRESENTATION, AND REDISTRIBUTION IN 21ST CENTURY PLANNING AND PRESERVATION**

Pre-Organized Session 84 - Summary

Session Includes 469, 471, 472, 473, 704

FRIMPONG BOAMAH, Emmanuel [University at Buffalo] efrimpon@buffalo.edu, organizer

This session's panelists argue that in this historical moment, planning must face the problematic nature of equity framing and "inclusion" based on racial representation. New theoretical frames of redistribution and relationality are required cognizant of varying degrees of culturally situated complicity with oppressive modes of power. Panelists contemplate the following questions. What does government selection of intermediaries and specific discursive spaces for funding reveal about the U.S.' progress toward racial justice? Do select intermediaries reinforce assimilationist, pluralistic, or liberating inclusion models based on specific constructions of Black sense of place, Black institutions, and Black sovereignty? Session conveners are concerned with the redistribution of power and expansion of public investments in hard (land) and soft infrastructure (preservation, education), and how the hard and soft overlap or intersect. Panelists will wrestle with the ways varied constructions and proxies for racial representation complicate, contest, or reify racial capitalism and colonial relationality within the US and in other contexts.

Objectives:

- How racial capitalism manifests in planning processes
- The relationship between racial representation and "just" planning outcomes
- Equity planning's shortcomings as a framework

### **INTERMEDIARY INSTITUTIONAL REGIMES AND STRATIFIED INTERGENERATIONAL LAND DISPOSSESSIONS**

Abstract ID: 469

Abstract within Pre-Organized Session 84

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The land question unveils planning's complicity in the material and immaterial forms of dispossessions in cities. Some observe that the birth of American city planning is a significant marker of when the land interests of the rentier class converged with the governing apparatus of the neoliberal settler colonial state, allowing for new forms of land dispossessions through financialized, oppressive, and exploitative state-capital institutional regimes (Sandercock, 1990; Foglesong, 1986). Several theoretical constructs, such as the growth machine (Molotch, 1976) and urban regime (Stone, 1989) theories, offer insight into how various configurations of state-capital regimes drive and are driven by the land-power-wealth nexus at multi-scales. This paper contributes to our understanding of this nexus by looking at a specific form of state-capital regime—intermediary institutional regimes—and their relevance



in unpacking the land question in planning theory and practice. To pursue this, we draw ideas from stratification economics, which explains how historically contingent structural processes shape the identity formation of dominant and subordinate groups in ways that lead to inter-group differences including forms of material dispossessions (Darity Jr, 2008; Darity Jr et al., 2015). We argue and view stratified intergenerational land dispossessions as the temporal and relational modes of racial land dispossessions through and in sustenance of intermediary institutional regimes. These regimes constitute an actor-network of discursive, planning, legal and extra-legal regimes that (un)map and (in)visibilize racialized spaces and reify racial capitalism through the (re)distribution of land, power, and wealth away from African Americans and other communities of color. We advance three conceptual arguments, interlaced with empirical moments, to illuminate the specific ways through which these intermediary institutional regimes foment stratified intergenerational land dispossessions in planning American cities.

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Key Words: land dispossessions, institutional regimes, racial capitalism, stratification economics, growth machine

### **EXPANDING BLACK PARTICIPATORY GEOGRAPHIES IN PUBLIC SCHOOL PLANNING**

Abstract ID: 471

Abstract within Pre-Organized Session 84

RODRIGUEZ, Akira [University of Pennsylvania] akirad@design.upenn.edu, presenting author

Although public schools are a critical form of infrastructure in many neighborhoods across the country, they have been fairly marginalized in urban planning research and practice (Bierbaum 2020; Vincent 2006); this marginalization and its effects are multiplied when accounting for race, class and place. In 2019, the School District of Philadelphia announced a Comprehensive School Planning Review (CSPR), a process that six years prior had resulted in the recommendation of closing 57 schools, the majority of which were in Black and Latinx low-income communities (Kitzmilller and McWilliams 2018). As these schools were removed from neighborhoods, critical infrastructure - from access to health and social services to social and green space - were also removed. Black participatory geographies (Rodriguez 2021), in the form of Home and School, School and Community, and other informal educational advocacy organizations, were also displaced from these neighborhoods, occasionally reconstituted in other community places or private charter schools.

This research examines the role of public schools as political spaces for addressing issues of neighborhood (under)development and racial inequity through participatory planning. By centering the public school as a critical infrastructure, and using the comprehensive planning process to strengthen both the physical and social capital therein, this paper demonstrates how the creation and use of “counter-plans” and “counter-spaces” can expand both the scope and scale of the school facility planning process to be more inclusive of marginalized groups and perspectives. In thinking comprehensively about education and school facilities, these counter plans challenge traditional notions about the use, purpose, and ownership of public school facilities, and the role of these facilities in stabilizing and strengthening local communities, and cities more broadly. Using qualitative methods in a multi-site

case study, this paper investigates the mobilization of parents across race and class lines in three planning areas to directly address the racial inequity in school planning processes, and the formation of counter spaces for preserving and maintaining Black participatory geographies in public schools. By comparing different political capacities, development pressures, and mobilization strategies in these areas, I offer recommendations for how planners can support, recognize, and incorporate these counter plans in other planning processes.

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Key Words: Public Schools, Community Organizing, Racial Justice, Participatory Planning

#### **LOCAL LIMITS AND LATITUDE FOR THE NATIONAL MAIN STREET CENTER SINCE THE BALTIMORE UPRISINGS OF 2015**

Abstract ID: 472

Abstract within Pre-Organized Session 84

AIDOO, Fallon [University of New Orleans] faidoo@uno.edu, presenting author

In the past decade, urban communities have gained newfound support to seek and sustain investment in their community assets. National nonprofit organizations that have helped municipalities develop historic preservation policies and deploy heritage management practices since the 1970s now work directly with organizations that manage the historic and cultural resources of BIPOC communities. The National Main Street Center (NMSC), a subsidiary of the National Trust for Historic Preservation, not only trains these “Main Street Managers” in commercial revitalization strategies but also advises city planners of corridor reinvestment on equitable development. While the Main Street Approach is an established revitalization and recovery strategy in small towns and suburban cities (Robertson, 2004; Rumbach and Appler 2019), there is limited empirical analysis of its impacts on urban communities, planning, policy and governance. In fact, there is scant literature analyzing the economic development interventions of national nonprofit such as LISC and Enterprise Community Partners (Martinez-Cosio & Bussell 2013), and little recognition of how these intermediary organizations leverage local resources, partner with local bodies and otherwise maximize impact and income (BondGraham 2011; Lowe 2008). In this paper, I explore how (if at all) NMSC’s UrbanMain development plans, heritage programs and governance practices have challenged and changed the course of community economic development for neighborhood organizations participating in Baltimore’s Main Street program between 2010 and 2020. A combination of qualitative and archival research on UrbanMain in its pilot city--Baltimore—will result not only in deeper understanding of an increasingly influential intermediary in community economic development and disaster recovery. Diverse evidence of the National Main Street Center’s embeddedness in urban governance and philanthropy after the Baltimore Uprisings of 2015 shows how local planners make space for national nonprofits to extract and impart value in BIPOC during nationalized emergencies in local police powers as well as federally-recognized local disasters.

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Key Words: Main Streets, nonprofits, BIPOC, municipal planning, emergency management

## IS PUBLICLY OWNED LAND USED FOR THE PUBLIC GOOD?: THE CASE FOR ADOPTING A DECOLONIAL ETHOS IN LAND REDISTRIBUTION PLANNING IN BUFFALO, NY

Abstract ID: 473

Abstract within Pre-Organized Session 84

LIPMAN, Micaela [University of Buffalo] micaelal@buffalo.edu, presenting author

Discourses around redistribution in planning and public policy remain central to envisioning just and reparative cities. This paper focuses on land as an object of and through which urban planning can meaningfully engage in equitable and redistributive politics in racialized and gendered capitalist cities. The paper utilizes an explanatory case study of Buffalo, NY grounded in community perspectives to explore the historical and ongoing city-community contestations around vacant lands. This case study highlights two important tensions in unpacking and pushing for a decolonializing land use planning ethos in a neoliberal, racially segregated Rust Belt City. First, city governments, operating as neoliberal ‘white’ municipal spaces have historically engaged in an entrepreneurial and distributional politics of holding land in trust for the highest bidder. Neoliberal municipal institutional spaces hold land in trust and maximize land values for the highest bidders (Harvey 1989). This tension builds on and advances Peterson’s “City Limits” argument, highlighting a utility-maximizing calculus in Buffalo’s land use politics where development politics cohere around a unitary interest to increase land value, embedded within a converging unitary interest to preserve racialized hegemonic institutional politics and entrepreneurialize government function (Peterson 1981; Wilson and Sternberg 2012). On the other hand, the second tension reveals that racialized hegemonic institutional politics around a unitary developmental agenda for land co-exists with oppositional grassroots, democratically run community organizations fighting for equitable, redistributive, and reparative land politics (Gilbert and Williams 2020). These community organizations epitomize institutional spaces that stand in solidarity with African Americans and other racial minorities for decolonial forms of reparative land redistribution in Buffalo, New York. Such community organizations include community land trusts, land banks and not for profits seeking to develop land for community housing, community gardens, and other community spaces that continue to contest and demand for control of city-controlled vacant lots in Buffalo. The current struggle over vacant land use policy in Buffalo, New York embodies these diverging institutional tensions. Situated within the decoloniality discourses, this paper wrestles with how to de-link the political and hegemonic in ways that bring to the foreground the need for a decolonializing land use planning ethos that supports redistributing land in an authentically communitarian manner. The paper concludes by offering conceptual and policy interventions in envisioning a decolonial land use planning ethos in racial capitalist cities in the United States.

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Key Words: land redistribution, racialized hegemonic institutions, reparative land use policy, decolonizing land use, hegemonic interest convergence

## **LAND USE PLANNING, PATH-DEPENDENCY AND EMERGING NEOLIBERAL POLITICS IN PUERTO RICO**

Abstract ID: 704

Abstract within Pre-Organized Session 84

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Puerto Rico's governing regime embodies colonially inherited laws, practices, and institutions that reify neoliberal and exclusionary politics around land ownership and use decisions. In the aftermath of the 2017 hurricanes Irma and María, David Carrasquillo, the past president of the Puerto Rican Planning Association, commented that both hurricanes "...washed away local laws." This comment refers to the rising tide of land use planning laws and zoning changes being enacted since 2017 by the Puerto Rico Planning Board. While some may view, and perhaps even welcome, these new zoning maps, zoning codes, and joint regulations, I critically examine these changes as a path-dependent process. Here, I draw ideas from "actually existing neoliberalism" (Brenner & Theodore, 2002) to argue that these emerging changes in land use planning and zoning laws manifest the deregulation and deterritorializing of spatial-institutional spaces (see Brenner, 2004). The reconfiguring of these territorial and institutional spaces allows for decoding wealth through new forms of (re)distributional politics anchored around neocolonial planning regimes, disaster colonialism (Rivera, 2020), and other exploitative and exclusionary planning practices. Leveraging multiple data sources, including archival data, newspaper articles, policy and other legal documents, and notes from legal and public hearings, I offer historical insights into the path-dependent process animating the current land governing regime in Puerto Rico, and the local oppositional efforts, who are leveraging both "invited and invented spaces" (Miraftab, 2009) to contest this emerging neoliberal land governing regime.

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Key Words: Land use, land governance, disaster colonialism, path-dependency, Puerto Rico

## **13.133 PRE-ORGANIZED SESSION - THE "DOUBLE AGENT": CRITICAL REFLECTIONS ON PURPOSE AND CHANGE IN PLANNING**

Pre-Organized Session 133 - Summary

Session Includes 697, 698, 699

RIVERA, Danielle [University of Colorado Denver] danielle.rivera@colorado.edu, organizer

Planners are part realist and part idealist. As such, any planning effort is empirically grounded and materialized by social actors, inclusive of all peoples and all walks of life. Yet simultaneously, planners attempt to formulate collective narratives and visions for “a better future” which requires reimagination of “how things could be different.” This tension can be referred to as the “double agent,” whereby a planner/planning researcher needs to constantly/continually (re)negotiate their intention (or ‘vision’) with the interests of divergent actors in social systems (Jon, 2021). Here, we ask: What is the “purpose” of this “change” that planners hope to make through their intervention/deliberate action, and where do they get inspirations for framing/cultivating this purpose (Lake, 2017)? This session centers critical reflections on planning research and practice. Panelists will reflect upon recent projects relative to existing and emerging concepts of “purpose” and “change” in planning. Panelists will also reflect upon the role of planner and planning researcher in today’s increasingly unequal and polarized world.

Objectives:

- Examining how to enact change through competing demands in planning
- Understanding purpose across competing demands in planning

## **TWO-WAY LEARNING AND POLITICAL SOLIDARITY: TOWARDS A HEART-CENTERED APPROACH TO PLANNING RESEARCH**

Abstract ID: 697

Abstract within Pre-Organized Session 133

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In urban planning, ethnographic research is increasingly common, yet few scholars (Rankin 2009) have engaged in critical reflexivity about their own positionalities, subjectivities, privilege, and ethical considerations while ‘in the field.’ In this paper, I ask, “How in planning do we accommodate multiple epistemologies, or ways of knowing (Sandercock 1999), while also acknowledging that epistemological differences are rooted in making sense of contextual, identity-based experiences (Umemoto 2001)? Moreover, how does our commitment to anti-racist, anti-colonial work shape the research process and everyday decisions we make? In this article, I reflect on a five-year ethnographic project in La Zurza, an informal settlement in Santo Domingo, Dominican Republic. Through a multi-scalar analysis of the lived experiences of young people and the structural forces that they negotiate daily, my work suggests that the legacies of colonialism live on through current governance regimes, while also revealing how everyday practices of young people resist capitalist logics and disciplinary strategies.

Drawing from feminist scholars and geographers (Sultana 2007, Morrison et al. 2013, Whitson 2017), this paper elaborates on a heart-centered approach to fieldwork and qualitative research more generally. I reflect on what it means to be an Indian-American planning scholar in the United States working with residents in the Caribbean. Specifically, I draw inspiration from hooks (2000) to suggest that love, as necessarily political, active, and aspirational, can have important consequences for how we understand our task as planners and how we define our solidarities. I suggest that addressing multiple epistemologies, identity-based experiences, and ‘deep differences’ (Watson 2006) amongst stakeholders in planning and development projects begins with a clear articulation of the researcher’s own normative positioning and an understanding of the specific context within which she is working. Important and often unclear questions around power, voice, ethics, inclusion, access and representation can be sorted through active alignment between knowledge (co)production, representation, and critical reflexivity to serve the best interests of research participants. Moreover, whereas elements of a researcher’s social location may remain momentarily fixed during fieldwork (positionality), the researcher’s self and the research process are also mutually constituted, materially constituted, and constantly dynamic (subjectivities) (Hiemstra & Billo 2017). In a two-way learning process, researchers are tasked with constant and consistent process of critical self-reflection with the intention of asking to what end and for whom planning research serves. Finally, I suggest that making art is one process through which the researcher is able to engage not only in critical self-reflection, but also self-care.

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Key Words: critical reflexivity, ethnography, critical planning, subjectivity, planning researcher

## THE DOUBLE AGENT: LIFE AND PRACTICE AS A PLANNING RESEARCHER/EDUCATOR

Abstract ID: 698

Abstract within Pre-Organized Session 133

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This reflection paper looks back on the author's past projects, teaching, and collaboration with students to reflect on the difficult practice of working as a "double agent". As someone interested in theory, I hoped to project radical visions about 'what planning should be/what planners should do' during my doctoral training; however, working with students (who want to be government planners or work for private consultancies) and within the university system (which is becoming more and more neoliberal), I sometimes had to negotiate my position a lot to the point where I question myself whether I'm becoming a 'sell-out'. How can we become a radically subversive pragmatist as a planning researcher--who doesn't ignore the reality that students and we ourselves find ourselves in (i.e. job market, market economy/domination...) and yet at the same time can offer new visions and inspiring reimaginings about the city we want? How can we practice a kind of teaching that is not to 'indoctrinate' students (with our own big ideas/ideologies) but to encourage them to reflect on 'justice/equity' values in everyday planning problems? How could thinking through planning research/education across these three axis--'history, collectives, and intangible values behind the tangibles (Jon, 2021)--help us design research and teaching materials for situated, and generative justice (Lake, 2017, 2018; Eglash, 2019)?

The paper tries to address these questions through the author's current research and collaboration with planning students. One of the topics I've studied during the past years was 'environment politics beyond the environment' (Jon, forthcoming), where I described the planning practitioners/environment activists' strategies of convincing the general public to be more conscious with the climate--looking at the cases of Tulsa, Darwin, Cleveland and Cape Town. The planners I've interviewed for this project know the limits of their power within the existing system, however they try to instil the vision that they have through practice and action.

Another topic I've recently worked on with a former student (now a planning practitioner) is about the introduction of micro-mobilities (particularly e-scooters) and what they imply for inclusive/climate conscious planning. Through this project, we've learned that many planners often feel caught in-between the constant emergence of technologies popping up in urban space (introduced by private sector--e.g., Airbnb or e-scooter sharing; Kim, 2019)

and the territorial/situated needs of the public (e.g., public safety, transport equity, we're building a city for "whom"?). The important part of their work was therefore to continually (re)negotiate competing/contradictory interests of public and private--over time, with patience.

In the absence of more ethnographic research on planners and their everyday operation of social values and vision (that they may have encountered during their master's degree training), planning researchers risk perpetuating the on-going division between theory and practice (Campbell, 2021).

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Key Words: planning theory and practice, situated justice, everyday life of planners, ethnographic research on planning practice

#### DIASPORA AND POSITIONALITY IN PLANNING: LESSONS FOR RESEARCH AND TEACHING

Abstract ID: 699

Abstract within Pre-Organized Session 133

RIVERA, Danielle [University of Colorado Boulder] danielle.rivera@colorado.edu, presenting author

"Where are all the Puerto Rican planners? Where are their op-eds?"

These questions were posed at the 2017 ACSP Conference session following the devastation of Hurricanes Irma and María. The question racked many of us for months: why had so few Puerto Ricans planners emerged as experts on their own lands and cultures? This question is examined, here, through the lens of diaspora and its impacts on "expertise" in planning research. Theories emanating from diasporic conditions have received renewed attention in 2021 given the fortieth anniversary of Anzaldúa and Moraga's *This Bridge Called My Back* (1981). This foundational volume opened up discourse on how identities are structured and reified across space. Despite this and other works, however, planning scholars frequently consider "place" and "people" as a singular entity (Eckstein, 2007, p. 24). In this way, diasporic communities are not viewed as part and parcel of planning processes due to the different and varied definitions of "here" and "there" that defines diasporic cartographies (Carter, 2005). Ultimately, relative to planning theory, these works beg the question: What are the epistemological strictures for diasporic planners?

This paper examines these and other conceptualizations of diaspora against the issue of "positionality" in planning research. The goal is to examine how diasporic identities often interfere with designations of "expertise" in planning research. Specifically, these issues are examined within the contexts of Puerto Rico post-Hurricane Maria in 2017 and Haiti post-earthquake in 2005. Planners across the Puerto Rican and Haitian diasporas share their struggles with diasporic identity and, as a result, assisting their communities after these disasters. Disaster studies, more broadly, helps frame the importance of diasporas in "reaching back" following disasters (Shivakoti, 2020). The paper analyses these experiences against common assumptions of space and rootedness that lie at the heart of planning theorizations of preservation. Conclusions point to the need to more deeply engage a wider variety of potential

relationships between space and culture in planning research.

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Key Words: Diaspora, Planning Research, Positionality, Disasters

## **ROUNDTABLES**

### **13.700 ROUNDTABLE - CONFRONTING COLONIAL STRUCTURES IN U.S. PLANNING**

Abstract ID: 700

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AIDOO, Fallon [University of New Orleans] faidoo@uno.edu, participant

LAMBA-NIEVES, Deepak [Center for a New Economy and University of Puerto Rico] deepak@grupocne.org, participant

SANTIAGO-BARTOLOMEI, Raul [Center for a New Economy and University of Puerto Rico] raul@grupocne.org, participant

RIVERA, Danielle [University of Colorado Boulder] danielle.rivera@colorado.edu, participant

MENDOZA, AnMarie [UCLA] annie520@ucla.edu, participant

Expanding previous conversations at the ACSP conference (Porter, et al., 2017), this roundtable provides space to discuss the experiences of United States (U.S.) colonies and colonized peoples within planning practice and research. Within planning, however, examinations of (de)colonization and coloniality too often omit the experiences of those under active colonization by the U.S. Reflecting recent calls to conceive of the U.S. as a “settler-colonial place” (Barry & Agyeman, 2020, p. 22), this roundtable centers the experiences of those within the U.S., while reflecting upon the wealth of existing research outside the U.S. at the intersection of planning and colonization (Dorries, 2012). The goal is to challenge discourses of decolonization within the U.S. that routinely omits voices from U.S. colonies and colonized peoples resulting in continued Indigenous dispossession. The roundtable seeks to challenge notions that Indigenous spaces and peoples are somehow “liminal” or “exceptional” within U.S. planning discourse, instead viewing them as central to understanding U.S. planning histories and futures. As a result, we follow Barry & Agyeman (2020, p. 22) in asking: “...what would it mean for U.S. urban planning to both recognize and confront its continued role in erasing these relationships?”

This roundtable provides a space for planners to discuss their professional and academic experiences within U.S. colonial systems and reflect on the strategies they employ to critically engage with colonial strictures and structures. Participants will bring their diverse backgrounds and experiences to discuss how the discipline has been complicit in reproducing uneven power relationships, while also providing insights into the tactics and strategies that can be employed to challenge entrenched systems of oppression. Participants will provide a brief overview of their experiences and then engage in discussion by asking the following questions:

1. Who is planning research on colonies “for”? What are the issues faced when bringing up these concerns in U.S. planning contexts?



2. How must/do we position ourselves between academia, its systems and demands, and the colonized communities we identify with? How can we negotiate representational politics within our communities against the desire to speak freely about our struggles?
3. Whose/which spatial knowledge and epistemologies of colonialism shape planning scholarship and practices?

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Key Words: United States, colonization, decolonization, coloniality

## **INDIVIDUAL PAPER SUBMISSIONS**

### **MAKING SPACE FOR NATURE: DE-CENTERING HUMANS FROM COLLABORATIVE PLANNING**

Abstract ID: 17

Individual Paper Submission

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In the context of anthropogenic climate change, our collective understanding of ‘justice’ is perpetually shifting in relation to vulnerable people, places, and species (Steele et al., 2015). There is growing evidence that climate change disproportionately affects marginalized human populations, but the effects of climate change are also experienced by a wide diversity of vulnerable nonhuman species and habitats. Yet, discussions of climate justice and its interpretation as both distributive (the allocation of benefits and burdens) and procedural (how interests are recognized) have been “largely confined to the equity implications of climate change on humans” (Steele et al., 2015, p. 121). Moreover, the vulnerabilities of human populations and those of nonhuman species are addressed largely within disciplinary silos.

At the same time, neoliberal planning processes have reinforced a narrow definition of ‘rights’ and a preoccupation with ownership that has marginalized nonhuman species in deliberative processes (Porter, 2014), leading to their dispossession of urban spaces. This disconnect between our understanding of climate justice in relation to the needs of human and nonhuman species, and the ways in which neoliberal planning reinforces this discrepancy, represents a barrier inhibiting the field of planning from tackling climate change in a comprehensive way. There is a pressing need to create new forms of practical engagement underpinned by a more integrated approach to planning for humans and nonhumans alike.

Drawing on the more-than-human and climate justice literature, this paper explores how the scaffolding of collaborative planning theory might be broadened to create a defined space for deliberation on nonhuman needs. Responding to calls from Houston et al. (2018), Jon (2020), and Metzger (2020) to create an urbanism that

“purposefully serve[s] non-human agents as important ‘stakeholders’ in rendering the urban form or conceptualization of planning” (Jon, 2020, p. 416), this paper poses two core questions for creating an urbanism that broadens the human-centered planning frame: 1) How can more-than-human thinking be applied to governance systems that oversee the built environment? 2) Can more-than-human thinking address the gap in collaborative planning between current participatory methods and more-than-human needs (gleaned through both scientific and experiential knowledge) in a manner that enhances climate justice?

To answer these questions, we review more-than-human literature and consider its migration from critical geography to planning. Next, we explore an incremental approach to mainstreaming nonhuman needs in neoliberal planning structures to address the current disconnect. Finally, given the entrenchment of neoliberal planning models within lower-tier governance structures in the Global North, and the challenges posed by the twin crises of climate change and biodiversity loss, we argue that rooting more-than-human approaches to urban development in contemporary planning requires a revised collaborative planning model that decenters humans from planning processes, and better represents the needs of nonhumans.

In the context of climate change, planning theorists must accelerate their work to decenter humans from planning processes and enhance theoretical frameworks for how more-than-human approaches can be operationalized at local governance scales. Embedding more-than-human approaches in local governance structures, while broadening the collaborative planning frame to conceptualize ‘nature’ as a formal planning constituency, will enable planners to act on their responsibility to create just and sustainable cities in the shadow of the climate crisis. Such a profound shift would create urgently needed material and conceptual space for nonhuman actors in shifting urban landscapes.

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Key Words: More-than-human, Collaborative planning, Climate justice, Planning process

### THREE HEURISTICS FOR STUDYING PLANNING EXPERTISE

Abstract ID: 74

Individual Paper Submission

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Based on the author’s dissertation experience, which examined economic expertise in development planning, this paper argues that three common assumptions in planning theory and scholarship limit our understanding of planning experts. In response, it presents three rules of thumb, or heuristics, from science studies as a remedy. The first common assumption is that experts’ success or failure rests on the strength or weakness of their rationality rather than their political efforts. Too often, planning theorists, like social reformers in the progressive era, made conclusions about expert influence based on the properties of intellectual rationality alone (Finegold, 1995). The second common assumption is that conflicting rationalities largely exist between experts’ intellectual rationality and

non-state actors' practical rationality (Corburn, 2007; Goulet, 1986; Scott, 1998; Watson, 2003). Many planning theorists assume that state institutions have no internal conflicts or contradictions (Angotti & Marcuse, 2011). The third common assumption in planning theory, with the notable exception of the Advocacy School, is that planning methods are ostensibly technical instruments of rationality rather than political interventions (i.e., Flyvbjerg, 1998).

This paper reconceptualizes these assumptions in planning theory and scholarship using heuristics derived from science studies. A science studies approach is advantageous in helping us rethink expert rationality, power, and methods. First, applying science studies, usually reserved for studying scientists, engineers, or other knowledge workers in laboratories, to planning organizations can help us understand experts' unique political strategies. Second, science studies treats knowledge production as political work that faces resistance and must be overcome (Latour, 1988). Finally, science studies suggests that expert methods black-box ideas and discourse (MacKenzie, 2005).

The first heuristic—"think symmetrically"—recommends that planning scholars treat non-experts and experts evenly: interests and politics define and motivate both groups' work (Bloor, 1981). Instead of speaking truth to power, experts' work is reframed as constructing rationality as power. Rationality becomes a local accomplishment in particular contexts rather than a property that people or organizations do or do not possess (Cabantous et al., 2010). The second heuristic—"look for trials of strength"—asks planning scholars to treat planning organizations as arenas of conflicting rationalities. Planning scholarship often treats the state as monolithic with a unitary logic and neglects conflicts within the state. However, experts, like scientists, have to conduct their work and defend it from competing experts with alternative rationalities, or withstand what Bruno Latour calls "trials of strength" (Latour, 1988). The third heuristic—"unpack experts' methods"—asks planning scholars to open the black boxes of methods. Methods become black-boxed when debates over the procedures of (social) scientific practice appear settled and their internal workings are overlooked. Getting inside methods reveals their political values and can foreshadow their possible political effects (Alonso & Starr, 1989; Dorling & Simpson, 1999; Sinclair, 2008).

These heuristics for studying planning expertise have implications for planning practice by keeping us from falling into the post-modern abyss (Beauregard, 1991). Postmodernism suspended us between the decaying validity of the modernist project and convincing, yet discomforting skepticism of the modern state and its experts (Beauregard, 1991; Putnam, 1992). However, if we think symmetrically and look for trials of strength, we can conceive of planning organizations as plural and diverse rather than singular and universal. Dualities between rationality and irrationality are rejected because power drives rationality and no form of expertise is structurally given or inevitable. Competing experts can enter the organizational arena to make a case for their alternative rationalities. In doing so, they engage in the kind of responsible restoration that Hilary Putnam said was necessary to avoid the dangers of deconstruction (Putnam, 1992: 132).

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Key Words: Heuristics, Expertise, Rationality, Science Studies, Postmodernism

#### PERIODISING METROPOLITAN REGIONS, PLANNING AND GOVERNANCE

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There is an inherent contradiction in regional planning: on the one hand, “never before has the necessity for effective regional governance and planning been so great” (Soja 2015, p. 379) and yet, on the other hand, there are those who argue “regional planning as we know it is now defunct and something we need to get used to” (Harrison et al 2021, p. 6).

Our starting point is a concern that much of the work which has approached the question of metropolitan regions, planning and governance has done so over recent decades from one of two perspectives. There is research which is oriented towards abstraction. Here, we can point towards seminal contributions which are geared towards providing broad conceptual and analytical frameworks that situate metropolitan regions within the contours of inter alia globalisation, neoliberalism, political economy, rather than systematic comparative analysis. There is then research which is much more systematic. Here, the approach involves taking an idea, concept or perspective and examining how it works in practice across specific contexts – be it different policy spheres, in specific metropolitan regions, in different national contexts. Both approaches could be considered at different ends of the research spectrum. Each is equally valuable in their own way, however it is our contention that there is an important middle ground between abstract conceptual and systematic comparative approaches which remains largely untapped.

In this paper, we argue that contributions which develop and operationalise broader frameworks for analysis are relatively scarce. Our own approach for conceptualising the planning and governance of metropolitan regions is a heuristic perspective which, due to its focus on thematic (T), temporal (T) and phronetic (P) approaches, we refer to as the TTP framework.

The thematic dimension is founded on four interrelated themes which are arguably the most salient in post-WWII debates over metropolitan change from a planning and governance perspective: institutions, policies and ideas, spatial imaginaries and planning styles.

The temporal dimension involves periodising metropolitan planning history to identify temporally defined scaled moments in how cities and regions have been planned for.

The phronetic dimension recognises the importance of going beyond being captivated by what is perceived of as ‘new’ to be much more critical of claims purporting to newness. Periodising metropolitan planning is an important step in setting us on the path towards conceptualising metropolitan regions ‘in retrospect’ (how have we arrived at this point?), ‘in snapshot’ (what is currently unfolding?) and ‘in prospect’ (what might happen in the future as a result?). Our argument is that a phronetic approach, with its emphasis on change, process and implications takes us closer to answering what we perceive to be the key question – what is at stake for planning metropolitan regions?

This paper introduces the TTP framework, reveals some of the key outcomes from a three-year international project which operationalised TTP, before concluding with a vision that seeks to reassert the purpose and values of planning by advocating going back to move forward.

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Key Words: Regional Planning, Planning History, Periodisation, Planning Styles, Metropolitan Regions

## **MAKING “A WATERFRONT FOR THE WORLD”: RACIAL CAPITALISM, INDIGENEITY, AND THE MARKETING OF ZIBI IN CANADA’S CAPITAL**

Abstract ID: 332

Individual Paper Submission

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Settler colonialism can be understood as a mode of racial capitalism that shapes urban development. In his formulation of racial capitalism, Cedric Robinson explains that capitalism development is enabled by the creation of racial hierarchies (Robinson, 2010). In the context of urban development, these hierarchies serve the creation of symbolic economies that have significant material consequences for racialized peoples. Examining how Blackness is aestheticized and depoliticized to enable neoliberal forms of urban development in Washington DC, Brandi Thompson Summers observes how “symbolic representations of difference and diversity encourage consumption, while at the same time they precipitate development strategies that privilege middle-class activities and values” (Summers, 2019: 13). According to Summers, urban marketing goes hand in hand with development processes that exclude and marginalize racialized people in urban space while at the same time trading in their imagery. In this paper I will examine how indigeneity is mobilized to justify the contested Zibi condominium project in Ottawa, Canada. I show through a marketing campaign that emphasized sustainability and reconciliation, an aestheticized version of indigeneity was used in the marketing of the project to sanitize histories of settler colonialism and commodify Indigenous presence.

Zibi is situated at Akikodjiwan, an area of spiritual and cultural significance for many Algonquin people. The site has also been a locus for Algonquin organizing, and the focal point for a plan articulated by Elder William Commanda that would see Algonquin stewardship of the site fostered through the development of a National Aboriginal Centre to “inspire respectful and responsible choice for sustainable relationships guided by values of sharing, balance and harmonious co-existence....” (Commanda, 2010). In contrast to William Commanda’s vision for Asinabka, Zibi will be primarily a private residential space comprised of condos, townhouses, and commercial space as well open space.

Construction on the Zibi development began in 2015. While only in its early stages of development, Zibi was already recognized for its commitment to sustainability and as an example of community planning, winning awards from the American Planning Association and International Society of City and Regional Planners. In 2015, the Canadian Urban Institute recognized the project with a Brownie Award for “Communications, Marketing & Public Engagement” for its introduction of a “brand that enhances acceptance and understanding of brownfield redevelopment, regeneration and reinvestment.” Zibi has been marketed as a sustainable project that facilitates reconciliation with Indigenous peoples. In a political context where Indigenous rights are gaining increasing recognition, developers are recognizing that projects may be placed at risk of delay or cancellation if support from Indigenous communities cannot be secured (Moody’s 2020). In this paper I show how the marketing of this project activated narratives of urban sustainability and reconciliation—both laudable goals— in ways that naturalized settler occupation and development. Through this framing, the developer was able to claim Zibi “for the world.” By actively reconstructing the meaning of this territory and its histories and commodifying racial difference, these narratives ultimately foreclosed possibilities for sustainability and reconciliation and affirmed the site as a white urban space.

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Key Words: Indigeneity, Racial capitalism, Settler colonialism, Urban development, Marketing

## PLANNING IN OCEANIA: LESSONS FROM INDIGENOUS PACIFIC ISLANDER POLITICAL THOUGHT

Abstract ID: 346

Individual Paper Submission

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The Pacific Islands comprise more than 30 states and territories, distributed across the geographical regions of Micronesia, Melanesia and Polynesia. Within development studies, their myriad barriers to economic development are well-documented (Duncan et al. 2014). High transportation and communication costs decrease returns to private investment. Poor domestic financing mechanisms and high costs of accessing international financial markets raise barriers to entry, particularly for small to medium firms. Weak state institutions—especially insecure property rights and poor contract enforcement—increase macroeconomic risks and promote market failures. Pacific Islands have long-standing aid dependency; with increasingly stringent accountability requirements in aid management, sovereign Pacific Island countries also have increasingly diminished autonomy over the terms of their own development (Murray and Overton 2011).

As argued by Epeli Hau'ofa (1994) development studies effectively constructs Pacific Island economic development as a problem of smallness—borne of its small supply of labor and human capital, small private sector etc. Historically, development scholars and practitioners have sought to resolve this problem of smallness through increasing Pacific Island access to larger markets. Some recommend that the Pacific Islands maintain subsovereign jurisdictional status, attach themselves to larger political-economic powers, and engage in development through exploiting the privileges of immigration, wage differentials and other associational benefits (Baldacchino 2006). Others recommend strategies of regional coordination—ranging from simple coordination of fisheries policies, to deeper regional economic integration via a formal political-economic union (akin to the European Union) and a common currency (akin to the Euro). Both solutions, however, have yielded mixed results. Indigenous sovereignty movements are thriving in many subsovereign Pacific Islands (from Hawai'i to Guåhan and French Polynesia); and regional coordination mechanisms have not yet forged clear pathways for effective long-term regional development.

Despite the ambivalent impacts of Western models of development, they continue to wield hegemonic influence over the region, at the expense of Indigenous visions of development. In this project, we deploy discursive and historical methods drawn from the history of political thought, applying them to a set of contemporary Indigenous Pacific Islander thinkers that have written substantially on issues of Indigeneity, nationalism, regionalism and/or development. These thinkers reject the colonial problem of (physical) smallness; following Hau'ofa, they opt instead to view their island homelands as part of "Oceania"—an ever-expanding transnational social space grounded in Indigenous Pacific Islander identity, epistemology and mobility.

Theoretically, this research forges new connections between Indigenous and transnational planning to think about planning in Oceania. Indigenous planning emphasizes the importance of Indigenous epistemology, but often treats Indigenous communities as locked in place, while sidelining the issue of transnationalism. This is because Indigenous planning has historically focused on Western settler-colonial states (e.g. Australia, Canada, Israel, New Zealand, United States), and not on Oceania. Yet, Indigenous Pacific Islanders are distinguishable from their other Indigenous

counterparts in that there are more of them living in diaspora than there are in their own homelands. Concurrently, transnational planning emphasizes the processes by which the cross-national movement of people, ideas and resources are made possible (Miraftab 2011), but has little to say about how diasporic Indigenous Pacific Islanders continue to maintain connections to their land and ocean, and the processes by which they engage in the decolonization of Oceania.

This research offers two insights for planning practice in Oceania. First, in addition to traditional development actors (the state and international development organizations), it invites planners to examine and harness the role that transnational Pacific Islander networks play in negotiating processes of Indigenous development. Second, it invites planners to align themselves with Indigenous sovereignty movements, and collaboratively build political-economic institutions that center ownership and benefits among Indigenous Pacific Islander communities.

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Key Words: Development, Indigeneity, Pacific, Governance, Postcolonial

#### REVITALIZING PLANNING THEORY THROUGH VISUAL THINKING? A CRITICAL REAPPRAISAL OF PLANNING'S VISUAL HISTORY AND THE MORALS EMBEDDED IN TRADITIONAL PLANNING DIAGRAMS

Abstract ID: 361

Individual Paper Submission

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This paper examines the underestimated influence of graphic visualizations in shaping and codifying planning thought. We often employ these diagrams to reinforce and crystalize planning ideas, and assume they are a neutral mirror of the text. But they often have a life of their own. They frame debates, steer our thinking, and tacitly constrain or expand our planning imagination. As a spatial field and as applied social scientists — and as prolific producers and consumers of maps, plans, tables and charts — planners consider themselves as doubly savvy visual thinkers. Yet our field often uncritically views these graphics as unproblematic, passive illustrations of planning ideas.

I explore two arguments: First, these diagrams shape our thinking more than we likely admit, and have unintended consequences. The relationship between visual representations and theories (typically in text and narrative format) is two-way and dynamic. We should therefore curate our use of planning's historical diagrams — and draw new diagrams — with as much critical reflection as we choose our words and tabulate our data. Second, if we seek to revitalize our planning theory (not just as a specialization within planning, but also as the shared forum where we debate planning-wide values and concepts), then we are well advised to critically rethink our visuals as well: to lead this reinvigoration of planning theory as much with graphical as textual arguments.

I begin by revisiting the standard portfolio of diagrams in introductory courses and textbooks. (I focus on graphics laden with planning ideas, rather than reference or thematic maps; illustrative photographs; data tables and charts — except when the latter are used to make conceptual arguments.) It's a familiar list, including: Howard's Garden City (1898); Patrick Geddes' "valley section" (1909); Burgess's concentric zone model (1925); bid rent curves; HOLC's "redlining" maps (1930s); Corbusier's radiant city (1933); NRPB regional maps (1930s); Isard's regional science hexagons (1956); Interstate highway map (1956); Jean Gottmann's megalopolis (1961); Neil Smith's gentrification "rent-gap" (1979); Friedmann's world city map (1986); Duany's transect (1997); etc.

Importantly, this chronology of influential graphics provides only a partial visual history of planning. What voices and ideas have been excluded? These images lean with a deference to clear lines, networks, simplification: modernist infrastructure; idealized visions of efficient mobility; stylized urban economics; aspirational models of "balanced" metropolitan systems — either urban/suburban/rural or the "three Es." This graphical vocabulary fails to engage the breadth and array of planning theory ideas. Important debates within planning theory (e.g., advocacy & communicative action, postcolonialism, social & environmental justice) frequently lack a visual language to drive our thinking.

One might reasonably counter that much of planning theory isn't suitable for graphic argumentation: debates about power, institutions, governance, racism and gender are most effectively engaged through oral and written rhetoric. (And a tour of many planning theory articles confirms this text-centric focus, with the included figures often wordy, unmemorable tables with detailed taxonomies of concepts, variables and actors.) But though planning continues to expand its disciplinary scope into social concerns, we are a discipline that invariably translates these issues into problems of land, property, boundaries and communities — and the primary language of space is the visual language of maps, plans and diagrams, with either existing, projected or idealized land uses. It is not just the explicitly spatial specializations of land use, urban design and transportation planning, but also planning theory, that needs a robust arsenal of communicative and analytical tools — including visualization.

The goals of this paper are thus to both critique the traditional use of diagrams in planning's intellectual history and promote a more critical and reflective visual thinking in contemporary planning theory.

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Key Words: planning theory, planning history, visualization, maps, visual thinking

#### **WE ARE NOT PLANNING FOR EQUITY: AN EVALUATION OF U.S. COMPREHENSIVE PLANS**

Abstract ID: 367

Individual Paper Submission

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Interest in equity in planning scholarship, education, and practice is on a sustained rise. While this trend is reflected in scholarly literature and course syllabi, the manner and extent to which equity is shaping actual planning practice remains poorly understood. Are we planning for equity in contemporary practice? How well and to what extent? What definitions of equity are guiding planning practice, if any? How do planners and communities imagine more equitable cities? In order to begin answering these questions, this research project looks to perhaps the most recognizable product of planning practice: the comprehensive plan. These documents—still central to the planning profession—provide a reasonable proxy for the state of planning practice as well as a window into the profession’s overall goals and orientation.

This research is part of a larger project investigating not only the quality of comprehensive plans’ treatment of equity, but also the meanings of equity at work in contemporary planning, their relationship to and dependence upon theories of justice coming from moral and political philosophy, and how comprehensive plans—with their varying meanings and quality with regard to equity—came to be.

This paper will primarily examine the quality of comprehensive plans’ treatment of equity through the use of a plan quality evaluation, with additional analysis on the meanings of equity found in plans and their relation to plan quality. In order to answer the primary question, I have employed a content analysis of a random sample of 25 U.S. cities with populations greater than 200,000 with plans written since 2010 which adapts Berke’s plan quality analysis rubric to focus on equity. To Berke’s existing internal plan quality components I have added evaluative sections for the adequacy of a plan’s treatment of equity, which is based on the proportion of a plan’s goals that include equity-oriented objectives, policies, or actions, and also a section for the importance a plan claims to place on equity, ranging from not mentioned to providing the plan’s organizing principle. This last measure makes it possible to tease out differences between plans that claim equity as a central or important concept but whose actual implementation varies substantially in quality. Finally, plans are inductively coded for their definition(s) of equity, whether explicit or implicit, and for the relation between these definitions and varying theories of justice.

Preliminary findings indicate that we have a long way to go with regard to equity in contemporary comprehensive plans and, by extension, planning more broadly. Plans which mention equity not at all or very little are not uncommon, definitions are often nonexistent or extremely vague, and issues with equity in communities—historic and current—are rarely explained or examined, making it impossible to reasonably formulate remedies.

The findings of this research provide, first and foremost, baseline data for the extent and quality of contemporary comprehensive plans’ inclusion of equity. This information—while instrumental to understanding how we are doing as a profession with regard to planning for equity—currently does not exist. Moreover, the concept of equity in planning is notoriously fuzzy. It is frequently left troublingly vague and underspecified in planning documents and processes, and it is my simple contention that if we cannot define equity, we cannot hope to bring it about, or even recognize it when we see it.

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Key Words: comprehensive plans, equity, justice, plan evaluation

## DO CITIES ACT?

Abstract ID: 414

Individual Paper Submission

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Do cities do things? Do they make plans? Do they compete with other cities? Thought statements suggesting that cities do act are commonplace, some warn that treating cities as possessing the same character as persons or firms is misleading. Such phrasing, they argue, obscures conflicts between distinct urban interests and the domination of some of those interests by others. Various defenses of treating localities as actors have been made. Cox and Mair (1991), for example, suggest that territorially coherent social structures can make reflexive decisions. Harvey (2001) has similarly drawn on Whitehead to characterize cities as having structured coherence that lends unity to their actions. This paper will add another.

But not before calling these other defenses into question. Each of them depend on the bifurcation of both space and society into a dualistic interior and exterior. Without territorially delimiting a locality, it is not possible to distinguish one from the other and thus put them into competition or posit that they make plans independent of other localities or ascribe to them personalities. In short, cities are defined by a territorially bound essential nature that makes each one unique. This essentialism breaks down in at least two ways. First, it is impossible to establish a clear boundary that separates the interior from the exterior. The literature on complexity and planetary urbanization has convincingly argued that territorial boundaries attributed to cities are untenable as urban processes like trade, communications, and tourism extend seamlessly outward from urban centers to encompass---ultimately---the entire planet. Planetary urbanists argue that we must adopt a flat ontological understanding of the urban as a set of relational processes that interiorizes everything. Thus, the territorial coherence of social structures is a false notion. Without a territorially coherent base, self-reflexive social structures cannot exist. Second, the analogy between cities and people or organizations is false. The problem lies not in the comparison itself but in the assumption that people, firms, and so on exhibit the essentialism denied to cities. Rather, the very notion of a coherent actor is untenable. Freud, Deleuze, Guattari, and others have clearly illustrated the ambivalence and conflicting desires that inhabit us all. Contemporary anthropologists and biologists have emphasized humans' mutual dependence and inseparability from their social and physical environment. Actor-network theory has arguably gone furthest in eviscerating the boundaries between nodal actors and their networks. In short, people and firms are equally decentered and lacking a clear distinction between their interior and exterior.

Fortunately, cognitive philosophy offers several tools for reassembling distinguishable actors. First, it suggests that humans' highly evolved pattern processing allows us to perceive those patterns of interaction that we identify with cities' social structures. Second, cognitive philosophy offers the intentional stance (Dennett, 1987), which humans employ to attribute consciousness and agency to objects in the world around them. Despite humans' inability to truly understand other peoples' consciousnesses, they attribute intentionality to other people as a shortcut for predicting how others will act. The same stance is applied to other external objects whose internal functioning is not understood, including pets and computers. For simplicity's sake, we assume other objects possess agency. And we can do the same for cities. Despite the lack of identifiable boundaries, we can attribute intentionality or agency as a cognitive shortcut.

This epistemological shift matters for at least two reasons. First, it reconciles the ontological inseparability of the stuff of existence with our own cognitive demand for efficient and effective representation. Second, as incomprehensible artificial intelligences take on more significant urban planning responsibilities, it offers a more robust frame for considering the interaction of biological and algorithmic urban planners.

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Key Words: agency, planetary urbanization, intentionality, essentialism, artificial intelligence

## ON THE INJUSTICE OF GENTRIFICATION

Abstract ID: 425

Individual Paper Submission

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Many contend that gentrification is unjust and should be opposed wherever it exists. Neil Smith (2010, 117), for example, condemns gentrification as a form of neocolonialism, which "justifies monstrous incivility in the heart of the city." Ruth Glass (1964) first called attention to the injustice of gentrification in the same essay where she coined the term, but most subsequent research on the topic has focused more narrowly on the definition, operationalization, and quantification of gentrification and its impacts. In response to the rise in contemporary anti-gentrification activist movements, scholars have recently returned to the moral questions that first animated Glass's seminal work, offering a range of different, and often conflicting, reasons to label gentrification as unjust.

In this paper, I evaluate several arguments advanced to support the claim that gentrification is unjust. Marxists argue that gentrification is a particular manifestation of the commodification of space that produces unjust forms of residential alienation through the conversion of residential use values into market exchange values (Madden and Marcuse 2016). Civic republicans argue that gentrification fosters domination, because the arbitrary decisions of landlords and in-migrants threaten incumbent residents' temporally extended security of tenure (Putnam 2020). Others argue that gentrification threatens a community's capacity for effective self-governance, destroys local cultural resources, and threatens incumbent residents' place-based sense of personal identity (Hyra 2015).

I examine and evaluate these and other arguments and conclude that while gentrification may be unjust for a variety of reasons, a tension exists between individualist, collectivist, and structuralist perspectives on the injustice of gentrification. These tensions become concrete when claims about the injustice of gentrification motivate policy responses. I offer a path forward that is grounded in a middle-ground normative perspective that is simultaneously individualist and relational. This perspective supports anti-gentrification policies that combat residential displacement and enhance security of tenure for incumbent residents while opposing policies that harm those who wish to inhabit gentrifying places.

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Key Words: gentrification, back to the city movement, urban revitalization, justice, injustice

## LEARNING FROM PANDEMICS: APPLYING RESILIENCE THINKING FOR COMPLEX ADAPTIVE SYSTEMS TO IDENTIFY PRIORITIES FOR PLANNING URBAN SETTLEMENTS

Abstract ID: 440

Individual Paper Submission

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The COVID-19 pandemic spurred many predictions and prescriptions about the resilience of human settlements. But individual disciplines have different, overlapping conceptualizations of resilience, tuned to their examination of specific areas of concern. Since the pandemic impacted a colossal range of actions and processes at multiple spatiotemporal scales, cementing our expectation of the regularity of *systemic* disturbances, I use resilience theory as developed for the study of complex systems as my conceptual framework to identify priority areas for planning/policy transformation.

### RESEARCH QUESTIONS & METHODS

This interdisciplinary narrative literature review frames human settlements as *systems* and novel diseases as *shocks* to the system, examining the sources of *stress*, *vulnerability*, *redundancy*, and *adaptive capacity*. The research was conducted from January–November 2020, in three overlapping stages (figure 1). From January–June 2020, I reviewed ~500 articles on the COVID-19 outbreak published by dozens of authoritative news outlets, websites associated with publications on planning by professionals and scholars, and on *Nature's* pandemic timeline. Simultaneously examining literature on disease emergence, local and community transmission, and outbreak, I created concept maps linking the myriad, interconnected planning and policy issues to these stages of disease spread. From May–September 2020, I conducted a literature search for this review, guided both by these concept maps and the key research questions emerging from applying the resilience thinking conceptual framework to disease spread. From May–November 2020, I read 237 journal articles, 132 of which are cited in this paper.

### FINDINGS

Examining how *shocks* like novel disease emerge, why human settlements are *vulnerable* to them, which *stresses* exacerbate the impacts of these shocks, and how *response diversity* and *adaptive capacity* help buffer those impacts, revealed five planning/policy issues to prioritize. First, since urban settlements and activities facilitate pathogen transmission between species, reducing 'shocks' like zoonotic diseases and climate change requires not just prioritizing urbanization patterns and land use in urban policies for environmental health, but also animal rearing practices and biodiversity maintenance. Second, since disease transmission is linked to not just contact rate but also host susceptibility, reducing vulnerability by improving equity in access to essential infrastructures like housing, water, sanitation, healthy food, green/public spaces, healthcare—that impact human health directly and indirectly—is critical. In its absence, curbing disease transmission requires focusing on contact rate suppression, but doing so brings human activity to a halt, decimating the economy and livelihoods. Third, the persistence of many pathogens or their vectors in environmental media suggests that built environment & public health professionals must address maintenance of environmental quality at various scales. Fourth, there is a need for redundancy, be it in commodity supply chains (like PPE, food) or data management for say, monitoring & enforcement of home quarantines during a pandemic. Fifth, as the Indian state of Kerala illustrates, social adaptive capacity—which requires investing in social capital (human capital, bonding and bridging relationships), developing social networks between state and non-state actors (via trust and clear communication, reciprocal and repetitive interactions)—is critical to responding to shocks.

## CONCLUSION & CONTRIBUTIONS

This paper has attempted to consolidate the unprecedented swath of causes and impacts of the COVID-19 pandemic to identify priority areas for planning/policy. It is also a first step in developing and applying the theoretical framework for resilience thinking for complex systems study to planning research. The presentation will also:

1. discuss how this framework was developed and applied in this study
2. explain its value in untangling the multi-factorial pathways through which planning impacts urban health
3. explore the possibility of further research by conceptualizing the system and its *boundary, variables, stable states* and scenarios of *regime change*, and the factors impacting the system at higher spatiotemporal scales (*panarchy*) (figure 2)

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Key Words: complex systems, resilience, pandemics

## **“ESO NO SE DICE!”: STORIES AS PUSHING DISCURSIVE LIMITS FOR THE PRODUCTION AND USE OF KNOWLEDGE IN PLANNING**

Abstract ID: 497

Individual Paper Submission

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Increasingly, planners are engaging in radical planning practices rooted in relations of solidarity with marginalized groups. However, given that planners are often members of dominant groups and tend to rely on research methods that are conventional to Western modes of knowing, there is a risk that they are reproducing oppressive knowledge hierarchies and missing vital information in the process. Planners often seek to do participation with groups that are underrepresented in, or excluded from, conventional decision-making processes as a way to capture and include their voices in knowledge production and emphasize the agency they have in determining their life trajectories. Radical planning theorists (Miraftab, 2017; Roy, 2009) however, have begun to question how much can be taken for granted about the causal relationship between participation and meaningful inclusion.

Theoretical developments that contribute to efforts to decolonize planning, or at least expose the fallacy of the scientific managerial approach, can be drawn from the work of interpretive scholars (VanHulst, 2012, Sandercock, 2003) which conceptualizes planning as a process of collective sensemaking and applies theories from discourse analysis and narrative theory to emphasize the importance of identity, relationships and emotions in creating “power-sensitive analyses of dynamic processes” (VanHulst and Yanow, 2016: 105). However, while the language of Storytelling is used to celebrate the human dynamics involved in professional planning practice, the same language is often used to undermine the validity of ‘local knowledge’ of the sort that is produced in participatory planning activities. This further highlights the disjuncture between the objectives of radical planning and the practice of

participation.

To create a “power-sensitive analysis of the dynamic process” of knowledge production in a participatory research project concerned with urban social planning with a marginalized group, this paper combines tools from discourse analysis, performance theory, embodiment and psychology. Drawing on research that used personal stories and theatre performances to explore the connections between leisure activities and delinquency among stigmatized youth in Old Havana, Cuba, this paper traces how participants respected or transgressed discursive limits around what is (un)sayable in their storytelling practices. The findings contribute to radical planning theory by highlighting the ways in which identity, relationships and emotions condition some people’s voices and agency in ways that participation enthusiasts’ focus on personal empowerment and individual experience risks simplifying. The analysis highlights how participation practices’ individualist notions of voice and agency, the belief in the ability and responsibility of a person to articulate and act on an issue that troubles them, can make participatory planning ineffective, even potentially risky, when not accompanied by the necessary structure of rights and entitlements for the participating population.

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Key Words: Radical Planning, Discourse Analysis, Storytelling, Participation, Inclusion

### ON ‘TVA AND THE GRASSROOTS’ AND ‘THE VIEW FROM BELOW’: RETHINKING OUR INTELLECTUAL GENEALOGIES OF PARTICIPATORY PLANNING

Abstract ID: 591

Individual Paper Submission

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More than two decades after the communicative turn in planning (Healey 1992, Forester 1999), and a dozen years after “insurgent planning” decisively shifted the conversation on who constituted a ‘planner’ (Miraftab 2009, Liggett 2009), public participation in planning processes remains a significant terrain of theoretical debate in our field (see, for example, Zakhour 2020 and Alfasi 2021). While the sustained interest in planning’s participatory dimensions is unsurprising, given the paramount importance of serving public interest in this field (AICP Code of Ethics pt. 1, 2016), relatively few intellectual histories tracing participation in planning have been written, and the most recent publication appeared in 2005 – prior to the widespread recognition of insurgent planning (Damer and Hague 1971, Lane 2005). Bearing this in mind, I sought to build upon existing historicizations of planning participation by extending them to the present; however, in reviewing the literature, I encountered numerous works examining public participation in city and regional planning that have fallen out of the canon, yet might meaningfully inform contemporary debates.

In this paper, I analyze two significant, yet little remembered, volumes that were expressly concerned with public participation in planning, and suggest how their (re)incorporation into academic planning discourse might contribute to contemporary theorizations of participation in practice. The first is Philip Selznick’s TVA and the

Grassroots, a study of the Tennessee Valley Authority's incorporation, and cooptation, of white farmers into resource management as part of federal efforts to modernize and develop the region during the 1930s (1949). Selznick's critique, that participation could take on the look of democratization without any redistribution of power, prefigured those made several decades later by planning scholars, who took note as Black communities and other low-income communities of color rose up and burned down US cities. While the federal government introduced programs like Model Cities and phrases like "maximum feasible participation" to quell the unrest, landmark publications including Paul Davidoff's "Advocacy and Pluralism in Planning" (1965) and Sherry Arnstein's "A Ladder of Citizen Participation" (1969) explicitly discussed power and inequality, and explored alternative means of democratizing planning processes in order to address these disparities. Yet, significant as they were, neither of these works foregrounded the perspectives, messaging, and priorities of key actors in the Black Power movement. In their 1972 edited volume, "The View From Below: Urban Politics and Social Policy," Susan and Norman Fainstein did. Essays by Bobby Seale, Charles Hamilton, and Kwame Toure (then Stokely Carmichael) appear alongside those of Herbert Gans and Edward Banfield; the history and theory behind "community control" was articulated by the very minds that conceptualized it. Yet 49 years after these Black Panther Party leaders were published by scholars with profound longevity and significance in our field, the volume has only been cited 16 times.

At present, I see two potential contributions that this deep study of two long-forgotten texts might make to contemporary discourse. In situating federal support for public participation in a pre-Black Power, pre-1960s-social-revolution context, Selznick's TVA study underscores, while complicating, existing arguments on the limitations of participation as a democratic project (let alone a radical, liberatory one). And, as planning and related fields begin to embrace long overdue interventions from Black Studies and theorization from movement-based scholars, it is necessary to reflect upon why, and how, interventions from these very same sites of praxis were previously foreclosed upon.

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Key Words: participation, planning history, planning theory, development planning, Black Power

#### **UNDOING FEARS BY BUILDING HOSPITALITY IN THE SANCTUARY CITY: REFLECTIONS FROM CHELSEA, MASSACHUSETTS**

Abstract ID: 650

Individual Paper Submission

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The notion of hospitality is central in shaping planning theories and practices focused on immigration. It has been pivotal in determining the Sanctuary City's concept enabling policies designed to welcome racial others to US cities and territories. However, the Sanctuary City concept itself has also been questioned for its problematic nature strictly dependent upon the very power sanctuaries are supposed to limit: the police power (Roy, 2019). By putting the conceptualization of Sanctuary under scrutiny, this horizon of work poses epistemological, theoretical, and

practical challenges by inviting to re-imagining the idea of hospitality and pushing for undoing structural mechanisms of oppression imbued in existing spatial arrangements for racial dispossession (De Genova & Roy, 2020).

As primary activity determining spatial arrangements, planning must be in itself under scrutiny in the Sanctuary Cities to unveil how practices of dispossession materialize, what forms of hospitality are fostered, and ultimately what type of future ought to be constructed and for whom. From this perspective, theorizations on the City of Difference (Sandercock, 2000) are helpful to explore whether mainstream planning agendas are still ingrained in the modernist paradigm and to what extent they keep cannibalizing and dismissing alternative forms of planning that have the potential to re-imagine hospitality. Especially in contexts characterized by profound difference, planning discourses and practices mainly focus on actions designed to protect the “host” from the “guest” racial other. More specifically, while urban fears perceived by the former primarily enable mainstream planning actions, fears perceived by the latter have been constantly dismissed, increasingly determining geographies of terror and exclusion (ibidem).

In this paper, I am interested in engaging with the debate on fears perceived by and alternative forms of planning enabled by cities’ newcomers to further reflect on hospitality and Sanctuary City’s concepts. I do so by drawing from in-depth interviews, community engagement workshops, and engaged learning pedagogy experiments designed as part of an ongoing research process in the City of Chelsea (Massachusetts). Historically, Chelsea represents the poster child of broken window policing and neoliberal scrutinization for space and racial control (Heatherton, 2018). A more recent history depicts Chelsea as a City going through institutional structural change through a highly collaborative city-wide civic design process (see Podziba’s interview in Forester, 2013) instrumental to fostering its Sanctuary City designation in 2007. Despite the increasing government and community efforts striving for hospitality in the renovated twenty-first century Chelsea, pervasive feelings of fear still rest and profoundly affect residents’ everyday lives.

I argue that future forms of hospitality informing Sanctuary Cities must be grounded in planning approaches intentionally engaging with cities’ newcomers’ ways of being, knowing, and acting. By using the notion of deep knowledge, alternative planning ideas, research, and practice are suggested to overcome the pitfalls of contemporary forms of inclusion of difference and diversity in the city of immigrants. I conclude by offering reflections on how renovated forms of engagement might enable the mobilization of deep knowledge, determining safe sharing spaces instrumental not only to re-imagine hospitality but to re-think planning as an empathetic and caring future-oriented endeavor.

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Key Words: Hospitality, Sanctuary City, City of Difference, Engaged Scholarship, Community Futures

#### MORE THAN MANAGING: PROCESSES OF URBAN DECLINE BEYOND GLOBAL CAUSES AND LOCAL RESPONSES

Abstract ID: 662



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Recent work by planning and geography scholars have aimed to defamiliarize urban decline and shrinking cities (Dewar & Thomas, 2012; Aalbers & Bernt, 2018). This research and analysis positions depopulation and economic instability as the consequences and challenges of neoliberal urbanization and the globalization of capital (Martinez-Fernandez, Audirac, Fol, & Cunningham-Sabot, 2012; Hartt 2018). By paying close attention to the political economy of urban decline, these interpretations and explanations have reinvigorated this once-emergent research domain (Hackworth, 2019; Berglund, 2020). Disinvestment and racist policies force municipal governments to generate and mobilize a repertoire of housing, infrastructure, and fiscal strategies to ameliorate the effects of decline and abandonment. In these characterizations, the process of decline is extralocal and the responses are local.

In this paper, I argue for a reconsideration of this scalar divide and a reflection on its consequences for planning theory and practice. Although the shrinking cities literature helped situate decline as an active and persistent process shaping neighborhoods and cities, its continued privileging of local and global scales concludes cities are in an endless state of managing outcomes and effects. This reliance on certain scales of action conceals the operations of capital (Mezzadra & Neilson, 2019). Following scholarship on the production of urban decline (Akers, 2013; Koscielniak, 2019; Seymour & Akers, 2019; Seymour 2020), I prioritize the pipelines, pathways, and practices that produce decline through the extraction of value from the built environment. Decline, in this refreshed portrayal, is not a withdrawal or absence with a spatial remainder, but a strategy and operation of capital that produces the declining city.

I draw on research from a five-year mixed-methods study of the Detroit Demolition Program (DDP) – the largest residential demolition program in American history – to illustrate the production of urban decline. Since 2014, DDP administrators and demolition contractors have collaborated to wreck over 20,000 vacant buildings. Critics have dismissed the DDP as an attempt to banish Black Detroiters and revive the city's property market for wealthy white newcomers. Boosters have insisted the DDP is an attempt to restore neighborhood stability to retain existing inhabitants. Both perspectives settle upon the DDP as a local response, albeit with different objectives, to the late capital afterlife of predatory subprime lending and foreclosure. However, by focusing on demolition supply chains and the logistical process of backfilling, I show the DDP is neither a sealing off of past decline nor preparation for a revitalized future. Rather, demolishing Detroit is local and regional operation that serves as a continuation of the production of urban decline. Planners and policymakers must view urban decline beyond scales of local and global that insist the former manages the effects of the latter. By approaching decline as a process of value extraction and a form of capitalist urbanization, researchers and practitioners can identify new opportunities to intervene in the production of urban decline.

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Key Words: Decline, Detroit, Demolition, Shrinking Cities, Theory

**THE CONSTRUCTION OF UNCERTAINTY IN URBAN PLANNING: ON POWER AND HOW IT CAN BE OVERTURNED**

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Urban planning often considers uncertainty as an impersonal outside force within which communities must make decisions. The various scenario planning approaches ask stakeholders to imagine the outside driving forces and make decisions within those frames. However, if we view uncertainty as a personal affective state, we can understand how uncertainty is socially constructed and maintained. This theoretical paper asks where uncertainty comes from and how it is socially constructed. In order to this, I develop the theoretical underpinnings from the literature and bring in case studies from both professional and academic practice.

Uncertainty exists when an individual place their attention towards action and perceives a knowledge gap between what they know and what they would like to know in order make decisions. Social actors construct uncertainty by guiding attention and influencing the inherent indeterminacy of the subject of that uncertainty. For instance, individuals are socially and materially directed towards the value of car ownership. Simultaneously, maintaining access to a working vehicle is often made extremely precarious for low income communities via land use and transportation policy decision. This construction usually supports the interest of more powerful actors at the expense of less powerful actors. Financiers develop risky housing products that put individual homeowners at even greater risk. Homeowners argue on behalf of zoning that provides them certainty regarding the future of their community, externalizing many environmental quality and housing uncertainties to other communities.

This framing is not meant to remove all latent uncertainties – the exact impacts of climate change are impossible to determine and communities are wise to understand that. Rather, I highlight that social and political avenues may often exist where technocratic rhetoric obfuscates them. Where political will exists, households can be protected against uncertain impacts of climate change no matter the unpredictability of long-range climate system. Introducing political agency into the conversation also introduces the possibility for marginalize groups to wield uncertainty in their own favor. Acts of protest, contestation, and politics reject the simple certainty of a bad outcome. Actors accept the potential of downside risk – arrest and repression – in order to open up possibilities of upside opportunity – policy and structural changes. These actions also push uncertainty back up towards the more powerful actors. Political, social, and economic elites, usually assured in their position, must place their attention toward the kaleidoscopic locations of their misunderstanding.

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Key Words: uncertainty, power, theory, climate change, politics

#### PLANNING WITH RECOGNITION: THREE FRAMEWORKS TO ENSURE URBAN JUSTICE

Abstract ID: 712

## Individual Paper Submission

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Planning theory and practice has been constructed through a broad range of exclusions and categorizations that persist to this day, including ethno-racial disparities, migration status, family type, and gender inequalities. To address such forms of exclusion, we contribute to a debate on planning and recognition of minority rights (Fincher & Iveson, 2008). Urban planning scholars have engaged with three frameworks centered on issues of recognition: multicultural planning, human rights cities, and postcolonial planning. These three frameworks have co-existed for some time, and raise crucial questions for the future of planning theory and practice. Thus, in this paper, we ask the following question: how can planning theory and practice address forms of exclusion through recognition, and what examples from planning practice should inspire future action?

To reflect upon the challenges of planning with recognition, this paper compares and contrasts three approaches to planning theory and practice that address recognition — multicultural planning, human rights cities, and postcolonial planning — through case studies of cities in Canada and the United States. In Canadian planning practice, multiculturalism has been a key influence since the 1990s, with a range of guidelines, best practices, and case studies that have even been used beyond Canada (Qadeer, 2009). Likewise, postcolonial planning in Canada has focused specifically on indigenous planning and First Nations-settler relations (Porter & Barry, 2015). By contrast, in the United States, emerging postcolonial approaches to planning have focused on racial injustices ingrained in the spatial politics of permanent housing insecurity and dispossession (Roy, 2019). Moreover, in the United States, the idea of human rights cities has gained considerable ground in planning practice, as the country has over a half century tradition of municipal human rights commissions, especially since the publication of Rice and Greenberg's 1952 *Municipal Protection of Human Rights in the Wisconsin Law Review* (Grigolo, 2019).

In this paper, we investigate municipal ordinances and human and civil rights commissions at the municipal level that regulate racial profiling, municipal stands on immigration status, and housing discrimination. We analyse resolutions enacted by such commissions, including those on the rights of the homeless, gender neutral bathroom facilities, and indigenous-colonial settler relations, among others. Our study contributes to a growing debate about challenging exclusion and ensuring urban justice through local planning practice. We assess the complementary or contested role that multiculturalism, postcolonialism, and human rights approaches provide towards possible ways forward for planning with recognition. Although postcolonial planning is more grounded in theory and activism, it can provide insights to rethink the nature and scope of human rights issues in cities, to address the legacy of dispossession of historical minorities, while multiculturalism tends to emphasize migration and globalization. These three approaches could improve efforts to build inter-ethnic solidarity and coalition building in cities.

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Key Words: Postcolonial Planning, Human Rights Cities, Multicultural Planning, United States, Canada

## LEARNING FROM MISTAKES: HOW STATE PLANNERS REFLECTIONS IMPACT THEIR APPROACH TO INSTITUTIONAL CHANGE IN MEDELLÍN, COLOMBIA

Abstract ID: 719

Individual Paper Submission

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Reflective practice helps planners develop more robust approaches to their work by refining individual practice (single-loop learning), understanding why events unfold the way they do (double-loop learning) and thinking about how they influence the planning process (triple-loop learning) (Argyris & Schön, 1974, 1978; Schön, 1983; Wilson, 2019). Recent work has analyzed how institutions guide reflection and learning (Forester, 2018; Forester et al., 2019; Mäntysalo et al., 2018; Salet, 2018a, 2018b) yet analysis of how reflective practice impacts institutions is lacking. In other words, while it is well established that reflection is used to alter situations and improve individual practice (Fischler, 2012; Willson, 2021) little is known about how reflection is used to alter planning institutions in a more permanent fashion. How does reflective practice impact a state planner's approach to institutional change? I argue that through reflexivity, planners identify which institutional factors are impediments to improving their practice and take advantage of what I term 'simple junctures' to change existing institutions. These simple junctures stand in contrast with the critical junctures identified in the literature on historical institutionalism (Capoccia & Kelemen, 2007; Collier & Collier, 1991) and its application to planning (Sorensen, 2015, 2018). Simple junctures are also distinct from everyday processes and, as such, present key opportunities for state planners to pursue institutional change.

I build on the literature on reflective practice and historical institutionalism to analyze the actions of 23 state planners involved in the design and implementation of spatial planning interventions in Medellín, Colombia between 1990 and 2015. I trace the history of planning during this period and combine it with document analysis and semi-structured interviews conducted between 2016 and 2017. My analysis shows how reflective practice is employed to learn from mistakes, and most importantly, to analyze the institutional elements that facilitate the reoccurrence of those mistakes. The lessons drawn from those reflections are then mobilized for institutional change during simple junctures such as the implementation of a new housing upgrading program or the design stage for a new partial plan. I identify the conditions that make simple junctures more likely to lead to permanent institutional change such as a planner's ability to make explicit the link between a program's shortcomings and the institutional factors causing it. I conclude by highlighting the limitations of simple junctures in achieving broader structural transformations. Findings show the importance of training planners to reflect on both the individual and institutional factors impacting their practice and on the strategic importance of leveraging simple junctures to partially rectify conditions negatively impacting their practice.

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Key Words: historical institutionalism, reflective practice, institutional change, global South, planning mistakes

## URBAN PLANNING AND THE CAPITALIST STATE: STRATEGIZING CONTRADICTIONS, CRISIS, AND RELATIVE AUTONOMY

Abstract ID: 721

Individual Paper Submission

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State theory has been neglected within planning theory. Yet, an understanding of the state is vital to political action and the struggle for social change. In neglecting a more robust theorizing of the state, urban planning is left with two major conceptualizations of the state. The state is either viewed within an instrumentalist approach, in which the state is a “tool” of capital accumulation, or the state has receded to the background, in which the power relations and contradictions of the state are neglected when analyzing planning. Both of these conceptualizations, present problems when identifying the ways in which planners can make actual progressive change. Marxist planning theorists tend to severely limit the agency of the planner, while the “planning as reform” theorists give too much agency to the planner or neglect constraints of their role. There is truth to both of them though. Reform-oriented planners are correct in highlighting the, however limited, agency of planners and opportunities to act for change, while the Marxists are also correct in understanding the role of planning in the capitalist state to be towards capitalist ends. Without a deeper analysis of the state and the roles of state actors, specifically planners, within the capitalist state, it is difficult to understand how planners work within the capitalist state, while maintaining agency to promote decisions that benefit the subaltern classes. Therefore, to truly understand the capacity to advance progressive change from within the state, one must continue to theorize the capitalist planning state.

This paper aims at developing a theory of the capitalist planning state through Antonio Gramsci, Nicos Poulantzas, and Stuart Hall. These three Marxist theorists provide analyses of the state which, when theorized within planning, interrogates the conditions and factors which influence the degree of relative autonomy for actors within the state as well as contributes to an understanding of the state as becoming a ground for class struggle. Gramsci’s state as organizer of capitalist fractions, elevates key concepts such as hegemony, crises, and “power blocs.” Poulantzas and Hall further Gramsci’s thought, through an understanding of the different institutions of the state as inhabiting “relative autonomy,” which challenges an economic determinist lens. Additionally, both theorize contradictions, crisis and consolidation. This allows for understanding how crisis might lead towards a moment of progressive change, but also how multiple institutions (and power blocs) consolidate into the state form and structure “common sense,” or rule. Their analysis and concepts are vital for theorizing the role and action of urban planners within the capitalist state.

This paper therefore makes two arguments. The first is that planning theorists need to advance a theory of the capitalist planning state. The second is that in doing so, we are able to map how progressive change can be enacted, even while embedded in capitalist governance. I draw on Marxist state theory to advance an analysis of urban planning within the capitalist state. Specifically I employ their concepts of contradictions, crises, consolidation, and “relative autonomy” within the discipline of urban planning. Each of these concepts helps to analyze the conditions that allow for the planner to act radically, even while embedded within a capitalist state that organizes towards capital accumulation. Through this understanding, the planner is part of an institution of the state, while inhabiting a contradictory position. This contradictory position can lead away from decisions making that emphasizes profit and accumulation, towards decisions that advance the causes of the dominated classes. The planner is entangled in the state apparatus and must be aware of how the capitalist state functions, to achieve their potential as a progressive force.

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Key Words: planning practice, progressive change, radical planning, relative autonomy, state theory

## RELIGIOUS ARGUMENTS FOR AND AGAINST PLANNING IN THE UNITED STATES

Abstract ID: 727

Individual Paper Submission

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This paper conjoins the two historiographies that often ignore one another – namely, planning history and the religious history of the United States. It probes various doctrinal schisms between conservative and liberal religionists over the role and scope of planning in the U.S: the former, for instance, reading Hayek and blending the language of civil liberties with scriptural admonitions; the latter, reading Mannheim and using the rhetoric of moral uplift for planning justifications.

This study identifies four defining moments in forging the relationship between religion and urban planning in the U.S. – namely, (a) at the birth of the planning professions during the late nineteenth century; (b) in the aftermaths of the Great Depression and the increased powers of planning during the New Deal (c) during the Civil Rights era and massive societal backlash against rational planning; and more recently, (d) in the post-Smith jurisprudential era and the past two decades of social and racial outrages.

This paper argues that, in virtually all these defining moments, urban planners have “seen” religion more through the doctrinal debates, and most through the spatial conflicts that involve elements of religion (especially zoning), and less through parallel progressive activism and calls for justice (racial, economic, and environmental) that have been in faith and tackled urban problems as issues of injustice (e.g., racism, poverty, degrading living and health conditions). The paper argues such heated theological-political debates have entrapped our disciplinary imagination into doctrinal abstractions that hang in the thin air, rather than to the emergent forms of social action that rest on firm ground.

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Key Words: Planning, Religion, Secularism, Social Justice, Conservatism and Liberalism

## THEORIZING TEMPORALITY AND ‘BECOMING’ IN RURAL ONTARIO: PLANNING COMMUNITIES OF DIVERSITY AND DIFFERENCE OUTSIDE THE COSMOPOLIS

Abstract ID: 747

Individual Paper Submission

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Over the past six decades, the settlement locations of immigrants to North America have primarily been cosmopolitan gateway cities and their surrounding suburbs. However, recent policy initiatives in Canada (e.g., federal *Rural and Northern Immigration Pilot*; *Rural Employment Initiative* in Ontario) have resulted in spatial redistributions of newcomers into smaller cities and rural towns. These changing settlement patterns are deemed necessary to mitigate the economic and social impacts of population decline prevalent in small cities and rural communities, while also addressing the barriers to successful integration facing recent immigrants residing in urban areas. These emergent trends provide new opportunities to explore issues and approaches to planning for diversity and difference outside of major urban areas with particular attention to the importance of temporality of/in the changing settlement and resettlement patterns of newcomers in Canada.

The role of time, temporality and ‘timescapes’ have received growing attention over the past decade by critical spatial scholars including those in planning (Degen, 2018; Laurian and Inch, 2019) who note: “planning...is a richly, temporal practice which has not yet fully explored the possibilities that could be opened up by adopting explicitly temporal ways of knowing and acting” (Laurian and Inch, 2019, p. 281). This paper heeds the call to more fully explore the importance of temporality in planning through a study of recruitment and resettlement of diverse immigrants into small cities and towns in Ontario, Canada. This mixed methods study draws on survey and interview data from key informants working within rural communities actively recruiting immigrant populations, as well as focus groups and interviews with newcomer populations who have or are in the process of resettling from urban into rural communities. The analysis highlights the contrast between community-based concepts of time and futurity with the personal temporal narratives and utopian visions of immigrants settling within those communities.

More specifically, the findings from staff and elected officials in rural communities illuminate how preoccupations with past timescapes (Degen, 2018) shape their plans for temporal transformations from a shrinking and stagnant community into a vibrant and ‘welcoming’ one. The temporal sense of ‘becoming’ (Grosz, 1998) is sought through social and economic policies prioritizing immigrant attraction and retention. From the perspective of immigrant participants, the promise of a previously unrealized utopian future in Canada was a primary driver for their decision to resettle outside of urban areas. Immigrants play with time in order to realize their own desire for socio-spatial belonging and personal ‘becoming’ (Grosz, 1998) in Canada.

This paper contributes to recent efforts to shed light on the role of time in planning theory as well as explore emergent issues in planning for diversity and difference (Burayidi, 2015; Qadeer, 2016). Specifically, the paper emphasizes the flexible constructions of time- slowing, pausing, speeding, imagining- that were implemented by communities seeking physical and social change towards and/or back to times of growth and vitality, and immigrants striving to settle, integrate and belong in Canadian society. The paper concludes with a discussion of what the changing settlement patterns of immigrants means for planning communities of diversity and difference outside the cosmopolis.

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Key Words: rural immigration and settlement, temporalities, community well-being, becoming, planning for diversity and difference

### **DELUSIONAL OR DISILLUSIONED COSMOPOLITAN?**

Abstract ID: 778

Individual Paper Submission

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Scholarships on cosmopolitanism, multiculturalism, interculturalism abound and have similarly long advocated for the right to claim presence in the city, democratizing its spaces and engaging residents fully in civic life as subjects rather than objects. Harvey (2008) insists the “freedom to make and remake our cities and ourselves” as a human right must entail the democratic management over urban development (p. 23). An undergirding principle is the idea that every individual who contributes to urban life should have a say in its operations and planning. This principle favors lived engagement, urban dwelling in a given place over formal status, cultural identity, or group association. Yet, when the urban dweller is a migrant, their life is regulated by immigration policies that set the rules of entry and exit, and define the means the state uses to regulate migrant life. The visa allowance, duration and work permitted, length of permitted stay, entitlement to temporary or permanent residency, and the eventual entitlement to citizenship rights and political participation all create a preordained infrastructure of legality for the life of the migrant (Morawska, 2003) hampering the afflatus that the notion of the right to the city may initially prompt. How do we make sense of our normative theoretical aspirations and immigration policies’ realities? What are the theories that inform the infrastructure of legality for the life of migrants in the US? This paper through surveys, media analysis, and personal experience is an explorative study of normative theories on how to live with diversity in relation to US immigration policies and its most recent developments to understand their respective assumptions, dissociations, trajectories, and impacts on migrant life.

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Key Words: immigration

### **WHY DEMOCRATIC PARTICIPATION IN CITY PLANNING MATTERS: SOME DEWEYAN INSIGHTS FOR CONTINUOUS PLANNING CITIES**

Abstract ID: 854

Individual Paper Submission

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Creating inclusive cities that are livable for all requires taking a “systems” approach to complex affordability within deeply democratic planning processes, within which “city people” work with each other and with their officials in ways that are collaborative, contributive, and educative for all participants. My thesis is that pragmatist theories of deep democracy matter in creating livable cities. John Dewey, George Herbert Mead, and their contemporary inheritors in philosophy and urban planning, such as Richard Bernstein, Judith Green, Charles Hoch, John Forester,



and Judith Innes and David Boohar offer important insights on how to more effectively develop real opportunities for a city's people to develop transformative visions and effective strategies for actualizing real and lasting change in their communities.

Deeply democratic urban planning processes must take seriously how the role of planners has changed since 1960, as outline by urban planning theorist John Forester in *The Deliberate Practitioner* (1999):

Because social planning is the guidance of future action, planning with others calls for astute deliberative practice: learning about others as well as about issues, learning about what we should do as well as what we can do. So when city planners deliberate with city residents, they shape public learning as well as public action. By sharing or withholding information, encouraging or discouraging public participation, city planners can nurture public hope or deepen citizens' resignation.

As his language suggests, Forester draws equally on Dewey's concept of participatory democracy and on Jürgen Habermas concept of collaborative deliberation. In partial contrast, as I will explain in this paper, my Dewey-inspired, public-inclusive, pragmatist planning model focuses on collaborative participatory democracy. This model, which David Woods outlined in *Democracy Deferred: Civic Leadership after 9/11* (2012) includes three key principles:

1. In contrast to contentious, anti-authoritarian models of participatory democracy, collaborative participatory democracy emphasizes among other factors the "educative function" of participatory events and planning processes, as these can affect both "ordinary" citizens and elected and appointed leaders.
2. Participatory democratic city planners place relatively greater emphasis on how specific social issues develop through direct interaction among groups and individuals, so as to produce shared community goals and values.
3. Last but not least, a distinctive feature of participatory democracy, in contrast to deliberative democracy, is concern about empowerment of citizens to develop their distinctive voices.

Building on this deeply democratic participatory planning model, we explore contemporary examples and applications of Deweyan pragmatist urban planning scholarship, which has been greatly influenced by Richard Bernstein's work. Our paper's final section will explain why democratic citizen participation continues to matter for "continuously planning" twenty-first century global cities.

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Key Words: Civic Engagement, Participatory Democracy, "Wicked Problems," educative function, Role of planners

#### **MAKING USE OF LOCAL CLIMATE PLANNING ACTIVISTS: SHARPENING TOOLS FOR MAPPING SHIFTS IN COST ASSIGNMENT AND BENEFIT CAPTURE UNDER ENVIRONMENTAL POLICY CHANGE**

Abstract ID: 892

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The global movement to address human-influenced climate change offers opportunities to reshape social, political, and economic practices toward mutually favorable outcomes. However, as restrictions and incentives are created toward climate objectives, new spatialities and new temporalities of difficult-to-observe costs and benefits emerge, often burdening groups and individuals that do not have the capacity to avoid exogenous cost assignment or benefit restriction. This can mean a high likelihood of resistance to climate change mitigation policies and practices that could be challenging to climate policy implementation over time, or that climate-beneficial policies may result in exacerbating structural inequality; an also less than ideal potential outcome. In advocacy planning, communicative planning, and other branches of the activist bent, a justice-oriented effort has adopted the tactic of structuring formal institutional practices of participation in which members of the public are brought into formal procedures to report useful data for institutional decision matrix consideration. While professional planners play a crucial institutional role in shaping governance and market outcomes to change the chemical and physical consequence of socioeconomic activity, there is an extent beyond which they have the capacity to observe certain fluid spaces and times. I argue that planners can also learn to read the “resistant texts” (Winkler, 2018) of groups involved in documenting and challenging local and global environmental externalities from outside the typical state-market nexus. Further, Planners can look to the efforts of both groups which self-identify with planning directly in branding as well as those which associate with planning indirectly by issue selection. Using a sample novel to the Planning academy of grant applications to the Liberty Hill Foundation in Los Angeles between 1976 and 2003, I apply case study methods using qualitative content analysis to demonstrate how progressive planning activists during that period perform discursive and spatial mapping of environmental externalities, critique and structure the cost assignment and value capture strategies for groups affected by environmental policy changes, and illustrate the complicated repositioning under environmental policy change that can create conflict between groups which might otherwise have been expected to be in justice-oriented alignment on environmental, political, and socioeconomic objectives. Lessons for institutional planning actors include an incipient method for data acquisition beyond the edges of the formal institution’s grasp, tools for understanding how environmental policies which are on average useful toward climate objectives might still create relative positions of advantage and disadvantage at local scales, and the potential for conflict resolution and preemption through communication, data documentation, and context-based scorekeeping.

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Key Words: Activist Planning, Resistant Texts, Socio-Spatial Dialectic, Environmental Externalities, Economic Externalities

**MAKING "THE PUBLIC" IN IMMIGRANT CITIES: POLITICS, THE MACHINE, AND THE STATE IN QUEENS, NY**

DEFILIPPIS, James [Rutgers, The State University of New Jersey] jdefilip@rutgers.edu, presenting author

The “public interest” is at the heart of what planners do and is enshrined in the first principle of AICP’s code of ethics. But it is obviously a concept that is loaded with ambiguity and contested meanings. This is true in any context, and neither a unitary “public” nor shared “interests” should be assumed a priori in any context. But this is perhaps particularly true in multiracial and multicultural immigrant areas where the existence of a unitary public with shared interests would seem least likely to be “a given.”

It is this lack of a unitary public in immigrant societies that has led moral philosophers from John Rawls to Michael Walzer to David Miller to advocate for strict limits to immigration. Ethnic, cultural, and racial diversity in their framings is itself a barrier to the forming of a coherent public. Mass immigration is therefore incompatible with a coherent, unitary public. Walzer’s famous line that, “to tear down the walls of the state is not...to create a world without walls, but rather to create a thousand petty fortresses” (Walzer, 1983, p. 39) is a useful expression of this thinking. And while there has certainly been significant pushback among planning theorists like Sandercock to these perspectives, they have also found support in our field among theorists like Fainstein (for whom “diversity” is clearly a problematic component of her “just city” [2010] framework). Importantly, the pushback from planning theorists such as Sandercock comes despite the fact that she shares their skepticism of the idea of a unitary public in multicultural spaces (Sandercock, 1998). Thus, for planning theorists like Fainstein the lack of a coherent public in immigrant cities is a problem to be overcome, while for those like Sandercock it is a feature of the contemporary city that is worth celebrating.

This talk takes a rather different approach to these debates. In understanding “the public” it assumes neither a shared interest nor shared identity. Instead, the public is an inherently heterogeneous and contentious realm that is produced in and through participation in public life. In a way that mirrors the old argument from democratic theory that democracy is produced through democratic practice (see, for instance, Pateman, 1970), there is no public independent of public participation (Dewey, 1927). Therefore, the questions of the existence or coherence of the public in immigrant societies becomes not a question for theory, but a question for empirical observation.

The site for these theoretically-informed empirical observations is Queens, NY. Queens is almost 50% foreign born, and is the most diverse county in the United States (Hum, *et al.* 2021). The talk focuses on three realms of formal political activity: 1) community boards, which play an advisory role in the frameworks of New York City government; 2) the Democratic political machine, which is the central player in much of electoral politics in Queens; and 3) electoral politics – at all tiers of government (from the City Council, to State Representative or Senator, to Member of Congress). It uses these three realms of public participation – and the role of immigrants in them – to argue that coherent (if always heterogeneous) publics can be, and are, constructed in the most diverse places. It further argues that we can see this not by looking to the theorists, but by looking to those that actually are constructing the publics in our cities.

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Key Words: immigration, the public, public interest, Queens, NY, electoral politics

## ***INHABITING DIGITAL SPACES: THE RIGHT TO THE CITY AND THE POLITICS OF MOBILITY***

Abstract ID: 933

Individual Paper Submission

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The urban is a hybrid mixing and layering of physical and digital spaces where algorithms, visualizations, and big data contribute to produce geographies of exclusions as well as new claims, sites and strategies for political action. The Right to the City's (Lefebvre 1996) focus on the appropriation of urban space for collective use has provided a useful frame for analyzing spatial struggles in the neoliberal city. However, these interventions occur mostly at 'lived' spaces, serving as dialectical openings for reimagining a just city. Increasingly, cities are constructed through visual technologies, which hold particular power in establishing legitimacy to policy-makers and the public. Space is often produced digitally before it is produced physically as experienced/lived infrastructure through conventional visualization methods such as mapping, as well as methods emerging out of a "new era in real-time data visualizations, models, path-finding algorithms and Pokémon" (Madden 2014: 479 in Shaw and Graham 2017). This raises the question on whether the right to the city must now include an "informational right to the city" (ibid). An "informational right" is especially crucial in transportation planning where planners and engineers rely on specific technologies (e.g. modeling) in conceptualizing transportation spaces. However, these methods 'black box' knowledge so residents only have access to inputs and outcomes. As such, this paper seeks to investigate how the Right to the City can be broadened to include how residents might appropriate both conceptual and lived transportation spaces in order to produce just outcomes. This paper addresses the following questions: (1) What are the mechanisms through which space is conceived, perceived, and lived through the lens of transportation planning?; (2) how might claims for technical information challenge dominant transportation policies and spatial production?; (3) how might participants inhabit these conceptual spaces enabled by technologies?

The article utilizes a case study approach with a focus on mobilization around opposition to highway expansion in two Texas cities: Dallas and Houston. Both metropolitan regions in Texas are well-known for their sprawling cities and high private car dependency. Using textual analysis, the study reviews news articles, social media, and documents from TxDOT's public participation process. While the Dallas case finds ground in a coalition of professionals, residents and other stakeholders by challenging assumptions built into the justification of proposed projects, the Houston case demonstrates the role of advocacy in mobilizing protests and expertise to produce alternative forms of knowledge and claims to space. Both cases challenge assumptions about how transportation 'needs' are often determined in conceptual planning spaces and attempt to halt the trajectory of highway projects by enacting alternative forms of citizenship and ways to claim rights to spatial justice. We then explore how these claims are grounded in specific sites and places, yet intertwined with issues of climate justice through localized practices for the purpose of reducing greenhouse gas emission, broadening sustainability frameworks, and conceptualizing perceptions of residents' needs including "those on the wrong side of digital divides" (Schwanen 2019: 7). Challenging the legitimacy of institutionalized knowledge production consequently forms part of a larger claim to the right of the city.

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Key Words: theory, right to the city, mobility

## THE PROMISE OF PLANS: AFFECT, DESIRE, AND COLLECTIVE FUTURES

Abstract ID: 943

Individual Paper Submission

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This paper uses the idea of “promise” to examine the affective dimensions of plans. A promise connects visions of a shared future with a subjective experience of desire in the present. Planning’s promises are well known: sustainability, equity, community, efficiency, and prosperity are among those most commonly found in plans’ imagined futures. While planning is replete with stories of failed promises and unrealized plans, the question this paper follows is not how they fail, but how the promise itself nevertheless survives. Inspired by studies of technologies that retain their persuasive power in the imagination despite their shortcomings in actuality, I argue that a plan works by mobilizing the affective orientations of those with the power to continually produce, maintain, and repair its promise. Planning scholarship has a long history of critically examining the contents of its utopian visions and the value-laden processes by which they are created, but far less attention has been given to theorizing the performativity of plans. In other words, building on Sara Ahmed’s (2010) examination of the “promise of happiness,” this paper asks not what plans’ promises *are*, but what they *do*.

My empirical basis is a study of transportation planners’ recent engagement with new mobility technologies, specifically emerging app-based ride-hailing and shared mobility services. Led by major tech companies and their investors, these new interventions in urban transportation promise reduced traffic congestion and emissions, greater mobility equity, more efficient policy supported by big data, and even the fun and freedom of travel. Although they do not endorse these pitches wholesale, planners and policy-makers co-produce these promises in their implicit and explicit visions of future urban mobility. Qualitative data drawn from stakeholder interviews, municipal regulations, industry conferences and publications, and documentation of mobility software development shows how subjects’ present desires and actions are co-constituted with an anticipatory orientation to mobility promises. In doing so, I illustrate how plans work by mobilizing affect.

My examination of this dynamic draws on two related literatures. The first is Ahmed (2010) and associated work in affect theory, which helps us to see promises in relational terms driven by desire. The promise has no inherent power, but works because it resonates with some already existing orientation of the subject to the promised object as good. The second is literature from technology studies on the on the “mythologies” (Mosco, 2004) and “imaginaries” (Jasanoff, 2015) that animate techno-utopianism. In these historical and contemporary accounts, visions of technological futures offer escape from mundanity and messiness of the present with the promise of transcendence. Each of these literatures helps us to see planning as operating not just rationally, but affectively.

This paper engages and extends recent theorizations of affect in geography (Anderson, 2014) and planning (Marotta & Cummings, 2019) to examine the “promising” work of new mobility plans. Specifically, I examine the role of the promise a mechanism for ordering the future and reducing the discomfort of uncertainty as well as the resulting bracketing of politics and difference. I find that plans, like many sociotechnical imaginaries, have an inherent conservatism in that they are most charismatic when they affirm pre-existing values and worldviews. I conclude by arguing that to realize radical transformation requires turning to the mess of the present rather than the promise of the plan.

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Key Words: affect, desire, futurism, technology, new mobility

## RE:CODE L.A.: RE-ZONING THE DEMOCRATIC-CAPITALIST CITY?

Abstract ID: 987

Individual Paper Submission

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Los Angeles presents a critical case for studying the political economy of urban development to understand the politics and practices of re-zoning the democratic-capitalist city. Although zoning codes are intended to regulate urban development to produce a ‘good city’ for all, empirical research explains how zoning can create or reinforce a system of social and economic inequality. The forces that shape urban development have been explained from the perspective of economics (Harvey, 1985) and governance regimes (Stone, 1993). The role of city planners in this process has been described as mediating the public and private interests (Foglesong, 1986; Friedmann, 1987), however, less is known about how they mediate the tensions between economic and democratic interests in practice. Debates around zoning are centered on historically negative outcomes of zoning such as redlining, racial segregation, gentrification, and urban sprawl (Rothstein, 2017; Stein, 2019). Scholars also study zoning innovations and disagree on the potential for improved outcomes (Carmona, 2009; Moroni, 2010). What is currently understudied is the blurring of public and private sector planning practices in producing zoning codes. More research is needed to understand how these evolving practices are influenced by contemporary forms of democratic governance and the changing role of planning expertise and discretion.

The research approach is an in-depth case study of “Re:Code L.A.,” the City of Los Angeles’ reform of its zoning code. The project began in 2013 and is the first comprehensive redesign of the zoning code since 1946. Los Angeles is a complex and diverse city with a history of urban development influenced by powerful political forces. From financial and business interests to homeowner associations, these powerful coalitions influence zoning and urban development that produces benefits for some while excluding or marginalizing others. This research examines the social and technical process of creating the new zoning code framework, addressing the critical need to understand the current politics and practices of zoning in Los Angeles. The case represents a multifaceted process, characterized by fuzzy boundaries between the phenomenon and its social context. Therefore, the study is conducted using a single embedded case study design (Yin, 2014) guided by a set of theoretical propositions and exploring the relevance of alternative explanations. The research is guided by scholarship suggesting how the role of planners is affected by the need to manage contradictions between economic interests and democratic legitimacy. However, the analysis will also respond by further analyzing how the new tools and practices of public-private planners are used to both mediate and affect the outcome based on professional norms and values.

Qualitative methods of semi-structured interviews, content analysis, and indirect observation are used to answer the following research questions: (1) How do governing coalitions influence the shaping of the Re:Code L.A. project? (2) How does the participatory planning mechanism frame citywide democratic representation? (3) How do public and private sector planners mediate competing interests while developing strategies for the new zoning code? Analytical techniques of process tracing and discourse analysis are used to understand how different actor groups contribute and interact throughout the process of creating the new zoning code. This methodology reveals how

individuals use language to produce spoken or written text, but also how individuals or groups then interact with and create new meaning with that text. Collectively, the analysis of the socio-political process and the planning content of the new zoning code seek to identify theoretically generalizable patterns from the literature and explain how they function in this particular case.

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Key Words: Zoning, Planning Theory and Practice, Political Economy

#### TOWARDS A MORE ENCOMPASSING INDIGENOUS PLANNING PARADIGM

Abstract ID: 1001

Individual Paper Submission

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A Thousand Roads video production on Native American peoples reads: "Though we journey down a thousand roads, all our roads lead home." Conversely, a quote from C.S. Lewis in "The Pilgrims Progress" declares: "One road leads home and a thousand roads lead into the wilderness." Both quotes provide valid cosmological views: one is philosophical and the other is more practical. Both phrases, however, offer alternatives based on a range of needs and preferences. Notwithstanding the travel options, one road eventually leads to the destination, home. "Home," in this case, is the Indigenous Planning paradigm. Augmenting its umbrella function could ably support the coexistence of the various Indigenous Planning models. This includes establishing a toolbox of research methods that extend to the Humanities and the Arts fields. The success of the Medical Humanities inspires similar opportunities for Urban Planning theory and practice where Social Sciences, Arts, and the Humanities methods can coexist under the realm of the Indigenous Planning paradigm. Over the years, researchers have introduced a variety of Indigenous Planning models. Distinguished Professor Ted Jojola first articulated the term Indigenous Planning between 1975 and 1982 through his graduate research products at the MIT and the University of Hawaii. His interests in Environmental Design and Political Science led to his focus on land tenure, physical planning and design, and the formation of proactive development practices for disempowered land based indigenous societies by transmitting the Seven Generations model from the past to the future. In 1987, *Planning Magazine* featured the Buffalo Commons model by Deborah and Frank Popper with the subtitle, "A Daring Proposal for dealing with inevitable disaster." The latter phrase addresses to the "boom and bust" culture of the Great Plain regions where mostly Whites and Native Americans became active contributors to the Great Plains Restoration Council and the Intertribal Bison Collective, as inspired by traditionally sustainable environmental models. This 1980's movement coincided with the Creole Planning movement which was formed by a group of environmentalists and urban planners the French Antilles as they mitigated European development impositions on the local culture. An enduring manifesto of this movement is found in the award-winning novel, "Texaco." By 1992, a group of MIT graduate students best articulated the essence of the Indigenous Planning paradigm; as they focused on urbanized, but rooted urban people of color including Blacks, Asian Americans, Latinos, and others. Urbanist Clyde Woods addressed on poor rural populations in the Mississippi Delta region, and particularly African American populations,

as he interpreted the meanings of the longstanding protest traditions as found in song lyrics. Also emerging from the UCLA School, Professor Leonie Sandercock spearheaded a convergence between the indigenous lens of Australian people and the Native Americans in Canada. Some addressed environmental and identity politics, others mediated differences among hybrid cultures and belief systems in the face of modernization and historic preservation practice. Addressing housing, economic, social or health and healing challenges among diverse people could also be defined by the Indigenous Planning paradigm. Unfortunately, it taken more than a generation for the various Indigenous models to be fully recognized by Urban Planning profession, as anticipated. A more complex reading of historic migratory patterns and place; longstanding populations whose values and preferences may differ from the experiences of mainstream U.S. Americans; recent immigrant settlers and communities; and deciphering rooted cultural and spatial practices that are found among people of all races. Together, these could provide a broader range of tools under the Indigenous Planning paradigm for interpreting hybrid urban conditions and the interwoven nature of urban and rural ways of knowing in contemporary societies.

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Key Words: Indigenous Planning, Planning Theory, Indigenous Planning Methods, Arts & Humanities Methods in Planning

#### THINKING THROUGH NONHUMAN TO RE-THINK PLANNING

Abstract ID: 1005

Individual Paper Submission

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The postcolonial-southern turn in planning exposed the hegemonic ways of seeing upon which the established traditions of planning are based. This has opened a fertile space of theorizing planning from the South. My argument is that although the southern turn has shifted the locus of planning from ‘some humans’ to ‘other humans’, it has not given sufficient attention to a fundamental coordinate of the postcolonial condition – the nonhuman. The paper reads the COVID pandemic as a symptom of the unsustainability of an economic rationality that historically emerged out of a distinctive alignment of the human with the nonhuman. It was the import of this economic rationality based on a specific arrangement between the human- nonhuman, that became the central premise for what we understand as colonialism, imperialism and globalization.

Given this, I propose that thinking through the question of ‘nonhuman’ in planning should be a key theoretical standpoint for the postcolonial-southern turn. After discussing a few traditions that have tried to address the nonhuman, I propose that one must learn to navigate through these multiple epistemologies, which may often be in conflict. I do this, by illustrating my 2.5 years of research work in central India with the indigenous communities. Through multi-sited ethnography and participatory action research my work inquires factors attributing to the vanishing insect population. Rearing *Kerria lacca* (an economically important species) is one of the main livelihood source of many indigenous, forest-dependent-communities in central India (Sharma et al., 2006), and its diminishing population from the nearby forest has been a serious threat to that source of livelihood. As a result of engaging with multiple epistemologies I propose an action plan, called Living Brood Lac Bank (an in-situ germplasm repository of *Kerria lacca*) to strengthen the livelihood source of the local communities. The paper concludes with the ethic of epistemological convergence on which the possibility of planning diverse sustainable future(s) holds, and which may



even help us rethink and replan our approach towards catastrophes like covid itself.

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Key Words: Southern planning, human-nonhuman, multiple epistemology, postcolonial planning

#### STRATEGIC FORESIGHT AND INNOVATIVE CODESIGN APPROACHES IN MUNICIPAL ORGANIZATIONS: TOWARDS A REGENERATION OF URBAN PLANNING ROUTINES?

Abstract ID: 1061

Individual Paper Submission

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#### Central theme

Cities will face increasingly complex challenges (carbon neutrality, resource optimization and circular economy, governance of artificial intelligence, environmental inequalities). The practices of collaboration substantiated by urban planners have not been able to solve the problems of the last decades related to urban sprawl, the overuse of the private car, the degradation of living environments, etc. In this community of urban planners, there is a traditional routine of the “good urban project”, a dominant rule-based design applied in a similar way from one project to another. This traditional routine, however, may be insufficient to design urban objects in the cities of tomorrow. Moreover, the growing gap between contemporary issues and professional capabilities questions the methods and tools of collaboration and calls for a paradigm shift. In this respect, the way “urban planning” is driven in North America will be able to constitute a “new” mode of implication for better targeted effects in time and space.

Thus, everything suggests that these routines must be renewed. What could be the characteristics and effects of innovative design routines in municipal organizations and how do they complement existing rule-based design routines? This communication wishes to present a specific way to address this challenge from an experimentation conducted in Montreal, Canada.

## Methodology

This project was conducted as an intervention research (IR), a field-oriented methodology with an experimental logic. IR approach implies the involvement of researchers in exploring new problem-framing and surprising solutions with planners and stakeholders. Tangibly, the IR takes the form of concrete methodological tools, notably the Diagnostic-Knowledge-Concept-Proposition (DKCP) tool.

This disruptive design tool was used in Montreal, in order to bring out a completely renewed proposal of a vast underused park. This reflection aimed to regenerate the traditional identity of an urban park, within the framework of the implementation of a master plan, through the formulation of new development prototypes. We use this approach to preparing a master plan as an experimental ground to explore the implications of the use of the DKCP tool.

## Findings

The traditional planner's routine generally focuses on a single activity in the process, the formulation of propositions (Phase P), by slightly adapting former planning to the local context and rules. However, the future urban planners' routine should include new capabilities for managing upstream stages of planning in the form of a succession of DKCP phases.

Thus, traditional urban planning routines can be complemented by innovative design routines to create disruptive effects and explore unprecedented dimensions of urban projects. This will prove difficult in municipal organizations. Imagining new urban objects or designing new routines needs specific pilot projects and implies acceptance of uncertainty. However, municipal organizations rarely allow a right to error, even with regard to innovation.

It may also be necessary to step back from territorial and spatial constraints - a process we call "deterritorialization". This could help to better explore the "field of breaks and possibilities". Otherwise, spatial constraints act as cognitive fixations that limit the expansive thinking of urban planners – in the study case, the future uses of an urban park.

## Relevance of research

This communication provides a reflexive look at how urban projects are driven by a "researcher planner". This research offers the opportunity to review the scope of these practices in a real-life situation. Through the mobilization of new knowledge, disruptive and surprising concepts are produced. The need to tackle the complex challenges of the 21st century city opens the way to a new professional identity: the "innovative urban planner".

Participants will also discover the value of prospective and innovative codesign as a mechanism for co-designing solutions with stakeholders.

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Key Words: Urban futures, Planning routines, Rule-based design, Innovative design, Strategic foresight

## COMPLEX SYSTEMS AND URBAN PLANNING, OR, THE PERSISTENCE OF TECHNOCRATIC PLANNING

Abstract ID: 1087

Individual Paper Submission

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In a discipline marked by numerous specializations and antagonistic research approaches there is nevertheless a consensus that the rational planning model of the 1950s and 1960s was a dramatic failure. Contra rational planning, contemporary planning approaches now see cities as complex interacting systems generating wicked problems which resist prediction and general theorizing. Planning then should respect the capacity of cities and people to adapt to changes by removing undemocratic processes and other bureaucratic barriers preventing the emergence of great places and novel local solutions (Innes and Booher 2018). Yet rational planning persists, with popular contemporary planning strategies such as smart cities, urban scenario planning, and new urbanism all criticizing the top-down rigidity of rational planning as a major barrier to addressing urban problems today (Townsend 2013; Goodspeed 2020; Talen and Ellis 2002). But, if rational planning was a disaster and contemporary approaches overwhelmingly reject its assumptions, why has it persisted (even if just as something to be replaced)?

Taking this seeming paradox as a starting point, this research attempts to answer the following question: does this new, complex systems theoretic understanding of planning differ (epistemologically and ontologically) from the rational planning model that it explicitly rejects? At stake here is an attempt to determine whether a planning grounded in complex systems theory actually moves the discipline beyond technocratic, rational planning, or alternatively, facilitates it.

As an examination of the history of contemporary planning strategies will show, breaking with rational planning is not so simple as rejecting its rigid, “top-down” approach. A genealogy of the theories behind urban operating systems of smart cities, the techniques of urban scenario planning, the assumptions behind the form-based codes of new urbanism reveals that all developed out of the cybernetic systems thinking of the post-World War II period that gave rise to planning as a rational, technocratic activity in the first place (see Light 2004).

To explain how contemporary approaches rejecting rational planning could emerge from the same cybernetic paradigm, a more nuanced understanding of rational planning is forwarded, both to better account for the knowledge of cities and planning it produced, and how this knowledge was made actionable for planners. Through analysis of postwar publications in the *Journal of the American Institute of Planners*, early editions of *Urban Land Use Planning* (planning's first textbook), and major critiques of planning in the 1950's and 1960s (ex. Jane Jacobs and Ian McHarg), the points of contact and translation between cybernetics and urban planning are traced to account for the shared rationality that supports both rational planning and contemporary complex systems approaches. This understanding is necessary if we are to properly evaluate claims that complex systems theory provides planning with a transformative alternative to rational planning approaches to infrastructure, land use and transportation, and urban design (see Goodspeed 2020; Talen & Ellis 2002).

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Key Words: complex systems, rational planning, scenario planning, smart cities, new urbanism

## **PATRICK GEDDES MEETS ELINOR OSTROM: URBAN AND REGIONAL INTERRELATIONSHIPS AS SETTINGS FOR COMMON-POOL RESOURCES**

Abstract ID: 1115

Individual Paper Submission

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Elinor Ostrom's highly influential Nobel Prize winning on common-pool resources has vast consequence for environmental policy and even, as is more recently being recognized, to various branches of urban physical planning. Ostrom built legitimacy for her idea in a prolonged debate with microeconomic theories of market failure.

She explains her concept in ongoing challenge to concepts of public goods originally defined by economist Robert Samuelson as "goods" (like national defense) that are non-excludable, in that beneficiaries cannot be excluded from it, and non-rival, in that many beneficiaries could consume it at the same time. "Common-pool resources" are also non-excludable, in that users or land owners cannot be excluded from taking advantage of it, but also rivalrous, in that one's use of the resource can reduce others' value from it. For example, landowners (in the absence of public regulation or community pressure) cannot be excluded from covering their land with impervious surfaces, but excess imperviousness will ultimately create rivalrous, harmful mutual effects through deterioration of surface water flows. Since Ostrom's work begins with traditional microeconomic concern with goods, it does not sufficiently address a critical question: what is it about certain resources that determines their relative excludability and rivalry? This paper seeks the answer in the classical planning tradition that starts with Patrick Geddes, and continues through Jaqueline Tyrwhitt, Ian McHarg, and more recent planners. They have sought to explicate the territorial, ecological, and urban infrastructural interrelationships that degenerate through dispersed, atomized interferences. Whereas Ostrom's work has generally been used to propose institutional frameworks for regulation and management of resources, the classical comprehensive planners have instead sought ways of making regional interrelationships intelligible, to facilitate planning, understood as the search for comprehensive insight. This paper will seek a fruitful conversation between Geddes' and Ostrom's seemingly contrasting, yet highly compatible, intellectual legacies.

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Key Words: common-pool resources, regional planning, planning theory, comprehensive planning

## **POSTERS**

### **SOCIAL INSTITUTION RESILIENCE THEORY FOR COMMUNITY RESILIENCE PLANNING**

Abstract ID: 872

## Poster

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An understanding of community resilience can lead to better policies and decisions that are designed to achieve community resilience goals. The Interconnected Networked Community Resilience Modeling Environment (IN-CORE) is an open source platform developed by the Center for Risk-Based Community Resilience Planning, a National Institute for Standards and Technology (NIST) funded Center of Excellence (COE). The COE strives to improve community resilience to natural hazards through planning. Tools, such as IN-CORE, help to understand how hazard events impact communities. Communities achieve resilience when individual and household needs are equitably met through functioning physical and social systems. NIST (2016, 14) defines social institutions as “a complex, organized pattern of beliefs and behaviors and can include family, education, government, religion, or economy, each of which is overlapping and interdependent. The purpose of social institutions is to meet the basic individual and household needs.” Social institutions at the community level may include healthcare, education, business, and government which are dependent on the performance of physical infrastructure systems. The inclusion of social institutions within complex systems models will improve the assessment of policies considered in resilience planning. To develop models grounded in theory, this poster presents findings of a systematic literature review and theory construction that contributes to unifying the theoretical constructs of community capitals (Flora, Flora, and Gasteyer, 2016), Maslow’s hierarchy of needs, resilience, disaster phases, event trees, and social vulnerability within a theory of social institution resilience.

Our approach focuses on three case studies that highlight the role of healthcare and education for community resilience. While education and healthcare play an important role, the proposed theory transcends these two social institutions and should apply to other social institutions, whether an individual organization, a network of organization, or a network of networks. A systematic literature review, guided by Xiao and Watson’s (2019) eight steps, was conducted for each case study. The systematic literature review process emphasized efficiency and replicability in order to improve the quality, reliability, and validity of the findings. Innovative tools to search, collect, review, and analyze the literature were utilized along with the qualitative content analysis software Atlas.ti and python coding in Google Colab notebooks (Rosenheim et al., 2020).

The proposed theory of social institution resilience will help planners recognize the “signal in the noise” of data. Findings suggest that the significance of community capitals depends on disaster phases. Models of social institutions that meet basic needs may include fewer community capitals and less complex event trees and models of social institutions that meet higher needs require more community capitals and complex event trees. Additionally, findings reinforce the importance of longitudinal data that follows the social vulnerability theory of community resilience after a disaster. Models of social institution resilience that help organizations understand the disproportionate impacts to and slower recovery of socio-economically marginalized populations will support equitable decisions relevant to community partners. This research reinforces the importance of planning theory for understanding complex systems and the value of theory to direct research and guide decisions about model assumptions.

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Key Words: community resilience, social institutions, systematic literature review, planning theory

# Track 14 – Regional Planning

## ROUNDTABLES

### 14.54 ROUNDTABLE - BEYOND THE LOCAL: A CALL-TO-ARMS FOR PLANNERS TO DRIVE NATIONAL URBAN POLICYMAKING

Abstract ID: 54

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CURRID-HALKETT, Elizabeth [University of Southern California] currid@price.usc.edu, participant  
FAINSTEIN, Susan [Harvard University] sfainstein@gsd.harvard.edu, participant

Planners tend to think and work at the scale of the neighborhood and city. Yet a wider analytical lens, focusing on extra-local forces, is essential to understanding contemporary urban problems. For example, over the past four decades, globalization and deindustrialization have produced new forms of inequality in our cities and regions—leading to highly polarized labor markets in “superstar cities” and chronic decline and disinvestment in many former industrial hubs. These patterns shape the political and policy contexts for economic development, housing, transportation, and many other urban planning domains. Similarly, while climate change, financialization, racial inequality, incarceration, and the Covid-19 pandemic all manifest locally in communities and cities, they are challenges that are difficult, if not impossible, to address through local policy alone.

Planning rightly embraces local, community-based action, and many academic planners call attention to systemic roots of local and regional problems. Yet in practice, planning rarely seeks to change extra-local forces through policy activism at higher levels of government. Planning, we argue, has ceded much of this ground to other fields, primarily economics. As a result, planners are largely absent from national policy conversations around issues that directly implicate cities. Not only does this reduce planning to a “fire-fighting” role, reacting to policy decisions from higher levels of authority; it also deprives national urban policymaking of the holistic, place-based approach to human development, where planners have great experience and expertise. This situation, of course, is neither an accident nor a strategic misstep by planners; it is the result of decades of federal government disinterest in comprehensive urban and regional policy, abetted by the broader neoliberal retreat of the state. However, the present moment of crisis, alongside a renewed focus on governance in Washington, D.C., may offer a once-in-a-generation opportunity for planners to reassert themselves in national policymaking. The challenge is a big one, because so much of the policy that affects and constrains cities and regions comes from agencies other than the Department of Housing and Urban Development, and the federal government is an extremely complex structure. Moreover, planning departments are no longer turning out large and effective cadres of future national policymakers, implying a major curricular effort.

Against this backdrop, this roundtable discussion will engage its speakers and the audience in the following questions:

How do we inculcate an appreciation for extra-local forces in planning research, practice and education? How do we inspire urban planning students to act in, but also beyond, the city?

To what extent are planners at the table in designing national policy solutions to our most difficult urban and regional challenges? How can we enhance the role of planning in policy design and implementation at the federal level?

What are the issues on which the planning field could most effectively assert a more prominent role in national policymaking?

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Key Words: National urban policy, Economic development, Climate change, Housing, Transportation

## **INDIVIDUAL PAPER SUBMISSIONS**

### **ARE "DESIRABLE" CITIES REALLY SO DESIRABLE? METROPOLITAN CHARACTERISTICS, LIFE SATISFACTION, AND SUBJECTIVE WELL-BEING IN THE U.S.**

Abstract ID: 52

Individual Paper Submission

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This paper examines the links between subjective well-being (specifically life satisfaction) and indicators of U.S. metropolitan area (MSA) "quality." These include population density, a leisure/cultural opportunities index, the violent crime rate, an index of climate favorability, racial/ethnic diversity, median metropolitan income, a cost of living index, an index of air and water quality, spending on the school system (reflected by the student/teacher ratio), the quality of the healthcare system (reflected by physicians per capita), and political affiliation (percent voting Republican in the last presidential election, which I take to be a proxy for local government policies such as environmental regulations, tax levels, and the extent of the social safety net). It uses well-being data from the American Time Use Survey married to data on metropolitan area characteristics drawn from two compendia of statistics on MSAs: *Cities Ranked and Rated* and the *Places Rated Almanac*. In addition to controlling for individual demographics, the analysis uses mixed-effects linear regression to reflect the impact of unobserved metropolitan area characteristics. A number of findings are of note. First, very little of life satisfaction is explained by the MSA in which one lives. Compared with a model which includes only individual demographic characteristics, the addition of 10 MSA-level variables raises the r-squared statistic only from .152 to .155. Further, the intraclass correlation coefficient (ICC) shows that there is almost no particular correlation of life satisfaction scores within MSAs, again suggesting that MSA characteristics have very limited association with life satisfaction. Theory and empirical evidence on MSA location decisions suggest that self-selection and sorting are unlikely to have caused the finding that life satisfaction largely evens out across MSAs. Second, despite a large sample size, only three of the MSA characteristics are significant in my preferred model. The most significant is median MSA income, which has a negative association with life satisfaction. Racial/ethnic diversity is significantly and negatively associated with life satisfaction, and a favorable climate is positively and significantly associated with it. Prior literature establishes that all three of these relationships are highly plausible: being surrounded by those with higher incomes makes people feel poorer; places with more diversity often have less sense of community and social capital; and prior empirical evidence establishes that people are happier in places with a better climate. In another exploration, I performed a principal components analysis to reduce dimensionality and multicollinearity among the independent variables. The results show that a package of characteristics associated with large, coastal cities (such as New York, Los Angeles, and San Francisco), including high density, high diversity, Democratic politics, high incomes and cost of living, good aesthetics, and greater use of alternate travel modes (e.g., walking, transit) are associated with significantly, if modestly, lower life satisfaction. At the same time, a package of characteristics typical of California's Central Valley and the Texas-Mexico border, including high diversity, low incomes, a favorable climate, high crime, poor aesthetics, and a high student/teacher ratio is associated with significantly higher life satisfaction. This counterintuitive result suggests that, all else equal, people may be somewhat less satisfied with life in highly "desirable" MSAs than might be supposed, and, conversely, may be more satisfied than expected in MSAs many might consider less desirable. While clearly we should not strive to make our cities poorer and less diverse, policy recommendations include



reducing income inequality to lessen feelings of deprivation resulting from people comparing themselves to wealthier others, and educational and cultural programs to increase appreciation of the merits of diversity.

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Key Words: Subjective well-being, Metropolitan areas, Life satisfaction, Happiness

#### **REGIONAL GOVERNANCE IN THE OREGON COAST TRAIL: IDENTIFYING METAGOVERNANCE CAUSAL MECHANISMS IN PRACTICE**

Abstract ID: 154

Individual Paper Submission

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This paper is an investigation into the causal mechanisms of metagovernance formation and operation in the context of the Oregon Coast Trail regional planning process. Oregon has considerable experience with regional governance as well as a long history of planning for bicycle and pedestrian modes. But these experiences are primarily concentrated in urban contexts, such as the Portland metropolitan area, and focused on land use and growth management. The Oregon Coast, by contrast, is a mixture of rural public lands and small communities, linked together by their primarily tourist, recreation, and ocean resource economies.

The Oregon Coast Trail is a collection of trail systems linking these lands and communities. While declared 'fully hikeable' in the late 1980s, the reality has been that around 30 trail segments throughout are incomplete, unsafe, or underwater at high tide. No individual city, county, or agency is capable of completing the entirety of the trail but each see the value in a coordinated response to their regional infrastructure. How then can these diverse agencies address what is essentially an infrastructure collective action problem? To address the Oregon Coast Trail collective action problem, a coalition of local agencies, tribes, state agencies, the federal government, and other key stakeholders are pursuing a regional collaborative governance framework for long-term trail wide management. This represents a 'metagovernance' challenge, whereby specific actors coalesce to develop new norms and practices for organizing long-term governance institutions.

In this paper, I examine these questions and issues in three parts. First, I provide the recent history of the OCT Action Plan development, including the key actors, utilizing primary documents from local, state, and federal agencies. Second, I examine relevant literature to identify governance characteristics that may help explain policy processes for multijurisdictional planning issues. Lastly, I craft a causal story based on the governance characteristics identified that helps explain the OCT Action Plan development process. Within the causal story, I identify actors that serve as 'metagovernors' in the regional planning process, or those individuals steering, shaping, and informing regional governance processes. The intent of the causal story is to both develop a theoretical framework for understanding multijurisdictional governance and inform future research. In closing, I reflect on the original metagovernance questions and offer possible avenues for future research.

The implications for future scholarship and practice of this paper are primarily emphasizing the role of ‘orders’ of metagovernance systems and how they influence one another in practice. First order governance refers to the day-to-day operations of a governance system (such as regular trail maintenance). Second order governance refers to the institutional structures managing the first order (such as memoranda of agreement on which agency will maintain which part of the trail). Third order governance refers to the development of governance norms in abstract that inform how second order governance systems form. For both scholars and practitioners, recognizing which actors is operating in which order and at what time is imperative for understating how policy is developed, by whom, and to what effect. Similarly, the metagovernance dynamic described enables both scholars and practitioners to better articulate where institutional power resides, how it is used, and where equity-based improvements to our planning system might occur.

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Key Words: regional, governance, planning, Transportation, Process

#### **PUBLIC POLICY AND THE FATE OF HISTORIC TOWNS IN DYNAMIC METROPOLITAN PERIPHERIES**

Abstract ID: 164

Individual Paper Submission

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Historic towns on the periphery of US metropolitan areas face existential threats from sprawling growth and increasing concentration in the retail sector, especially internet retail. They may be able to avoid becoming subsumed in sprawl and play new roles in the regional economy (e.g. as telecommuting centers), if they can strike a balance between the spatial demand of new uses and preservation of the town’s historic fabric, and if regional growth does not undermine their distinctiveness. Indeed, some observers (e.g. Wagner, 2020) see in the current COVID pandemic an opportunity for such towns to assume roles in the digital economy. Others (e.g. Simon, 2020) see primarily only retail decline. Regardless of the impact of COVID, metropolitan expansion and retail restructuring are likely to continue.

How will state, county and local policy help to shape the outcomes of structural change for historic towns in the metropolitan periphery? Critical analyses of the implementation of smart-growth policy in Maryland by Lewis et al. (2009) and Ali (2016), for example, suggest that a strategic vision that is consistently implemented by the state, counties and towns may be an optimal way to concentrate development and limit sprawling growth. Such a regime may also enable historic towns in the metro periphery to retain both their character and economic viability. Yet growth management through multi-level policy alignment and implementation is not the norm in the US. (See Downs, 2007, for example.) What other combinations of state, county and town policy might effectively promote both the economic viability and historic character of towns in the metro periphery?

In this paper, we present the results of an exploratory study of this question. First, we show the results of qualitative case studies of several historic towns that led us to posit three ideal typical scenarios: (a) Subsumed in Sprawling Growth, (b) Self-Contained Historic Oasis, and (c) The Cool and Connected Historic Town. We used these ideal types to construct a national survey of historic towns in US metropolitan peripheries. Second, based on the 133 responses we received to this survey (conducted January through March 2020), we examine the impact of town, county, and state policies on the economic viability of, and threats to, these historic towns, as perceived by their Main Street program directors. Third, for 15 of these cases, we report our analyses of state and county land-use and strategic plan documents relevant to, and interviews with selected public officials on, the roles and potential of historic towns in the metro periphery, as reflected in public policy.

We conclude by identifying the economic, spatial and policy factors that may determine the direction of change for historic towns in metro areas – toward Subsumed in Sprawling Growth, Self-Contained Historic Oasis, or the Cool and Connected Historic Town.

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Key Words: Regional policy, Metropolitan periphery, Main Street, Historic preservation

#### RESEARCH ON THE EVOLUTION OF URBAN FORMS IN CHINESE METROPOLITAN AREAS : BASED ON THE COUPLING PATTERN BETWEEN BEIJING'S TRANSPORT NETWORK AND LAND-USE

Abstract ID: 243

Individual Paper Submission

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In the past 20 years, China's urbanization has entered a stage of rapid development ,—got extraordinary achievements. Some researches have shown that China's urban built-up area has increased from 22,000 km<sup>2</sup> to 60,000 km<sup>2</sup>, the total mileage of graded highways has increased by nearly four times, and the total length of urban rail transit has increased from 150 km to 7,000 km. The rapid expansion of urban built-up areas and the continuous growth of various transportation networks have enabled large cities to rapidly develop into metropolitan areas. However, due to the inconsistency between transportation and land-use in the metropolitan area, waste of land resources, insufficient utilization of public transportation, energy waste, environmental pollution, and urban congestion have been caused. The land expansion of major metropolitan areas in the world is not synchronized with the innovation of transportation technology. The development process often focuses on land expansion and ignores the impact of transportation. The results of research are difficult to apply to today's planning practice. Therefore, it

is of great practical significance to study the rapid evolution of urban morphology in China's metropolitan area in the past two decades.

Firstly, this research summarized the characteristics of construction land expansion and transportation network evolution in some metropolitan areas of China in the past 20 years, integrated transportation and land-use, two variables that characterize urban space expansion, and explored the laws and patterns of urban morphology changes caused by the interaction between them. The study collected and organized the diachronic data of the transportation network and construction land in the metropolitan areas, and constructed a basic spatial data base reflecting the evolution of transportation and land-use. Based on the analysis of the interaction characteristics between the transportation network and construction land, the relationship values of the two in each growth unit were obtained from the three aspects of dominant factors, form coordination degree and expansion rate, and the multi-dimensional interaction characteristics of the transportation network and construction land were analyzed.

Next, starting from the multi-dimensional analysis of the interaction characteristics between the growth of the transportation network and the expansion of construction land, the typological method was used to accurately identify the coupling modes of the two, and the evolution and interaction of the coupling modes on long-term series and multiple spatial scales are explored. The coupling mode of each unit in each period is dynamically investigated in a long-time sequence, and the spatio-temporal evolution characteristics of the coupling mode are analyzed from multiple dimensions such as the change of growth unit, the replacement of dominant factors, the conversion of coupling speed, and the change of coupling quality. Then summarized the generation logic and interaction mechanism of urban morphology in the multi-scale spatial organization of the metropolitan area, deeply understood the reasons for the evolution of the urban morphology caused by the two and applied these experiences to promote the continuous optimization of the urban morphology of the metropolitan area.

The research comprehensively uses methods such as Typology, Spatial Morphology Analysis, System Dynamics and Cellular Automata, and explores the "multi-scale urban morphology generation mechanism and optimization method of metropolitan areas" around the "transportation network and construction land coupling mode" of metropolitan areas such as Beijing and Shanghai. It is of scientific significance to clarify the multi-scale urban morphological evolution mechanism of metropolitan areas and to enrich the spatial organization theory of metropolitan areas. It can provide not only technical means for urban space delineation and pattern optimization but also a scientific basis for resource conservation and environmental protection.

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Key Words: Metropolitan Areas, Traffic Network, Coupling Pattern, Land-use, Urban Forms

#### WHAT FACTOR CONTRIBUTES THE MOST TO REGIONAL CONVERGENCE? AN EXPLORATORY ANALYSIS ON US MEGAREGIONS

Abstract ID: 360

Individual Paper Submission

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Megaregion refers to the city clusters containing more than two metropolitans and their hinterlands with highly intensive transportation connectivity and economic collaborations. The increasing attention on megaregion as the economic engine attracts people and capital swarm into this new urban morphology. Study has found that global megaregions habitats with 18% of the world's population, accounts for more than 66% of the global economic activity and 85% of the technological and scientific innovation (Florida et al., 2008). In the US, megaregions hold more than 85% of the economic activities, more than 90% of Fortune 500 companies and 80% of the patents (Ross et al., 2014). However, debates remain on whether the investments can bring an overall accelerate growth or lead to an uneven impact on the national economy.

The hypothesis of Kuznets curve claims that the economies will experience an increase in inequality and then decrease as the wealth accumulated, where the first phase is called the economic divergence, and the second phase refers to the economic convergence. Regional convergence is one way to measure how spatial inequality changes by economic growth over the years where alpha-convergence describes the general reduction of disparity across economies while beta-convergence, also called the catch-up theory, happens when poor economies grow faster than the rich. The conditional beta-convergence refers to the circumstances where there are other indicators, for example, investment rate or population growth rate, affect the converging process, while unconditional beta-convergence happens when the growth rate declines or reaches the steady point (Rey and Janikas, 2005).

From national perspective, studies have found that determinants of regional convergence include development, resources, openness, mobility, institutions, education and ethnic. Besides, labor productivity by sectors and social stratification have an influence on the convergence (Goubin and Hooghe, 2020; Kinfemichael and Morshed, 2019; Lessmann and Seidel, 2017).

In terms of the megaregion, few studies have provided an overall review of the determinants on megaregional convergence. In one of the few studies for convergence in US megaregion emphasizing on the transportation investment, while the discussions on other determinants remain to be enriched (Woo et al., 2015). This study starts with a generation question, what determinant contributes to the convergence in the megaregions and how does it relate to national convergence process. Moreover, the study would be interested in 1) whether advanced professional services (APS), especially the high-tech industry, contribute to the convergence process as it contributes to the economic growth and megaregion competitiveness and 2) what is the backbone industry in the process of convergence and whether is it differentiated among megaregions.

This study applies the beta convergence function with spatial autocorrelation to analyze both megaregion and national level convergence with determinants of overall economic productivity, labor productivity by sectors, social stratification, federal expenditure, transportation infrastructure, etc. Considering the limited geographic unit in the megaregion, the study utilizes zip code level aggregated data for both national and megaregion level convergence analysis. The study expects a result that although high-tech industries promote the economic growth in megaregion, the manufacturing is still the main factor in the convergence process. besides, better transportation connectivity within the megaregion will help and thus enhance the megaregional convergence.

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Key Words: Regional convergence, Megaregion, Sectoral Productivity, Infrastructure investment, transportation

## **A BI-DIRECTIONAL, INTEGRATED MODEL OF REGIONAL GROWTH AND STORMWATER RUNOFF: SPATIOTEMPORAL PROJECTIONS THROUGH A COUPLED MODELING SYSTEM**

Abstract ID: 371

Individual Paper Submission

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One of the major challenges in plan-making for urban resilience is dealing with the deep uncertainty inherent in coupled human-natural systems. For example, while regional growth plans are intended to manage or minimize a wide array of negative urbanization impacts, they many times fail to achieve their intended goals due to an inability to assess the complex interactions in regional systems. These complex interactions vary over both time and space with climate change and other dynamic forces adding to the uncertainty. The result is often a slew of unintended consequences.

Cross-scale and cross-disciplinary approaches that promote resilient planning solutions are required in order to strategically and adaptively address these uncertain futures (Deal et al., 2017). The success of such efforts improve when they can be tested with simulation and quantified assessment of the dynamic interactions between human and natural functions (Alberti, 2017).

Stormwater runoff is one critical issue that exemplifies the complexity of human natural systems coupling. It is directly related to both socio (urban growth) and physical (climate change) system changes (Abdulkareem et al., 2019). Innumerable studies have described and assessed the hydrological responses that result from land-use changes. Most (if not all) of these studies explore one-directional impacts – the effects of changing land use on hydrological systems. Complex systems theory however, suggests that these urban /eco - systems are interconnected and operate as an intertwined whole (Alberti, 2017; Batty, 2007). This means that typical one-directional analysis can miss critical components of the interrelations between land-use change and hydrological responses. More specifically, as patterns of regional growth affect runoff occurrence and severity, spatial configurations of runoff also affect the location-choices of land development. To date, little work has been done that illustrates how ‘bi-directional’ impacts proceed both spatially and temporally to support growth and water resource management planning.

In this research, we simulate bi-directional impacts between regional growth and changes in surface runoff in a northern Illinois watershed, where both urbanization pressures and flooding have been notable. We use this region as our case study to examine the following questions: Q1) What are the complex and nonlinear interrelations between runoff and land-use change? Q2) How do the interactions operate at multiple scales under different scenarios in response to socioeconomic and sociophysical changes? Finally, Q3) what are the bi-directional implications of regional growth and flooding given a changing climate?

To address these questions, we develop an integrated, finely scaled, sociohydrological modeling system, coupling the Gridded Surface Subsurface Hydrologic Analysis (GSSHA) with the Land-use Evaluation and Impact Assessment Model (LEAM). The system operates using iterative feedback processes where outputs from each model are plugged into the others as input variables. We then examine the relationships between the probabilities of future development and hydrological variables, including runoff depth and proximity to water, to illustrate the effects that

regional hydrology has on patterns and trends of land development. We also spatially compare the results across cities/towns in the study region to explore their contextual dependency.

Our results show how location-choices of land development differ across areas and across scenarios. It shows that simple dose-response approaches to managing stormwater may not be as effective as bi-directional approaches. We also found that residential and commercial land uses exhibit different responses to hydrological variables. Not unexpectedly, spatial comparisons also reveal the necessity of locally-scaled strategies in dealing with spatial inequities. For example, some fringe areas are found to be more vulnerable to runoff due to sprawling patterns of developments.

This research will contribute to efforts to move toward more robust and resilient regional planning and climate preparedness that takes into account changing environmental and social conditions.

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Key Words: runoff simulation, land-use change projection, coupled modeling system, growth management, resilience

#### **TOWARD COMPARATIVE POLYCENTRICITY SCORES: ASSESSING VARIATIONS IN REGIONAL DELINEATION AND SUBCENTER IDENTIFICATION**

Abstract ID: 462

Individual Paper Submission

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As development patterns have become more fragmented, polycentricity has become a useful lens to interpret and measure the spatial structure of urban regions (Kloosterman and Musterd, 2001). There are an increasing number of valid methods for urban geographers to assess polycentricity, but little guidance on how to choose between them. Assessing polycentricity is a complex operation comprising three stages of analysis—regional delineation, subcenter identification, and scoring. Due to the variation in approaches, a growing body of research has emerged to evaluate and improve the methodologies for calculating polycentricity (See for example Green, 2007; McMillen, 2004; Zhang and Derudder, 2019). These studies often attempt to reconcile conceptualizations of polycentricity (such as inter- or intra-city, morphological or functional, and economic or cultural) with quantification techniques. Most of these methods have been developed through their application to regions that analysts have intuitively predefined as polycentric, an approach that may limit the suitability of polycentricity as a generic measure of urban spatial structure, like density, compactness, and sprawl. Furthermore, most methodological studies have only varied one or two of these stages.

This paper contributes to this discussion by assessing the effects of methodological choices on functional

polycentricity scores, using Germany as a case study. We calculate functional polycentricity scores for all regions in Germany using five different regional delineations (four of which are administrative, and one that results from a network clustering algorithm applied to inter-municipal commuting patterns) and three different methods of subcenter identification (geographically weighted regression, local indicator of spatial autocorrelation (LISA), and a simple threshold). This results in 15 methods of operationalizing regional polycentricity. We illustrate the findings using regions that are paradigmatically monocentric (Berlin), polycentric (Cologne), and ambiguously mono- or polycentric (Munich). Following Zhang and Derudder (2019), we report the results in a stepwise fashion that incrementally varies the number of subcenters.

We find that the choice of regional delineation and subcenter identification methods greatly affect the polycentricity score. Specifically, regions that are intuitively polycentric at a large scale may appear monocentric on a small scale, but the same is not true for intuitively monocentric regions. Network clustering approaches and metropolitan regions appear to identify regions of moderate size that are suitable for measuring polycentricity. Also, geographically weighted regression appears to be a promising subcenter identification method for comparing multiple regions at different scales. Finally, we demonstrate how the multi-stage, comparative method we developed can be applied to urban regions on a national scale, again using Germany as an example. Our findings suggest that regional development policies and economic geographers should consider the implications of methodological choices at each of the three stages before promoting any particular method.

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Key Words: functional polycentricity, monocentricity, metropolitan spatial structure, German urban regions, agglomeration economies

#### **TACKLING THE BROADBAND GAP: THE ROLE OF CITIES AND REGULATION IN ENSURING UNIVERSAL ACCESS**

Abstract ID: 503

Individual Paper Submission

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The global pandemic has spurred the migration of everyday activities online – from remote work to online schooling, telehealth to commerce – and with them, increasing pressure to close the digital divide between urban, suburban and rural areas. The FCC estimates that about 14.5 million Americans lack access to fixed broadband service with at least 25/3 Mbps. Broadband Internet behaves as a natural monopoly, and deployment is largely driven by economic gain and led by private service providers. Planning for network growth is fragmented, contributing to a widening gap across demographic and socioeconomic groups – part of a larger phenomenon that Graham and Marvin (2001) identified as ‘splintering urbanism’.

Acknowledging that upfront costs already represent a risky investment for last-mile deployment, service providers and policymakers have sought to ease regulatory barriers that might discourage entry to rural markets or competition with incumbents – taxes, use of the rights-of-way, access to public infrastructure (poles) and permits.



Successful industry lobbying has led to increasing preemption of local authority in broadband (Bravo, Warner and Aldag, 2020).

At the same time, lack of competition has allowed incumbents to refuse to expand or improve their speeds, prompting a growing number of cities to consider investing in their own approaches. Municipally owned networks have drawn criticism as a risky move for post-pandemic economies (Oh, 2021) and as unfair competition. Nevertheless, public delivery opens up the opportunity of inter-municipality cooperation: When Wilson, NC, adopted their own fiber optic network, interest emerged from the neighboring town of Pinetops to hire their services – an expansion which was preempted by the state of North Carolina (Gonzalez, 2018). I will explore the impact of state and local policies on local broadband expansion. Do they stimulate or discourage infrastructure deployment? What avenues can localities pursue when private providers are unable or unwilling to expand service? Can local governments move beyond relieving regulation and subsidizing subscription to direct service provision?

This paper will present three different local approaches, of varying scales, that will shed light on some the challenges and opportunities faced by government when pursuing public delivery and universal access. Case studies will include service supplied by 1) a municipal network, 2) a rural cooperative 3) a public facility (such as a school or library) acting as an access point. In these cases I will identify 1) current state policy barriers at the state level using data from the Pew Charitable Trusts; 2) regulatory financial barriers, such as costs for use of the state right-of-way and infrastructure access in each state, which will be extracted from publicly available data from state departments of transportation, and 3) local policies and barriers, which will be identified from representative case examples. These policies may be specific to each individual area's characteristics and resources, but there are similar policies across the case studies.

I seek to explore the future role of local governments and planners in expanding broadband access, including opportunities for cooperation across different levels of government, and between the public and private, where local governments continue to have an active role in infrastructure deployment and addressing the emerging demand for faster, better broadband – beyond simply giving up their regulatory power.

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Key Words: broadband policy, urban-rural gap, intergovernmental relations, local authority, universal access

#### **DO MEGAREGIONS OUT-PERFORM NON-MEGAREGION IN ECONOMIC PRODUCTIVITY, AND TO WHAT EXTENT?**

Abstract ID: 574

Individual Paper Submission

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With the continuous expansion of the urban area, the predefined geographic entities like cities and states are becoming less meaningful in the context of economic globalization. Benefited from the agglomeration, cities become the engines of economic development. With the expansion from cities and metropolitans, scholars realized that the “mega-regions not only define the economies of the advanced nations but play a central role in emerging economies as well.” (Florida et al., 2008). As a result, the concept of megaregion is gaining increasing attention (He et al., 2019; Todorovich, 2009). Many scholars argue that megaregions present the advantages of scale economy and play a central role in advancing economic productivity (Florida et al., 2008). Studies have shown that megaregions as new economic units perform agglomerating functions, for instance, attracting talents, fostering innovations, and enhancing production and market efficiencies. However, as scholars proposed the importance of the megaregional economy, there is little research to quantify the economic differences in megaregion and non-megaregion. More importantly, studies on national or regional convergence are voluminous, but few have explored the issue of megaregions.

This study answers the questions of 1) does and to what extent megaregions out-perform non-megaregions; 2) whether megaregions lead to convergence of economic productivity. This research performs two analytical tasks. First, it applies the framework of beta-convergence and sigma-convergence to assess the trends of economic productivity (measured by gross regional product per worker) for the 11 megaregions as well as the non-megaregion areas in the contiguous United States. Second, it models productivity variations across megaregions and non-megaregions and their relations to different investment strategies like capital investment and technology innovations. Data used for the research include the developed land area data from the U.S. Geological Survey as a novel proxy of capital investment from 2001 to 2016, apart from the social demographic and economic data derived from the U.S. censuses and patent data from the US Patent and Trademark Office.

The anticipated findings include: 1) megaregions lead to convergence of economic productivity over time; 2) megaregions significantly out-perform non-megaregions in a cluster manner regarding economic productivity; 3) the correlation between land investment and economic productivity is statistically significantly positive only in the Texas Triangle. The expected findings of the research contribute to the literature by highlighting the key roles of megaregions in regional economic development. Moreover, obtaining empirical evidence of economic productivity in megaregions can inform policymakers to initiative programs for achieving regional integration and reducing disparity.

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Key Words: megaregion, economic productivity, convergence, regional planning

#### SHRINKING CITIES IN URBANIZED CHINA: DYNAMIC TIME-SERIES CLUSTERING

Abstract ID: 638

Individual Paper Submission

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Shrinking cities are now considered one of the most critical challenges in urban planning. However, the issue of urban shrinkage has not been explored much in the developing world, especially in rapidly urbanizing China. The “developing” character tends to divert the research focus to the growing and mega cities, masking the paralleled uneven development and the problem of shrinkage in other cities. In fact, the massive state-led urbanization in China has created different development trajectories for cities.

To fill the gap of shrinking cities in developing contexts, this paper contributes to the study of urban shrinkage in China both methodologically and theoretically. Instead of choosing two time points and calculate urban changes, this paper utilizes an innovative technique, Dynamic Time Warping (DTW) algorithms, to conduct time-series clustering analysis on urban growth and shrinkage. It groups all 290 prefecture cities in China into different urban trajectories from 2006 to 2018, such as continuous growth, recent growth, stabilized shrinking, recent decline etc. The typologies are further created based on the trend of time-series clustering results of urban population and economy dimensions.

Then, the paper further explores the factors that may affect urban shrinkage in China using a multinomial logistic regression. The impacts of state spatial selectivity, local responses to state rescaling, core-periphery neighboring effects and economic restructuring are examined across different urban trajectory typologies. In general, cities in the northern China, especially in the Middle Yellow River region and the Northeast suffer from population loss and economic decline due to not being privileged by the state for development, higher local economic share in resource-based sectors, lower natural growth rate, less competitiveness and attractiveness to the market and developers. In contrast, shrinking cities in the south-central China, especially in the southeastern coast and Middle Yangtze River, can be attributed to their proximity to state-selected high-level large cities that have a gravitational pull of people and economic activities. Since these middle and smaller cities are not favored by the state policies, they are likely to rely on debts to sustain local economic growth.

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Key Words: Shrinking Cities, Dynamic Time Warping, State Rescaling, Regional Planning

#### **TRANSIT-INDUCED COMMERCIAL GENTRIFICATION? BUSINESS OWNERS' PERSPECTIVES OF NEIGHBOURHOOD CHANGE IN KITCHENER-WATERLOO**

Abstract ID: 709

Individual Paper Submission

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Over the last two decades in North America, there has been a resurgence in the use of rapid transit systems. When leveraged alongside transit-oriented development (TOD) planning ideals which encourage compact, mixed-use development in station areas, modern rapid transit systems are increasingly recognized for their ability to function

as a catalyst for neighbourhood revitalization and economic development. In response to the increased use of transit systems for their perceived economic benefits, a growing body of literature has emerged which connects rapid transit development to gentrification and displacement (Baker & Lee, 2019). Through the process of transit-induced gentrification, higher-income residents who value increased accessibility and living an urban lifestyle move into TOD neighbourhoods, putting those who rely on public transit, and who would be most likely to benefit from improved transit access, at risk of displacement.

Despite being central to the walkability and liveability goals of TOD, a fundamental component of neighbourhood change is missing from the narrative of transit-induced gentrification; the effects of rapid transit infrastructure and TOD planning on commercial businesses (Dawkins & Moeckel, 2016). In addition to withstanding disturbances associated with rapid transit construction (Ray, 2017), local businesses are also vulnerable to the effects of gentrification as they face changing consumer profiles and increased commercial rent prices (Meltzer, 2016). Although somewhat context specific and dependent on the identities and consumption patterns of the gentrifiers themselves, common signs of commercial gentrification include a higher presence of restaurants and cafés, personal service businesses, boutiques, chain stores, and the overall upgrading of businesses to meet the needs of a higher-income clientele (Bridge & Dowling, 2001; Meltzer, 2016).

In this research, we explore the concept of transit-induced commercial gentrification in the mid-sized cities of Kitchener and Waterloo, Ontario, which we argue has occurred alongside the development of their “ION” light rail transit (LRT) system. Since the project was announced in 2011, the transit corridor has seen more than \$2.6 billion in new construction value – materializing primarily in the form of luxury condominiums – and is beginning to show signs of gentrification as young professionals and empty nesters enter the area. This redevelopment and gentrification is concentrated in the cities’ urban cores, Downtown Kitchener and UpTown Waterloo.

This paper presents results from 18 semi-structured interviews with business owners in Downtown Kitchener and UpTown Waterloo. The aim of these interviews was to understand owners’ perspectives and experiences related to LRT development and neighbourhood change. First, we found that characteristics related to customer base, product offerings and personal values strongly impacted owners’ opinions of the LRT and redevelopment activity. For example, local businesses who offer general products and services (i.e., restaurants, barbershops) had more positive opinions, whereas those who identified as a destination business and/or offer niche products had negative opinions, especially associated with the loss of parking. Second, while the LRT’s construction (2014-2018) was disruptive to all, businesses located directly on the line were more heavily impacted by reduced accessibility. While customer traffic increased once construction ended, most businesses reported that their sales numbers still have not returned to pre-LRT levels. Third, we find that trends occurring in both Downtown Kitchener and UpTown Waterloo point to commercial gentrification, as participants frequently reported the loss of “legacy” businesses, an increase in upscale and chain businesses, and higher commercial rents since the LRT was approved. The results of this study contribute to the limited body of transit-induced commercial gentrification scholarship, add to the limited qualitative research on transit’s role in gentrification and are relevant to planners and policymakers in other mid-sized municipalities considering LRT.

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Key Words: transit-induced gentrification, commercial gentrification, rapid transit, transit-oriented development

**WHERE ARE NEW BUSINESSES LOCATED MORE? APPLICATIONS OF MULTILEVEL GROWTH CURVE MODELING TO THE RELATIONSHIP BETWEEN URBAN COMPACTNESS AND NEW BUSINESS ESTABLISHMENTS AMONG METROPOLITAN STATISTICAL AREA IN THE U.S. BETWEEN 2000 AND 2018.**

Abstract ID: 847

Individual Paper Submission

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Given that there have been growing concerns over the long-term, sustainable, and equitable economic developments of urban areas across the U.S., creating and maintaining a better physical environment for new business attraction and growth are keys to fulfill agglomeration economies and economic innovation while continuously providing sustainable job opportunities. From the urban planning standpoint, urban planning strategies and guidelines for new business creation are supported by recent evidence of the relationship between overall urban development patterns and new business establishment birth rates across MSAs or regions. Despite spatial variations in new business establishments in response to differences in urban form or development patterns across MSAs or regions over time, we do not know much about how change or difference in urban development patterns among MSAs affects the dynamics of new firm formation. Most of the existing literature focuses on investigating either interregional or intraregional differences in the creation of new business establishments in their analyses.

Using the Census Business Dynamics Statistics (BDS) by establishment ages from 2000 to 2018, this study aims to analyze differences in new business creation among MSAs over time regarding the overall index score for urban development patterns—urban compactness index by Ewing and Hamidi (2014). To establish several important factors, this study addresses both interregional and intraregional differences in new firm formation among MSAs by using a modeling approach called growth curve modeling with a multilevel modeling framework. A total of 3,838 records of the proportions of new business establishments to the total number of businesses were collected for 202 Metropolitan Statistical Areas (MSAs). To address fixed and random effects on the slope and intercept of the growth trajectories of new business entry rates, twelve time-invariant and three time-varying covariates are used to control for demographic and socioeconomic aspects of each MSA. Given differences in the percentages of new business establishments within and between MSAs during the study period, this study particularly uses a spline growth model with the multilevel modeling framework—the measurement occasions of new business birth rates nested within each MSA.

Based on the new business birth rates for each MSA from 2000 and 2018, this study first conducts exploratory data analysis to identify differences in the growth trajectories of new business birth rates among 202 MSAs. As we expected, exploratory data analysis results confirm variations in growth trajectories among MSAs and identify a rapid decrease in the new business birth rates during the Great Recession between 2007 and 2009, suggesting the validity of using the spline linear growth curve modeling for further inferential statistical analysis. The multilevel growth curve modeling results show that urban compactness is significantly related to variations in the slope and intercept of the growth trajectories of new business birth rates among MSAs in this study. Particularly, interaction effects between urban compactness and change in the new business birth rates show that MSAs with compact development patterns tended to have lower slopes and intercepts before the Great Recession, but these MSAs were more likely to attract more new businesses after the Great Recession, suggesting a stronger economic recovery in terms of new business creation. From these findings, this study contributes to expanding the further discussion about the effects of compact development patterns on new business growth by predicting changes in the slopes and intercepts of the overall new business growth trajectories in response to demographic, socioeconomic, and physical aspects of MSAs.

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Key Words: new business birth rate, urban compactness index, metropolitan statistical areas, growth curve modeling, longitudinal research

## SUSTAINABLE COMMUNITIES STRATEGIES PLANNING IN CALIFORNIA

Abstract ID: 875

Individual Paper Submission

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The intent of the Sustainable Communities and Climate Protection Act (SB 375), passed in 2008, was to encourage California to achieve its greenhouse gas (GHG) reduction goals through the integration of land use, transportation, and housing. This bill directed the California Air Resources Board to set regional targets for its 18 Metropolitan Planning Organizations (MPOs) to reduce greenhouse gas emissions by 2035. Each region was then required to prepare a Sustainable Community Strategy (SCS) plan to reach these targets. Most California MPOs are now in their second or third iteration of SCS plans. The literature to date indicates that these SCSs have not been highly effective (Barbour, 2002; Barbour & Deakin, 2012; Niemeier et al., 2015; California’s Sustainable Communities and Climate Protection Act, 2018) We wanted to understand more specifically why this initial generation of Sustainable Community Strategies had or had not been effective, and how such plans might be improved in the future. To achieve this research objective we first analyzed SCS documents of the state’s four largest metropolitan areas—the Metropolitan Transportation Commission and Association of Bay Area Governments (MTC/ABAG), the Southern California Association of Governments (SCAG), SANDAG (the San Diego Association of Governments), and Sacramento Area Council of Governments (SACOG)—with attention to their handling of both GHG reduction and social equity, since the latter is a strong concern of members of the state legislature. We compared SCSs and related Environmental Impact Reports (EIRs) of the four jurisdictions according to how they presented GHG emissions goals, levels, and reduction progress; how they developed and presented policy alternatives; how they linked goals and policies to implementation; how they maintained continuity across generations of SCSs; and how they articulated and responded to social equity needs. We then conducted semi-structured interviews with MPO staff in the four metropolitan regions to provide further insight into SCS implementation challenges. Our preliminary findings are 1) that the plans across the MPOs are very different in nature and presentation, making it difficult to determine these regions’ progress toward GHG reductions from land use, transportation, and housing policy; 2) that from the available evidence these plans are currently not meeting their goals for GHG emissions related to vehicle miles travelled; 3) that plans lack continuity of data and analysis across their multiple interactions and do not develop a standard yardstick of GHG reduction progress which the public can understand; 4) that the SCSs make little effort to identify potential implementation processes likely to bring about GHG reductions; 5) that most plans never develop workable definitions of “sustainable community” or address important dimensions of “sustainable community” as agreed upon by the international literature and the United Nations’ Sustainable Development Goals; and 6) that social equity is not addressed in a consistent or policy-relevant way in any of the SCS documents. We develop specific recommendations for how the state’s Office of Planning and Research or the ARB might improve SCS

preparation guidance for MPOs to address these deficiencies. We also discuss potential elements of a more successful Sustainable Community Strategy planning framework for the state that might better meet the intent of the original legislation.

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Key Words: Sustainable community strategies, regional planning, SB 375, carbon emission reduction, social equity

#### REVIVING THE CULTURAL DIMENSION OF RURAL REGIONAL PLANNING: LESSONS FROM HOWARD W. ODUM

Abstract ID: 1000

Individual Paper Submission

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In the 1990s, scholars and policy-makers in Europe and globally (the United Nations) recognized a “cultural turn,” whereby urban and regional planning, and international development, were no longer considered monolithic, a-contextual activities, and they were instead integrated into “local and regional traditions, practices and habits (intellectual, emotional, moral and spiritual routines)” (Knieling and Othengrafen 2009, p. xxv). In the U.S., no such cultural turn in planning has yet to gain comparable prominence. As a result, the planning field has remained oblivious to, and in denial of, glaring cultural differences between places, such as between urban and rural regions, and their implications for practice. The neglect of culture in understanding and defining regions, especially rural regions, has been to the field’s detriment, enabling an urban bias and leaving American planners out of touch with the needs and practices of rural communities.

Our study seeks to strengthen the cultural lens in rural regional planning by picking up where these ideas were last left off, with the work of sociologist Howard W. Odum in the 1930s and 1940s. We qualitatively analyze Odum’s writings on regional culture, and cultural regionalism for social planning, such as in *American Regionalism: A Cultural-Historical Approach to National Integration* (Odum and Moore 1938), as well as secondary sources on Odum’s contributions (e.g., Kantor 1978), to draw insights for rural regional planning theory and practice in the 21<sup>st</sup> century. In our paper we ask, How have rural regional cultures been identified, and how might this be updated for today’s planning? What planning principles reflect rural regional cultures? What have we lost in rural regional planning by neglecting culture and Odum’s views on integrated social planning? Further, we consider possible reasons Odum’s ideas have been neglected in the intervening years, despite Odum’s guidance for applying his social science to planning. The criticisms Odum’s work received in the post-WWII years were in part culturally-based, including questions surrounding racism, and thus responsible application of his lessons must take them into account.

This study is a step towards operationalizing our previous argument in favor of incorporating rural culture (i.e., rurality) into rural planning (Hibbard and Frank 2020). Our study complements Stephen Ramos’ (2020) ongoing historical research into the legacy of Odum’s Southern regionalism in American planning. Through these efforts, we hope to restart and refresh Odum’s deeply American discourse on cultural regionalism, in order to raise awareness

of the potential of a cultural turn in planning in this country, and especially for the benefit of rural regional planning.

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Key Words: rural, regional, culture

### **ARE NJ'S REGIONAL PLANNING PROGRAMS SUCCESSFULLY REIGNING IN SPRAWL IN THE FIERCELY HOME-RULE STATE?**

Abstract ID: 1012

Individual Paper Submission

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New Jersey is the nation's most densely populated state and under continued growth pressures due to its location wedged between NY City and Philadelphia. At its current trajectory the Garden State will be the first to reach buildout sometime in the midcentury (Lathrop & Hasse 2020). The "home-rule" state delegates land use zoning control to each of the 565 local municipal governments exacerbating sprawling development patterns. In an effort to coordinate and manage growth on a regional level, three different approaches for coordinating regional-scale goals: 1) the State Development and Redevelopment Plan (i.e. State Plan), 2) the Pinelands Comprehensive Management Plan (CMP) and 3) the Highlands Regional Master Plan(RMP). Each planning initiatives has a different backstory, different inception date, different implementation mechanism and different degree of legal enforceability. Together New Jersey's three main regional planning systems provide, in essence, a natural experiment for comparing various approaches to regional planning in a state that lies in one of the most significant growth corridors in the nation. A decade ago Burchell & Dolphin (2009) projected the potential impact of the state plan to the year 2020. Walker and Solecki 1999 explored the potential outcomes of the Pinelands on land use. By analyzing three decades of land use change data we are able to assess the on-the-ground outcomes. We employ GIS assessment of highly detailed digital land use mapping data produced by the state between 1986 and 2015. The findings indicate the successes and limitations of New Jersey's regional planning systems.

The State Plan Planning Areas PA1 Urban and PA2 Suburban as well as Designated Centers are the intended smart growth areas of the plan. Nevertheless, 32% of development acres occurred in the rural and sensitive planning areas intended to receive minimal growth. The preponderance of the growth in these planning areas was attributable to a large lot low-density housing. For three decades, large-lot single-unit housing was responsible for consuming the majority of state's most sensitive lands. However, the most recent land use data reveals a major departure from the sprawling trends of the previous decades in favor of the delineated smart growth zones. Land use change and development growth in the Pinelands over the three decades since the Pinelands CMP implementation occurred at half the rate of the rest of the state relative to the proportion of the land area that the Pinelands occupies within the state. The development that did occur was more compact and less land consumptive than the state as a whole and generally occurred in areas designated as growth zones, which generally have the



infrastructure to accommodate growth. The slower development rate in the conservation zones has maintained the majority of rural lands over the decades and thus given more time for conservation actions to occur. Development patterns in the Highlands have shifted significantly since the implementation of the Highlands RMP. The rate of land developed has been substantially reduced from the pre-2007 era of rapid growth. A greater proportion of subsequent development was in the planning zones with an increasing portion of residential land occurring in a compact form while large-lot sprawling residential housing experienced an observable downturn. While the study provides compelling evidence that all three plans have had a measure of success mitigating sprawl compared to earlier unconstrained development, each regional planning program impacts have been distinct with the Pinelands being most effective at mitigating sprawl followed by the Highlands and the State Plan. The study provides insight into the efficacy of the regional planning program strategies for what has worked and what has been ineffective in fostering compact development in New Jersey.

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Key Words: Regional planning, Compact growth/sprawl, New Jersey, Land Use, GIS

#### **A PLANNING SUPPORT SYSTEM FOR METROPOLITAN AND REGIONAL LEVEL COMPREHENSIVE PLANNING ACTIVITIES AND POLICYMAKING**

Abstract ID: 1013

Individual Paper Submission

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This paper presents a planning and support system (PSS) that helps with a multitude of problems in urban areas, including the effects of future developments on the environment, economic development, stakeholders' input, ease of use for decision-makers, and better integration with other regional planning efforts and MPO's transportation planning process. The PSS utilizes all the relevant information that facilitates the analyses and processes institutions need to go through when preparing a metropolitan or subregional area's plan or demographic analysis for a variety of planning and policymaking purposes. The open framework can be tailored to different settings and is helpful for comprehensive plan-making, economic development, and policy decisions of all types at the local, city, county, or regional levels. It introduces innovative approaches to planning an urban area—including a variant of a geographic information system-based land-use and environmental suitability analysis in deriving development potential for a small-cell grid of the study region. This approach enables public and stakeholder input into the process, facilitating micro-level consideration of different attributes inside the land-use demographic analysis.

These features allow the planning process to be open to human interaction, making it possible to input social and political aspects and decisions into the easy-to-work and easy-to-understand approach. The input is accomplished by the inclusion and participation of representatives of the decision-making bodies, stakeholders, and the public in various aspects of the planning process. This inclusiveness would involve multiple voices in the process from the outset, which makes it more open and understandable by the public and the decision-makers.

The PSS, structure, and the analysis process's openness allow input from stakeholders and decision-makers during

the process. Such information is critical in decision-making, economic development, land-use planning, and resource allocation, which helps to achieve results in line with stakeholders' development perceptions, local economic activities, and jurisdictional plans and visions. This input allows the derivation of development potentials in the suitability stage, and more importantly, in the land-use activity allocation process, allotting commercial activities and households to their most appropriate locations.

A significant point and opportunity in the land use activity allocation step of the process involve the stakeholders, public and private parties, decision-makers, and local expert representatives to elicit their input and intimate local knowledge in this critical step and continue during the land-use allocation process. This is possible in PSS because of its open structure, contrive use of land suitability analysis variant, economic base framework, and the other model attributes. Through this involvement, the stakeholders' views and reflections are part of the process from the outset, and it is more so during the land use allocation process. Therefore, there are no surprises when the projected plan results become public. Usually, issues and disagreements arise between jurisdictions and regional planning agencies over the region's perceived future growth decline and MPO projections activities. The inclusion of the public and stakeholders in such a process is new and is not possible in other planning support systems or modeling outfits.

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Key Words: Land Use, Demographic analysis and forecasting, Metropolitan and Regional Planning, Planning Support System, GIS

## THE LONGER-TERM POTENTIAL OF LAND VALUE UPLIFT: INSIGHTS FROM GREATER LONDON AND GREATER SHANGHAI

Abstract ID: 1017

Individual Paper Submission

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The study aims to address two well-known gaps in the evidence base supporting land policies that are relevant to value capture. First, in most metropolitan areas, the value of land is expected to increase over time. The prospects and rates of the increase have direct implications on the approach and timing of value capture, but such knowledge is far from complete, and thus value capture tends to benefit little from the later, higher value phases of property development. Second, spatially coordinated and balanced development for all urban land uses, activities and infrastructure provision is shown to increase the value of land significantly, but only in a small number of metropolitan areas over a few periods of development is well-coordinated and balanced, e.g., between land use and transport. This is in large part because analytical tools capable of understanding the longer-term prospects of land value changes have not always been widely available.

In this study, we developed a recursive spatial equilibrium model to understand and measure the land value uplift potential under various planning interventions (i.e. jobs, housing and transport). We have chosen Greater London

and Greater Shanghai for our study not only because there are intense interests in land value capture (LVC) in both areas, but also because both cities now have access to well-developed advanced analytical models that can track and measure the degree of coordination and balance of spatial development over a few decades. This facilitates the in-depth comparison of land and related urban policies, pinpointing the causes and effects in terms of land values and their implications for value capture and future growth. Both city regions also have a rich typology of development (from historic conservation to urban regeneration, brownfield infill and greenfield expansion) which may be relevant to many other metropolitan areas. Shanghai is also a considerably younger city region which can learn from London's longer development cycles.

Furthermore, both the UK and China are keen to decentralize their business activities and populations from overheated cores to the periphery, and in both cases, knowledge about LVC in the periphery is particularly deficient. In the UK, the long-term potential of land value uplift tends to be the most uncertain for large-scale urban projects especially when an investment is made in less developed areas (see e.g., UK2070 Commission, 2019). In Chinese metropolitan areas, the seriously overheated central business districts (CBDs) provide a stark contrast with low expectations in peripheral towns even under a persistent effort of activity decentralization. Such imbalanced growth could result in a 'lose-lose' situation as the CBDs suffer from rising welfare losses, whereas the peripheral areas in spite of massive investment fail to exploit their economic potential in the long run.

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Key Words: land value uplift, value capture, spatial equilibrium, land use and transport, planning support systems

#### **COOPERATION OR COMPETITION? AN EMPIRICAL STUDY OF STATE RESCALING AND GOVERNANCE IN GANJIANG NATIONAL NEW AREA, CHINA**

Abstract ID: 1021

Individual Paper Submission

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Although originating from western discourse, the State Rescaling Theory has been well practiced by authoritarian Leninist political economies such as China. This paper places emphasis on the emerging geographies of National New Areas (NNAs), typically planned as "Regional Growth Pole" through reterritorialization—and, thus, changing the original administrative areas and/or spatial units—in recent decades. This paper seeks first to understand how the rescaling process is organized and realized in a socialist planned economy and, secondly, to discuss how well the cross-jurisdictional cooperation worked in the subsequent planning and governance reality?

For a deeper look into the procedure of cross-jurisdictional governance, we select the representative Ganjiang National New Area (GjNNA) as an example, which is complexly reorganized by several districts from prefecture- and county-level cities. The analysis is based on a qualitative database that includes—but is not limited to—important meeting memos, protocols, published works, and a series of interviews with relevant government officials and urban planners, which are drawn to decode the governmental structure and working mechanism within the new-built

area.

The analysis suggests that the spatial reorganization and the formation of functional departments run smoothly through top-down interventions. Major projects and regional plans are carried out through a consultation mechanism by a multi-level government, comprised of provincial governments, a new management committee (focus on economic function), and the local ones. However, the rescaling area is not appropriate to describe as an integrated agglomeration-the wildly assumed concept in recent policy documents-or at least far from being it. The paper critically argues that there are overlapping functions and conflicts of interest among local governments, and processes within NNA can be understood as rather as economic competition than cooperation. Those findings are further supported by comparing socio-economic indicators of temporal (before and after establishment) and spatial (In and out of the area) dimensions. Firstly, competing measures for attracting investment such as tax incentives and large-scale infrastructure construction have been recorded more frequently in neighboring regions than ever before, which has caused waste of public finances and has a negative impact on long-term governance. Moreover, villages and towns without strengths in manufacturing or tourism are becoming "unattended" during rounds of administrative boundary changes. This was related to the fact that economic performance is the primary evaluation factor for government cadres. Last but not the least, cooperation among local governments still leans strongly on authoritative policy initiatives and/or the participation of senior officials. In other words, instead of acting as a member of the NNA, most of the participants made a "guest appearance" in the actual governance process. Hence, we can say that the existing geographical boundaries are still in the policy sense rather than in the consensus of all participants, and partnerships among the local governments in the re-adjusted region-Ganjiang NNA-are still in the early stage of integrated governance. Ultimately, we further discuss the modification of the consultation frameworks in such new political actors and suggest that actual cooperation requires full participation by multi-level governments, especially the local governments, which means a new way of benefit distribution and assessment of cadres.

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Key Words: State rescaling, Cross-jurisdictional governance, Consultation mechanism, Ganjiang National New Area, China

#### LIMITS AND POTENTIALS OF GEODESIGN FRAMEWORK IN THEORY AND PRACTICE

Abstract ID: 1043

Individual Paper Submission

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While the Geodesign term is widely used, research on the concept and its application is quite limited (Batty, 2013). As noted earlier, Geodesign can easily be considered an outflow or evolution of earlier decision support and participatory geographic information system (GIS) applications. Looking back even further, it can be characterized as

an evolution of McHarg's (1969) Design with Nature approach characterized concisely as the "stack of layers" predecessor to current GIS (Dangermond, 2010; Goodchild, 2010, p. 8). Regardless of the particular genesis of the term, Geodesign can be characterized by three facets. First, geography within Geodesign is illustrated in its relationship to processes and forms on or near the Earth's surface, accomplishing what Steinitz (2012) calls "geography by design." Second, design in Geodesign is about "sketch" and "simulation," accomplished through the "technology of design" (Goodchild, 2010, p. 8). Third, Geodesign is characterized by social and process dimensions, as it incorporates scientific knowledge, integrates with human decision-making, and allows decision makers to enact the pattern-process-design relationship (Dangermond, 2010; Goodchild, 2010; Nassauer & Opdam, 2008). This last facet reveals a key prospect for application and further development. In particular, Geodesign is acknowledged as a means of simulating impacts within geographic contexts (Flaxman, 2010) and decreasing the cycle time of participatory design processes (Dangermond, 2010), by facilitating an efficient process of proposition-disposition for design ideas (ESRI Press, 2013; Lyle, 1985).

However, as researchers point out, the definition of Geodesign is still not clear and is interpreted differently from various angles. Steiner explains that this is because Geodesign is a new concept, but it is fundamentally because of the ambiguity inherent in design (Steiner, 2016). Even if the concept of design is limited to the spatial domain, the area covered by Geodesign practice is wider than the scope of any planning/design theory, and the subject is not limited to a specific object or discipline. This study attempts to reveal the differentiation of Geodesign, which has not yet been clearly identified, and to grasp the possibilities and problems that Geodesign presents as a methodology for new planning and design. To this end, this study analyzed the projects of IGC (International Geodesign Collaboration) to grasp the most recent practical trend of Geodesign. At what level and in what way the theoretical differentiation of Geodesign appears in planned projects, and analyzes the differentiation and its causes that are not clearly revealed in practice.

The major characteristics of Geodesign can be summarized as four: synthetic process, digital technology, scale shifts, and participatory approach. Theoretically, the framework of Geodesign goes through three iterations of the set of six models of Representation, Process, Evaluation, Change, Impact, and Decision. The results of analyzing IGC projects, the case studies of recent Geodesign practice, are as following: 1) Geodesign seems to be most useful in dealing with urban issues in planning and larger scale projects. 2) Most of the IGC projects applied the synthetic process of Geodesign and recent digital technologies while working in multi-scales. 3) However, it is hard to say that the participatory approach was well integrated into the projects. Despite of some limitations, Geodesign has great potential in providing universal planning methods that can applied to different planning contexts while being useful in finding out new site-specific solutions for local problems.

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Key Words: Geodesign, Urban Design

#### PLANNING CAPITAL CITIES: A CULTURAL DISTRICT AS THE HEART OF CANADA'S CAPITAL REGION

Abstract ID: 1093

Individual Paper Submission

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Planning federal capital cities raises the question: how can they represent the complexity of national identity while involving in the planning different layers of government? This paper investigates issues of national identity representation and multi-level governance of the heart of Canada's National Capital called Confederation Boulevard (CB). Designed by the National Capital Commission (NCC), we argue that CB has the features of a cultural district displaying national representations and enabling a multi-level governance. We focus our analysis on NCC's plans from the 1980s to the 2000s using a framework that combines the literature on cultural districts with the one on multi-level governance. This analysis reveals the value of planning the heart of the capital as a cultural district (1) for a pluralistic national representation and (2) for enhanced collaboration among national, regional, and local actors. These results also confirms that planning documents are a precious source for unraveling this process.

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Key Words: Capital cities, Ottawa, multi-level governance, national symbols, cultural district

## **POSTERS**

### **INFLUENCE OF METROPOLITAN CLUSTER FORMATION ON SURROUNDING AREAS**

Abstract ID: 415

Poster

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Since the 1960s, South Korea has built many national industrial complexes, starting with the Guro Industrial Complex and the Ulsan Industrial Complex. The first Comprehensive National Territorial Development Plan (1972-1981) focused on regional development for economic growth with several growth poles. Major national industrial complexes were created with export-oriented economic development policies contributing greatly to the economic development of Korea. However, the initial industrial complex creation left many side effects, such as severe environmental pollution, widening gaps between regions, and a lack of infrastructure. In addition, in the 2000s, the emergence of new industries and the pursuit of innovative growth centered on knowledge and information. To solve the problems of such reckless industrial complex creation and promote regional development along with the growth of new industries, the emphasis has been on fostering clusters. It is to deliberately develop the existing manufacturing and industrial-centered industrial complexes and convert them into clusters or develop new clusters.

As such, it is known that the creation of clusters has positive effects such as creating jobs and revitalizing the region through employment and population growth. For this reason, local governments continue to propose to create major industrial bases in the capital region of South Korea. Clusters established in the current metropolitan area

have played a key role in the regional economy, and cluster-based policies have become an important means of regional industrial and spatial policies for regional development.

While the role of clusters has been highlighted these days, the conceptual distinction between 'accumulation' and 'cluster' is not clearly in existing studies, and the terms of established industrial complexes and clusters are also used interchangeably. Convergence occurs between concepts and theories, and there is a problem of loss of its identity. Therefore, it is necessary to eliminate ambiguity among theories and establish a logical concept for clusters that are emphasized socially, economically and politically. In addition, there are various studies on the economic ripple effect of the region due to the establishment of industrial clusters. However, little is known about the effect of the clusters on their surrounding areas.

Therefore, in this study, first, the concepts are organized by classifying clusters and industrial complexes, and industrial complexes and clusters located in the metropolitan area are categorized and presented by industry and type. Second, the overall ripple effect of the currently formed cluster area is identified, and the effect of the cluster composition on the surrounding area is analyzed through multiple regression analysis. As a result, while an industrial complex refers to a simple integration of work, a cluster is a concept that includes a network of industry-academia-research centers related to technological innovation, and has an aspect of emphasizing the interactions between innovation subjects. The results also show that the clusters by industry type, knowledge industry-oriented clusters such as Pangyo Techno Valley, located in Gyeonggi-do, generally increased employment, population, and housing prices in the surrounding area. However, it was found that the cluster centered on the manufacturing industry did not have a significant impact on the surrounding area. The knowledge industry-centered cluster had a positive effect on the overall regional development, but differs from the manufacturing industry-centered cluster, indicating that a differential ripple effect appears depending on the type of clusters. This study is meaningful in that it can provide implications for the cluster creation policies by providing objective evidences on the effect of cluster formations on their nearby communities.

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Key Words: cluster, regional planning, industrial estate, Surrounding Area, housing value

#### THE IMPACTS OF SUBURBAN NEW TOWNS DEVELOPMENT ON THE OLD TOWNS

Abstract ID: 416

Poster

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It is known that the development of new towns in the suburbs solved the housing shortage problems in a short period of time, but caused the decline of old towns in cities. This is because residents and employees in the old towns and city halls in some cases moved along with the development of the new towns. However, there is an argue that some new towns induce the development of old towns depending on their urban development stages and

urban characteristics. In this way, depending on the characteristics of the city, the old town may not decline due to the development of the new town. However, existing research focuses only on the patterns and causes of decline in the old towns due to the development of the new town without a comprehensive consideration of urban patterns.

In this line, this study attempts to analyze the effects of the development of new towns on the old towns by reflecting urban characteristics. To this end, first, cities across the country are categorized according to city characteristics. Second, using multiple regression models, it is analyzed how the development of new towns affects the old towns based on the city characteristics of growth.

The analysis results are as follows. According to urban growth patterns, economic characteristics, and physical characteristics, the effects of new towns on the decline of the old towns was different. In particular, while the development of new towns caused the decline of the old town in declining cities, in a growing city it did not cause the decline of the old town.

The following implications can be given through the results. Currently, the development of new urban areas in Korea is proceeding regardless of the characteristics of cities. However, in order for the old town and the new town to grow together, urban characteristics must be reflected in the development of the new town.

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Key Words: development of new town, old town, urban decline, urban generation, multiple regression model

#### **CORRELATION BETWEEN RESILIENCE AND THE TYPE OF NETWORKS**

Abstract ID: 417

Poster

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Since urban competitiveness is directly related to national competitiveness, many countries around the world are making great efforts to strengthen urban competitiveness in line with the rapidly changing globalization trend. Accordingly, discussions on strengthening regional competitiveness are being actively conducted, leading to research on regional living areas and regional bases. There are various methods for enhancing regional competitiveness, but the method through regional networks is receiving the most attention. In addition, the necessity of a strategy for developing a functional network between cities as a way to secure regional competitiveness is also mentioned. And the network formation between cities and regions is a close relationship with the overall competitiveness.

As the problems of individual urban planning and policies centered on physical scale and space are continuously



raised, the importance of interregional networks taking into account interactions between cities and regions is emerging. In addition to this, "Resilience" has been discussed as an element of recent urban competitiveness. In Korea, research has been conducted to improve resilience from the perspective of local communities that can cope with uncertain future changes, to strengthen resilience in terms of the Fourth Industrial Revolution and disasters and safety. In recent years, as the concept of resilience for overcoming Corona 19 has been re-examined, discussions have been increasing in the international community and governments to examine resilience capabilities and prepare response strategies. As such, interest and efforts to realize a city with socio-economic resilience capable of responding to unpredictable crises and risks around the world are continuing. However, although resilience is a major growth factor for urban competitiveness, research on domestic land and regional planning taking this into account is insufficient. In particular, resilience is not considered in the recent discussion of regional hub cities and the type of network, although various factors within the region must be considered to strengthen urban competitiveness. In other words, it is necessary to study the type of regional bases and networks that reflect urban resilience.

Therefore, this study aims to empirically analyze the correlation between regional bases and resilience by network characteristics and type. This is different from the existing studies on network analysis in that the study focuses on analyzing the differences in Degree of resilience according to the network characteristics and type. The analysis includes four steps. First, the base city is identified using the interdependence and centrality index for the whole country. The second is to use the Markov-chain model to establish an urban area with a network function similar to the base city derived earlier. Third, the resilience is calculated using the indices suggested by existing studies, such as the population growth rate and the degree of financial independence. Finally, the network characteristics for each urban area are identified, and the correlation with the Degree of resilience calculated for each network characteristic is analyzed. As a result of the study, cities with strong interactions with metropolitan areas (metropolitan areas, special cities, and special autonomous cities) in both the metropolitan area and regional cities showed strong resilience. In addition, the degree of resilience was stronger in the metropolitan area network than the local network.

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Key Words: Resilience, Functional network, Markov-chain Model, Urban competitiveness, Correlation

#### **ANALYSIS OF THE CURRENT STATUS AND CHARACTERISTICS OF POPULATION INFLOW FROM THE METROPOLITAN AREA TO THE "INNOVATIVE CITY": FOCUSING ON THE RELATIONSHIP WITH LARGE-SCALE CITIES AROUND THE INNOVATIVE CITY**

Abstract ID: 436

Poster

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The problem of regional imbalance due to the concentration of population in the Seoul metropolitan area is being discussed as a continuing social problem in Korea(ROK). To solve this problem, the Korean government has implemented various countermeasures, the most representative of which is the construction of "innovative cities" and relocation of public institutions. One of the main objectives of this policy is to relocate the population to provinces that suffer from population reduction problems. Previous studies on its effect consisted of a number of negative opinions. They point out that, contrary to the intention of the policy, more populations from small and medium-sized cities around the innovative city flow into the place developed as a new city than from the Seoul metropolitan area, resulting in problems such as urban communalization. On the other hand, they collide with some positive evaluations. Among them, the result is impressive that this policy had a significant effect on the outflow of the population from the Seoul metropolitan area. It seems that there has not been an accurate analysis of which region the population who has left the Seoul metropolitan area is heading to under the influence of the policy. At the same time, the innovative city policy is planned to continue until at least 2030 with a lot of criticism.

Therefore, this study will make an accurate diagnosis of the effect of the policy so far by grasping the movement and settlement of the population who have left the Seoul metropolitan area since the policy was implemented. This will be analyzed by visualizing the moving-in and moving-out data between administrative districts using a geographic information system. In addition, it will analyze the difference in the proportion of the population that flows from the Seoul metropolitan area among the total population that flows into the innovation city according to the characteristics and relationships of the innovation city and the surrounding large-scale cities. This study will perform multiple regression analysis, suggesting that existing urban infrastructure and population size of neighboring metropolitan cities can play an important role in preventing side effects such as urban communization, which was pointed out as a policy issue.

Through this, this study can not only supplement the limitations of previous studies that evaluated the effect of population dispersion of innovative city policies, but also provide an analytical basis for supplementing policies to be implemented in the future. In addition, this study is meaningful in that it reveals the importance of large-scale cities in mitigating the side effects of developing new towns for balanced development of national territory.

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Key Words: Population decentralization, metropolitan area, innovative city, urban communization

#### URBAN HEAT ISLAND AND VULNERABLE POPULATION IN THE GLOBAL SOUTH: A SPATIAL REGRESSION APPROACH

Abstract ID: 564

Poster

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The urban environment has been threatened by the interaction of global climate change and local urbanization, especially global temperature annually increased by 0.18 °C since 1981. Urban Heat Island (UHI), in which urban areas are warmer than their surrounding, are included in urban and regional planners agendas because mitigation strategies need to be implemented to counteract UHI negative effects. Given 68 % of the world population will reside in urban areas in 2050, preparing for a sustainable urban environment is an important goal. Various empirical studies found positive relationships between UHI and health risks (Jr, 2005; Wong et al., 2013). Therefore, studying UHI as a spatial phenomenon that can affect the most vulnerable population is important.

Previous studies linking UHI to socio-demographic have targeted cities located in the Global North (see Madrid Sánchez-Guevara Sánchez et al., 2017; see Philadelphia Johnson & Wilson, 2009). However, only a few attempts have been made to investigate the spatial relationship between UHI and vulnerable social groups in metropolitan regions located in the Global South, despite their rapid urbanization and high poverty rate. To fill this gap in the literature, we will explore the spatial distribution of UHI in a Global South metropolitan region and compare this distribution with hotspots of poverty and green areas. Our research hypothesis follows: UHI is more likely to be close to areas of high concentration of poverty and low green areas per capita, where the most vulnerable people live.

Our study area will be the Belo Horizonte Metropolitan Region (BHMR), located in the State of Minas Gerais, in Brazil. BHMR had a population of around 6 million in 2019, of which 1.5 million residents reside in poverty. BHMR is one of the few metropolitan regions in the country that has a metropolitan body of governance, and adopted a Regional Master Plan, which includes planning for greening initiatives. We will collect Landsat 8 TIR imagery data to develop the Land Surface Temperature (LST) spatial layer, using remote sensing techniques. This LST layer is the dependent variable of our spatial regression models. We will have the following independent variables of interest: (a) hotspots of poverty, calculated using Local Indicators of Spatial Association; and (b) an Euclidean distance surface using all the green areas as the sources. Our spatial unit of analysis will be 30 m by 30 m cells corresponding to the LST layer. The control variables to be included in our spatial regressions will be impervious surface fraction, building fraction, and water proportion.

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Key Words: Urban heat island, Vulnerable population, Global South, Green space, Poverty

#### CHANGES IN TRAVEL PATTERNS AND SELF-SUFFICIENCY IN THE SEOUL METROPOLITAN AREA BY INTRODUCING THE GTX(GREAT TRAIN EXPRESS; REGIONAL RAPID RAILROAD)

Abstract ID: 630

Poster

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In the last period, the Seoul metropolitan area has undergone rapid urbanization and population growth, and the urbanized areas have been continuously expanded in the use of land in the metropolitan area. The development of new cities in the metropolitan area and large-scale housing site developments had a profound effect on the movement of the population, and it was confirmed that the flow of population movement stretched out throughout the metropolitan area and the commuting traffic patterns changed accordingly. With the expansion of the spatial range of the metropolitan area, the new transportation method introduced in the metropolitan area is the "Great Train eXpress (referred to as GTX)". The introduction of GTX is expected to significantly shorten the travel time of the region. Also, it would bring many changes to the spatial structure and movement patterns of the metropolitan area. This is one of the solutions to improve the low expression speed of existing railways, and it has a different status from existing interregional railways and metropolitan railways.

It is analyzed that the emergence of a new form of transportation that is different from the existing one will bring positive results in the existing research. With the result that a new concept of transportation, such as high-speed rail, relieves the population concentration in the metropolitan area and has a positive effect on the balance of the regional spatial structure. With the opening of GTX, the metropolitan area is expected to be improved in accessibility along the GTX line. In addition, research on new spatial structures has been conducted, such as predicting that the opening of GTX will dramatically improve accessibility with a radius of 20-50 kilometers in Seoul and emerge as a new commuter area.

On the other hand, other studies have mentioned negative effects such as a new form of regional imbalance that improved accessibility through the opening of new transportation means. In other words, concerns have also been raised that the straw effect will appear. There is a concern that GTX, which enables rapid movement to Seoul, weakens the competitiveness of suburbs of Seoul and accelerates the concentration of the central city. However, while studies on a national scale such as KTX (Korea Train eXpress; high speed railway of Korea) have been conducted, and studies related to GTX are still insufficient. In addition, studies related to GTX are mostly about its economic effects and changes in spatial structure, but studies on movement patterns of people and movement by purpose, and studies on predicting changes in spatial structure and self-sufficiency based on this are insufficient.

Therefore, this study aims to analyze and predict how the opening of GTX affects the movement patterns in the metropolitan area, based on the purpose of movement, and to evaluate the self-sufficiency of local governments in the metropolitan area. To this end, an urban transport modeling system is used for the transport demand measurement modeling. After assuming a situation suitable for each situation through the Four-Step Travel Demand Model method, changes in movement patterns in the metropolitan area after the opening of GTX are examined. In addition, after analyzing the spatial structure change according to the change in the movement pattern, the degree of self-sufficiency in the outskirts of Seoul is evaluated using the self-sufficiency index. The analysis framework suggested in the study is expected to be applied for analyzing and predicting how the rapid railway system affects other metropolitan areas in the future. In addition, the study can provide implications for transportation policies to enhance regional balanced development.

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Key Words: GTX, Travel pattern, Seoul Metropolitan Area, Self-sufficiency, Four-Step Travel Demand Model

# Track 15 – Transportation & Infrastructure Planning

## PRE-ORGANIZED SESSION SUMMARIES AND ABSTRACTS FOR THE SESSIONS

### 15.1 PRE-ORGANIZED SESSION - TRANSPORTATION BEHAVIOR, EQUITY, AND TECHNOLOGY CHANGES AFTER COVID-19

Pre-Organized Session 1 - Summary

Session Includes 115, 116, 117, 118, 353

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COVID-19 has changed how North Americans travel, but the evidence does not indicate which of these changes will persist after the risks of COVID-19 subside and social distancing policies end. It is also unclear to what extent crisis-induced societal changes, from corporate telework policies to street space reallocations and public transit service reductions, will be reversed in a post-COVID recovery. This session presents results from multiple studies that document the how and why behind recent travel behavior changes in North America. Questions in these studies include: How has COVID-19 impacted people's ability to reach essential destinations? To what extent do travelers plan to return to prior travel patterns when COVID ends? Have attitudes towards new forms of mobility changed in response to the pandemic? How do these outcomes vary by place and person? The session will provide a forum to synthesize evidence addressing these questions. It will support planners who seek to advance equitable and sustainable transportation as communities recover from the pandemic.

Objectives:

- After attending this session, a planner will be able to incorporate latest research insights into the temporary vs. longer-term impacts of the pandemic on travel demand in their plans and models
- After attending this session, a planner will be able to synthesize the evidence on the impact of COVID-19 on travel behavior.

### INVESTIGATING THE TEMPORARY VS. LONGER-TERM IMPACT OF THE COVID-19 PANDEMIC ON MOBILITY

Abstract ID: 115

Abstract within Pre-Organized Session 1

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The COVID-19 pandemic has led to many changes in household activities and mobility patterns. With offices and non-essential activities temporarily shutdown there has been a surge in the adoption of telecommuting and a reported increase in internet-based shopping. The pandemic has also caused huge disruptions to the transportation sector. Mass transit and shared mobility services have seen a stark decline in ridership, whereas walking and cycling for recreational purposes has reportedly increased. With the risk of a large economic recession and the likely scenarios of social distancing measures extended over time, there is reason to believe that at least part of the observed temporary changes might extend in the longer term, and into the new "normal". Accordingly, this research examines whether the new habits developed during the various phases of the pandemic as individuals adapt their activity patterns to their new reality will persist during and beyond the pandemic.

Using a unique longitudinal dataset, spanning from before and at two time periods during the pandemic (Spring and

Fall 2020), we compare the short- and longer-term impacts of the COVID-19 pandemic on household activities and mobility patterns. Attitudinal questions are further investigated to understand how people are adjusting to the COVID-19 pandemic and learn more about their changes in individual attitudes towards future travel choices. Findings from this research will prove valuable to transportation planners and policymakers seeking to understand how the COVID-19 pandemic has impacted mobility across various segments of the population, and will in turn enable them to enact effective policies and reign in transportation in the “post pandemic” society.

#### Citations

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Key Words: COVID-19, long-term impacts, Mobility, Household activities

#### COVID-19 IMPACTS ON PUBLIC TRANSIT RIDERS: FINDINGS FROM A US SURVEY

Abstract ID: 116

Abstract within Pre-Organized Session 1

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Public transit provides essential mobility options for transportation constrained populations, allowing them to fulfill their daily needs (Taylor & Morris, 2015). The Covid-19 pandemic has decimated public transit service across the United States and caused significant decreases in ridership (Liu et al., 2020; Vock, 2020). Adapting to the pandemic has been challenging for transit riders, and in particular for vulnerable and transportation constrained populations. Previous studies have evaluated which populations have remained on transit (Liu et al., 2020), however little is known about the reasons for pandemic-era transit mode shifts and the impacts of pandemic-related transit reductions on transit riders’ day-to-day lives.

Using a national survey of U.S. transit riders (n=500), this study examines changes in transit use since the pandemic began (number of trips conducted using all modes of public transit), reasons for transit reductions (due to changes in destinations, concern about the risks of contracting Covid-19, transit service changes, expense, concerns about harassment, and concerns about interacting with police and immigration officials), and the effects of reduced transit use and transit service on transit riders’ ability to meet their travel needs (accessing work, grocery, healthcare, and pharmacy). Results of the negative binomial model indicate that vulnerable populations (people earning under twice the poverty threshold, Hispanic and Latinx, and people with a physical disability) and constrained transit riders (people without vehicle access and people who reported that they rely on transit to meet their travel needs) are using transit more frequently than their counterparts during the Covid-19 pandemic. Additionally, transportation vulnerable populations are more likely to experience difficulty reaching essential destinations during the Covid-19 pandemic due to changes in transit service. The findings also reveal that concerns about interacting with police and immigration officials on transit are a greater deterrent for Hispanic and Latinx riders than for non-Hispanic White riders. The findings of this study characterize the impact of Covid-19 on transit riders on vulnerable and

transportation constrained populations, pointing to several policy recommendations that can protect transit service for these groups as we recover from the pandemic.

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Key Words: Transportation Justice, Covid-19, Public Transit, Constraint Transit Riders, Travel Behavior

### **COVID19 STREETS: USING A MOBILITY JUSTICE FRAMEWORK TO EVALUATE SAFETY AND UTILITY OF RAPID ROLLOUT ACTIVE MOBILITY INFRASTRUCTURE**

Abstract ID: 117

Abstract within Pre-Organized Session 1

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With the COVID19 pandemic came a rapid increase in demand for safe, physically distant space for walking and cycling. Cities around the world responded by rolling out temporary active mobility infrastructure in existing roadways. Where active mobility infrastructure projects previously took years to plan and build, 2020 has seen them go from inception to installation in a matter of days. These rapid rollout infrastructure projects (RRIs) have been widely praised by advocates and have led to dozens of efforts aimed at propagating and cementing them. Their popularity also suggests we may be entering a new era of transport planning characterized by innovation and in situ experimentation rather than strict adherence to conventional practices.

However, RRIs have been critiqued for being arbitrary and out of touch with the communities' needs. Observers have noted that transportation planning's history of poor public engagement has been further entrenched by a crisis planning mentality engendered by the pandemic. Furthermore, preliminary evidence from the Shifting Streets database—a global crowdsourced database that tracks RRIs—suggests the majority of RRIs involved little public consultation, were not called for in relevant adopted plans, and were not aligned with on-going planning efforts.

There are clear benefits to shortening timelines and increasing flexibility in implementation of active mobility infrastructure. Yet the unlinking of RRIs from public processes suggests a widespread failure of procedural justice that could translate to inequitable distribution of impacts, raising critical questions about the effectiveness of RRIs and whether cities' newfound appetite for rapid, experimental infrastructure implementation is consistent with mobility justice.

#### Research questions and methods

This research evaluates the planning processes behind and impacts of RRIs in twelve North American cities. Our overall objective is to identify and develop new best planning practices that support more timely, just deployments of active mobility infrastructure in a post-pandemic future. We focus on two specific research questions:

What factors influenced the decision to implement RRIs? Specifically, what was the role of local planners in RRI decisions, and how were RRI decisions influenced by existing plans, public engagement, or advocacy efforts? We address this question through structured interviews with staff, elected officials, advocates, and community representatives in our study cities. Interviews focused on consistency of RRIs with adopted plans; how cities engaged with the public in deciding whether and how to implement RRIs; and whether the use of temporary



materials created opportunities for in situ public engagement. Interview responses are analyzed using a generalized inductive content analysis.

What were the impacts of RRI with respect to objective and perceived non-car travel behavior?

We address this question via a multimethod approach combining quantitative data on changes in walking and bicycling behaviors with secondary data on public perceptions about RRI's impacts on behaviors. We use ped/bike count data from 2016-2019 and 2020 in our study cities vs. a set of peer controls to analyze travel behavior change. Data on public perceptions of impacts come from surveys and listening sessions conducted by local planning staff in our study cities.

Anticipated outcomes and implications for planning

We expect to find that RRI shaped by robust public engagement and/or consistent with adopted plans are associated with greater use and more positive public perceptions. We are hopeful that by evaluating the planning processes behind RRI, our research will uncover potential new best practices that both shorten timeframes for implementation of active mobility infrastructure and ensure more just distribution of costs and benefits of that infrastructure.

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Key Words: COVID-19, Pedestrian and bicycle planning, Mobility justice, Public engagement, Infrastructure

## **EVIDENCE ON THE STICKINESS OF PANDEMIC-ERA BEHAVIOR CHANGE: INSIGHTS FROM THE COVID FUTURE PANEL SURVEY**

Abstract ID: 118

Abstract within Pre-Organized Session 1

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Disruptions in our lives present opportunities to learn and practice new ways of doing things, as well as re-evaluate our choices and habits. The COVID-19 pandemic has been perhaps the largest disruption event in modern human history. Nearly every human on the planet has been forced to modify their habits to adjust to the reality of the pandemic, making this historical moment a tremendous opportunity for long-term change at both the individual and collective levels. Importantly, the pandemic has coincided in time with the widespread availability of new technologies such as broadband internet service and videoconferencing, as well as many new app-based services

available through mobile phones.

The COVID Future Panel Study ([www.covidfuture.org](http://www.covidfuture.org)) is collecting national survey data in the United States that will help to identify and understand key changes in behaviors and habits, both during the pandemic period and beyond. The first wave sample size includes nearly 8,000 adults, while the second wave includes over 3,000. Both are weighted to be representative of the national adult population. The choices of main interest in this research are those about remote work, online shopping, restaurant dining, air travel, transit use, car commuting, non-motorized transport use, and household relocation – all of which are highly relevant to the planning profession.

Three waves of this pandemic-era survey have collected and will collect information about respondents' pre-pandemic and current choices, as well as expectations about their own future behavior, i.e. their intentions for the post-pandemic period. Many respondents indicated that the pandemic experience has led to new personal realizations and changes in employer policies that will lead to long-term behavioral changes, such as increased telework. We also asked about aspects of pandemic life that respondents would like to continue, and more than 70% selected at least one.

We focus here on remote work and commuting during the pandemic, and identify the extent to which our data suggest that changes are likely to “stick” for the long term. Preliminary results based on the first wave of survey data indicate large increases in remote work frequency that are likely to persist even after the threat of the pandemic has subsided. These results are accompanied by substantial and similarly persistent decreases in car commuting as well as transit commuting. These changes, however, are not evenly distributed across the population; workers with bachelor's degrees are about twice as likely to have adopted new commuting habits during the pandemic, compared to workers without bachelor's degrees. The post-pandemic “new normal”, therefore, may exacerbate existing societal disparities.

At the conference, we will be able to report results from the full three-wave panel, including how both behavior and expectations for the future have evolved during the pandemic, and more nuanced explanations of why.

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Key Words: telework, remote work, telecommuting, COVID-19

#### **WILL THEY COME BACK TO TRANSIT? CHANGING PERSPECTIVES ON TRANSIT FROM A PANEL OF FORMER RIDERS**

Abstract ID: 353

Abstract within Pre-Organized Session 1

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Millions of people across North America began avoiding public transit at the onset of the COVID-19 pandemic, pushing transit ridership down to 30% of 2019 levels (Liu et al., 2020). Ridership has since recovered to roughly 40% of pre-pandemic levels (Transit and APTA, 2021). In a prior study, we surveyed over 3,000 regular transit users in Toronto and Vancouver who stopped riding in the first two months of the pandemic (Palm et al., In press). We found that women, people with disabilities, car-less travelers, and those with health problems were more likely to experience difficulties reaching essential destinations without transit.

This paper presents results from the second wave of this survey, which ran in Toronto and Vancouver in March 2021. We sought to answer three questions. First, who returned to transit before vaccines became widely available, for what purposes did they start riding again, and why? Second, who among riders avoiding transit purchased a bicycle or an automobile during the pandemic? Third, what factors are associated with riders' intentions to return to transit when the pandemic ends?

Our results will help planners and policymakers who seek to build more equitable transportation systems in cities emerging from lockdowns. Specifically, we aim to illuminate the equity implications of who is planning to return to transit when the pandemic ends, and who is not. Finally, our results will provide early insights into the long-term ridership implications of the pandemic, and how long-term impacts might vary across cities with diverse ridership.

#### Citations

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Key Words: COVID-19, public transit, travel behavior, transportation equity

### 15.10 PRE-ORGANIZED SESSION - PUBLIC TRANSIT CHALLENGES AND OPPORTUNITIES IN A POST-PANDEMIC WORLD

Pre-Organized Session 10 - Summary

Session Includes 600, 601, 602, 603, 604

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Even before the COVID-19 pandemic cut transit use by up to 90 percent in some places, public transit ridership in the US had been on a long decline since its peak around the mid-2010s. Travelers have more transportation choices than ever before; to meet sustainability and equity goals, cities and public transit operators must innovate to ensure service provides critical access to those who rely on public transit and to encourage those who have other transportation choices to choose transit first. This session brings together five papers that explore the challenges and opportunities that transit agencies face in boosting ridership from the perspectives of potential transit users. The papers identify barriers to transit use before, during, and after COVID-19, examine why people stop riding transit, describe complications and innovations in fare payment for underbanked passengers, and explore the ways micromobility and environmental design can create more accessible transit systems.

#### Objectives:

- Attendees will identify barriers to transit use before, during, and after COVID-19
- Attendees will understand how transit agencies are developing equitable fare payment systems

- Attendees will evaluate how environmental design near transit stations plays a key role in the integration of shared micromobility for transit access

## **ENVIRONMENTAL DESIGN CONNECTING MICROMOBILITY WITH PUBLIC TRANSIT**

Abstract ID: 600

Abstract within Pre-Organized Session 10

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This paper will focus on the environmental design of first and last mile connections between micromobility and public transportation stations. Shared micromobility (bikes, e-bikes, and e-scooters) has the potential to reduce greenhouse gas emissions, traffic congestion, and air pollution, particularly when replacing private vehicle use and integrating with public transit. The design of the built environment in and around transit stations plays a key role in the integration of shared micromobility for first and last mile travel, by facilitating access to shared vehicles, protected bike lanes, and parking and charging for docked and dockless bikes, e-bikes, e-scooters. This paper will present a case study of nineteen Bay Area Rapid Transit (BART) rail stations in the California Bay Area, which are served by seven shared micromobility operators. Results from site surveys, stakeholder interviews, and bicycle and transit maps will be discussed.

### **Citations**

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Key Words: micromobility, public transit, urban design, last mile

## **ASSESSING THE NEEDS OF THE UN- AND UNDERBANKED IN INTEGRATED FARE PAYMENT FOR TRANSIT**

Abstract ID: 601

Abstract within Pre-Organized Session 10

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California's transit network is fractured and disjointed. Moving between cities on public transit, and in many cases within regions, requires moving between operators with different payment mediums and scheduling specifications. This is a major obstacle, especially for the most disadvantaged passengers. Following the passage of 2004 legislation to establish integrated payments for California transit, the state initiated the California Integrated Travel Project (Cal-ITP) which developed a multi-phased approach for studying and implementing integrative solutions for transit. The goals of Cal-ITP include identifying and implementing a single payment medium across all transit operators in the state of California.

Cal-ITP has identified the Europay, Mastercard, Visa (EMV) payment system as the most viable option for this effort, since it is already used for huge numbers of transactions worldwide. EMV systems are open-loop, meaning any credit or debit card may be used. As early as 2015 these systems were planned, or already underway in several

areas of the US, including Salt Lake City, UT, Chicago, IL, and Philadelphia, PA (Tavilla 2015).

However, for those without a credit card or debit card, the un/underbanked, EMV-based transit payment systems may not be accessible. In the most recent household survey of the Federal Deposit Insurance Corporation (FDIC), in 2019 5.4% of US households were unbanked, that is without a bank account (FDIC 2020). The top two reasons for not having a bank account are not having enough money to meet a minimum balance, and a distrust of banks (FDIC 2020). Although the use of cash is decreasing in general, cash continues to be used more by lower income individuals, and more by those without credit or (non-prepaid) debit cards (Green 2020). Typically transit systems implementing open-loop payment systems continue to provide cash payment options to serve un/underbanked passengers. But cash payments are slow, require extra steps, and can be costly for transit operators.

Working with Cal-ITP and a small set of transit operators, this study identifies barriers for un/underbanked passengers to use an EMV payment systems for transit. A key question we address is, "What can be done to make EMV systems a viable option for transit operators by making it an acceptable and accessible means of payment for all of their riders; specifically, those that are un/underbanked?"

Data will be collected in late spring of 2021, using intercept-based recruitment to reach transit riders and un/underbanked populations in a small sample of California transit systems. The survey focuses on participant's transit use, and preferences for payment options and financial services. We will present survey results, highlighting key challenges for un/underbanked passengers to use an EMV based payment system.

The results of this phase of our study will inform a larger scale, statewide investigation into how Cal-ITP can be accessible to the un/underbanked. Our work will also enable Cal-ITP with important insights into how to serve the un/underbanked with the Cal-ITP, and what they can do to make Cal-ITP accessible to all travelers in California. Further Cal-ITP could be a model for transit operations across the US, so the outcomes of this and future phases of this study will provide important insights throughout the country.

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Key Words: public transit, transit payment, integrated travel, unbanked and underbanked

#### **CAR DRIVERS' PREFERENCES AND ATTITUDES TOWARDS PUBLIC TRANSPORTATION AND OTHER MODES IN A POST-PANDEMIC CONTEXT**

Abstract ID: 602

Abstract within Pre-Organized Session 10

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The negative externalities and heavy resource consumption associated with the high levels of private car use in urban areas have prompted cities around the world to seek ways of encouraging a shift towards more sustainable transportation modes. This is more important and challenging in a highly car-dependent context, which is produced by the urban structure, limited transit availability and level of service, unequal income distribution, among many other factors. This is not an easy task though. To date, many research and planning efforts have gone towards

understanding people's behavior and attitudes towards the use of public transportation and new mobility trends, such as the adoption of smartphone app-based services including ridehailing or micromobility. However, not enough efforts are spent in understanding what makes a car driver shift to a more efficient mode of transportation possible, and likely to happen. This is important as car drivers perceive public transportation attributes differently to day-to-day transit passengers (van Exel & Rietveld, 2010, Beirão & Cabral, 2007).

This objective gains a new dimension when considering the implications of COVID-19 over vehicle ownership and willingness (or, better say, lack of willingness) to share a vehicle, as in public transportation. Individuals' concerns about contracting the virus, combined with various measures implemented to contain the contagion during the various stages of the pandemic, have caused huge modifications in activity organizations and travel choices. Among other transportation impacts, car travel heavily dropped during the early stage of the pandemic, but has rebounded since then, while the use of other means of travel (in particular, shared modes of transportation) remains substantially below the pre-pandemic levels.

Our research team is leading a large data collection to investigate the temporary vs. longer-term effects of the pandemic, with a combination of quantitative (detailed behavioral and attitudinal surveys) and qualitative (in-depth phone interviews) approaches. We resampled respondents from previous surveys in 2018 and 2019 creating a unique longitudinal dataset with information from before and during the pandemic (with new waves of surveys in Spring and Fall 2020), and we will continue to collect data during 2021 and beyond. More than 10,000 respondents, primarily located in 17 metro regions in the United States and Canada, have participated in the data collections in 2020.

Thus, this research focuses on understanding to which extent any behavioral or attitudinal change triggered by the pandemic may continue over time. It might be the case that when the pandemic is over, people might return to their typical routine from before COVID-19 impacted their lives. However, it is also possible that these attitudinal changes and alternative mobility options might be perceived as better matching individual needs and preferred to those that were used in the past. Potential new bike riders, people stopping using transit, people driving more frequently, among others, are key to be identified and studied, as these changes have substantial sustainability implications, in terms of formation of new travel habits, changes in vehicle miles traveled (VMT), and impacts on traffic congestion, greenhouse gas emissions and active lifestyles/health impacts of transportation. Through a better understanding of private car commuter attitudes in combination with longitudinal behavioral surveys' responses, we expect to be able to identify what set of attributes and conditions makes a car driver overcome inertia and consider other sets of more sustainable mobility options.

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Key Words: Sustainable Transportation, VMT reduction, Car commuters, Longitudinal analysis, COVID-19

#### HOUSEHOLD ATTITUDES AND BARRIERS REGARDING TRANSIT USE IN MID-SIZED CITIES

Abstract ID: 603

Abstract within Pre-Organized Session 10

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Transit ridership has been declining across the U.S. since around 2014, with varying rates by population size. In metropolitan statistical areas (MSAs) with less than 1 million residents, for example, ridership fell 7% between 2014 and 2018. Suggested reasons for transit decline across the country vary, including: service reduction, population decline, demographic shifts, displacement, telecommuting, changes in non-work travel, vehicle ownership, and shared mobility (Boisjoly et al., 2018; Manville et al., 2018; Graehler et al., 2019; Watkins et al., 2019). Most of this research has examined transit ridership trends in large metro areas; because mid-sized cities have been largely understudied, the extent and determinants of ridership decline there are not well understood. Moreover, despite the immediate transit ridership losses as a result of the COVID-19 pandemic, projections of longer-term and even post-pandemic ridership trends are unclear. Understanding the extent and determinants for declining ridership in mid-sized cities pre-COVID-19, together with the lingering effects of the pandemic on future ridership, can help transit agencies respond through planning, policy, and service changes. Essential workers—generally lower-income workers and people of color—who have continued to comprise the bulk of transit ridership stand the most to gain from these changes (Transit Blog, 2020).

The purpose of this study is to identify the extent and determinants of declining transit ridership in mid-sized cities. The research draws from an analysis of transit ridership trends and a household survey conducted in seven Illinois MSAs located outside the Chicago region, each of which have one or more transit agencies that serve at least 1.5 million passengers annually. This research is part of a broader mixed-methods study on transit ridership in mid-sized Illinois cities. First, to contextualize the study, we will briefly present descriptive findings from practitioner interviews and an analysis of route-level ridership trends from 2013 to 2017 across all agencies. Preliminary results suggest that there is no common cause in ridership decline as a result of demographic or employment changes; other broader macroeconomic trends coupled with structural changes unique to each city are more likely causal factors.

Second, we will share findings from a household survey conducted in each of the seven mid-sized MSAs. The purpose of the household survey is to identify the characteristics of transit riders compared to non-riders, the barriers to transit use among non-riders, the ways evolving transportation technologies influence transit ridership, and the strategies that would encourage more frequent transit use. A secondary purpose of the survey is to understand potential long-term consequences of COVID-19 on transit use. A questionnaire will be distributed by mail to a stratified random sample of 80,000 potential transit riders, defined as households who live within one-half mile of fixed-route transit service in each of the MSAs, in early April. The survey asks questions in multiple categories, including travel frequency both currently and prior to COVID-19 stay-at-home orders; the extent to which respondents rode transit in the past; why former transit riders stopped riding transit; attitudes, barriers, and preferences regarding transit; travel expectations after COVID-19; and sociodemographic characteristics. We will present both descriptive analyses and comparisons across key variables.

This study will offer new insights into the barriers to transit that non-riders face, how emerging and evolving transportation technologies influence transit ridership, and how the COVID-19 pandemic may continue to influence transit ridership. Primary data collection will help us draw new conclusions that are unavailable in studies that use secondary data to analyze transit ridership trends. The setting of the study will also offer novel information about transit use in mid-sized U.S. cities. We expect the study to contribute to short-term and long-term transit system and service improvements.

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Key Words: transit ridership, travel barriers, travel attitudes, COVID-19

## WHO GAVE UP ON THE BUS? LAPSED TRANSIT RIDER NEEDS IN MID-SIZED CITIES

Abstract ID: 604

Abstract within Pre-Organized Session 10

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Nationwide transit ridership has been declining since 2014, when many transit agencies across the United States recorded peak numbers (Grisby et al., 2018). This trend was exacerbated by the COVID-19 pandemic. While a plethora of quantitative work has examined the likely factors causing transit ridership loss (Boisjoly et al., 2018), little qualitative work has explored barriers to transit use specifically for former transit riders (e.g. Lowe and Mosby, 2016). Descriptive analyses of transit ridership, though often outdated, have been criticized for failing to address causal links between transit conditions and ridership (Taylor and Fink, 2013). For example, as Boisjoly et al. have found, increasing car ownership rates are thought to be contributing to downward ridership trends. However, quantitative data alone cannot explain why a household decides to replace the bus with a car. Less research yet has examined these barriers in mid-sized US cities, which are characterized by differences in spatial form, funding levels, and socioeconomic conditions compared to larger metro areas.

The purpose of this study is to explore the characteristics and experiences of people who previously used transit on a regular basis, known as lapsed riders. We define lapsed riders as people who consistently rode transit for a sustained period within the past five years but have since stopped or significantly reduced their use. The research will address three questions: (1) What are the characteristics of lapsed riders (e.g., sociodemographic attributes and general travel behavior)? (2) What are the key barriers to transit use among lapsed riders? (3) What types of strategies do lapsed riders think might encourage more frequent transit use? This research is part of a broader mixed-methods study on transit ridership in mid-sized Illinois cities.

We are conducting interviews with approximately 50 individuals who live in areas served by one of eight transit agencies in mid-sized Illinois cities and who report having previously taken transit on a regular basis. We are recruiting individuals via direct social media campaigns, online communication channels of community services organizations, and a follow-up question on the household survey administered as part of the larger study. The semi-structured interviews ask participants about their transit ridership history, their experiences riding transit, their transit needs, solutions that might encourage them to ride transit again, and their perceptions of service in their city. Our interview method candidly probes for causal links by inviting interviewees to share specific stories about why they stopped riding. Interviews are recorded and transcribed for qualitative analysis. We are following the



flexible coding approach to analysis advocated by Deterding and Waters (2018), a departure from grounded theory in which researchers begin with large index codes and end with smaller analytic codes. These methods help improve construct validity when analysis is distributed across a team.

As part of a larger mixed-methods research approach, by engaging directly with lapsed riders we hope to gain insights about for whom transit becomes an unfit mode choice and why. Exploring the extent of and reasons for ridership decline can help agencies accurately respond to trends without putting riders at risk of reduced mobility. The results of this work can contribute to strategies for local and state agencies in Illinois as they respond to ridership decline, including that resulting from the COVID-19 pandemic. For the field of transportation research, our paper will show how exploring the qualitative knowledge and experiences of lapsed transit riders can strengthen analyses of determinants of transit ridership.

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Key Words: transit ridership, lapsed riders, travel barriers, qualitative research

#### **15.19 PRE-ORGANIZED SESSION - NEW MOBILITIES, TRANSPORTATION EQUITY, AND SPATIAL JUSTICE (SESSION 1/2)**

Pre-Organized Session 19 - Summary

Session Includes 510, 511, 512, 513

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Driven by new transportation models and technologies, new mobilities such as ride-hailing, car- and bike-share systems, and other forms of “mobility-as-a-service,” have constituted a disruptive trend in the transportation sector worldwide. Scholars have found mixed results regarding the promise of new mobilities to generate a more sustainable and livable urban form. But what about the promise to shape more equitable cities? Do new mobilities contribute to transportation equity and spatial justice? These questions arise as new mobilities disrupt the transportation systems that have historically provided for the mobility of most vulnerable populations, including the disabled, the poor, the children, and historically disenfranchised populations for gender-, race-, or ethnicity reasons. This pre-organized session will gather scholars interested in the equity impacts of new transportation models and technologies. Empirical studies will be presented, using a range of qualitative and/or quantitative methods.

#### Objectives:

- Mobility-as-a-service (ride-hailing, car sharing, bike sharing, etc.)

- Public-private partnerships between transportation network companies and public agencies
- Mobility and accessibility of vulnerable populations

## **TECHNO-LOGIC: EVALUATING RELATIONSHIPS BETWEEN AUTO OWNERSHIP, TRIP-MAKING, AND NEW MOBILITY SERVICES**

Abstract ID: 510

Abstract within Pre-Organized Session 19

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New technology-based services and activities reduce the advantages of private vehicle ownership, potentially allowing households to live car-free or downsize their household vehicle fleets. Several promising alternatives to car ownership have emerged globally in the last decade. These new services include smartphone-facilitated ridehail (e.g., Uber and Lyft), carshare (e.g., Zipcar), and micro-mobility options such as scooters and bike share systems.

Previous studies in the U.S. show a negative relationship between ridehail use and automobile ownership. However, existing research has struggled to document any long-term substitution effects of ridehail services on household vehicle fleet size. Ridehail competes most heavily with non-auto modes such as transit, walking, and bicycling and with taxi service (Dong, 2020; Tirachini, 2019). Although this hypothesis is difficult to test, ridehail service may delay vehicle purchases among a subset of these households. Further, ridehail services and particularly shared services such as Lyftline provide auto access to low-income households who do not own automobiles (Tirachini, 2019; Wang & Mu, 2018).

Carshare services including Zipcar, Maven, and Car2Go also offer alternatives to private vehicle ownership. These services allow users to rent fleets of vehicles for short time periods, providing the benefits of vehicle ownership without the fixed costs. Some studies show that carshare users disposed of vehicles or were less likely to purchase vehicles (Cervero et al., 2007). However, many carshare programs at least initially cater to travelers who already lack vehicles (Martin & Shaheen, 2011).

Beyond ridehail and carshare, the capability to transact business online—for work and shopping—may affect mobility decisions. Online activities such as telework and online shopping have increased over time and have grown dramatically during the current COVID-19 pandemic. While the lasting effects of this abrupt shift are unclear, online activities may persist at elevated levels beyond the current COVID-19 crisis.

In this study we use data from the 2017 U.S. National Household Travel Survey and multinomial logistic regression to investigate the relationship between technology-based accessibility and vehicle ownership. We also examine whether these relationships are consistent among households that otherwise vary in the constraints they face related to automobile ownership. Finally, to interpret the findings, we assess whether technology-facilitated services provide varying levels of mobility for households with and without auto constraints.

The analysis indicates a positive relationship between the use of ridehail and carshare services and the likelihood of being a zero-vehicle household. We also find positive relationships between online shopping and working from home and the likelihood of having fewer household vehicles than adults. Finally, ridehail use brings the trip making of auto constrained households almost to parity with unconstrained households.

New technology-based activities may allow some households to eliminate or reduce their dependence on household vehicle fleets. For other households, new technology-based services may increase their access to opportunities while easing the financial burden of vehicle ownership. Agencies and organizations should explore opportunities to better connect households—particularly households with travel and financial constraints—to technology-based

services and activities that facilitate better access.

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Key Words: automobile ownership, carshare, ridehail, E-commerce

#### **RIDE-HAILING SERVICES TOWARDS AN INCLUSIVE FUTURE: THE IMPORTANCE OF LOCAL COLLABORATION**

Abstract ID: 511

Abstract within Pre-Organized Session 19

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Partnerships between public agencies and transportation network companies (TNCs) are an emerging trend in the United States to support the mobilities of those experiencing transportation disadvantages (Leistner and Steiner 2017, Palm et al 2020). The convenience and efficiency of ride-hail services promise to improve the socio-economic accessibility of its users. Addressing transportation disadvantages also has significant implications for creating a more inclusive community (Palm et al 2020, King et al 2019). However, it remains unclear what kind and how much responsibility public sector agencies should assume to ensure that new service is making progressive contributions to its intended users.

To address these issues, I present case studies of partnerships between the public sector and ride-hail companies in the US to tackle long-standing transportation disadvantages in each community. I examine three cases: the Jobs Access Program with Lyft in Philadelphia (PA), the Mobility on Demand with Lyft in Santa Monica (CA), and the MyRide program supported by Via in Montpelier (VT). My analysis draws on policy documents, evaluation of service performances, and interviews conducted with key stakeholders including sponsoring public agencies (i.e., transit agencies and housing authorities), ride-hail industry partners, and local community organizations.

I find that the public agencies have engaged in collaboration with local community organizations and advocacy groups to ensure that the new services are delivering mobility benefits to their target user groups. Local collaborations addressed both short-term challenges to service access (e.g., digital divide and service registration) and long-term goals of guiding the built environment towards a more sustainable and inclusive future (Warner and Zhang 2020). However, even with collaboration, the services still fail to cater to some of the most vulnerable and harder-to-reach user groups namely those requiring ADA access or door-to-door service (Fraade-Blanar et al 2021, Pangbourne et al 2020). Together, these case studies highlight that ride-hail services in themselves should not be treated as a solution for transportation inequality, despite their convenience and flexibility. Instead, the public sector and civil society should come together to guide the design and implementation of services enabled by new mobility technologies towards the goal of building an inclusive community (Warner and Zhang 2020).

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Key Words: Ride-Hail, Equity, Transportation Disadvantage, Collaboration

## **RIDE-HAILING AND FIRST/LAST-MILE MOBILITY: ENHANCING TRANSIT ACCESS FOR DISADVANTAGED RESIDENTS OF A SUBURBAN COMMUNITY**

Abstract ID: 512

Abstract within Pre-Organized Session 19

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Transportation network companies (TNCs), such as Uber and Lyft, may promote transit use by filling the gap for the first/last mile in accessing rail transit stations (Hall et al., 2018; McLeod et al., 2017; Rayle et al., 2019). Whether this holds true in suburban areas, as transit lines extend to these locations, remains to be investigated. The first/last mile issue is of particular significance in promoting transit ridership in these typically low-density and car-dependent localities. Furthermore, the first/last mile issue is critical to advance equitable access to opportunities in sprawled metropolitan areas (Boarnet et al., 2017). Yet, there has been no quantitative study assessing whether TNCs as a complement to transit can contribute to advancing transportation equity. This paper aims to examine the effectiveness of a municipality's partnership with a TNC to meet the first/last mile mobility needs of disadvantaged residents in a suburban community.

The paper draws on an in-depth case study of the GoMonrovia program through which the City of Monrovia, a suburban community connected to the Los Angeles Metro system since 2016, provides its residents with subsidized Lyft rides. What is the socioeconomic and demographic profile of the first/last mile users of the program? To what extent does the GoMonrovia program promote rail transit access to low-income and transit-dependent populations? These are some of the key research questions addressed in this paper.

Building on a trip database provided by Lyft, recent demographic and socio-economic information from the American Community Survey, and City's zoning and land use, we analyzed the spatial distribution of trip origins and destinations at the census block group level. This work will be supplemented by person-level data from a survey of users, to be completed in April 2021. The survey will be distributed via the Lyft app, the City's newsletter, and social media (Facebook, Twitter, and Instagram). At least 500 responses are anticipated. Regression analyses of both the Lyft travel data and the survey responses will identify the extent to which socio-demographic and land use factors predict the use of the GoMonrovia program as a first/last mile transit enabler.

More than one million Lyft trips were subsidized by the City of Monrovia between March 2018 and August 2020, out of which approximately 10% either began or ended near the Monrovia Metro station. Preliminary analyses indicate that neighborhoods with relatively high shares of low-income transit-dependent renters or young Latinx families

generate the bulk of these trips. Again, analysis of survey data should further illuminate whether the program is a reliable first/last mile option for disadvantaged populations. The findings can inform transportation researchers and policymakers by establishing the profile of suburban users most likely to rely on TNCs for the first/last mile of a transit station.

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Key Words: Transportation network companies (TNCs), First-last mile, Public-private partnership, Transit access, Transportation equity

## EVALUATING THE EQUITY IMPLICATIONS OF RIDE-HAILING THROUGH A MULTI-MODAL ACCESSIBILITY FRAMEWORK

Abstract ID: 513

Abstract within Pre-Organized Session 19

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In metropolitan regions, it is crucial that transportation policies and services provide equal opportunity to participate in economic, social, and civic activities. As such, accessibility has emerged as the primary metric of transportation benefits researchers use in distributional analyses and equity evaluations (El-Geneidy et al., 2016). Despite the importance of incorporating accessibility into equity evaluations, and the many examples of examining ridehailing equity (e.g. Barajas and Brown, 2021), there have been few attempts to measure ridehailing benefits within an accessibility framework. One reason for this shortcoming is that most common accessibility measures rely on travel-time-based fields of interaction, which exaggerate the benefits of travel modes that have pecuniary costs based on travel time or distance, such as ridehailing. We address this challenge through the application of Accessibility Profile Analysis (APA) (Neudorf, 2014; Lee, 2019). APA is an analytical framework that can assess place-based accessibility using generalized costs (GC) of travel, rather than time alone. We deploy APA in a comparison of accessibility provided by ridehailing, public transportation, and an integrated mode with ridehailing serving as the ingress mode in a rapid transit trip. We apply an equity lens to our analysis of Toronto to uncover where and for whom ridehailing and integrated modes provide accessibility benefits over and above those offered by the public transportation system.

The base APA results consist of jobs accessibility scores for different modes of travel and increasing levels of generalized cost. We were quite shocked to see how closely the ridehailing profile tracked with the profile for public transportation, indicative of a concerning level of competition between the two modes. In general, ridehailing provided slightly higher levels of jobs accessibility at lower levels of generalized cost, and slightly less benefit for higher cost thresholds. The ridehailing benefit was higher farther away from the central business district, especially near the municipal boundary where cross-boundary job opportunities were cheaper and faster to reach by ridehailing compared to poorly integrated transit services and double-fare requirements.

Surprisingly, when analysing the integrated ridehail/transit mode, we found that it offered almost no accessibility benefits over transit alone, reaching a maximum neighbourhood-level benefit of just 3%. Presumably, the high fixed cost of ridehailing outweighs the time-savings provided over walking+bus access to rapid transit. This result may be tightly tied to the Toronto case study, where the Toronto Transit Commission operates one of the most extensive and frequent bus networks in North America.

For both ridehailing and integrated ridehailing/transit, their comparison to transit largely depends on the assumed value-of-time (VOT). In our paper, we selected a VOT near the minimum wage for the city of CAD14; using a higher VOT would increase the estimated benefit of ridehailing. This has two implications for equity. First, the benefits for ridehailing accrue to those with higher VOT, assumed to be wealthier. Second, the benefits of ridehailing are achievable only if the high out-of-pocket costs are affordable to equity seeking groups, many of whom are low wage workers or belong to low-income families (Young et al., 2019).

We compared all of our results between the general population of Toronto and those living within Neighbourhood Improvement Areas (NIAs). Notwithstanding affordability barriers to use, ridehailing was estimated to provide nearly twice the benefit for residents of NIAs compared to other neighbourhoods in Toronto for lower cost trips, and about 1.4 times the benefit for higher cost trips. Thus, targeted mobility subsidies NIA residents may result in the realization of ridehailing-based accessibility benefits by members of equity seeking groups. Nonetheless, job accessibility for carless households remains lower in disadvantaged areas – even after the introduction of ridehailing.

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Key Words: accessibility, ridehailing, equity analysis, first/last mile, generalized cost

#### 15.45 PRE-ORGANIZED SESSION - OUTLINING A RESEARCH AGENDA FOR TRANSPORTATION GOVERNANCE

Pre-Organized Session 45 - Summary

Session Includes 653, 654, 655, 656

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A growing number of transportation planning scholars recognize that the institutional underpinnings of transportation policies can be just as consequential, or more so, than the technological and engineering solutions that often dominate the discourse. For the pursuit of sustainable transportation in particular, existing scholarship suggests that impediments are not technical but institutional--the decision to adopt, deploy or use a particular technology or policy tool, not the tool itself. While technical and operational barriers do exist, most are well understood and involve fairly routine actions for implementation. Decisions to do things differently, however, must

confront existing institutional landscapes and established governance systems. This session represents an opportunity to look across geographic scales--state, region, and municipal--to assess both what we know and what we still need to know about transportation governance and policy-making. This session aims to bring many of these research strands together into a single conversation to outline a research agenda around transportation governance moving forward.

Objectives:

- Understanding the state of practice of research on transportation governance

## **MAPPING THE RISE OF CITY TRANSIT PLANNING**

Abstract ID: 653

Abstract within Pre-Organized Session 45

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Academics and practicing planners have long emphasized the import of regional transit planning (Weinreich, 2016). Planning at the regional scale ensures that transit is coordinated across the multi-jurisdictional commuteshed, and enables transit networks to serve a variety of travel needs (in theory). The regional focus, however, has the potential to obscure transit planning efforts at the city and neighborhood scale, including the responsibility municipal governments have over local streets that transit networks require to operate efficiently. Since the mid-2000s, an increasing number of cities have taken steps to enhance their transit planning capacity. This has happened along several fronts. A range of cities have taken responsibility for improving the reliability of buses on their streets (Ray, 2019) while multiple mid-size cities have pushed forward with neighborhood transit systems to facilitate economic development (King and Fischer, 2016), and as a means to overcome regional barriers to transit funding (Fischer 2019).

While Wachs (2003) has traced the devolution in funding and the rising role of the local option sales tax in California, there is a lack of research examining the corresponding devolution of planning for transit across contexts. This paper seeks to fill the current gap using a novel database of transit planning and governance in the 40 most populous US cities. Using website analysis and review of existing planning documents, our analysis indicates that local responses are mixed. Of the 40 cities examined, one-third had no transit plan, one-third had a mobility plan that deprioritized cars but was not specifically transit focused and one-third had a transit plan either completed or in progress. In this paper we present three cases studies drawn from each of these categories, to better understand the motivations behind local transit and mobility planning and to provide insights on how the 'devolution revolution' in transport finance (Wachs 2003) is playing out in the planning realm.

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Key Words: transportation governance, transit planning

## **SUPPORTING REGIONAL TRAVEL THROUGH CROSS-BOUNDARY DECISION-MAKING: CASE STUDIES OF METROPOLITAN PUBLIC TRANSPORTATION SYSTEMS AS POLYCENTRIC GOVERNANCE NETWORKS**

Abstract ID: 654

Abstract within Pre-Organized Session 45

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Some US MSAs have over 20 transit agencies in the same region (e.g. 23 in Miami and 21 in Los Angeles), while 16 US metro regions with over 1 million people lay in a state that allows local jurisdictions to opt out of a transit agency, creating the potential for “transit deserts” with no service (Weinreich & Bonakdar, 2020). This study examines the presence of fragmentation of transit agencies within a metropolitan region, as well as the contours of formal cross-agency linkages that provide opportunities for service coordination across transit agencies and municipal governments. We define a regional space for analysis of public transit that covers an entire region, rather than a single transit organization. Such regional units of transit service will clearly differ according to effectiveness, efficiency, and equity, but we do not know if and how the variation in outcomes links systematically and significantly to variation in metropolitan governance. Does the organization of decision-making authority—the number of decision-making centers in the system, and their independence and interdependence—matter to their ability to connect localities by transit, a longstanding question among scholars of planning, public policy, and public administration—requiring a valid and reliable method for measuring regional transit governance that could support large-sample quantitative and comparative analyses. However, the complexity of even one regional area’s transit governing system has hindered the development of such a measure, making it impossible to compare governing systems across regions, or tie governance methods with particular transit outcomes. This article is an attempt to overcome that obstacle. We draw together insights from polycentric governance and network theory to develop a conceptual framework for answering this question here, by measuring the fragmentation of a single region’s transit governance systems. We follow this with a network analysis of its formal methods for connecting transit agencies in order to provide coordinated or integrated transit service. The framework we develop includes two components that capture the independence and interdependence within the system: weighted nodes that represent semi-autonomous decision-making centers, and weighted edges that represent the formal and informal institutions (e.g., interagency agreements, conjunctions, and cross-jurisdictional funding sources earmarked for transit). These institutions provide the formal structure necessary to connect multiple transit agencies and municipalities in an integrated transit system. We describe the logics behind delineating and weighting nodes, review the possible cross-boundary mechanisms that comprise the inter-nodal edges, and apply the results in a single region in order to understand how the network of governing institutions impacts their ability to overcome fragmentation barriers and provide integrated transit services across the region.

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Key Words: Fragmentation, Polycentricity, Network, Regional Governance, Collaboration, Coordination

## **TRANSPORTATION FUNDING, ENERGY TRANSITION, AND GOVERNANCE: THE ROLE OF STATE LEGISLATORS**

Abstract ID: 655

Abstract within Pre-Organized Session 45

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Absent coordinated national policy to guide the transition towards less carbon intensive energy use patterns, policies addressing energy transition have largely been left to subnational governments. Planning departments and local officials in many cities have embraced this challenge, particularly when it comes to promoting sustainable transportation. Yet sustainable cities need state partners as well.

State legislatures stand to substantially influence movement toward decarbonization in the transportation sector. State legislators and legislative committees play a key role in generating and directing public revenues to support transportation planning and investment in the U.S. Historically, the basic institutions of state transportation funding are tightly coupled with the transportation sector's dependence on fossil fuels. For instance, legislatures rely overwhelmingly on the per-gallon motor fuel excise tax to raise state transportation funds, making growth in transportation investment often dependent on increased gasoline and diesel fuel consumption. Further, many legislatures have adopted laws or constitutional provisions preventing use of state transportation revenues for public transportation and other non-highway modes, cementing the link between state resources and car-based transportation.

Given their responsibilities for transportation revenue, state legislators unavoidably confront policy choices that impact the prospects for and pace of transportation decarbonization. This is true as much in states with expansive sustainability and decarbonization policy commitments as in states with no such commitments. State legislation is needed, for example, to adjust the structure or rate of existing fuel taxes and other transportation taxes and fees or to adopt any new, non-carbon-based transportation revenue sources. Legislators also oversee the budgets and expenditures of state transportation agencies and the distribution of funds to metropolitan and local transportation planning bodies and divisions.

Informed by interdisciplinary perspectives from planning, political science, and public finance and economics, this research asks how statehouse lawmakers understand the connection between the energy transition underway in transportation and the state resources available for transport infrastructure and services. Changing options for transportation energy sources increasingly promise to reduce consumption of conventional motor fuels, underscored by General Motors' recent announcement that it would phase out petroleum-fueled vehicle production by 2035. The accelerating shift to electric vehicles promises to sink state fuel tax revenues, weakened already by increasingly fuel-efficient conventional cars and by newer hybrids.

As the transportation industry moves steadily toward low carbon energy sources, we examine how state lawmakers view the important transportation policy problems facing their states. When lawmakers consider energy transition or decarbonization, what concerns are important to them, and how do they discuss or frame the issues? To what stakeholders do they look for cues and information about this policy area? How do urban and rural concerns play in? We note for context that while over 30 states have increased their state motor fuel taxes since 2013, few have

made larger structural moves to address the dismantling of transportation revenues from energy changes.

This project surveys the roughly 1,700 statehouse lawmakers working at the intersection of transportation and energy policy across U.S. state legislatures. These legislators decide central questions about how to marshal and use resources for transportation investment in their states.

We explore legislators' perceptions of transportation policy problems and their connection to energy policy, the nature and salience of the challenges faced, perceived solutions, opportunities or constraints to enacting policy change, and relevant stakeholders. Our work promises to shed light on how state policy elites frame problems in this domain and to suggest the circumstances under which state lawmakers might facilitate energy transition in the transportation sector and local efforts to support that transition.

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Key Words: decarbonization, transportation finance, state legislature

#### **AIRPORT COMPETITION AND MEGAREGIONAL IMPACTS: CHALLENGES AND OPPORTUNITIES FOR PLANNING INSTITUTIONS**

Abstract ID: 656

Abstract within Pre-Organized Session 45

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Changing dynamics in U.S. aviation have significant reverberations across ground transportation systems within and beyond metropolitan regions. Yet, studies of regional and megaregional transportation planning in the U.S. have paid generally little attention to the influence of aviation trends on surface transportation demand in and among metro regions. Further, most studies on metropolitan planning organizations (MPOs)—the bodies responsible for federally required transportation plans and spending programs in urban regions—say very little about the role of airports or aviation representatives in regional transportation decision-making.

This research is the first of its kind to explore formal and informal relationships between airports and metropolitan planning organizations (MPOs). We observe that rapid change in U.S. aviation has significant impacts for ground transportation access to airports, affecting not only on-airport planning but also regional and megaregional travel flows and economic development. During the 2000s, seven major US airlines merged into three, concentrating flights in key hubs and reducing flights in smaller airports. These changes expand the geography of airport choice, resulting in the phenomenon known as 'market leakage.' Air travelers increasingly make longer distance trips, often in personal vehicles, to access key hub airports, substituting these for more proximate local airports (Fuellhart, 2007; Ryerson & Kim, 2018; Kim & Ryerson, 2018); such substitutions visibly impact surface travel between megaregional nodes.

This study explores the challenges and opportunities that aviation market changes present for existing transportation governance structures and institutions. In particular, we examine the capacity of existing planning

institutions—largely siloed in separate air and surface transport planning domains—to address the megaregional dynamics associated with aviation sector shifts. For instance, how do U.S. airport ownership and governance models enhance or hamper airport engagement in regional and megaregional transportation planning?

We draw on original data to characterize airport representation across MPOs nationwide. Next, we follow a case study approach to observe, in a single geographic context, how and to what extent airport sponsors engage in regional and megaregional transportation planning. We focus on Texas Triangle megaregion, one of the fastest growing megaregions in the country, and home to two large hub airports. Extensive review of planning documents and interviews with key informants allow us to report on the relationship between airport planning and planning by MPOs.

We find the incidence of airport-MPO institutional overlaps or formal coordination is limited. Further, where MPO-airport planning mechanisms exist, like the Regional Aviation System Planning (RASP), they may be underutilized, leaving important shifts like market leakage and their regional and megaregional impacts unaddressed. We also find ample scope for greater airport involvement in MPO planning, for instance through data collection and sharing at minimum, and through more expansive joint planning efforts. We conclude with lessons for policymakers, planners (particularly at airport authorities and MPOs), and planning scholars with an interest in aviation issues.

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Key Words: market leakage, megaregion, governance, airport sponsor, MPO

### **15.100 PRE-ORGANIZED SESSION - NEW MOBILITIES, TRANSPORTATION EQUITY, AND SPATIAL JUSTICE (SESSION 2/2)**

Pre-Organized Session 100 - Summary

Session Includes 525, 526, 528, 529, 561

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Driven by new transportation models and technologies, new mobilities such as ride-hailing, car- and bike-sharing systems, and other forms of “mobility-as-a-service” have constituted a disruptive trend in the transportation sector worldwide. Scholars have found mixed results regarding the promise of new mobilities to generate a more sustainable and livable urban form. But what about the promise to shape more equitable cities? Do new mobilities contribute to transportation equity and spatial justice? These questions arise as new mobilities disrupt the transportation systems that have historically provided for the mobility of most vulnerable populations, including the disabled, the poor, the children, and historically disenfranchised populations for gender-, race-, or ethnicity reasons. This pre-organized session will gather scholars interested in the equity impacts of new transportation models and technologies. Empirical studies will be presented, using a range of qualitative and/or quantitative methods.

#### Objectives:

- Mobility-as-a-service (ride-hailing, car sharing, bike sharing, etc.)

- Public-private partnerships between transportation network companies and public agencies
- Mobility and accessibility of vulnerable populations

## **OLDER ADULTS AND RIDE-HAILING IN CALIFORNIA: ESTIMATING WILLINGNESS TO PAY FOR NEW SERVICE FEATURES ACROSS VARIOUS TRIP DESTINATIONS**

Abstract ID: 525

Abstract within Pre-Organized Session 100

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Recent scholarship shows that most ride-hailing users are young and educated individuals (Alemi et al., 2018; Conway et al., 2018; Vivoda et al., 2018). There is little research, comparatively, on how willing older adults are to adopt ride-hailing services. The limited research that is available suggests that few seniors use ride-hailing services to meet their mobility needs (Vivoda et al., 2018). On the one hand, individuals over 64 are more likely to age in place than move late in life. Studies also indicate that the senior population is growing faster in suburbs and rural locations than in city centers (Rosenbloom, 2012). Seniors who do not live in city centers are particularly at risk of being transportation deficient. On the other hand, ride-hailing has the potential to expand out-of-home mobility in some of these locations but we do not yet understand two crucial aspects of demand for ride-hailing among older adults. Are there ride-hailing service features currently not supplied by providers that can positively influence seniors' decisions to use ride-hailing services? How much are older adults willing to pay for ride-hailing in its current form and for these potentially helpful new service features?

To learn about the reasons why older adults might adopt ride-hailing, we collected 2,917 completed responses via an online survey of Californians 55 and older. We requested that the data vendor provide a sample that represented California adults 55 and older in terms of 2017 American Community Survey 5-year estimates for gender, race and ethnicity, employment status, annual household income, and age. The data were also sampled by Zip Code so that the sample would represent various types of communities found across California, including, urban centers, suburbs, and small town/rural areas. We designed the survey instrument to gather responses regarding ride-hailing service availability and use patterns under a variety of scenarios using a stated-preference experimental design. Specifically, we offered various combinations of service features and pricing across three categories of trip destination.

We estimated the willingness to pay for ride-hailing services to three trip destinations, namely, trips for errands like grocery/pharmaceutical needs, trips for social purposes (visiting family/friends), and trips for non-emergency medical purposes. We also investigated preference for service features such as ability to pay using paper bill, accessible vehicle, driver trained in elder care, and booking over phone. We estimated the willingness to pay for these service features using a nested logit model. We found that older adults (65+) are willing to pay for social purpose rides more than errand-type rides or medical rides, while the 55-64 year cohort is willing to pay for social and medical rides more than errand-type rides. Older adults are generally willing to pay less than \$20 for any trip purpose, while the 55-64 year cohort is willing to pay \$20 but less than \$30 for rides to social and medical destinations. Moreover, most riders are willing to pay an average additional \$5 for their preferred service feature. Our research provides an understanding of how ride-hailing services can be made more attractive for older adults as well as a foundation for the pricing structure that is acceptable for senior riders.

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Key Words: Older Adults, Ride-hailing, Service feature, Technology adoption, Willingness to Pay

## RIDE-HAIL USE AND BARRIERS AMONG LOW-INCOME ZERO CAR HOUSEHOLDS

Abstract ID: 526

Abstract within Pre-Organized Session 100

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In most US cities, cars remain the most effective mode to access economic and social opportunities. The large majority of American households own a car, and most zero-car households do not choose to be car-less, but rather face physical and economic constraints to car ownership (Brown, 2017). But car ownership is often unstable, with households moving in and out of car ownership over time (Klein & Smart, 2015). Despite not owning a car, zero-car households still make many trips by car, either by borrowing one, getting a ride, or hailing a taxi (Pucher & Renne, 2003). More recently, research suggests that ride-hail services like Uber and Lyft may provide car access to travelers and neighborhoods with lower levels of car ownership and filling an existing gap in automobility (Brown, 2019). Research has previously investigated ride-hail access among other groups with reduced car access, such as older adults and travelers with disabilities (see for example Shirgaokar (2018)); but research has yet to examine in detail how a third group of oft-marginalized travelers—low-income and zero-car households—may use ride-hailing to boost mobility. To this end, our research addresses three questions: First, how do zero-car, low-income households typically gain access to cars? Second, how do these households use ride-hail services? And third, what barriers do they face to accessing ride-hail services?

We answer these questions using a combination of survey and interview data. We administered an online survey to 1,000 adults and conducted interviews with an additional 40 adults, all of whom earn less than \$50,000 per year and do not own a car. In addition to background information on household, personal, and general travel characteristics, we asked if and how respondents use and access cars, including ride-hail services, for their daily travel. The surveys communicate issue and experience prevalence, while the interviews highlight the nuance and complexity of car access in America.

Our findings offer rich insights for planners and transportation professionals about the mobility challenges zero-car households face and their strategies to access the benefits of automobility. Findings reveal the share of zero-car, low-income households who use ride-hailing to gain car access, and the frequency and trip purposes for which they

hail a ride. Findings also yield understandings into the barriers that travelers face in accessing ride-hail services and offer policy imperatives for broadening car access to travelers with constrained automobility options.

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Key Words: ride-hail, transportation equity, car-less, travel behavior, shared mobility

### ASSESSING E-BIKES AS AN EQUITABLE AND SUSTAINABLE TRANSPORT OPTION

Abstract ID: 528

Abstract within Pre-Organized Session 100

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Many trips made in the United States are 2-4 miles long, a distance cyclists can cover in 10-20 minutes. Yet bike mode share remains below one percent nationwide. Barriers to cycling include not knowing how to ride a bicycle, not having one, costs of acquiring one, maintenance requirements; worries about theft, and a shortage of bike lanes and parking. Physical limitations, concerns about falls and crashes, and concerns about the comfort levels of riding pose additional barriers. Perceived mismatches with dress / grooming expectations and fear of disapproval of family members, friends and colleagues are also issues for some (Deakin et al., 2019.)

Electric bicycles (e-bikes) don’t entirely remove concerns about cycling, but they do overcome several barriers and reduce the impact of others (Dill and Rose, 2012; MacArthur et al., 2014). The battery-powered electric motor reduces the physical demands of riding and means that a wider range of trips can be accomplished. E-bikes cost more than conventional ones but are far cheaper than a small automobile and can cost less than a transit pass. In addition, e-bike rental options are often available.

This study identifies target markets and factors to build into e-bike demonstration projects for California. We analyze the California Add-on to the National Household Travel Survey (CA-NHTS) and conduct focus groups, interviews and a survey to assess market potential and program design alternatives. We focus on e-bikes’ ability to 1) increase mobility and access for low income and minority households, and 2) reduce auto use.

Our analysis shows that over 40% of trips in California are 3 miles or less, with most made for shopping, personal business, school and social-recreational purposes. A significant portion of work trips are also short. Most trips made by members of disadvantaged groups are shorter than average.

About 10% of focus group and interview respondents expressed enthusiasm about trying e-bikes, primarily for social-recreational trips or short errands. An additional 20% would be “interested but concerned” (Dill and McNeil, 2013; Haustein and Moller, 2017). Enthusiasts are predominantly young and many are current cyclists. The

“interested but concerned” included car drivers and a small number of pre-pandemic transit riders.

Of those who expressed interest in e-bikes, anticipated advantages were less physical effort, somewhat higher speeds, and the ability to carry cargo or passengers. A few cited the lure of “new technology” as an attraction. For those uninterested in e-bikes, the main barriers are 1) not having ridden a bike in many years - concerns about their ability to ride safely, 2) concerns about a lack of public infrastructure separating bikes from cars, 3) not having a secure place to park an e-bike at home, 4) concern about the durability of e-bikes and resulting costs, and 5) concern that riding an e-bike would make them seem unprofessional, un “lady-like”, or otherwise foolish.

Our survey confirmed these findings and revealed that members of carless households thought an e-bike would allow them to expand their range of activities. However, respondents revealed a reluctance to bike or e-bike in bad weather or after dark and underscored concerns about e-bikes’ cost and the lack of secure parking for them (cf. Jones et al., 2016).

The findings of the study indicate that e-bikes have potential for increasing mobility and access for transportation-disadvantaged households in California and a small, but real potential for reducing auto trips. In order to encourage e-bike use, planners should press for safe bike lanes and secure parking at both residential and commercial locations. E-bike demonstration projects should be conducted in both summer and winter seasons to evaluate changes in use as a function of weather.

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Key Words: Bicycles, e-bikes, transportation disadvantaged, sustainable transport

#### **MICROTRANSIT FOR SUBURBIA: CAN ON-DEMAND MICROTRANSIT IMPROVE ACCESS**

Abstract ID: 529

Abstract within Pre-Organized Session 100

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On-demand and shared transport services have blossomed in the past decade, from scooters to ridehailing to microtransit. To date, the overall effect of these services on improving accessibility as part of integrated transport systems is unclear, though the potential of benefits through integration remain. This research examines how microtransit can be incorporated into Transportation Demand Management (TDM) policies in Tempe, Arizona to improve non-car accessibility in suburban locations. For neighborhood transit service, Tempe currently operates a multi-route transit circulator system called Orbit, which offers fare-free transit at 15-minute headways to and from downtown Tempe, next to the Arizona State University campus in north Tempe. The Orbit system is financed through the city, and as part of the overall budget consequences of COVID-19, service has been reduced. Starting summer 2021, the city will pilot a program to replace the southernmost Orbit line (named STRN) with privately

operated microtransit that will operate under the umbrella of the city's TDM program. Specifically, the microtransit services will operate under a mobility hub model where on-demand service is offered to a small number of activity centers in south Tempe in an effort to improve access to communities currently underserved by non-auto modes. This research consists of analyses of the development, deployment and evaluation of the microtransit pilot. The governance of targeted microtransit systems, constraints and opportunities from city-financed programs, influences on ridership, evaluation of mobility hubs, and the role the new mobility technologies can play in TDM programs.

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Key Words: Microtransit, Mobility Hub, Transportation Demand Management, Tempe, Governance

#### **BIKESHARE DESTINATION CHOICES AND ACCESSIBILITY AMONG DISADVANTAGED COMMUNITIES**

Abstract ID: 561

Abstract within Pre-Organized Session 100

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Disadvantaged populations are not highly represented in bikeshare users' profiles (1), due to physical, financial, and cultural barriers (2–4). However, for disadvantaged populations, bikeshare may represent an affordable option to travel from one place, thus improving access to basic needs, services, and opportunities. A previous theory paper by the authors has already shown that bikeshare systems could significantly improve accessibility, especially for disadvantaged communities, provided that users have the capability to access and use bikeshare services (5). However, there is a lack of research exploring whether individuals from disadvantaged areas actually experience improved accessibility by using bikeshare as a transport mode. Moreover, a greater understanding of the destination choices of bikeshare trips among disadvantaged populations is needed, which would help confirm the connection between bikeshare and accessibility, and the extent to which bikeshare is used to access desired places and opportunities. To help fill this gap, this study concentrates on analyzing bikeshare destination choices for disadvantaged populations. Analyzing these choices enhances our understanding of the spatial dimension of accessibility and the equality of opportunities.

This study uses Chicago as a case study given its large urbanized area (2,443 square miles), the number of disadvantaged areas (approximately 10% of census blocks are in disadvantaged areas) in the southern and western parts of the city, and its large bikeshare system (Divvy bikeshare system, with 611 stations and around 6,000 bikes). The authors created a 400-meter buffer for every bikeshare station, and compiled demographic data (e.g., percentage of minority populations and median income data) and other socio-economic information (e.g., job opportunities and points of interest) for each buffer area based on the Census and American Community Survey (ACS) data. Then, this study uses historical bikeshare trip origin-destination (OD) data to calibrate a competing



destination model (CDM). All OD pairs were classified into four types, based on originations and destinations observed in disadvantaged areas and other areas, to capture different travel patterns of bikeshare trips.

The results show that improved accessibility (more desired opportunities) between origins and destinations plays an important role in attracting disadvantaged populations to bikeshare. It is also interesting to note that disadvantaged users tend to make longer trips to other areas to reach greater accessibility, e.g., to access better grocery stores and more job opportunities. Job opportunities (typically the most important outcome in accessibility studies) will attract more bikeshare trips in disadvantaged areas, which can be verified by mapping the employment rate against OD trips. This indicates that commuting is an important trip purpose for bikeshare usage, especially for people living in disadvantaged areas. However, these users are more sensitive to the extra charge levied after the free trip time threshold (30-minute grace period). In the end, this study conducts a sensitivity analysis to further show the influence of improved accessibility on bikeshare destination choices, particularly in disadvantaged areas.

This study also offers practical applications for bikeshare operators and local governments. First, the CDM provides a reasonable estimation of distributions for bikeshare trip distance. This can inform local governments and service providers in siting bikeshare stations to cover bikeshare trip demand within the most frequent trip distance/time range. Second, bikeshare planning processes should include accessibility metrics when choosing bikeshare station locations in disadvantaged areas. This will steer bikeshare development in the direction of maximizing social benefits with distributive justice and equity considerations for disadvantaged populations. Third, increasing the grace travel time limit could promote more bikeshare demand in disadvantaged areas (hopefully, while opportunities are also being increased within those areas). Overall, this study provides insights into equity issues and travel behaviors for bikeshare systems in disadvantaged areas.

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Key Words: bikeshare systems, competing destination model (CDM), accessibility, transportation equity, social benefits

## **ROUNDTABLES**

### **15.46 ROUNDTABLE - MOVING FORWARD AGE-FRIENDLY TRANSPORTATION IN THE U.S. IN A TECHNOLOGY ERA**

Abstract ID: 46

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This round table discusses critical topics related to transportation planning and policies for older adults in a technology era. The rapidly aging cities and communities in the United States call for planners' efforts to accommodate older adults' residential and mobility needs. Based on the Census Bureau's projections, the nation's 78 million older people (those aged 65 and over), primarily Baby Boomers (born between 1946 and 1964), will outnumber those under 18 for the first time in U.S. history in 2035. Places with rapidly increasing older adults are mainly located in low-density areas in the Southern and Western states, such as Florida, California, and Texas. In the short run, the private vehicle is still the dominant travel mode for older adults in the U.S. (Rosenbloom, 2009). Car dependence adds to the travel difficulties for older adults who have medical conditions resulting in asking others for a ride or giving up driving and those who could not afford cars.

However, transportation technologies and Information Communication Technologies (ICT) may redefine future transportation for older adults. The ride-hailing services have redefined "car access" and have enabled those who have difficulties owning a car or driving with more convenient access to daily destinations. Other technologies, such as online shopping, e-health, have also redefined older adults' lifestyles. Older adults benefit less from these technologies than younger people. Poor and less-educated older adults benefit even less (Agrawal et al., 2020; Brozen et al., 2019). However, policymakers may help mitigate the age disparities in technology use. For example, in Florida, the local government subsidizes low-income people in using ride-hailing services for healthcare trips and connect with public transit (Leistner & Steiner, 2017).

The COVID-19 aggravated inequities of technology use and vehicle access among older adults. Technology use is more important than ever for older adults during COVID-19 as older people have more limitations in travel and have more health threats than ever than their younger counterparts. Therefore, those who have more readily access to technologies during COVID-19 and those who have more technological knowledge are easier to offset their loneliness and depression during the pandemic.

As transportation planners aiming for more age-friendly communities and cities, we will discuss three questions intersecting aging and transportation in an era of technology through this round table: (1) What could urban planners do to retrofit the built environment and transportation systems in the U.S. to reduce older adults' car dependency? What are the obstacles and opportunities? (2) Will ride-hailing and other new technologies among older adults relieve the travel difficulties of the transport disadvantaged older adults? To what extent do poor, less-educated, or otherwise less privileged older adults benefit from these technologies? How can programs or policies be structured to make these options accessible to all older adults? (3) What does the COVID-19 say about the inequity of technology use and transportation planning for older adults? What are the implications for transportation planning for older adults in the post-COVID time?

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Key Words: older adults, automobile, built environment, technology, ride-hailing

## 15.85 ROUNDTABLE - MOBILITY-AS-A-SERVICE IN THE US: THE CURRENT STATE OF PRACTICE

Abstract ID: 85

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Mobility-as-a-Service or MaaS is the concept of a platform that offers integrated access to a full suite of public and private transportation modes. The benefit of a MaaS system is that it allows individuals to easily understand the full complement of transportation services available to them and then to book and pay for their transportation -- all through one platform. This easy-to-use access to transportation services also facilitates the move away from single-occupant-vehicle trips. The MaaS concept has been much more developed in Europe, with leaders such as Ubigo in Sweden, Qixit in Germany, Whim in Finland and Smile in Austria.

The purpose of this session is to understand the current state-of-the-art in of MaaS-oriented planning practice in the United States. This includes the major players working towards MaaS concepts in the U.S., whether in the public sector, among consultants, and among technology firms; the performance of various pilot projects working towards multimodal integration; how different MaaS thinkers are approaching governance and regulatory issues; and the role that technology can play or has played in offering greater transparency and choice in multimodal travel planning, booking, and payment. Challenges to implementation will be identified and addressed, including duty of care (municipal liability), data and privacy standards and management, and the path from MaaS to automated and connected mobility.

We will also discuss the relationship between MaaS and public transit, including the issue of whether public transit agencies should be trailblazers at the forefront of MaaS implementation, or whether such agencies are better suited to be partners with the private sector leading the charge for change and innovation.

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Key Words: Mobility-as-a-Service, Mobility on Demand, Transportation Governance, Transportation Technology

## 15.777 ROUNDTABLE - TRANSPORTATION BARRIERS TO HEALTHCARE ACCESS: WHAT HAVE WE LEARNED DURING COVID-19

Abstract ID: 777

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Transportation has been widely recognized as a major barrier to health care access (Syed et al., 2013). Nearly 5.8 million Americans in 2017 reported the delay of medical care because of a lack of viable transportation options (Wolfe et al., 2020). Transport and healthcare system changes during COVID-19 provide a new way to understand barriers and facilitators of medical care access. Transit system disruptions combined with health concerns from shared vehicles greatly reduced transit supply and likely increased barriers. However, the pandemic also brought policy changes to make telemedicine more accessible and reduce transport barriers.

This roundtable will review how the pandemic impacted transport supply particularly for public transit. We will bring in user perspectives by sharing survey work with transit riders, health care providers, and individuals with high healthcare needs. The group will reflect on

1. What COVID-19 clarified about transport barriers to care, and
2. How what we have learned can be applied in the post-pandemic period to reduce transport barriers.

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Key Words: healthcare, equity, covid-19

## **INDIVIDUAL PAPER SUBMISSIONS**

### **QUANTIFYING THE IMPACT OF CORRIDOR MANAGEMENT INTEGRATING TRANSPORTATION AND LAND USE**

Abstract ID: 21

Individual Paper Submission

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The primary goal of conventional corridor management has been centered on maintaining road conditions or improving traffic flows in the face of legal, environmental, and economic constraints on the corridor system itself (Démare et al., 2017). However, this narrow focus on travel speed and efficient moves has ignored significant

interactions between transportation corridors and the areas they serve, mainly trip generation by serving areas. This study investigates the interaction between the corridor highway system and surrounding land use, developing a methodology for predicting the traffic impacts by the surrounding corridor impact area.

We collected household travel survey data with XY coordinates and computed built environment characteristics in terms of D variables of corridor impact area in 30 metropolitan regions. In the planning field, land use characteristics are often denoted in terms of D variables: words beginning with D, including density, diversity, design, destination accessibility, and distance to transit, as well as demographics that are not part of the built environment (Ewing & Cervero, 2010). We defined the corridor impact area to examine the association between new highway investments and built environment change, creating a 2-mile buffer area distancing from the centerline of the corridor using ArcMap10.7.1 (Funderburg et al., 2010).

A multilevel regression modeling (MLM) is employed as statistical analysis for estimating the probability of trips captured as internal trips within corridor impact area and external trips with different travel mode choices. The multilevel regression modeling allows us to explain the hierarchical data structure, which is nested at different levels: individual, corridor, and regional levels. In addition, models were estimated separately by trip purposes (home-based work (HBW), home-based other (HBO), and non-home-based (NHB)) to distinguish peak hour trips from non-peak trips.

We expect the research results that those corridor impact areas with good access to the destination, employment, and transit services will have a higher level of walking, biking, and transit mode shares, which result in lower vehicle miles traveled on the corridor highways. In addition, the mode share of internal trips of corridor impact area will decrease with larger household size and higher vehicle per capita.

While transportation and land use integration are often associated with best planning and engineering practices, this is the first study to establish empirically based methods to understand and improve corridor management in order to provide decision-making tools for planners and engineers. We need to move away from a paradigm of defining a corridor simply by vehicle throughput to include notions of the best land uses that are attractive for development. This research will develop new performance measures that demonstrate the trade-offs between corridors function and remaining attractive for development.

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Key Words: Corridor management, trip generation, land use, vehicle miles traveled, mode share

## STRENGTHENING THE RESILIENCE OF INTERDEPENDENT INFRASTRUCTURE SYSTEMS THROUGH TRANSFORMATIVE CLIMATE ADAPTATION PLANNING

Abstract ID: 38

Individual Paper Submission

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Climate hazards can cause widespread loss of infrastructure assets and services. Floods, storm surge, and recurrent tidal flooding continue to threaten road networks and other infrastructure assets, thereby increasing repair and maintenance costs. Persistent saltwater intrusion puts drinking water supplies at-risk in many coastal communities. Droughts and wildfires continue to ravage large parts of the American Southwest and elsewhere. Climate change is expected to exacerbate extreme weather events, which will add stress to the nation's critical infrastructure and increase the risk of cascading failures.

The devastating impacts of Hurricane Maria on Puerto Rico's utility networks in 2017, the trail of destruction left by the California wildfires, and the massive blackouts in Texas during the 2021 winter extremes highlighted the vulnerability of interdependent infrastructure systems. In addition to major cities, rural areas and low-income communities prone to climate hazards may experience more widespread and prolonged power outages and disruptions of the transportation and communications networks that can further reduce social services availability that supports their health, cultural, and social well-being (Mitsova et al. 2018). Recovery from extreme events by returning to a pre-event "normal" may not be sufficient to help communities adapt to the impacts of climate change

This paper will detail a study that explored a scenario-based tabletop exercise approach to probe the decision-making process related to infrastructure restoration and prioritization during a catastrophic tropical cyclone. The tabletop exercise involved experts in emergency management, power and water utilities, transportation agencies, Metropolitan Planning Organizations (MPOs), cell service providers, and other stakeholders. The tabletop exercise served multiple purposes, including (1) collection of data on practices and decision criteria for prioritization of infrastructure restoration using a simulated scenario embedded in the TEST software system; (2) provided opportunities for roundtable discussions to deepen the understanding of the issues within the simulation scenarios; (3) delivered a product that can be used by agencies, professional planners, and researchers in conducting such exercises in other areas or sectors. The exercise was organized in two modules (pre- and post-event), each containing questions in the following categories: damage assessment, no notice or short-notice (no warning) events, prioritization criteria, cross-function coordination, cross-function interdependencies, decision support tools and workflow, and viable alternatives and innovations when priorities cannot be met. The roundtable discussions allowed the participants to interact with their colleagues from other agencies and sectors and discuss the decision-making processes used in each sector to identify needs and prioritize infrastructure resilience decisions.

Our paper advances the premise that transformative climate adaptation planning must address interdependent infrastructure systems and related restoration, adaptation, and resilience priorities in areas exposed to climate hazards. To strengthen the resilience of infrastructure assets located in floodplains and vulnerable coastal areas, transformative actions embedded in future land use plans should consider exposure to hazards, susceptibility to damage, required levels of service, and future demand (Solecki et al. 2015). Additional factors include potential buyouts in high-risk areas or repurposing for renewable energy deployment (Fazey et al. 2018). Transformative adaptation (Fedele et al., 2019) also requires building capacity for effective community and stakeholder engagement (Moser and Pike, 2015). We highlight the value of collaborative decision-making and scenario planning with allied professions and sectors to assess and identify viable resilience pathways that account for socioeconomic disparities and variability across geographies, including the urban/ rural divide. There are multiple intersections with various planning pedagogy domains, including planning for hazards, disasters, and extremes, planning for resilience in urban and rural communities and planning for climate adaptation (including retreat and population displacement).

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Key Words: interdependent infrastructures, climate hazards, transformative climate adaptation planning, scenario planning, tabletop exercise

## **WHOSE EMISSIONS ARE THESE ANYWAY? ESTIMATING VEHICLE MILES TRAVELED TO ACCOUNT FOR SITE-LEVEL TRANSPORTATION IMPACTS ON CLIMATE CHANGE**

Abstract ID: 45

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Although the scope of climate change is global, reducing its threat will require the cooperation of a large number of small, local actors. In recent decades, many institutions, corporations, and municipalities have committed to reducing their respective greenhouse gas (GHG) emissions, which has necessitated the development of methods to account for disaggregated GHG emissions allocated them at a fine spatial resolution. Since a substantial share of global GHG emissions are generated by transportation emissions, this requires accounting for GHG emission resulting from site-generated vehicle travel.

Vehicle-generated GHG emissions are a function of fuel efficiency and distance traveled. National and regional measures of total distance traveled, in units of vehicle miles traveled (VMT), have been collected and reported since the mid-twentieth century. However, the need to produce sub-regional and site-level VMT estimates has recently emerged in connection with efforts to account for GHG emissions. A common method for estimating VMT at the site-level has not been established.

In this paper, we summarize three climate policy initiatives that require site-level VMT estimation. The first of these is the adoption of the Greenhouse Gas Protocol by private corporations (Hickmann 2017; Green 2010); the second is the American College and University Presidents' Climate Commitment (Dyer and Dyer 2017); and the third is the implementation of Senate Bill 743 in cities and regions throughout California (Volker, Lee, and Fitch 2019; Elkind, Lamm, and Prather 2018, 743). We describe the role site-level VMT estimation plays and the VMT estimation methods that have been used in connection with each of these initiatives.

Next, we develop a set of fifteen possible methods that could reasonably be used to estimate site-generated VMT for office buildings and corporate campuses. We apply these methods to each of eleven sites located in the Wasatch Front Region of Utah and the San Francisco Bay Area.

We find that estimates site-generated VMT vary widely among the identified methods. Moreover, there was no consistent ranking of methods across sites: no method produced estimates that were consistently higher or lower than all others.

Based on these findings, we discuss the relative importance of accuracy and consistency. If institutions are likely to select a method to minimize the apparent climate impacts of developments, is it preferable to sacrifice accuracy for consistency in order to create a useful basis for comparison among sites? We conclude with a recommendation that planning institutions mandate consistent methods for estimating allocating land-use-generated VMT.

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Key Words: Vehicle miles traveled, Emissions accounting, Impact analysis

#### **ANALYZING TRANSIT SERVICE AND RIDERSHIP CHANGES DURING THE COVID-10 PANDEMIC: INSIGHTS FROM BOSTON, HOUSTON, AND LOS ANGELES**

Abstract ID: 50

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The COVID-19 pandemic has upended urban life as we know it. To protect residents and stem the spread of the pandemic, public agencies have instituted policies that have indirectly reduced travel for many. In the U.S., the effects of the pandemic on public transit -- and its sharp ridership declines in 2020 -- have generated particular concern. Many former transit commuters are unemployed, work from home, or have switched to commuting in private vehicles. But for those who work outside the home and cannot drive -- and who are more likely to have low incomes or be people of color -- public transit remains an important means of mobility (TransitCenter, 2020).

However, most transit agencies have reduced transit service during the pandemic, reflecting reduced ridership demand, increasing costs of providing service, and shrinking or uncertain budgets. This downward spiral of falling ridership and declining service is particularly worrisome in neighborhoods with many so-called "constrained" riders, who have little or no use of automobiles (Beimborn et al., 2003).

The COVID-19 pandemic has unfolded within urban contexts rife with social inequities and in many cases compounded them. As one example, higher rates of coronavirus infection and mortality have occurred in neighborhoods with large proportions of African American residents (Price-Haywood et al., 2020). Additionally, certain jobs require workers to continue to commute to their workplaces, even when public officials recommend limiting travel.



Use of public transit itself also reflects the unequal nature of access in the U.S. Low-income and BIPOC have historically owned fewer automobiles and used transit at higher rates, often substituting bus services for driving (Taylor & Morris, 2015). The disadvantages faced by transit users also depend on regional factors. Cities host different built environments, urban spatial patterns, and population densities. These may position some agencies as better (or worse) suited to offer high-quality transit service. Such complexities of transportation access and attendant equity issues have become more salient in today's uncertain public health environment.

To analyze the effects of the COVID-19 pandemic on transit systems and their users, we examine local bus ridership changes by neighborhood in Boston, Houston, and Los Angeles from 2019 to 2020. Combining stop-level ridership and passenger survey data from three major transit agencies with U.S. Census data, we identify associations between travel patterns and neighborhood demographics. We find that early in the pandemic, neighborhoods with larger BIPOC populations and lower socio-economic status levels lost proportionally fewer riders when compared with 2019 levels. However, gaps between high-ridership-loss and low-loss neighborhoods diminished as the pandemic continued into late 2020.

We also use logistic regression to model ridership change while simultaneously controlling for many factors. While ridership in Houston and Los Angeles outperformed that in Boston during the early and middle parts of the pandemic, differences in the built environment and demographics account for some regional differences. Urban centrality proved a significant negative predictor of ridership change, with neighborhoods located further from downtowns faring better (in relative terms) than central ones. Additionally, neighborhoods with high shares of African American residents performed better in the early part of the pandemic. By fall 2020 that race effect disappeared, replaced by an ethnicity one, as neighborhoods with large numbers of Hispanic residents fared better. Ultimately, as pandemic wore on, demographic and built environment factors less systematically predicted observed changes in bus ridership.

Our analysis suggests important roles for neighborhood demographics and the built environment in determining public transit demand during the pandemic. It also highlights the importance of public transit for those with limited mobility options, and for considering equity and travel constraints as communities recover from the COVID-19 pandemic.

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Key Words: public transit, COVID-19, service planning, neighborhood demographics, travel behavior

#### HOW DO BABY BOOMERS TRAVEL DIFFERENTLY FROM THE SILENT GENERATION?

Abstract ID: 57

Individual Paper Submission

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Known as car lovers, the travel preferences and behavior of Baby Boomers in the U.S. will inform transportation infrastructure and policies for older adults in the future decades. Born between 1946 and 1964 amid rapid suburbanization and interstate highway construction, Baby Boomers have life-long experiences of living in the suburbs and depend on automobiles in their daily travel. Probing into the generational difference in vehicle travel helps urban planners to understand how the needs of aging Boomers' daily travel differ from their previous generation.

At least three research gaps remain in the existing literature. First, many previous studies have documented that Boomers have more vehicle trips than other generations (McGuckin & Lynott, 2012; Newbold & Scott, 2017; Siren & Haustein, 2013). However, current literature does not tell whether Boomers' travel patterns are due to their middle age or unique generational characteristics. Second, the current study needs a better understanding of how the residential built environment relates to travel behavior differently for Boomers and their previous generations. A majority of Boomers are willing to stay in their homes and communities, a large share of which are in low-density areas, where they were born and raised (Joint Center for Housing Studies of Harvard University, 2019). This trend implies that today's older adults rely more heavily on automobiles due to their residential built environments. However, some other Baby Boomers may have fewer vehicle trips than before if they live in denser environments. Third, Boomers are more demographically and socioeconomically heterogeneous than the previous generation. As the number of non-Whites, low-income people, females, and people who live alone has increased since 2011, when the youngest Boomer enter 65 years, it is also relevant to examine whether they have more disadvantages daily travel.

In this study, I ask: How do Baby Boomers' vehicle travel frequency and distance differ from their older cohort-the Silent Generation? To what extent are these two generations' residential location, demographic and socioeconomic attributes, and employment status associated with their vehicle travel changes? In answering these questions, I use the 2001 and 2017 National Household Travel Survey to examine the vehicle travel characteristics of those aged 56-71 in 2001 (Silent Generation) and 2017 (Baby Boomers) with descriptive analysis and some regression models.

Descriptive analysis and regressions show that Boomers aged 56-71 had fewer vehicle miles traveled than those in the same age of the Silent Generation, controlling for other factors. However, Boomers aged 65-71 in 2017 had more vehicle miles but fewer non-work vehicle travel than the Silent Generation. One reason is that Boomers delayed retirement and had more working trips. Boomers who retired or were unemployed had less vehicle travel but more non-work vehicle travel than the Silent Generation. Boomers who lived in metropolitan areas with population sizes between 250,000 and 1 million, where a larger share of Boomers lived, had more vehicle travel than in 2001. Females and non-Whites took a larger share of Baby Boomers than the Silent Generation, and they generated more vehicle miles traveled among Boomers than among the Silent Generation. However, racial, income and gender disparities in vehicle travel still exist.

This study has several important policy implications for planning practices. First, it shows the needs for planners to better understand older Boomers' increasing non-work travel after retirements. Second, it shows the possibility to promote sustainable transportation among younger Boomers as they have less vehicle travel than the older cohort. Third, it shows that as the increasing of racial minorities, females, and low-income people among aging Boomers, planners need to pay more attention to transportation for transport disadvantaged groups among older adults.

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Key Words: Baby Boomer, automobile, travel behavior, older adult, built environment

## INEQUITABLE INEFFICIENCY: A CASE STUDY OF RAIL TRANSIT FARE POLICIES

Abstract ID: 59

Individual Paper Submission

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Research on the equity and efficiency of transit fare policy was popular during the 1980s, following the “public takeover” of transit and many operators substituting flat-rate fares for time- and distance-based fares. This evolution in fare practice and operational inefficiency was largely driven by federal transit subsidy policies that prioritized population over ridership (Meyers and Gomez-Ibanez, 1981; Wachs, 1989), led to the cost-per-rider of peak period service being 45% more than off-peak (Parody, 1990), and has produced regressive impacts wherein lower-income and minority persons who tend to travel shorter distances pay disproportionately more for services received (Cervero, 1981; Taylor et al., 2000). Yet, these studies are outdated, so may not explain contemporary fare policies and their impacts.

While there has been a renewed interest in this subject matter (e.g., Brown, 2018; Rubensson et al., 2020; Yang and Tang, 2018), little new has been methodologically developed and applied to United States transit systems, and there remains little, if any, fare policy equity and efficiency research that focuses principally on United States rail transit or the spatial distribution of equity and efficiency. How do cost-recoveries of rail transit service through fares (i.e., farebox recoveries) vary by time and location of travel on the network, and what, if any, sociodemographic impacts does this generate?

In this research, a cost allocation model is developed from rail transit agency data to allocate capital and labor costs of rail transit service to different times of the day and segments of the rail network. Costs are then contrasted with fare revenue generated at different times of the day and across different areas of the network to evaluate the temporal and spatial parity of fare policies. The sociodemographic make-up of riders who travel at different times or across different locations is studied to test for sociodemographic disparities. Three regional rail transit providers, each with a different fare structure, are evaluated to estimate if different fare policies lead to different results.

Findings suggest that the marginal additional costs of serving peak travel are greater than the marginal increase in peak fare revenue when capital costs are accounted for, that this difference is reduced with peak-period (congestion) fare pricing, but often offset by base fare structures that reward longer distance travel. Additional findings indicate that distance from the urban core more so than rider travel distance increases costs per rider and reduces farebox recovery, and these patterns produce disparate impacts that facilitate lower-income riders paying disproportionately more of the costs of their travel. These findings support that, to the extent distributional and benefit principles of equity are important in transit planning, temporal and spatial cost-recoveries warrant consideration in the evaluation of transit capital projects, service provision, and fare policies.

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Key Words: Transit, Passenger rail, Fare policy, Equity

## EXPLORING THE HETEROGENEOUS NONLINEAR EFFECTS OF BUILT ENVIRONMENT ATTRIBUTES ON DRIVING, TRANSIT USE, AND ACTIVE TRAVEL

Abstract ID: 60

Individual Paper Submission

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Urban sprawl has been criticized for its contribution to auto dependence and associated problems, such as traffic congestion, obesity, and climate change. To address these problems, policymakers have adopted various planning policies to modify the built environment. To substantiate the efficacy of these policies, some studies have employed advanced modeling techniques to uncover the complex nonlinear relationships between built environment attributes and travel behavior (Christiansen et al., 2016; Ding, Cao, & Næss, 2018; Wang & Ozbilen, 2020). These studies improve planners' understanding of the relative importance of built environment attributes to travel behavior compared with other correlates such as demographics and identify the threshold effects of built environment attributes (Tao et al., 2020). However, they focus on one type of travel behavior and seldom explore the heterogeneous nonlinear and threshold effects on different types of travel behavior.

Automobile, transit, and active travel (i.e., walking and biking), the most frequently used travel modes in daily life, have been extensively examined by planning scholars. The literature suggests that planning policies that modify built environment attributes may influence different modes of travel differently. For instance, built environment attributes at the regional level (e.g., distance to downtown) contribute more to auto use and transit use whereas those at the neighborhood level (e.g., intersection density) contribute more to active travel (Ewing & Cervero, 2010). Examining their relative importance while relaxing the nonlinear assumption will substantiate the validity of this conventional understanding. Furthermore, the nonlinear effects of built environment attributes on travel, particularly their effective ranges (i.e., thresholds), may differ by behavioral type. Urban planners must consider these differences so that they can choose effective and efficient policies and built environment interventions in planning practice.

In this study, we will apply gradient boosting decision tree to analyze the 2018 regional travel data collected by the Metropolitan Council in the Twin Cities metropolitan area. The objectives are to (1) explore the nonlinear and threshold effects of built environment attributes on respondents' use of automobile, transit, and active travel; (2) compare the differences and similarities of these effects in terms of their relative importance and thresholds; and (3) use the results to optimize planning interventions to discourage automobile use and promote transit and active travel.

This study contributes twofold to the literature. First, it enriches planners' understanding of the complex nonlinear connection between the built environment and travel behavior. This new empirical study will provide additional evidence to assess the efficacy of using land use and transportation policies to alter travel behavior. It will further identify the differing thresholds within which built environment attributes affect auto use, transit use, and active travel. Second, with these findings, policymakers can design specific land use and transportation policies to achieve targeted travel behavior goals. For example, if built environment attributes at the regional level play a more important role in influencing auto use, planners can use the effective ranges of these attributes as planning

guidelines to reduce auto dependence.

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Key Words: threshold effect, machine learning, land use, travel behavior, planning policy

#### WHAT THE HECK IS A CHOICE RIDER? A THEORETICAL FRAMEWORK AND EMPIRICAL MODEL

Abstract ID: 67

Individual Paper Submission

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As local, state, and federal agencies begin investing substantial resources into subsidizing transit in the 1960s and 70s, public documents argue that transit agencies should focus on attracting choice riders instead of dependent riders, who have no alternatives and use transit regardless of service quality. After six decades, the definitions, uses, and implications of the terms choice and dependent rider have remained consistent in the academic and professional literature. These definitions, however, lack a strong theoretical grounding or empirical evidence.

Using travel diary data from the Philadelphia region, I estimate discrete choice models to identify choice riders, who I define as those who have close to a 50% probability of choosing between a car or transit for a given trip. The Philadelphia region, which has a diverse range of transit users and transit services, is an ideal place to develop and fit an empirical model of choice ridership.

Attributes assumed to be associated with dependent riders, such as a lack of a car, low income, and being a racial or ethnic minority, are much more prevalent among choice riders than the general metropolitan population. Choice riders are also diverse, with a mix of racial backgrounds, income levels, educational attainment, and access to private cars. Transit dependency, by contrast, is rare. The lowest and highest income residents generally only choose transit when service quality is high, and transit is cost- and time-competitive with the car.

Practitioners and academics should avoid under-theorized and empirically unsupported descriptions of choice and dependent riders. Moreover, the debate between using transit to reduce automobile use or increase accessibility for low-income transit users is likely misplaced. Improving urban bus service into low-income neighborhoods almost certainly attracts people out of cars.

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Key Words: choice rider, dependent rider, captive rider, transit, public transport

## REVISIT COMMUTE TRIP REDUCTION PROGRAM, WHAT WORKS AND WHAT DOESN'T WORK?

Abstract ID: 80

Individual Paper Submission

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Commute trip reduction (CTR) programs have been implemented for decades in the US, while a systematic evaluation of CTR's performance is missing. This study assesses the effectiveness of CTR tools by examining vehicle trip rates (VTR) and vehicle miles traveled (VMT). The results suggest: (1) among various CTR tools, a collective bargaining process helps reduce vehicle trip rates (VTR) led by governmental agencies; (2) distributing transit passes to employees outperforms providing subsidies to decrease VTR; (3) the compressed workweek is a favored tool to reduce VTR; (4) free rides, no matter employer-provided vehicles or emergency rides, both contribute to increments in VTR. To inform practice, when rewarding employees, distributing transit passes is the preferred strategy. Free employer-provided goods, such as transit subsidies, vehicles, and emergency rides, are not recommended. Governmental agencies should lead other employers to better advertise CTR programs and engage employees for collective bargaining.

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Key Words: commute trip reduction, congestion mitigation, vehicle trip rates, vehicle miles traveled, policy evaluation

## RIDE-HAILING COMES TO GRANDPARENTS IN LOW-DENSITY AREAS: WHO, WHERE, WHY, AND HOW

Abstract ID: 81

Individual Paper Submission

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The United States is rapidly aging, and most older adults in the United States age in their own homes or communities and rely heavily on automobiles in their daily travel. However, older people face more driving difficulties as their physical and cognition levels deteriorate. Ride-hailing can be a promising travel mode providing mobility to older adults, especially for those living in low-density regions with bad levels of public transit. Besides, with ride-hailing, older adults might also relieve the dependence on their immediate social networks, like children and neighbors, and improve their self-esteem and sense of independence.

Studies on how ride-hailing services change people's travel behavior and mitigate the travel difficulties among the transport disadvantaged groups have increased over the past decade, but previous studies disproportionately focus on the big cities and young adults. Only a few studies have explored ride-hailing usage among older adults (Agrawal et al., 2020; Mitra et al., 2019). Also, it remains rare that to which extent ride-hailing services change the travel behavior of those who live in low-density areas (Rieland, 2017; Shirgaokar et al., 2020).

This study aims to fill up these research gaps by asking: Who are the ride-hailing users among those aged 55 and over in low-density areas in the United States? Where do they live? How and why do they use ride-hailing services? We answer the above questions using the data on four Southwestern states in the 2017 National Household Travel Survey of the United States and a survey on 1,000 ride-hailing users in this region's four major metropolitan areas. We find that ride-hailing users older than 55 years tend to be wealthier, whiter, and younger males without medical conditions. Nevertheless, ride-hailing services serve those living in relatively low-density areas and secondary cities and live in zero-car households. Our Texas ride-hailing survey further shows that many older adults use ride-hailing in the evenings, and ride-hailing users tend to use it for connecting other transportation modes. Older adults regard convenience as the primary reason for using ride-hailing against other travel modes.

The results have three implications for transportation planners and service providers for older adults. First, this study shows ride-hailing services' potentials in reducing travel difficulties of older adults who live in low-density areas. Second, this study finds that ride-hailing services are not distributed equitably across social groups and places. We suggest that private companies and governments work together to improve of the usage of ride-hailing services among disadvantaged groups and more distant areas.

Additionally, our study finds the potential of ride-hailing services as a connector to other transportation modes, especially public transit. We suggest that developing more efficient and affordable public transit systems may help encourage transit usage among older adults with ride-hailing services as feeder services. Local governments may also consider collaborating with TNCs to encourage the integration of ride-hailing and transit where public transit is available using subsidies.

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Key Words: Ride-hailing, Automobile, Public transit, Low-density, Older adults

## **SHIFTING GEARS: CYCLING INFRASTRUCTURE DEVELOPMENT DURING COVID-19**

Abstract ID: 82

Individual Paper Submission

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The widespread "stay at home" orders, closure of indoor exercise spaces, and risks of exposure to the novel Coronavirus in public transit have prompted a significant uptake in cycling. With more cyclists on the road, the pandemic has renewed focus on the lack of safe cycling infrastructure within our cities (Hertel & Keil, 2020). Although cities are improving their cycling infrastructure during the pandemic, this infrastructure remains inequitably distributed. This unequal distribution is inextricably linked to issues of race, class, gender, and cultural capital (Stehlin, 2019; Yasin, 2020). Uneven development inhibits access to safe cycling infrastructure in "low-growth" and underprivileged neighbourhoods, whereas "high-growth" and privileged neighbourhoods receive most of the attention and resources (Hoffman, 2016). This presentation investigates these inequities by detailing the process the City of Vancouver uses to allocate cycling infrastructure and policies, with a focus on the impact of COVID-19. Through qualitative semi-structured interviews in the City of Vancouver, Canada, this article presents a largely unseen narrative that is crucial to research on cycling. In particular, its findings suggest that development cost levies and a lack of representation in the decision-making process result in an inequitable distribution of safe cycling infrastructure. This presentation offers insight into the cycling infrastructure planning process and how researchers and practitioners can work to develop an equitable distribution of infrastructure.

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Key Words: cycling infrastructure, transportation, equity, policy, representation

## **ABRUPT CHANGES, INSTITUTIONAL REACTIONS, AND ADAPTIVE BEHAVIORS: AN EXPLORATORY STUDY OF COVID-19 AND RELATED EVENTS' IMPACTS ON HONG KONG'S METRO RIDERS**

Abstract ID: 107

Individual Paper Submission



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Abrupt changes caused by economic and financial crises, social movements, terrorist attacks, and outbreak of pandemics/epidemics have become increasingly commonplace. In face of these, both institutions and individuals must adapt and have adapted. Against the backdrop of the COVID-19 pandemic, suddenness, scale, and impacts of which are unprecedented as compared to its counterparts in history, this paper first proposes transferable measures and methods that can be used to quantify and geovisualize COVID-19 and subsequent events' impacts on metro riders' travel patterns/behaviors. Then it operationalizes and implements those measures and methods with empirical data from Hong Kong, a metropolis heavily reliant on transit/metro services, quantifying and geovisualizing the above impacts. It maps out where those impacts were the largest and explores its correlates. After that, it uses the best publicly available data to assemble probable explanatory variables and to examine quantitatively whether those variables are correlated to the impacts and if so, to what degree. It finds that both macro- and meso-level external/internal events following the COVID-19 outbreak significantly influenced travel patterns/behaviors of metro/transit riders, including their changes. These events' impacts and their changes varied from one station to another where the provision of recreational facilities around a metro station area could well predict those impacts. Besides, certain socio-demographic characteristics (e.g., median age of the population and average age of households in metro-served communities) can mediate or moderate the impacts. The changing rate of incoming and outgoing trips of a metro station also can well predict the impacts and their changes. The above findings indicate that the COVID-19 and subsequent events could have spatially and socially heterogeneous impacts on transit/metro riders. New methods and data can/should be exploited to examine those impacts. Quantification/geovisualization of the impact heterogeneity and its possible determinants can ensure that we know where and who the most disadvantaged and/or vulnerable are.

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Key Words: COVID-19, Adaptive travel behaviors, Measurement, Geovisualization, Heterogeneity

#### **A GENDER-BASED STUDY OF DRIVING BEHAVIOR IN A SIMULATED VIRTUAL ENVIRONMENT OF ABU DHABI**

Abstract ID: 108

Individual Paper Submission

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The 2018 Global Status Report on Road Safety reports that the traffic death in the eastern-Mediterranean region reached 18 deaths per 100,000 population, the third-highest in the world after Africa (26.2 per 100,000) and South-

east Asia (20.7 per 100,000) (WHO, 2018). Furthermore, the Eastern Mediterranean Status Report specified that these fatalities were the leading cause of death between the ages of 15 and 29, followed by the age-group of 30 to 44 years.

In the 2019 RoadSafetyUAE report, 45% of all road accidents UAE-wide were caused by young drivers aged between 18 and 30. This age group reported the highest among the victims of road fatalities (34%) and road accidents (63%) in the Emirate of Abu Dhabi. They also concluded that the novice driver segment of 18 to 24 years reported twice the death rates of the older drivers (RoadSafetyUAE, 2019).

It is well-documented that the primary cause of road accidents is human-error related to inappropriate driving behavior or fatigue and drowsiness. However, real-world experiments to test the proposition involve risk to users, hindering and limiting the research focused on road traffic crashes. Conversely, virtual environments (VEs) have been validated and extensively used by transportation researchers because they do not result in participants' physical injury during experimentation (Maghelal et al 2011). Virtual reality (VR) devices also offer affordable driving simulation with a high degree of immersive feeling, allowing opportunities to measure the drivers' physiological responses (Maghelal 2012).

Forty participants (13 females, 27 males) completed the pre-test driving behavior survey to report their personal driving experience in Abu Dhabi. The average age of respondents was 22 years of age with an average driving experience of about three years, representing young drivers with limited driving experience from multiple nationalities. A post-test survey evaluated their experience of driving in the simulator and its comparison to real-world driving.

Participants drove through six blocks of a semi-immersive simulated driving environment with distractions such as a mobile call, pedestrian and vehicular interception, signal change, construction zone, and car accidents introduced in the simulated environment representative of peak hour traffic of downtown Abu Dhabi.

Driving data from the simulator and the eye-tracking (using Tobii glasses) were used to evaluate the hotspot and focus of the participants during the distractions and also its impact on driving speed, braking, and signaling. Male drivers were less adhering to safe driving behavior than female drivers. Although both males and female drivers drove above the designated speed limit, on average, the male participants drove at higher speeds above the limit and did not use signaling during the lane changes. However, hotspot analysis reported higher distraction among female drivers during the phone calls and during car accidents in the adjoining lane.

This study's outcome provides implications for additional training requirements for driving education (theoretical and practical test). Also, recommendations to reduce or mitigate the accidents among the adolescent age groups are discussed to help achieve the UAE National Committee's goals on Sustainable Development Goals (NCSGD 2021) and global objectives of the World Health Organization (WHO).

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Key Words: Virtual Environment, Adolescent Drivers, Driving Behavior, Simulation, Abu Dhabi

## **THE DETERMINATION OF FAULT IN URBAN PEDESTRIAN CRASHES: ASSESSING THE ROLE OF THE BUILT ENVIRONMENT AND NEIGHBORHOOD INEQUALITY**

Abstract ID: 125

Individual Paper Submission

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This paper explores the built environmental factors and neighborhood inequities that are related to the outcome of who, if anyone, is determined to be at fault by reporting officers for urban traffic crashes involving pedestrians. The initial determination of fault in traffic crashes can be a judgment of individual responsibility but can also point to collective responsibility and the need for design or policy interventions to prevent further crashes. However, when fault is neatly assigned only to one or more individual participants in a crash, it limits possibilities for such collective action, representing part of what Lee (2015) denotes as a “cumulative irresponsibility” towards road safety. Furthermore, street designs may be distributed unevenly contributing to inequalities in outcomes of not just injury, but also blame. Finally, the assignment of fault in pedestrian crashes has taken on new importance with the growing adoption of Vision Zero policies, which should aim to explicitly broaden responsibility for crashes to include system designers (Belin et al. 2012).

Research on pedestrian safety has largely sought to understand the environmental and behavioral factors that determine outcomes of injury severity and crash frequency to inform road policies and street design. Urban environments with narrower and slower roads, have better traffic safety outcomes, including for pedestrians, while wider and faster arterial roads, accompanied by large scale “big box” retail are associated with more crashes (Dumbaugh and Rae 2009). Particular urban form characteristics such as longer blocks with driveways make some areas less safe for pedestrians (Loukaitou-Sideris et al. 2007). Research on perceptions of fault in crashes is recently growing. For example, Goddard et al. (2019) consider how driver-oriented media coverage of crashes that tends to blame pedestrians, shapes individual perceptions and contributes to a wider societal bias.

The goal of our research is to connect and inform these literatures on safe urban design and perceptions of crashes through an analysis of the determination of fault for pedestrian crashes in a US metropolitan area. For our data, we examine ten years of pedestrian crashes in Franklin County, Ohio, the site of its state capital and largest city, Columbus. For our methods, we first fit a multinomial logistic regression model to indicate the factors associated with different fault outcomes, with an interest in those related to the built environment such as road class, speed limit, and number of retail outlets, as well as the location of the pedestrian at the point of the crash. We then conduct a spatial analysis and case study of arterial road segments in four high crash communities—Downtown Columbus, South Linden, University District, and Hilltop.

Our findings indicate that the built environment influences the determination of fault in pedestrian crashes on two levels. Firstly, better provision of signalized and marked intersections on arterials in some neighborhoods leads to a higher proportion of marked intersection crashes, which are less likely to be blamed on pedestrians, as well as less severe. Secondly, independent of pedestrian location, pedestrians are more likely to be found at fault in areas with wider, faster roads, less density of retail, and more drivers. We interpret our findings through the lens of equity and in light of the recent launching of a Vision Zero initiative by the City of Columbus.

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Key Words: Pedestrian, Safety, Traffic Crashes, Transportation Equity, Vision Zero

## RACE, CLASS, AND THE PRODUCTION OF AND EXPOSURE TO VEHICULAR POLLUTION IN LOS ANGELES

Abstract ID: 157

Individual Paper Submission

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Vehicular air pollution presents an ongoing public health crisis. Despite growing knowledge of racial injustice in exposure to vehicular particulate matter emissions (PM<sub>2.5</sub>), less is known about the sociodemographics-mediated relationship between the production of pollution and exposure to pollution (Bell and Ebisu, 2012; Schweitzer and Valenzuela, 2004). This study addresses this gap by linking the production of and exposure to vehicular PM<sub>2.5</sub> in a unified indicator assessing local exposure (to PM<sub>2.5</sub>) adjusted by local production (of vehicle kilometers traveled [VKT]). It analyzes this indicator through a case study of Los Angeles that examines: (a) how production-adjusted exposure to vehicular PM<sub>2.5</sub> relates to race/ethnicity and socioeconomic status, (b) how this relationship varies across the region.

This study integrates tract-level on-road PM<sub>2.5</sub> emissions estimates with VKT estimates and census data. Using ordinary least squares (OLS) regression and geographically weighted regression (GWR), it explores relationships between local production-adjusted exposure and sociodemographics (Gilbert and Chakraborty, 2011). This reveals a strong negative relationship between VKT and PM<sub>2.5</sub> exposure: people who drive more tend to be exposed to less vehicular pollution, whereas people who drive less are burdened with disproportionately high air pollution at their home location. In our base model, a 1 percentage point (pp) increase in VKT production is associated with a 1.6 pp decrease in home-based exposure to vehicular PM<sub>2.5</sub> emissions, and a 0.6 pp reduction when including a complete set of demographic and socioeconomic controls. Though standard in the literature, global OLS regression conceals local variation in relationships essential to environmental justice analysis. Our GWR model instead reveals how relationships between PM<sub>2.5</sub> exposure and explanatory variables vary across Los Angeles. People in the 17% of tracts in which VKT production and PM<sub>2.5</sub> exposure are significantly negatively associated tend to be whiter and wealthier, and only 9% of tracts have a significant positive relationship between VKT production and emissions exposure.

To augment this regression analysis, we simulate commutes using LEHD LODES block-level origin-destination data and the OSMnx Python package to estimate commuting patterns across Los Angeles. We compare the sociodemographics of the commuters to the sociodemographics of the tracts they drive through. Compared to

others, commuters from majority-white tracts disproportionately travel through majority non-white areas to get to work. This highlights the role that decades of racialized freeway infrastructure planning and residential segregation play in today's disparities between who produces vehicular pollution versus who is exposed to it. This entails urgent policy and planning implications. Moving beyond just the racialized placement of infrastructure, we probe justice and equity dimensions to suggest constructive paths toward racial justice at the nexus of urban transport and environmental planning, including identifying "worst offender" communities and in turn possible interventions such as VKT taxes, tolls, emissions standards, and electrification.

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Key Words: air pollution, geographically weighted regression, racial justice, VKT

## EXPLORING HOUSING PROGRAMS AND MARKET RESPONSES TO CAR-LITE POLICIES WITH EMERGING MOBILITIES USING LUTI MICROSIMULATION

Abstract ID: 160

Individual Paper Submission

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Emerging mobilities like automated vehicles, mobility-on-demand, and micromobility are motivating discussions on the future of cities. Domain experts agree that there is great uncertainty about their net effects on cities. While short-term travel time and cost savings are possible, the induced travel demand will likely cancel out those benefits in the long-term. There is less uncertainty and more agreement about accessibility benefits, which can increase worker welfare but might also result in larger travel distances and urban sprawl. Several megacities are actively planning 'car-lite' strategies to reduce private car ownership and use with the help of these emerging mobilities (and supporting transportation and land use policies). Car-lite policies are likely to be first piloted at a neighborhood scale instead of the entire city because it stands to reason that planning agencies will test out the policy in a limited capacity first before rolling it out to their entire jurisdiction. How will such pilots impact neighborhoods? Will they be successful in reducing vehicle ownership and use? To what extent will they induce undesirable but consequential side-effects such as gentrification?

This study attempts to address these questions using SimMobility - a state-of-the-art agent-based land-use transportation interaction (LUTI) microsimulation model. We use the Long-Term (LT) component that involves the creation of a synthetic population, followed by household-level residential location and mobility holdings choices, and individual-level job location choices, at the temporal scale of days to years. This study uses the SimMobility calibration for the city-state of Singapore, which makes for a particularly interesting study area for testing housing and mobility policies owing to the tightly regulated markets. We construct car-lite policies that improve accessibility locally in selected neighborhoods as a representation of the localized impacts of emerging mobilities. Various scenarios are designed based on hypotheses about market responses to car-lite policies – (a) baseline (no reaction), (b) minimal effect (awareness only), (c) increase in buyer valuations, and (d) increase in both buyer and seller valuations.

We find that the increased accessibility from the car-lite pilot does make most neighborhoods significantly more

vehicle-free. However, the in-mover households are found to be comparatively higher-income than both the households they displace as well as the original study area population. The vision of a car-lite community is adversely impacted in such circumstances where higher-income households, who are more likely to have private mobility holdings, refuse to reduce their mobility holdings after outbidding lower-income households for housing in the study area. Thus, the gentrification side-effect significantly reduces the potential vehicle-free gains from the car-lite policy. In certain neighborhoods, as much as 90% of the expected reduction in vehicle ownership can be offset by the housing market-driven effect. These neighborhoods turn out to be only marginally more vehicle-free than they were initially without the car-lite pilot.

Our results suggest that it might be possible to counter the gentrification side-effects with new housing development and reduction of minimum parking requirements. Possible configurations of new housing development include (a) market-rate housing of all types (both public and private), (b) market-rate public housing, (c) mixed-rate public housing, and (d) affordable public housing. We are exploring targeted housing supply that can make the study area differentially attractive to lower-income vehicle-free households, in addition to the price points at which they are being offered. Additionally, we operationalize reducing minimum parking requirements by restricting car ownership for residents of selected units in the study area. This is still research in progress, and we hope to have the results ready by the conference. Our preliminary results suggest that a mix of market-rate and affordable public housing can be quite successful in attracting households with car-lite travel behavior.

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Key Words: Shared mobility, Vehicle ownership, Automated vehicles, Land use-transport interaction (LUTI) model, Agent-based microsimulation

## ASSESSING THE USE OF TWITTER BY TRANSIT AGENCIES FOR COMMUNICATION WITH RIDERS DURING THE COVID-19 PANDEMIC

Abstract ID: 162

Individual Paper Submission

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Public transit agencies are increasingly using social media platforms to communicate with riders. These platforms provide a cost-effective, reliable, and timely mechanism for sharing information with passengers and other travelers (Chan and Shofer, 2014; Cottrill et al., 2017; Schweitzer, 2014;). Increasingly, these platforms have become critical parts of transit agencies' communication infrastructure and strategy during times of crisis, disruption, or other emergency conditions (Chan and Shofer, 2014). We examine the use of Twitter by transit agencies during the COVID-19 pandemic, specifically the content of disseminated messages and the responses to these messages, to

categorize the type of tweets and the impact of these tweets. This research combined a machine learning model and a set of case study interviews to examine the role of transit agency communication during disasters via social media. We collected and analyzed tweets associated with the tweet handles of the top 40 largest transit agencies in the U.S. based on the National Transit Database (NTD). The collected tweets included the original tweets, associated characteristics of tweets (e.g., time of creation, number of likes, retweets, etc.), as well as the conversations initiated by the original tweets. We developed and verified an effective machine learning classifier (at an accuracy of 90%) to filter tweets and replies that are associated with COVID pandemic communication. We then examined the patterns of COVID-related tweets using metrics, such as the number of tweets, the similarity of content, the structure of online conversations, etc. We also applied topic modeling (i.e., Latent Dirichlet Allocation topic model) and sentiment analysis to characterize COVID pandemic communication patterns on Twitter. Following a review of Twitter and marketing literature, we developed a list of relevant metrics to produce an integrated framework for measurement. We applied the framework to measure users' interactions using tweet-likes, retweets, and conversation patterns. The results revealed different communication strategies across transit agencies and the relationship between user interactions and specific content.

Based on the typologies generated in our analysis, we conducted interviews with three representative transit agencies to better understand motivations and objectives for social media engagement and to obtain practitioner input on future research design. This research informs planners and transit agencies on how to craft public messaging that resonates and is shared-- thereby potentially increasing brand loyalty, rider engagement, and awareness. A robust and resilient transit network requires ample financial support. As the largest share of revenue for transit agencies is generated by transit ridership, maintaining and increasing transit ridership is one of the keys to ensuring that public transit persists and provides critical mobility support, especially during disruptions & crises. We identified opportunities & challenges for enhanced engagement online and found that transit agencies are using the tools of corporate marketing to measure their success, but that these measures could be expanded to include sentiment, content, and conversational pattern analysis. Future opportunities for research include establishing a causal link between social media engagement, ridership, and trust.

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Key Words: transit, disaster communication, ICT (information and communication technology), engagement

#### HOW THE COVID-19 PANDEMIC CHANGED OLDER ADULTS' CYCLING BEHAVIORS IN TALLAHASSEE, FLORIDA

Abstract ID: 167

Individual Paper Submission

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## Central Theme or Planning Issue

Although older adults account for a small share of the U.S bicycle trips (0.5%), the existing literature indicates that age itself does not prevent older adults from bicycling. Thus, it is realistic to assume that U.S. cycling levels could increase among this cohort. However, the existing literature is limited related to how to encourage bicycling among older Americans.

The COVID-19 pandemic caused a disruption to many aspects of our lives, including our transportation behaviors. Recent reports highlight mobility changes across the globe (Chinazzi et al., 2020), where use of some modes decreased and others, such as bicycling, increased. The “50+ Cycling Survey”, indicates that the COVID-19 pandemic has motivated older adults to start cycling again, and to ride more (Kachadoorian, 2020). However, it is not known whether these changes occurred primarily in places with strong cycling cultures and in places that normally see high cycling levels. Further, the survey did not seek to investigate whether older adults plan to maintain these habits post-pandemic.

Voluntary travel behavior change (VTBC) programs has been shown to be an effective and affordable way to alter travel behaviors among the general population (Cairns et al., 2008). Similarly, after a short period of “trying it out”, cycling can become the normal mode of transportation (Strömberg & Karlsson, 2016). However, the TDM literature is limited when it comes to older adults, and due to older adults’ reluctance to use other modes (Rosenbloom, 2009), VTBC measures might prove more important for this cohort than for the general population.

## Approach and Methodology

Using the COVID 19-pandemic as a “naturalistic” intervention, or a naturalistic “try it out” period, to travel behaviors, this explanatory sequential mixed-methods case study seek to explore: Are there things that can encourage older adults to cycle more in an environment lacking a strong cycling culture and where no changes have been made to the cycling infrastructure?

For the purpose of this study, the specific research questions are:

- \* How did the COVID 19-pandemic change older adult’s bicycle habits?
- \* Do older adults intend to maintain these habits post-pandemic? If so,
  - \* In what ways do older adults intend to maintain these habits post-pandemic?
  - \* What is the underlying reason for maintaining these habits post-pandemic?

Quantitative data was gathered using a self-reported cross-sectional online survey (n= 146). In addition, the locally gathered quantitative data will be contrasted to a larger national data set, comprising of roughly 600 responses. Qualitative data gathered from in-depth phenomenological phone interviews with older adults 65+ will be used to further explore the initial quantitative results.

## Findings, Relevance, and Implications

The findings from this study could help set the course for how to promote cycling among older adults. Furthermore, the findings from this research might serve as proof of concept that changing incentives can lead to changed travel behavior among older adults. Such findings could then be turned into planning policies that seek to replicate these change behaviors on a more permanent basis. For example, the findings would point to aspects that might prove useful when designing VTBC programs aimed at encouraging active transportation among older adults

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Key Words: older adults, bike planning, COVID-19, travel behaviors, VTBC programs

## **DISENTANGLING TRANSPORTATION AND THE CRIMINAL JUSTICE SYSTEM: COERCING MONETARY SANCTIONS WITH DRIVER’S LICENSE SUSPENSIONS**

Abstract ID: 187

Individual Paper Submission

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A driver’s license serves two broad purposes: primarily, as a tool to filter and enforce who is eligible to drive legally, and secondarily as a general form of official identification. When a driver loses their driver’s license, they not only lose their right to drive legally, but also risk their livelihoods, ability to participate in elections, and easy access to various public institutions and services (Schneider, 2020, Hershey, 2009). A person can lose their driver’s license for endangering others on the road - such as for reckless driving or speeding. But a driver also can lose their license for reasons unrelated to road safety, such as for child support delinquency, not paying court fines and fees, failing to appear in court, graffiti, or not attending school. This study aims to better understand the relationships among driver’s license suspensions and race-based discrimination in transportation policy and enforcement, criminal justice related to monetary sanctions, and mobility among low-income people. In the face of shrinking city budgets, local governments have increasingly turned to fines and fees to pay for public goods and services (Garrett and Wagner, 2009). However, not all drivers are equally likely to be stopped and ticketed, or to face driver’s license suspensions for unpaid fines and fees. Traffic laws disproportionately target low-income people of color, whose traffic fines generate revenue for city governments (US Department of Justice, 2015). And when low-income drivers are unable to pay for traffic tickets, they can face escalating fines, and may risk losing their driver’s license. Consequently recent political uprisings over racial injustice and disparate law enforcement in the US are intertwined with issues of transportation.

The purpose of this study is to answer the questions: how does license policy compound existing income and race/ethnicity-based disparities in accessibility, and to what extent have recent policy reforms ameliorated these disparities? I use an interrupted time series analysis to estimate the effect of the policy change on suspensions following legislative reforms to suspension policy in California in 2017. The California legislature has increasingly used license suspensions to discourage certain behaviors unrelated to driving, including graffiti, school truancy, failure to appear in court and failure to pay court fines and fees. In 2017, with AB 103, the state stopped suspending licenses for failure to pay fines and fees. I analyze whether this policy reform affected suspensions in low-income and minority areas. I rely on annual California Department of Motor Vehicle suspension data aggregated at the zip code level by type between 2013 and 2020 to measure spatial and temporal variations in driver’s license

suspensions before and after 2017. To account for differences in police prevalence, I use police stop data that the state began to make publicly available after the Racial and Identity Profiling Act (RIPA) in 2015. I find higher rates of suspensions in low-income and minority areas and in places with higher rates of police stops. I also find that the state issued fewer non-driving-related suspensions following policy reform in 2017.

This study adds to the literature on monetary sanctions, impediments to mobility, and racial profiling in law enforcement. It also highlights the ways states such as California use driver's licenses for purposes other than driving and, in so doing, disenfranchise minority populations. In some states, again like California, these types of policies have prompted reform efforts. This study, therefore, informs current policy debates on license suspension reform.

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Key Words: Driver's license, monetary sanctions, suspensions, race/ethnicity, poverty

## USING REAL ESTATE MARKETS TO EVALUATE TRANSIT STATION AREA DEVELOPMENT OUTCOMES

Abstract ID: 188

Individual Paper Submission

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The primary purpose of fixed route transit (FRT) systems is to move people to, from and between nodes or areas. This is advanced when land uses near transit stations maximize access to them. In turn, this depends mostly on private real estate investment but real estate developers will make investments near transit stations only if rents meet investment targets. Rents are affected by the amenity benefit of transit station proximity but can be offset by such negative externalities as noise, traffic, and simply poor urban design of stations and their surroundings. If amenity benefits exceed negative externalities, rents will rise the closer real estate development is to transit stations. If negative externalities exceed amenity benefits, rents will fall. The spatial relationship between real estate rents and transit station proximity reveals how the real estate market internalizes transit station proximity (Li and Brown 1980; Nelson and McClesky 1990). We identify four theoretical outcomes of transit station proximity effects on real estate rents that can be used to evaluate transit station area development outcomes:

1. Rents rise with respect to station proximity signaling that being near stations is an amenity benefit;
2. Rents fall with respect to station proximity signaling that being near stations is associated with negative externalities;
3. A convex form is revealed wherein rents fall from the station outward but then rise signaling that proximity is an amenity benefit to some point after which negative externalities prevail; and
4. A concave form is revealed wherein rents rise from the station outward but then fall signaling that negative externalities give way to accessibility benefits.

Real estate rent slopes with respect to station proximity consistent with **1** and **3** advance transit objectives while rent slopes consistent with **2** and **4** do not.

We apply this theory to the study of office, retail and multifamily rental real estate markets in more than 30 metropolitan areas where more than 50 FRT systems operate. We are guided by two questions:

1. Is there an association between real estate rent and proximity to transit stations?
2. If so, what is the form of that relationship?

We use cross-section quasi-experimental research design. Our time period is 2019 for office and 2018 for multifamily and retail real estate. Using CoStar and census data, we test for the association between transit station proximity and real estate rents per square foot within and across multiple metropolitan areas. Although not causal, associations can be used as guidance for transit and land use planning nonetheless. Ordinary least squares regression is used where rents (the independent variable) are logged and dependent variables are binary or linear. Coefficients may be interpreted reasonably as the percent change in rent with respect to a unit change in the independent variable.

For the most part, we find that transit station areas do not advance transit station area objectives with respect to attracting real estate investment because rents are mostly upward/concave sloping away from transit stations, or ambiguous (Nelson, Hibberd, Currans 2021). However, we identify individual systems with downward/convex sloping rent gradients that are worthy of case study analysis to draw lessons for transit station planning, station area land use planning and urban design for other systems to emulate.

#### Citations

- Arthur C. Nelson, Ph.D., FAcSS, FAICP (presenting author) is professor of urban planning and real estate development at the University of Arizona. His recent work has been in such areas as transit and land use, transit and economic development, the effects of changing demographics on housing demand, and emerging patterns of metropolitan form.
- Robert Hibberd, GISP, is a doctoral student in geography and planning at the University of Arizona. In part based on the work presented, he was recognized as the doctoral student of the year by the National Institute of Transportation and Communities, a USDOT national university transportation center.
- Kristina Currans, Ph.D. is associate professor of urban planning at the University of Arizona. Her fields are modeling the interaction between transit and land use; evaluating the nature of parking demand under different urban form scenarios, and analyzing transportation and transit behavior.

Key Words: Transit Oriented Development, Transit Stations and Real Estate Rent, Transit Stations and Development Outcomes, Transit Stations and Economic Development

#### **WHERE THE CROSSWALK ENDS: MAPPING CROSSWALK COVERAGE VIA SATELLITE IMAGERY IN SAN FRANCISCO**

Abstract ID: 209

Individual Paper Submission

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Marked crosswalks are the primary means of safeguarding pedestrian travel at intersections in American cities. In the face of decades-high pedestrian fatalities nationwide, the provision of adequate sidewalks is highly salient. However, the policies in place which guide where crosswalks are implemented often follow faulty logic, in that they are only recommended where pedestrian crossings *already occur*. In addition, how crosswalks are spatially distributed across a single city, and vary by neighborhood, density, or income, has drawn little academic scrutiny.

Given that, this study employs satellite imagery to map every crosswalk in San Francisco, a dense, walkable city that has struggled to reach its pedestrian-safety goals. Crosswalks are categorized by design type, condition, number of traffic lanes, and the presence of automobile and/or pedestrian signaling. For the first time, this allows for the calculation of 'crosswalk coverage,' which indicates what percentage of overall intersections feature crosswalks. Citywide, crosswalk coverage is less than 50%, and varies significantly across San Francisco neighborhoods, which possibly contributes to disparities in pedestrian safety, as well as signal public under-investment generally. On a three-point scale, roughly three-quarters of all crosswalks received the highest rating (meaning they were highly visible), and the two most common crosswalk design types were continental and ladder. Of the intersections with at least one painted crosswalk, the vast majority featured full treatment, meaning that each possible pedestrian choice (block A to block B, etc.) included a crosswalk. Overall, satellite imagery provides a low-cost and scalable way of identifying marked crosswalks, and evaluating their quality. The creation of this dataset also allows for further analysis in terms of comparing the spatial distribution of crosswalks to socio-economic patterns and pedestrian-safety outcomes. Planners should consider the ways in which crosswalks are present across entire cities — and where notable gaps exist — in their pursuit of Vision Zero goals.

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Key Words: Pedestrian, GIS, Safety, Sattelite, Remote Sensing

#### ENVIRONMENTAL CONTRIBUTIONS TO THE PEDESTRIANS' PERCEPTION AND CROSSING BEHAVIOR: AN EXPERIMENTAL STUDY IN VIRTUAL REALITY

Abstract ID: 230

Individual Paper Submission

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Pedestrian safety turn into one of the important issues in most cities (Rankavat & Tiwari, 2016), and whereby it becomes crucial to provide pedestrians with safe, accessible, and comprehensive facilities to reduce pedestrian crashes. Many of the solutions as a reaction to the emerging crash risk of pedestrians are within the range of the modification of the road environment primarily based on post-accident analysis. Although the traditional crash-based methods have been largely successful, more recently the surrogate safety measures (SSMs), including subjective evaluation of road users and their behavioral indicators, have been proposed as an alternative for studies in the consideration of the fact that reported accidents are rare and difficult to observe requiring years of data collection for a robust analysis (Johnsson, Laureshyne, & De Ceunynck, 2018). Despite this increasing importance of

investigation of the SSMs, existing studies suffer from the methodological shortcomings of field-based techniques related to the consistency and reliability. Within this reasoning scheme, we proposed to leverage the advantage of virtual reality (VR) tool for the scrutinization of risk perception and behavior of pedestrian in more controlled and immersive environments.

The purpose of the present study is primarily to investigate how environmental features incorporated into the shared space have a role in determining the risk perceptions and crossing behaviors of pedestrians. Our study particularly compared the impact of environments attributes including visibility, road design, pavement symbol, vehicle speed and lighting conditions on risk perception in shared streets from that in non-shared streets. This study further addressed the question of whether the perceived risk of pedestrians influences their crossing behaviors. For the purpose, we were based on “situational awareness theory” (Endsley, 1995) to support our hypothesis. The theoretical model describes that human perception of the relevant elements in the environment forms his or her situation awareness, followed by action selection and performance phase.

To accomplish this, an experimental setup for analyzing pedestrians’ crossing perception and crossing behavior was developed using a highly immersive virtual reality (VR) simulation involving a wireless head-mounted display (HMD). In these experiments, 200 participants who were facing 31 traffic scenarios including changes in environmental conditions in the context of the 8-meter-wide segment within residential area were instructed to cross the road whenever they felt it was safe to cross and then evaluate the crash risk perception. From the data recorded by VR system, participants behaviors were also measured by 4 variables indicating waiting time, reaction time, crossing time, and gait variability. For a first sight into the comparison of effect of design features on perceived risk of pedestrian between the contexts of shared space and street with sidewalk, we developed two regression models with random intercept which capture individual differences. Secondly, we used multi-level structural equation model (MSEM) to analyze the relationship among environmental attributes, perceived risk, and behavior in road crossing scenarios.

The findings suggest that all environmental variables used in this study (i.e. visibility, road design, pavement symbol, vehicle speed, and lighting conditions) have a significant influence on risk perception of pedestrians. However, the results of analysis presented the significance of the effect is dependent on the road types (i.e. shared or non-shared space). Therefore, we could discuss implications of this study focused particularly on planning interventions required for each type of road. Specifically, this study recommended to enhance risk awareness through securing visibility and increase feeling of safety through restriction on vehicle traffic in, respectively, shared and non-shared space. From the evidence of behavioral analysis, the present study could also shed light on role of pedestrian’s perceived risk in encouraging their risk-averse behavior when it comes to crossing the road.

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Key Words: Pedestrian, Risk perception, Crossing behavior, Virtual Reality

#### **SPATIO-TEMPORAL PATTERNS OF TRAFFIC FATALITIES AND ECONOMIC DEVELOPMENT IN THE US**

Abstract ID: 249

Individual Paper Submission

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Traffic crashes have been a severe transportation safety problem in the United States for decades. Though traffic fatalities in the US have experienced a continuous downward trend with small fluctuations since 1970s, there are still more than 30,000 annual traffic fatalities in recent years. What is worse, the numbers are estimated to jump even higher in 2020.

Roadway safety studies have been extensively focusing on crash frequency modeling which interprets the relationship between crash counts and various explanatory factors. Among these factors, economic indicators usually play a supplementary role since the economy's impact is not direct and always associated with the travel demand. Kopits & Cropper (2005) proposed that traffic fatality risk increases as the economy grows, and when the GDP per capita reaches a high level, the traffic fatality risk starts to decline. Several studies have been searching for a variety of economic indicators as predictors for traffic crashes. However, only unemployment rate has shown a strong association with fatality changes. The higher unemployment rate indicate less fatalities. While other indicators were either not examined, or have not had consistent associations with fatalities.

Another issue of the existing studies is that traffic crashes occur randomly in space and time, as well as the explanatory factors. Since crashes cluster in certain areas, the neighboring unit would have similar geographic, environmental, and social-behavioral characteristics. As for the temporal pattern, crashes may occur more in some specific years. The causes of the increase or decrease become essential in associating the trends with policy decisions. Omitting the spatial, temporal, and their interactive variations could lead to biased estimation of variability, inaccurate interpretation of the rest of explanatory factors, or model misspecification.

This study examines the relationship between fatalities and economic activities and explores the spatio-temporal patterns of traffic fatalities in the US as related to economic indicators.

We used county-level panel data in the US from 1990 to 2017, including traffic fatalities, economic, demographic, travel demand, and other infrastructure related and land use related indicators. Three models were developed to study the relationship between fatalities and economic activities - the Poisson lognormal spatio-temporal model (PLN-ST), the generalized additive model (GAM), and Random Forests (RF). All these models considered the spatial, temporal, and spatio-temporal dependencies. GAM and RF models are frequently used to capture the non-linear relationship among explanatory variables. PLN-ST applies the assumption that fatality counts follow a Poisson distribution, which could be modeled according to the Besag-York-Mollie method. The spatial effects were specified using the conditional autoregressive structure.

The RF method outperformed the rest and had the best fit in the analysis. The results suggest that the economic indicators play a significant role in traffic fatalities and fatality risks. Specifically, the raise of personal income could lead to the increase of fatalities, while the drop of unemployment rate could lead to the decrease of fatalities. The results also showed that the fatalities have spatial, temporal, and spatio-temporal effects.

This study contributes to the expansion of the existing knowledge in transportation planning. It provides new findings in understanding the association of economic development and traffic safety issues. The study finds that there is an endogenous relationship between traffic safety and economic development, and that differentiates at time stages and geographical locations. This is why a spatio-temporal view of the traffic safety problem is essential to develop a better understanding of the interplay between economic development and traffic safety. This study provides transportation policy makers, transportation planners, and economic development practitioners a better understanding of the effects of economics on traffic safety.

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Key Words: Spatio-temporal modeling, traffic fatality, economic development, machine learning, roadway safety

## CYCLING DURING THE COVID PANDEMIC: INITIAL TRENDS FROM THE USA AND WESTERN EUROPE

Abstract ID: 255

Individual Paper Submission

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During the COVID-19 pandemic government-imposed lockdowns as well as increases in remote working, learning, and shopping resulted in a sharp drop in overall travel. However, the number of trips made by bicycle seems to have increased in 2020 compared to 2019. This study examines the impact of COVID-19 on bicycling in Europe and North America. Based on information from automated counters, app-based data, and city level evidence we trace changes and variations in bicycling in 2020 compared to 2019 by time of day, time of year, and geographic location. We also explore trends in bike-friendly measures implemented in response to the pandemic.

Available bicycle industry data point to an increased interest in cycling with growth in bicycle sales in 2020 compared to 2019: +17% in Germany, +20% in the UK, and +39% in the United States. Based on data from permanent bicycle counters, overall bicycling levels in 2020 were greater than in 2019: Europe (+8%), the United States (+16%) and Canada (+3%). There was great variability among European countries ranging from +24% and +20% increases in Portugal and Sweden to net declines in Austria (-3%) and Ireland (-9%). Similarly in Canada, the western part of the country reported overall growth in cycling, while the eastern part of the country reported a net decline in cycling. In the USA, the Southwest saw the strongest growth in cycling and the Southeast the smallest.

In all countries and all regions of countries studied here, cycling increased on weekends: Europe (+23%), USA (+28%), and Canada (+28%). Even those countries and regions that reported net declines in cycling saw bicycling increases on weekends. During the week, cycling increased at a lower rate or even fell: Europe (+3%), USA (+10%), Canada (-8%). The diverging trend in cycling on weekdays is likely explained by a reduction in bicycle commuting due to a greater share of the populations working or learning from home. This is supported by data from traffic counters and tracking apps that show strong declines in bicycle trips during the weekday morning commute hours in 2020 compared to 2019.

The app-based data from Streetlight shows overall declines in bicycling in U.S. cities where the commute traditionally had accounted for a high share of bicycle trips, such as Washington, DC—while other cities report net increases in cycling. However, according to Streetlight data, even in places where cycling decreased, its mode share likely increased because overall trip making declined at a fast rate.

Cycling levels also varied throughout the year with strong declines in cycling in 2020 compared to 2019 during lockdown periods in countries like France, Italy or Spain—where lockdowns restricted almost all non-essential out-

of-home activities. For example, in France cycling fell by 70% when the first severe lockdown was instituted in March 2020, only to rebound five-fold to 144% of pre-lockdown levels once travel restrictions were lifted.

To date, little is known about individual motivations for more cycling. In 2020, People for Bikes asked new cyclists for their top reasons for cycling: stress relief and mental health (58%), exercise and physical fitness (57%), socializing with friends and family (43%), relaxation (37%), and getting outdoors (33%).

Based on data from the European Cyclist Federation, People for Bikes, initial published research, and data obtained directly from planners and policy makers, countries and cities supported bicycling during COVID-19 through bikeway infrastructure and facilities, street closures or speed reductions for motorized traffic, and increased funding. Many cities have plans to make temporary COVID-19 measures permanent to promote cycling in the future.

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Key Words: bicycling, COVID, increases, infrastructure

## **A DOUBLE JEOPARDY: COVID-19 IMPACTS ON PEOPLE WITH DISABILITIES' TRAVEL BEHAVIOR AND COMMUNITY LIVING**

Abstract ID: 266

Individual Paper Submission

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Community participation is vital to health, well-being, self-determination, and quality of life. COVID-19 has negatively impacted individuals' ability to participate in their community (Pfefferbaum & North, 2020). In addition, people with disabilities are simultaneously dealing with existing social disadvantages. This combination can heighten vulnerability and lead to disproportionate effects (Armitage & Nellums, 2020; Constantino et al., 2020; Pineda & Corburn, 2020). Yet, there is limited evidence documenting the extent to which activities of daily community living (ADCL) for people with disabilities have been impacted. Consequently, there is a lack of appropriate interventions and evidence-based decision-making to address challenges related to employment, housing, community services, planning/transportation, recreation, social engagement, and education.

This study aims to assess people with disabilities' ADCL during COVID-19 pandemic conditions compared to the general population. We ask four research questions. First, to what extent has the number of trips changed? Second, if trip reductions have occurred, have people with disabilities made a more significant reduction on certain modes? Third, are changes in travel behavior and community living different between people with and without disabilities by



place type? Last, do socio-economically disadvantaged people with disabilities show an even more significant reduction in their daily travel and community living? Our hypothesis was greater relative trip reduction for people with disabilities as well as a disproportionate reduction for socio-economically disadvantaged people with disabilities.

To answer those questions, we conducted a web survey using Qualtrics' online panel data. The final sample includes 161 people with disabilities and 232 people without disabilities across the United States. We collected data on the frequency of weekday trips, frequency of modes, and places visited. Each participant was asked to estimate their activities "pre-COVID" (2019), "during COVID" (2020 after the COVID-19 outbreaks), and "post-COVID" (the time when COVID-19 is no longer a concern in the U.S.). We ran bivariate inferential statistics such as t-test and Chi-square test of independence to see if the mean differences are statistically significant. Then, multiple regression models were developed for different hypotheses that explain travel behavior outcomes by internal and external factors. To model moderating effects of socio-demographic factors, interaction terms were added between disability status and personal income variable.

Our survey data shows people with and without disabilities have reduced their daily travel across all transportation modes and destination types during COVID, compared pre-COVID. And as hypothesized, those with mobility disability reduced their travel to a greater extent than other groups when socioeconomic status is equal. By travel mode, walking trips decreased further among individuals with mobility and sensory disabilities, and taxi trips (including ride-hailing services) were reduced more significantly among those with cognitive and sensory disabilities.

By place type, we observed more significant trip reductions to grocery stores, community service providers, and outdoor recreation facilities among people with disabilities during the pandemic. Regression models show that cognitive disability is most associated with a trip reduction in multiple destination types. Lastly, we found more negative impacts of COVID-19 on travel behavior and community living among low-income people with disabilities. Our results indicate lower-income people with disabilities may still rely on public transit during the pandemic, as they have less access to alternative forms of transport.

This study shows that COVID-19 impacts were more negative among people with disabilities, an already disadvantaged population. Our findings could contribute to evidence-based decision- and policy-making during the remainder of the COVID-19 pandemic and for consideration of future public health crises. More importantly, its practical implications would also be relevant post-COVID because the adjustments in travel behavior and community living might be longer-term during the "new normal."

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Key Words: individuals with disabilities, disability, activities of daily community living, pandemic, transportation

## CHALLENGES AND OPPORTUNITIES OF TRANSPORTATION PLANNING FOR DISADVANTAGED COMMUNITIES IN SOUTHERN CALIFORNIA BEFORE AND DURING COVID-19 PANDEMIC

Abstract ID: 267

Individual Paper Submission

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Transportation equity has been a hot topic over decades (Karner, 2016). Disadvantaged communities are often faced with great transportation barriers to employment, education, healthcare, and other essential social services (Kaufman et al., 2017). These barriers motivate the study of transportation accessibility, affordability, and reliability (Litman, 2008; Fan & Huang, 2011). However, there is a lack of assessment on the challenges and opportunities of traditional and emerging transportation options before and during the unprecedented COVID-19 pandemic for disadvantaged communities.

Our study area includes 382 neighborhoods (census block groups) from 11 communities in the greater Los Angeles region (e.g., Carson, Compton, and Los Angeles) with a total population of ~ 630,000 residents. Most of the studied neighborhoods are identified as disadvantaged neighborhoods according to CalEnviroScreen 3.0 (OEHHA, 2018). In this study, we conducted both neighborhood-level analyses and individual-level surveys to uncover the transportation challenges and opportunities before and during the pandemic.

We developed four groups of indexes to describe the socio-demographic characteristics of the study area and to quantify their transportation accessibility, affordability, and reliability. Specifically, we used seven indexes to characterize socio-demographic features (e.g., racial/ethnic composition, household income) and vehicle ownership and eight indexes to measure the transportation accessibility for opportunities (e.g., employment, healthcare, and parks) via different travel modes (e.g., auto, transit, and biking/walking). We measured neighborhood affordability (housing and transportation costs) and reliability (transit on-time performance and travel time). We designed a resident survey to gather individual-level information regarding parking availability, transportation costs, familiarity and use frequency with different transportation modes before and during COVID.

We found most of the studied neighborhoods are socioeconomic disadvantaged (e.g., predominantly minority with low or moderate income and poor education attainment). However, car ownership in the neighborhoods is slightly greater than the regional average suggesting limited non-auto transportation options. In general, there is a huge disparity in transportation accessibility and reliability for residents who have access to cars and those who rely on other transportation options. Accessibility to opportunities (e.g., jobs, healthcare, education, food, and parks) varies by mode choice, distance to center, and facility availability. The bikeability and walkability are generally worse than the regional averages. The residents are burdened with transportation and housing costs and suffer from poor transportation reliability (e.g., much longer travel time and out-of-vehicle time).

We have received 430 complete survey responses currently. These respondents are mostly female (77%), 18-34 year old (69%), Hispanic or Latino (62%), and full-time employed (41%). In general, more than 82% respondents have at least two cars in the household and half of the respondents do not own bicycles, which echoes the auto-dependent status of the study area. There are 6% more respondents who find parking difficult and public transit unsafe while more than 53% respondents find the transportation costs decreased during COVID. For emerging transportation options, more than 90% never use car-share, bike-share, scooter-share, or micro-transit before COVID; this rate has climbed to 97% during COVID. Similarly, there is an increase of respondents who never use carpool service, public transit, nor bikes during COVID (from 64% to 85%) as well as ridehailing or taxi services (from 35% to 76%). Finally, respondents will consider using carpool and non-auto modes (e.g., bus/light rail, bike, walk, and scooters) if they are readily available and affordable.

The neighborhood-level analyses and individual-level survey focus on assessing how disadvantaged neighborhoods have been hindered by mobility challenge in terms of accessibility, affordability, and reliability before and during COVID pandemic. Our work could help overcome transportation barriers and improve opportunities to emerging mobility options, thus facilitating transportation planning and developing equitable, resilient, and healthy cities.

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Key Words: Transportation equity, environmental justice, mobility challenge, disadvantaged community, COVID-19

#### **PUBLIC TRANSPORT FOR ALL? MIGRANTS' VIEWS ON ONE OF EUROPE'S TOP PUBLIC TRANSPORT CITIES**

Abstract ID: 290

Individual Paper Submission

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Vienna, Austria, has been consistently ranked among the world's most livable cities by several different quality of life indices. Factors often cited for Vienna's top rankings include an extensive public transportation system, a robust public health system, low crime rates, and a large supply of public housing. Several studies have identified public transport in Vienna as exemplary in Europe based on its geographic coverage, cost, and ridership levels.

However, quality of life indices and available studies heralding Vienna's public transport system do not differentiate the quality of life and public transport quality for minority groups such as migrants. In 2020, migrants who were born abroad or have at least one parent who was born abroad, accounting for 41 % of Vienna's population--one of the highest migrant population shares for a city world-wide. Research from the United States and other OECD countries has shown that migrants are more likely to ride public transport than non-migrants--similar to the travel behavior of individuals with lower incomes.

Treating public transport in Vienna as an integral part of daily life, this paper investigates if migrants in Vienna ride public transport more than non-migrants and if migrants perceive the quality of public transport differently from non-migrants. Also, we examine differences between migrant sub-groups by region of origin. Understanding the travel behavior of migrants can help understand the conditions and constraints in which migrants master their daily life (Smart, 2010). Reduced mobility in terms of access and frequency of migrants can lead to reduced participation in everyday life

After describing Vienna's public transport system, the paper utilizes the 2019 Austrian Mikrozensus (Microzensus) to analyze public transport ridership and perceptions among migrants and non-migrants. Logistic regressions compare

frequency levels of public transit usage and perceptions regarding six aspects of public transit: cost, travel time, coverage, condition of the interior, headways, and safety.

We find that migrants are more likely regular public transport riders than non-migrants--in particular migrants from Turkey. Turkish migrants are not only the second largest migrant group in Vienna but literature confirms that the travel behavior of Turkish Migrants is more different than non-migrants compared to other migrant groups (Harms, 2007; Kasper et al. 2007; Welsch, 2018).

Regarding the perception of six different aspects of public transit, similar trends are discovered. While non-migrants and migrants as a whole do not seem to have any statistically significant differences in perception of public transport, these differences become substantial when looking specifically at Turkish migrants. Turkish migrants seem to be significantly less content about public transit in all of the six categories compared to non-Turkish migrants and non-migrants, especially regarding costs and safety. This aligns with the literature that finds that Turkish migrants face more financial hurdles than other migrant groups and non-migrants as well as more discrimination and racist encounters.

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Key Words: Travel Behavior, Vienna, Immigrants, Transportation Equity, Sustainability

#### RACE, INCOME, AND AUTOMOBILE DEBT

Abstract ID: 304

Individual Paper Submission

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Households across America regularly take on debt to purchase or lease automobiles. The vast majority of low-income households own and travel by automobile, and a growing number of studies link automobile ownership to a host of positive outcomes including employment, wages, and access to high-quality neighborhoods. However, automobiles are expensive to own and operate. Consequently, many households struggle to repay the auto loans taken out in order to finance these vehicles.

The geographic and demographic contours of auto loans, debt, and delinquencies are uneven. The COVID-19 pandemic has likely exacerbated these disparities, as its economic fallout has been hardest on low-income and non-white families. In this paper, we examine the effect of the COVID-19 crisis on the geographic distribution of automobile indebtedness and delinquency, across neighborhoods in California by income and race/ethnicity. We use a new dataset, the University of California Consumer Credit Panel, which contains anonymized credit data with information on all individual loans in California from 2004 to 2020, allowing analysis of debt both before and during

the current crisis. The dataset includes outstanding debt, credit scores, and delinquencies. It also includes a census-tract identifier, enabling us to link the data to the characteristics of the neighborhoods in which consumers live. Our research analyzes approximately 300 million loans in California's 8,057 census tracts (neighborhoods) over eleven years, which we group into two categories: pre-pandemic (2010-2019) and pandemic (2020).

In the pre-pandemic analysis, our preliminary findings have uncovered trends in auto debt that correlate with a number of existing inequities. We find that although auto and overall debt balances grew in tandem in the top income quintile of neighborhoods from 2010 to 2019, auto debt balance growth has far outpaced overall debt balance in the bottom income quintile of neighborhoods, where overall debt has remained largely constant. Additionally, we find that while auto debt is increasing across all neighborhoods with a race/ethnicity majority, Latino neighborhoods have seen the greatest growth and prior to the pandemic held the most auto debt per capita.

During the pandemic, the relative standings of per-capita auto debt balance remained roughly constant among neighborhoods with race majorities. However, we find big effects during the pandemic in the changes to debt balance in the bottom income quintile of neighborhoods as compared with the top quintile. In February 2020, cumulative auto debt in wealthier neighborhoods grew by three percent, while in poorer neighborhoods, auto debt grew by less than one percent. However, by May, the month-over-month growth rates had swapped: auto debt in poorer neighborhoods continued to grow (by 0.2%), while declining in wealthier neighborhoods (by 0.5%). Auto debt in both neighborhood types grew again in June, but more rapidly among consumers in the bottom quintile; it peaked at four percent growth—more than double the growth rate in early 2020. Consequently, low-income neighborhoods held more per capita auto debt than wealthier neighborhoods by year's end, a reversal from prior to COVID-19. We also see potential effects from federal economic relief payments in April and the lapse of unemployment benefits in July.

Our research places auto debt and inequities therein in a transportation context and highlights the effects of the pandemic on indebtedness. The findings suggest that automobile ownership became more important for low-income households during the pandemic, yet this crisis likely saddled low-income and non-white families with untenable debt, which for some households may result in the loss of household vehicles. The analysis suggests the importance of policy efforts to ease racial disparities in auto finance as well as to address barriers to transit use, many of which have been elevated during the COVID pandemic.

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Key Words: Automobile debt, Automobile loans, Transportation Dependency, Access, Race

#### INCORPORATING EQUITY PRINCIPLES TO ASSESS MODAL MISMATCH IN THE SAN FRANCISCO

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Last few years, a variety of social and political movements around the world have spotlighted the equity issues in many areas. It gains the momentum and provides the opportunity for everyone including scholars to engage in the conversation of this particular topic. Although the term equity is multi-disciplinary and widely used in politics, economics, public health, environmental science, etc., it shares a common meaning that benefits and risks are distributed proportionally among different groups of people in a way favoring those in disadvantage due to social, historic, geographic, or other influencing factors (Pereira et al., 2017; Litman, 2021).

In the field of transportation planning, equity is an essential component in most plans or strategies (Karner & Niemeier, 2013). It is multidimensional in considering mobility and accessibility, safety, traffic-related pollution, health, and other system and individual goals (Creger et al., 2018). Among these different perspectives, our main focus of this study is accessibility which is the most representative indicator of transportation system's main function – to move people around and to provide access to opportunities by various means, such as car, public transit, shared mobility, biking, and walking (Geurs & van Wee, 2004). As our travel behavior gradually shifting from highly car-dependent to multimodal, we are enthusiastic to understand the degree of job accessibility gap distributed between car users and transit-dependent population, as we define it as accessibility-based modal equity.

Most studies discussing transportation equity did not pay enough attention to the difference between equality and equity and often used them interchangeably. The lack of clarity of concepts directly results in the confusion of methods used to assess equity or equality. One of the most common mistakes is that studies used approaches (Gini index, Lorenz curves, Palma ratio) that normally evaluate equality – the equal distribution of a subject but claimed to evaluate equity. Meanwhile, methods that truly assess equity are rare to find and usually more complex. In order to operationalize equity analysis, we synthesized two main equity principles – basic needs and equitable difference, and developed a 6-step framework based on a variety of social and philosophical theories regarding equity as well as multiple studies that incorporated equity principles in accessibility-related analysis. We selected one of the most transit-rich cities in the U.S. – San Francisco as our study area. We firstly computed two critical indexes for each spatial analysis unit (block group). One is transit-dependent index that is based on socioeconomic data and represents the level of transit dependency for people living there, the other one is mismatch index that demonstrates the difference of job accessibility provided between car and transit. Based on the two indexes, we were able to know how the job accessibility gap is distributed among different places with various transit demand level. Then by utilizing the two synthesized equity principles, we can evaluate how equitable the transit resources are distributed across the city.

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Key Words: Transportation Equity, Accessibility, Modal Mismatch, Public Transit, San Francisco

## EXPLORING THE FACILITATORS OF E-SCOOTER USE: HOW DIFFERENT FACTORS AFFECT VARIOUS SOCIAL GROUPS?

Abstract ID: 309

Individual Paper Submission

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Docked and dockless shared electric scooters (hereafter e-scooters) have been adopted in many countries since their first appearance in California in 2017. Recent statistics show an exponential increase in their use, particularly in the U.S. (NACTO (National Association of City Transportation Officials), 2019). E-scooters have the potential to contribute to sustainable mobility. A recent study from San Francisco, CA shows that e-scooters replace existing private automobile trips and induce new transit trips that would have not occurred if scooters were not available (San Francisco Municipal Transportation Agency, 2019). Additionally, e-scooters can play a key role in providing mobility options for disadvantaged communities by solving their first and last mile problems (Shaheen et al., 2019). Recent research shows that we have limited empirical evidence on currently evolving e-scooters and the factors affecting their use (McQueen et al., 2020). Empirical studies that investigate how different factors affect various social groups' e-scooter use are essential to develop planning policies that can promote their use as a complementary sustainable mobility option.

This study contributes to the literature by analyzing the facilitators and deterrents of e-scooter use. It uses data collected from The Ohio State University's (OSU) main campus in Columbus, OH. Data were collected through an online survey by OSU's Transportation and Parking Services in conjunction with our research team in November 2019. Invitation emails including the link to the survey were sent to a sample of 47,822 members of the university community including faculty, staff, undergraduate students, and graduate students (about 50% of the total campus population). After checking for early dropouts, responses with considerably incomplete information, etc. the study sample comprised of 4,170 respondents that equal to a response rate of 9%. The survey includes detailed questions on socio-demographics, travel mode preferences, travel frequencies, satisfaction levels with various transportation modes as well as e-scooter related attitudes, perceptions regarding the impacts of built environment factors on e-scooter use, and frequency of e-scooter use for different trip purposes.

Considering the potential impacts of built environment characteristics on individuals' e-scooter use, it is crucial to account for these factors in the analysis. For that reason, we merge the campus transportation survey dataset with the United States Environmental Protection Agency (EPA)'s Smart Location Database (SLD) using Census Block Group level geocoded household locations. SLD is a nationwide geographic data resource summarizing more than 90 different indicators associated with the built environment and location efficiency (for details see U.S. EPA, 2014). Using the aggregated dataset, we explore the facilitators and deterrents of e-scooter use among campus population controlling for socio-demographics and life-style related factors through a generalized structural equation modeling (SEM) approach.

As a novel transportation technology and mobility option, our knowledge about e-scooters is limited. This study adds to the existing knowledge on the factors affecting e-scooter use. It provides scholars and policymakers an understanding of how different factors, particularly those related to built environment characteristics and individual attitudes, affect various social groups' e-scooter use. The major findings present some guidelines for authorities in integrating e-scooters into the existing transportation networks and promoting their use through built environment interventions.

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Key Words: Micromobility, E-scooter, Sustainable transportation, Structural Equation Modeling

## CAN NEW FRAMES HELP OVERCOME OPPOSITION TO AUTOMATED TRAFFIC ENFORCEMENT?

Abstract ID: 310

Individual Paper Submission

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Speed and red-light cameras have been shown to improve traffic safety, offer consistent general deterrence, and avoid undue police discretion. Despite the promise of these schemes and their successful implementation in other countries, automated enforcement is rare in the United States and many states have banned speed cameras. The U.S. public is deeply skeptical about the credibility and legitimacy of speed cameras as tools for traffic enforcement. The lack of automated enforcement in the U.S. is a serious problem. Nationwide, 33,000 people die each year in traffic crashes and over one quarter of these violent deaths are caused by excessive speed. Enforcement is exceedingly rare; the average U.S. driver has only a 1% chance of being pulled over in a given year. Sporadic enforcement is an ineffective deterrent and has low credibility as a safety tool. Finally, Black and Hispanic communities are disproportionately targeted for enforcement and, far too often, traffic stops escalate, leading to serious injuries or death.

To overcome public opposition and build support for this important policy tool, road safety scholars have called for research on the messaging surrounding automated enforcement. In short, they ask, could we increase support for automated traffic enforcement by framing the problem differently?

Frames are “diagnostic/prescriptive stories story” about “what needs fixing and how it might be fixed” (Rein & Schön, 1996). These are known alternately as problem characterizations (Jones & Baumgartner, 2005) or problem definitions (Rochefort & Cobb, 1994), but regardless of their name, each of these stories highlights some aspects of the issue while de-emphasizing others, which in turn profoundly shape how problems are addressed.

To assess the efficacy of alternative frames, we conducted a survey experiment with a representative sample of the U.S. public (n=2,000). Respondents were randomly assigned to read one of three different messages about traffic cameras, each with a unique problem frame. The first message focused on traffic safety and the risks of high speeds. The second emphasized drivers’ frustration with speed traps and their belief that enforcement is primarily for raising revenue. The third focused on racial bias in traffic enforcement. After introducing the unique problem frame,



each message presents automated enforcement as a reasonable solution. Each message is of similar length (~180 words) and reading level (Flesch-Kincaid Grade Level of 12 or lower).

The results of this work clarify the potential benefits and risks of each alternative message. They will assist practitioners—who are currently “flying blind”—to lay the groundwork for widespread implementation of this important safety and equity tool.

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Key Words: Framing, Traffic safety, Racial bias, Experiment

#### DO ENGINEERS AND THE PUBLIC SHARE PLANNER’S CANONICAL VIEWS ABOUT TRANSPORTATION?

Abstract ID: 312

Individual Paper Submission

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Among urban planners, many ideas enjoy near universal support. In transportation these canonical ideas include promoting walking, biking, and transit. Despite the consensus among most planners, it is unclear whether the public or transportation engineers share those views. Identifying points of consensus and divergence is essential because the public and engineers play an outsized role in shaping the transportation planning process.

To explore these issues, we surveyed a representative sample of 599 U.S. adults, as well as 592 transportation students enrolled in transportation planning and engineering courses in the United States. We asked respondents for their views on the goals of transportation and their preferred approaches for dealing with congestion and transportation finance.

First, the good news. Many of planning’s canonical views enjoyed broad appeal. For instance, 95% of planning students supported expanding transit service to combat congestion, a view supported by 91% of engineering students, and 88% of the public and. When it came to using gas taxes to fund non-auto travel modes, 93% of planners and over three quarters of the public and engineers agreed that it was fair to do so. Ninety-seven percent of planners, eight in ten members of the public, and nine in ten engineering students agreed that safety and environmental regulations should go farther. Finally, when it came to having drivers share their historic right to the roadway with other road users, 97% of planners, 81% engineering and 71% public were supportive.

Now, for the bad news. Several policies that planning students favor enjoyed far less support from engineering students and the public. Whereas 83% of planning students say that the central goal of transportation planning should be to reduce driving, just 52% of engineering students and 30% of the public agreed. Similarly, 83% of planning students preferred to raise the gas tax rather than divert money from the general fund, but only 59% of engineering students and 45% of the U.S. public approved. The starkest differences materialized with respect to building our way out of congestion. Ninety-three percent of planning students opposed this approach, just 59% of engineers and 30% of the public did. This pattern of opposition closely mirrored knowledge of induced demand, which was nearly universal among planning students (93%) but was lower among engineers (70%) and lower still among the public (39%).

These results have to implications for planning practice and pedagogy. Practitioners and educators alike should be aware of the false consensus effect, whereby people overestimate the extent to which their views are shared by others. Students may be in for a rude shock when they encounter public opposition for the first time. Planning pedagogy should help students recognize public preferences and prepare them to work across ideological differences.

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Key Words: Public opinion, Transportation, Engineering, Congestion, Education

#### **TITLE: DRIVE UNTIL YOU QUALIFY: EXPLORING LONG COMMUTES IN A HIGH HOUSING COST REGION**

Abstract ID: 313

Individual Paper Submission

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Policy analysts and planners have begun to link extreme commuting with a lack of housing affordability in the urban core. The assumption being that low-income persons, priced out of the city center, move to the fringe but continue to commute long distances (Kakar and Grossman, 2018). Supercommuting has increased by 1.8% annually from 2005 to 2016, comprising nearly 3 of every 100 U.S. commuters in 2016 (Bennet, 2018). Following existing literature, supercommuting in this paper is defined as one-way commutes longer than 90 minutes or at least 50 miles (FHWA, 2018). California’s Central Valley has several metropolitan areas within the top ten of the highest shares of supercommuters in the U.S. Based on ACS data, the San Francisco Bay Area, has seen rapid increases in its

share of super-commuters, growing from a 2.3% share in 2005 to a 4.8% share in 2016 (Bennet, 2018). Several areas of the Central Valley surrounding the Bay Area have even higher proportions of super-commuters: San Joaquin and Stanislaus had 10.2% and 8.6% share of supercommuters (ACS, 2015-2019).

Researchers have suggested that the imbalance between affordable housing in the Central Valley and thriving job opportunities in the Bay Area increase the need for long-distance commuting (San Joaquin Council of Governments, 2011). The restrictive housing supply in San Francisco metro forces workers to migrate out of the Bay Area. However, there has been little evidence of such an association. Past literature fails to explain the mixed results between two types of supercommuters: 1) the lower-income workers who live in the metropolitan area's periphery and travel frequently to the workplace and 2) the higher-income workers who live further away but tend to have more flexible schedules and travel less frequent to work. This paper aims to fill the gap by answering the following questions: 1) Does migration from adjacent regions increase the share of supercommuting? 2) Who bears the burden of increased supercommuting? 3) Do commute patterns vary between different industries?

This paper focuses on studying the combined Bay Area and the Central Valley region, but the research methods and results are generally applicable to other regions since supercommute has become a growing trend nationally and globally. We look at the three best available data sources on commuting (travel surveys, ACS, and LEHD) to statistically understand the incidence of supercommuting over time. We run a trip-level regression analysis across the Central Valley and the Bay Area using variables in the travel diary. COVID 19 has altered commutes substantially since the survey and census data were available. We also use Streetlight data to explore how pandemic patterns have changed from past trends.

All data sources show that the Central Valley counties, especially El Dorado, Merced, and San Joaquin county, generate more supercommutes than the Bay Area counties. The results point out an imbalanced commute flow between the Central Valley and the Bay Area. Workers who commute from the Central Valley to the Bay Area are ten times more than workers who commute from the Bay Area to Central Valley. In the Bay Area, the wealthiest group (>\$3333 / month) has the lowest share of supercommuters; while in the Central Valley, the wealthiest group has the highest supercommuter share. Also, the youngest group (Age <30) has the highest share of supercommuters in all counties in both the Bay Area and the Central Valley. Results from the analysis also indicate that household characteristics play an important role in commuting. Commuters with jobs in manufacturing and farming travel the longest to work. Neighborhoods with a higher share of renter-occupied housing also produced more supercommuters.

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Key Words: Supercommute, Migration, Displacement, Income inequality, Regional disparity

#### LOCATION-ALLOCATION MODEL BASED ON SIMULATIONS OF PUBLIC FACILITY CHOICE BEHAVIOR: A CASE STUDY ON NURSING HOME PLANNING IN SHANGHAI, CHINA

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As an essential task of public facility planning, facility location problem has received continuous attentions for many years. A number of models are developed to rationalize location decision-making process, among which, location-allocation (LA) models are widely acknowledged. Classical LA models mainly apply distance-based principles, such as p-center and p-median algorithms, to generate optimal solutions which minimize the average or the most unfavorable distance from public facility to its potential users. However, two oversimplified assumptions make these principles less convincing: only distance-to-home is considered when modelling users' choices of facilities, and this single factor determines in an all-or-nothing way. In contrast, it's obvious that choosing facilities are influenced by various preferential attributes and should be better regarded as probabilistic spatial behavior, with unobservable attributes counted as random errors. Therefore, we propose a new LA model which is based on analysis of users' preference on public facilities and probability-based simulations of their choices. For preference modelling, Logit model under Random Utility Theory is employed by assuming that one would choose the facility with the largest utility. Furthermore, utility-based indicators are maximized to generate optimal solutions using Genetic Algorithm, which is a generalization to classical LA models that just minimize distance-based indicators. As an application, we adopt the proposed LA model in the planning of 5 new nursing homes (NH) in Shanghai, China. A stated preference study is implemented on 293 respondents to show how the elderly people make tradeoffs among several attributes when choosing NHs, including distance to home, distance to hospital, accessibility to metro station, air quality, monthly cost, and level of service. This enables the proposed LA model to simulate the complicated choice behavior in a much more reasonable way, comparing with simply allocating all the elderly people to the nearest NH. Meanwhile, our model maximizes the mean utility over all simulated people, which comprehensively considers all the NH attributes stated above as well as their relative importance according to preference analysis. The results show that the solution suggested by the new LA model outperforms those by classical LA models. Finally, a simulating and optimizing tool with geographic user interface is developed to support decision making process of public facility planning.

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Key Words: location-allocation models, public facility planning, preference analysis, spatial behavior simulation

**PUBLIC TRANSPORTATION, AGGLOMERATION ECONOMIES, AND EQUITY: THE EFFECT OF TRANSIT-INDUCED AGGLOMERATION ON LOW-SKILLED JOB ACCESSIBILITY IN PORTLAND, OR.**

Abstract ID: 343  
Individual Paper Submission

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The spatial mismatch hypothesis states that the decentralization of jobs undermines socially disadvantaged group's job accessibility. One potential solution is the promotion of transit-induced agglomeration economies which could enhance job accessibility for low-wage or low-skilled workers by centralizing jobs to urban areas with relatively high-density surrounding transit stations. However, the gentrification through Transit-Oriented Development (TOD) could limit jobs available to the underrepresented workers in the urban central area. In this case, agglomeration may not help these workers have better access to matching jobs. To unravel these relationships, this research investigates the effect of transit-induced agglomeration on gravity-based job accessibility by transit in Portland, OR. Furthermore, this study compares the agglomeration impact on low-skilled job accessibility to the overall job accessibility. Effective density is proxy for transit-induced agglomeration economies in the analysis. The relationship is estimated with spatial econometric models to evaluate the direct effect as well as the spillover effect of agglomeration. Overall, transit-induced agglomeration brings a positive effect on job accessibility. However, agglomeration economies of one location reduces the job accessibility of their neighbors, implying that concentrating economic activities beyond a certain spatial scale may absorb jobs from the neighboring areas. Decision-makers and urban planners should set an upper limit in the spatial scale of TODs to avoid a zero-sum game. The agglomeration effect on job accessibility for low-skilled workers is not as strong as the accessibility for all workers, calling for decision-makers' attention to the importance of "redistributing" the agglomeration effect through progressive land use and transportation policy efforts for underrepresented workers.

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Key Words: Agglomeration, Job accessibility, Public transit, Low-skilled employment, Equity

#### COMMUTE KNOWLEDGE: HOW TRANSIT USERS LEARN AND ALTER TRAVEL PATTERNS

Abstract ID: 356  
Individual Paper Submission

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This paper investigates the ways that transit users learn about, make decisions around, and ultimately change the ways they commute via public transit. The setting for this research is the newly instituted Southeastern Pennsylvania Transportation Authority (SEPTA) bus Route 49 in Philadelphia – the first new bus route added to SEPTA's network in a decade. Using a mixed-methods research design that incorporates quantitative survey data collected onboard, as well as qualitative data from semi-structured interviews with select users, I address the following research questions: 1) How do users learn about the ways they travel to work via public transit and

thereby gain “commute knowledge”? 2) What role do communications from formal versus informal actors play in the “commute knowledge” acquisition process? 3) How did users commute before the new bus came on line? 4) How did users ultimately decide to change their commute to a new route? Users of the new Route 49 appear to gain substantial levels of “commute knowledge” from informal mechanisms, such as conversations with coworkers, or merely from seeing the bus go by. Respondents often discuss the new route with their peers, signaling robust communication networks when it comes to making transit choices. Overwhelming numbers of Route 49 users switched to this route from another public transit mode. Users often make decisions around whether or not to use the Route 49 day-of or even during the commute itself. I conclude the paper by synthesizing these various pathways into a theoretical model of “Commute Knowledge Acquisition” that can inform future transportation planning around new route developments. Together, these findings describe a universe of social and informal communications and sometimes spontaneous actions that shape commute knowledge and, ultimately, change.

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Key Words: Commute, Mixed-methods, Transit, Networks

#### COMMUTE DISTANCE AND JOBS-HOUSING FIT

Abstract ID: 357

Individual Paper Submission

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Anecdotal evidence suggests that the growing affordable housing crisis in major metropolitan areas, such as Los Angeles, is forcing households to seek lower cost housing in the outer reaches of metropolitan areas, helping to explain the recent increase in commute distances (Dougherty & Burton, 2017; Holder, 2018). In the Los Angeles metropolitan area, the number of jobs near the average resident decreased by 7.4 percent from 2000 to 2012, with high increases in commute distance in high-poverty and majority-minority neighborhoods (Kneebone & Holmes, 2016). At the same time, housing prices—both home and rental—have continued to climb, even in the midst of the current COVID-19 pandemic (Joint Center for Housing Studies, 2020). High housing costs may limit the ability of lower-income households to act on their preferences for living in close proximity to where they work (Levine, 1998).

Despite suggestive evidence of the relationship between housing costs and commute distance, there are relatively few studies that document this association and its magnitude. We use spatial regression to examine this relationship between the availability of affordable housing in close proximity to jobs (jobs-housing fit) and commute distance in the Los Angeles metropolitan area controlling for several locational, employment, and housing characteristics of workers’ workplace census tracts. The analysis draws on 2015 Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) by workplace supplemented with data from the 2017 5-Year American Community Survey on affordable housing units.

We find substantial variation in jobs-housing fit across Los Angeles neighborhoods. The imbalance is greatest in higher-income neighborhoods located along the coast and in Orange County, south of Los Angeles. Overall only four percent of low-wage workers work in neighborhoods where cost-appropriate housing units exceed the number of workers. In comparison, 58 percent of medium wage workers and 77 percent of higher-wage workers work in neighborhoods where cost-appropriate housing exceeds the total number of jobs.

Controlling for other determinants of commute distance, higher ratio of jobs to affordable housing is associated with longer distance commutes. These findings suggest that the lack of reasonably priced housing options near employment locations likely force low-wage workers to live far from job locations and, consequently, lead to longer commutes. The character and affordability of housing may not adequately meet worker demand—particularly demand from low- and medium-wage workers.

Longer distance commutes can be detrimental to families as well as to the environment—adversely affecting economic mobility, activity participation, health, and air quality. The results of this study underscore the importance of available and affordable housing in enabling workers to live close to their jobs, if they so choose. To address increasing commute distances, policymakers must greatly expand and protect the supply of long-term rental housing particularly in job-rich neighborhoods.

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Key Words: commuting, low-wage workers, affordable housing, residential location

#### INFRA-STRUCTURAL CHANGE: 20 YEARS OF TRANSPORTATION INVESTMENTS AND THE IMPLICATIONS FOR POLICY

Abstract ID: 364

Individual Paper Submission

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A critical strategy for both mobility justice and climate mitigation is a transportation system that provides people with viable transportation options besides the automobile. In a given year 13 percent of families in the US are carless (Klein & Smart 2017); even in autcentric California that figure is nearly 8 percent (ACS 2019). Car access is neither static nor uniform: poor families, immigrants, and people of color (particularly Black people) are “considerably more likely to transition into and out of car ownership frequently” than affluent, US-born, or White people (Klein & Smart 2017). Further, “involuntarily carless” households tend to live in neighborhoods with poor transit and active transportation options (Mitra & Saphores 2017). Simultaneously, the transportation sector is the largest source of carbon emissions in the US with nearly 30 percent of total emissions (EPA 2018). To meet climate targets, the transportation sector needs “not just technological-focused measures” such as vehicle electrification but also “structural changes that avoid or shift transportation activity” (Rogelj et al. 2018). A requisite for a just and low-carbon transportation system is alignment between accessibility needs, climate goals, and the significant sums that governments invest in transportation each year.

Much of the power over transportation funding resides at the regional scale. Regional transportation plans lay out a regional vision that spans a 20-year planning horizon. Plans are implemented by near-term transportation improvement programs (“TIPs”). That is, TIPs put actual dollars towards projects and programs that physically create access and barriers to opportunities, many of which endure for generations. Questions of justice are thus particularly relevant to transportation investment decisions, but “analyses of transportation investment programs are relatively uncommon in both academic literature and professional practice” (Karner & Golub 2019). Does infrastructure spending in TIPs enhance multimodal access or entrench automobility? Have investments like highway expansions that attempt to reduce auto congestion for peak-hour drivers – people who are disproportionately wealthy (Manville & Goldman 2017) – been funded faster or more frequently than transit or pedestrian safety projects? This case study of the Sacramento metropolitan region helps answer these questions, using ten cycles and 20 years of TIP data.

This study codes and analyzes projects included in Sacramento Area Council of Governments’ (SACOG) regional transportation plans and TIPs from 2000 to 2020, during which SACOG programmed over 2,000 projects that sum to hundreds of billions of dollars. The 20-year timeframe is key to more accurately capture investment priorities – projects often span multiple TIPs, and infrequent but large projects can skew single TIPs (e.g. high-speed rail).

While plans may show recent increases in high-profile transit projects in areas with high economic activity, we hypothesize that investment has consistently and overwhelmingly prioritized automobile infrastructure and roadway capacity despite innovation in the climate policy arena that brought about state goals to increase multimodal transportation and reduce driving. This study tests that hypothesis. And practically, this study offers insight into policy implementation and a useful methodology for agencies to analyze transportation investments longitudinally.

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Key Words: mobility justice, climate mitigation, transportation investments, transportation improvement program, highway capacity

#### PLANNING FOR POST PANDEMIC PUBLIC TRANSIT

Abstract ID: 394

Individual Paper Submission

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Leading into 2020, U.S. transit ridership had declined for 6 straight years (National Academies of Sciences, Engineering, and Medicine, 2020). Then, the pandemic arrived, travel demand declined significantly as cities locked



down, and transit agencies in many communities were left reeling as they struggled to adapt.

The pandemic has introduced significant uncertainty into an already challenging transit landscape (National Academies of Sciences, Engineering, and Medicine, 2021). The greatest uncertainty has to do with ridership, namely will riders return in the numbers needed to maintain service at pre-pandemic levels. While there is a significant body of research on the factors associated with ridership (Chen et. al. 2020; Taylor et. al. 2019; Driscoll et.al. 2018), the pandemic is a new phenomenon that is relatively understudied and has few close analogues. By exploring how agencies were impacted and responded to the pandemic's onset, and how its consequences have influenced their thinking about their own futures, this study seeks to shed light on a critically important issue and thus help to advance our knowledge.

The study uses interviews with officials at selected bus-only agencies that were performing well prior to the pandemic. Using data from the National Transit Database, the authors identified agencies that experienced ridership growth (unlinked passenger trips) year over year leading to the last quarter of 2019. The authors then selected 12 bus-only agencies located in a diversity of locations around the country (urban, suburban, college towns) to approach for an in-depth semi-structured interview. Through the interviews, the authors sought to understand how the pandemic impacted ridership (and when), the strategies employed to respond to the pandemic and adapt to it, and how the ongoing public health situation has impacted thinking about longer-term planning and operational strategies. Interview responses were subject to content analysis to identify key themes. All interviews took place over zoom.

The results indicate that the selected agencies were impacted negatively by the pandemic and their ridership declined dramatically. The challenges varied somewhat across agencies and included driver shortages, loss of fare box revenue, and loss of community partners, but all the agencies rose to these challenges to provide the service to the essential workers in the first phase, and transit dependent riders in the subsequent phase. Most agencies relied heavily on peers and the CDC, as well as state level guidance, to recover and carve their path forward. While all the agencies were quick to adopt mask wearing, social distancing guidelines, frequent sanitizing, protective barriers and PPE in the short term, these agencies have very varying approaches for setting their long term plans and policies that depend a great deal on their context. The lessons from their experience can inform practice and scholarship around post-pandemic transit in the U.S.

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Key Words: transit, ridership, covid, pandemic

#### DO MULTI-NUCLEI SPATIAL STRUCTURE POLICIES ACCOMPLISH COMMUTING EFFICIENCY? THE CASE OF SEOUL METROPOLITAN AREA IN KOREA

Abstract ID: 402

#### Individual Paper Submission

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Since the 1960s, the Seoul metropolitan area (SMA) has been rapidly urbanized and population concentration has been accelerated. These trends led to various urban problems such as traffic congestion, inefficient travel patterns, and surge in real estate prices. To address these urban problems, Korean government has initiated multi-nuclei decentralization policies including large-scale new town development and transportation infrastructure investments in the SMA. The development of new towns so far can be divided into the first new towns announced in 1989 (5 towns), the second new towns announced in 2003 (12 towns), and the third new towns announced in 2020 (4 towns). In addition, the SMA is more likely to be expanded by proposed Great Train Expresses (GTX) system and additional metropolitan express bus routes.

However, little studies have evaluated the impacts of multi-nuclei decentralization policies on commuting efficiency in the SMA. From the point of view of commuting patterns, some studies argued that commuting distances have been reduced due to the new town developments. On the contrary, some studies indicate that new town developments exacerbate commuting efficiency. Therefore, this study analyzes whether the changes in urban spatial structure by multi-nuclei decentralization policies accomplish commuting efficiency in the SMA. To do so, we utilize the 'Household Travel Diary Survey Data' conducted since 1996 and the 'Smart Card Data' accumulated since 2010.

Analysis results indicate that the changes in urban spatial structure have no significant effect in reducing commuting time in the SMA. The reasons for this result are as follows. First, although commuting time and distance are the main factors in deciding the location of residence, other important factors such as house price, the possibility of development of the neighborhood, and the level of the school district play crucial roles in longer commuting time and distance. Second, the commuting inefficiency in the SMA is related to not only the lack of jobs in the new towns, but also job-housing mismatch between the new towns and the parent city of Seoul. Furthermore, continuous provision of the metropolitan transportation system to the major employment centers of Seoul lowered the self-sufficiency of the new towns, leading to inefficient commuting patterns.

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Key Words: Urban Spatial Structure, New town, Commuting, Excess Commuting, Self-Sufficiency

#### RACIAL AND DEMOGRAPHIC PREDICTORS OF TRANSPORTATION-RELATED POLICING DEATHS

Abstract ID: 405

#### Individual Paper Submission

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Researchers argue that there is inherent racial bias in policing against minority groups in the United States. More persons of color, relative to their percentage in the larger population, are subject to everyday violent policing actions. Policing actions are disproportionately higher in locations with predominantly non-White populations as well as in locations with a large percentage of White populations. Fatalities from policing actions have gained primacy in the national consciousness, with many people arguing for reimagining police departments. Systematic nationwide analyses of policing violence data, however, are lacking to guide any such efforts. In this paper, we ask two questions: How do majority non-White locations systematically differ in policing-related deaths from majority White locations? Which age, gender, race, or ethnicity cohorts are at a higher risk of death in policing actions due to gunshots, transportation incidents, and various other causes?

Using online data ( $n \approx 10,000$ ), we focus on records from January 2012 to September 2019. Our unit of analysis is the incident level, where each event is a death resulting from a policing action within the United States. We group the records into three categories, namely, deaths from violent means including gunshots, deaths from transportation-related events, and deaths from other causes. We use a series of multinomial logistic specifications to study the full national sample, and incidents that occurred in the top and bottom quintile of locations with White populations. We find that there are significant impacts along cohorts by age, gender, race, and Hispanic identity. Specifically, women are far more likely to die in policing actions in the transportation sector than has been reported in the popular press. People aged 25 and older are much less likely to die in transportation-related policing events than the younger cohort (age <25), relative to death by violent means. The lowest likelihood of death by a transportation-related policing event is associated with the age group 55-69 years. People of Hispanic identity are more likely to die in transportation-related policing actions than non-Hispanic individuals relative to death by violent means, and so are people who identify as non-White.

Planning scholarship and practice is yet to confront the phenomenon of policing and fatalities. Our findings provide guideposts to think about how policing-related deaths are an indicator for location-based policymaking, specifically between transportation issues and biases across gender, racial, ethnic, and age groups.

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Key Words: Gender, Gunshots, Location, Policing, Transportation

**INVESTIGATING BARRIERS TO INTEGRATING MULTIPLE PATHS WITH GREEN TRANSPORTATION SYSTEM IN GREATER CINCINNATI, OHIO**

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Bicycles have become more than recreational equipment and bike sharing has given people an even more convenient and inexpensive way to take both recreational and utilitarian trips. The benefits bike sharing offers to help solve inequity in accessibility increase when it is used as a solution to the first/last mile (FLM) issue with respect to public transit (Shaheen & Chan, 2016; Zou, Wei, Chen, & Zhang, 2020). Even though barriers to FLM, such as the distribution of stations and trips between bike sharing and transit, safety, weather, etc., have been frequently studied (Venter, 2020), few incorporate people's individual-level perceptions of their barriers and/or the integration of multiuse paths into the network of bike sharing and public transit.

This paper uses a survey that was conducted in the eight counties of the Ohio, Kentucky, Indiana (OKI) region (Greater Cincinnati) to examine individual-level perceptions of integrating bike sharing (Red Bike) and public transit (Go Metro) with a focus on barriers to using multiuse paths. The survey which was designed and implemented by our research team addressed three major research questions: 1) What are people's major barriers to using (or using more frequently) multiuse paths to solve the FLM issue? 2) To what extent does the built environment around people's residential location affect their integration level? 3) Which improvements would mostly likely encourage people to integrate green modes (e.g., cycling, walking, and riding transit) more often? Statistical comparison and geographical mapping were employed to investigate two groups defined as "Integration" (those who have taken at least two green modes together in one journey) and "No Integration" (those who have not).

The major barrier to integrating multiuse paths into the usage of green transportation system was their lack of connection to transit and bike sharing. Results reveal that more than half of all respondents in both groups would use multiuse paths or do so more often if an integrated green transportation system could be provided or improved. Geographical mapping results of 400-meter catchment areas around green transportation facilities based on respondents' residential locations indicate that a person's living environment is spatially related to their integration level: the more connected green transportation facilities they are near, the more likely they are to integrate them. These findings suggest the potential for incorporating multiuse paths to address the FLM issue.

In addition, the results from phone interviews based on the agreement in the survey contribute even more evidence that decreasing the distance between active transportation networks will lower the impact of barriers on people who have to incorporate them into their daily lives. If these green modes are planned and designed as a well-connected system from the start, most people, especially those who have been already using green modes, will be more likely to use them. This implies that better coordination should take place among local government, transit agencies (both bus and streetcar), bike-sharing programs, and trail management organizations in planning and implementing plans and investing in relevant facilities. Specifically, building and connecting more multiuse paths to transit stops through extensions and/or signage will give bike-sharing riders easy and safe access to jobs, healthcare, and more. In a post-pandemic world, keeping the new wave of cyclists, as well as current cyclists, on the road will partly depend on the improvement in active transportation integration.

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Key Words: Transportation integration, Bike sharing, Multiuse paths, Transit, Perceptions

## **DOCKED VS. DOCKLESS EQUITY: COMPARING THREE MICROMOBILITY SERVICE GEOGRAPHIES**

Abstract ID: 424

Individual Paper Submission

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Docked bikeshare used to be the primary mode of micromobility, but studies show that docked stations' distribution is geographically unequal and disproportionately located in white and affluent communities (Dill & McNeil, 2020). Since 2017, dockless programs, such as e-bikes and scooters, have proliferated across US cities, which may offer marginalized communities a more flexible, convenient and efficient transportation solution (Zheyen Chen, van Lierop, & Ettema, 2020a). In 2019, people took 96 million trips on dockless modes in the US, accounting for almost 70% of micromobility trips (NACTO, 2019). However, it remains unclear if and how dockless systems address inequities present in docked systems. While a limited number of studies compare docked and dockless use patterns, existing research typically examines a single city case study. Thus, a holistic examination comparing docked and dockless programs' service geographies is pressing to promote equitable policy.

This study asks three questions: 1) How do docked service geographies differ from dockless service geographies across the US? 2) Do service areas of dockless systems equate with vehicle accessibility? And 3) What are the equity and policy implications of docked versus dockless micromobility? To answer these research questions, we gathered data from all 32 US cities with docked and dockless programs, including real-time dockless vehicle location data and docked station location data. Specifically, we created three indicators of service geographies (SG) to compare docked versus dockless equity, including: 1) "docked" SG, docked stations' catchment area; 2) "designated" SG, the area where dockless vehicles are allowed to operate; and 3) "actual" SG, the area where dockless vehicles are deployed and parked. We utilized Lorenz Curve and Gini Indexes to investigate the overall horizontal equity, which shows the distribution of service geographies at the census tract and city levels. We also ran logistic and Tobit regression models to examine what neighborhood-level characteristics are related to the presence and coverage of micromobility service geographies in the census tracts, respectively.

Consistent with previous studies, docked SG is unevenly distributed across US cities and disproportionately service white and affluent communities. Lorenz Curves and Gini Indexes show that dockless systems can primarily ameliorate geographic inequalities, but the actual SG is less equally distributed than the designated SG. The regression analysis reveals the neighborhoods with a higher percentage of young people, males and zero-car households, high population and transit density, and high-income levels are related to all three service geographies. Additionally, designated and actual SG yield different racial equity outcomes.

This study suggests that policymakers should compare docked versus dockless service geographies to differentiate these two systems' roles in addressing transportation inequities when implementing new micromobility programs. Place-based policies and incentives may apply to areas with a specific combination of different service geographies. Additionally, policymakers need to pay attention to the gaps between designated and actual SG in dockless systems. Cities should develop performance metrics that measure the unbalanced deployment of vehicles within designated SG. Current deployment levels suggest that designating micromobility service areas do not guarantee access to micromobility vehicles, and some vehicles parked outside of designated SG reflect latent demand for these services.

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Key Words: Micromobility, Service Geography, Equity, Bikeshare, E-scooter

## **WE SHAPE OUR BUILDINGS, BUT DO THEY THEN SHAPE US? A LONGITUDINAL ANALYSIS OF PEDESTRIAN FLOWS AND DEVELOPMENT ACTIVITY IN MELBOURNE.**

Abstract ID: 435

Individual Paper Submission

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As demand for walkable cities increases due to their environmental, economic and quality of life benefits, there is a rising need for pedestrian traffic models in planning practice and academia. This paper offers an activity- and network-based pedestrian flow model at a property-level resolution in the City of Melbourne, which we calibrate on hourly observed pedestrian counts from automated sensors. Data on Melbourne's urban form, land-uses, amenities and pedestrian walkways as well as climatic conditions are used to train a multi-level model and six machine learning techniques on observed pedestrian counts. Updating the built-environment data annually, we (1) test the accuracy of each technique for predicting foot-traffic on the city's streets in subsequent years; (2) assess how closely the variations in land uses and urban form explain the distribution of foot-traffic; (3) analyze the extent to which each pedestrian trip type (e.g. home to transit station; transit station to workplace etc.) contributes to foot-traffic at AM, Lunch and PM weekday periods; and (4) assess the frequency at which such a model should be updated to maintain accuracy. We find that annual changes in the built environment have a highly significant impact on the spatial distribution of Melbourne's pedestrian flows and find that the model explains over 90% of foot-traffic variations in the calibration year, and predicts the effects of land use changes on pedestrian flows with over 70% accuracy in a following, out-of-sample year. Overall, the distribution of walking activity during different peak periods in Melbourne is well explained by estimated trips that result from land-use interactions. The model is well suited for conducting "pedestrian impact assessments" of proposed land use changes and developments. It can be used to guide where public investments or developer contributions to pedestrian infrastructure can benefit most constituents.

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Key Words: Pedestrian mobility, Traffic Modelling, Network Analysis, Melbourne

## **CLOSET, OFFICE, LABORATORY, OR AIRBNB?: AUTONOMOUS VEHICLES AND THE FUTURE OF THE SUBURBAN GARAGE**

Abstract ID: 441

Individual Paper Submission

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With work-from-home and the arrival of autonomous vehicles, more than 60 million American garages may lose relevance and be the focus for mass redevelopment (Bick et al 2020, Fagnant & Kockelman 2015, Kramer & Kramer 2020). The simple structure first incorporated into American housing by Frank Lloyd Wright over a century ago and now found in two-thirds of residences may soon lose its purpose, value, and use (Erlanger & Govea 2018, Henley 2008). Garages are more than a place to store vehicles, however, they also house the accoutrements of suburban living, are home to invention and music, an occasional bargain emporium, and container of items no longer needed but too good to discard. One aspect of the transition to autonomous vehicles will be the impact on housing and the implications of repurposing the 400 square feet of space consumed by the average two-car garage.

The research combines an understanding of the link between disruptive technologies and land use that is then applied to the case of the suburban garage. The presentation starts with national trends associated with work from home, autonomous vehicles, and the stock of garage space that is then assessed in terms of potential impacts. We analyze the possible land use scenarios that a transition in mobility will bring to our cities, encompassing perspectives such as engineering (reuse of space, toxic material removal, building codes, domicology), architecture and design, and urban planning (zoning, expanded housing size, conversion to second living spaces, property tax implications). The result is a taxonomy of potential end uses for suburban garages and the factors associated with each use.

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Key Words: Autonomous vehicles, garages, land use

## **HOW DOES THE TRANSJAKARTA BUS RAPID TRANSIT REDUCE PRIVATE MOTORCYCLE USE IN JAKARTA, INDONESIA?**

Abstract ID: 453

Individual Paper Submission

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Reducing the use of private motor vehicles (PMVs) generates environmental and public health benefits: less greenhouse gas (GHG) emissions, less air pollution, less traffic accidents, and more physical activity. Large metropolitan areas could contribute much to PMV use reduction because they are big in population and land area, and they also provide preferred settings for investments in high-capacity transit systems normally operated in fixed guideway form, such as the metro system or mass rapid transit (MRT) and bus rapid transit (BRT). Asia is particularly concerning because a large portion of its PMVs are motorized two-wheelers, or motorcycles, whose per-vehicle GHG emission and fatality rate is higher than automobiles (Nugroho et al, 2011). Large Asian cities have been aggressively establishing and expanding their high-capacity transit systems since the turn of the 21<sup>st</sup> century.

However, high-capacity transit investments in large Asian cities may or may not result in considerable modal shift from the PMVs. Jakarta, Indonesia did not have a metro system until 2019, and after its first BRT system TransJakarta opened in 2004, despite some initial shift from cars and motorcycles to the BRT (Nugroho et al, 2011), the PMV modal share in the Jakarta metropolitan area was still a high 78% (motorcycle 67%) in 2019 as opposed to public transportation and non-motorized transportation.

To evaluate how high-capacity transit investments in large motorcycle-dependent Asian cities influence travel behavior in favor of sustainable transport, this research explores this research question: How do high-capacity transit investments influence private motorcycle use for passenger transportation? This research proposes: high-capacity transit investments do reduce private motorcycle use, controlling for sociodemographic variables that are considered explanatory of private vehicle use; such travel behavior changes differ in magnitude across high-capacity transit station catchment areas (800 meters, or half mile) due to different conditions in terms of land use and/or the supply of other transportation options; those station catchment areas that undergo Smart Growth planning interventions experience the greatest reduction in private motorcycle use; and the stations in these areas also experience a growth in passenger boarding that is commensurate with local population growth and is faster than the growth in system-wide passenger boarding. (Guerra, 2014)

This research confirms these hypotheses by identifying sociodemographic and land use and transportation options supply predictors of private vehicle use, performing regressions of motorcycle use on high-capacity transit proximity controlling for sociodemographic variables, determining whether high-capacity transit investments have influenced private motorcycle use, investigating land use-related and transportation options supply-related potential causes of the disparity in supposedly transit-induced private motorcycle use reduction across traffic analysis zones (TAZs), reperforming regressions of motorcycle use on high-capacity transit proximity controlling for sociodemographic, land use, and transportation variables, and determining whether high-capacity transit use changes have been commensurate to population growth (Guerra, 2014). The study context is the Jakarta metropolitan area. Data from travel diary surveys are used to measure changes in travel behavior after the BRT investments.

The findings of this research are new empirical insights on how high-capacity transit investments influence travel behavior in favor of sustainable transport in a large motorcycle-dependent Asian city. Despite the differences in the history of transit investments and economic development, the experience of Jakarta can provide useful lessons for other large, densely populated, motorcycle-dependent cities in Asia, Latin America, and Africa that have strived to establish or expand their high-capacity transit systems. The research enriches the currently small research literature that uses travel diary survey data, tests transportation and land use theories in an Asian context and augments the research literature on the relationship between transit investments and travel behavior with new empirical findings based on data rarely used.

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Key Words: bus rapid transit, motorcycle, TransJakarta, Jakarta, Indonesia

# **ARE PEDESTRIAN AND CYCLING INJURIES UNDER-REPORTED IN DISADVANTAGED COMMUNITIES? EVIDENCE FROM AN ILLINOIS DATA LINKAGE PROJECT**

Abstract ID: 455

Individual Paper Submission

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On March 24<sup>th</sup>, 2017 a four year old boy darted into a busy street in a Midwestern American city where he was struck by a passing car. Upon witnessing the violence, the boy's father pulled the driver from the car and assaulted him; the driver was eventually shot to death in the aftermath at the scene – though it remains unclear by whom. The father phoned police to report the incident while transporting his son, who had non-life-threatening injuries, in a private car to the hospital. Yet as tragic as this event was, it could have been worse. It is well documented that pedestrian and cycling crashes do not affect all people and communities equally. Those in communities with high rates of poverty, carelessness, and racial/ethnic minorities are disproportionately hit by motor vehicles while walking or cycling compared to members of other communities (Loukaitou-Sideris et al., 2007). Minority children are especially over-represented as victims. Children were victims in greater than one-fifth of hospital visits resulting from motor vehicle crashes that involved either a pedestrian or cyclist in Illinois throughout 2019. Of those children, twenty-two percent were Hispanic/Latino and twenty-three percent were Black. This is true even though the Hispanic/Latino population represented a relatively smaller proportion of all pedestrian and cycling crash victims who visited hospitals at sixteen percent. Meanwhile, Black children were under-represented compared to the overall proportion of the Black population of pedestrian and cycling crash victims at twenty-nine percent. Yet the true burden borne by the disadvantaged communities of Illinois may go under-reported to police. Previous studies conducted elsewhere have found a relationship between under-reporting and road user group (pedestrian, cyclist, motorcycle), victim identity (age, race, ethnicity), region (urban, rural), and injury type and severity. Crashes involving Blacks, men, children, cyclists, those resulting in a less severe injury, and those in rural areas have been found to disproportionately go unreported (Langely et al., 2003; Sciortino et al., 2005; Watson, et al., 2014).

This research uses statistical linkage methodology and software to match crash records provided by the Illinois Department of Transportation with hospital records provided by the Illinois Department of Public Health. Hospital records coded as an injury sustained by a pedestrian or cyclist involving a motor vehicle that fail to match with a crash record are singled out and further analyzed. Anonymized patient information is further analyzed, which include home zip code, gender, age, race/ethnicity, and hospital charges among others. The aim of this research is to better understand whether crashes involving pedestrians and cyclists go un-or under-reported to police – and if they do, by whom. Findings have implications for study focus areas, allocation of public funds, identification of high risk communities, and road safety interventions.

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Key Words: Transportation equity, Pedestrian, Cycling, Crash injuries, Reporting

## **WHO SERVES TRANSIT-DEPENDENT RIDERS BEST? INTERMETROPOLITAN COMPARISON OF TRANSIT-HOUSING MATCH**

Abstract ID: 468

Individual Paper Submission

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Poor people benefit when public transit agencies give priority to providing high-quality service to neighborhoods where many people are dependent on transit. And poor people who are dependent on transit gain transportation benefits when they are able to reside in transit-rich neighborhoods. Which metropolitan areas in the United States allow high proportions of transit-dependent people to live where transit service is best? This study develops a region-level indicator to assess the extent to which transit-dependent people live in transit-rich areas in metropolitan areas of the United States. High scores reflect a spatial match between carless people and high transit accessibility. A region that allows for increases in supplies of affordable housing in transit-rich areas will demonstrate a better match than one that enforces exclusionary zoning. Examples of regions that perform best in the match between transit-dependent households and neighborhoods of high public-transit accessibility include New York and San Francisco. By contrast, regions including Los Angeles, Houston, and Cleveland perform less well. The indicator focuses policymaking attention on the location of public-transit lines, on housing-stock constraints, and on other barriers impeding the location of transit-dependent households in transit-rich areas.

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Key Words: public transit, social equity, accessibility, poverty, housing

## **IMPROVING PUBLIC HEALTH WITH WALKING: THE EFFECTS OF A WALKING BOUT AND BUILT ENVIRONMENT ON HEALTH OUTCOMES**

Abstract ID: 474

Individual Paper Submission

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Walking can be easily integrated into daily routines, and is an accessible physical activity for both leisure and transportation. World Health Organization (WHO) recommends at least 150-minute moderate-intensity physical activity throughout the week for better health with bouts of at least 10 minutes (World Health Organization, 2010). Thus, increasing walking durations can improve public health efficiently. However, studies report majority of walking trips take less than 10 minutes (for instance: Buehler, Pucher, & Bauman, 2020).

Walking decisions are affected by various built environment characteristics. Among these characteristics, density, diversity, and design are widely used in studies measuring the effects of the built environment (Cervero & Kockelman, 1997). Density is frequently used among these variables because it is not only easy to obtain and quantify, but also represents various household characteristics (Ewing & Cervero, 2001). Although many studies have shown that density variables have significant relationships with walking amounts, we hypothesize that not all density variables linked with daily walking trips are necessarily associated with long-bout walking trips. Within these considerations, we explore the health benefits and environmental determinants of long-bout (more than 10 minutes) and short-bout walking trips.

This paper relies on the California add-on survey data of the 2017 National Household Travel Survey (NHTS). The data set contains socioeconomic factors and extensive information on the travel behavior of each respondent. Also, the data set includes the self-assessed health status of respondents, home locations, and detailed built environment variables, such as intersection density. The analysis sample of this study consists of 31,562 individuals aged over 18. The present study consists of a two-step analysis. In the first step, we use a binary logistic model to estimate the relationships between self-assessed health status and the durations of walking trips. The dependent variable is the self-assessed health status. We include two groups of independent variables: 1) socioeconomic and major built environment characteristics, and 2) the durations of long-bout and short-bout walking trips. The socioeconomic variables include a various set of characteristics, such as age, race, and education. The built environment variables include population and housing densities. In the second step, we use a negative binomial regression model to explore which built environment variables are significantly associated with the durations of the different walking types (dependent variable). We add more detailed built environment variables, such as intersection and employment densities, as independent variables.

The binary logistic regression models show that walking trips with long-bouts (more than 10 minutes) are associated with significant health benefits, while those with short-bouts (less than 10 minutes) are not. This finding is consistent with the existing literature that each bout of physical activity should be at least 10 minutes for better health (Lee & Buchner, 2008). The negative binomial regression models show that while short-bout walking trips are statistically associated with all density variables, this is not the case for long-bout ones. Longer walking trips are only associated with housing and intersection densities. This finding suggests that the environmental determinants for long and short duration walking trips can be different and indicates we need a deeper understanding of various walking types and their environmental determinants. This understanding is essential to create sustainable urban environments that promote healthy lifestyles.

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Key Words: Walking, Public health, Built environment, Household Travel Survey

## **ENCOURAGING PEOPLE WITH DISABILITIES TO USE PUBLIC TRANSIT: THE ROLE OF NEIGHBORHOOD WALKABILITY**

Abstract ID: 476

Individual Paper Submission

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Participating in social activities is important for good physical and emotional health (Schmöcker et al., 2005; Ermagun et al., 2016). However, disabilities make it difficult for people to travel and participate in out-of-home activities. A recent study, for instance, argues that about 14 percent of people with a mobility related disability do not leave their home (Brumbaugh, 2018). Although people with disabilities have distinct travel patterns and assistance needs, insufficient research attention has been directed to understanding their unique circumstances (Daniels et al., 2005; Ermagun et al., 2016).

Empirical studies have shown that people with disabilities have different socio-demographic characteristics and travel patterns as compared to those without disabilities. For instance, people with disabilities are more likely to belong to low-income and zero-vehicle households. Moreover, only one-fifth of people with disabilities work full- or part-time (Brumbaugh, 2018). In terms of travel patterns, they make fewer trips and tend to travel longer distances to their destinations (Schmöcker et al., 2005; Farber and Paez, 2010; Bruker and Rollins, 2016).

People with disabilities in most cases prefer private vehicle (Stern, 1993; Schmöcker et al., 2008), and they are more likely to travel as passengers for a greater share of their personal vehicle trips (Bears et al., 2004). While this is the case, American adults with disabilities make more transit trips as compared to those with no disabilities (Brumbaugh, 2018). Public transportation helps increase activity participation levels for individuals with disabilities (Paez and Farber, 2012). While this is the case, there are not many empirical works investigating the use of transit among individuals with disabilities.

Based on the 2017 National Household Travel Survey (NHTS) data, about 77.8 percent of transit users access public transit by walking. People with disabilities are more likely to be concerned about their neighborhood walking environments in terms of infrastructure i.e., lack of nearby paths or trails, sidewalks, or poor condition of sidewalks (NHTS, 2017). However, most studies on the determinants of transit use have focused only on the walking distance to public transport stations (El-Geneidy et al., 2010). To fill this gap, this study is concerned with the role that the neighborhood-built environment plays in determining people's public transit use. This study identifies the links between transit use and built environment characteristics (particularly walkability) with a focus on the differences between disabled individuals and others.

This study uses walkability index as a proxy for neighborhood-built environment. Neighborhood walkability is an outcome of net residential density, street connectivity, and land use mix (Frank et al., 2006; Sundquist et al., 2011). The walkability index is measured within a ¼ mile radius around one's residential location. This study utilizes the detailed individual level data from 2017 National Household Travel Survey-California Add-on (2017 NHTS-CA). We employ negative binomial regression models in order to examine the factors associated with the number of public transit trips.

Preliminary results indicate, after controlling for various other factors, disabled individuals living in walkable neighborhoods use public transit significantly more than those that do not. The findings of this study provide empirical evidence on how walkable neighborhoods can help disabled individuals reach their destinations, not only

by walking but also by enabling their use of public transit.

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Key Words: Public transit use, People with disabilities, Walkability index, A negative binomial regression model

#### **PUBLIC VIEWS ON THE REALLOCATION OF STREET SPACE AND WALKING DURING AND AFTER THE COVID-19 PANDEMIC**

Abstract ID: 486

Individual Paper Submission

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Many towns and cities throughout the US and the world have reallocated street space in response to the COVID-19 pandemic. This was done to allow more social distancing for those walking and using other active modes of travel, and also to provide space for restaurants to offer outdoor dining. Our research uses data collected via an online Qualtrics panel of New Jersey residents to evaluate how these street closures were viewed. Did people take advantage of the opportunity to dine outside? Was walking more attractive with more space? How did respondents feel about changes in traffic patterns due to the closures? Did people walk more frequently and longer distances, and how did this behavior correlate with views on street closures?

Results of our analysis, to date, suggest that there is broad public support for these types of interventions that allow for more walking and more lively town centers (about 40-45% of respondents). In New Jersey, many towns are considering making these changes permanent and there is broad support for this as well. A minority of respondents indicated disagreement with the street closures, believing that they increase congestion and that outdoor dining makes it more difficult to walk (about 35% of respondents). Additional work, not yet completed, will explore whether these views are correlated with demographic measures and residence location.

The New Jersey Department of Transportation is generally opposed to these changes, citing a 1955 law that requires streets to be maintained as throughways for vehicle traffic. Any permanent change requires a full traffic impact analysis and could likely lead to the removal of the street closure, despite public support. This suggests that the lack of traction in improving walkable environments has to do with deeply entrenched systems, politics, and institutional practices. Specifically, there is an overarching tradition of traffic forecasting that a) largely ignores modes apart from automobiles, and b) is accompanied by virtually zero consideration of public desires. We suggest that the current

groundswell of support for street changes represents a rare opportunity that could be harnessed to overcome these forces and implement street design changes that support pedestrians and outdoor activities.

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Key Words: COVID-19, street closures, walking

#### **THE INDIRECT EFFECT OF TRANSIT ON VEHICLE MILES TRAVELED: ESTIMATING THE TRANSIT MULTIPLIER EFFECT USING HOUSEHOLD TRAVEL SURVEY DATA FOR 28 REGIONS ACROSS THE U.S.**

Abstract ID: 543

Individual Paper Submission

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There is a growing body of research suggesting that transit investments have both direct and indirect effects on vehicle miles traveled (VMT), and the indirect effect (through more compact, dense and mixed land uses, especially in station areas) can be greater than the direct effect (through transit ridership alone). In other words, regions with comprehensive transit facilities and supportive public policies realize lower VMT that is not fully explained by mode shifts from driving to transit but in addition by shorter auto trips and more walking and bicycling. This means that public transit investments have a multiplier effect often expressed as the number of VMT reduced per passenger mile of transit (Ewing and Hamidi, 2014).

The transit multiplier is the ratio of the total VMT reduction associated with transit, including both direct and indirect effects on VMT, divided by the VMT reduction associated with transit use alone (i.e., direct effect). The literature on the transit multiplier has many gaps, including mixed results, lack of external validity or generalizability due to focusing only on one region or transit system, and lack of concrete results due to weak modeling approaches and failure to control for critical confounding variables.

As part of Transit Cooperative Research Program (TCRP) Report 226, this study uses geocoded household travel data for 28 diverse regions (in terms of population size, location, and built environment) and applies a multi-level piecewise Structural Equation Model (SEM) to explain household VMT in terms of sociodemographic, built environment, and travel variables. We then estimate a transit multiplier for the 28 regions and provide an equation that regions (transit operators) across the U.S. can use to compute their multipliers. In fact, this is the main contribution of the paper. The regions in our sample are as diverse as Boston and Portland at one end of the urban form continuum and Houston and Indianapolis at the other.

Our results suggest that transit-rich regions tend to have higher transit multipliers than transit-poor regions. The direct effect of transit accessibility on VMT is about the same in all regions. A transit trip is a transit trip that partially substitutes for an auto trip. It is the indirect effect that varies from region to region which causes variance in the transit multiplier. In transit-rich regions, the effect of transit is primarily through land-use changes, favoring density and its effect on travel variables other than transit passenger miles. In these regions, the main effect of transit is to boost walk trips and shorten auto trips, both indirect effects of transit service quality. The range of the multiplier is from 6.1 (Charleston, SC, and Indianapolis, IN) to 9.5 (Boston, MA) for the regions in our sample. Note that this is not the transit land use multiplier as usually defined in the literature, but a multiplier of total VMT reduction relative to VMT reduction directly due to transit passenger miles.

For urban planning and design practices, this study suggests that building rail lines with supportive local government land use policies, as well as local and even state investments around rail stations can promote the use of sustainable modes of travel and eliminate or slow down the growth of automobile use. This finding has important implications for policy and planning practice, where decision makers seek solutions to deal with VMT, air quality and emissions, energy, obesity, and other health and environmental concerns. It is good news for transit operators, who are often criticized for low transit mode shares.

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Key Words: Transit Multiplier, Vehicle Miles Traveled (VMT), Compact Development, Sustainable Transportation, Structural Equation Modeling (SEM)

#### **PARATRANSIT SERVICES FOR PEOPLE WITH DISABILITIES IN THE SEATTLE REGION DURING THE COVID-19 PANDEMIC: LESSONS FOR RECOVERY PLANNING.**

Abstract ID: 548

Individual Paper Submission

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The Americans with Disabilities Act (ADA) of 1990 obligates transit agencies to provide door-to-door paratransit service for riders with disabilities that hinder them from using fixed-route transportation. Many Americans with disabilities depend on this service to access their everyday needs, such as grocery or emergent health care needs (Burkhardt, 2010). As the COVID-19 pandemic is causing significant disruption in mobility, ADA riders emerge as one

of the most vulnerable groups with minimal access to alternative transportation modes. Like other public transit services, ADA paratransit experienced substantially reduced demand and an increased need to provide equitable services while protecting their clients' and staff's safety during the COVID-19 pandemic (Abdullah et al., 2020; Dixon, 2020). Paratransit services provide a lifeline for their clients' essential mobility needs, including access to medical appointments and grocery stores. Examining transit agencies' responses to provide paratransit services during the pandemic can help inform planning for post-pandemic recovery and future disruptive events.

In September 2020, the research team conducted semi-structured interviews with 15 decision-makers, planners, and drivers working for the primary transit agency in the Seattle region – King County Metro – and its paratransit contractors. Interview questions were designed to identify current services, policy gaps, and critical challenges for recovery planning and post-pandemic paratransit services. Interview transcripts were analyzed using NVivo software to obtain essential themes.

The interviewees provided insights about (1) paratransit service changes in response to the pandemic, (2) anticipated impacts of a returning demand on paratransit service efficiency, equity, and quality during the recovery period, and (3) innovative approaches for maintaining post-pandemic equitable paratransit services while balancing safety measures with available resources.

Study findings suggest that paratransit service providers should consider (1) developing guidelines for future disruptive events, (2) examining alternative methods for food delivery to clients, (3) planning scenarios for delivering equitable services in the post-pandemic recovery period, and (4) increasing resilience possibly by establishing partnerships with transportation network companies.

#### Takeaways for practice

Amid the significant disruption that COVID-19 has on the transportation sector, some groups are particularly vulnerable to the pandemic's downsides.

As non-motorized travel emerges to be the safest and most accessible option during the pandemic, especially to get everyday necessities such as medicines and groceries, it is worth examining groups that do not have access to that due to physical disabilities, climate conditions, or unique geographic or land use characteristics.

It is crucial to expand travel alternatives or service delivery options for these disadvantaged group, including food and medication delivery services and multi-modal paratransit.

The lack of a pandemic-plan has caused disruptions, delays, and uncertainties in responding to the pandemic-related challenges. Safe and dependable public transportation appears to be a significant gap that needs to be well-studied and incorporated in transit agencies' plans to address current and futuristic hazards and disrupting events.

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Key Words: ADA paratransit, COVID-19 pandemic, equity, safety, recovery

#### TRACKING THE DOMESTIC IMPACTS OF TRANSPORTATION IMPROVEMENTS IN THE POST-PANDEMIC BELT AND ROAD INITIATIVE

Abstract ID: 562



## Individual Paper Submission

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Over the past year, the pandemic has largely distracted world attention from China's major diplomatic and domestic development priority – the Belt and Road Initiative (BRI). Despite a near total shift in global focus towards issues of public health, official Chinese announcements regarding the BRI and its ambitious development goals have not significantly changed. With the BRI now an official part of the constitution of the Chinese Communist Party, the Chinese leadership has little choice practically and politically but to press on. Yet, the vision of the BRI that will emerge post-pandemic will likely be substantially different from the version that was promoted and pursued in 2019.

Even before the emergence of the pandemic, the Chinese government had received criticism for the lack of a concrete definition of what constituted a “BRI project” versus an unrelated transportation infrastructure improvement.[1] This was particularly problematic in the Chinese domestic context in which the provinces that were the focus of the BRI were already the target of substantial preexisting transportation infrastructure expenditure. In one sense, the pandemic provides an opportunity to pragmatically reassess China's true long-term transportation infrastructure priorities related to the BRI and to develop a better mechanism for tracking the efficacy of transportation infrastructure projects labeled as part of the BRI from a domestic development perspective. This paper poses the following research questions

1. How has the pandemic shifted the definition, scope and timeline of BRI transportation projects?
2. How can we assess, from a Chinese domestic perspective, whether the projects identified as BRI-affiliated are impacting the economic development of target provinces?

As noted in a recent analysis in the *Diplomat* “the piecemeal realization of BRI projects is determined by local governments and their related political and economic interests via diverse and time-consuming bilateral interaction with Beijing.”[2] Thus, while the West frames the BRI as a centralized master plan, the reality is that its long-term realization increasingly relies on local government actors. Despite the top-down nature of China's political structure, projects without an identifiable benefit to the local economy are likely to face sustained resistance, lowering their likelihood of completion. This paper creates a framework for assessing these local benefits.

## Methodology

In this study, we first develop a set of stringent criteria to determine whether a transportation infrastructure investment should be classified as a BRI project. We then evaluate the extent to which identified BRI projects have measurable benefits in terms of trade, freight flows and firm performance.

This study integrates cross-province panel data from 2008 to 2020 to assess the impact of BRI transport infrastructure (railway and highway) on economic growth and firm performance in freight related industries in the BRI target provinces. Using both static and dynamic spatial models, it explores relationships between BRI transport infrastructure and economic growth. It relates to analogous studies of the economic geography of trade that have correlated specific improvements in transportation networks with induced trade flows.[3] Additional research has evaluated the impact of railway and road-specific BRI infrastructure on economic growth in a global context.[4] This study builds on prior efforts in that it focuses on domestic impacts and uses a firm level dataset.

The estimation results reveal the extent to which BRI transport infrastructure facilitates local economic growth and diversification. Moreover, this study measures the positive spatial spillover effects of economic growth in the geographical distance spatial weight matrices.

## Study Contribution

This study contributes to existing literature by developing a set of criteria to define BRI transportation infrastructure in a post-pandemic context. It also examines the impact of BRI transport infrastructure investment on local economic growth in the BRI target provinces.

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Key Words: Belt and Road Initiative, China, Rail, Trade, Development

#### EXPLORING THE IMPACT OF COVID-19 ON BIKE-SHARING IN TWO GLOBAL CITIES USING LSTM DEEP LEARNING TIME SERIES ALGORITHM SEUNG JUN CHOI<sup>A A</sup> URBAN INFORMATION LAB, THE UNIVERSITY OF TEXAS AT AUSTIN, TX 78712, USA

Abstract ID: 568

Individual Paper Submission

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The COVID-19 pandemic led to drastic changes in transportation usage patterns. One transit mode that received increased attention during the COVID-19 pandemic was bike-sharing because bike-sharing can help users travel by keeping their social distance and can replace other transportation modes during the crisis. Past studies individually identified the impacts of the COVID-19 on bike-sharing (Campisi et al., 2020; Jenelius & Cebecauer, 2020). However, broader knowledge is needed to understand bike-sharing in the context of COVID-19 further, for the COVID-19 pandemic is global, the responses to it are local (Tashiro et al., 2020). This study used multiple case studies to explore bike-sharing during the COVID-19 pandemic in two global cities, New York City, USA, and Seoul, South Korea.

This study collected bike-sharing data in both cities between January 2018 and December 2020. An LSTM (Long short-term memory) deep learning time series algorithm model was built to predict bike-sharing use throughout the year (2020) of the COVID-19 pandemic. LSTM is an RNN (Recurrent Neural Network) model algorithm that overcomes *Long-Term dependency* issues by using different gates to delete, update, and reflect the features (Nielson, 2019). We individually classified NYC and Seoul and created two LSTM models.

For bike-sharing ridership and COVID-19, the study confirmed that two cities' bike-sharing ridership decreased in both New York City and Seoul during high COVID-19 infection rates the pandemic, which led to a peak number of cases in each respective city. Nevertheless, the mean trip duration of bike-sharing ridership increased in both New York City and Seoul during the COVID-19 pandemic. Moreover, authentic bike-sharing use turned out higher than previous years and more prominent in numbers.

The LSTM models suggest that the high amount of COVID-19 confirmed cases have a noticeable impact on bike-sharing ridership. Comparing two LSTM models' predicted bike-sharing ridership counts versus the actual numbers

in the second half of 2020 reveals information about the continuing impacts of the pandemic on bike-sharing use. In NYC, the observed bike-sharing ridership counts were consistently higher than the predicted values. Similarly, in Seoul, the actual bike-sharing ridership counts were higher than the predicted values. However, in November and December of 2020, as COVID-19 cases heat the peak, the number of actual bike-sharing ridership decreased to below the prediction.

Comparing NYC and Seoul's changes in bike-sharing use during the pandemic suggests that events of exceptional COVID-19 cases within cities caused a decrease in bike-sharing rates. Nevertheless, people across the world who use bike-sharing are using it for longer. These findings recommend bike-sharing system operators ensure that their bike-sharing infrastructure is well maintained and available during pandemics. Furthermore, they should expect bike-sharing usage to increase in the time of pandemic and post-pandemic.

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Key Words: COVID-19, Bike-sharing, Time series analysis, Deep Learning, Micro Mobility

#### **“WOULD IT BE WEIRD TO LIVE HERE WITHOUT A CAR?”: USING SOCIAL MEDIA TO UNDERSTAND CAR OWNERSHIP DECISIONS**

Abstract ID: 573

Individual Paper Submission

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Car ownership is a major predictor of automobile travel, presenting an attractive target for efforts to reduce negative externalities related to automobile dependence. While many people who live without cars do so out of constraint, e.g., because they cannot afford one, others live car-free by choice (Brown, 2017). A better understanding of the latter group could help to promote more people to adopt a car-free lifestyle.

Existing scholarship highlights certain predictors of car ownership, e.g., household attributes and income (Hess & Ong, 2002). Moreover, characteristics and travel patterns of households with at least one car differ sharply from those without (Blumenberg et al., 2020). Research on car ownership decisions, however, has been primarily quantitative. While extant literature tells us much about what factors predict car ownership, it tells us less about how these decisions are made or how people live with them. This project adds to this understanding by examining how people talk about their car ownership decisions, specifically in urban contexts where voluntarily living without a car is more likely to be possible.

This paper complements existing literature on car ownership by addressing two primary research questions:

- 1) How do people who choose to live car-free characterize their travel routines?

## 2) How do people who choose to own cars characterize their travel routines?

To understand how people talk about transportation decisions, I collected comments about car ownership posted on Reddit, an online social content-sharing site where people post in subject-specific forums ( $n = 42$  threads). These threads represent seven US cities, ranging from sprawling and auto-dependent (Houston) to compact, walkable, and transit-oriented (Boston). I included only comments where respondents shared first-person accounts of travel decisions and experiences ( $n = 437$  comments).

I analyze the data by combining directed and conventional content analysis techniques (Hsieh & Shannon, 2005). While directed content analysis begins with a set of codes derived from existing theory and scholarship, conventional content analysis is exploratory, with codes emerging organically as a researcher analyzes the data. This combination is appropriate, as it combines the coding of known travel behavior variables (e.g., car ownership, trip purposes) with structures that emerged through coding the data (e.g., the arrangement of commenters into categories based on the importance of the car in their travel lives).

I find that car-free travelers are highly multimodal, and report needing more planning, flexibility, and knowledge of contingencies than their car-owning counterparts. They also use ridehailing and carsharing services to fill occasional mobility gaps that accompany living without a car. Moreover, car-free travelers reported becoming habituated to their routines despite their added complexity.

By contrast, travel routines of car owners are extremely heterogeneous, ranging from people who drive on a daily basis to those who own a car but only use it occasionally. Beyond frequency, rationales for car ownership varied widely by degree of necessity, ranging from purposes of pure convenience (e.g., shopping at a preferred grocery store) to firm need (e.g., necessary to commute).

This paper contributes to scholarship by developing a first-person understanding of car ownership behaviors that complements extant knowledge of the antecedents and dynamics of car ownership decisions. For example, the fact that some drivers cite needing a car to get to work despite living in a walkable neighborhood illustrates how regional characteristics like location of employment opportunities inform personal travel decisions (Ewing et al., 2018).

This understanding can inform policy by identifying opportunities to a) convert certain driver subtypes (e.g., convenience-based) to car-free travelers, b) reduce driving among people who must own a car for one or more mobility needs, and c) help car-free travelers stick with their routines.

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Key Words: car ownership, Reddit, automobile dependence, car-free, content analysis

## EVALUATING THE PERFORMANCE OF A MICROTRANSIT PROGRAM IN AN LOW-INCOME, LOW-DENSITY AREA

Abstract ID: 575

Individual Paper Submission

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In recent years, transportation planners have focused increasing attention on new mobility options, including transportation network companies (TNCs) and microtransit. TNC customers use mobile apps to secure individual and carpooling rides from drivers who use their own vehicles. These so-called “ride-hailing” or “ridesharing” companies were primarily seen as competition with taxis, yet their connection with transit is also debated in the literature (Hall, Palsson & Price, 2018; Rayle, Dai, Chan, Cervero & Shaheen, 2016). Similarly, microtransit can be seen as a shared ride providing the first-mile, last-mile service to transit that operates along a predetermined route or assembled on-demand using sophisticated computer algorithms (Hall et al., 2018). Thus, passengers walk to a pick-up location and pay a flat-rate fare. Microtransit was initially provided by TNCs, such as Via, Chariot, and Bridj, in a limited number of markets. More recently transit agencies have begun to offer microtransit services as first-mile, last-mile service in highly dispersed areas that are not well served by conventional public transit (Schaller, 2018). Transit agencies have provided their own microtransit service or they have partnered with TNCs or other providers to operate it. While many urbanized areas are experimenting with microtransit, few studies have been completed on the effectiveness and opportunities for microtransit as a part of a transit system operation.

Beginning in January 2019, the City of Gainesville, Florida, Regional Transit System began to operate microtransit on two routes in East Gainesville. These routes support a low-income population that is geographically dispersed and not easily served by conventional public transit. Over time, the service was expanded to a third route and can get direct service to a greater diversity of destinations. Users can access the service through one of four methods: a phone app, phone (through a dispatcher), a website, and as walk-on at transit stops.

### Methodology

In this research, we evaluate the use of microtransit as a part of transit service. We collected, mapped and analyzed a variety of data on trips taken on microtransit from January through December 2020, including date and time of trips, the mode of access, and the origins and destinations. We also conducted interviews with community leaders and collected surveys from residents, both users and non-users, in the neighborhoods served by the microtransit.

### Findings

The service initially provided access from residential areas to the Downtown Rosa Parks Transit Transfer Center. Over time, service has been provided to a greater variety of destinations. The major destinations of the service include the Downtown Rosa Park Transit Transfer Station, which provides direct access to large parts of the system, a Walmart Super Center, schools, and churches. More customers ride in the morning than the afternoon. The COVID-19 pandemic resulted in a significant decrease in ridership on microtransit between March and September 2020; however, the decline was smaller than service declines throughout the system. Over time access to the service via the app increased while usage of the web system remained small and declined over time. Community leaders strongly support the microtransit service, but long-term sustainability of the service is not yet guaranteed.

### Implications of the Research

The microtransit service is providing service to a greater access to a greater number of destinations on a convenient basis for a relatively small number of passengers, yet it also confirms that microtransit has a place within the range of publicly-provided, new mobility options. The destinations served by microtransit service suggest an opportunity for the transit agency to partner with the school system to provide service for children, even those who live within

the two-mile “parental responsibility zone”.

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Key Words: microtransit, public transit, low-income populations, flexible routes, on-demand transit services

### EXPLORING THE IMPACT OF BIKE INFRASTRUCTURE ON MODE CHOICE: A SIMULATION-BASED, ROUTE-LEVEL IMPACT ANALYSIS

Abstract ID: 577

Individual Paper Submission

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In the U.S., active mobility, particularly bicycling, has been promoted as an effective alternative to car-centricity in short-distance trips, and for its benefits to the environment, public health, and the economy. Accordingly, a significant amount of local, state, and federal budget is being expended for bike infrastructure development. Bike infrastructure is regarded as an effective tool that ensures the safety and comfort of bike users and encourages more people to ride a bike. There have been many studies supporting the hypothesis that more bike lanes are associated with more willingness to ride a bike. However, we still know little about whether better and more extensive bike infrastructure influences people’s actual travel mode choices (Aziz et al., 2018; Dill and Voros, 2007; Moudon et al., 2005; Schoner and Levinson, 2014; Zahabi et al., 2016). Furthermore, the empirical analyses in the previous studies have been conducted at an aggregate city or neighborhood levels and therefore limited in understanding individual-level choices given various alternatives.

This study seeks to understand how the level of bike infrastructure, as well as other active-mobility-related factors, affect individuals’ travel behavior based on their actual trip data and route simulations. Specifically, we simulate a hypothetical bike trip of tens of thousands of O-D coordinates using a path-finding algorithm and employ the resultant individual route information—such as the proportion of bike infrastructure, the average bicycle level of traffic stress, and terrain—as independent variables in a mode shift model. The spatial scope of this study includes Atlanta, GA, Chicago, IL, and Minneapolis-Saint Paul, MN. Although the area we are focusing on is Atlanta, the sample of bike users in a travel survey of Atlanta is not sizable enough to build a robust model. Thus, we identified a few metro regions that share similar characteristics to Atlanta in terms of the travel environment using cluster analysis and selected the two regions from where recent travel survey samples with O-D coordinates could be obtained.

This approach is expected to bring more in-depth and quantifiable information about how the improvement in bike infrastructure affects mode shifts. Moreover, by including variables associated with public transit as well, the model will help ascertain the efficacy of bike infrastructure in alleviating auto-dependency and encouraging both active and multi-modal transportation.

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Key Words: Bike Infrastructure, Trip Simulation, Mode Choice, Travel Behavior, Network Analysis

## ACCESSIBLE TRANSPORTATION: INVESTIGATING THE TRAVEL EXPERIENCES OF PEOPLE WITH DISABILITIES

Abstract ID: 589

Individual Paper Submission

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It has been more than thirty years since the Americans with Disabilities Act (ADA) was created to protect the rights of individuals with disabilities to access public and private spaces without facing discrimination. Since then, cities across the country have been working to create transportation systems that support the travel needs of people with disabilities. While progress has been made, many places still fail to provide a transportation network that all people can easily and independently navigate. How are the travel experiences of people with disabilities impacted by these incomplete environments? What are the biggest factors influencing travel decisions related to mode choice, trip making, and trip timing for people with disabilities? To answer these questions, we conducted a series of individual semi-structured interviews with people with disabilities to gain insights into the various factors considered before taking a trip. Thematic and content analysis of the notes from the interviews revealed how multiple factors – including policy, technology, zoning, and the built environment – act together to influence the safety and quality of mobility options for people with disabilities. Importantly, the impact of the different variables varied significantly across different types of disabilities. When working to create an accessible transportation network, it is critical for transportation professionals to consider the specific design needs of individuals with different types of disabilities.

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Key Words: ADA, Accessibility, Disability, Mobility, Universal Design

## **EXAMINING THE ROLE OF BIKE-SHARE IN IMPROVING URBAN TRANSPORTATION SYSTEM'S RESILIENCE TOWARD COVID-19 PANDEMIC: THE CASE STUDY OF SEOUL, KOREA**

Abstract ID: 594

Individual Paper Submission

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Recently, bicycling, which includes both private bike and public bike-share, has been highlighted as one of the most effective means to improve the urban transportation systems' resilience due to its mobility and economic feasibility (Clemente, 2020). In particular, bicycling has been regarded as a sustainable alternative when public transit systems become difficult to use. When the disastrous earthquakes occurred in Japan and Mexico, for example, the bicycle was utilized as the most efficient and safe transportation mode while private vehicles and public transit are physically restricted (Lubin, 2011). Also, the strikes of public transit service in London resulted in increased the city's bike-share use by 85% per day, suggesting that bike-share can thoroughly fill the gap in the public transit system (Saber et al., 2018).

More recently, worldwide spreads of the COVID-19 pandemic has also significantly restricted the citizens' travel mode choice. Previous studies showed that people tend to avoid public transit, including bus and subway, and instead prefer personal mobility such as a private vehicle, bike-share, and e-scooter to minimize unnecessary physical contact with others (Tirachini & Cats, 2020). The use of bike-share in Seoul increased by 23% after the outbreak of COVID-19, while public transit ridership decreased by 30% during the same periods. It is a notable case in that people voluntarily utilized bike-share to improve their mobility.

This study aims to examine the role of bike-share in improving urban transportation systems' resilience toward the current COVID-19 pandemic. To this end, we hypothesized that the bike-share ridership would be reduced for short-term trips as the bike-transit integration has been limited. For long-term bike-share trips, however, bike-share ridership would increased to replace public transit trips after COVID-19. Further, this study examines the effects of bike-share stations' surrounding built-environment, socio-demographic features on the degree of public transit use replacement by bike-share.

To this end, this study combines time-series forecasting methods and OLS regression models. First, we used bike-share ridership data in Seoul from 2018 to 2019 (Before COVID-19), and forecast the ridership in 2020 (After COVID-19) by utilizing Holt-Winters seasonal smoothing techniques. Forecasted values refer to the bike-share ridership in Seoul if the COVID-19 has not been occurred. Since we also have actual bike-share ridership in 2020, which has been actually affected by COVID-19, we further calculates the differences between predicted and actual ridership. We defined this value as the effects of COVID-19 on the bike-share ridership. We calculated it as monthly station-based panel dataset. And then, we developed the OLS regression models for five distance group (0~2km, 2~5km, 5~10km, Over 10km, Same OD), which has "Actual Ridership – Predicted Ridership" as dependent variable and surrounding built-environment and bike-transit infrastructure, socio-demographic features of bike-share stations as independent variables.

Our results showed that the number of bus stops within 500m radius from bike-share station is positively associated with bike-share ridership change before (2018) and after (2020) the outbreak of COVID-19. Also, the



number of subway stations within the service area of bike-share stations showed negative associations with the ridership change of bike-share. These associations were more clearer for short-term trips (less than 5km). It suggests that the first and last mile connection of bike-share to subway stations has been significantly discouraged after the COVID-19, while the substitution from bus to bike-share has been more preferred to people. Besides, the distance to nearest university and floating population of 20-30 years old showed positive relationships with bike-share ridership. Our findings imply that bike-share serves to increase the overall resilience of urban transportation system, by providing an alternative modes to people who are dependent on public transit system.

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Key Words: Bikeshare, Public Transit, COVID-19, Resilience

## **RAILS TO RESILIENCE: EVALUATING NEW ORLEANS AND BATON ROUGE RAIL TERMINALS AND TRANSIT LINKS**

Abstract ID: 597

Individual Paper Submission

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The success of a passenger rail transit is contingent upon the convenient provision of multimodal transportation facilities and services connecting the rail service to the surrounding communities. Planning for intercity passenger rail transit should begin with an assessment of community needs, including direction to guide development standards to ensure that outcomes match local goals (Kline et al. 2013, Feinsod et al. 2016). Stations and surrounding areas should be designed with the multimodal rider in mind, meaning that high occupancy infrastructure should be properly connected with active transportation routes supporting walkers and bikers, safe and sufficient bicycle parking should be provided, and surrounding blocks should be scaled to pedestrian use with complete sidewalks and pedestrian amenities (Suraci 2018). Bicycling in particular has been found to be an important first and last-mile connector, particularly in more suburban, auto-oriented locations where transit options are limited (Gatien and Baghaie 2019).

New Orleans and Baton Rouge, the most populous city and the state's capitol of the State of Louisiana, are less than 80 miles away from each other. However, there are few transportation options available to travel between the two cities that are practical and affordable for occupational commuters and those without vehicles. There is a growing interest in a passenger rail between Baton Rouge and New Orleans following the trend shifting towards multimodal and transit-oriented development within and between metropolitan regions.

By studying a proposed passenger rail connection between Baton Rouge and New Orleans and several proposed terminal sites in the communities among the connection, this research aims to investigate the success of the

planning process for a passenger rail transit by evaluating the connection between the proposed rail terminal sites and existing transportation networks and seeking potential passenger rail riders and their needs.

Through a comprehensive evaluation, this research found that recently completed station area plans and local transit/streets enhancement project have created a robust blueprint for future service. Implementation of these plans would position local jurisdictions to substantially improve multimodal accessibility and provide key connections for future rail service users to connect to and from their final destinations. The remaining challenge is to identify funding sources to implement these proposed plans.

Through a survey, which drew in over 4600 responses (primarily from the parishes along the proposed rail corridor), this research found strong support regionwide for passenger rail as well considerable interest in multimodal travel locally. However, corridor residents were not necessarily currently interested in using active modes of transport or public transportation to access the train, indicative of current deficiencies in these networks and reflecting the region's relatively dispersed, auto-oriented development patterns. Although interest exists among commuters who work across parish lines to use the train for work trips, most potential riders would not expect to utilize passenger rail for work trips. Instead, it was viewed as a vital means of accessing the region's many cultural, recreational, sporting, and entertainment events, as well as connecting families.

This research shows the process of planning passenger rail transit and multimodal transportation network. For a proposed rail service to be successful and meet revenue targets, it must be designed to meet the needs of those most likely to ride it. The implementation of such project needs to be advanced through outreach and technology transfer to local, regional, and state-level stakeholders and promotion of efficient and effective transportation investments.

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Key Words: passenger rail, transit, intercity train, multimodal transportation, planning

#### **TRANSIT-ORIENTED DEVELOPMENT AND ITS LONG-TERM IMPACT ON LOCATION AFFORDABILITY: LESSONS FROM LOS ANGELES**

Abstract ID: 605

Individual Paper Submission

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Location affordability, which integrates housing and transportation affordability, is critical to internalize the housing and transportation trade-off made by households and comprehend the real meaning of affordability for various income populations, especially for low-income households (Center for Transit-Oriented Development, 2009; Renne et al., 2016). There is a growing trend nowadays of combining transit-oriented development (TOD), with affordable housing by planners and policymakers to increase housing affordability while providing transit proximity (Boarnet et al., 2017). This study will contribute to a larger, emerging area of research on location affordability. On the one hand, the existing literature reveals a heated debate among housing affordability and social equity activists in

response to the higher costs of housing in TOD and the resulting gentrification and displacement. On the other hand, transit-oriented neighborhoods generate lower vehicle miles traveled (VMT) and more walk and transit trips (Ewing & Cervero, 2010), and thus reduce household transportation expenditures. The contradictory impacts of TOD on transportation and housing costs need to be integrated and analyzed as a whole. Given this, the study examines (1) how TOD influences the combined share of housing and transportation costs for households over time and (2) what TOD design characteristics such as density and connectivity contributes to increasing location affordability.

This study focused on analyses of two relatively new-established light rail transit corridors – Los Angeles Metro Exposition Line and Los Angeles Metro Gold Line – to explore the changing housing and transportation cost for residents living within a half-mile from 31 targeted rail stations by Census block group. The study identified four types of factors influencing location affordability from the literature, which are neighborhood characteristics, the local housing market, transit accessibility, and urban design. It first explored how the aggregated location affordability of these selected census block groups change across different phases of TOD, including the “planning phase,” the “construction phase,” and the “permanent phase.” Housing and transportation cost for each census block group in different TOD phases were calculated based on U.S. Census data, Location Affordability Index Model created by U.S. Department of Housing & Urban Development, and the Housing + Transportation (H+T) Index from the Center for Neighborhood Technology. The results from the comparison of means tests indicate that the average location affordability stayed relatively constant when rail stations were planned and constructed, but it decreased after their opening. Households in census block groups with a higher proportion of low-income minority populations located near the downtown area experienced the most significant increase in their combined housing and transportation costs.

Further, the study explored the impact of urban design features of TOD in the permanent phase on location affordability using a multivariate regression analysis. By controlling variables measuring neighborhood characteristics, the local housing market and transit accessibility, the study examined the association between location affordability and urban design features of TOD such as scale and density, public spaces for human use, variety and complexity, pedestrian and cyclist orientation, and vehicular movement and parking. The results indicate that mixed-use and pedestrian-oriented design promote location affordability, while increasing household density contributes to higher location affordability only within a certain threshold.

Overall, the study emphasizes the necessity of early intervention from the local level to prevent gentrification and displacement of low-income minority households and the prospect of building mixed-income transit-adjacent communities which are dense, mixed-use and pedestrian-friendly.

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Key Words: Transit-Oriented Development, Location Affordability, Los Angeles

## **RIDE-HAILING, RIDESHARING, AND TRANSIT RIDERSHIP: A NATIONAL STUDY USING THE 2017 NATIONAL HOUSEHOLD TRAVEL SURVEY**

Abstract ID: 610

Individual Paper Submission

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While launched with the promise of “car-sharing” reducing the need for private vehicle ownership, ridehail/TNC services such as Uber and Lyft have been in competition with transit agencies for riders ever since their emergence - prompting the question whether ridehail is a complement to or a substitute for transit. This study uses person-level data containing travel behaviors and home locations from the 2017 National Household Travel Survey (“2017 NHTS”) to evaluate to which extent the ridership of ridehailing services (such as Uber and Lyft) overlaps with that of public transit, and whether the degree of complementarity between modes varies across space.

Previous research on the complementarity between ridehail services and transit focused either on aggregate ridership, on tours or on individual trips. So far, findings on complementarity have been mixed: Overall transit ridership did not decline following the TNCs market entry (Hall et al., 2018), and many tours involving ridehail also involve transit trips (Conway et al., 2018; King et al., 2020). At the same time, surveys suggest that at least some share of ridehail trips would have been transit trips, if not for the availability of ridehailing (Rayle et al., 2016). This study addresses two gaps in the literature: No prior studies focus on people as the level of observation, or evaluate what role the availability of rail transit near a person’s home location plays in determining whether or not somebody uses transit, ridehailing, both, or neither.

Using data from the 2017 National Household Travel Survey (NHTS), a regression model of trip counts at the person-level suggest that ridehailing and transit usage are complements, but also that this complementary relationship is concentrated among people who live within proximity to rail stations: The degree of complementarity between services decreases with distance from stations. Further, it is greater in terms of trips for locations near commuter rail, but greater in terms of people for locations near frequent rail. However, a multinomial logit rider classification model sorting people into users of transit, ridehailing, both, or neither on the basis of demographic information and land uses near their homes suggests that proximity to stations is associated with an increase in the probability of using either mode (or both) versus using neither – implying that any observed complementarity might be the outcome of individual preferences and lifestyles, rather than about the modes themselves.

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Key Words: Public transit, Ridehailing, mode choice, last-mile problem, NHTS

## **EFFECTS OF VARIANT HIGH-SPEED RAILS AND COMMUTER RAILS ON COMMUTING ACROSS BOUNDARIES: IMPLICATION FOR INTEGRATED TRANSPORTATION PLANNING IN THE CHINA GREATER BAY AREA**

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**Abstract:** The development of high-speed railway, bullet train, and intercity commuter railway has played an important role in shaping coordinated development and transportation integration in the Chinese mega-regions, facilitating an increasing number of commuters across administrative boundaries. Only a limited number of empirical studies have investigated the effects of variant types of railway infrastructure on interregional commuting; few have fully considered the impact of land use contexts of both residential and workplace areas, as well as the infrastructural facilitation and administrative impedance between them. This raises two research questions in this study: (1) whether there are different significant roles of high-speed railway, bullet train and intercity railway in promoting cross-boundary commuting, as well as their synergistic effects; (2) whether the restriction of administrative boundaries on commuting could be moderated by different types of railway and transit infrastructure. Moreover, the direct and moderated influence of land use at both residence and workplace on intercity commuting needs to be further explored.

This study applies a cross-classified multilevel model to comprehensively estimate the above factors affecting intercity commuting at the sub-district scale (i.e., urban neighborhoods, small towns, or villages) in the Pearl River Delta (PRD), the mainland part of the China Greater Bay Area. The study relies on multiple sets of big data, including a 2018 mobile phone signaling dataset for estimating the commuting flows between 609 sub-districts, the passage travel-time dataset of different types of railways and the areal housing transaction data, both crawled online, along with traditional district-level census data. The results suggest that socioeconomic condition and land use in the workplace area has a greater impact on intercity commuting than the residential area, implying traditional research may overlook the impact from the workplace area. For high-speed railway, empirical findings reveal the high-speed railway connection can effectively reduce the impedance of city boundary on intercity commuting. And high-speed railway could produce synergistic effects in the residential area with high employment density, as well as the workplace area with high population and employment density. Also, bullet train and intercity railway are more helpful for improving cross-boundary commuting within cities. These findings demonstrate the merger of administrative units and the development of intercity railway would promote mobility across boundaries in the China Greater Bay Area.

This study has two major contributions. First, we develop a novel method for evaluating the comprehensive relationships, including residential area and workplace area, among traffic conditions, land use, sociodemographic attributes, and the number of intercity commuters. Second, the findings provide enlightenment for incorporating regional coordinated development and transportation integration planning to facilitate labor mobility in the China Greater Bay Area.

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Key Words: high-speed rail, public transportation accessibility, commuting across boundaries, cross-classified multilevel model, the China Greater Bay Area

## TRAVEL BEHAVIOR OF UNBANKED, UNDERBANKED, AND ULTRA-LOW-INCOME TRANSIT RIDERS IN OHIO

Abstract ID: 622

Individual Paper Submission

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This research investigates the travel behavior of various transit rider groups, particularly unbanked, underbanked, and ultra-low-income people. Our main research questions are: which demographic characteristics are associated with membership in these groups? How have their travel patterns been altered under COVID? and Do unbanked and ultra-low-income people pay higher average costs per trip compared to other transit riders?

Many transit agencies are moving to cashless validator/mobile fare systems that have the potential to lower costs and increase operational efficiency compared with traditional payment systems. Our greater research project (a three-year grant, focusing on EZfare) focuses on cashless payment systems that have the capacity to promote more flexible and affordable fare structures, provide touchless payment that could be more attractive to riders concerned with COVID, and enhance the ease with which riders access transit, while addressing the social benefits to transit riders from using this system as measured by increased access to work, shopping and other destinations.

This study integrates survey data with smart card transaction data of transit riders to investigate the implications of cashless fare systems. The research team has already collected over 1,200 surveys from riders in eight transit agencies in Ohio, covering rural, suburban, and urban populations. Three more agencies are also in the queue. The 15-minute online survey is part of a panel study that has been designed to document several aspects of the self-reported travel behavior of transit riders in Ohio over a period of 18 months, starting just before the onset of the COVID pandemic.

To complement the survey data, the research team has also partnered with NEORide, Masabi and CALSTART to collate records of the smart card transactions of about 35% of the survey respondents who used EZfare. during the study period. The smart card data provides detailed information about the exact time and geographic location of boarding for each individual rider. Using data processing techniques that have been demonstrated in existing research, we are able to build origin-destination matrices at dynamic time-space scales for each transit rider who uses a smart card. We combine the demographic and self-reported trip information from the survey with the information gleaned from the smart card data to provide insights into the travel behavior of the unbanked and lower income study group, compared with the balance of transit users in our sample.

Our analytical strategy includes a series of descriptive statistics, discriminant, regression, and geostatistical analysis.

We perform discriminant analysis to determine whether there are significant differences between our classification of unbanked, underbanked, ultra-low-income, and other riders in the sample. Regression analysis is used to investigate the effect of being unbanked or underbanked and of low-income on trip outcomes such as trip frequency, distance traveled, social well-being, fear of COVID, and change in trip destinations before and during COVID, and travel costs. We employ geostatistical techniques including kernel estimation and cluster/outlier analysis to explore spatial patterns in the smart card data. The main rationale of this research is embedded in vertical transport equity, that is the strategic design of public transport policies and infrastructure that favor population groups that are of lower income and social class. Thus, the findings of the study will contribute to the existing body of research on transportation equity. Also, the geographic and temporal scope of our data will potentially provide new insights into travel behavior in different spatial and demographic contexts. Our research is a contribution to the body of knowledge in resource allocation planning for transit agencies.

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Key Words: Transportation Equity, COVID, Cashless Payment System, GIS, Unbanked

#### IS INFORMAL TRANSPORT FLEXIBLE? PLANNING IN PUBLIC TRANSPORT IN THE GLOBAL SOUTH

Abstract ID: 623

Individual Paper Submission

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Informal transport is often described as flexible, reactive, demand responsive, niche-filling and in-tune with passenger needs (Cervero, 2000; Grava, 1980; Kumar and Barrett, 2008; Mateo-Babiano, 2016). This paper interrogates the uses and meanings of these descriptors in planning and research, and argues that there is limited evidence to justify them, certainly as a universal characteristic.

This study is based on fieldwork in four African cities. Interviews were conducted with regulatory authorities and transport workers in Nairobi and Lilongwe, and interviews and extensive surveys of passengers and minibuss drivers carried out in Djibouti and Lubumbashi. This, alongside the available evidence in the informal transport literature, drawing from anthropology, planning, labour studies and economics, is used to make a different argument in contributing to theorizing the behaviour, operations and equity impacts of transport and accessibility in African cities.

Informal transport, in many circumstances, is slow and stubborn to change compared to the pace of growth of the cities it operates in, and the existing patterns are often limited in distribution, oriented to mass markets and serve relatively narrow slices of the population at a high cost of money, time, safety and dignity. These are captive audiences with little ability to influence service patterns, much less large sections of the population for whom

services are geographically irrelevant or financially out of reach (Nakamura and Avner, 2021; Quiros et al., 2019; Salon and Gulyani, 2010). Flexibility, where evinced, is often in short term, erratic search behavior that is inefficient in itself and shows little evidence at consistently keeping pace with passenger needs .

Informal systems do have mechanisms for changing their planning and routing. However, this is thanks to active and powerful association, organization, political engagement and institution building on the part of informal transport workers and operators, who, collectively, are acting as transport planners in the cities in which they operate. It is not through individual, laissez-faire competition guided by the invisible hand, nor through notions of intuitive operation according to formless and de-politicized 'local knowledge.'

This study examines the ways transport operators carry out route planning, and finds careful processes of demand mapping and management, with collective, firm- and association-level investment in data gathering, demand assessment and subsidization of operations. However, this does not necessarily lead to equitable outcomes, as limitations of profitability and interest in competition over existing, high-volume routes preempt the development of new destinations and the identification of fine-grained passenger niches.

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Key Words: informal transport, labor, global south, accessibility, economic geography

## EXAMINING THE ROLE OF E-SCOOTERS AS THE FIRST AND LAST MILE SOLUTION

Abstract ID: 649

Individual Paper Submission

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Emerging shared micro-mobility services are quickly changing the traditional transportation landscape, especially on university campuses where cutting edge technologies are often incubated and tested. One of the recent shared micro-mobility services was the shared electric scooters (e-scooters). The rapid adoption of these e-scooters on campus and surrounding areas poses significant challenges for transportation planners and policymakers as there is limited information and data about how e-scooters may affect travel behaviors. Despite the increasing popularity, the impact of e-scooter service on travel behaviors remains largely uncertain.

This paper exams the role of e-scooters as the first/last mile mobility solution through two methods. One is a campus wide survey at Michigan State University (MSU) that addressed the adoption and utilization of e-scooters by faculty, staff, and students for their commuting and on-campus trips. The other is an analysis of one year's e-scooters route data on campus and surrounding areas. Findings from these two data sources are consistent with each other in the role of e-scooters as the first/last mile solution. First, while e-scooters is gaining popularity for



social and recreation purpose among young people, the usage of e-scooters as the connection to public transportation was minimum regardless of trip distance. Second, the free-fare bus on campus, however, was proven to be more attractive to students than taking e-scooters for short distance trips. Third, e-scooters were found to have a strong competing relationship with active transportation modes in that 60% of e-scooter trips would have been taken by active modes.

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Key Words: micro-mobility, first/last mile solution, shared mobility, travel behaviors, active transportation

#### **BARRIERS ABOUND: DISPARITIES IN SAFETY AND SECURITY PERCEPTIONS OF WALKING AND BICYCLING**

Abstract ID: 663

Individual Paper Submission

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Perceptions of traffic safety and personal security are key indicators of resident physical activity and neighborhood satisfaction (Lovejoy et al. 2010; Thornton et al. 2016; Cao et al. 2020). Previous studies have assessed the perceptions of pedestrians (Adkins et al. 2019) or bicyclists (Winters et al. 2012). However, more information is needed from diverse neighborhood populations regarding perceived barriers to walking and bicycling. For example, scholars have found that Mexican-American and Non-Hispanic white participants emphasized different characteristics of walkability (Adkins et al. 2019) and that lower- and higher-income neighborhood residents rated pedestrian streetscape elements differently (Thornton et al. 2016). Our study provides further insight into perceived barriers to walking and bicycling and their distributions among population groups.

Working collaboratively with government, academic, and community-based organizations, we surveyed City of Milwaukee, WI residents to investigate following questions: How do residents perceive the traffic safety and personal security of walking and bicycling in their neighborhoods? What neighborhood and individual respondent characteristics are associated with negative perceptions of safety and security? Our survey was distributed by mail to randomly-selected addresses in all of Milwaukee's 15 council districts and by e-mail and social media networks in June 2020.

Qualitative themes across the 801 survey responses revealed that most residents enjoy walking and are concerned with reckless driving (particularly speeding). Multiple open-ended comments mentioned having friendly neighbors, but a lack of traffic safety prevents full enjoyment of neighborhood streets. Respondents from lower-income areas often mentioned personal security and neighborhood upkeep (e.g., overgrown lawns, vacant lots, homes in poor repair) as negative qualities of their streets.

At the neighborhood level, binary logistic regression models showed that respondents who perceived the traffic safety of walking or bicycling to be “unsafe” were significantly more likely than other respondents to rate traffic speeds and sidewalks poorly. Both traffic safety and personal security barriers were associated with neighborhood characteristics reflecting disinvestment (e.g., poor cleanliness, few places to walk to, few opportunities to exercise).

At an individual level, respondents in households without vehicles were significantly more likely to perceive traffic safety and personal security barriers. This is particularly troubling because these people are most likely to depend on walking and bicycling for transportation. Other factors associated with traffic safety and personal security barriers to walking included having disabilities and living in a low-income neighborhood. Self-reported poor health was associated with both traffic safety and personal security barriers to bicycling. Being Black, Hispanic, or  $\geq 35$  years old were also associated with personal security barriers to bicycling.

For comparison, we also asked about perceptions of safety and security when driving an automobile. Interestingly, perceived traffic safety barriers to driving also included neighborhood traffic speeds and neighborhood characteristics reflecting disinvestment. Further, Black and Hispanic respondents were more likely than others to perceive traffic safety barriers to driving. Disparities in the perceived safety and security of neighborhood streets are not confined to walking and bicycling.

Our results have practical implications. Reducing neighborhood traffic speeds through actions such as redesigning streets and lowering speed limits is likely to improve safety and security for pedestrians, bicyclists, and other street users. Yet, residents’ perceptions of traffic safety and personal security extend beyond design. Neighborhood investment, street cleaning, and recreational programming may also help reduce safety and security barriers to walking and bicycling. Finally, some groups perceive greater walking and bicycling barriers than others: planners should make special efforts to engage groups such as people of color, with disabilities, without automobiles, and/or in poor health about how to reduce the barriers they experience and make walking and bicycling accessible and attractive to the entire community.

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Key Words: Perceptions, Walking, Bicycling, Traffic Safety, Personal Security

#### **WHICH TRIP DESTINATION MATTERS? ESTIMATING THE INFLUENCE OF LAND USE ON MODE CHOICE FOR HOME-BASED COMPLEX TOURS**

Abstract ID: 666

Individual Paper Submission

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#### Background:

In recent decades, considerable efforts have been made to investigate the link between land use and transportation using tour-based analyses. A complex home-based tour involves multiple out-of-home destinations, each of which may have distinct land-use patterns. Therefore, how to aggregate the land-use characteristics of various trip destinations to the tour level has been a measurement issue for land-use and travel-behavior studies that apply a tour-based approach. The majority of existing tour-based research simplifies this issue by only focusing on the most representative trip, which can be problematic (Frank et al., 2008; Ho & Mulley, 2013).

#### Study Design:

This study addresses this measurement issue by investigating how and to what extent different measurements of the land-use patterns associated with a complex home-based tour influence the estimation of individual mode choice. We compare three measurement approaches. First, we measure the land use patterns associated with a tour by only considering the main destination (i.e., the destination of the trip for the primary activity). Second, we measure land use by only considering the destination of the trip with the lowest probability for non-driving alternatives. The idea behind this approach is similar to the Liebig law of the minimum, which suggests that a bucket's capacity is determined by its shortest stave (Whitson & Walster, 1912). Finally, assuming that each trip of a tour plays a role in shaping an individual's mode choice, we compute the land-use indicators associated with all the trip destinations and take their average.

#### Findings:

For home-based non-work tours, more land use factors (i.e., design and diversity) are statistically significant in predicting non-auto use when they are measured at trip destination with the lowest walkability compared to the two other measurement approaches. These findings support the hypothesis that the “weakest link” of a tour, i.e., the trip without lowest probability for using non-driving modes, has a major impact on travelers' mode choice of the tour. For home-based work tours, land-use characteristics at the main tour destination have a determinant effect on the mode choice of an HBW tour. Transit use is strongly impacted by the built environment variables for both home-based work and non-work tours, regardless of them being measured at the trip destination with the worst walkability or measured by averaging land use characteristics at all trip destinations.

#### Contributions:

1. We conclude that how researchers measure land use of tour destinations makes a difference in estimating the strength of the land-use and travel-behavior connection: (a) For home-based non-work tours, when measured at trip destination with the lowest walkability, land use variables have the strongest impact on mode choice. (b) For home-based work tours, increasing density and walkability around the employment centers/school areas can potentially promote non-driving modes among commuters.
2. To increase transit use in these regions, planners may focus on promoting dense and mixed-use development within walking distance of transit centers (i.e., transit-oriented development). Thus, transit users can carry out different activities on foot in transit-adjacent areas instead of traveling distance destinations that may require driving.

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Key Words: land use, mode choice, trip destination, complex tour

## **PUBLIC TRANSPORTATION AND COMMERCIAL GENTRIFICATION: EVIDENCE FROM THE SURVIVAL RATES OF INDIVIDUAL BUSINESSES AFTER NEW OPEN OF SUBWAY LINE 9 IN SEOUL, KOREA**

Abstract ID: 682

Individual Paper Submission

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The expansion of the public transportation network brings about positive effects on the regional economy, but it also has a negative influence on someone who cannot afford a rising land price. This is because increased economic activities from the expansion of the public transportation network causes a rise in housing prices and commercial rents due to the rise in land value. That is, the new public transport network is a great benefit for those who own land and buildings in the surrounding areas, whereas it can be negative for those who rent them. In general, people who cannot afford the increased rents may be forced to be displaced, which is defined as the commercial gentrification. Although the initial study on the gentrification has focused on the residential areas (Glass, 1964), gentrification research has been diversified because this phenomenon has occurred in a variety of regions such as industrial places, tourist destinations, and commercial areas. However, relatively few studies have been conducted on the commercial areas.

At the beginning stage, commercial gentrification has a positive effect on regional economies as well as business owners who start to open with low rents, which improves the unique characteristics of the neighborhoods and thus attracts more consumers and tourists. As the gentrification phase progresses, however, the inflow of investment and speculative capital leads to a rise in rents and a decrease in uniqueness of the neighborhoods due to excessive commercialization. Consequently, this process may lead to an increase in closing rates of original retail stores, restaurants, and small businesses. If new public transit opens in a nearby area, this process may occur much faster. That is, the construction of new public transportation is closely related to the commercial gentrification. However, our understanding of the relationship between commercial gentrification and public transportation is still limited because only a few empirical studies have been conducted so far.

With this perspective, we aim to explore how the new construction of public transit affects survival rates of individual business in surrounding areas. In particular, we attempt to empirically verify the impact of the expansion of subway line 9 on the closing rates of small businesses in Seoul by focusing on the changes in survival rates before and after the opening of the subway line 9. For doing this, we obtain individual business license data that contain information on the X and Y coordinates, opening and closing dates, and business types, and then select subsamples that are located within 500m from the each subway station. In order to estimate the effect of newly opened subway network on the survival rates of small business, we employ the nonparametric survival analysis model.

Our results show that opening of the new subway stations negatively affects survival rates of individual business located in the surrounding areas. Particularly, the survival rates of restaurants are much lower than those of other types of businesses. In addition, the survival rates of individual business are getting lower as the distance to the subway stations is getting shorter. Findings suggest that transportation planning should be carefully designed because the construction of new transit could have a negative influence on the small business owners due to rising rents. It is suggested that the unintended consequences can be minimized when transportation planners, urban planners, city governors, and community leaders make great efforts not only for economic development, but also

achieve sustainable and win-win development.

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Key Words: Commercial Gentrification, Public Transportation, Survival Analysis, Small Business, Seoul

#### **STICKY TRAVEL DEMAND: EXAMINING VEHICLE TRAVEL IN TWO PERIODS DURING THE COVID-19 PANDEMIC**

Abstract ID: 684

Individual Paper Submission

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The unprecedented coronavirus disease (COVID-19) pandemic put the spurring U.S. economy on pause in early 2020. Not only did we observe a once-in-a-lifetime mandatory lockdown in most cities and states across the country, but we also dramatically altered our travel behavior to protect our very own life and avoid further spread of the epidemics. According to the Federal Highway Administration (FHWA, April 2020), the year-over-year total road traffic volume declined by 39.8% (-112 billion vehicle miles, -41.2% seasonal adjusted) in April 2020. A month after the initial lockdown, however, states started implementing their phased reopening plans to combat escalating unemployment caused by the economic shutdown. The unexpected policy interventions provide us a unique opportunity to look into the inertia in travel behavior, i.e., the “sticky” travel demand.

We hypothesize that the long-run built environment and employment sector factors significantly determine the sticky travel demand. In addition, due to the underlying differences in residential built environment and employment composition among different sociodemographic groups, such sticky travel demand could adversely affect certain socially vulnerable population. We use empirical evidence to test our hypotheses and we provide a policy discussion on transportation equity to address the issue of sticky vehicle travel demand. While emerging literature starts to focus on variations in mobility patterns for multiple transportation modes prior to and after the lockdown orders (Pan et al, 2020; Lee et al., 2020; Tirachini & Cats, 2020), we are primarily interested in studying the inertia in driving by taking advantage of the natural experiment setting from the lockdown (and reopening) orders.

We adopt a data-driven approach that establish the statistical relationship between shifting vehicle miles traveled in two phases (lockdown and reopening), the shifting trends in Covid-19 cases and the unemployment rate, as well as the long-range built environment, employment sector, and sociodemographic characteristics at the county level. Instead of dividing the observational periods by the exact lockdown and reopening dates, which were drawn either

arbitrarily or politically motivated, we separately examine two study periods between March and June 2020 divided by the date when a county reached the minimum 7-day average vehicle miles traveled (VMT). This allows us to objectively evaluate the magnitude of the sticky vehicle travel demand.

The empirical results suggest that both built environment and industry composition contribute to the inertia in vehicle travel. In particular, limited access to grocery stores, pharmacies, and Internet are significantly associated with less vehicle travel reduction during the lockdown. A diverse industry composition and a flexible working arrangement may also alleviate commuters' reliance on vehicle travel. In the long run, building a compact, job-housing balanced, multimodal urban environment would reduce car dependency. In addition, the "sticky" vehicle travel is more prominent among the disadvantaged sociodemographic groups, such as African Americans and the elderly population, especially those who live in the rural areas. Our findings reveal the needs to improve long range transportation and land use planning for the socially vulnerable communities.

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Key Words: VMT, COVID-19, Accessibility, Equity, Travel Behavior

#### **DOES TRAFFIC CONGESTION INCREASE AIR POLLUTION? EMPIRICAL EVIDENCE BEFORE/AFTER COVID-19 IN SEOUL, KOREA**

Abstract ID: 685

Individual Paper Submission

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Air quality is one of the important elements for human daily lives. However, developing countries have still struggled with the serious air pollution due to the expansion of hazardous industries. A number of studies have shown that there exist numerous factors (e.g., burning of fossil fuels from factories, car and truck, dust, human activities, wildfire, etc.) that have a negative influence on air quality. Among the various factors, emission from the vehicle is the major component related to the bad air quality of urban areas. Numerous previous studies have provided evidence that growing car usage increases air pollution (Bigazzi, et al., 2015; Coria, et al., 2015). However, relatively few empirical studies have been conducted to examine the relationship between traffic congestion and air pollution. Particularly, it is curious about how much we can reduce air pollution when we mitigate traffic congestion in a large city.

Hence, we attempt to explore how the traffic congestion affects air quality focusing on the city of Seoul, one of the largest cities that has been fighting severe traffic congestion. Since 2000, the average annual Particulate Matter (PM<sub>10</sub>, PM<sub>2.5</sub>) concentration in Seoul has decreased through various air quality improvement policies. However, since 2013 reduction rates of PM<sub>10</sub> have slowed, whereas occurrence of high daily PM<sub>10</sub> events has increased. The city of Seoul began to alert a warning for PM<sub>10</sub> on days when the concentration of PM<sub>10</sub> exceeds a standard level. In

addition, city governors encouraged commuters to use public transportation by providing free services in order to reduce vehicle usage. However, it is unclear how much particulate matter could decrease as traffic volume decreases. Although our belief is that reduction of traffic congestion may decrease air pollution and thus increase air quality, our understanding is still limited on how much we can improve air quality by reducing traffic congestion.

With this perspective, the objective of our study is to investigate the relationship between traffic congestion and PM<sub>10</sub> concentration with large data sets of air pollution and traffic speed by employing fixed-effects panel model that allows us to control for the time and spatial characteristics. As a form of the hourly dataset, we first collect traffic speed information consisting of total of 200 million observations, air pollution information consisting of 680,000 observations, and meteorological information consisting of 500,000 observations from the Korea Public Data Portal in 2018-2020. And then, we conduct data cleaning and processing based on 25 administrative districts that are our spatial units of Analysis. Particularly, it is expected that the amount of pollutants generated in Korea and neighboring countries (China and Mongolia) has decreased in 2020 (the period of COVID-19) than in 2018. Hence, we compare the effects of traffic congestion on air pollution in 2020 and those in 2018. After accounting for other factors, our results show that traffic congestion adversely affects air quality. That is, an increase in traffic congestion leads to an increase in PM<sub>10</sub> as well as PM<sub>2.5</sub>. By comparing with the effects in the periods of COVID-19 and pre-COVID-19, it is clear that traffic congestion is a significant factor associated with PM<sub>10</sub> and PM<sub>2.5</sub>. Our study suggests important implications for urban planners and transportation planners that reducing traffic congestion is important for improving not only transportation accessibility, but also air quality and human subjective well-being.

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Key Words: Traffic Congestion, Air Pollution, PM<sub>10</sub>, PM<sub>2.5</sub>, COVID-19

#### ECONOMIC IMPACT OF SMART CITY INVESTMENT: EVIDENCE FROM THE SMART COLUMBUS PROJECTS

Abstract ID: 696

Individual Paper Submission

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Smart city, as a new urban planning strategy, has received increasing attention in recent years worldwide. Many scholars also believe that the development of smart technologies through infrastructure investment may provide effective solutions to various challenges (Tan & Taeihagh, 2020). In December 2015, the U.S. Department of

Transportation (USDOT) launched the Smart City Challenge, which was an initiative focusing on smart city development to solve modern city challenges with an emphasis on transportation problems (USDOT, 2016). As the winner of this initiative, Columbus launched Smart Columbus (SC) Projects to facilitate smart city development with a focus on the following four main areas: connected transportation network, electric vehicle infrastructure, integrated data exchange, and enhanced human services.

While many studies have investigated the fundamentals of smart cities, such as concepts, characteristics, and dimensions (Tan & Taeihagh, 2020), there is a lack of in-depth understanding of the economic impact of smart cities, especially from the perspective of real-world practices.

This study addresses this issue by developing an assessment framework of the economic impact of smart city investment using a computable general equilibrium (CGE) model, which is an advanced approach to conduct economic analysis (Chen et al., 2021).

The objective of this research is to evaluate the economic impact of the SC project. The initial investment of the SC projects focuses on developing a pilot program and testbed for smart technology applications. While the infrastructure investment may generate a short-run economic impact through the increase of local public capital expenditure during the project development stage, it should be noted that a successfully deployed system is expected to have a long-run impact on the economy if the applications and adoption of smart technologies could lead to a large scale of behavioral change of urban mobility.

The study is implemented in three steps. First, SC projects were introduced in detail, especially how do these projects have been implemented practically. Second, an economic assessment framework of smart city investment was developed using the CGE model, which captures both short-term economic effects generated by capital and labor expenditures and long-term economic effects generated by productivity improvement and travel behavior changes. The economic performance was measured from three aspects: GDP, employment, and gross output/business revenue. Third, the economic effects of Smart Columbus projects were assessed using the established modeling framework.

The analysis shows that the short-run impact was generated through the investment in factor inputs of related sectors, such as transportation, information, and communication, during its implementation stage. It was found that the total capital investment implemented during the project development stage generated a GMP growth by \$173.39 million or by 0.098%, and a job increase by 2,366 or an increase by 0.195% as compared with the level in 2018. The long-term impact was primarily achieved through the changes in productivity of urban transportation sectors and the demand for mobility services. The successful deployment of the SC projects and utilization of the services is likely to generate a \$671.28 million or 0.538% increase in GMP, and 7,039 jobs or an employment increase of 0.3%. Overall, the multiplier of the SC investment was found to range between 1.77 and 2.58, with an average rate of 2.24, which suggests that each dollar investment in the SC project is associated with a 1.77 – 2.58 dollar increase in value-added GDP.

This research has important implications. First, it provides a useful assessment tool for the economic impact assessment of smart city investment. Second, it also improves the understanding of the economic benefits of a smart city strategy, which may provide implications for future investment decision-making both in Columbus and other cities.

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Key Words: Smart city, Economic Impact, Computable General Equilibrium Model, Autonomous Vehicle, Connected Vehicle Environment

## IDENTIFYING SPATIAL GAPS IN ALTERNATIVE TRANSPORTATION SERVICES FOR LOW-INCOME OLDER ADULTS BY AGE GROUP

Abstract ID: 705

Individual Paper Submission

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### Background:

As older adults gradually lose the ability or become reluctant to drive, the provision of alternative transportation services for such populations, especially for those in low-income brackets, takes an important focus in transportation and aging studies. While previous studies have argued for the necessity of appropriate alternatives for such vulnerable population group, there has been little research in developing models to quantify the supply of these services and compare them to the travel needs of low-income older adults. This study aims to fill this gap but providing a methodology to quantify and visualize the gaps between transportation supply and older adult's transportation needs, particularly for low-income older adults.

### Study Design:

We implement a supply-demand approach to determine the spatial gaps between provision of alternative transportation services for low-income older adults and their needs. To quantify the supply, we construct a model that calculates an index at the census block group level which is the unit of analysis for this research. The supply model considers the accessibility to destinations for each transportation service based on user eligibility and special accommodation needs. We use a modified GIS-based gravity model by transportation service route type such as fixed or flexible route. To measure the travel demand for low-income older adults, we utilize a transportation needs index, which estimates the travel demand of low-income older adults using available socio-economic data. Finally, the gaps are determined by comparing the transportation supply to the demand. The model is applied to a study area in Orange County, Florida.

### Results:

Based on the resulting indices of supply and demand, the block groups are categorized into three groups - high, medium, and low - by applying a natural break classification to the supply and demand values. The results are visualized by combining a gap map to show the spatial pattern of service-deficient areas and a tabular matrix to compute the amount of affected older adult population. The gap areas identified for people 65 or higher, between 65 and 74, between 75 and 84, and 85 above (with the number of census block groups in parentheses) are 30,294 (22), 17,376 (20), 7,819 (16), and 2,659 (13), respectively. Overall, the spatial pattern generally shows that the gap areas are located outside of the city of Orlando and part of Apopka and Winter Garden by age groups. However, while the gap areas are located at the fringes of city boundaries for older adults age 85 or higher, the deficient areas of younger older adults (i.e., between 65 and 74, and between 75 and 84) are spread out toward unincorporated areas in Orange County.

### Conclusion/Contribution:

This study presents a geospatial method for identifying spatial gaps between transportation service provision for low-income older adults and their needs. While most older adults transportation accessibility studies look at the the

older adults as a monolithic group of 65 or older, our method applies a finer resolution unit by looking at this population in three age group categories 65 and 74, 75 and 84, and 85 above. The findings show differences in accessibility gaps by group which can help planners and decision makers to address the different needs accordingly when planning the various transportation options to reduce gaps in service and support the individual mobility needs of low-income older adult sub-groups.

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Key Words: Alternative transportation options, Transportation accessibility, Older adults, Transportation needs, Low-income

## POWER OUTAGES AND RESIDENTIAL ENERGY USE PRIORITIZATION

Abstract ID: 713

Individual Paper Submission

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Along with climate change, extreme weather events have led to an increase in power outages (Kenward and Raja, 2014). Recent winter storms in Texas caused severe power outages that impacted over 4.5 million homes and businesses. Between 2003 and 2012, most power outages in the United States (80%) were climate-related, the result of severe weather, ice storms, and hurricanes (Kenward and Raja, 2014). Annually, weather-related power outages cost the US economy anywhere from \$20 billion to \$55 billion (Campbell, 2012).

Vehicle-to-home technology is a new process that exchanges power between an electric vehicle (EV) and home. Since EVs have a sizeable capacity for energy storage, they can be a valuable energy source during power outages, supplying electricity for basic needs such as lighting, heating, and charging telecommunication devices. EVs are becoming more popular; according to BloombergNEF (2020), it is expected that by 2040, nearly 500 million EVs will be on the road, representing approximately 31% of the passenger cars in the world. In addition, due to the COVID-19 pandemic, more people are working from home via computers and the internet. This employment trend may be the dominant paradigm in the near future. If so, this will increase energy consumption in residential buildings, and uninterrupted supply will become even more important. Although vehicle-to-home concepts have been studied for electric load leveling and storage purposes, EVs' potential role during power outages and how best to utilize EVs' energy storage capabilities are newly emerging topics of interest.

The objective of this research was to identify how residential building occupants use energy-intensive appliances

during power outages and what they do to prepare back-up energy sources. We conducted an online survey through Qualtrics to analyze residential energy demand and blackout preparation. The study population was comprised of students, faculty, and staff at Ohio State University. From 2003 to 2012, Ohio was one of the top 10 states most suffering from frequent weather-related power outages (Kenward and Raja, 2014). Our survey consisted of questions regarding energy consumption priorities (e.g., heating, air conditioning, washers and dryers, refrigerators) during power outages in summer and winter, back-up sources for power and light, current electricity service and usage, and housing and household characteristics. The results highlight the different patterns of energy use priorities between summer and winter. As expected, the most frequently selected activity was “keeping the fridge running” in summer and “heating” in winter. The results also show that the usage patterns depended upon certain household characteristics.

The results of this study will contribute to expanding our understanding of what activities are considered top priority, and assist with addressing how much energy is needed to be more resilient during unexpected outages. This is in contrast to earlier studies, which focused on residential energy consumption behavior during normal times. This study will serve as a baseline for decisionmakers seeking to improve the energy infrastructure and make their cities more resilient, as well as provide guidelines for mitigating the damage and failures that result from sudden outages.

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Key Words: residential energy use prioritization, back-up energy, power outages

#### **WALKING BY DESIGN: INTEGRATING STREETSCAPES INTO A PEDESTRIAN ROUTE CHOICE MODEL**

Abstract ID: 717

Individual Paper Submission

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Urban design research finds that streetscapes influence whether urban environments feel comfortable and attractive for pedestrians. As such, we expect walkers to prefer routes along more pedestrian-friendly streetscapes with characteristics such as spatial enclosure, transparent facades, and human-scale architectural features (Ewing & Handy, 2009). Nonetheless, streetscapes are not commonly accounted for in pedestrian travel models and there is limited evidence of relationships between streetscape design and pedestrian decisions. This study, a component of my doctoral dissertation, examines the role of streetscapes in explaining revealed pedestrian route choices in San Francisco. It aims to substantiate (1) the direction and magnitude of relationships between streetscape characteristics and preferred walking routes and (2) the degree to which accounting for streetscapes improves route predictions, compared with more conventional factors such as route distance, number of turns, and sidewalk availability.

A primary obstacle to accounting for streetscapes in travel models is collecting spatially precise measures of them across large street networks. Research evaluating link-level pedestrian environments has traditionally used auditing procedures that are inefficient to scale, limiting analysis to a small number of trips within a focused geographic

context (Rodríguez et al., 2015). City-scale pedestrian models have tended to either externalize streetscape design or represent it coarsely with measures such as commercial land use adjacency (Lue & Miller, 2019) or business density (Clifton et al., 2016). These studies substantiate the importance of pedestrian environments either in general terms or specific contexts, but do not provide evidence of how individual design characteristics relate to walking across diverse contexts.

This study makes progress in addressing these limitations by using link-level streetscape design measures derived computationally across the entire city of San Francisco, and pairing them with detailed pedestrian route data from a large-sample smartphone travel survey. Streetscape measures indicating qualities identified by Ewing and Handy (2009)—enclosure, human scale, transparency, and complexity—are derived from citywide geospatial datasets representing building footprints and heights, parcel-level land uses and building characteristics, retail locations, and tree canopy. These measures are then attached to links along more than 50,000 actual pedestrian routes that were captured by the 2019 Bay Area Transportation Study

Route choice modeling traditionally compares entire routes and, therefore, requires constructing choice sets of unobserved alternatives. Developing appropriate choice sets for network routes is, in itself, a complex and resource-intensive undertaking, as different choice sets may produce substantially different parameter estimates. Partial overlap between alternative routes can also bias estimates due to lack of independence between alternatives. To ameliorate these issues, this study instead uses recursive logit (RL) models, which evaluate choices between alternative links at sequential nodes along observed routes. These models have been applied previously for predicting vehicular and bicycle routes (Zimmermann et al., 2017), but not yet for pedestrians. They may be particularly suitable for pedestrian modeling, however, because they better approximate progressive routing decisions based on options at each intersection rather than assuming that routes are preplanned. Estimating ML models can also require substantially less computational time than choice set-based models it more feasible to apply them with large samples of routes.

Preliminary results indicate that models with streetscape variables provide additional power in explaining pedestrian route choices compared with null models based only on distance, turns, and sidewalk availability, though the marginal effects of streetscape variables are small compared with distance. Nonetheless, robust evidence of how streetscapes contribute to real-world pedestrian preferences and decision making may help position pedestrian-oriented streetscape design as an integral component of walking infrastructure and a useful tool for promoting sustainable transportation.

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Key Words: walking, pedestrian travel, streetscapes, route choice modeling, recursive logit modeling

## **POLARIZED PATHS: 'SELLING' CYCLING IN CITY AND SUBURB**

Abstract ID: 742

Individual Paper Submission

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The integration of cycling infrastructure into mid-sized cities has been positively received by politicians and bike enthusiasts alike, who present cycling as an environmentally friendly way to engage in physical activity via an individual's daily commute or through recreational rides (Li & Joh, 2017). Cycling infrastructure has also been linked to an increase in property values, especially in core urban areas that offer a connected cycling network (Krizek, 2006). Despite extensive research illustrating the positive implications of cycling, new infrastructure is still met with considerable resistance. Concern about housing – that bike lanes will either lower property values or spur gentrification – is central to this 'bikelash' (Stehlin, 2015; Wild et al., 2018). Our research explores and analyses the ways that cycling infrastructure contributes to the production and consumption of housing and real estate in a growing mid-sized region that is implementing new cycling infrastructure, guided by two research questions. The first, to what extent does cycling infrastructure play a role in the buying, selling and developing of residential real estate? And the second, to what extent does this vary between core urban areas and automobile-oriented suburban neighbourhoods?

This paper seeks to contextualize current perceptions of cycling infrastructure at the neighbourhood level through a case study of three mid-size cities in Southern Ontario: Cambridge, Kitchener and Waterloo, or the Tri-Cities. All three cities are experiencing widespread development and densification in their downtown cores, which has in part been motivated by a new light rail transit line that became operational in 2019, and Kitchener's growing position as one of Canada's major technology hubs. This widespread growth means that the region which houses the Tri-Cities regularly ranks as Canada's fastest growing census tract. At the time of this research, Kitchener and Waterloo are testing separated bike lane pilot projects in their downtown cores, motivated by larger changes ongoing within the Tri-Cities to each city's Trails Master Plans (TMP).

Our research explores the spatial divides that exist within these cities, how individuals perceive these differences, and what this means generally for equitable planning for the integration of cycling infrastructure in neighbourhoods with different built forms. Harnessing a qualitative methodology, issues of spatial division, public perception and planning for cycling were collected through 22 semi-structured interviews with realtors and developers working in the Tri-Cities. We focus on realtors and developers for their privileged insight and experience (McCormack, et al., 2020).

Through an analysis of the perceptions, experiences and opinions of real estate agents and developers, this article provides new insights into how cycling is 'sold' and marketed in both the home-building and -buying process. Our research reveals key differences between core urban areas, where the built environment is more conducive to cycling, and automobile-oriented suburban neighbourhoods. These differences are furthered through demographic trends, affordability and the overall lifestyle associated with each form. We also argue for the active role that realtors and developers play in marketing cycling as location, age of clients and personal bias all play into selling cycling as transportation, culture or recreation.

Overall, our article contributes necessary qualitative research to a field largely dominated by quantitative approaches. Harnessing realtors and developers, we offer a privileged look into the home-buying experience necessary in understanding why resistance towards cycling still exists, and further how planners and overlapping professions should consider the urban/suburban when approaching integrating new cycling infrastructure in mid-sized cities.

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Key Words: Cycling, urban/suburban divide, developers, realtors, bikelash

## COMMUTE DISTANCE, LOW-WAGE WORKERS, AND RESIDENTIAL LOCATION IN HIGH-COST AND LOW-COST HOUSING MARKETS

Abstract ID: 746

Individual Paper Submission

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America's suburbs now house more people living below poverty than do urban areas. While cities continue to have higher rates of poverty, in 2000, the suburbs bypassed cities in terms of both number and pace of growth (Kneebone 2019). Research shows that the search for affordable housing in increasingly expensive metropolitan regions contributes to the changing demographics—particularly the increase of low-income people of color—in suburbs over recent decades (Howell and Timberlake 2014; Kneebone 2019). Moreover, coastal areas, like those in Southern California, have geographic constraints that limit housing supply and so have higher housing prices compared to inland areas (Glaeser, Gyourko, and Saks 2006; Saiz 2010).

Commute distances have increased over time. The growing affordable housing crisis in high-cost metropolitan areas may force households to seek lower cost housing in the outer reaches of metropolitan areas, and help to explain the increase in commute distance. To test this, we explore the association between the availability of affordable housing near low-wage jobs, or jobs-housing fit (Benner and Karner 2016), and commute distance of low-wage workers in two diverse metropolitan areas in Southern California: Los Angeles-Orange (a high-cost, coastal, more urban MSA) and Riverside-San Bernardino (a lower cost, inland, more suburban MSA). We developed multivariate regression models drawing on data from the 2015 Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) by residential location of workers supplemented with data from the 2017 5-year American Community Survey.

As expected, we find that commute distances are longer for workers living in inland counties with more suburban neighborhoods than those living in coastal counties with more urban neighborhoods. Specifically, median commute distance for workers living in Los Angeles-Orange is about 12 miles and for those in Riverside-San Bernardino is about 20 miles. We also find that neighborhoods in coastal counties have higher ratios of low-wage jobs to affordable housing, suggesting that low-wage jobs continue to concentrate in traditional job centers on the coast rather than in inland areas to which low-wage workers are moving. Also not surprisingly, the coastal region has higher median home values than those in inland counties.

Controlling for other determinants of commute distance, we find that the effect of the low-wage jobs-housing fit varies across the two metropolitan areas: A higher ratio of low-wage jobs to housing is associated with longer

commute distances for low-wage workers in Los Angeles-Orange, but has no effect in San Bernardino-Riverside. Moreover, higher median housing value is associated with shorter commute distances, supporting the notion of more affordable homeowner opportunities in suburban inland areas far away from the more urban coast.

Zoning and sentiments favoring single-family over multi-family development restrict housing supply, including affordable housing, in more urban and coastal metros like Los Angeles-Orange. The findings from this study underscore the importance of protecting and expanding the supply of affordable housing particularly in job-rich neighborhoods located in the more expensive urban coastal areas. The findings also contribute to the growing body of work considering the travel behavior implications of the suburbanization of low-wage workers and their families.

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Key Words: commute distance, low-wage workers, residential location, housing supply

#### **TECH, EQUITY AND THE CITY: PROMISES AND PITFALLS IN REGULATING, DEPLOYING AND MANAGING TECHNOLOGICAL CHANGE TO PROMOTE EQUITABLE AND EFFICIENT OUTCOMES IN URBAN AREAS**

Abstract ID: 754

Individual Paper Submission

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What technological trends in transportation and land use are the most important and influential in US cities? How are city planners responding to rapid technological changes, and what future challenges will they need to respond to? To what extent do planners' responses to technological trends promise to improve the efficiency of cities, focusing particularly on outcomes for their least advantaged residents? In this paper I address this trilogy of research questions by reviewing historical documents, scholarly literature, institutional reports, municipal planning documents, and conference presentations, and by interviewing planners at municipal agencies and nonprofit groups in some of the major metropolitan areas in the US.

Taking an historical approach, the paper discusses bases for many of the disruptive technologies of today, such as the rise of smartphone and GPS technology and high rates of smartphone and data plan ownership across income classes. Relevant technological developments in transportation include app-based ridesharing, bus information systems, point-to-point car sharing, micromobility options such as scooter and bike share systems, and electric and alternative fuel vehicles. The paper also addresses construction and development innovations (e.g., building information management (BIM) systems, construction techniques like modular housing), space-sharing innovations (e.g., Airbnb, WeWork) and innovations in retail, warehousing and freight (e.g., e-commerce trends, rapid warehousing and delivery), though the conference presentation will focus primarily on transportation.

The second part of the paper begins by contextualizing these changes given demographic, economic, workforce, travel and housing trends in the US over the past 20 years, and relating these trends to the technologies discussed

in the first part of the paper. It then discusses the planning sector responses to date to these trends, including greater involvement in transit data provision to patrons, regulatory management of intracity freight delivery, public involvement in electrification infrastructure, and municipal charges on private transportation firms, as well as a discussion of existing planning regulations and standards that influence the adoption and use of technology.

The third and final part of the paper evaluates these responses with a focus on equity concerns. Planners, particularly at the municipal level, report efforts to regulate technology in order to positively influence broad social welfare related goals such as road congestion, alternative mode use, accessibility, urban form, and safety. They also report more parochial but highly relevant concerns with the municipal fisc, transit agency ridership and revenue, and parking revenue. In particular, in this section I address which demographic groups are benefiting from the management and regulation of contemporary technologies in transportation and land use, and how; and what could possibly be done to improve technology-related outcomes in the near future, including via the use of technology to facilitate greater levels of participatory planning.

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Key Words: technology, equity, housing, travel patterns

## UNDERSTANDING THE LIMITATIONS OF SCHOOL TRAVEL SURVEYS

Abstract ID: 759

Individual Paper Submission

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Since Congress approved federal funding for the Safe Routes to School (SRTS) program in 2005, researchers have analyzed many aspects of the program, but few have turned a critical lens on the effectiveness of the main sources of data used to justify SRTS programming, policies, and infrastructure changes: the National Center for Safe Routes to School parent survey instrument and tallies of student-reported mode use collected by teachers. The national, standardized parent survey and teacher tallies have been analyzed for their internal reliability and validity (McDonald et al., 2011), but their utility for capturing the accessibility challenges of caregivers and students and for developing active transportation to school interventions that meet the needs of diverse families is unclear.

In Boulder County, Colorado, the two local school districts, Boulder Valley School District (BVSD) and Saint Vrain Valley School District (SVVSD), in collaboration with the county government, have developed SRTS programs supported periodically by federal money allocated to states for SRTS. That funding is contingent upon reporting of data collected through the standardized SRTS parent surveys and teacher tallies. Yet, the parent surveys have consistently elicited low response rates, and the measures used in the survey provide only a generalized snapshot of school travel mode choices and parental concerns about active travel options. Researchers have typically used data



from the National Household Travel Survey to analyze families' school travel mode choices, but this instrument, too, provides limited data for understanding what influences school travel decisions (Kontou et al., 2020).

As part of a larger research project on the transportation needs of families and their choices for school travel, I collaborated with BVSD and Boulder County transportation staff to analyze the content of the comments section in 300 SRTS parent surveys collected by both entities in fall 2019. For this qualitative analysis, I used a grounded theory approach to code the comments, asking the question, "How do parents feel about their children's opportunities to walk or bike to school, and why?" I noted specific comment themes and coded the comments based on the sentiment or emotional tone parents expressed about each theme: satisfied, neutral, or unsatisfied.

The results illustrate the complexity of families' opportunities and inclinations to engage in active travel to school. Parents commented on their concerns about the safety of their children and the behavior of drivers; the lack of adequate infrastructure to support students' walking and bicycling at specific locations around schools; and the impact of school choice, housing costs, and work schedules on the ability of their children to travel actively to school. The comments also indicate the impact of strong, district-based SRTS programs: parents in BVSD, which has three SRTS-focused employees in its transportation department working on implementing programs and infrastructure at schools, were more likely to express satisfaction with active transportation than parents in SVVSD, which does not currently have any employees on staff to directly support SRTS programming or infrastructure. While 20% of the comments by BVSD parents indicated satisfaction with active modes, only 14% of comments by SVVSD parents indicated the same.

The parent survey comment data illustrate the need for researchers and practitioners to go beyond standard SRTS methods and programs that educate and encourage students to travel actively, to explore new opportunities for making active travel convenient and safe for diverse families. That will require new forms of data collection that more accurately capture the complexity of families' lives. As stated by Westman and colleagues (2020, p. 55), "We constantly need to be asking ourselves if we are measuring the relevant factors, and if we are measuring them in a valid way."

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Key Words: Data, Transportation, Activity, Safe Routes to School

#### **DRIVERS' ATTITUDES TOWARDS BIKESHARE USERS IN MEXICO CITY**

Abstract ID: 760

Individual Paper Submission

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Central Theme

Recent research indicates that bikesharing systems have a better safety record than private cycling. This raises questions about why this would be the case. It has been hypothesized that this relates to the quality and size of bikes being used, the location of bikesharing stations, differing attitudes/riding styles of cyclists that use shared bikes, and/or the attitudes of drivers toward different types of cyclists. This study focuses on the last of these reasons. The specific research question we will test is whether drivers have a more positive attitude towards cyclists using bikes provided by a local bikesharing system.

## Methodology

An internet survey of drivers in Mexico City presented respondents with a set of images of cyclists that varied systematically by gender, attire, use of a helmet, and whether the bike being used has the typical color and markings of those provided by the local bikeshare (Ecobici). Respondents were asked to indicate how comfortable they would be driving next to the cyclist in the image using Likert scale ratings (1-4). A regression analysis will be conducted where the stated level of comfort with the cyclist in the image is the dependent variable and the independent variables will be the characteristics of the cyclist in the image (including whether they are using an Ecobici bike) and the individual characteristics of the survey respondent. We hypothesize that Ecobici bikes will increase drivers' level of comfort, all other things equal.

## Relevance

Cycling is a sustainable mode of travel (it is healthy, low cost, and generates no emissions) that is often poorly utilized. Urban planners are frequently concerned with increasing the rates of cycling. The danger of a vehicle collision (real or perceived) and/or acts of aggression from drivers can be significant barriers to increased cycling. Determining the underlying factors that make bikesharing safer than private cycling is an important line of inquiry that can help planners understand how they can make cycling safer and more attractive.

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Key Words: bikeshare, cycling

## **PRIORITIZING SIDEWALKS: HOW ARE CITY PEDESTRIAN PLANS USING EQUITY TO FRAME SIDEWALK IMPROVEMENTS?**

Abstract ID: 763

Individual Paper Submission

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Access to desired destinations is facilitated by the pedestrian network. Whether using active transportation, public transit, or a car, segments of the first and last mile of a trip must be completed by walking or rolling on pedestrian facilities. The pedestrian network, which consists of sidewalks, trails, curb cuts, crosswalks, seating areas, public utility infrastructure, and vegetation, provide greater access for pedestrians if it is conveniently located, and well connected, and well maintained. However, active transportation infrastructure investments are not always

implemented in an equitable manner and project outcomes can lead to greater displacement and gentrification for disadvantaged residents (Lee et al., 2017).

In practice and research, there is a data gap regarding the quality of the pedestrian network because of the costs and effort associated with collecting detailed information. There is also a lack of guidance on how pedestrian facility improvements should be prioritized. Lee, Sener, and Jones (2017) indicate that while equity is commonly employed in motorized and land use planning, it is often missing from active transportation planning practice. In addition, transportation infrastructure investments have historically benefited largely white and higher-income communities while reproducing barriers for marginalized groups (Mahmoudi et al., 2019). Sidewalk quality, in particular, has been identified as a significant environmental barrier to using walking as a mode (Clarke et al., 2011; Ferrer et al., 2015).

Some cities in the United States have published pedestrian plans to demonstrate their dedication to improving the pedestrian network and their region's access to opportunities. Using an evaluation framework based on related literature, this study evaluates the pedestrian plans from four growing cities between published between 2016 and 2019: Seattle, Portland, Austin, and Los Angeles. The evaluation framework helps answer research questions regarding how sidewalks are being prioritized by cities, how the needs of historically marginalized communities are being addressed in pedestrian planning, and how the concept of accessibility is incorporated into pedestrian planning. Common approaches among the cities included a focus on pedestrian safety, the demand for walking to access opportunities, and equity for residents who rely on public transit for travel. Seattle was the only city to explicitly prioritize people with disabilities in their sidewalk improvement process. The results from this study highlight the current state of pedestrian planning and sidewalk prioritization in the U.S. context. This study outlines recommendations for how cities can be more inclusive when planning and investing in pedestrian network facilities.

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Key Words: pedestrian planning, sidewalks, accessibility, transportation equity

#### TRANSPORTATION BARRIERS TO HEALTH CARE ACCESS DURING THE COVID-19 PANDEMIC AMONG NORTH CAROLINA RESIDENTS

Abstract ID: 764

Individual Paper Submission

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Drawing on results of a large survey study, we investigate transportation barriers to accessing health care during the COVID-19 pandemic among North Carolina residents. Transportation barriers are known barriers to health care and result in delayed care, as well as missed appointments and missed or delayed medication use (Syed et al. 2013).

Examining data from the National Health Interview Survey, Wolfe et al. (2020) found that in 2017 5.8 million people in the United States delayed medical care because they did not have transportation. Groups that are already prone to greater social and economic disadvantage, including individuals who are poor and/or under or uninsured and who have chronic conditions, are more likely to encounter transportation barriers to care and to experience negative health consequences (Wolfe et al. 2020). Addressing transportation barriers resulting in missed or delayed care is important not only for mitigating adverse health outcomes among patients, but also for avoiding costs to the health care system stemming from increased use of emergency departments and hospitalizations (Kangovi et al. 2013; Nguyen and DeJesus 2010).

Synthesizing knowledge on transportation access to health care during the COVID-19 pandemic, Chen et al. (2021) found that some patients seeking care required additional support, particularly those who already experienced socioeconomic and transportation disadvantages such as low-income individuals, people of color, and people with disabilities. They were not always able to rely on others or on public transportation for rides like they had in the past, experienced additional challenges because of economic hardship due to COVID-19, and found it more difficult to fulfill their health care needs using telemedicine. The authors suggested that partnerships between health and transportation systems hold promise for addressing transportation barriers during and after the pandemic, but noted that these partnerships are largely limited to low-income patients enrolled in Medicaid. They reviewed some alternative strategies for addressing patients' transportation needs, including new models for providing non-emergency medical transportation through health care partnerships with ridehailing companies as well as innovations in health care coordination and policy, and concluded that such strategies might reduce transportation barriers and promote equity in health care access.

Analyzing survey results, we examine if and how North Carolina adult residents in the UNC Health system who had at least one medical appointment between April 2020 and April 2021 and are enrolled in Medicaid or Medicare encountered transportation barriers to health care during the COVID-19 pandemic. We explain how barriers affected respondents' care due to missed or delayed appointments, and describe their experiences traveling to in-person appointments during the pandemic as well as using telemedicine, an innovation that may alleviate transportation challenges for some. Using demographic and home location information collected for respondents, we analyze what factors were associated with reporting transportation barriers and related outcomes including missed or delayed care. We conclude by making recommendations regarding strategies to address transportation barriers that might meet the needs of low-income, high-frequency health care users who have higher health care-related transportation burdens and are more likely to encounter transportation barriers to care.

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Key Words: COVID-19, transportation barriers, health care access, non-emergency medical transportation, telemedicine

## DISPARITIES VERSUS INSUFFICIENCIES: EQUITY ANALYSIS OF ACCESSIBILITY PATTERNS

Abstract ID: 769

Individual Paper Submission

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Many studies on equity in transport have analyzed disparities in access to destinations between different population groups (1-3). In this paper, we challenge this disparity-focused approach to equity and propose an alternative: the analysis of accessibility insufficiencies (4). We argue that a disparity-focused analysis fails on two accounts. First, such analyses are based on aggregated group averages that inherently hide possibly large in-group variance. Second, these studies compare levels of accessibility between groups, without addressing whether these levels actually allow people to engage in daily activities. The proposed sufficiency approach, in contrast, avoids the former ecological fallacy and addresses the latter by setting an explicit benchmark for comparison.

In this paper we develop an Accessibility Insufficiency Index to evaluate transport insufficiency in 49 of the 50 largest metropolitan areas in the US. We examine accessibility insufficiency across dimensions of income and race/ethnicity and compare these outcomes to an analysis of disparities along similar dimensions.

The presented empirical analyses for 49 of the 50 largest US metropolitan areas confirm the problematic nature of disparity-focused analyses. In line with most literature, our analyses of disparities show that disadvantaged groups, defined along lines of income or income and race/ethnicity jointly, are virtually always better served by public transport than their more advantaged counterparts. Yet, a systematic sufficiency analysis reveals large inequities in accessibility, irrespective of the exact sufficiency threshold employed. Even for a modest sufficiency threshold of 10% of average car-based accessibility, a total of 19 million people is affected, representing 15% of the total population in the 49 metropolitan regions. A further assessment shows a clear ethnic/racial dimension in the observed insufficiencies, with the poor Black population carrying a substantially larger share of accessibility insufficiency than their share in the poor population.

Moving from a disparities to an insufficiencies analysis allows identifying disadvantaged groups that suffer from inadequate transit and the regions in which this occurs. Thus, we call for more systematic equity analyses, even if that implies inevitably normative, and thus difficult, decisions and the moving away from a seemingly neutral analysis of disparities.

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Key Words: Accessibility, Insufficiency, Disparities, Equity

## **PERSPECTIVE OF WHEELCHAIR USERS ON ACCESSIBILITY OF TRANSPORTATION SERVICE HAILED VIA UBER AND LYFT**

Abstract ID: 775

Individual Paper Submission

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Issues of wheelchair accessibility in service hailed through transportation-network companies have led to lawsuits against the companies and have been reported by the media and within grey literature. Uber and Lyft, the two most common ride-hailing platforms, have been criticized for several reasons: a lack of wheelchair-accessible vehicles; poor service for those using non-foldable wheelchairs; unreliable wheelchair-accessible service; long wait times; lack of assistance from drivers; and inadequate training of drivers (Calabro, 2018; Plautz, 2019; Ruvolo, 2020; and San Francisco Municipal Transportation Agency, Taxis and Accessible Services Division, 2019).

Little academic research has investigated the first-hand experience of wheelchair users in relation to service hailed through transportation-network companies. This presents a challenge to understanding transportation experiences of the disability community regarding new mobility options and to overcoming barriers, where they exist, in order to improve their access to opportunities. Thus, the study investigates wheelchair accessibility of transportation hailed through Uber and Lyft in the U.S. from the perspective of wheelchair users. Understanding the topic from their perspective is paramount. In the disability community, the motto nothing about us without us asserts the importance of engaging the disability community as an important stakeholder in work pertaining to the community. This in essence reflects the importance of engaging directly impacted stakeholders as experts of the problem issue in policymaking, planning processes, and building scientific knowledge.

The research question that drives this study is: What are the perceptions, experiences, and travel preferences of wheelchair users? A survey of wheelchair users was conducted to understand general trends and patterns. Participants who have experience with Uber or Lyft were asked questions pertaining to their experiences and preferences of using these services. Those without experience were asked questions that aim to understand their perceptions of transportation through these companies and their preferences in order to use the service. Data was gathered from 224 fully completed and 117 partial survey responses.

Findings show that more than 50 percent of respondents were satisfied with the service, but over 30 percent reported that they experienced service denial. Almost half of those without Uber or Lyft experience reported that they perceive Uber and Lyft as a viable means of transportation for them as wheelchair users. However, close to 40 percent felt discouraged from using the service based on what they heard about these two companies. To address accessibility issues experienced and perceived, both groups of participants indicated the following preferred changes: improved availability of wheelchair-accessible vehicles, training of drivers on the companies' platforms, and elimination of discriminatory practices.

The study contributes to accessible transportation for persons with disabilities in two ways. Firstly, it contributes to the development of new knowledge on wheelchair accessibility of new mobility options currently permeating the transportation landscape. Rosenbloom (2007) stated there is limited knowledge on travel behaviors of persons with disabilities in general; the study fills the gap. Secondly, it outlines recommendations for how the companies, regulators, and policy makers can address the problems of wheelchair accessibility in these services.

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Key Words: Wheelchair accessibility and Uber and Lyft, Travel behavior and disability, Accessible transportation

## RETHINKING TRANSIT AND HOUSING OPPORTUNITY IN AN ERA OF MAAS, MICROTRANSIT AND AUTOMATED TRAVEL

Abstract ID: 783

Individual Paper Submission

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There has been much recent discussion about disruptive transport that opens up new ways for travel yet very little work has evaluated this trend through lens of housing development and environmental impacts. Although there have been studies that have established common ways to conduct “trip degeneration” and estimate the impacts of smart growth on ITE Trip Generation Rates (Schneider et al., 2015), no work has estimated the effect development projects under the new CEQA regime (SB 743) have on project-related trips or come up with a rubric that environmental professionals can use in the context of SB 748. The era of ridesharing and mobility on demand has opened up the possibility of making mobility more efficient (Cervero, 2017). The emergence of these tools corresponds to generational and demographic trends that have reinforced their growth (Circella et al., 2016; Shaheen, 2018).

At the same time, private sector companies have developed a successful operational on-demand platform to serve as a last mile solution (Via, 2019). In locations like Berlin, discussions with BVG indicate that the service has been a success in dense corridors where it has been piloted. This corresponds to research that indicates that ridesharing tools fill gaps in the transportation network unserved by the taxi industry (Hall et al., 2018; Rayle et al., 2016; Shaheen & Chan, 2016). These new service concepts are being experimented with at scale in places like the Netherlands where planners and engineers are working on “Mobiliteitsknooppunten” or integrated mobility hubs that connect housing with planning for on-demand / MaaS-based transport (Mobiliteitsalliantie, 2019). These offer dramatic potential in the US as we seek to build the future of the accessible and sustainable city.

This study evaluates the VMT for transit in the context of future transit and housing opportunities using the case of the City of San Jose, California. The city implemented compact development and VMT-based project approvals in 2018. Using development information from the city and transportation data collected through intercept surveys and traffic cameras VMT for car-light and car-free verses traditional development. Despite higher density and less parking VMT increases—a trend that is significantly correlated with increased volumes of ridesharing vehicles. While we find that this increase in total mobility may not represent a net negative particularly in the lens of minority populations who had been less served by traditional transit routes, these emerging technologies could confound these policy efforts aimed at emissions reductions. They lead to new ways of thinking about transportation demand management, transport and housing concepts can help promote access and while also increasing the number of sustainable and affordable housing sites.

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Key Words: Transit, Housing, Vehicle miles traveled, Trip generation, Automation

## DO NEW CYCLING FACILITIES IMPROVE NEIGHBOURHOOD LIVABILITY?

Abstract ID: 787

Individual Paper Submission

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Livable communities are a key focus for urban planners around the world, and transportation is arguably one of the most important factors that contribute to neighbourhood livability. While the term 'livability' is subjective, current literature has placed an emphasis on connecting people to the places in which they work, live, learn, and recreate (Miller et al., 2013; Wang et al., 2015), and defines livable neighbourhoods as communities where people have access to opportunities they can use in the pursuit of improvements to their quality of life (Appleyard et al., 2017). While there have been attempts to examine how walking and public transit may improve the livability of neighbourhoods and transit corridors (Appleyard et al., 2017; Higgs et al., 2019), very few studies have focused on the role of bicycle infrastructure. This research begins to close this gap by exploring the association between cycling facilities, specifically painted bicycle lanes and on-street cycle tracks, and perceived neighbourhood livability.

An online survey was conducted in 17 urban and suburban neighbourhoods within the Greater Toronto and Hamilton Area (GTHA), Canada: 11 with a recently-built on-street cycling facility (i.e., case study sites) and six without (i.e., case-control sites). A total of 1,640 adults participated in the survey, including cyclists and non-cyclists. Subjective perceptions of livability were captured by nine statements and recorded on a Likert-type scale. A principal component analysis (PCA) was conducted to reduce their dimensionality and create three meaningful factors representing perceptions of various aspects of neighbourhood livability, namely— Street Safety and Comfort, Active Street Life, and Accessibility. Next, multivariate linear regression models were estimated where each model explored one factor as the dependent variable.

Results suggest that the presence of a cycling facility was not associated with the perception of street safety and comfort, after controlling for respondent's socio-demographic characteristics and travel-related preferences and attitudes. However, on-street cycle tracks in an urban neighbourhood (compared to a suburban neighbourhood) correlated with a higher perception of active street life, and a heightened perception of accessibility. The presence of a painted bicycle lane also explained a higher perception of accessibility, regardless of its location. Collectively, these findings indicate an association between newly-built cycling facilities and improved perception of neighbourhood livability, and support the policy emphasis on active transportation, particularly bicycle



infrastructure, in creating better communities.

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Key Words: Livable communities, Bicycling, Street design, Bicycle infrastructure, Subjective perceptions

#### DO E-SCOOTERS FILL MOBILITY GAPS AND PROMOTE EQUITY? A SPATIOTEMPORAL ANALYSIS USING OPEN BIG DATA

Abstract ID: 790

Individual Paper Submission

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The growing popularity of e-scooters and their rapid expansion across urban streets has attracted widespread attention (McKenzie, 2019; NACTO, 2020; Gossling, 2020; Bai and Jiao, 2020). To shed light on the impacts of e-scooters on urban mobility, We address two major policy questions in this study. First, do e-scooters substitute existing public mobility options including transit and station-based bikesharing or fill the service gaps left by them (Barajas and Brown, 2021)? Second, do e-scooters promote transport equity in terms of ensuring equitable access and usage in low-income communities?

We examine the first question by analyzing the spatiotemporal patterns of e-scooter service availability and use in Washington DC, focusing on their spatial relationships with public transit and bikesharing. An analysis of three open big datasets (i.e., General Transit Feed Specification, General Bikeshare Feed Specification, and real-time Capital Bikeshare system data) shows that e-scooters have both competing and complementary effects on transit and bikesharing services. The supply of e-scooters significantly overlaps with the service areas of transit and bikesharing, and we classify most e-scooter trips as substitutes for transit and bikesharing uses. A travel-time-based analysis further reveals that when choosing e-scooters over transit, travelers pay a price premium and save some travel time. The price premium is greater during the COVID-19 pandemic, but the associated travel-time savings are smaller. This implies that public health considerations rather than time-cost tradeoffs are the main driver for many to choose e-scooters over transit during COVID. On the other hand, e-scooters also complement existing mobility options. E-scooters expand transportation access to neighborhoods underserved or unserved by transit or bikesharing services. In addition, we estimate that between 8% to 12% of e-scooter trips are taken to connect with the rail services.

To answer the second question, we assess spatial equity of e-scooters services in DC by examining e-scooter availability and usage in D.C.'s Equity Emphasis Areas versus the rest of the city. We will measure spatial accessibility to dockless vehicles with a kernel density approach, and we will measure micromobility use with trips per capita

(jobs plus residents). We will perform the analysis on data collected from 2019 to the present, which allows us to examine equity outcomes over time. Moreover, given that the City of Washington DC has included different equity-related provisions in the dockless micromobility regulations, a longitudinal analysis can show which types of equity requirements can achieve the best policy outcome. Our preliminary analysis suggests that the “equity zone requirement” (i.e., e-scooter operators are required to place 25% of its fleet in Equity Emphasis Areas) indeed promotes greater e-scooter availability in disadvantaged communities; however, the rate of e-scooter use is significantly lower in disadvantaged communities compared to other parts of the city. These results suggest the need for policymaking to go beyond the issue of spatial access and to focus on overcoming other barriers such as lack of information and technology illiteracy.

Our study has important implications for cities that are developing policies and regulations to manage shared e-scooters and other forms of micromobility. Future research may combine the big-data-based analysis presented here with traditional survey methods to further shed light on the interactions between e-scooter services, bikesharing, and public transit. Future research may further assess equity of e-scooter services by focusing on how low-income people perceive e-scooters and the barriers for them to adopt e-scooter services.

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Key Words: Micromobility, e-scooter, public transit, bikesharing, big data

#### RESIDENT PREFERENCES TOWARD ADOPTION AND USE OF CONNECTED AND AUTONOMOUS VEHICLES.

Abstract ID: 798

Individual Paper Submission

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Connected and autonomous vehicles (CAVs) are expected to dramatically change the future of cities. This includes mobility landscapes, distribution of jobs, safety, urban form, and land use. However, many of these transformations are associated with uncertainties specifically related to development trajectories and community impacts (Freemark, Hudson, and Zhao 2019). As a result, the polarization and entanglement of uncertainties is making it difficult for planners to fully consider CAVs in their long-term plans (Guerra 2016), as is the lack of guidance from the state and federal transportation agencies (Chatman and Moran 2019).

CAV adoption rates and the nature of proliferation will play an influential role in the rollout of CAVs and their impacts on cities. For example, due to a likely decrease in the costs of time spent in traveling, people may be willing to live farther from downtowns and sprawling development may be exacerbated. Likewise, as human-caused crashes are reduced and efficient driving decisions are made, use of CAVs might increase which will impact vehicle

miles traveled (VMT) and congestion. For instance, it is expected that at a CAV penetration of 90%, congestion rates will decrease by 60% and VMT will decrease by 10% (Fagnant and Kockelman 2015).

Impact of CAVs on VMT, congestion rates, equity, accessibility, and urban form is highly dependent on consumer preferences towards overall adoption, type of ownership (private vs. shared CAV), type of ridership (single occupancy vs. shared), and affordability. Those preferences are influenced by individual characteristics such as demographics, familiarity with CAVs, commuting habits, and location of residency (Nodjomian and Kockelman 2019). For example, people living in the suburbs are more likely to use private CAVs. Shared CAVs on the other hand, are expected to be used by commuters, people with lower income or inability to drive, and those who rely heavily on public transportation (Nodjomian and Kockelman 2019).

In this study, we conduct a household survey in Peoria, a mid-sized region in Illinois. The surveys are mailed to 5800 households drawn from a random, address-based sample, with an option to complete the survey online. The survey is designed to gauge participants' familiarity with CAVs and their preferences with respect to a set of future uncertainties, including CAV ownership models (personal vs. fleet), CAV use (single occupancy vs. shared ride), residential location (dispersed vs. compact), and other relevant behaviors. As a complement to this information, we also assess residents' attitudes toward the CAV impacts (e.g., safety, congestion, emissions, job shifts) and relevant sociodemographic characteristics that might affect the rollout of CAVs.

We summarize the survey results and discuss participants' degrees of acceptance and willingness to use CAVs in the future. We expect our results to provide a better understanding of the extent to which residents are aware of CAVs and their willingness to use this technology. We also expect to shed light on the relationship between demographics, travel behavior preferences, and residential location preferences in a CAV-dominant environment. The key benefit of this work is to assist planners, practitioners, and decision makers in mid-size regions and beyond to proactively plan for CAVs in their respective cities.

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Key Words: Connected and Autonomous Vehicles, Household surveys, Consumer preference

#### **ENSURING EQUITABLE TRANSPORTATION: AN EXAMINATION OF ADA PARATRANSIT USAGE CHANGE DURING THE COVID-19 PANDEMIC**

Abstract ID: 804

Individual Paper Submission

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The passage of the Americans with Disabilities Act (ADA) by the US Congress in 1990 required the transit agencies to provide a transportation service comparable to fixed-route transit for people with disabilities. Such a service, commonly known as ADA paratransit, is an origin to destination service that usually takes the form of calling a ride on ADA-compliant vehicles at least one day in advance (Thatcher and Gaffney 1991). For people with disabilities, ADA paratransit serves as a critical means to perform necessary activities, access socioeconomic opportunities, and maintain social connections (Bascom and Christensen 2017). For society as a whole, ADA paratransit is an essential component for ensuring a fair and just transportation system (Martens, Golub, and Robinson 2012; Manaugh, Badami, and El-Geneidy 2015).

The COVID-19 pandemic poses an unprecedented challenge to both ADA paratransit riders and transit agencies who operate the service (Cochran 2020). The negative impacts are likely to be more severe on the socioeconomically disadvantaged riders as they tend to lack transportation alternatives. Thus, it is imperative to understand the differential impacts of the pandemic on ADA paratransit riders with varying transportation needs, sociodemographic characteristics, levels of disabilities, and neighborhood built environments, so that public transit agencies can strategically prepare for the recovery and future disruptions.

By examining the complete records of service trips and riders between Jan 2019 and July 2020 obtained from the Access Transportation program, the ADA paratransit service in the Seattle region, this study aims to answer the following two questions:

1. How have the ridership and trip purposes of ADA paratransit service changed after the outbreak of the COVID-19 pandemic?
2. At the individual level of ADA paratransit riders, what factors explain their changing levels of service usage in response to the pandemic?

The study employs descriptive statistics for the first question and statistical modeling, including a Hurdle model, for the second. The descriptive statistics show that paratransit ridership has dramatically decreased to only one third of the pre-pandemic level. The most substantial reductions were working and non-essential personal trips, and a majority of the remaining trips have been for medical purposes, suggesting that many of these trips were medical appointments that could not be delayed. The Hurdle model examines associations between various factors and service usage during the pandemic, and it explicitly accounts for the fact that many riders stopped using the service after the outbreak of the pandemic. The model results show that riders' service usage during the pandemic is associated with their sociodemographic characteristics (i.e., age and gender), disability conditions, and pre-pandemic travel demand (i.e., number of trips and types of travel needs), and neighborhood characteristics. Most importantly, when controlling for other factors, riders who live in neighborhoods with lower income and lower access to vehicles are more dependent on the service, which indicates that paratransit services function as a 'safety-net' for those who lack alternative options to travel.

Based on the findings, we recommend that during the pandemic and the subsequent economic recovery, transit agencies prioritize ADA paratransit services for neighborhoods with disadvantaged population groups to ensure an adequate level of accessibility, while strictly implementing safety guidelines to protect the most vulnerable riders. We also recommend that public transit agencies and paratransit operators include ADA paratransit as an important component when they develop plans to prepare for future disruptive events.

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Key Words: COVID-19 pandemic, Transportation equity, People with disabilities, ADA paratransit, Hurdle model

## IS WALKABILITY HEALTHY AND ACCESSIBLE FOR ALL? VARIATIONS IN THE ENVIRONMENTAL CORRELATES OF WALKABILITY ACROSS SOCIODEMOGRAPHIC GROUPS IN THE U.S.

Abstract ID: 805

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### Central Planning Issue

Past research suggests that there is a "disadvantaged advantage" in walkability in the U.S.<sup>1</sup>—that is, places with higher proportions of people of color and low-income residents tend to be objectively more "walkable" on indicators such as density and street connectivity. This could pose an opportunity to promote health equity, since populations that are disproportionately burdened by chronic disease<sup>2</sup> may live in environments that are conducive to physical activity from travel.

This potential, however, depends on the extent to which walkable environments in fact support pedestrian activity and health in marginalized communities. Measures such as density and connectivity may not capture the true experience of walking in marginalized communities, which tend to rate less favorably on measures of infrastructure quality and traffic safety.<sup>3,4</sup> Thus, walkability might "look" different across sociodemographic groups in ways that could affect the health benefits of walking.

### Research Questions

We examined differences in the characteristics of walkability across places of varying sociodemographic composition, asking two questions:

1. How is walkability associated with sociodemographic characteristics?
2. Does walkability "look" different with respect to environmental health exposures and accessibility (access to destinations) across places with varying sociodemographic composition?

### Methods

We used data from the National Environmental Database, which provides a standardized set of built, natural, and social environmental measures for block groups across the U.S. The present analysis is based on data from the ten largest regions, and analyses are underway for the entire country.

Our variables fell into four categories. First, we measured walkability using a composite index based on five component measures: residential density, transit access, vehicle miles traveled, intersection density, and employment mix. Second, we measured sociodemographic (dis)advantage using indicators of race/ethnicity, income, education, and vehicle ownership. Third, we measured environmental health exposures in terms of particulate matter 2.5 $\mu$ m (PM<sub>2.5</sub>) concentrations, pedestrian fatality rates, noise levels, and tree coverage. Finally, we measured accessibility in terms of pedestrian-oriented intersection density, employment entropy, and job density.

For the first question, we used multilevel mixed-effects regression models to predict the walkability index as a function of each sociodemographic variable, clustering block groups and standard errors by region. For the second question, we used the same method to predict each environmental health exposure and each accessibility measure as a function of the cross-tabulation between walkability and sociodemographic characteristics in a four-by-four matrix: low walkability/disadvantaged, low walkability/advantaged, high walkability/disadvantaged, high walkability/advantaged (“high” and “low” defined by top and bottom three deciles, respectively, for each variable).

#### Findings

Block groups with higher values of the walkability index tended to be more disadvantaged across all sociodemographic characteristics, aligning with the suggested “disadvantaged advantage” in walkability. However, measures of environmental health and accessibility varied significantly for highly-walkable block groups with different sociodemographic profiles. Compared to “advantaged” walkable block groups, “disadvantaged” walkable block groups tended to have higher PM<sub>2.5</sub> concentrations, higher pedestrian fatality rates, and lower tree coverage. While lower walkability was generally associated with more favorable environmental conditions (lower pollution and noise, higher tree coverage), these benefits were primarily limited to advantaged block groups. Compared to “advantaged” walkable block groups, “disadvantaged” walkable block groups had lower pedestrian-oriented intersection densities, employment entropy, and job densities.

#### Planning Implications

While marginalized populations tend to live in places with higher walkability index values, the characteristics of “high” walkability for these populations tend to also reflect greater environmental health risks (pollution exposure, pedestrian fatalities, limited tree coverage) and lower accessibility than the “high” walkability to which advantaged groups are exposed. These findings illustrate the importance of considering walkability within its sociodemographic context<sup>5</sup> and resolving environmental burdens that could dampen the potential benefits of walkability in marginalized communities.

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Key Words: walkability, equity, health, environmental exposure, accessibility

## **APPLYING AN EQUITY-BASED EVALUATION FRAMEWORK TO ASSESS FTA FUNDED MOD PROJECTS**

Abstract ID: 806

Individual Paper Submission

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Emerging research has demonstrated a need to invest in transportation infrastructure and technology to support equitable access to mobility services (Akar & Miller, 2021). While the equity dimensions of physical transportation networks are fairly well understood (e.g., transportation network accessibility) less is understood about the equity outcomes for and implications of new mobility technologies and related digital platforms. Mobility on Demand (MOD) platforms, or integrated and connected multi-modal networks of transportation options, offer digital support for continued and increased transit ridership, shifts from single occupancy vehicle travel to shared mobility, and integrated payment systems (Fedorowicz et al., n.d.). We therefore examined eleven projects funded by the 2016 MOD Sandbox Program of the Federal Transit Administration (FTA) to identify the extent to which equity was included in project goals and performance measures, and desired outcomes.

FTA MOD projects range from integrated carpool and commuting programs, last-mile/first-mile solutions, mobility platforms and open trip planners, integrated fare payment systems, paratransit and adaptive mobility services, and innovative partnerships for transportation delivery. Project goals include integrating transit with other multimodal services through enabling technologies and innovative partnerships; providing equitable, accessible traveler-centric service; and enhancing regional transportation networks by providing efficient, reliable service for all travelers (Mobility on Demand (MOD) Sandbox Program | FTA, n.d.).

A key objective of the MOD Program is to measure the impact of projects on travelers and transportation systems. To better understand how the MOD Sandbox Program contributes to equitable, accessible, traveler-centric service, we evaluated each of the 11 projects using an adapted equity-based scorecard or rating system ((Schrock et al., 2015) Schrock, Bassett, and Green, 2015) evaluating three types of equity - procedural, geographic and social. Project information was used to answer the following questions: How do practitioners measure equity benefits? What disadvantaged groups are practitioners targeting with technology interventions? How do practitioners identify that benefits should be distributed across disadvantaged groups?

This research was conducted in two phases (1) planning and development document review and (2) implementation and evaluation document review. The first phase included a review of project description and planning documents for each of the the 11 MOD Sandbox projects. In the second phase, we examined the evaluation research reports for the 11 MOD Sandbox projects. Information about performance measures, data collected, and the overall evaluation plan and processes were collected. Where necessary, supplemental documentation about each project was consulted including city websites and other relevant transportation or local government resources that detailed progress towards project implementation. The findings suggest that a clearer distinction between procedural, social and geographic equity will help guide FTA and local partners to better integrate these dimensions into future MOD projects. This research provides actionable ways to integrate equity in the design and evaluation of MOD projects, bringing them into alignment with contemporary conversations about equitable access to mobility services.

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Key Words: equity, mobility on demand, project evaluation, text analysis

## LOOKING BEYOND THE FRINGE: EXAMINING THE MARGINAL EFFECTS OF BOGOTA'S URBAN GONDOLA ON JOB ACCESSIBILITY

Abstract ID: 811

Individual Paper Submission

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Rapid urbanization and rising land costs often relegate low-income households in global South cities to difficult-to-access peripheral zones far away from urban centers. These peripheries are often characterized by an inadequate provision of public transport services and multiple topographical challenges, resulting in onerous commutes and significant inequalities in access to opportunities. Recognizing the needs of historically marginalized populations and the limitations on other alternatives, several cities, predominantly in Latin America, have invested in electrified cable-propelled transit -- or urban gondolas, which are more environmentally sustainable. During the past two decades, more than two dozen urban gondolas have opened to serve economically disadvantaged communities in places like La Paz, Bolivia; Medellín, Colombia; Caracas, Venezuela; Mexico City, Mexico; Lagos, Nigeria; and Constantine, Algeria. Most recently, Colombia's capital, Bogotá, opened its first cable-propelled line, locally known as TransMiCable, in December 2018.

The rise in investments in urban gondolas coincides with a growing body of scholarship critically examining how expanding public transport infrastructure reshape socio-spatial inequalities in urban areas worldwide, particularly accessibility, broadly understood as the ease of reaching urban opportunities. Despite the increasing interest in assessing the distribution of accessibility enabled by public transport investments, surprisingly little work examines how investments in cable-propelled transit infrastructure reduce employment accessibility gaps in cities in the global South. Furthermore, scholarship studying access to opportunities is rarely in direct conversation with the philosophical principles that often drive transport policy discussions and pays little attention to network or spatial spillover effects from transport investments, with a few exceptions including Fan et al. (2012) but in different contexts.

The rising popularity of urban gondolas has been challenged by some transport engineers and planners who claim they are too expensive and only benefit a small fraction of residents near stations. Criticisms like these are consistent with principles of utilitarianism, which, according to Fainstein (2010), incorporate an ideal of equity, calculated in terms of the utilitarian formulates of the greatest good of the greatest number people. These views are also supported by a growing body of literature assessing the effects of public transport investments that focus on station areas (e.g. Bocarejo et al., 2014). Despite utilitarianism's influence on decades of transport planning, a growing number of scholars advocate for a different moral principle that helps address pervasive inequalities in urban areas, notably political philosopher John Rawls, who contend a just society ought to generate the greatest benefit to the least-advantaged members of society (e.g. Golub & Martens, 2014; Pereira et al., 2019).

This paper takes a Rawlsian distributive justice approach. It uses Bogota's TransMiCable as a case of study to answer three fundamental questions: [1] Is TransMiCable placed where the least advantaged groups locate, in terms of



socioeconomic status and level of access to jobs? [2] How many people across all socioeconomic groups benefit from increases in job accessibility enabled by TransMiCable? [3] What is the role of TransMiCable in reducing employment accessibility gaps in the city? I employed a quasi-counterfactual research design paired with open-access GTFS and jobs data, and multiple descriptive comparative analyses. I demonstrate that, while investing in TransMiCable enabled notable increases in employment accessibility for economically disadvantaged residents near the project's three stations, as expected, positive gains go well-beyond station areas, spilling over multiple low- and middle- socioeconomic status neighborhoods in other parts of the city. With this latter finding, I challenge utilitarian arguments against investment in small projects located in the urban fringe and invite a more nuanced interpretation of Rawls' distributive justice principle. I close by quantifying the extent to which TransMiCable helped close job accessibility gaps in Bogotá.

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Key Words: transport justice, accessibility, equity, urban gondolas, global South

#### **ASSESSING THE IMPACT OF SHARED MICROMOBILITY ON VEHICLE MILES TRAVELED (VMT): FOCUSED ON DOCKLESS BIKE AND SCOOTER SHARING PROGRAMS**

Abstract ID: 812

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In the United States, shared micromobility ridership has dramatically risen in the past years. The number of trips on bike share (both station-based and dockless) and scooter share marked 35 million in 2017. Since then, this number increased by a factor of four (136 million trips) in only two years (National Association of City Transportation Officials, 2020). As these new mobility options have been widely used, their impact on our environment, society, and economy has become significant, particularly in urban areas (Roukouni & Homem de Almeida Correia, 2020).

In terms of its travel impacts, it has been expected to reduce regional vehicle travel. For instance, shared micromobility could increase public transit ridership by dealing with the first/last mile connection issue if it complements the local or regional transit system (Ma et al., 2015; Zhang & Zhang, 2018). However, findings are rather mixed. Another study shows shared micromobility as substitute might compete with the public transit service in the area (Campbell & Brakewood, 2017), which does not lead to reduction in regional vehicle travel. Despite these uncertainties, the impact of shared micromobility on vehicle travel, in particular, vehicle miles traveled (VMT), has been understudied.

To fill this gap in the existing literature, this study assesses the impact of two specific shared micromobility options on regional VMT. To this end, this study identifies 127 U.S. cities where dockless bike or scooter sharing program has been in operation. The sharing services considered in this study include six most popular services—Bird, Lime, Lyft, Skip, Spin, and Jump. With an urbanized area (UA) as the unit of analysis, this study examines the changes in VMT per capita before and after the arrival of shared micromobility while controlling the built environment and other demographic and socio-economic characteristics of the areas.

By assessing the impact of shared micromobility on regional VMT, this study suggests policy implications for future regional transportation planning.

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Key Words: shared micromobility, dockless bikeshare, e-scooter, vehicle miles traveled (VMT), urbanized area

#### EXPLORING THE SPATIAL VARIABILITY OF SOCIO-DEMOGRAPHICS OF PARATRANSIT RIDERS: A CASE STUDY IN ARLINGTON, TX.

Abstract ID: 814

Individual Paper Submission

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Elderly and people with disabilities, as a part of the transportation-dependent population, have specific mobility needs. The share of the transportation-dependent population has steadily increased in recent years (Vespa et al., 2018). Accordingly, a rich body of the literature has studied the travel behavior and associated socio-demographic characteristics of the group. Most of the existing research has been performed in large cities with mass transit services (Deka, 2014; Zegras et al., 2012). Few studies have addressed this issue in smaller cities lacking mass transit systems where transportation-dependent people may rely only on dedicated transit services or other means. This research fills the gap by studying the spatial patterns of travel and related socio-demographic characteristics of the transportation-dependent group in the City of Arlington, TX. The city of Arlington is the largest city in the US without a mass transit service. However, it offers two city-wide on-demand ridesharing and paratransit services. Recently, the city started a pilot project to integrate autonomous vehicles with its existing on-demand ridesharing service.

Most of the existing research has been conducted based on collected data from large geographic scales such as census tracts or higher (Yang et al., 2018). This study investigates the spatial patterns of trips at a block group level

while controlling for socio-demographic variables.

We analyze trip level data from Handitran- a paratransit service- dedicated to providing service for people with disabilities and older adults in the city. The data set we obtained contains a total number of 373,172 trips requested by users through Handitran during the year 2019. We employ the Geographically Weighted Regression (GWR) technique to analyze the spatial patterns of determinant socio-demographic factors. GWR, contrary to simple regression techniques, provides in-depth information about spatial patterns at a localized scale and helps discover patterns at a disaggregated scale (Nkeki & Asikhia, 2019).

Our results indicate that the usage of Handitran service is not uniformly distributed, but it varies spatially across the city. The study findings also show that the effects of socio-demographic characteristics such as race, income, age, educational attainment level and vehicle ownership on paratransit ridership vary in different parts of the city. Our results help stakeholders and policymakers to have a deep understanding of demand of services in a local context and allow them to allocate resources more efficiently. Our analysis could be used as a low-cost decision support tool for decision-makers in optimizing the existing services or expanding services in the near future.

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Key Words: Transportation Dependent, Paratransit, On-demand ridesharing, Geographically Weighted Regression

#### **HAS THE TRAVEL DISTANCE/TIME PATTERN FOR LONG-DISTANCE TRAVEL CHANGED ACROSS GENERATIONS? THE COMPARISON BETWEEN GENERATIONS IN THE UNITED STATES**

Abstract ID: 816

Individual Paper Submission

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There have been widespread concerns about transportation-related Green House Gas (GHG) emissions. Many studies have examined the GHG contributions of daily travel. The role of long-distance travel to GHG emissions has been acknowledged but inadequately investigated, mainly due to the lack of long-distance travel-focused surveys and related data. The concern over GHG emissions from the transportation sector and the inadequate research on long-distance travel motivate this study. Specifically, the study compares the travel distance/time pattern for long-distance travel (50+ miles one-way) between Millennials, Generation X, and Baby Boomers. In the United States, Millennials are the largest generation in the current population (The Council of Economic Advisers, 2014). They have

attracted much attention and have been seen as the keys to the future travel industry. However, existing studies have shown diverse and conflicting findings in terms of Millennials' travel distance/time patterns. Being born to be the first generation to grow up with the rapid development of information and communication technology (Pedró, 2011), they are found to own few vehicles, delay to obtain a driver's license, and travel fewer miles and make fewer trips than the previous generations of the same life stage (Blumenberg et al., 2012). And the decreased auto usage results from the decreasing trip rate, rather than the shift to other transportation modes or shorter travel distance (McDonald, 2015). However, news media has reported that Millennials would more like to conduct long-distance trips or travel to another city/country for vacation. The average U.S commute time gets longer, increasing from 25.1 to 26.9 min between 2005 and 2017. The proportion of workable laborers (16+) who commute over one-hour one-way increases from 7.9% to 9.3% during the same period (Mitra & Saphores, 2019). Motivated by the conflicting findings reported by existing studies, this study aims to answer the research question:

How and to what extent do the Millennials' travel distance/time patterns for long-distance travel differ from those of other older generations?

What variables impact the travel distance/time of the members belonging to each generation (cohort)? This study assembles a dataset on long-distance travel from six U.S. National Household Travel Surveys (NHTS) and Nationwide Personal Transportation Surveys (NPTS) from 1983 to 2017. Trip distance/time will be regressed against cohort and period (year) predictors along with a set of socioeconomic and spatial variables. The study's findings are expected to shed light on generational characteristics of long-distance travel and inform policy deliberations on travel demand management strategy and travel-related GHG emission reduction policy.

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Key Words: Long-distance travel, Trip distance/time, Generational differences, NHTS/NPTS

#### **WHAT TYPES OF TRAVEL DO WE PRIORITIZE DURING COVID-19? AN EXPLORATION OF SOCIAL AND SPATIAL DISPARITIES IN THE ACTIVITY-TRAVEL BEHAVIOR CHANGE**

Abstract ID: 821

Individual Paper Submission

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The onset of COVID-19 has disrupted many aspects of human life, which has, directly and indirectly, changed people's mobility styles (Shamshiripour et al., 2020). Studies have revealed significant disparities in mobility reduction among different socio-demographic groups during the lockdown; neighborhoods with higher percentages of white and people with higher income and high education degree tend to have more mobility reduction (Dasgupta, 2020; Pepe, et al., 2020). However, limited is known about the changes in activity-travel behavior during the lockdown and whether the changes persisted afterward or bounced back to the pre-pandemic level. This

knowledge will be useful to guide health policymakers to make public health policy. it would be also important for planning policymakers to develop more equitable and resilient transportation systems.

To fill this gap, this research investigates how and to what extent people's activity-travel behavior has changed in North Carolina during and after the lockdown compared to the same period in 2019 and how these changes are associated with the socio-demographic and spatial characteristics at the block group level. Specifically, using the mobile phone data from Safegraph, we analyze the activity-travel behavior of seven types of activities, including offices, retail stores, grocery stores, outdoor and indoor recreational activities, health care and social assistance, and restaurant/bars, and estimate models to examine the correlation between changes in activity-travel behavior with the socio-demographic characteristics at the block group. The analysis reveals significant changes in people's travel behavior and disparities in these changes by block groups with different socio-demographic and spatial characteristics.

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Key Words: Mobility-style, Equity, Mobile phone data, COVID-19

## TURNING STREETS INTO HOUSING

Abstract ID: 829

Individual Paper Submission

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“Living on the streets” is synonymous with homelessness. While unhoused people use many different strategies for shelter, from couch surfing to formalized shelter accommodation, the images of street sleepers is particularly visceral. At the same time, the number of people living on the streets reflects the sheer amount of space that is available on rights-of-way, whether on sidewalks, in medians, in parking spaces, or at the side of freeways. Between 13% and 30% of land in US cities may be devoted to street rights-of-way (Meyer & Gómez-Ibáñez, 1981).

The use of streets by unhoused people is normally seen as a social problem. In this paper, in contrast, I consider whether and how the large reservoir of land devoted to streets can be repurposed for short- and long-term housing options. I argue that wide residential streets in US cities are both a contributor to homelessness and a potential strategy to provide more affordable housing.

I first discuss the economic as well as the social imperative for turning streets into housing. In US residential neighborhoods, subdivision ordinances typically set binding standards for street width, far in excess of what is economically optimal or what private developer and residents would likely prefer (Millard-Ball 2021). These street width standards are one contributor to high housing costs and supply restrictions, which exacerbate the housing affordability crisis in high-cost cities.

If and when autonomous vehicles become widely available, the imperative may become a practical one as well. Anti-

camping ordinances become hard to enforce when a car or camper van can slowly cruise or periodically reposition itself throughout the night. Thus, future planning for autonomous vehicles may highlight the overprovision of streets in urban areas. Because they can evade municipal anti-camping restrictions that restrict the use of streets by unhoused people, autonomous camper vans have the ability to blur the distinction between land for housing and land for streets.

I then discuss the practicality of turning streets into housing, and sketch out two potential pathways for established neighborhoods. First, cities could permit camper van parking on the right-of-way, analogous to liveaboard canal boats that provide housing options in UK cities such as London and Oxford. Cities could allow vehicle owners to rent part of the street on a short- or long-term basis, and provide sanitation, water, electricity and other basic services. The accommodations need not even be a van; mobile tiny houses could do the same, with a year-long lease agreement making the transportation and set-up costs worthwhile for residents.

Second, in the longer term, cities could begin to cede their excess rights of way to adjacent property owners in order to permit accessory dwelling units or redevelopment at higher densities. Many possible configurations are possible, including free-standing units, garage conversions or expansions, or extensions to the main house that creates space for separate units.

In short, I argue that cities should not seek to evict unhoused people from the streets, but rather find ways to turn those streets into adequate housing. Streets provide the largest reservoir of public land in most cities, and much of this land can and should be used to house, or at least shelter, unhoused people.

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Key Words: streets, street widths, homelessness, vehicular homelessness, accessory dwelling units

#### **"HOW WILL IT HELP?" LEGITIMACY AND REPRESENTATIVENESS OF CROWDSOURCING IN TRANSPORTATION PLANNING**

Abstract ID: 830

Individual Paper Submission

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Planners deploy crowdsourcing in transportation planning to fill gaps in data, information, and ideas, but critical questions exist regarding their suitability (legitimacy) and coverage of communities (representativeness). If planners are to integrate crowdsourcing in meaningful ways, we must consider the structures and mechanisms of crowdsourcing in its techno-organizational context (Bygstad, Munkvold, and Volkoff, 2016). We recruited 31

interviewees from a sub-set of 105 respondents to a previous survey, composed of transportation professionals in the United States. We developed a nine-question, semi-structured interview guide that centered on two guiding research questions: 1) how do planners navigate their role in organizational use of crowdsourced data for transportation planning?, and 2) how do planners conceptualize and address (if at all) potential gaps in data representation? We coded transcripts through a three-stage process of indexing, analysis, and meta-analysis.

Initial findings suggest 13 inter-related topics that provide answers to our guiding questions about the legitimacy and representation of crowdsourcing in transportation planning. The most prevalent topics in our interviews concerned equity in planning (160 instances), the cost or expense of data (155 instances), and collaborative planning processes (154 instances). We find a balance of optimism and skepticism regarding the legitimacy of crowdsourcing in transportation planning. Many of these assessments are context-dependent—crowdsourcing cases range from mining smartphone app data for trip records to local generation of policy alternatives. For instance, the same planner who framed the challenge of planners using crowdsourced data as “how will it help?” also pointed to previous failures in including bicycle and pedestrian counts with motor vehicle counts, along with privacy concerns with “smart” lights capable of monitoring traffic with cameras. We also found that planners describe the (mis)representation of communities in crowdsourcing as a persistent challenge, with varying perceptions of whether these problems can be mitigated through technical and community engagement means.

In the context of previous scholarship, our findings suggest crowdsourcing requires changes in data collection and public engagement mechanisms of urban planning (Liao, et al., 2019) that can center the communities of interest (Bai and Jiao, 2020), and further an open data ethic (Schweitzer and Afzalan, 2017). A critical realist perspective proposes that deeper changes may be needed to realize crowdsourcing as a representative community approach in urban planning, such as the mechanisms of planners’ data collection and public engagement, and the legal and organizational structures of what constitutes data versus opinion. Though we are continuing analysis as of this writing, initial findings suggest opportunities to reform federal and state requirements for transportation agencies regarding data collection and public engagement through crowdsourcing. Researchers may also transfer our approaches to the analysis of other techno-organizational challenges. Practicing planners can apply our findings to decide on the appropriateness of crowdsourcing as an approach to gather data, information, and ideas in light of persistent problems of representation. Educators of planning theory, transportation, and public engagement can use our interview analysis to add context and stories to emerging issues in each field.

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Key Words: crowdsourcing, transportation planning, interviews, mixed methods, critical realism

#### PREPARING TRANSIT FOR THE NEXT FUNDING CRISIS: UNDERSTANDING THE INTERNATIONAL FINANCIAL RESILIENCE OF TRANSIT FUNDING

Abstract ID: 838

## Individual Paper Submission

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### Preparing Transit for the Next Funding Crisis: Understanding the Financial Resilience of Transit Funding Through International Research

Clearly the pandemic has taken a toll on the ability of public transit systems to operate. In particular, transit operations in the US is highly dependent on local funding sources earmarked for public transit. An international comparison will shed light on the limitations of the current system that could be remedied to improve its resiliency in future crises, like those seen in 2020 and 2009. This research will conduct an international survey to gain an understanding of the various financing sources of public transport operations, the extent to which they have been affected by the Covid crisis, and the various ways in which authorities, operators and governments (local, regional, national) have responded to the financial challenges. In particular, the type of funding source, as well as the level of government that provides it are likely to have important impacts on transit agencies' ability to weather the crisis, but the extent to which this is the case is not fully understood, nor are the specific impacts on real transit agencies or operators. The sample used in this study will provide a strong contrast between states and countries that use highly localized funding sources with those that use highly centralized ones. It also examines those with strong national support with those where such support is very weak, and examines a myriad of different types of taxes and fees—some likely to be more sustainable than others during a financial crisis. The outcome is likely to provide very practical results for cities, transit agencies and operators looking to design their structure in a way that can withstand future crises.

At the same time, this work builds toward greater comparison of financial and governing systems for public transit across countries and continents. A small but interesting literature has done work on this question so far, though it has yet to yield a systematic understanding of the governance/finance differences, and how they may impact real-world outcomes—which could lead to subsequent work focusing on the impact on the transit systems, their coverage, fragmentation and ridership, and how these are influenced by governance and financial structures that vary significantly from one country to another.

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Key Words: Financial Resilience, Transit, Taxation, Governance, Organization

## THE EFFECT OF THE PROVO-OREM BUS RAPID TRANSIT (BRT) ON TRAVEL BEHAVIOR, LAND USE, AND EMISSION

Abstract ID: 845

Individual Paper Submission



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Today, the US population is growing continuously, and vehicle miles traveled (VMT) are also rapidly growing. Therefore, the importance of public transportation is emerging more than ever before (NHTSA, 2017). Among many types of public transportation, Bus Rapid Transit (BRT) is receiving attention for its efficiency and relatively low cost as compared to rail modes. It is available to carry many people simultaneously, and it has more reliability than conventional bus service.

In Utah County, BRT's positive attributes, transportation agencies opened the Utah Valley Express (UVX) line in Central Utah County in 2018. This line is operated by Utah Transit Authority (UTA) and runs between southwest Orem to south-central Provo by way of Utah Valley University (UVU) and Brigham Young University (BYU).

Previous research found that BRT leads to increased job growth, increased land price premiums, increased retail employment, increased accessibility to jobs and healthcare, and decreased delay (Nelson, 2013., Cervero and Kang, 2011., Lee and Miller, 2018). Additionally, Ewing et al. (2014) researched light-rail's (LRT) impact on traffic in the University TRAX travel corridor in Salt Lake City. BRT is often described as rubber-tired LRT because they share operating characteristics. From this research, Ewing et al. found LRT was associated with increased transit ridership and decreasing vehicle traffic volume within the travel corridor.

However, there has been limited exploration of the comprehensive quantitative impact of BRT on travel behavior, land-use change, and air quality in previous papers. Especially, there has been limited exploration of how BRT impacts travel behavior (traffic volume, travel time, ridership, crash rate), land use (land use, trip generation, parking occupancy), and emission. In fact, from the previous BRT studies, BRT worked very well in Bogota, Lahore, or Mexico City. However, in the Delhi and Taichung cases, BRT was failed (Tsivanidis 2019, Majid et al. 2018, Bel and Holst 2018, Pojani and Stead 2017).

Therefore, in this study, to achieve an understanding of the quantitative effects of BRT, we studied public transit ridership, traffic volume, travel time, land-use change, total and injury crash rate, emission, parking occupancy, and trip generation change in the 0.5 miles buffer area of the UVX alignment from 2013 to 2019 through time series analysis. BRT was constructed and opened during that period. In particular, we used a quasi-experimental research method to estimate the causal impacts of an intervention (BRT) on the target area. This comes as close to a true scientific experiment as one typically can come in the social sciences.

As a result, even though the population (+9.17%) and the student enrollments in the study area (+6.27%) were increased between before and after the BRT operation, however, the traffic volume in the BRT line (-2514 VPD or -7.38%) and in the 0.5 mile buffered area from BRT line (-1514 VPD or -6.81%) was decreased than the estimated value due to the increased bus ridership (+8687 or 122.66%).

In addition, due to the BRT, commercial area (+1.18%), public area (+9.87%), the numbers of residential units (+962 units), total trip generation (commercial: +12309, residential: +5326, total: +17634), and parking spaces (+3126 parking spots) were increased, and vacant land (-17.76%), travel time (-6.13%), total (-25.26%) and injury (-33.30%) crash rate, and estimated emission were decreased than predicted value. This research can be strong evidence providing the justification for the introduction of BRT.

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Key Words: Bus Rapid Transit, Ridership, Traffic Volume, Trip Generation, Crash rate

## **CONSEQUENCES OF COVID-19 ON PEDESTRIAN MOVEMENT IN THE URBAN SPACES: CONSIDERATIONS FOR ESTEVES JUNIOR STREET IN FLORIANOPOLIS, BRAZIL**

Abstract ID: 850

Individual Paper Submission

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Florianopolis is a city of 600.000 inhabitants located in Brazil's southern region. The city's economy is based on tourism, public services, and the technological industry. Its urban form follows the typical Portuguese configuration, with a downtown characterized by narrow streets, tiny sidewalks, storefronts, with no setbacks.

Esteves Junior street is an example the central city's mixed-use configuration. It has stores, restaurants, bakeries, and supermarkets combined with apartment buildings, houses, and institutional structures (schools, fitness centers, and government buildings). These uses are complemented by several squares and large plaza at the end of the street. The mixed-use character of this street is a critical component in promoting pedestrian activity (Cervero and Duncan, 2003). In 2018, the street was further improved by adding bikeways, increasing sidewalk width, and narrowed crosswalks. The addition of these types of facilities have been demonstrated to encourage pedestrian activity (Hutabarat, 2009). The arrangement of urban space along this street provides security and reasons to walk, adding a feeling of belonging and improving social interactions. According to Amancio (2005), continuous interaction between people and the built environment is a fundamental aspect of good urban spaces.

In 2019, we analyzed pedestrian usage of this street. An instrument was developed to evaluate the presence and movement of people on the route. It examined the quantity of pedestrians, their interactions, and the types of activities they were conducting in the different squares. The analysis considered whether people were walking or standing, whether they were by themselves, or whether they were interacting with other people, or just passing through. The Syntax Observation Manual was the method used to count the number of pedestrians in each square (Saboya, 2007). According to Gehl and Gemzoe (1996), one of the easiest and quickest ways to understand pedestrian movement in urban spaces is to count the number of people walking or involved in various activities. The diversity of people, especially children, the elderly, and people with special needs, denotes the quality, integrity, and health of the pedestrian space. The results confirmed the potential of mixed land uses and urban infrastructure in promoting pedestrian movement and public interactions. For example, at least 600 pedestrian were observed per hour during the morning and afternoon.

Several factors can affect the demand for non-motorized transport, such as climate, temperature, infrastructure, security, and urban design (Moudon, 2001). We plan to build on this work by examining how the current pandemic brought many functional changes to urban spaces. Social distancing and quarantines resulted in many behavior changes, including pedestrian movement and interactions in urban spaces.

In an effort to understand the changes in how people interact with each other in urban spaces, this study will repeat the previous analysis of pedestrian usage on Esteves Junior Street following the Syntax Observation Method that

was previously used. The new observation will be done during Spring 2021. These results will be directly compared with the 2019 results to assess the impact of the pandemic on the use of urban spaces.

Preliminary results showed a reduction in the number of people walking, and a drastic reduction in social interactions and recreational activity in urban spaces, especially in terms of group interactions.

This study will be helpful in understanding the implications and complications of COVID restrictions on interactions and socialization. As we beyond the pandemics, urban planners will need think carefully about how to restore confidence in the use of urban spaces. More generally, it can provide lessons in how to think creatively about overcoming barriers to pedestrian activity.

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Key Words: Pedestrian interaction, Social behavior, COVID 19

#### **THE INFLUENCE OF UBER AND LYFT ON AUTO USE AND OWNERSHIP ACROSS LEVELS OF TRANSIT ACCESS IN METROPOLITAN BOSTON**

Abstract ID: 859

Individual Paper Submission

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Many envision a transition away from widespread personal vehicle ownership in which future urban transportation demands are satisfied through a combination of shared mobility and public transit. A key element of these predictions is the role of transportation network companies (TNCs) such as Uber and Lyft. On one hand, surveys of TNC riders indicate that TNC availability may encourage urban commuters and single millennials to forego private vehicle ownership (Coogan et al., 2018). But despite the potential for these services to discourage car ownership, current data suggest that driving has increased since the advent of TNCs. Several studies conclude that TNC operations increase congestion and vehicle miles traveled (VMT) within service areas (Erhardt et al., 2019; Henao & Marshall, 2019). With regards to TNCs interaction with public transit, there is growing evidence suggesting that TNCs act as a compliment to public transit in some situations, but as a substitute in others (Young, Allen, & Farber, 2020; Hall, Palsson & Price, 2018). As such, TNCs may more strongly encourage users to forego personal vehicle use in situations where TNCs compliment transit, but to what extent is unclear. With these dynamics in mind, we address the following research question: Does access to TNCs, or to both TNCs and transit, lead to reduced personal vehicle use or ownership? In contrast to previous research, this current study uses data that can more directly measure whether access to TNCs, or access to both TNCs and public transit, affect the use of individual personal vehicles, by analyzing changes in auto ownership and use using data from the Massachusetts vehicle census (MVC) of 2009-14, focusing on the metropolitan area of Boston. The MVC includes annual vehicle mileage data collected at the time of emissions testing and inspection. It also includes locational and storage data sourced through the vehicles' registration. Using the MVC, we assess the impact of TNCs on private vehicle use by analyzing changes to the stock of vehicles and to the annual VMT of individuals depending on vehicles' level of access to TNC and transit services as defined by their registered location over time. The findings of this study provide insight into TNCs influence on personal vehicle use and ownership, and whether this effect is amplified, muted, or unchanged in areas

with varying levels of transit access. Such insight has the potential to inform local transportation policy, particularly how to regulate TNCs and personal vehicle use as part of an evolving transportation system, and when considering the role of TNCs alongside transit.

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Key Words: transportation network companies (TNCs), auto use and ownership, public transportation, ride-hailing

#### ACCESSIBILITY AND EQUITY OF MICROTRANSIT SERVICES: A CASE STUDY OF GAINESVILLE, FL

Abstract ID: 865

Individual Paper Submission

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Public transit ridership has faced a steep decline in the last few years. From 2014 to 2017, the top 40 urban centers in the United States had over 85 percent of the country's decline in ridership, and the Covid-19 pandemic has worsened the situation (Dickens, 2020). Historically overburdened communities with health and racial inequities are the ones who suffer the most in the crisis aftermath. Those transit-dependent communities need reliable public transit to access basic needs, such as health care, education, and jobs.

Since 2013, all top transit operators in Florida have experienced a decline in their services (Polzin & Godfrey, 2020). On-demand services (such as microtransit) are functional in a low job and population density. Transit agencies started using microtransit to improve riders' experiences by providing on-demand services with flexible routing and scheduling. In January 2019, the City of Gainesville Regional Transit System (RTS) offered free microtransit services in East Gainesville (RTS, 2019). The flexible routes covered by the microtransit service supports a geographically dispersed area with a low-income, transit-dependent population, who have limited access to conventional public transit. We evaluate the success and shortcomings of the microtransit services while exploring what steps the RTS should take to connect more individuals to those services, considering that existing digital inequalities adversely impact East Gainesville communities' access to new mobility options, such as microtransit.

#### Methodology

We completed 15 interviews with local officials and community leaders either in person or over Zoom about their perspective on the efficiency and effectiveness of the microtransit service and how the service met the needs of residents of the neighborhood. The interviews were transcribed and analyzed using Zoom to categorize the responses.

### Findings

The microtransit services in East Gainesville initially covered two routes and provided access to the central bus station. Services then expanded to three routes and made a connection with a variety of popular destinations. Given the significance of accessibility for all transportation users, the city and microtransit providers need to work together to address the existing disparities to accessibility of resources across the metropolitan area — specifically the reliability of services and availability in other parts of the city. The existing infrastructure does not meet the transportation needs of the residents in the pilot neighborhoods. Community leaders have emphasized the urgency of improving existing infrastructure in order to leverage the features and strengths of the microtransit service. Additionally, community leaders and local officials agree that regional partnership, with employers, are essential to ensure long-term sustainability and efficiency of services. Partnerships are also key to continuing existing services and expanding routes in other parts of the city, specifically considering the aging population's transportation constraints, such as digital divide.

### Implications of the Research

The microtransit pilot program is filling the gap of conventional public transit, which is the only mobility option for a considerable number of citizens in East Gainesville. Microtransit services can have substantial equity implications if those being used to replace low-usage transit routes, and those services are abruptly canceled by the local authorities. Therefore, local partnerships among key stakeholders are essential to ensure transparency and the long-term financial stability of services. The recommendations provided in this research will help local officials effectively expand services and equitably meet the needs of transit-dependent and transportation-disadvantaged communities in Gainesville.

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Key Words: microtransit, flexible routes, transit-dependent populations, transit, on-demand transit services

## **SLOW STREETS AND DOCKLESS TRAVEL: USING A NATURAL EXPERIMENT FOR INSIGHT INTO THE ROLE OF SUPPORTIVE INFRASTRUCTURE ON NON-MOTORIZED TRAVEL**

Abstract ID: 866

Individual Paper Submission

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At the onset of the COVID-19 pandemic, several cities implemented slow street programs which limited car travel to local traffic, reduced speeds, and allowed a substantial shift of street space from car lanes to non-motorized travel. These slow streets programs were intended to provide a safer, supportive infrastructure for the people to walk, bike and ride other non-motorized vehicles. The slow street program allows an unprecedented opportunity to study how supportive non-motorized travel infrastructure is associated with increases in non-motorized travel. While there are some other cities with similar programs, we have identified 4 cities, Los Angeles, Oakland, San Francisco, and Portland, which initiated slow street programs since April 2020 as a part of COVID 19 response with data available for the analysis. By using these four case study cities, this study focuses on understanding the impact of supportive infrastructure on non-motorized travel. As a comparison, a recent study of bike-lanes examined the development of 92 miles of bike lanes in Boston over a 7-year period (Pedroso, et al., 2016), similar to the size of the slow street programs that we study, which were implemented within a few months.

We partnered with Lime, a major national provider of dockless bicycle and scooter services, to obtain data from July, 2019 (first baseline), November, 2019 (second baseline), July, 2020 (after first-wave implementation of slow streets), and November 2020 (after second-wave implementation). We use a before-after, experimental-control group research design to examine the effect of Slow Streets on dockless vehicle flows during the pandemic. We use data including counts of daily trips that crossed the midpoints of about 3,000 blocks that were converted to slow streets as the experimental group and blocks in a surrounding  $\frac{1}{2}$  mile area and  $\frac{3}{4}$  to 1 mile areas as control groups. Our analysis is based on aggregated trip counts by weekday/weekend, and by four different times of day including AM peak, mid-day, PM peak, and night. For the first and second control groups, we match experimental and control blocks based on similar street characteristics. Additionally, we identify a third control group which includes blocks which were identified as candidates for slow streets, but never actually implemented due to conflicts with stakeholders, or were implemented in a later phase. This third control group can be seen to represent blocks with similar characteristics to slow streets blocks, which will allow for an additional model using treatments and controls which are likely to be characteristically similar. While the effects of a supportive infrastructure program can be difficult to estimate due to differences in underlying characteristics between treated and untreated blocks, this data will allow us to address that concern using block-level fixed effects. Therefore, we implement a differences-in-differences statistical model to measure the effect of slow street implementation, relative to control groups, on dockless travel.

Results show large increases in dockless travel on the converted slow streets. By examining the land use characteristics and slow street project details that are most strongly associated with increased dockless travel, the results will suggest concrete actions cities can take to implement supportive infrastructure to encourage non-motorized travel.

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Key Words: active transportation, COVID 19, slow streets, non-motorized travel, travel behavior

## **CAR OWNERSHIP TRANSITIONS AMONG LOW-INCOME HOUSEHOLDS**

Abstract ID: 871

Individual Paper Submission

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This research precarious car ownership among low-income households. Previous research has painted a partial picture of these transitions which have a large effect on households' wellbeing. We know that low-income households' grasp on car ownership is tenuous. These households experience more transitions into and out of car ownership compared with more affluent households. We also know that having or gaining a car is associated with upward economic and social mobility. Yet, we know little about how low-income households acquire cars or the consequences for these households when they lose or give up a car. This research examines these two aspects of car ownership transitions.

First, I examine the consequences of losing access to a car for low-income households. My research will highlight the effects of losing a car on employment, finances, healthcare, access to food, recreational opportunities, childcare and child-serving travel, and residential mobility. Second, I examine how households subsequently regain a car. When searching for a car, low-income households often have to navigate subprime lenders and informal markets and risk buying unreliable vehicles. My research will examine the search processes, risks, constraints, and compromises entailed in purchasing a car.

To address these questions, I plan to interview low-income individuals in and around Philadelphia, PA, and Ithaca, NY. I will work with social service agencies in both cities to recruit participants with annual household incomes below \$40,000. In these interviews, I will adopt a biographical approach to focus on the processes of change (the search for cars) and the consequences of these changes (the effects of losing a car) over the life-course.

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Key Words: transportation, auto ownership, precarity

## **IMPROVING TRANSIT ACCESS TO JOBS IN SOUTHEAST LOS ANGELES**

Abstract ID: 873

Individual Paper Submission

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Transit ridership has been falling in virtually every U.S. city. Hypotheses abound. Analysts have cited falling gas prices, the economic recovery and rising incomes, the rise of ride-hailing and new mobility options, and the

adoption of driving by immigrants who arrived in the past two to three decades (Manville et al., 2018). Yet, those factors are largely outside of the ability of transit agency control. This study will examine how transit system characteristics – including frequencies, routes, first/last-mile access – would affect job access in the Southeast Los Angeles (SELA) region, focusing on (but not necessarily an exclusive focus) on buses. Public transit systems across the United States were vulnerable to disruption and shocks caused by the global pandemic; reports reflect disparate declines in ridership among metropolitan areas (Liu et al., 2020). The paper also pays attention to the effects of COVID-19 on both transit networks and economic development in the SELA region. The region is densely populated, with a relatively low median household income, and low car ownership rates, making residents highly dependent on public transportation (Giuliano et al., 2017). Historically, low-income communities are at a disadvantage due to limited mobility (Giuliano, 2005).

Compared to the County of Los Angeles, ACS data estimates from 2019 indicate that a high percentage of households in the SELA region have no private vehicle and live below the poverty line. The research will leverage new open-source data on transit accessibility from Remix, an online commercial transit access software tool, and ArcGIS to simulate how transit improvements affect regional job access in the SELA region. Our simulation is conducted at the city level, where we use the number of jobs that can be reached from each SELA region city's geographic centroid to represent the job access for residents living in this city. In addition to quantitative analysis, we also use qualitative methods - survey and focus group interviews - to learn more about residents' needs. The simulation results indicate that first-last mile access, including robust bike-share and rapid shuttle, are the best options for increasing residents' mobility and, in turn, improve transit job access. The results corroborate similar accessibility models that focus on using faster station access/egress modes such as bicycles and rideshare that reduce transit service wait time (Boarnet et al., 2017). Before COVID-19, the Los Angeles Metro Transportation Agency, the major public transit supplier in the region, aimed to reduced bus headways during peak hours. Unfortunately, the transit agency had no choice but to reduce its service frequency. Our results show that the second-best option for improving transit job access is a 10-minute headway or less on all lines within the SELA region. The responses from the survey and focus group interviews also correspond to the above two findings.

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Key Words: Job accessibility, Southeast Los Angeles, Transit ridership, first/last mile, SELA

#### WHAT TYPE OF INFRASTRUCTURES DO E-SCOOTER RIDERS PREFER? A ROUTE CHOICE MODEL

Abstract ID: 883

Individual Paper Submission

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E-scooter is an innovative transportation mode that meets the travel demand of many travelers by providing flexible, affordable, and accessible mobility services. E-scooters have proven popular with the public, with usage increasing at a much faster rate than other forms of shared mobility (i.e. cars, bicycles) (Clewlow, 2019). In 2018, there were 85,000 e-scooters available for public use in 100 U.S. cities, resulting in 38.5 million trips (NACTO, 2018). Local policymakers, however, face the challenge of providing safe and convenient environments to accommodate this emerging travel mode. This study contributes to the research gap by developing an e-scooter route choice model using revealed preference data collected using Global Position System (GPS) units installed on e-scooters on Virginia Tech Blacksburg Campus.

This study uses 2000 randomly sampled GPS observations of e-scooter trips on Virginia Tech's Blacksburg Campus. The used dataset represents a sample of trips from riders who gave consent to participate. E-scooter trajectory data were collected using the default GPS units on the e-scooters, which record locations every 5 seconds. To protect users' privacy, the GPS trajectory points located in the first and last 50 feet of the trajectory were removed prior to analysis. GPS trajectory point data were then map-matched to the open street map to generate routes before feeding data into the route choice model. We used Recursive Logit (RL) models to examine e-scooter riders' route preferences. The RL model overcomes the limitation of conventional route choice model by consistently estimating route preferences with a dynamic choice set. The link-level infrastructure attributes, including length, slope, presence of different types of transportation infrastructures, turning angles along the roads and at intersections, etc., are used for model estimation.

The results suggest e-scooter users are willing to travel 59% and 28% longer on segments with bikeways and multi-use paths. Local roads, such as tertiary roads or one-way roads (including roads with wide medians to separate right of the ways) are also found to be attractive, as the perceived travel distance is reduced by 15% and 21% correspondingly. Bikeways display the largest positive estimated coefficients and are the most preferred infrastructures. Stairs on walkways are considered as unattractive, and e-scooter users are willing to travel 55% longer to avoid them. The coefficients of other infrastructures, such as pedestrian ways, primary and service roads, bridges, and tunnels are found to be statistically insignificant, indicating e-scooter users are not sensitive to these amenities on Virginia Tech's campus. This may be attributed to the fact that there is a limited amount of these transportation infrastructures on campus and e-scooter users are not allowed to travel in the Town of Blacksburg. Similar to cyclists, e-scooter users also tend to take shorter and simpler routes, and to avoid left turns and U-turns. However, different from the findings of bicycle route choice models, the upward slope of the segment is not negatively perceived, likely because e-scooters are powered by an electric motor.

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Key Words: E-scooter, Route Choice, Recursive Logit, Revealed Preference, GPS data

#### CAR MODIFICATION FOR PEOPLE WITH DISABILITIES: A CAPABILITY APPROACH

Abstract ID: 884

Individual Paper Submission

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Sixty-one million Americans have disabilities, and many face transportation barriers to social and economic participation (Henly and Brucker, 2019). Understanding the transportation barriers people with disabilities face and how they navigate those barriers is necessary to help expand access to opportunities. To date, research on transportation barriers among people with disabilities has focused primarily on their experiences using paratransit services and public transit. While these efforts represent helpful steps, they neglect a key avenue through which people with disabilities can get to places: private modified vehicles (Darcy and Burke, 2018).

Private modified vehicles are adaptive cars or vans for the use of a person with physical disabilities. Owning a modified vehicle improves the well-being of many people with disabilities (Darcy and Burke, 2018). Previous work has shown that people with disabilities who own a modified vehicle have higher chances of receiving job call-backs (Tsai, et al., 2014) and higher salary (Berkowitz, et al., 1998).

Yet, this access comes at a high cost; the average cost of car modification is \$6,500 and can be as expensive as \$65,000 (Berkowitz, et al., 1998). As a result, many people with disabilities have difficulty accessing a modified vehicle (Darcy and Burke, 2018).

Most of the existing studies on automobility among people with disabilities have looked at the association between car ownership and social or economic outcomes. This quantitative approach tells us little about how financial barriers to getting a modified car were negotiated and how having a modified car changes travel behavior. This research gap calls for a qualitative research for two reasons: first, qualitative methods can situate the lived experience of people with disabilities in looking for a modified car in a rich context that takes into account social welfare policy, barriers to other transportation options, and transportation needs. Second, qualitative methods can enrich our understanding of how having a modified car enables people with disabilities to access opportunities.

My research examines how having a modified car affects access to opportunities among people with disabilities and situates the access to these cars within their economic resources, personal characteristics, and environmental factors. I interviewed 30 working-age people with Spinal Cord Injuries who own or wish to own a modified car. I asked them about their experience purchasing or looking for a modified car and their experiences of traveling to job opportunities and healthcare services.

I used the capability approach to understand how car ownership affects the traveling and activity of people with disabilities. Sen Yamagata explains that a person's functioning, or activity, is achieved through three factors: the person's economic resources, environmental factors, and personal characteristics. Adopting this approach, Mitra (2007) defines disability as a deprivation of functioning, which arises from the interactions between those three factors. I conceptualize a modified car as an economic resource and examine how the modified car interacts with the disabled person's environment (i.e. access to paratransit services) and personal characteristics (i.e. severity of disability). Then, I studied how these interactions affect their functioning to travel and access opportunities.

My findings enrich our understanding of how car ownership is both challenging and beneficial for people with disabilities, a contradiction most previous studies have not addressed. My work also informs policymakers and planners how solving transportation challenges for people with disabilities needs to include resources to support car modification. Finally, it reveals how car modifications can improve access to medical appointments and job opportunities.

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Key Words: disability, car ownership, access to health care, access to opportunities, capability approach

## THE INDEPENDENT AND COMBINED INFLUENCE OF METROPOLITAN ACCESSIBILITY AND LOCAL PEDESTRIAN ENVIRONMENT ON STATION BOARDINGS

Abstract ID: 901

Individual Paper Submission

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Numerous studies have documented key determinants of transit ridership along a variety of explanatory vectors. These include land-use and urban design (e.g. 3Ds; walkability; special generators); socio-economic characteristics of residents; transit service quality; and network topology. More recent studies highlight the importance of bus feeder connectivity; residential bias; regional economic conditions; local policy support; competition from other travel modes (e.g. automobile); among other contextual factors. Still, very few studies have explored the potential influence of metropolitan accessibility (e.g. gravity-based cumulative opportunities measures). Furthermore, to this author's knowledge no study has explored its potential interaction with local-level walkability factors or with other ridership determinants. This study explores this possibility, as well as other potential interactions between covariates. Multi-level generalized linear models were implemented where key predictors are regressed onto station-level average weekday boardings ( $n=102$  stations). Station-level boarding data is drawn from Los Angeles bus and rail on-board survey (2011). Other sources of data for predictors are station WalkScore® ranks and their sub-components; US-Census ACS and LEHD databases for population and employment levels; and LA multi-agency GTFS files (LA Metro + SCAG; Southern California Association of Governments) for service levels calculations and for development of the gravity-based metropolitan accessibility index. The time impedance matrix for the metropolitan accessibility matrix was calculated with transit network tools in ArcGIS Pro (v.2.X) using year 2011 GTFS files (morning peak schedules). Results indicate that independently metropolitan accessibility is significant at a 90% confidence level with a small relative effect; and walkability around stations, operationalized as a multi-dimensional WalkScore rank, is not significant. However, their interaction results in a significant but small effect at a 90% confidence level. Because of a relative high collinearity with the number of jobs, WalkScore® ranks were replaced with sub-component measures related to design attributes of the built environment around stations (e.g. intersection density, median block size), and these yielded significant independent results in a new model. The variable intersection density also yielded a positive and significant interaction effect with the metropolitan accessibility index, but also yields a relatively small effect when compared to other predictors. Other predictors and control variables registered significant results with the expected sign. The final model reports a good fit (Cox-Snell/ML pseudo- $R^2 = 0.87$ ; mean VIF=2.76). Variables representing station topological functions transfer hub and terminal report the largest multiplicative factors. The number of jobs (log-transformed) and population (squared) parameters report the largest IRR (incidence rate ratios) parameters. Taken together, results suggest that LA's rapid-transit patrons, which include users of heavy-rail, light-rail, and bus rapid-transit value the greater spatial accessibility to dispersed destinations afforded by the multimodal network, and this reflects on transfer hubs high significance and effect, and with higher number of bus feeder connectors per station. Although statistically significant, it appears that users don't necessarily value metropolitan-wide accessibility when compared to other predictors. This could be a result of the way it was operationalized in this study. Yet, this author speculates that LA's metropolitan employment landscape, argued by some urban geographers to be better described as dispersed rather than polycentric, could partly explain the unexpected weak influence of the metropolitan accessibility measure, in

contrast to the high significance and greater magnitude of effect noted in other studies based on center-focused cities.

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Key Words: accessibility, ridership, station, walkability, forecasting

## **BUILDING A FRAMEWORK AND GEOSPATIAL MODEL FOR THE INTEGRATION OF VERTIPOINTS INTO LAND-USE PLANNING**

Abstract ID: 903

Individual Paper Submission

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Recent advancements in technology and regulation are integrating Unmanned Aerial Vehicle (UAV) transportation into existing communities. UAV integration represents a form of disruptive transportation (Adam Cohen, 2020) with the potential to positively and negatively affect communities of all sizes. UAV can complete various tasks, such as food and medicine delivery, package delivery, and eventually human transport. To best support the integration of UAVs into our communities for such tasks, it will be necessary to implement a system of hubs referred to as vertiports. Vertiports are used to facilitate interaction with ground-based transportation systems. Exactly how, where, and what vertiports will be in the future is still widely unknown; as planners, it will be essential to understand how these systems will be distributed throughout communities, as well as the potential implications (Vascik & Hansman, 2017). This study is supported by the Utah Department of Transportation and is centered on understanding where vertiports can be integrated within the region's transportation system by focusing on residential delivery services.

Our study is being conducted within the Wasatch Front region in Utah (a greater Salt Lake City area). The Wasatch Front contains approximately 80% of Utah's population, predominantly suburban with several city centers and peri-urban regions. This region is bordered by the Great Salt Lake and the Wasatch Mountains, with a population predominately situated along I-15 and eastward into the foothills. The region is one of the fastest-growing in the country and is host to the Salt Lake City international airport, military and air force bases, wildlife refuges, and vast public lands.

To conduct our analyses, we have developed two different frameworks—conceptual and procedural—based on the literature and stakeholder inputs. The conceptual framework provides the foundation for establishing the various elements of importance, while the process framework facilitates the spatially explicit analysis of vertiport siting. Determining these locations is accomplished through a weighted discrete combination-based suitability analysis that allows for the analysis of community elements through five community dimensions and eighteen categories. Guidance for developing the conceptual framework is provided by a Technical Advisory Committee that consists of individuals from government, non-government, and university entities. The process framework

follows conventional suitability and sensitivity analyses (Steinitz, 2012) but has been adapted specifically for UAV in residential communities.

This paper focuses on the selection and integration of the various spatial criteria that make up the conceptual framework. We have identified five dimensions important for the consideration of vertiport planning (in italics). The built environment consists of existing physical elements constructed for societal use and includes land usage, transportation networks, essential facilities, and population density as proxies for broad indications of infrastructural development. The natural environment recognizes environmental hazards that may pose a risk to UAV vice versa. These include recreational areas, large water bodies, vegetation, environmental hazards, topography, and vulnerable areas. Regulatory restrictions address the range of regulatory or legal bodies with potential control or limitations over UAV in the project area, including air, land, and water-based regulations. Technological aspects of the model encompass significant limitations of UAVs due to their limited flight distance and electrical demand. Finally, value-based factors include spatially explicit elements of equity, walkability, audible and visual nuisance potential, and spatial distribution of vertiports.

This study represents the first known spatially-explicit model for vertiport planning within residential communities. We demonstrate the integration of the five dimensions through an ESRI ModelBuilder suitability analysis. Spatial rules predominately focus on various instantiations of buffering and network analyses, and the resulting maps highlight suitable locations for vertiports. We also discuss the planning implications of vertiports on land-use, transportation, and society (e.g., equity and nuisance).

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Key Words: UAV, Unmanned Aerial Vehicle, Vertiport, Land Use Planning, Suitability

#### **ARE PUBLIC LIBRARIES LOCATED FAIRLY IN CITIES?: CASE STUDY OF BUSAN, SOUTH KOREA**

Abstract ID: 904

Individual Paper Submission

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[Problems] The purpose of this paper is to examine the accessibility of libraries that provide various functions to the community among public service facilities. Currently, public services are being converted to non-face-to-face services. As individual activities are restricted, concerns about the decline in community capacity have been raised. Concerned about the deterioration of the community due to this situation, many regions are looking for ways to ensure the sustainability of their communities. After the end of COVID19, the non-face-to-face service will continue, but the desire for community communication and face-to-face activities is expected to come true. Therefore, this study aims to analyze the accessibility of public libraries that can be considered as a base for community centers. In addition to book rentals, the library offers movie screenings and a variety of educational programs and is sometimes used as a meeting place for people. It is not just an open space, it has become a hub for a community that provides a complex culture by providing educational and cultural programs to local residents(Park et. al. 2018). However, depending on the current situation, the library's book rental service is being converted to contactless services such

as e-books and unmanned loans. Serious areas have been temporarily closed or face-to-face programs have been temporarily suspended. Meanwhile, the libraries are operating services that the community needs, such as providing childcare services to families in need. These services are provided to local residents, and residents living near the library benefit. Local governments provide a variety of public services to citizens, but public facilities have the characteristics of public goods whose benefits decrease as the distance increases (Tiebout, 1956). In addition, since cities are complex and large in size, it is difficult to consider all groups in the city, creating spaces and groups that are inconvenient to use services. In urban planning, researchers have conducted on the equity of space. In addition, at the UN Habitat III conference, the "City for All" vision of [New Urban Agenda] was shared. The issue of segregation and exclusion of space has been raised, and the equity of urban facilities has become important. Therefore, equity studies of public services and major urban services are continually being conducted. [Research Methodology] The study area of this paper covers Busan Metropolitan City in South Korea. GIS network analysis was used. After deriving the service area through network analysis, We derived the public meaning of service accessibility by overlapping the data of the socially vulnerable class with the service area. [Findings] We conducted GIS network analysis and overlay analysis on Busan Metropolitan City. As a result, an old downtown that includes 'Seo-Gu,' 'Jung-Gu,' 'Dong-Gu' in Busan Metropolitan City has few public libraries. Some little libraries in there have been deteriorated, and it is almost impossible to find programs for people. The people living in old downtown have a lower income than the other places on average. Also, there are more older people living in the old downtown than the others. As a result, there is an imbalance in the supply of public services from public libraries for citizens. [Policy Implications] The role of the government is growing in emergencies situation. Citizens are also expecting an Quick response. Non-face-to-face services for government-provided public services have increased due to emergencies, but there are still services that can only handle face-to-face. To rebuild the community solidarity after the end of COVID-19, local governments will implement policies around community centers. In this situation, it is necessary to analyze groups and regions that are marginalized and prepare alternatives in order to develop regional policies into cities for all.

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Key Words: public service, accessibility, public libraries

## EXAMINING MICROMOBILITY USER EXPERIENCE USING TEXT MINING TECHNIQUES: AN INVESTIGATION ACROSS GENDER

Abstract ID: 915

Individual Paper Submission

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Developments in battery technologies and supporting equipment have enabled a variety of shared and electronic micromobility services to flourish and expand (Shaheen and Cohen, 2019). The surge in public desire to use scooters as a mobility tool has surprised both the public and private sectors (Populus, 2018). In response, some private bike-share companies have even switched their fleets from bikes to scooters (Nacto, 2019). Given that recently launched e-scooter sharing programs have generated 35.5 million trips in the U.S. in one year (Nacto, 2019) and are identified as first-mile/last-mile solutions for daily trips (Arendsen, 2019), it is critical that mobility companies, transportation

planners, and decision-makers gain more insight into the factors that inspire or influence e-scooter user satisfaction and experience (Bai and Jiao 2020) . Limited research, to date, has utilized app store reviews to investigate the opinions of e-scooter users. Factors that influence rider satisfaction are still misunderstood as there has been limited use of traditional techniques (e.g., surveys) to examine e-scooter rider satisfaction or sentiment. Moreover, very few studies have investigated the impact of gender as an attribute relevant to riding experience and satisfaction. Assessing factors that contribute to user or rider satisfaction, therefore, offers the ability to evaluate current and future barriers to e-scooter access, rider needs, and willingness to ride.

In this study, app store reviews from two important micromobility companies are examined using text mining techniques to identify the factors that affect rider satisfaction. Using topic modeling, over 12,000 rider-generated reviews on app stores were analyzed to identify factors related to rider satisfaction. These factors cover various topics such as safety (speed and riding lane), ease of use, pricing, and app interface, to name a few. Moreover, name-centric gender classification is applied to detect rider gender. Then, differences in general review content and level of satisfaction across gender were identified. Our analysis suggest that female riders show more positive emotion and are more satisfied than men, it is widely recognized that micromobility is not a gender-neutral mode of transportation, and men are considered as the main user group. Another finding of this paper is that women's satisfaction (unlike men) is not associated with technical features of the apps or vehicles, including lock, map, app issues, or safety-related factors. Research findings contribute to the existing literature by demonstrating the use of app store reviews in a transportation mobility study to investigate shared electric scooter user opinions.

The development of a method to assess factors contributing to the user or rider satisfaction offers the ability to evaluate current and future e-scooter rider needs and barriers to access and participation. Thus, providing companies, planners, and policymakers the opportunity to employ consistent, effective, and integrated strategies for improving the e-scooter experience and meeting rider expectations.

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Key Words: Micromobility, E-scooters, Shared mobility, Text mining, User satisfaction

#### DOES RIDESOURCING PROVIDE EQUITABLE ACCESSIBILITY?

Abstract ID: 917

Individual Paper Submission

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Accessibility is an indicator of the ease with which people can access opportunities for specific activities by specific modes of transportation. Scholars have quantified accessibility for a variety of transportation modes (e.g., car driving, public transit, walking, bicycling, etc.) and demonstrated that there are inequities in access to many opportunities. It has been claimed that the emerging app-based ridesourcing services such as Uber and Lyft could improve transportation accessibility, especially for areas with poor transit access or low car ownership. However,

little is known about whether ridesourcing provides accessibility equally across space and population groups. It is also unclear what factors are associated with ridesourcing accessibility.

In this study, we conduct a comprehensive evaluation of the accessibility offered by ridesourcing services. We measure ridesourcing accessibility by applying gravity-based metrics that include the attractiveness and travel impedance factors. We use transportation network providers' data for Chicago to calculate the average travel times between origins and destinations for ridesourcing trips. Travel impedance factors are computed based on the real travel times. Both the employment volume by sector and points of interest locations are used to measure the opportunity attractiveness. We estimate accessibility for three types of non-work destinations: healthcare facilities, restaurants, and grocery stores, and compare the accessibility between ridesourcing, transit, and taxis. Given the presence of spatial autocorrelation in our data, we estimate both ordinary least squares regression models and spatial autoregressive models to examine the associations between ridesourcing accessibility and census tract-level demographic and socioeconomic indicators. We find that ridesourcing has a less equitable distribution compared to transit and taxis, based on the median household income of census tracts and minority populations. Ridesourcing accessibility is also negatively associated with the percentages of three age groups (0 – 5, 6 – 17, and 65 plus) but positively associated with the percentage of zero-vehicle households.

The implications of our analyses not only aim to address the inequality of transportation but also shed light on the allocation of social and economic resources for disadvantaged populations in response to the emergence of new transportation technologies and mobilities. First, new mobilities like ridesourcing may not promote the equity of accessibility as people expect. People in low-income or minority communities still need private automobiles to access essential opportunities in their daily life due to the limited ridesourcing accessibility. Increasing service supplies in these areas could help, but it would not fundamentally resolve the problem given the relatively fixed travel durations to potential opportunities, not to mention the much higher prices compared to public transit. Transit services are still critical for disadvantaged populations' accessibility given their relatively equal provision and affordable prices. Therefore, the investment for transit should not be distracted by the development of emerging urban mobilities. Increasing available opportunities is the key to the promotion of accessibility for economically and socially disadvantaged populations.

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Key Words: Ridesourcing, accessibility, equity, spatial model

#### **MACHINE LEARNING AUTOMATED VEHICLE (AV)-RELATED MODE CHOICE AND NONLINEAR AND THRESHOLD EFFECTS OF KEY FACTORS**

Abstract ID: 918

Individual Paper Submission

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The majority of simulation efforts on the impacts of Automated Vehicles (AVs) assume homogeneous mode choice (Narayanan et al., 2020) despite the heterogeneity of AV mode choice suggested by a wealth of literature (Zhang et al., 2020). This is because discrete choice models adopted by most studies have low prediction accuracy, which may introduce biases if directly integrated into simulation efforts. Additionally, existing AV mode choice studies assumed linear relationships between independent variables (e.g., socioeconomic) and the dependent variable (i.e., mode choices) which is barely true in reality (Hillel et al., 2021). Moreover, limited is known about the generalizability of AV mode choice models across areas. Therefore, the objective of this study is to propose an interpretable machine learning framework to predict AV mode choice, which provides high prediction accuracy, insights on the nonlinear effects of key factors, and estimation of generalization error across areas.

This research is conducted using an AV mode choice experiment survey collected in Seattle metropolitan area. The survey collects respondents' socioeconomic and demographic, travel habit, attitudes towards environment and AVs. Each respondent takes six mode choice experiments for a revealed trip taken in a typical week given scenarios about travel time, walk distance and cost. The choice set includes current mode (i.e., private vehicle, transit, taxi, walk and bike), PAV, SAV and SAV pool. We only model the AV mode shift behaviors of vehicle and transit users, since the sample sizes of taxi and active modes are small (i.e., less than 30 responses). There are 3,186 and 312 experiments taken by vehicle users and transit riders separately. SAV and SAV pool choices are combined together due to their small share in choice experiment results. Specifically, the share of current mode, PAV, SAV and SAV pool choices from choice experiments are 73.82%, 21.31%, 3.45% and 1.41% for vehicle trips and 46.47%, 32.69%, 11.54%, and 9.29% for transit trips.

The research method is three-fold. First, we group the respondents by their current mode usage and train machine learning models on each set of responses. The trained model predicts future mode shifts, given the current mode choices. We balanced the distribution of dependent variables for model training to avoid possible model biases towards favored mode choice. The models examined include Decision Tree Classifier, Support Vector Classifier, K-Neighbors Classifier, Random Forest Classifier, and Gradient Boosting. We use five-fold cross validation to select the best model with the highest average prediction accuracy since we have already balanced the training samples.

Second, we identify the nonlinear and threshold effects of key factors from the best model using an interpretable machine learning tool, i.e., Individual Conditional Expectation (ICE) plots. ICE plots visualize the probability of selecting each mode across the values of an independent variable for each observation. Based on the findings, we provide suggestions to promote adoption of sustainable travel modes (i.e., SAV and SAV pool). Finally, we use the spatial cross validation method (i.e., iteratively train models on selected zip codes to predict the mode shifts for respondents in zip codes that the model has not seen before) to determine the generalizability of the trained machine learning model.

This study may inform the policymakers about the key factors influencing mode shifts in the era of AVs. Specifically, the results provide insights on the nonlinear and threshold effects of the explanatory variables so that policymakers can be informed to devise more efficient policies and interventions to promote the adoption of sustainable AV modes. Additionally, the trained models can be generalized to other areas with an estimation of prediction accuracy and be integrated into simulation studies to conduct more robust impact analysis.

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Key Words: Automated Vehicles, Mode choice, Machine learning, Nonlinear effect, Threshold effect

## SEGREGATION IN SHARED MICRO-MOBILITY AND IMPACT OF PLANNING IN U.S. CITIES

Abstract ID: 919

Individual Paper Submission

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The growth of shared micro-mobility (bikeshare and scooter share) in the U.S. has been tremendous in the past few years. In 2019 alone, the US increased 60% of more trips than in 2018 on shared bikes, e-bikes, and scooters (NACTO, 2019). Shared micro-mobility has been envisioned as the alternative to automobile-oriented transport to make cities more livable and adapt to climate change. However, as shared micro-mobility systems have gained popularity in the U.S., data has repeatedly shown that users skew higher income and are predominately white, not reflecting the demographics of their cities' populations as a whole.

Many barriers have been identified that exclude or limit participation and access by low-income people and people of color (Ursaki and Aultman-Hall, 2015, Howland et al., 2017, Caspi and Noland, 2019). Cities and shared mobility operators have been working to address these challenges, though measuring the success of equity interventions has limitations and has lacked standardization. Few have quantified changes in the shared micro-mobility use and access by ethnicity groups over multiple cities and years. As ethnoracial residential segregation persists in communities across the U.S. (Chodrow, 2017), we argue that it is important for cities to measure changes in access between areas of different profiles with respect to race and income.

To address these gaps in the literature, we focused on bikeshare programs in four US cities (metro Boston, Chicago, New York City, and Philadelphia) over five years (2015 to 2019). Low-income communities of color often bear the brunt of the burden with respect to traffic emissions, which are also the biggest contributors to climate change in many cities. Understanding the mobility barriers in these communities to access bikeshare is critical to creating a lower carbon transportation future and freedom of mobility in impacted communities.

We define restricted or limited travel between areas of different race and income profiles as mobility segregation. We quantify a new measure of bikeshare equity and systemwide equity improvement attempts to date. Using publicly available bikeshare trip data from four U.S. cities in five years and sociodemographic data from American Community Survey (ACS), we design a data mining framework to measure the degree of mobility segregation by race and income and its changes over time. Location quotients by race (for white non-Hispanic and Black) and income at bikeshare station locations are calculated, and flow between trip origin and destination is analyzed to determine the degree of mobility segregation.

We find that bikeshare trips in Chicago and New York City demonstrate the highest degree of segregation by both race and income and those in Philadelphia and Boston are more equitably distributed. The built environment and equity considerations during system startup and design both play a role in mobility segregation. Equity infusions that are not sustained or intentional will not have the intended impact. Philadelphia, which is heralded for incorporating

equity into the system planning from the start, showed an increase in segregation over time, as investment in the system did not continue with a strong focus on under resourced communities. Finally, we provide policy recommendations and call for planning actions for cities to mitigate and disrupt mobility segregation, to design and expand the shared micro-mobility systems in more equitable ways to adapt to climate change, and to create uniform data collection and sharing principles across cities to make the planning and assessment processes more open and accessible for the public.

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Key Words: Bikeshare, Equity, Segregation, Shared Micro-mobility, Spatial Data Analytics

### **NOT ENOUGH PARKING, YOU SAY? A STUDY OF GARAGE USE AND PARKING SUPPLY FOR SINGLE-FAMILY HOMES IN SACRAMENTO AND IMPLICATIONS FOR ADUS**

Abstract ID: 924

Individual Paper Submission

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Minimum residential parking standards are problematic. Parking is expensive to build and maintain, it can be environmentally destructive, and it has untold opportunity costs for the land it paves. Yet despite minimal evidence of parking demand, local jurisdictions across the United States frequently require both on-street and off-street residential parking, particularly in single-family neighborhoods. This can create parking surpluses that exacerbate parking's high costs and negative impacts. Yet few attempts have been made to estimate the sufficiency of the parking supplies in single-family neighborhoods, let alone explore how nominal off-street parking spaces are actually used. We use a survey of homeowners in Sacramento, California to help fill those gaps. We also use our findings to examine one of the most commonly cited reasons for opposing construction of accessory dwelling units in single-family neighborhoods – that the new residents would overwhelm scarce on-street parking. We find that 63% of single-family detached homeowners in Sacramento use their garage at least partially for car parking. However, only 18% use their garage solely to park cars, while 27% use their garage exclusively for storage. Regarding parking sufficiency, we find that more than 75% of households have enough off-street parking to park all their vehicles. When we combine off-street and on-street parking supplies, we find that households have an average of 1.59 more parking spaces available to them than they have vehicles. That surplus is more than enough to accommodate the average ADU tenant and their vehicle. Our findings thus tend to belie claims that ADUs will overwhelm existing parking supplies in single-family neighborhoods.

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Key Words: Parking, Garages, Accessory dwelling units, Single-family homes

## DIVERSITY, DEMOGRAPHIC CHANGE, AND VOTER SUPPORT FOR REGIONAL TRANSIT

Abstract ID: 928

Individual Paper Submission

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Despite the frequent linkages between efficient, comprehensive public transportation and economic development, transit referenda in highly segregated metropolitan areas have often faced fierce opposition by various regional interest groups. These proposed network expansions often reveal acute political and social tensions, particularly between low-income urban residents seeking transit connections with suburban employment centers and suburbanites who fear both transit development's tax burden and its impacts on the character and social fabric of their towns. There are, however, instances when the interests of more affluent suburbs and central city residents converge. Despite decades-long resistance to the expansion of Atlanta's MARTA system, many metro counties are now creating plans to integrate and expand transit capacity, as evidenced by the very narrow defeats of referenda in 2019 and 2020 for wealthy Gwinnett County, both of which garnered broad bipartisan support. In contrast, Metro Detroit has attempted numerous times to expand regional transit through ballot initiatives and legislative action, most of which have failed as recently as 2016. Despite historically sharing a common racial-spatial regional configuration, Detroit's demographics have remained largely stable while Atlanta's metro populations have experienced massive shifts with increased diversity. Both regions, however, continue to be subject to strong anti-transit sentiment that has prevented the development of comprehensive regional transit. Differing from these two regions, the Seattle metro area, which has a smaller but arguably better integrated minority population, has had much greater success at passing transit ballot initiatives. Is this region's progress with referenda due to its greater racial integration, and do the same political or demographic factors that discourage transit support in more segregated regions have any resonance in a more diverse metropolitan region? Using both the Racial Threat Hypothesis and the closely related Politicized Places Hypothesis as conceptual lenses, this paper discusses the roles of demographic composition in reflecting, and potentially influencing, changing levels of regional transit referendum support. Through comparative census, geospatial, and electoral data analyses of the case study metropolitan regions, this study seeks to establish spatial and demographic patterns that may nurture voter hostility to regional transit. Preliminary results indicate that transit opposition at the voting district level has a particularly strong relationship to racial composition and its proxies (poverty status, partisanship) in more segregated counties. Conversely, districts in diverse counties exhibit little connection between race and transit support, with AMI and proximity benefits from transit development being better predictors. This research has meaningful implications for understanding how demographic transition can influence anticipated support for transit expansion, and may provide guidance for where and to whom transit advocacy resources can most effectively be focused.

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Key Words: demographics, transit, race, spatial, segregation

## WHAT MAKES A CITY ‘SMART’? A REVIEW AND ANALYSIS OF USDOT’S SMART CITY CHALLENGE

Abstract ID: 935

Individual Paper Submission

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The concept of a “smart city” has gained currency in the planning field as a recognition of the potentially transformative role advanced information technology will play in urban transportation as the 21<sup>st</sup> century progresses. What makes a city “smart”, however, and who is the smart city for are crucial questions for the planning literature to systematically address. Despite the concept’s recent popularity, “Smart City” is a poorly defined term and remains an undertheorized dimension of urban scholarship. Little existing theoretical work on the Smart City concept focuses on the United States, with its particular mix of build forms, public policies and social conditions—all of which shape how transportation systems help constitute the city. The smart city idea has gained in prominence as federal urban policy has retrenched from direct service provision in favor of policies to more effectively or intelligently utilize existing resources. As such, the smart city concept operates from the implicit assumption that sufficient material resources already exist in cities to solve urban problems such as sustainability or traffic congestion if only those resources were allocated in a sufficiently efficient manner. In addition, by focusing heavily on information technology, the smart city concept approaches incomplete, disconnected and/or delayed information as primary barriers to effective planning (Luque-Ayala & Marvin, 2015; Viitanen & Kingston, 2014).

To address these knowledge gaps, this research synthesizes a working concept of the “Smart City” from the U.S. Department of Transportation’s (USDOT) Smart City Challenge, launched in 2015 as a competitive grant program with the intent to provide a spark for incentivizing the development of smart infrastructure in mid-sized US cities (Kelley et al., 2020). We compare the action plans of the seven finalist cities selected to create plans to implement their visions, including Columbus, Ohio, the eventual winner. We employ interpretivist content analysis of the applications and award decision, as well as of early implementation in Columbus, to explore shared meanings of recurring themes and key concepts, building a grounded theory of the Smart City in the U.S. context (Allen & Davey, 2018). The comparative analysis of implementation strategies revealed insights into challenges associated with deploying the vision elements framed by USDOT at the city level. While an overhaul of city operations toward smart management benefits integrating information and communications technology silos across sectors and communities, it may be more effective to implement sector-specific strategies incrementally and integrate functionality with current systems where capacity to do so exists. The findings of the comparative analysis reveal further insights into prevailing challenges in smart city deployment, particularly for the areas lacking inherent technology platforms.

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Key Words: smart city, technology, infrastructure, USDOT

## **SOCIAL AND ENVIRONMENTAL JUSTICE IN URBAN BLUE SPACE: PORT ELECTRIFICATION SCENARIO IN NEW JERSEY**

Abstract ID: 939

Individual Paper Submission

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Over the past three decades, waterfront redevelopment has been discussed as one of the key research topics in planning literature, mainly around benefits for industry, manufacturing and transportation for economic growth (Avni and Teschner 2019). Simultaneously however, these redevelopment issues also created debates on inequity, exclusion and privatization of space (Avni and Fischler 2020). These angles can be studied from ports and their emission impacts on the ambient air quality, especially on how the social and environmental justice is affected on the nearby port terminal residents (Houston, Krudysz, and Winer 2008). Due to ever-growing global supply chain networks, the importance of cleaner industrial operations became more critical for lower environment impacts on the local community. Accordingly, port electrification has actively been discussed to effectively reduce the long-term carbon emissions from port industrial activities (Gillingham and Huang 2020).

This paper aims to visualize the impacts by conducting port electrification scenario planning on Urban Footprint, to investigate the electrification impacts on the long-term carbon emissions of port and social vulnerability level in the Union county and Essex County, New Jersey. The research questions are centered around: If the port is electrified, how the trajectory of long-term emissions will be spatially illustrated? What are the socio-economic implications on the local communities living around the port terminals? What will the spatial distribution of long-term port emission explain about environmental justice?

The research is designed by three different scenarios – 1) baseline model of emission level in the status quo, 2) scenario A of partial electrification on the truck level, and finally 3) the scenario B of the entire port electrification at full degree. In terms of the datasets, the emission level of annual concentration of carbon dioxide is collected from the 2019 port emission inventory reports at the Port of New York and New Jersey. The Social Vulnerability Index data are from the Centers for Disease Control and Prevention’s Social Vulnerability Index based on the U.S. Census data to determine the social vulnerability of every census tract.

The study implications lie on the environmental justice accountability of industrial activities on the immediate residents to live in a cleaner environment for a higher quality of life. Especially, residents nearby port-terminal areas are more likely to be whose income levels are below average compared to the other neighborhoods with cleaner environment distant from the port terminals. Ports, as public infrastructure, are accountable for upholding principles of environmental justice and to protect marginalized and vulnerable groups of people for their fundamental right to live in a clean and healthy environment. The local air pollution is likely to be highest in the Union county and Essex county where three biggest container terminals are located. While emission contributions vary by pollutants and locations within the states, the study would like to provide a guiding evidence by providing

scenario planning.

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Key Words: blue space, waterfront redevelopment, port electrification, environmental justice

#### ACCESS FOR ACCESS: IMPROVING PUBLIC TRANSIT ACCESSIBILITY FOR PEOPLE WITH LIMITED MOBILITY

Abstract ID: 971

Individual Paper Submission

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Public transportation plays a critical role in ensuring access to basic needs for all people regardless of income, race, social status, age, or ability by providing a range of travel choices to the destinations. For people with limited mobility, including older adults and people with disabilities, physical accessibility to public transportation is a prerequisite for them to access transit. Transit agencies have invested in making the fixed-route transit service possible for many people with limited mobility by improving their fixed-route bus and rail services wheelchair accessible with lift-equipped or low floor buses and trains and driver training to assist passengers with disabilities. According to the 2020 Public Transportation Fact Book presented by APTA(American Public Transit Association), there have been huge improvements on accessible public transit vehicles during recent decades. Although it didn't forget to note that transit system accessibility is also affected by station accessibility, it still lacks the consideration of comprehensive transit accessibility—way to get to the station. Despite the increased attention on getting to and from transit stops/stations—frequently referred to as "first mile/last mile," — transit accessibility for populations with limited mobility has received much less attention.

This study will explore the needs and current transit planning practices that account for built environment conditions to public transportation for people with limited mobility to identify the barriers and opportunities in transportation planning. In the first phase, the authors will explore how physical accessibility to transit is considered in transit planning and try to find gaps between the needs of users and the efforts of transit providers through focus groups and interviews with ADA paratransit users, staffs in transit agencies, and disability advocates, along with the content analysis of the meeting minutes and recordings of a citizen advisory group for accessible transportation. Notably, it is addressed that beyond transit stops, institutional barriers lie behind physical and environmental barriers. Oftentimes, it is not the sole agency that can solve the issues. Given that the study started from a single mid-size metropolitan area, Salt Lake City region, Utah, we will seek the efforts and strategies to improve comprehensive public transit accessibility by reviewing the practices, processes, and plans of other US transit agencies and MPOs. Our finding would benefit both practitioners and policymakers in incorporating comprehensive transit accessibility not exclusively for those with limited mobility but for all riders and communities in planning

process to achieve accessibility justice.

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Key Words: public transit, accessibility, disability, transportation equity

#### DO ICT DEVELOPMENT AND TECHNOLOGY USE DECREASE THE DEMAND FOR BUSINESS TRAVEL?

Abstract ID: 972

Individual Paper Submission

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In the early 2000s, researchers argued to what extent information and communication technology (ICT) would replace face-to-face communications, including distant-communication that involves business travels. Early studies say that technology cannot fully replace physical meetings (Urry, 2002; Wickam and Vecchi, 2008), while other studies find substitute effects on long-distance business travels (Arnfolk and Kogg, 2003; Denstadli, 2004).

This paper contributes to long-lasting debates about substitution vs. complementary effects of ICT on business travel demand from two different perspectives. One is the heterogeneity by occupations, and the other is heterogeneity by the timing of ICT developments. Regarding the first point, literature documents the communication needs and relationships with the communication counterparts are different by profession. Researchers also argue that affinity with the ICT varies by frequency, depth, and complexity of communications. Thus, we hypothesize that the effects of ICT familiarity on business travel behavior vary by occupation. Concerning the second point, we hypothesize that the ICT impacts on business travel behavior vary by the timing of ICT developments. Since the early 2000s, we have observed rapid advancements in the internet infrastructure, mobile tools, and virtual communication applications. These improvements would affect the degree of virtual substitution of face-to-face communication and alter the marginal impacts of ICT usage on business travels.

Our analysis reveals how technology usage associates with (1) the likelihood of making business travels, (2) business trip frequency per day, and (3) business travel distance per day. We employ Probit, Poisson and Tobit censored estimation techniques, respectively. As an indicator of familiarity with the ICT, we focus on the frequency of internet usage. All the data are obtained from the National Household Travel Survey data of 2001, 2009, and 2017. We define internet-savvy as frequent internet users (a few times per week or more) and non-internet-savvy as infrequent internet users (less than weekly). We closely examine the marginal effects of internet familiarity for a specific occupation and year.

Our analysis finds a significant and continuous decrease in business travels throughout the period. As the ICT advances and become universally accessible, business travels seem to be substituted by digital communications. Yet,



the impacts of internet usage on business travel vary among occupations. The complementary effects between technology usage and business travel are more substantial for sales and service workers than other professions. The substitution effect is more significant for professionals than sales and service workers.

Our findings provide implications on the business practices in the post-pandemic era. In 2020, COVID-19 added pressures for substituting face-to-face communications by ICT due to the disrupted personal interactions. As the post-crisis effect might take years to revive business activities, it is critical to understand the heterogeneous relationships between ICT developments and business communication. By examining the 20 years of previous experience, we would be able to predict the bottlenecks of digital transformation and advance further to the new virtual realm.

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Key Words: business travel, ICT, travel behavior

## PREDICTING FUTURE REDUCTION OF TRAFFIC CRASHES DUE TO ADOPTION OF FULLY AUTONOMOUS VEHICLES

Abstract ID: 984

Individual Paper Submission

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#### Background:

As part of transportation planning, the concerns for improvements in traffic safety have recently become critical. This is because it is estimated that traffic crashes killed over 42,000 people in 2020, an alarming 8% increase compared to 2019, despite the reduction of driving mileage by 13%. Inspired by the promise of a safer future, autonomous vehicle (AV) developers are making progress in trying to deliver fully AVs (Level-5 AVs), which have the potential to significantly reduce crashes by replacing human drivers and eliminate human driver errors. However, complete replacement of human drivers in every vehicle would require a long adoption process. During this adoption process, fully AVs would need to interact with human-driven vehicles and therefore the safety concern will remain.

Since very little is known about AVs' effectiveness in reducing traffic crashes when interacting with human-driven vehicles in various geographic areas, subsequently it is unknown how transportation planning would address AV implementation in terms of traffic safety. For instance, what kind of crash reduction rates and where could we expect them as a function of the number of the AVs deployed and the types of roadways in which they are deployed?

This research aims to predict the future crash reduction as a result of the deployment of fully AVs and to project the trend of crash reduction as AVs would gradually replace human-driven vehicles.

#### Method:

The approach of this research is to determine avoidable crashes due to the adoption of fully AVs by analyzing historic crashes and replacing traditional vehicles with fully AVs. We reconstruct crash scenes of about 3,000 historical crashes in Florida and examine whether each crash could be avoided under the situation when a) the crash initiating vehicle was a fully AV; b) the responding vehicles were fully AVs; c) or all the involved vehicles were fully AVs. We utilize machine learning to automate the process of identifying avoidable crashes. A prediction model was developed to randomly replace the human-driven vehicles with fully AVs in an entire year of historic crashes in Florida. We then measure the crash rate reduction as the percentage of AVs in the market increases gradually. The location of the vehicle ownership is also considered to adjust for the different rates of AV adoption in urban and rural areas.

#### Preliminary Results:

Preliminary results show the estimated crash reduction number and trend in Florida and its different counties when the share of fully AVs gradually increases. Interestingly the results show that not all crashes would be eliminated when the percentage of fully AVs would reach 100%. The results show disparities regarding the effectiveness of expected crash reduction in different geographic areas. The AV adoption speeds in urban and rural vehicles affect the number of crashes reduced.

#### Conclusion/Contribution:

This research makes the following contributions: 1) Provides insights in understanding the crash reduction of fully AVs during their adoption process; 2) Offers a methodological contribution by providing machine learning models that can identify avoidable crashes by fully AVs; 3) Provides a summary of rare crash events that are challenging for fully AVs to handle, which can be useful for AV developers to improve AV capabilities; 4) Can assist planners and other stakeholders in developing plans and incentives to influence fully AV deployment in order to reach their crash reduction goals.

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Key Words: Autonomous vehicles, traffic safety, traffic crash, machine learning

## TRANSIT-ORIENTED DEVELOPMENTS AND PHYSICAL HEALTH OUTCOMES

Abstract ID: 985

Individual Paper Submission

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The intricate linkage between the built environment, transportation infrastructures and public health represents an important area to realize the potential for improved public health outcomes such as higher levels of physical activity and lower levels of obesity. While evidence has shown how physical activity on a regular basis benefits physical health outcomes, further exploration is warranted on how active transportation—walking and biking to destinations—and transportation infrastructures can be leveraged to improve physical well-being. Land-use patterns have followed a historical trajectory of massive suburbanization, massive interstate highway development, and urban sprawl since the end of WWII. Subsequently, urban sprawl has led to increased levels of automobile dependency, sedentary lifestyles, and lower levels of walking and biking. Even though walking and biking are relatively easy, low-risk modes of active transportation that can potentially fulfill a quarter of all trips that are less

than a mile, these modes are severely underused due to the higher speeds of automobiles for most trips (Handy et al., 2002, p. 72). Two ways that can increase levels of active transportation is through promoting educational programs informs people on the merits of walking, and also through incorporating built environment elements that are pedestrian-oriented, including mixed-use developments and street connectivity (Handy et al., 2002, p.72).

Transit-oriented developments (TODs) presents a context in which to realize pedestrian-oriented designs encouraging active transportation, less reliance on automobiles, and the potential to unlock more active and healthier lifestyles. TODs were first coined by Peter Calthorpe (1993) who defined them as “a mixed-use community within an average of 2,000 foot (or 10-minute) walking distance of a transit stop and core commercial area” (p.9). TODs are walkable by design, and represent a synergistic combination of transit services, infrastructures supporting active transportation, and mixed-use development patterns. The operationalization of TODs was conducted through the “D” hypothesis by Cervero and Kockelman (1997), which posits that Density, Diversity and Design are the necessary antecedents or “D’s” for decreased vehicle miles traveled (VMT) and increased transit use. The three “D” hypothesis has been extended to the six “Ds” to include Distance to Transit, Destination Accessibility, and Demand Management (Ewing and Cervero, 2010), paving the way to quantitatively measure TOD. The now twenty-eight year old concept of TOD has been explored extensively in relation to property value-capture and marketing effects, yet there remains a gap in the literature on whether TODs are associated with higher physical activity levels and lower obesity (Jamme et al., 2019). This gap is addressed by exploring the research question of how physical activity outcomes (such as walking and biking) and obesity levels compares between areas that display higher levels of TODness (higher levels of the “D” variables) as compared to areas with less TODness. A statistical regression analysis of a single-case study on the Chicago metropolitan region using data from the EPA smart location database and the CDC 500 healthy cities report was analyzed to observe whether higher levels of “D” variables (and thereby TODness) are significantly associated with higher levels of physical activity and lower obesity levels. Statistical analysis of this data reveals that areas with higher levels of TODness are associated with higher levels of physical activity, as well as lower level of obesity. The implications from this study are that TODs should not only be embraced for their value-capture properties that has been thoroughly captured in the literature, but also for the potential health benefits that they hold through their support of active transportation infrastructures.

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Key Words: TOD, Active, Transportation, Health, Obesity

#### **AN INNOVATIVE APPROACH TO USING CROWDSOURCED DATA AS A TRANSPORTATION PLANNING TOOL: STUDYING TRAFFIC CONGESTION IN KARACHI, PAKISTAN THROUGH TWITTER DATA**

Abstract ID: 986

Individual Paper Submission

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Rapid population growth, economic development, and large-scale migration towards cities worldwide have created great mobility needs for urban dwellers. The increasing travel demand has burdened the existing transportation infrastructure resulting in issues such as traffic congestion, crashes, and deteriorating air quality (Rajé et al., 2018). Traffic congestion is a perpetual challenge for sustainable transportation development around the world. This becomes even a bigger challenge for cities in developing countries due to the scarcity of infrastructure, lack of enforcement of traffic laws, and poor or non-existent traffic regulation plans (Pucher et al., 2005; Sietchiping et al., 2012). While traffic data collection is a standard in the developed world, the availability of reliable, updated, and accurate traffic data in developing countries is limited, rendering effective monitoring or data-driven planning almost impossible. This could bring about the high cost of transportation data collection and management (Misra et al., 2014).

Advancements in science and technology and the growing number of social media users have created several new data streams where a large volume of information is voluntarily contributed by users in real-time. Such data is available in the form of social media posts, blogs, geographical data, and pictures/images. Twitter is one of the oldest and most widely used social media networks. On this micro-blogging platform, users generate more than 500 million posts (called Tweets) per day (wordstream.com). Tweets are used to express personal opinions, ideas, and feelings. Recently, government and private organizations have started using Twitter to communicate with their users/followers for delivering important and real-time information.

Keeping in view the lower cost, high volume, and ease of data collection, this research suggests an innovative approach to collecting Twitter data for temporal and spatial analysis of traffic congestion in one of the biggest cities in the world- Karachi, Pakistan.

We intend to scrape tweets made by the official twitter account of the city traffic police department which regularly tweets about real-time traffic situation in the city such as locations and reasons of traffic jams. An extensive database of tweets is built by collecting tweets from last five years. The tweets' content is then analyzed using text analysis by employing Natural Language Processing (NLP) algorithms to get insights about traffic problems in the city.

The analysis results reveal spatial and temporal patterns and the major causes of traffic congestion in the city. These findings could be used by policy and decision-makers to devise future strategies for mitigating traffic congestion on city streets.

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Key Words: Traffic Congestion, Developing Countries, Twitter, User Generated Data, Social Media Big Data

## HOW FAR DOES THE US POPULATION TRAVEL AMID THE COVID-19 PANDEMIC?

Abstract ID: 1004

Individual Paper Submission

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In 2020, the outbreak of the novel coronavirus (COVID-19) suddenly occurred, and large segments of the population immediately began to stay at home and socially distance. People's travel behavior was drastically reshaped almost immediately. At least 316 million people in 42 states, D.C., and Puerto Rico were placed under statewide stay-at-home orders before mid-April 2020. By comparison, the other eight states either only had such an order in part of their state or did not have an order at all (The New York Times, 2020). Though the changes in public travel behavior have attracted researchers' attention, many early studies are conducted through questionnaires, the results of which are limited to the survey samples. Mobile phone data and geo-tagged tweets are analyzed in later literature; however, most of the studies use the early months of 2020 as their baselines. This procedure excludes the disparities of travel in different periods during the year. Moreover, only a few studies investigate the changes in trips by distance. This research gap leaves us with an unclear question: How far does the US population travel amid the COVID-19 pandemic?

This research unveils the percentage changes of two travel behavior indicators due to COVID-19 for people in all US states and the nation, including the population staying at home and the number of trips of ten distances from less than one mile to over 500 miles. We ask two research questions: 1) Which distances of trips have been affected, and to what degree? and 2) How far do people in different states travel? This research analyzes the data of over two million mobile phones and uses the same periods of 2019 as the baseline. This research investigates two periods since the start of the pandemic: a significant voluntary restriction (SVR) period of public travel behaviors between mid-March to mid-to-late May, as well as its following (post-SVR) period until the end of September in 2020.

COVID-19 results in an approximate 30% increase of the US population staying at home and a slightly over 30% decrease of the number of trips per capita during and after the SVR. With the decrease of the population staying at home after SVR, the percentage change of number of trips also decreases after SVR. We demonstrate that the two indicators are not necessarily associated in an individual state. Moreover, walkable trips (<1 mile) and medium-distance trips within one-hour to one-day driving (50-500 miles) are less affected than trips of other distances during SVR. A new demand emerges for these medium-distance trips after SVR, and they even surpass those of 2019. These findings suggest that people's desire to go out after the initial travel restriction do not reflect on the increase of number of trips but are somewhat compensated by the increase of travel distance. Furthermore, the stay-at-home order did not exert a significant impact on public travel behaviors. People in the eight states without statewide orders had similar drops in travel as some other states during and after the SVR, and the drops did not show a generalizable rule. This finding indicates that people's fear of COVID-19 suppresses travel. This research suggests that urban planners and policymakers should consider the provision of services and facilities based on the criticalness of the travel needs and people's changing travel habits. Regional features should also be taken into account due to the varied changes in public travel behaviors among states.

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Key Words: Travel behavior, Trips, Distance, Stay at home, Voluntary restriction

## **TRANSIT FARE POLICY IN THE WAKE OF COVID-19**

Abstract ID: 1041

Individual Paper Submission

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A year since the start of the COVID-10 pandemic, transit patronage in Los Angeles, and indeed most of the U.S., is half of its historical trend. Reduced ridership isn't the only way that transit use has changed as a result of the ongoing crisis. Transit riders are now required to wear masks, and transit operators have taken a variety of steps to reduce the public health risks associated with transit use. include more frequent cleaning of vehicles, distribution of personal protective equipment to employees and riders, and the blocking off of seats to allow for social distancing between passengers. Transit operators in Los Angeles, like transit operators nationwide, have also experimented with "fare-free" transit as a way to reduce the risks of spreading COVID-19.

Transit operators have historically been reluctant to adopt innovative fare policy due to equity concerns, a firmly-established history (in the United States) of flat-rate transit fares, and risk-averse transit management (Yoh, et al., 2010). "Flat" fares may seem equitable at first blush but charge different travelers the same price for trips of different lengths, modes, and time of day, effectively cross-subsidizing longer, more expensive-to-provide trips with revenues from shorter, less-expensive-to-provide trips (Nuworsoo, et al., 2009). Fare schedules that charge different fares to different user groups based on ability to pay can help mitigate vertical equity concerns, while distance-based fares that vary by trip distance and/or time-of-day do a better job of matching the price charged for transit service to the cost of serving that trip (Farber, et al., 2014). Other factors influencing the cost of trip provision include the mode of transit used, passenger counts, vehicle load factors, and the specific characteristics of the urban area being served. Although Los Angeles Metro and other operators around the U.S. expressed interest in experimenting with fare-free transit before the current pandemic as a response to longstanding structural issues stemming from over-reliance on flat fares, it took the unforeseen exigencies of COVID-19 to incentivize rapid widespread experimentation in fare policy. Coupled with reduced patronage, however, experiments in fare-free transit have exacerbated long term declines in the share of transit agency costs covered by fare revenues.

In this paper we review innovative fare policies currently being explored or implemented by transit agencies nationally, with a focus on Southern California. We identify the characteristics of transit agencies that are currently exploring or implementing innovative policies. We evaluate the success of agencies in generating revenues and addressing equity concerns. We specifically examine fare-free transit compared with those that vary based on time, distance, and customer type. We focus on the recent rise of fare free transit, evaluating its effects. Given that eliminating payments also eliminates the need for fare enforcement, what does the net fiscal and equity impacts of free fare policies tend to be? What are the opportunity costs? In short, we are interested in understanding, based on current practice and research, the future of transit fare policy.

We contribute to existing literature by summarizing the current landscape of innovative transit fare policy and analyzing these policies through an equity and efficiency lens. The results of our analysis will be used to shape our future work on the fiscal and performance implications of innovative fare policies for specific agencies. By better understanding how emerging technology can help to match the marginal costs of serving different traveler and trip types, our findings can help ensure that fare policies are equitable but also economical. In doing so, we endeavor to

provide actionable guidance for transit agencies as they move toward fare policy reform in the wake of COVID-19.

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Key Words: Transit, Fares, Equity

### DRIVING ELECTRIC WITH EQUITY: AN EVALUATION OF CURRENT ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

Abstract ID: 1042

Individual Paper Submission

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Amongst the financial or non-financial incentives for adopting electric vehicles (EV), those who target electric vehicle supply equipment (EVSE) infrastructure, also known as charging stations, aim to increase the attractiveness of EV by not only making the vehicle more affordable, but to decrease the cost of owning EV. Financial incentives for EV charging infrastructure include subsidies, rebates, or tax credits to defer the purchase and installation costs of EVSE. Adopting EV depends on developing charging infrastructure, and they can be charged from a standard power outlet or at a direct current fast-charging station. Infrastructure is not a direct way to motivate consumers to adopt EV, but increasing the number of EV charging stations could incentivize consumers to adopt the technology. Policymakers, workplaces, utility companies, and local agencies are promoting the introduction of such infrastructure in the hope of increasing EV's market share. Some states also proposed financial incentives for EVSE installations with an income tax credit at the state level. In Georgia, businesses could obtain qualified EVSEs and receive 10% of the cost of EVSE as a tax credit, up to \$2,500. New York also offers an income tax credit for 50% of the cost of charging infrastructure for up to \$5,000.

However, with all the incentives and policies, there is no evaluation of how equitable these initiatives are, i.e., whether or not the less-advantaged communities can benefit from them, as current EV owners tend to have higher education, with higher income, younger, owning more than one vehicle, and male-dominated. Hence, it is equally important to make sure that charging infrastructure funded by public dollars are distributed equitably and fairly. Government-provided or subsidized charging infrastructure is expected to help address the problem of limited EV range and the inability to charge at home for those who do not own a home of sufficient space to install charging equipment. Yet, existing literature and professional reports do not evaluate the equity aspects of these policies and incentives. This study intended to focus on a spatial analysis of the equitability of current EVSE installation site selection. Moreover, the study aims to build an EVSE equity measurement, which could provide nuanced analysis for stakeholders to take into account the socioeconomic conditions while a rapid transition is happening to the transportation sector, and also promote climate justice when electrification is considered to alleviate climate change.

To evaluate current EVSE spatial distribution, we collected the location of all non-residential charging stations in North America, and identified if a spatial relationship between the distribution of charging facilities and the less-

advantaged communities can be found. We focused on four cities in the west coast, namely Los Angeles, San Francisco, Portland, and Seattle, whilst all of them among the cities that are considered “friendliest” for EV ownership. The result indicated different EVSE accessibility in the less-advantaged communities in different cities. Portland, for instance, has shown statistically significant positive correlation between lower-income or colored neighborhoods and public funded charging infrastructure. Los Angeles, on the other hand, faces a gap of EVSE accessibility in Latino neighborhoods. We also found that less-advantaged groups benefit better from the EV policies and incentives when equity is addressed in EV strategies in planning documents. The results suggest that the current incentive model of providing subsidies to everyone who purchases EV or EVSE does not take social equity into account. Governments should actively explore for a more comprehensive inventory of planning policy toolboxes that target mobility, accessibility, sustainability, and equity could be simultaneously built. This study could contribute to building such toolboxes and a framework that helps governments weigh their priorities when planning for EV infrastructure.

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Key Words: electric vehicle, charging station, equity, climate justice, spatial analysis

#### PILOT TESTING A QUIET STREET INITIATIVE IN RESPONSE TO COVID-19 IN KINGSTON, ONTARIO, CANADA

Abstract ID: 1068

Individual Paper Submission

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When COVID-19 sent the country into lockdown in March 2020, rates of physical inactivity increased for many Canadians (Lesser and Nienhuis, 2020). In response to this worrying trend, health experts began encouraging residents to walk or bicycle within their neighbourhoods for exercise, recognizing the physical and mental health benefits that such activity would confer (Colley et al., 2020). This new reality stimulated calls for cities to quickly introduce active transportation (AT) corridors to accommodate residents’ needs to be active while also being physically distant from each other (Fischer & Winters, 2021). Indeed, by June 2020, the Federation of Canadian Municipalities had released its own Street Rebalancing Guide, to give municipalities some direction on how this work can be completed quickly and with minimal effort and resources (FCM, 2020). It remains unclear, however, whether such initiatives have been effective at increasing active transportation engagement among residents, as well as how they have been received by residents who live along the affected corridors.

In response to growing public enthusiasm for street rebalancing initiatives, on June 16, 2020, Kingston, Ontario’s city council voted unanimously to delegate authority to a locally based not-for-profit organization, the Kingston Coalition



for Active Transportation (KCAT), to implement the city's first ever Quiet Street. Following a series of consultations with city councillors, city staff, and community association leaders, KCAT designed a single 3km Quiet Street route that would traverse the city's central and downtown neighbourhoods. The Quiet Street was approved by City staff on August 5, 2020, and the initiative ran from September 1 to November 9, 2020. KCAT partnered with Queen's University to evaluate the initiative in terms of AT engagement along the corridor, perceived safety of the corridor among AT users, and corridor residents' attitudes towards the initiative. The evaluation was conducted using three data sources: street observations; an online survey of Quiet Street users; and an online survey of Quiet Street residents.

The observations revealed that AT engagement increased from baseline to October on weekdays, and that walkers were the majority AT users during all observation periods. The majority of AT users perceived the Quiet Street corridor as safe, but bicyclists felt more positively about the initiative than walkers/runners. The majority of resident survey respondents felt the Quiet Street corridor created a safe space for pedestrians and bicyclists, observed no change in congestion caused by the initiative, and felt positively about the initiative.

Several recommendations emerged to guide future efforts: solicit applications from neighbourhoods to facilitate greater community buy-in and support from residents; address arterial road barriers to expand beyond the city's core; use low maintenance and inviting street barriers that cannot be easily moved by residents; promote the initiative through events and street stewards; and run the initiative for longer periods to induce sustained changes in travel habits. The moderate benefits observed from a 3km Quiet Street corridor coupled with minimal adverse effects suggests this approach to street rebalancing should be expanded and tested elsewhere.

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Key Words: COVID-19, Quiet Street, active transportation, Kingston, Ontario, program evaluation

#### CAR CULTURE AND DRIVING CESSATION

Abstract ID: 1073

Individual Paper Submission

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Driving cessation is the process of individual physical and mental declines resulting in losing the ability to drive a car. Driving cessation in the United States, and the myriad problems it poses, tend to be treated as an inevitable aspect of aging. But losing the ability to drive is only a problem if one depends on a car. As such, efforts to address the problem of driving cessation at its root must start at addressing the larger culture in the US that treats auto-dependence as a normal, and even a celebrated component of American identity.

Car Culture in the United States is perhaps best typified by the popular culture of the post-World-War II era. Films like George Lucas' "American Graffiti" (1973) and songs like The Beach Boys "Little Deuce Coupe" (1963) celebrate the cultural significance of the car in the US. In the intervening years since WWII, the children who grew up in the suburbs of the post-war era have largely spent their lives in auto-dependent places. In turn, the so-called "baby boomers" raised in these suburbs have watched their parents lose the ability to drive and dealt first-hand with the consequences of driving cessation.

Rosenbloom, in a 2010 study, suggested a "policy window" to address driving cessation had opened as boomers faced their own parent's driving cessation. Unfortunately, in the intervening decade, there have been limited policy-responses to address driving cessation. If we are to still take advantage of this inflection point, we need to better understand car culture as a barrier to addressing driving cessation. This research empirically assesses the assumption of American car culture as a monolith. We do this by uncovering latent individual attitudes and perceptions that are typically grouped together as a single car culture. We use data drawn from a household survey administered in the midwestern United States (a region known for its auto-dependence and increasing proportion of older people in the population).

We developed over 50 attitudinal questions about driving cessation and car culture by following applicable theories in aging and travel behavior research. Questions regarding social integration, ability to contribute to society, and individual autonomy are rooted in a recent application of the Capabilities Approach (Sen, 1985) to functional aging (McKee and Shuz, 2015). From the travel behavior literature, we developed questions incorporating elements of Ajzen's Theory of Planned Behavior (Ajzen, 1991), including attitudes, subjective norms, and perceived behavioral control, supplemented with measures meant to quantify personal efficacy, identity, and habit (Anable, 2005).

Results of a Principal Components Analysis indicate six attitudinal factors associated with age-related driving cessation: car-dependent lifestyle, active-aging and walkable-community policies, personal identification around cars/driving, desire to voluntarily stop driving, concerns around autonomy and losing the ability to drive, and rejection of the possibility of losing the ability to drive. We then identified significant correlations between these factors and variables representing the built environment, travel behavior, demographic, and driving cessation policies.

Our results point to generational divides in addressing age-related driving cessation. Younger people tend not to associate cars and driving with their identity or their independence, and thus may be more likely to support accessibility-enhancing policies in general and as a means to address age-related driving cessation. In contrast, some older individuals are particularly tied to driving, identify favorably with "car-culture," and perceive continuing to drive as necessary for personal independence (and potentially a social indicator of one's continued independence in later life). Our results suggest that policies to address age-related driving cessation in a holistic way should focus on how such approaches can increase independence and ability to engage with society as one ages.

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Key Words: Driving Cessation, Aging, Travel Behavior, Car Culture

## **(DIS)ASSOCIATION OF TRANSIT QUALITY AND RESIDENTIAL LOCATION DECISIONS OF IMMIGRANTS IN TORONTO SUBURBS**

Abstract ID: 1075

Individual Paper Submission

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This research sits at the juncture of three themes: immigrants' residential patterns, their choice of commuting modes, and the uneven distribution of public transit quality. It is a well-known fact that immigrants' transportation behavior is substantially different from that of non-immigrants. Studies point towards higher use of transit and carpooling, lower individual car use, and also shorter travel distances, among immigrants compared to the non-immigrants (Heisz & Schellenberg, 2004; Newbold, Scott, & Burke, 2017). Meanwhile, immigrants are increasingly residing in the suburbs, departing from the past tendency to settle in traditional inner-city gateways. This change in the residential settlement pattern has resulted in the rise of ethnoburbs, where the immigrants cluster near their co-ethnic population in the suburbs, and form fully functional ethnic communities consisting of ethnic businesses, services, and institutions (Li, 1998; Wang & Zhong, 2013). This suburbanization of immigrants can place those who rely on public transit in a difficult position as public transit service levels are lower and more uneven in suburbs than in more central parts. Research has linked the quality of neighbourhoods with higher transit use and lower car use among their residents (Foth, Manaugh, & El-Geneidy, 2013). That immigrants are residing in the suburbs where transit quality is uneven, we can expect that suburban living will cause many immigrants who use public transit to transition more rapidly to the car. Other transit-reliant immigrants may instead be drawn to those suburban residential locations registering transit quality levels above the suburban norm.

This study investigates whether transit quality of neighbourhoods influences residential choices of immigrants living in the suburbs. It also gauges the relation between the transit quality of an area registering concentrations of immigrants and the level of transit use among residents of this area. A number of questions are addressed in this research. How important is transit quality as a factor of immigrant residential location? How does the attraction of transit quality in residential areas vary between immigrants and non-immigrants? To what extent does transit quality influence the modal choice in the areas where immigrants reside? How does transit quality compare to other variables in determining modal choices in immigrant neighbourhoods?

The research focusses on the Toronto metropolitan area, where nearly half of the population are immigrants, and the suburbs register uneven transit quality. In order to single out the effects of economic and cultural differences among immigrant communities on their attractions to quality transit neighbourhoods, we concentrate on two largest immigrant groups in Toronto, Chinese and South Asians. The analysis in this research is performed in three stages. First, a new transit quality index is devised for Toronto neighbourhoods, since prior ones do not explicitly consider the suburbs, as well as different types of transit services. Second, the association of transit quality and the residential and modal choices of immigrants is determined. Finally, the relationship between transit quality and modal share in Chinese and South Asian suburban settlements is derived.

Findings from this study reveals that although immigrants generally register a high propensity to use public transit and are attracted to quality transit neighbourhoods, transit quality has a weak impact on immigrants' residential location and commuting mode decisions. There are also differences in the extent of the relationship between the Chinese and South Asian immigrants residing in the Toronto suburbs. The study determines stronger influence of locational factors other than transit quality influencing these immigrants' choice of residential locations and commuting modes. From a planning perspective, the findings are further evidences of the difficulties transit oriented development strategies encounter when trying to assure that transit-reliant populations live close to high quality transit services.

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Key Words: Immigrant suburbanization, Immigrant transportation, Transit Quality, Toronto, Urban Planning

## OPERATIONAL CONSIDERATIONS OF ZERO EMISSION HEAVY-DUTY TRUCKS: PERSPECTIVES FROM THE TRUCKING INDUSTRY

Abstract ID: 1084

Individual Paper Submission

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Freight is a significant cause of air pollution and greenhouse gas emissions in Southern California, in part due to 20,000 full and empty containers traversing the freeways to and from the San Pedro Bay port complex to industrial parks and intermodal facilities daily. According to the California Office of Environmental Health Hazard Assessment, these corridors have the highest diesel particulate matter and overall pollution burden for California communities. (California Office of Environmental Health Hazard Assessment) To reduce greenhouse emissions, battery-electric vehicles (BEV) and other alternative powertrains are gaining headway in California and elsewhere, especially in the medium-duty delivery truck market. But what about heavy-duty trucks? Can zero-emission vehicles handle the operational requirements of firms with this type of equipment? For example, battery-electric trucks must carry heavy batteries, which limits the cargo they can carry. Between charges, BEV trucks have a lower range than their diesel counterparts. Also, fleets will need to reconfigure their lots to accommodate the charging infrastructure. This presentation addresses California's legal framework driving heavy-duty BEV technology and the magnitude of operational adjustments firms will face to implement BEVs in the near to medium term.

The first part of this presentation discusses California's legislation to reduce emissions from trucks. California has passed laws for both market and rule-based policies on heavy-duty trucks to promote zero and near-zero vehicles and infrastructure. A brief discussion of these different policies will demonstrate California's commitment to the evolution of trucking technology. (Dexter; Choe)

The second section presents potential markets for alternative fuel trucks in the Los Angeles region. Using Southern California Association of Governments (SCAG) regional transportation model data, a spatial analysis concluded that by overlaying truck trip intensity, employment, distribution center locations, and intermodal facilities, three specific truck-related activity clusters exist in the greater Los Angeles area. In-depth interviews of fleet operation managers provided industry insights on alternative fuel heavy-duty trucks arising from demonstration projects and BEV truck manufacturer contact. Finally, to understand the nature of operations, three vastly different types of firms provided daily operational data for daily truck trips. Analysis of these case studies estimates how much demand could be

handled by BEVs. Results of the interviews and case studies demonstrate that while BEV technology has made strides in the heavy-duty space, efficiencies must improve before firms will commit to the additional expense of electric vehicles except for some cherry-picked routes. Incentives alone cannot compensate for the massive changes in operations that would be required. (Giuliano et al.)

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Key Words: trucks, emissions, drayage, battery-electric

### THE INFLUENCES OF AIRPORT DEVELOPMENT AND SUSPENSION ON COMMERCIAL PROPERTIES: EVIDENCE FROM SINGAPORE

Abstract ID: 1089

Individual Paper Submission

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Over the last few decades, cities have been making a series of multibillion-dollar investments in hub airports not only as transportation nodes to manage regional traffic growth but also as employment centers to drive local economic growth (International Transport Forum, 2014). The development of airport systems, including 24-hour operation, runway expansion, terminal modernization, service automation, and ground transportation, is expected to produce additional capacity, improve operational efficiency, increase service accessibility, attract competitive firms, create business opportunities, and, consequently, uplift commercial property values in airport-linked free economic zones and industrial parks. Indeed, a series of airport expansion projects are also likely to generate property value discounts for extra negative externalities (e.g., traffic congestion, noise, air pollution, building height restriction, and infectious disease spread) in nearby economic zones.

Numerous hedonic price studies have been conducted with public concern about the geospatial influences of airport noise exposure on residential communities since the 1970s. A meta-analysis across cities in North America suggests that the positive influences of airport accessibility and employment opportunities can be more valued by local communities than the negative externality effects of airport proximity, depending on land use zoning requirements and socioeconomic conditions (Nelson, 2004). One hedonic price analysis also infers that some advancements in aircraft technology and airport design are likely to produce greater opportunities for land use rezoning and real estate development around hub airports in North America (McMillen, 2004). Another study suggests that the operation of city airports is undesirable for their significant noise costs and insignificant accessibility benefits to densely developed commercial areas in Europe (Ahlfeldt and Maennig, 2013). However, the positive and/or negative influences of airport system development on nearby commercial properties are less reported, especially from cities with hub airports in Asia.

This study presents the influences of airport system "development" (a series of new terminal, runway expansion, and airport rail link construction projects), as well as "suspension" during the recent pandemic/lockdown periods of Severe Acute Respiratory Syndrome (SARS) in 2003 and Coronavirus Disease 2019 (COVID-19) in 2020/2021, on (i) office, (ii) retail, and (iii) industrial values, respectively, using property sales transaction data around Changi Airport in Singapore for the past few decades. Spatiotemporal inferences drawn from the three sets of hedonic regression models are summarized for the dialogs between, airport managers, planning authorities, property owners,

commercial tenants, and local communities, with special attention to the competitiveness and sustainability of cities with hub airports in Asia or called “airport centric development” in North America (US Government Accountability Office, 2013).

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Key Words: Airport Planning, Economic Development, Transportation and Land Use, Hedonic Price Analysis, Pandemic

#### MITIGATION OF TRANSPORTATION DISASTERS DURING EXTREME FLOODING IN HARRIS COUNTY, TX

Abstract ID: 1094

Individual Paper Submission

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Flooding is the second most common natural disaster to result in death, and approximately sixty percent of those who die in extreme flooding events are in their vehicle (Ashley & Ashley, 2006). Improved weather prediction technology has not translated to fewer lives lost as the number of deaths has increased in the last twenty years (Terti, Ruin, Anquetin, & Gourley, 2017). While technology and community education have aided in the decline of other natural hazards such as lightening and tornadoes, significant decline in flood related fatalities has not occurred (Maples & Tiefenbacher, 2009). Literature offers uncharted opportunities to bridge the gap between mitigation and transportation policy, which from a theoretical lens, parallels each other but fails to work in tandem to realize greater mitigation in roadway disaster during extreme flooding events.

In an interdisciplinary study, researchers determined through a predictive scenario survey of participants in Denver and Austin that experience with historic flooding led to more cautious drivers, those that did not take warning seriously were more likely to drive in flooded roads, those that didn't realized that half of fatalities in flooding came from drivers were more likely to drive in flooded roads and drivers with no previous experiences to flooded roadways and drivers under the age of thirty-five were also more willing to risk driving with water on the road (Drobot, Benight, & Gruntfest, 2007). Zahran et al. (2008) used social vulnerability to measure against flood-related deaths and found that flooding near socially vulnerable populations, increased rain the day of the flood, the duration of the flood, and population density can increase the number of deaths. This study did recommend that future research include a qualitative component (Zahran, Brody, Peacock, Vedlitz, & Grover, 2008). Jonkman et al.'s review of flood fatalities from Hurricane Harvey found that most of those deaths occurred outside the 100-year floodplain, and that men comprised seventy percent of the deaths, with those over the age of 50 an increasing trend (2018).

Various quantitative research projects indicated observed characteristics of those most likely to die and the potential reasons for it; however, the field is missing a narrative to explore the reasons behind the phenomenon. Despite the body of quantitative analysis, no one understands why people end up driving into flood water.

Specifically, urban planning studies could provide a missing link to engage a more interdisciplinary discussion among public health officials, highway designers and engineers. This critical case study focused on vehicle related deaths from Tropical Storm Allison (2001), Memorial Day Flood (2016), Tax Day Flood (2016), Hurricane Harvey (2017), and Tropical Storm Imelda (2019) in Harris County, Texas. Harris County's seat, Houston, is the fourth largest city in the United States. With twenty-two waterways flowing to the Gulf of Mexico, Harris County is prone to both sudden onset and slow onset flooding. Flood fatalities in the greater Houston metropolitan lead in numbers for the United States (Sharif, Hossain, Jackson, & Bin-Shafique, 2012). Victims of these selected storms that died in an automobile or died from abandoning their vehicle were mapped in GIS. The researcher conducted 97 semi-structured interviews of people who drove during these extreme flood events as well as reviewed past and current mitigation policies for driving during extreme flooding. Street observations of all the locations were made to determine any patterns in the death to improve current mitigation practices of Harris County.

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Key Words: Transportation, Disaster, Flooding, Hazards, Mitigation

### **REDUCING IMPACTS OF HEAVY DUTY TRUCKS IN COMMUNITIES OF COLOR**

Abstract ID: 1113

Individual Paper Submission

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There is extensive evidence that the externalities of freight traffic disproportionately affect low income, minority communities. Studies of truck traffic in New York revealed that neighborhoods near the ports – predominantly low income and minority -- incur a heavy burden of diesel pollution and noise (Lena et al, 2002). Studies of the Los Angeles region show the same pattern (Kozawa, Fruin & Winer, 2009; Houston, Li & Wu, 2014). Warehouse and distribution clusters, which attract heavy freight traffic, are major sources of pollution, and are disproportionately located near minority communities (Bluffstone, & Ouderkirk, 2007; Yuan, 2018).

The purpose of our research was to examine impacts of freight traffic on communities of color located in southeast Los Angeles County. We partnered with a local community organization, the Southeast Los Angeles Collaborative (SELA), to examine impacts and develop recommendations for mitigation. The SELA area includes 11 cities and some unincorporated areas of Los Angeles County. With a population of 750,000 within 62 square miles, it is one of the densest areas of the County. It is majority Hispanic, and the median income is below the County average. It is identified as a high pollution, high population burden area by CalEnviroScreen.[1]

Our approach was informed by the interests and concerns of the community. We used a mixed methods approach

that included interviews with public agencies, community focus groups, data analysis, field observation, and micro-simulation modeling. The original purpose of the research was to focus on emissions from truck traffic and identify strategies for reducing emissions. Our research changed after the first focus group revealed traffic safety to be a more critical concern than air pollution. The research therefore addresses both emissions reductions and traffic safety.

Findings to date include the following:

Regional truck traffic: Using data from the regional transportation planning model we identified truck trips that originated, arrived, or traveled through the SELA area. Most truck traffic is through traffic, and SELA has a higher proportion of truck traffic than the average for the region. Mitigation of emissions at the regional level will be required to substantially reduce emissions within SELA.

Local truck traffic: We identified hot spots of concentrated truck activity. As expected, these were areas of warehousing and manufacturing and the major arterials connecting these areas. Truck crashes and pedestrian safety: We used a California crash database to examine truck involved incidents over a three year period. Truck crashes per capita are higher in SELA than the region as a whole, and 55% of the crashes take place on local roads. We identified hot spots based on truck volumes, crash numbers, location with respect to sensitive facilities, and other factors. We selected 5 hot spots for detailed analysis. Of these, we selected two for modeling the impact of mitigation strategies.

Full results, conclusions, policy recommendations, and reflections on the collaboration with SELA will be included in the final paper.

[1] CalEnviroScreen is a mapping tool that uses environmental, health and socioeconomic data to rank vulnerability of communities to the impacts of pollution. See <https://oehha.ca.gov/calenviroscreen/about-calenviroscreen>.

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Key Words: urban freight, emissions, environmental justice

## **POSTERS**

### **DO ECONOMIC ACTIVITIES HAVE A CAUSAL RELATIONSHIP TO TRAFFIC FATALITIES? AN INTERNATIONAL STUDY FROM 76 COUNTRIES**

Abstract ID: 250

Poster



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While traffic safety improvements have been an ongoing focus of the transportation planning research community for a long time, traffic fatalities trend in recent years in the world remains unacceptably high. According to the World Health Organization (WHO), in 2018, the number of road traffic fatalities was about 1.35 million, ranking eighth among all causes of death in the world. The number of fatalities has been growing and there are significant differences among countries with different income levels. A higher traffic fatality rate exists in low-income countries and traffic fatalities have become the most severe problem in several developing countries.

Kopits & Cropper (2005) describes the relationship between traffic fatalities and economic growth as an inverted-U pattern. In this study, we develop a more detailed inquiry to associate the traffic fatality rates with economic indicators, and examine the causal effects of changes in economy on traffic fatalities. Our research question is concentrated on understanding which economic indicators have causal impacts on traffic fatality rates, and whether there is a difference among countries of different economic levels.

Our study models the fatality rates in 76 countries of different income levels and explores the possible causal relationship between economic development and traffic fatality rates. We use panel data including traffic fatalities, economic indicators, regulation-related indicator, and other related indicators. The countries were studied in groups by income level. The evidence shows different influences on traffic fatality rates from explanatory variables by group. The dynamic panel data (DPD) model and Random Forests (RF) were applied. DPD is a classic econometric approach that contains one or more lagged dependent variables, allowing for modeling unobserved heterogeneity. The major advantages of this model include the considerations of individual time series for each unit area and the cross-sectional variations among the unit areas. RF is a machine learning method famous for its predictive capabilities. Though it is not designed for causal inference, the flexibility of RF could help to reveal the relationship among the variables as well as the lagged variables by its predicting abilities.

By comparing the DPD and RF models among countries of different income levels, this study concludes that there is causality between some economic indicators and fatality rates, such as GDP per capita, energy consumption per capita, and unemployment rate. GDP per capita has a causal effect on fatality rates in high-income countries, but not significant in the rest of the countries. Unemployment rate shows consistent causal effects on all groups of countries. The other related variables, did not show statistically significant causality to fatality rates.

The study illustrates the causal links between economic developments and traffic safety issues. Reducing fatality rates is an important goal for all countries worldwide. High-income countries could focus on the raise of GDP per capita, since it has a causal link to the drop of fatality rates. The rest of the counties - upper-middle, lower-middle, and low-income - would remain suffering the noncausal relationship from the GDP growth to the drop of fatality rates. By raising the energy consumption per capita, these countries could reduce fatality rates. Other related variables, such as people's attitude towards the law showed its importance in predicting the fatalities. Thus, to adopt the safety-related legislation and to educate the driving population may also improve traffic safety. Future research could focus on the causal connection between traffic fatalities and government safety legislations and expenditures.

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Key Words: traffic fatalities, economic development, international study, causal relationship, panel data

## EFFECTS OF LIGHT RAIL TRANSIT ON TRAFFIC IN A TRAVEL CORRIDOR: AN UPDATE

Abstract ID: 617

Poster

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In 2014, researchers at the University of Utah completed a study on the short term effects of a light rail extension along a 2.3-mile stretch of University Blvd from downtown Salt Lake City to the University of Utah. The report concluded that the light rail extension reduced traffic in the corridor by about 10,400 vehicles per day in 2012 compared to traffic volumes in 1999 before construction began. Since this study was published, the University Blvd corridor has undergone rapid change, with transit station area zoning having encouraged much high density mixed use development near rail stations in the corridor. Several large apartment buildings and mixed use developments have been constructed since the study's completion, yet University Blvd still rarely experiences heavy congestion. This led the Utah Transit Authority to wonder whether light rail continues to suppress traffic volumes in the corridor.

This study serves as an update and investigates how new development in the University Blvd corridor has affected traffic levels since 2012. The study also aims to quantify the value of new development in the corridor and the amount of air pollution and carbon emissions avoided due to light rail. Before the update, anecdotal evidence suggested that traffic volumes in the corridor remained well below levels expected with the large amount of new development, and this also suggests substantial pollution and carbon emission reductions. Using a quasi-experimental design, this study concludes that, despite an uptick in traffic volumes and a slight decrease in overall transit ridership since 2012, traffic levels in the corridor remain about 7,800 vehicles per day lower than expected based on trip generation calculations. This amount of traffic suppression prevents an estimated 5.93 million pounds of carbon dioxide emissions annually and causes a sizable decrease in several other common air pollutants. The analysis also finds that about \$7.7 billion worth of development occurred in the light rail corridor from 1999 to 2020, with \$3.2 billion occurring in the most recent decade.

As cities and metropolitan areas move into the future, climate change and environmental justice will remain two of the largest and most challenging issues. The transportation sector is one of the largest sources of carbon emissions and other pollutants, and this study provides evidence that well-planned rail transit can not only substantially reduce carbon emissions directly by taking vehicles off the road but also by encouraging denser, more compact development which produces less carbon per capita. It is our hope that this research can help planners and decisionmakers justify planning, funding, and constructing rail transit to address climate change and increase transportation equity.

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Key Words: transit, emissions, sustainability, traffic, development

## THE BIKE NETWORK AND ITS ACCESSIBILITY IN RELATION TO KEY DESTINATIONS, A CASE STUDY OF ARLINGTON, TX

Abstract ID: 779

Poster

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During the past century, cars dominated urban transportation in the U.S, which resulted in car-oriented urban landscapes and car-dependent cities. However, during the past decades, many scholars and planners have discussed that car-dependent cities are not sustainable (McNeil, 2011) due to issues such as traffic congestion, climate change, air pollution, shortage in energy resources, and lack of physical activity (Winters et al., 2013; Krenn et al., 2015). Accordingly, there have been various efforts to moderate issues resulted from car-oriented urban planning. To provide more sustainable and equitable transportation options, biking and designing bike-able cities are among the most acceptable and widespread strategies. Unlike pedestrians, cyclists can access a broader type of destinations, travel faster, and carry loads more easily (McNeil, 2011; Winters et al., 2013). Therefore, providing accessible, safe, and ample bike routes is becoming one of the central policies for cities all around the nation.

The City of Arlington is the self-proclaimed "American Dream City," a place characterized by entertainment, education, and entrepreneurial opportunity. In support of this ideal, the City of Arlington is taking strides towards implementing the infrastructure that facilitates this claim. One of the City's actions towards this goal is the release of its "Hike and Bike System Master Plan" in 2011. Since then, the City has begun implementing a network of 138 miles of on and off-street bike routes and trails in addition to the limited existing hike and bike trails (City Of Arlington, TX., 2011). Therefore, this study aims to investigate whether Arlington's existing and planned bike network connects its residents to key destinations within the City?

We assess the existing and planned bike network's accessibility to identify if it specifically facilitates bike connections between residential areas and six major destinations within Arlington, including apartment complexes, healthcare destinations, educational facilities, top employers, municipal facilities, and food destinations. Utilizing ArcGIS Pro, we mapped the locations of the six categories of key destinations. We then proceeded to overlay each category with the existing and planned Arlington bike network. To assess the accessibility of the key destinations to the bike network, we determined if the key destination that lies within 0.25 miles of some portion of the bike route is accessible to the network (McNeil, 2011; Perry, 1929). Finally, we conducted a spatial query to determine which of the key destinations in each category intersected with the 0.25-mile buffer.

Our analysis reflects that the accessibility of these key destinations will improve dramatically through the establishment of the City's planned bike routes. Our findings indicate that the three key destinations currently

having the lowest accessibility rate to the existing bike routes are healthcare facilities, key food establishments, and municipal facilities, with 25%, 36%, and 40%, respectively. The accessibility rate will be improved dramatically to 63%, 67%, and 83%, respectively, when the planned bike routes are constructed and added into the network. The other three key destinations, including education centers, apartment complexes, and top employers, are accessible by the existing bike network with 44%, 48%, and 50% of key destinations lying within a quarter-mile of the network, respectively; however, these rates will hop up to 84%, 74%, and 60% respectively with the addition of the planned segments of the network. In its application, this study can help to explore where existing and planned infrastructure is adequate and which neighborhoods may not be receiving much-added value from the planned bike routes. This kind of analysis provides a powerful visual aid to identify zones where changes are needed to support sustainable transportation options.

Keywords: Bike Network, Bike-ability, Accessibility, Spatial Analysis

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Key Words: Bike Network, Bike-ability, Accessibility, Spatial Analysis

## **GENDER DIVISION OF HOUSEHOLD CAR USE: A COMPARISON BETWEEN “AUTO-DEFICIT” AND “NON CAR-DEFICIT” HOUSEHOLDS**

Abstract ID: 962

Poster

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Individuals without adequate access to cars face higher social and transport disadvantages, and by consequence, social exclusion. This is particularly true in car based economies like the US where about 15 percent of total households reported fewer vehicles than drivers in 2017. These “car-deficit” households have however not received enough research or policy attention, particularly in terms of how it marginalizes certain members of the household. In this paper, we investigate the travel characteristics of car-deficit households with a focus on how gender shapes access to household vehicles among heterosexually paired couples. How do these “car-deficit” households differ from “non car-deficit” households (in which, the number of drivers is equal to the number of vehicles)? What are the implications for transport planners and policymakers in general?

We use the 2017 National Household Travel Survey data to compare the gender division of automobile use at the intra-household level between households which are car-deficit and those which are not. Our dataset combines household, person-level, and trip data using household IDs and filters for the following characteristics: (i)

Households headed by heterosexually paired couples; (ii) where both are drivers; and have (iii) either a single car (car-deficit) or two cars (not car-deficit). We control for regional (urban) characteristics, and use statistical and regression analyses to evaluate gender differences in household characteristics and trip behaviors.

The preliminary study findings indicate that how and how much a car is used among car deficit households is often a function of household income, that is, low-income, car-deficit households show constrained and reduced travel. A gendered analysis reveals that women in car-deficit households have greater access to the household car than their male counterparts, primarily a result of their complex travel patterns involving their need to travel for work as well as for household care trips. This stands in contrast to previous findings that highlight men's greater access to private vehicles.

The findings would be helpful in identifying areas/neighborhoods where public transport investments must take priority based on poor access to opportunities using cars among households/individuals from car deficit households. It will also allow planners to innovate, plan, and introduce interventions like car sharing schemes in low income areas or areas with poor transport accessibility.

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Key Words: Transport planning, Gender equity, Travel behavior, Car-deficit

#### THE IMPACT OF COVID-19 VACCINATION ON HUMAN MOBILITY

Abstract ID: 976

Poster

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Covid-19 has had an unprecedented impact on people's travel behavior over the world, in particular, the United States, which has greatly decreased people's mobility and affected people's daily lives. With the development and delivery of vaccines in a short period since the breakout of the pandemic, people's travel activities should recover to varying degrees. Decreased mobility will seriously affect economic development (Borkowski et al., 2021), but it is still unclear to what extent the Covid-19 Vaccine Rollout in the USA affects daily human mobility. This study utilizes Apple Mobility's mobility data, which is a location-based service data with detailed information about mobility and economic trends from Apple users during the pandemic, at both the state- and county-level based on three types of travel (driving, walking and transit) to explore the impact of Covid -19 vaccine distribution and administration on the mobility patterns. Using regression analyses, this study will investigate the statistical relationship between the

changes in people's flow and the total doses of vaccines that have been administered in a given state or county. From the state perspective, the study could help us understand the comprehensive trend of mobility change due to vaccination. From the county perspective, this study allows us to understand the heterogeneity among counties with more detailed data and to improve planning management in the face of infectious diseases. In addition, other factors, such as the number of confirmed cases of Covid -19, the number of deaths, related restrictions on traffic, and other socio-economic factors, will be taken into consideration will increase the rationality of the research.

We use the OLS regression method to analyze the influence of the total administrated doses at the state level. The equation is specified as follows.

$$Y = \beta_0 + \beta_1 \text{AdministeredTotal} + \beta_2 \text{ConfirmedCases} + \beta_3 \text{DeathCases} + \beta_4 \text{racePercentage} + \beta_5 \text{medianIncome} + \beta_6 \text{age} + \beta_7 \text{femalePercentage} + \beta_8 \text{temp} + \beta_9 \text{rain} + \varepsilon$$

where  $Y$  is one of the three modes of transport – driving, walking and transit. *AdministeredTotal* represents the total Covid-19 vaccine doses that people have been administered in a given state. It should be noted that people might have received one dose and have not received the second one yet. *ConfirmedCases* and *DeathCases* refer to the Covid-19 confirmed cases and death cases, respectively. *racePercentage* stands for the proportion of black people in a given state and *femalePercentage* the proportion of females. *temp* represents the average temperature. *rain* is a dummy variable referring to whether it is raining or not.

In addition, the study will also investigate the different impacts of vaccine administration among different counties in the same state. More specific traffic data, known as StreetLight Data will be analyzed using the Geographically Weighted Regression (GWR) to examine the spatial factors that influence travel behaviors among different regions.

The preliminary results based on the OLS analyses show that the total administered doses have a positive effect on the flow of people significantly. Specifically, walking has experienced the most significant increase while transit has the smallest growth. This shows that vaccination promotes people's outdoor walking activities. Although the flow of public transportation has also increased slightly, confined public spaces may still be a hindering factor. In addition, this study proposes to delve into the impact of vaccination on a different group of people.

This research will provide an essential understanding of intercity travel behavior during COVID-19, which may facilitate the decision-making for future transportation planning. In particular, the empirical evidence may provide timely insight to help planners and policymakers to improve the effectiveness of resource allocation to achieve a sustainable and equitable planning strategy for future infrastructure development.

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Key Words: mobility, modes of transport, Covid-19

## SHARED E-SCOOTER USAGE PATTERNS DURING COVID-19

Abstract ID: 988

Poster

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The expansion of micromobility services such as shared bikes and shared e-scooters presents an exciting realm of study in the context of sustainable and resilient modes of transportation. Given the recent expansion of shared e-scooters, the usage patterns and trip purposes of this mode of transportation remains understudied (Caspi et al., 2020), and even less is known about how e-scooters were used during the COVID-19 pandemic. Travel behavior studies show that shared e-scooters—in contrast to shared bikes—are not usually used for commuting purposes (McKenzie, 2019), nor for fulfilling the last-mile (Mathew et al., 2019). The purpose behind e-scooters usage has been shown to be more so for leisure, recreation, and tourism purposes (McKenzie, 2019). In order to understand the resiliency of e-scooters and how trip purposes may change during a time of crisis, the Covid-19 pandemic serves as a context to study what the trip purposes have been during this global crisis. This can provide insights into the travel behavior propelling the usage of shared e-scooters during the pandemic and how it may or may not have changed as compared to pre-pandemic times, as well as inform future studies on how e-scooter usage patterns will compare in the post-pandemic era.

This research explores trip purposes of e-scooters in the Chicago region during the COVID-19 pandemic. A comprehensive survey sponsored by the Illinois Center for Transportation (ICT) was designed by the Translab of the University of IL at Chicago in collaboration with the Chicago Department of Transportation (CDOT), and was distributed by all the of the shared e-scooter vendors to their registered users. The data collected was between November 20<sup>th</sup> and December 15<sup>th</sup>, and there were a total of 2,400 completed responses received, which represents users from all three e-scooter vendors (i.e. Lime, Spin, and Bird). Information was collected regarding the attitudes and preferences of respondents towards e-scooter usage, and Google Maps API was incorporated in order to collect approximate residential locations of those surveyed. The research question explored through the survey results was how people perceived and used shared e-scooters during the pandemic, and how this data could help improve the benefits of shared e-scooters for future users.

In order to analyze survey results, users were grouped based on their patterns of usage—including those who used shared e-scooters for one major purpose, those who used shared e-scooters for two or more purposes, those who used shared e-scooters for or one major purpose sometimes and those who used e-scooter for two or more purposes sometimes. The main contribution of these results is that it shows how various segments of the population perceive e-scooters and the function of e-scooters depending on their usage patterns. Results indicate that there are some common purposes for riding e-scooters among all users (whether they used it always or sometimes for those purposes)—including avoiding transit for COVID-19-related reasons (i.e. to avoid proximity to others), for fun (i.e. for the sake of riding the e-scooter itself), to reach recreational destinations, and for avoiding transit for purposes besides COVID-19. While the purpose of riding shared e-scooters for leisure, recreation and tourism has been documented prior to the pandemic, survey results indicate these purposes persisting throughout the pandemic (McKenzie, 2019). In addition, survey results indicate how the pandemic may have specifically affected riders' habits by serving as a substitution to transit services.

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Key Words: E-scooter, Chicago, Micromobility, shared, pandemic



# Track 16 – Urban Design

## INDIVIDUAL PAPER SUBMISSIONS

### RETHINKING SUBURBAN DESIGN: STREETS V/S ALLEYS IN IMPROVING NETWORK CONNECTIVITY

Abstract ID: 14

Individual Paper Submission

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The notion of an urban-suburban dichotomy is deep-rooted in the planning literature, which regularly denigrates suburbs and nostalgically glorifies urban centers. Movements such as Compact City, New Urbanism, and Smart Growth have reinforced the narrative that unfairly label suburbs as undesirable and wasteful landscape. Suburbs have been contested and evolved over the course of the long history of urban design and planning scholarship and practice. Meanwhile, suburbs have continued to prevail and dominate the urbanization process in many regions. This paper does not reject suburbs as an undesirable phenomenon but instead investigates how suburbs can be improved and transformed into better places. The article focuses on the efficiency of one urban form element in suburbs: street connectivity. Connectivity efficiency is quantified using Pedestrian Route Directness (PRD), a measure which captures the ability of the layout to provide direct routes between origins and destinations. Taking Abu Dhabi and Dubai as case studies, the article studies the connectivity efficiency and provides design strategies and guidelines for retrofitting and improving connectivity in suburbs. Results reveal that not all suburbs have inefficient connectivity, but there is a room for improvement. One major improvement strategy is reclaiming alleys, which are usually critical but forgotten infrastructure elements in suburbs. Results reveal that the utilization of a complementary network of alleys enhances PRD results by 31 percent in some areas.

Currently, suburbs dominate the built landscape throughout the world. In the UAE also, suburbs occupy significant portions of the built landscape, more than 50% of Abu Dhabi's urbanized land and 38% of Dubai's urban area. Suburbs are constantly vilified unlike the spectacularization of downtown revival. Nevertheless, suburbs have continued to exist, and therefore cannot be ignored blatantly without exploring the potential to retrofit for enhancing pedestrian connectivity.

In the UAE, public housing programs are the main contributors to suburban growth. Similar to North America and the rest of the world, the typologies of neighborhoods changed from compact forms to dispersed suburbs. This article studies the connectivity efficiency of diverse suburban street typologies to provide design actions and guidelines for future suburban street design. It is unwarranted to discard any suburban typology simply because it does not represent a pre-modern dense fabric. Thus, the paper analyses a total of sixteen neighborhoods, eight each from Dubai and Abu Dhabi, that represent different street typologies of suburbs from their origin (early 1970s) to present and asks three questions- 1) How connected are the suburbs of Dubai and Abu Dhabi for pedestrian movement? 2) What are some similarities and divergences between the suburbs of Abu Dhabi and Dubai in terms of connectivity efficiency? 3) What kinds of urban design strategies would increase the connectivity efficiency of future/existing suburbs?

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Key Words: suburban design, walkable neighborhoods, pedestrian route directness, gulf urbanism

## **TRANSFORMATIVE APPROACHES TO MITIGATE THE IMPACTS OF BOOM-AND-BUST IN DECLINING URBAN COMMUNITIES**

Abstract ID: 16

Individual Paper Submission

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Strategic partnerships between universities and declining urban neighborhoods with limited resources have resulted in some innovative and forward-thinking approaches to land use and planning that respond to the impacts of boom-and-bust through the implementation of problem-based solutions, and have spurred development to make communities more resilient. The university-community partnerships and engagements have multiple goals. They include increasing university responsiveness to local needs, stimulating real-world change, and preparing students to effectively address complex social challenges (Dorado, 2004). However, such approaches are complicated by a variety of factors, including stakeholder expectations, power imbalances, and the conflicting goals of educators and community members (Mansuri and Rao, 2004). While the benefits of service-learning programs to universities are well documented, the benefits of such higher education partnerships to community participants are not as well known (Netshandama, 2010). Successful engagements seem to require community involvement and decision-making authority at every phase, mutual accountability, and trust (Winkler, 2013). This presentation refers to a series of case studies of community engagement and neighborhood empowerment in the development of a collective sustainable plan/vision for declining inner-city neighborhoods with limited resources. These neighborhoods, located in Columbus, Ohio, have seen tremendous declines in population and economy over the past years due to significant loss of manufacturing jobs. The case studies demonstrate that service-learning has the potential to provide communities with place-specific guidelines and recommendations that improve the quality of life for residents, but their implementation requires a collective effort that goes beyond the classroom.

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Key Words: urban design, service-learning, university-community partnership, participatory planning, sustainable land use approaches

## **MODERN PEDESTRIAN PLAZAS: UNDERSTANDING PROGRAM EFFECTIVENESS**

Abstract ID: 27

Individual Paper Submission

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Cities across the United States have implemented plaza programs to create new pedestrian spaces in the roadway. Some have been high profile downtown projects, like the Times Square pedestrianization project. Most have been smaller, such as closing a small, underused street to traffic. These programs cite benefits that include encouraging walking and cycling, creating new gathering spaces, and traffic calming. This research asks the question: how effective are plaza programs at achieving these goals? This research question is addressed through semi-structured interviews with plaza program staff and community partners in Los Angeles, California.

This research focuses on the Los Angeles Department of Transportation's "People St" program. This program provides a way for community partners to receive City permission to transform street space into plazas. It resulted in the installation four plazas between 2012-2015. The plazas are designed to be installed at a low cost; bollards, paint, tables and chairs, and umbrellas are key pieces of the toolkit. The City's stated hope is that these projects lead to more capital-intensive, permanent installations as a part of a larger corridor or area plan.

Our research team is in the process of interviewing key stakeholders in the People St program, including City staff and community partners. This method is similar to the one used to measure pedestrianization program effectiveness in Auckland (Wooller et al., 2012). This is one of the first studies of how modern pedestrian streets are used and managed where there is a significant time gap (five years) between installation and study. These interviews will be complemented by background research on similar plaza programs throughout the United States.

The negative impacts of car-oriented development and car-only street design have become well-known in recent years. As our society confronts global climate change and the role of cars as major emissions sources, we must look for ways to reduce driving. Returning streets to pedestrians and cyclists can encourage walking and cycling, and it is one of the goals of this program. This research is critical, as the results will point to best practices and practices to be avoided when designing, implementing, and operating new plazas. This research also builds on the recent growing literature on historic pedestrian malls and plazas in the United States (Gregg, 2018; Amos, 2019; Matuke et al., 2020). It relies on knowledge of these historic examples to contextualize the strategies and locations for modern plazas.

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Key Words: urban design, pedestrianization, plazas, los ángeles, pedestrian mall

#### **TOWARDS RESILIENT SHOPPING CENTRES AMID THE RISE OF ONLINE RETAILING: A TYPOMORPHOLOGY OF SHOPPING CENTRES WITH AN APPLE STORE IN THE US**

Abstract ID: 32

Individual Paper Submission

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This research explores in what socio-spatial forms shopping centres could coexist with online retailing, based on a typomorphological analysis of all shopping centres with an Apple store in the US.

20th-century shopping centre development in the US features a boom-and-bust cycle where the rise of shopping malls forced main streets into a decline and the subsequent proliferation of power centres stimulated 'dead malls'. This boom-and-bust cycle has morphed into a new stage where the fast expansion of online retailing poses a threat to all types of shopping centres. There has been a long list of retail bankruptcies with massive store closures since 2010, leading to a concern that all stores would disappear with everything traded online; the 'retail apocalypse'.

While being an unlikely dystopian scenario, the 'retail apocalypse' was dramatically turned into reality when cities went into lockdown to combat the COVID-19 pandemic. As the US re-embraced science and democracy after the end of Trump's presidency, there are fewer doubts that the country would emerge from the pandemic. However, the deepening penetration of digital technologies into people's everyday life during the pandemic, where online retailing is arguably at the forefront, is likely to continue, leading to what some called the 'digidemic'.

While many brick-and-mortar stores struggle amid the rise of online retailing, exceptions exist. Apple store has become one of the most profitable retail spaces in the US. It offers various kinds of experience, from the touch-and-feel, to a sense of user-community, and the latest 'town square' experience. These experiences are seamlessly integrated with online retailing (Apple.com) so that each Apple store generates revenues well beyond its in-store sales. Apple store strategically joins iconic shopping centres in a metropolitan area; it can be considered a key indicator for resilient shopping centres.

There is, however, a lack of urban planning/design research investigating the ways that socio-spatial forms of shopping centres could be adapted to online retailing. Economists and the shopping centre industry have widely discussed the impact of online retailing on shopping space; they identified a shift of focus in the contemporary shopping space: from 'price' to 'experience' (Singleton et al., 2016; Dolega et al., 2019). A few urban planning/design studies linked the current shopping experience to the urban sense of place (Rao, 2020; Weltevreden and van Rietbergen, 2009), yet this viewpoint requires empirical tests.

This research seeks to explore the key socio-spatial forms of shopping centres that could be adapted to online retailing, examining whether the trend of morphological changes in contemporary shopping centres is towards the urban experience. All shopping centres with an Apple store in the US, a total of 269 examples (as of March 1st, 2021), are selected for a typomorphological analysis. Typomorphology is an emerging urban design research method for unravelling complex socio-spatial changes/forms of city space (Moudon, 1997) and is therefore suitable for this research.

There are two key preliminary findings. First, most of the selected shopping centres are synergies between the main street, shopping mall, and power centre, indicating that a mix of retail types may foster resilience. Second, most examples of retail synergies embody malls or power centres emulating the socio-spatial form of the main street. Thus, this research confirms that the trend of morphological transformations in current shopping centres is towards the street/urban experience.

There are important implications for practice. Retail planning should be more open to dynamic socio-spatial forms of shopping centres while reducing its dependency on a static retail hierarchy and typology. Retail planning should also focus more on mediating the conflicts between the curated urban experience for profits and the urban public life.

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Key Words: Shopping Centre, Online Retailing, Apple Store, Typomorphology, Resilience

## USING GOOGLE STREETVIEW IMAGES TO EVALUATE THE ROLE OF BEAUTY IN TRANSPORTATION PLANNING

Abstract ID: 64

Individual Paper Submission

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This presentation will explore the relationship between perceived beauty and transportation policies. A convolutional neural network was trained using a dataset containing beauty perception scores for Google Street View images taken in Boston, MA, generated by Raskar et al. (2015). The beauty perception scores of Montreal and Toronto were then generated by applying the trained neural network to Google Street View images of coordinates in those two cities. We used cross-sectional datasets that included both beauty scores, transportation policy variables, and a set of control variables to estimate probit, logit, and linear regression models by regressing the beauty perception scores on the rest of the variables. We then observed the direction, magnitude, and statistical significance of the coefficient estimates associated with the policy variables across all regression models. Based on the transportation policies we studied for the past decade in Montreal and Toronto, our findings show that the census tracts with lower beauty perception scores were mainly the locations targeted with transportation investments by planners. The study adopts Google Street View images as a novel data source for evaluating recently completed and on-going transportation policies, which makes a methodological contribution to the analysis of transportation planning and extends planning insights to consider the beauty perception of the built environment as a factor in policymaking.

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Key Words: Google Street View, Transportation policy, Machine learning, Canada

## BLACKLIGHTING URBAN DESIGN: RECONSTRUCTING PUBLICNESS AS BLACKNESS IN PHILADELPHIA AND LOS ANGELES

Abstract ID: 114

Individual Paper Submission

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Since the late twentieth century, postindustrial American cities' have worked to re-make themselves into beacons of cultural capital. Spurned by New Urbanism (Appleyard and Jacobs, 1987), sociocultural assets like neighborhood retail, art galleries, and waterfronts are cast as desirable characters in this postmodern urbanist fantasy and "re-theorising" of public realms (Carmona 2015). While tolerating the perennial social justice critiques, few urban design theories and practices have actively incorporated and systematically preserved public realms of Black heritage as valuable. In this paper, I ask: what if Blackness mattered to urban design's public function and forms? How do Black urban actors perceive and steward public space? By comparing separately conducted mixed-methods qualitative studies of cultural planning in two large urban cities with historic Black populations – Los Angeles from 2016-2019 and Philadelphia from 2019-2021– it reveals ongoing (missed) opportunities to reconstruct Blackness in/as public space. In Philadelphia, it focuses on a subset of Black residents with memories of the Delaware riverfront amid Philadelphia's pursuits of nearly \$500 million for connectivity projects, a chance for urban maritime design and creative placemaking to be in conversation with Black Philadelphian history. In Los Angeles, the focus was on Black small business owners and artists in a historic neighborhood in the Crenshaw district of South Central amid Metropolitan Transportation Agency's deployment of a light-rail line in 2020. Both evince Black ecopoetics – Pan-African senses of place and relations (Glissant 2010) – in unique yet related ways.

In Philadelphia, the paper finds that the aims of inclusive design ambitiously pursued in the participation process may still reproduce forms of injustice due to politically advantageous historical amnesia from white elite stakeholders. The case locates three contemporary and historical associations that represent a broader life cycle beyond the short-term "connectivity" and "access" framing of the planners eliciting participation. Specifically, this paper shines light through three specific Black relations to the riverfront: 1) spectacle, 2) sugar industrialism, 3) slavery – which persist despite a failure by several public-private actors to spatialize most of these meanings into the design strategy. This Black globalized sense of place exists, even in the absence of a localized formal claim to property rights, on the waterfront. Los Angeles offers an exceptional profile on the surface: Leimert Park, a historically Black retail corridor assembled in the wake of 1960s' suburban white flight by artistic merchants and property owners who have re-designed the identity as a Black creative "mecca." Their cultural and economic vibrations are seen and felt in community institutions: Destination Crenshaw, People's Plaza, Drum Circle. However, in welcoming transit-oriented development, property-based placemakers are challenged by machinations of gentrification and succession planning. I find that Black designers are learning how to balance cultural commerce with stewarding sociality, long-term management, and environmental justice: an improvisational form of Black spatiality.

Together, my findings call for conceptual reconstructions in urban design to recognize Blackness' importance in public realms. Whether it's an absence of property rights to draw upon or struggles to maintain ownership amid resurgent investment, I find that neither "placemaking" or "place-keeping" operationalizes the liminal forms of place attachment found in Black Geographies. I offer a new term as a bridging concept to validate the existence of a prismatic spectrum of needs and intentions among everyday actors who steady place identities. The work raises concerns and needs for a critical accompaniment of the "interdiscipline" of Black Studies and Black Geographies in design education to be meaningful for Black people and refuse the placeless "distemic space" polluting cities' gentrifying urban landscapes (Greenbie 1976). Cultural histories can be translated for planning scholarship to render environmental justice both authentic and beautiful.

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Key Words: Black Geographies, Planning theory, place making, heritage, resilience

## THE MAKING OF VOLUMETRIC HONG KONG: THREE-DIMENSIONAL PEDESTRIAN NETWORK AS THE CRITICAL WALKING INFRASTRUCTURE

Abstract ID: 190

Individual Paper Submission

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A three-dimensional (3D) pedestrian network is crucial for Hong Kong. Government authorities, international consulting firms, and urban designers love to talk about walkability. However, when it comes to the high-density city, unfortunately, their analyses are hardly convincing. Besides miss-conceptualisations of walkability for Asian contexts, usually, from European and North American experience, they also use inaccurate data. Pedestrians walk on the 3D networks, such as the footbridges and undergrounds. But since the city did not have such data in the past, people use road network as a substitute.

In this paper, first, I deliberate how a continuous 3D pedestrian network constitutes an entirely different urban morphological spatial hierarchy compared to a two-dimensional city because of the footbridge system, underground connected with metro stations, and paths connected with mall developments. I argue that high-density adds to a good city form only if the city elements are well connected for pedestrian movement. The connection is conceived, physically, as a 3D pedestrian network, through which the interplay of density, concentration, complexity and verticality becomes possible to produce a high degree of urban intensity.

Second, I show how we mapped the 3D pedestrian network of Hong Kong from 2016 to 2019. Our 3D pedestrian network model in GIS classifies segments into 23 categories with multi-height levels, such as sidewalk, footbridge, underground, crosswalk, ramp, and rooftop paths. The network is over 8000 km, which is 2.4 times in length and 8.5 times in link size greater than the road network (Sun et al., 2019). During the mapping, I visualise how all independently operated urban systems connect to and comply with each other at different levels, and how public space has not been shaped by a prescriptive design code but rather by a consensus reached by a variety of stakeholders.

Third, I present a few analysis to demonstrate how the network makes a striking difference in walkability evaluation compared to road network. A connectivity comparison through a betweenness measure reveals striking differences between the two networks and indicated that footbridges and underground links could enhance walkability when they are well connected with the ground-level networks. A walkability scoring (Zhao et al., 2020) evaluation would show a serious underestimation if use road network as substitute, and streets were considered twice as walkable if rated by pedestrian network.

Last, I present a few local cases in the making of volumetric Hong Kong in which I demonstrate how the interaction is greatly benefited from on staircases, escalators and elevators that allow for movements between layers both

above and below ground and transfers between interior and exterior networks, horizontally and vertically. Volumetric development is a highly compressed and internalised city form through highly connected buildings and their spaces (Bruyns et al., 2020). It is the 3D network that facilitates interaction and vibrancy by integrating a diverse set of sectors in a volumetric way.

The pedestrian network provides us with an angle to investigate the city and to decipher spatial relationships and design rationales. Unpicking it will give clues to other high-density cities in Asia and elsewhere about how to better connect up multiple levels, neighbourhoods, groups, and land uses through the urban design lens.

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Key Words: Pedestrian network, Walkability, High density cities, Asia

## **TOWARDS COOPERATIVE, PARTICIPATORY, AND SUSTAINABLE STREET DESIGN: A CASE STUDY OF POLICY CHANGES IN SHANGHAI**

Abstract ID: 318

Individual Paper Submission

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The street is a key urban public space for residents. With the increasing socio-economic conditions of residents in Chinese cities, the improvement of urban landscape and public space through street design has attracted much attention. However, the streetscape consists of multiple dynamically changing socio-spatial elements and embodies multiple stakeholders. How to build a consensus between multiple parties and effectively implement the street design is a key and challenging topic for contemporary urban planning and design.

First, the street space includes multiple spatial elements such as architecture, greening, and municipal infrastructure. In China, the municipal departments for these spatial elements are different, including planning, housing administration, transportation, city appearance and environment, public health, and so forth. These departments often initiate street design from their respective perspectives, often without an overall consideration. Also, there is often a lack of communication and cooperation between departments. As a result, street design is often difficult to be implemented in a sustainable way. In addition, the streetscape improvement involves multiple stakeholders such as property owners, shopkeepers, local residents, and the government. Due to their different perspectives, the difficulty in planning, coordination, communication, and cooperation is escalated.

The planning and design of streetscape in China has gone through three stages in the recent two decades: First is to demolish illegal constructions and eliminate buildings with safety hazards (the street regeneration stage). Second is to prepare street design plans and establish government-led management (the street beautiful movement). Third is to prepare detailed street design guidelines and foster cooperative, participatory, and sustainable street design centered on community governance (the consensus building stage). The first author of this article has directly



participated in the development of street design policies and practices in Shanghai, from the one of the leading planners initiating the street design policies in 2007, to a key street designers in 2015 and one of the first community planners in 2017. Her rich urban/community planning and street design experience provides rare first-hand insights to this research. Using the city of Shanghai as an example, this article reviews street design policies and plans since 2007, categorizes the development stages, identifies the evolution of street design modes, and reflects the issues and challenges of street design. This research, in particular, focuses on the core area of the previous Shanghai French Concession (area 4.4Km<sup>2</sup>, 31 historical streets).

This article summarizes the evolution of the Chinese street design regime: from top-down governmental control to community-based co-governance between multiple stakeholders. This article also highlights two core elements for cooperative, participatory, and sustainable street design. One is to build a participatory planning regime with a strong consensus between various municipal departments (e.g., planning, transportation), business, and residents on promoting street design. This can be done by recruiting community planners and professional design teams to generate comprehensive, holistic, and detailed street design and guidelines. Second is to rely on the local community to scrutinize and tackle the dynamic changes of streetscapes. Here community planners should play a key role of coordinating the implementation of street design guidelines in specific projects.

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Key Words: urban design, urban management, community governance, community planner, urban revitalization

#### **PRESERVING MODERNISM AT THE URBAN CORE: A CASE STUDY OF THE DECLINE AND RESURRECTION OF LAWRENCE HALPRIN'S MANHATTAN SQUARE PARK IN ROCHESTER, NY**

Abstract ID: 344

Individual Paper Submission

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Destruction of landscapes designed and installed during the modernist era (early 1950's to late 1970's) are endemic in contemporary planning practice. Since the stark brutalist forms are often blamed as contributory to urban decline, their removal and redevelopment is declared the solution. Manhattan Square Park (now Martin Luther King, Jr. Park) in Rochester, NY offers an example of a city that elected a different option. In restoring their modernist landscape, they sought to renew the urban core through celebrating the moment the city embraced modernism as a statement of urban innovation.

In 1971 the City of Rochester hired landscape architect Lawrence Halprin to design a signature statement in their urban core. Halprin's Forecourt Fountain (now the Ira Keller Fountain) in Portland had just opened in 1970 to widespread positive media attention. City officials throughout the United States clamored to possess the haute couture of civic urban centers; a Halprin fountain. With ambitions to rival New York City as a center of commerce

and the arts in New York State, Rochester chose the name Manhattan Square Park to reflect its aspirational goal. Completed in 1976, the park achieved its purpose as a space of active civic engagement. Performances, impromptu gatherings, and organized sports venues inhabited the park. The large abstract Halprin fountain and space frame served as focal points for the activities.

Two decades after installation the city suffered decline and a subsequent disinvestment in the urban core. In 1990 the fountain fell into disrepair and was shuttered. While use was minimal, positive moments of site engagement persisted. Gaping concrete walls and empty space invited both impromptu urban graffiti and a city sanctioned participatory community mural. An underground parkour group found the brutalist concrete forms perfect for their athletic urban gymnastics. In fact, they became stewards of the site and revered Halprin, claiming him as a “Parkour Architect”. And rather than destroy the failing derelict space, the city elected restoration. The plaza was rebranded as the Martin Luther King, Jr. Park, and on July 4, 2017, after a 1.2 million-dollar investment, the fountain was turned back on.

Understanding the life-cycle process of this modernist centerpiece in Rochester details the mixed legacy of urban renewal, the complexity of modernism in urban places, and how one community elected to transform and restore their modernist gem. Reviewing the redevelopment effort is key in understanding how a period design can maintain relevancy through the restoration process.

Through an in-depth examination of the urban life cycle of this space the analysis and investigation reveal significant findings germane to reinterpretation of historic public space design within a continually evolving context. Mixed-method methodology for this research includes: Archival investigation; Interviews with involved planners, designers, and engineers; Participant community site observation mapping and interviews; Visual design analysis; and Visual documentation of the restoration process.

Creation and destruction are continual cycles in urban evolution. While this story is of one place within one city, it can serve as a guide to other cities contemplating the best actions to take to either preserve or dismantle significant designed landscapes, and how it can impact urban growth or decline. This investigation also documents and interprets how the significance of community memory and designed landscapes are key in determining urban change or preservation.

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Key Words: Urban, Renewal, Modernism, Preservation, Health

## MULTI-APPROACH URBAN DESIGN PRACTICES SLOWING DOWN NEGATIVE IMPACTS OF GENTRIFICATION: CASE STUDIES OF CHICAGO'S 606 TRAIL AND NEW YORK'S HIGH LINE PARK

Abstract ID: 413

Individual Paper Submission

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While the advent of modern urban design brought new possibilities in terms of mobility of goods, people, and the provision of amenities, it has also had numerous documented negative impacts on communities. The lack of social coherence and a diminished sense of place are understood to be the symptoms of the death of urban space. The modernist approach defines the urban space as an engineered social product. The social engineering approach has led to continuous negative impacts on the vitality of daily flux, social and spatial amnesia by demolishing the built environment, and a sort of urban decline of communities such as the Pruitt-Igoe which is a prime example of modern urban design failure. This form of urban approach can be traced back to the modernist architect Le Corbusier, who laid the blueprint for demolishing high-density urban areas and old buildings in his bid to escape the unsustainable urban environment (Gehl, 2010). This paper identifies a new position in understanding and approaches the city. Cities are inexhaustible and contain so many overlapping and interacting meanings related to visual qualities, perception, sense of place, and public realm that they are never reconciled into a single understanding. Gentrified urban space is thus inherently a contested field (Urry, 1995; Freeman, 2006). In this study, the combination of multi-angled urban design approaches including tactical urbanism, everyday urbanism, and landscape urbanism approaches are highlighted to create a socially coherent and diverse built environment (Kelbaugh, 2001; Chase et al., 1999). The multi-design approach delineates the physical domain of everyday activities in urban spaces as the connective tissue that binds the social activities together while contributing to the emergence of creative activities and relations strengthening the social and economic coherence of urban space. By taking into account the multi-approach urban design, this study raises these research questions:

What is the relationship between gentrification and urban design approaches?

How can the multi-approach urban design process influence gentrification practices?

Why does gentrification need to be reformulated? In this study, we researched the triangulated interaction of the multiple effects of urban design practices on social, spatial activities, and ipso facto ripple effects on the built environment. From this perspective, we focused on two recent urban projects: the Bloomingdale Trail (entitled the 606 Trail), Chicago, and the High Line, NYC. These projects are effective in providing the functional support necessary to create a socially cohesive space and a sense of community to neighborhoods within a 15-minute walking distance. In the meantime, these projects are socio-spatial icons of transition from the modernist urban designs to the multi-approach urban design practices encouraging ipso facto creative urban practices. Thereby, this study aims to extract and map the visible and invisible social and spatial actors, relations, and activities working together and creating a built environment of these urban projects. The analysis includes two steps: 1) mapping of social and cultural activities (passive and active participation), and spatial land-use zoning, using daily online news sources (Media Content Analysis), and secondary geospatial data, and 2) surveying of the literature for investigating theoretical frameworks of urban design practices. The results have shown that several social, spatial actors and measures, such as awareness, resident-led approaches, and multi-functionality shaping urban space makes it socially resilient to external interventions (e.g., profit-based gentrification projects) (Gehl, 2010). Further, an integrative design framework is suggested to reduce the negative impacts of gentrification, such as racism and gender inequality. In the meantime, this study identifies a design approach to the conversion of the non-utilized railway lines. This study represents zones of social and spatial transitions with the new social arrangements.

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Key Words: Multi-approach Urban Design, The 606 Trail Chicago, The High Line NYC, Gentrification, Media Content Analysis

## HOW CAN A TRADE-OFF METHOD WITH APPLIED CONNECTIVITY ANALYSIS CONTRIBUTE TO THE DESIGN AND PLANNING OF LARGE URBAN PARKS?: YONGSAN PARK IN SEOUL, KOREA

Abstract ID: 420

Individual Paper Submission

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Since the development of empirical research methods for urban environments, urban planning processes have actively used empirical approaches to improve urban project and policy development. However, the urban park design and planning process still uses the conceptual research approach, which generally involves a designer's abstract ideas and philosophical concepts. Because the conceptual research approach is based on the designer's interpretation of urban environments, discrepancies often arise between the designer's intention and real phenomena. In this work, we examine and propose a trade-off method for urban park design and planning that integrates a connectivity analysis, specifically for the Yongsan Park master plan. Yongsan Park is a mega-scale urban park project with a unique history as a military post-industrial site that has been in development for a long time. The park site is in the center of Seoul Metropolitan City, but it has been isolated and untouched as the surrounding neighborhoods have evolved. To re-link the park site, a former military enclave, to its urban context, connectivity is a key issue in park design and planning that will affect park visitors' behavior, utilization, and visitation. Therefore, the urban connectivity of the park requires careful consideration both conceptually and empirically during the design and planning process. We used the spatial network analytic methods of accessibility and centrality to empirically investigate the potential visit load for the park at the pedestrian level proposed by the park master plan. Then we used statistical analysis to understand the causal relationships between park accessibility and built environment factors. The results indicate that (1) office and community facilities are the only factors that can substantially increase park visitor demand based on the current park master plan; (2) the park entrance location or hierarchical order should be updated to properly reflect the designers' and planners' ideas about the project; (3) an iterative process is needed between conceptual design ideas and empirical connectivity analyses, as in the proposed trade-off method, to improve the long-term outcomes of large urban park design and planning in the city; and (4) the trade-off method also provides insights that can improve the urban planning strategies for nearby neighborhoods to enhance park connectivity and potentially contribute to the park management phase.

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Key Words: Urban Design and Planning Progress, Green Accessibility, Park Visit Demand, Urban Park Master Plan

## **STREET EXPERIMENT PLACE-MAKING IN AN ASIAN HIGH-DENSITY CITY: WHY POSITIVE FEEDBACK DOES NOT PROMISE LONG-TERM CHANGES?**

Abstract ID: 423

Individual Paper Submission

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Street experiment is a quick and low-cost way to test out urban design ideas. It has gained popularity among European and North American cities in the recent decade for its flexibility and room for innovation. Project-based studies have shown increased physical activity, enhanced neighborhood relationship and other positive benefits brought by street experiments (Bertolini, 2020). However, this kind of activities is not yet prominent in Asian high-density cities. Reasons could be that underlying issues are different between the Asian and Western context. Room for experimentation is limited in high-density cities, as spaces are sought after by private developers, and the economic value often precedes public interest. There is also a lack of citizen initiative in community development (Cheung, 2011). The official urban planning agencies take the role of decision making, and the public is there to be informed. Only in recent years did citizens start to demand better public spaces (Rossini, 2019).

While the street experiment is praised for its short-term efficiency, its long-term influence is limited in the Asian context. In Hong Kong, a known Asian high-density city, NGOs had tried temporary pedestrianization, installation of ground-level pedestrian lights, and re-purposing of parks to be all-user friendly. However, only the park re-purposing was partially adopted and scaled-up by the government. There has not been an existing study on government adoption mechanisms in Asian context, where civic engagement is different from its western counterparts. A study on the low adoption rate is needed to maximize the social impact of future experiments.

This research aims to investigate the outcomes and problems of street experiment in an Asian context through a year-long project conducted in Hong Kong. The project was located in a school zone within a densely populated neighborhood, Sham Shui Po. A local NGO led a series of public participatory workshops to devices prototypes to address the pedestrian-vehicle conflict and provide a large open space for nearby families. They tested out the prototypes during a three-day pedestrianization of a parking street, and the neighborhood welcomed their event. The project preparation started in late 2019 and lasted one year due to interruptions by the covid-19 pandemic, and the implementation took place for three days in mid-November 2020.

The research methods include field survey, direct observation and semi-structured interviews. Prior to the experiment, the researchers conducted pedestrian counting around the site, a two-street-block school district, at different times frames of the day. Videos and photos were taken to supplement the documentation. This survey provides an understanding of the normal traffic flow in the area. During the experiment, the researchers documented participation size and activity types. This is crucial to the understanding of residents' actual preferences in the real-world setting. Interviews were also taken from event participants and pedestrians to learn their opinions on the experiment. Shortly after the experiment, interviews were conducted with stakeholders, including the project team, school representatives, and government officials. The multifaceted views would help draw suggestions for improvements.

The study's expected results include the contribution of the participants to the experiment, the degree of satisfaction from different stakeholders, and the challenges of actualizing design prototypes and converting short-term projects into long-term changes. The results of this study will contribute to the existing literature by discussing the mechanism, difficulties, and opportunities in implementing a street experiment in a high-density city under an Asian context.

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Key Words: Street experiment, tactical urbanism, place-making, community development, volumetric city

#### A GLOBAL PERSPECTIVE ON MURAL POLICIES: RESULTS OF AN INTERNATIONAL SURVEY

Abstract ID: 482

Individual Paper Submission

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In recent decades, murals have become a common phenomenon in urban landscapes, acting as a major avenue for public expression and reflecting and influencing the city's social, political, cultural, and aesthetic values (Halsey and Young 2006; Iveson 2010). They are markers of identity and can provide benefits to individuals, communities, and cities. Some murals are created sporadically (or insurgently), while others are carefully promoted by the establishment. Because of their artistic character, location, and public exposure, murals incorporate tensions and contradictions that present many challenges to policymakers, owners, and those involved in their creation. Furthermore, unsanctioned murals, created without permission, are considered by many municipalities to be chaotic and threatening, leading cities to develop an ambivalent approach towards murals in general. In addition, murals confront the planning system and city governments with questions regarding ownership, rights, and control.

With the global shift towards cultural planning, cities around the world have been adopting (or coopting) murals as an acceptable element in their municipal toolkit, crafting mural policies that focus on facilitating and managing of mural artwork in the public domain. While a plethora of studies exists regarding murals and public art in general, their policy aspects have been somewhat neglected by the literature. Furthermore, studies that directly relate to mural policies usually focus predominately on specific topics or focus on specific cases. Only few scholars, however, undertook analysis of mural policies in a broader comparative context (Halsey and Young 2002; Young 2013; Sheldon 2015). Moreover, to my knowledge, there are no scholarly contributions that map mural policies, nor provide an overarching global view of the way cities react to, conceptualize, and regulate murals.

This paper seeks to fill-in this gap. In it, I will present results of an international survey that included 119 cities from 40 countries across five continents regarding their mural policies. The data in this research were obtained through an internet-based survey which applied a structured questionnaire. The survey was disseminated during the spring

of 2020. The structure of the questionnaire is based on a comprehensive literature review on mural policies and regulation previously conducted, data obtained from semi structured interviews, and a pilot questionnaire administered to 14 artists and mural experts employed by governmental and non-governmental agencies.

The paper will present the result of this survey, focusing on key questions. Additionally, it will present a cluster analysis conducted on the data using a k-means method. This analysis shows how cities around the globe can be divided into sub-groups on the base of their similarities.

An example of an interesting finding from the survey is that although the majority of respondents indicated that unsanctioned artworks are always or sometimes criminalized in their city, when asked if unsanctioned murals were generally tolerated, a different picture emerged. Only 26% of respondents answered that unsanctioned murals are not tolerated in their city. 36% noted that unsanctioned murals are generally tolerated and additional 28% indicated that unsanctioned murals are tolerated in certain neighborhoods or areas, or in specific sites. These figures indicate that in many cities there is an interesting gap between the ‘formal’ approach which criminalizes certain artworks and the ‘informal’ disposition, which is more tolerant, at least on the face of it. This gap may be attributed to a range of factors, such as political awareness to the importance of insurgencies in the city, or – alternatively- enforcement considerations (prioritizing and lax enforcement).

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Key Words: mural, street art, culture, policy, survey

#### **CAPTURING THE EPHEMERAL LINKAGES BETWEEN SPATIAL AND SOCIAL STRUCTURE: A STUDY OF EMAIL COMMUNICATIONS AND SPATIAL RELATEDNESS ON THE MIT CAMPUS.**

Abstract ID: 488

Individual Paper Submission

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How does urban spatial structure affect social structure among its users? This question has fascinated planners and sociologists alike, but remained elusive to careful examination due to lack of spatialized data on social relationships. Here we present the results of a study conducted on the MIT campus, where we used an anonymized dataset of e-mail communication of faculty and researchers to examine how spatial relationships between researchers’ offices can impact the likelihoods of social ties (in the form of email communication) between them. Our analysis finding suggest that spatial structure affects social ties in at least three distinct ways—i) people whose offices are within a closer walking distance from each other are more likely to exchange emails with each other, ii) people who are more likely to walk past each other’s offices on the way to or from work, are more likely to exchange emails with each other, and iii) people who share access to similar eating venues around their offices are more likely to exchange emails with each other. These relationships remain significant after controlling for relatedness and size of departments and centers where they work. However, two mitigating factors also impact the spatial-social tie formation. First, the existence of social ties is negatively affected by crowdedness—if encounters with each other’s

offices occur at more crowded locations, chances of communication are reduced. Second, indoor corridor connections between offices lead to higher rates of social exchange than outdoor connections on the MIT campus. Email communication is more likely if researchers are connected along MIT's renowned "infinite corridor" network than if the physical connection between them requires crossing a courtyard or other outdoor space. We hypothesize that the campus offers a microcosm of built environments where similar spatial mechanisms may operate at a larger scales with more complex interactions.

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Key Words: social networks, spatial networks, campus, social ties, email

#### **WHOSE SPACE IS PRIVATELY OWNED PUBLIC SPACE? EXCLUSION, UNDERUSE AND THE LACK OF KNOWLEDGE AND AWARENESS**

Abstract ID: 493

Individual Paper Submission

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Privately Owned Public Space/s (POPS) refers to physical space that is owned and managed by private owner but is dedicated to public use and enjoyment. While the provision of POPS has become a popular mechanism to increase provision of public space, particularly in densely built-up urban areas, the quality of POPS has been called into question. Two problems that are often mentioned in the literature are exclusion and underuse. Several attempts have been made to increase the inclusiveness and liveliness of POPS, and solutions are often found in design aspects, i.e. the provision of essential amenities and high accessibility. This research questions whether well equipped and highly accessible POPS are indeed inclusive and lively.

A research was conducted in Seoul – a highly populated and densely built city with a population of over 10 million. In an effort to provide public space, a POPS program was introduced and it is now a popular means of providing public space in the city. Within the city, a case study area along the Teheran-ro was chosen for two reasons: 1) the area has a high number of POPS; and 2) the area is part of mixed-use neighborhood that is busy during both the day and night, full of people from different groups, such as office workers, pedestrians, residents and school children. Twenty POPS within the case study area were visited and their design analyzed. In addition to field visits and observations, a survey with 68 actual occupants of POPS was carried out to gain a better understanding of their use. A survey was also conducted in the neighborhood to see how POPS are perceived and if they fulfilled their role as public spaces. The survey involved 93 pedestrians, 107 residents and 476 schoolchildren – they are the ones constantly present and thus regarded as potential occupants of POPS. Furthermore, the research involved semi-structured interviews with eight experts including public sector planners, an architect, a scholar, a member of non-profit organization and a building manager.

The result of empirical work suggests that POPS can still be exclusive or underused even though they are well-



equipped and highly accessible. This paper argues that the problem of exclusion and underuse is not simply due to the lack of amenities provided or inaccessibility. Instead, it is, in the first place, due to the lack of knowledge about POPS and then the lack of awareness that they are public spaces. Hence, more should be done than just improving their design. Two suggestions are made here. First, the city policy regarding the use of POPS should be promoted further by lowering the threshold for getting a permit. Second, I recommend more engagement of various stakeholders with POPS. Engaging various actors would increase the inclusiveness and use of POPS as the public start to know what POPS are and what rights they have in regard to POPS. Through such engagement, they would feel more responsible and this might increase the quality of POPS as the public become more active in monitoring them. The more their demands are fulfilled, the more people will become involved, and the stronger the civic life will be. The establishment of a civic organization could help further, as it would connect all the relevant actors, encourage their engagement with POPS, and thereby promote the use of POPS.

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Key Words: privately owned public space, hybrid space, co-production, public space governance, public participation

### **DESIGNING DHAKA'S ADAPTATION REGIMES: CLIMATE CHANGE, URBANIZATION, AND THE ROLE OF DESIGNERS IN REMAKING WATER MANAGEMENT IN BANGLADESH'S CAPITAL**

Abstract ID: 504

Individual Paper Submission

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Dhaka, the fast-growing capital of Bangladesh, is frequently included on lists of the global cities most vulnerable to climate change. In recent years, infrastructure investments and land use planning for the capital region have often been framed as adaptations necessary to counter present and projected climate vulnerabilities. Design professionals are increasingly included alongside state engineering bureaucracies and international development institutions in advocating for massive investments in water management infrastructure to enable urban expansion and to protect already urbanized areas from flooding.

This paper examines the role that design professionals (urban designers, landscape architects, and architects) have come to play in Dhaka's evolving "adaptation regimes," the coalitions of actors shaping "the landscape of possible intervention in the face of climate change" in the city (Paprocki 2018). The paper is based on analysis of documents from historical and ongoing flood infrastructure and planning projects, along with interviews with over 80 participants and observers in recent projects. Drawing on these sources, the paper examines how designers shape Dhaka's adaptation regimes in ways that are simultaneously linked to global networks of "urban environmental project making" (Goh 2019) and rooted in Dhaka's place-specific and historically-contingent processes of infrastructural modernization and urbanization.

Since the end of the colonial era, Dhaka's flood planning and infrastructure have been shaped by shifting coalitions of domestic water engineering and planning bureaucracies and international contractors, donors, and lending

institutions. While some recent Dhaka flood protection proposals, including those put forward by a state-linked Chinese engineering and construction firm, are broadly in keeping with 20<sup>th</sup> century models of Promethean infrastructural modernization (Kaika 2004), advocates of Dutch “delta planning” present their projects as a new paradigm. Promising a novel approach to ‘living with water’ and ‘designing with nature,’ many of these efforts prominently feature design professionals and design methods (Meyer 2014). In spite of these bold ambitions, many of these design-supported efforts actually seem to recycle strategies and, in some cases, whole projects from earlier problematic eras of flood control in Dhaka. The paper closes by identifying three specific mechanisms by which designers contribute to climate adaptation “antipolitics” (Swyngedouw 2010). The Dhaka cases illustrate how designers can wittingly or unwittingly revive long critiqued water management strategies and obscure uneven costs and benefits by invoking: 1) existential urgency; 2) restorationist visions of harmonious relations between human settlements and landscape processes; and 3) promises of costless transformations in which everyone wins.

The paper makes two primary contributions. First, it places contemporary climate change-oriented flood infrastructure design in relation to historical processes of city making in Dhaka, a city that has seen relatively little international scholarly attention compared to other South Asian mega-cities. Second, it examines how the inclusion of designers and design methods in these processes shapes Dhaka’s adaptation regimes, advancing particular urban infrastructural futures while ignoring or obscuring other possibilities. The role of design in shaping adaptation regimes is an increasingly pressing concern as cities around the world look to designers to manage complex urban climate adaptation processes that can have profound and enormously inequitable impacts on the lives of city dwellers.

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Key Words: climate change, adaptation, flooding, urban design, Dhaka

#### **STREET DESIGN UNDER COVID-19: A CONTENT ANALYSIS OF STRATEGIES, GOALS, AND POTENTIAL FUTURES**

Abstract ID: 537

Individual Paper Submission

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Urban street design has been changing to better accommodate pedestrians and cycles and create better public spaces. Cities have improved cycling infrastructure, created new pedestrian spaces, and implemented “complete streets” and “vision zero” policies (Hess, Gregg, and Whitney 2019). The COVID-19 pandemic further accelerated these changes as cities sought to manage public space access and changing transportation needs. What was not immediately clear was what design strategies should be employed. Some officials advocated opening up roadways to pedestrians and cyclists to support physical activity and essential travel; others initially resisted these ideas as in conflict with public health goals of “social distancing.” Concurrently, advocacy organizations argued that the

reduced traffic allowed cities to radically rethink streets and permanently move away from auto-centric designs. Over the course of several months, cities experimented with a number of interventions that may have longer-term impacts on the design and use of streets beyond the period of the pandemic.

This paper uses content analysis of national news media sources to probe COVID-related street design strategies along with the rhetoric that accompanied them. We examine the range of design interventions, goals, perceptions, and discussions from the initial stay-at-home orders through the fall of 2020. We draw ideas from literatures on disaster recovery planning (Johnson and Olshansky 2017), policy mobilities (Peck and Theodore 2015), and path dependencies and critical junctures (Sorensen 2015) to consider the permanence of new ideas and how they may travel in a time of crisis. To do so, we coded some 150 articles for a number of themes including: the interventions implemented and how these changed over the time period studied; the stated goals for each; regulatory and procedural issues including public consultation; equity and public space concerns; and whether interventions were considered short-term or as intended to create longer term changes.

Our initial findings present a typology of interventions used. We then discuss four key themes: process and tactical response; gathering vs social distancing; mobility and challenging automobility; and public space and privatization. After an initial period of experimentation, cities converged on three major strategies: the rapid expansion of cycling networks with new bike lanes; the creation of “slow streets” to support socially-distanced walking, cycling, and other non-motorized activity; and programs that allowed restaurants to quickly establish outdoor cafés in roadway and sidewalk space to allow outdoor dining. Initially, cities were most concerned with creating space for social-distancing and expanding cycling networks, a strategy discussed throughout the study period. Towards the end of the period, attention shifted to street cafes and supporting economic activity, almost to the exclusion of other goals. Projects were largely unquestioned in terms of their top-down implementation with little public consultation, nor in terms of how they impact social equity and public space use. In many ways the pandemic became a testing ground to experiment with street design that has drastically altered the way cities allocate space for pedestrians, cyclists, and café uses. Some, but not all, of these changes will have longer term impacts but whether they will constitute a critical juncture is not yet clear.

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Key Words: Street-design, Public space, COVID-19

#### **STREET GREENERY INDICES: DEVELOPMENT OF ACTIVITY-FRIENDLY STREET GREENERY MEASURES AND ASSOCIATED ENVIRONMENTAL JUSTICE ISSUES**

Abstract ID: 538

Individual Paper Submission

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Urban green space is a critical public amenity that promotes physical activity, mental health and well-being, and social interactions (Astell-Burt et al., 2014; Thompson Coon et al., 2011). Easily accessible street greenery, including trees, grass, and shrubs, might have a higher potential to support active transportation, regular physical activity, and outdoor social engagement than distant public parks, especially for groups with limited mobility (e.g., low-income households, seniors, children, and people with disabilities). Besides the moral imperative to plan for these groups, U.S. law also includes provisions to support their needs. Specifically, the U.S. Environmental Protection Agency requires the fair treatment of all people regardless of race, color, national origin, or income to achieve environmental justice, and that fair treatment includes the provision of green space. Nevertheless, only a few recent studies have analyzed whether street greenery is equitably distributed across socioeconomic, racial/ethnic, and age groups (Choi et al., 2020; Nesbitt et al., 2019), and this is in part due to the lack of agreement about how to measure the quantity and quality of street greenery. In this study, we (1) introduce quantitative measures of street greenery qualities that might help promote physical activity, such as accessibility, connectivity, and a sense of enclosure, and (2) examine whether these measures vary by socioeconomic status, race/ethnicity, and age.

The study sites are neighborhoods of large urban areas in the lower U.S. West that display a semi-arid and desert climate with an extremely long and hot summer. The major source of street greenery is aerial images generated by the U.S. National Agriculture Imagery Program (NAIP). We use locally-identified Normalized Difference Vegetation Index (NDVI) values and road buffers to extract vegetation along city streets. To develop the street greenery index, street greenery is first measured in four different ways: Street Greenery Coverage (total street greenery per unit area), Street Tree Coverage (total street tree cover per unit area), Street Tree Enclosure (total length of street links enclosed by 25% tree shade density), and Street Tree Connectivity (total number of intersecting points between street links enclosed by 25% tree shade density). While the first two measures quantify overall street greenery availability in a neighborhood, the third and fourth measures capture the street greenery qualities (enclosure and connectivity) that might promote physical activity (Ewing and Handy, 2009). Finally, we build regression models to analyze whether the indices are associated with neighborhoods' sociodemographic (income, race/ethnicity, education level, age) and built environmental characteristics (population density, land use diversity, street connectivity, presence of sidewalks, park area density, neighborhood age). Preliminary analyses show that significant unjust patterns were found in terms of household income, educational levels, race, and ethnicity across all the four street greenery measures for the neighborhoods of four urban areas we examined, including Denver, Las Vegas, Salt Lake City, and Albuquerque. The unjust relationships were stronger for two indices—street tree enclosure and street tree connectivity—than the other two—street greenery coverage and street tree coverage.

This study sheds light on everyday greenery that can be easily accessed by a wide range of people, including those with limited mobility (older adults, children, people with low-income, and people with disabilities), who have been often underrepresented in planning practice. This quantitative measure of street greenery can provide a comprehensive perspective on whether urban residents have adequate green environments for walking and other outdoor activities in their neighborhoods. Moreover, the research findings help decision-makers to navigate areas for street environment improvement, public health promotion, and tree planting initiatives, such as the 4,000-tree initiative in Salt Lake City and the "Urban Forest Plan" of San Francisco.

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mental wellbeing than physical activity indoors? A systematic review. *Environmental Science and Technology*, Vol. 45, pp. 1761–1772.

Key Words: Street Greenery, Urban Green Space, Environmental Justice, Active Living

## **CHILDREN'S PLAY EXPERIENCE IN THE THORNCLIFFE PARK NEIGHBOURHOOD, TORONTO**

Abstract ID: 563

Individual Paper Submission

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Parks and playgrounds are now widely accepted as children's formal playspaces in urban areas. However, the way the public realm itself can offer informal play opportunities has been overlooked within planning practices. Previous research demonstrates that the availability of playgrounds does not necessarily guarantee their usability and functionality (Veitch et al., 2006). Furthermore, it has been argued that formal playgrounds alone do not entirely meet children's playing needs in urban environments (Hanssen, 2019). Therefore, it is important for planning to aim for play-inclusive public spaces that can serve both adults and children.

It is crucial to understand that play experience is not limited to what happens within the physical boundaries of parks and playgrounds (Hanssen, 2019). Children tend to play everywhere and under any circumstances (Walsh, 2006). However, different factors may impede their freedom of play outside of the designated playspaces. Among them are the risk of traffic interactions and strangers' danger as two important safety concerns frequently studied in previous research (Horschelmann & Van Blerk, 2012). This is while in the past year, the role of outdoor free play has become crucial for children after the provincial park closures in Ontario, Canada due to the Covid-19 Pandemic. However, social distancing measures and health concerns exasperate children's presence in the public realm. Providing informal play opportunities within the public realm is particularly important when it comes to dense urban areas with limited open spaces.

The overarching objective of this research is to understand how the public realm can provide play opportunities for children living in urban neighbourhoods. Drawing on a case study in the city of Toronto, the main question of this research is "what are the forms and qualities of children's outdoor play?" This study is also looking to understand "how the Covid-19 pandemic may have changed the quality, frequency, and range of children's outdoor play?" The challenge in answering these questions is that planning for a play-inclusive urban public realm can be very context-specific. Meaning that creating informal playspaces is, at least in part, related to the lived experiences of children and depends on the social and geographical dimensions of the area.

To closely examine children's play experiences in urban environments, this study uses online surveys to collect information about the play experiences of children between 7 to 12 years old residing in the Thorncliffe Park Neighbourhood, Toronto, Canada. Although located in mid-town Toronto and characterized by its smaller housing units and high-rise dwelling types, the share of children's population is relatively high (27%) in this neighborhood as compared to the city-wide percentage (15%) (Agrawal & Rutgers, 2014). Moreover, the percentage of immigrants living in Thorncliffe Park is 63% of the total neighbourhood population. This number is the highest among the neighbourhoods of a similar profile that are located in central Toronto (downtown and mid-town). Given the existing cultural diversity of the city of Toronto, this case study provides useful information regarding the correlation between children's cultural background and their informal play experiences within the neighbourhood.

Due to the Covid-19 pandemic and safety guidelines, this study had limitations in the choice of research methods. Online surveys are chosen over more interactive data collection methods such as in-person walk-along interviews with children to adhere to the "social distancing" guidelines. To validate the data collected through the survey questions a number of participants will be invited to virtual interviews to elaborate on their answers. The results of this study will inform future planning and design projects aiming for the creation of safe and quality playspaces for

children living in dense urban neighbourhoods. Furthermore, this study will create an understanding of how circumstances such as the 2020 pandemic can be considered in future planning practices that aim for child-friendly environments.

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Key Words: Outdoor Play, Child-friendly Planning, Urban Neighbourhoods, Public Realm, Social Distancing

### EXPLORING THE STRATEGY OF TRANSFORMING VACANT LOTS TO POCKET PARKS TO IMPROVE PARK ACCESSIBILITY IN CINCINNATI, OHIO

Abstract ID: 585

Individual Paper Submission

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During the COVID-19 pandemic since the spring in 2020, people around the world have been suffering from various activity restrictions. As these physical and mental restrictions increase people's need and desire for outdoor activities (especially doing physical exercise, relaxing, and getting close to nature) and social interactions, urban population's accessibility to parks has been greatly compromised since many urban neighborhoods do not have sufficient parks reachable on foot. In response, many researchers have advocated for attention to the once overlooked problem of lack of accessible urban green space for all social groups by focusing on walking-accessible parks, such as pocket parks (Honey-Rosés et al., 2020). Research has shown that quality pocket parks can contribute to the health and well-being of urban populations through multiple functions such as acting as a place for leisure activities and relaxation (Gibson and Canfield, 2016) and providing green outdoor exposure for psychological restoration. In addition, highly accessible pocket parks can serve as daily convenient recreational destinations for urban population, promoting physical activities of nearby residents and contributing to more social interactions and thus strong community sense (Nordh and Østby, 2013). Such benefits would remain and even get more evident during abnormal situations such as the COVID-19. Compared with large parks, the relatively small size of pocket parks gives them the advantage of making an easier fit into vacant properties scattered throughout the urban fabric to maximize their proximity to a variety of urban populations (Peschardt, 2014). The design of pocket parks can also be flexible to fit the surroundings and meet local needs.

In this study, we explore the feasibility and effectiveness of developing vacant lots into pocket parks as a solution to the problem of local park accessibility across Cincinnati, Ohio. Adopting the concept of geodesign in combining the creation of design proposals with impact simulations informed by geographic contexts (Geertman and Stillwell, 2020), our study includes three phases: knowledge-building phase, design intervention phase and impact assessment phase. In the first phase, we perform spatial analysis of the distribution of existing parks and their service areas to

identify areas with insufficient park resources for meeting local population needs and eligible vacant lots for developing pocket parks. In the second phase, after categorizing pocket park design types (facilities, green space and other amenities) based on the prioritization of needs from differential social groups in the study region, we will develop guidelines for site selection and pocket park design to effectively serve the surrounding neighborhoods. In the final phase, we will assess the impact of converting eligible pocket parks to the improvement of park accessibility.

Pocket parks are considered to have multiple merits and great potential in improving park accessibility in many studies over the years, and the current pandemic situation has drawn attention to urban green space and the importance of accessible parks for urban population's health and well-being. This research will provide a framework to evaluate the strategies of turning vacant lots into pocket parks to improve the urban park system by increasing local park accessibility to all urban population. Through applying the geodesign concept of combining strategic spatial analysis and context-specific pocket park design guidelines, we provide more actionable pocket park proposals for future development project that can benefit urban population during normal times and abnormal situations like the current coronavirus pandemic.

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Key Words: Pocket parks, Accessibility, spatial analysis, geodesign

#### **SOCIO-DEMOGRAPHIC CHANGES OF URBAN SPRAWL RETROFITTING PROJECTS**

Abstract ID: 688

Individual Paper Submission

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As a city grows, the population flows out of the urbanized area and forms a suburban settlement beyond the city boundary. These settlements are often scattered throughout big blocks, having low walkability and accessibility to amenities and services. This kind of development is referred to as urban sprawl. Urban sprawl negatively impacts the environment, society, and economy, decreases accessibility, and promotes car dependency. It also modifies a community's population structure by attracting or repelling specific groups or races. Urban redevelopment, as a response to sprawl, has received a great deal of attention. However, not many studies examine socio-demographic changes resulting from those redevelopment projects, often called sprawl retrofitting. This study will explore neighborhoods that experienced urban sprawl retrofitting projects to understand the impact of those projects on socio-demographic patterns.

We first collected sprawl retrofitting projects across the country. The projects were informed from several books (e.g., *Retrofitting Suburbia* by Ellen Dunham-Jones, *The Sprawl Repair Manual* by Galina Tachieva), academic articles, and websites (e.g., Congress for New Urbanism project database, the Town and Paper Traditional Neighborhood

development list). The criteria we used to define a sprawl retrofitting case were 1) it needed to have a previous use; while there are many examples of new developments built with sprawl retrofitting principles, they were not considered if there was no previous built environment use, 2) the new development must have a mix of uses. For example, public housing redevelopment projects were excluded if they remained residential-only community, and 3) to compare socio-demographic characteristics before and after the project, we had to limit our cases to those completed between 2000 and 2017, aligned with Decennial Census 2000 and ACS 2015-2019.

Sprawl retrofitting aims to modify the environmental quality of urban settings in a better way to increase the sustainability aspects of dispersed areas. Since any changes in physical attributes affect inhabitants, we can see demographic changes before and after every project. This research's primary purpose is to examine socio-demographic attributes of the retrofitted suburbia and examine its relationship to the physical status of sprawl retrofitting cases around the United States. We finally compiled a list of 75 projects in the U.S. and joined those with Census block-group-level data from NHGIS and LEHD. The changes in demographic status before and after projects are analyzed, and results are illustrated on maps.

Our study finds that as a result of a sprawl retrofitting project, a neighborhood became to have higher population density, higher gross rent, fewer renter-occupied housing units, and fewer older adults, compared with a comparison group (block groups near those study neighborhoods). Also, we observed a decrease in average time to work, implying improved job accessibility. Possible reasons include an improvement in walkability and public transit access and developments for a job-housing mix.

This study can help the future sprawl retrofitting research better understand the socio-demographic changes from those urban redevelopment projects. Planners can also apply the research findings to identify strengths and weaknesses in development projects, which improves demographic resilience and equity in a community.

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Key Words: Sprawl Retrofitting, infill development, socio-demographic structure, quasi-experiment

#### **DIFFERENTIAL INCLUSIVENESS: INVESTIGATING GOVERNANCE REGIMES STRATEGIES OF DOWNTOWN DALLAS SIGNATURE PARKS**

Abstract ID: 701

Individual Paper Submission

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This study explores some of the more current tendencies in the management of public spaces to consider whether current directions in downtown Dallas signature parks are driven by a desire to improve social inclusion and justice in such spaces. Also, the study benefits from the theoretical lenses provided by urban design and planning, political



feminist geography, and public administration scholarship and their differential views in conceptualizing and operationalizing just and inclusive management and control over public spaces. Lefebvre's theory of the production of space plays a foundational role in contextualizing the conflicts between contradictory ideas and ideals of competing interests.

This research benefits from a Social constructionist comparative case analysis on three publicly used signature parks deliberately selected in downtown Dallas representing different combinations of public/private ownership and management: (1) publicly-owned, publicly-managed; (2) publicly-owned, privately-managed; (3) privately-owned, privately-managed. The research methodology includes interviews with park managers and city staffs and content analysis of official documents, local newspapers, and social media accounts. I critically studied a variety of inclusionary/exclusionary strategies in different times, spaces, and events. Investigating these anecdotes and governance practices in public space challenges some long-held assumptions about privatization and the degree of inclusion in quasi-public spaces.

Throughout this work, I have discussed ownership, management, and use as the main contributing factors to our understanding and perception of publicly-used spaces. Still, I have focused on how governance regimes reshape the contestations between managers and other prominent stakeholders versus current and potential users to reveal whether a space is truly public. The documented governance regimes' attributes center around five general concepts, including privatization, commercialization, eventization, securitization, and representation, introduced as governance strategies. I have studied and evaluated how these strategies are handled and applied by those in power, including designers, managers, board members, and city officials.

Through numerous instances, this study has shown while undoubtedly significant to classify and analyze public spaces, private ownership and management are not as central as previous studies have shown. After scrutinizing and examining the three case studies, I argue it is difficult to claim a sharp conceptual distinction between the two realms of inclusive versus exclusive. The investigation of three case studies demonstrates that public space and social inclusion are rich, contestable, and not at all simple concepts, mainly because of the powerful structural element to the notion of social inclusion. Downtown Dallas signature park are simultaneously 'spaces of provision' and 'spaces of prescriptions,' and the users' experiences differ in the time-space-event continuum. Thereby, it is problematic to reduce the social inclusiveness value to a simple dichotomy of private versus public. Perhaps trichotomies like private-faith-based-public or continuums from less to more public across time, space, and events can better express the phenomenon.

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Key Words: Inclusiveness, Governance strategies, Signature public spaces

#### **OPTIMIZE THE HOSPITAL DESIGN TO REDUCE TRAFFIC CONGESTION THROUGH GENERATIVE DESIGN**

Abstract ID: 703

Individual Paper Submission

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Due to the lack of systematic science and moderately forward-looking overall planning and design, problems of parking difficulties and traffic congestion are common around large hospitals in China, which have affected the quality of health care service and urban mobility. Since many hospitals are currently located in urban places accessible to residents, it is not advisable to relocate them. How to balance the need of utilizing the limited land resources and mitigating traffic congestion is the key challenge (Ge et al., 2011). Therefore, the research question in this study is how urban planners and designers can help minimize the negative impact of hospital trips on traffic in surrounding areas. Most existing studies are qualitative analysis of traffic congestion outside hospitals to derive strategies without data and models to quantify their effectiveness (Wu, 2012). In order to fill this gap, this study quantitatively explores the dynamics between hospital design and the inbound and outbound traffic. Microscope traffic simulations are embedded in a generative design process to optimize the reduction of hospital traffic congestion during morning peak hours.

The design of hospital buildings and interior space is commonly in strict accordance with medical building design and construction manual. There is little flexibility to change the layout of interior space to tackle the traffic congestion problem. At the same time, the design of exterior entry space of hospitals is not supported with the actual flow data modeling and analysis. In reality, different sources of flows near hospital entrances are mixed, which is the major cause of traffic congestion around it (Ge et al., 2011). Therefore, there is room for optimizing hospital exterior design to reduce traffic congestion.

Generative design framework allows designers to leverage the power of computation to derive novel and high-performing design solutions based on a set of goals, which has been widely applied in the domains of industrial design and engineering (Nagy, Villaggi & Benjamin, 2018). Addressing urban design problems can significantly benefit from the generative design due to the complexity of problems and the consideration of multiple stakeholders. Some scholars have explored the artificial intelligence-based urban space generative design (Lin et al., 2019; Quan et al., 2019). In this study, the generative design process consists of two modeling components and an optimization component. Hundreds of design options are first produced through a parametric model with a set of predetermined site parameters by using Grasshopper for Rhino3D. The site parameters include hospital entrance locations, pickup and drop-off locations, and main spaces like parking lot, and pedestrian space. The non-hospital related traffic volumes on streets at existing and potential hospital entrances are set as constants. The performance of each design is then modeled against the design goal. The design goal of this study is to reduce traffic congestion at the hospital entrance, and we use PTV VISSIM to simulate traffic flow. Finally, a pool of top performing designs is compiled using a metaheuristic optimization search algorithm. Decision-makers select the final design from the pool for implementation.

This study will advance the understanding of hospital flow generations and the knowledge of optimizing hospital designs. This generative design framework can be used in new hospital design or modification of existing hospitals. We will show that hospital design can be optimized to alleviate the stress on urban traffic and improve the efficiency and quality of hospital services.

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Key Words: urban design, generative design, public health, optimization, artificial intelligence

## **AGE-FRIENDLY COMMUNITY PLANNING STRATEGIES BASED ON THE KOREAN SENIORS GPS TRACKING SURVEY**

Abstract ID: 714

Individual Paper Submission

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This study derived the Korean elderly's daily walking area and use of facilities and services through GPS tracking survey of the elderly's outdoor activities in their communities. The age-friendly urban welfare policies and projects were proposed based on the study findings.

First of all, the policies and cases of countries with the aging society were reviewed. This study found that the US, Japan, and major European countries strengthened the access to health welfare and convenience facilities and services within the range of the elderly's daily walking area. Korean policies for creating such the elderly access friendly so to be age-friendly built environment were insufficient, despite the emphasis on improving welfare services for the elderly. The analysis of policies and systems for creating an age-friendly built environment at home and abroad, this study derived implications for the necessity of strengthening the elderly's accessibility to facilities and services within the local daily walking boundary. In addition, it was confirmed that the necessity of demonstrating the daily life of Korean seniors in detail to reveal the characteristics of the elderly's daily walking area.

As the secondary spatial data analysis, using the Korea national geographic information map data, it was analyzed that the accessibility of major outdoor convenience facilities for the elderly within their local community boundary. This study found that the Korean elderly had to travel up to about 30% longer distance than the population of all age groups to use the outdoor convenience facilities in their local communities. Using the raw data from the Korea national survey of the elderly life in 2017, it was also found that the Korean elderly showed dissatisfaction with the lack of daily convenience facilities in their current residence or low accessibility to the use of facilities.

This study then conducted a GPS tracking survey on the Korean elderly's daily walking movement to reveal their actual daily walking area with their daily convenience facilities use status. The daily waking movement of a total of 128 elderly samples (a total of 453,458 GPS recording points from July to September in 2020) were collected. The senior participants were selected in 4 different case regions where had similar population aging ratio (15-17%) with similar socioeconomic environments each other. The case areas were differentiated mostly by their housing types (an apartment-dominant area group vs a single-detached houses dominant group).

Through analysis of differences in accessibility to facilities of the elderly, analysis of awareness of the living environment, and GPS tracking survey results of elderly people, this study proposed that Korean age-friendly urban welfare policy should consider differences in the distribution of major housing types for elderly people in their community, and should strengthen access to services, food, health, culture and arts, religion, and educational facilities for the elderly.

This study also proposed the basic direction of Korean age-friendly urban welfare policies related to create an age-friendly built environment. The necessity of planning for an age-friendly built environment especially within the daily walking area of the elderly, and improvement of related laws were presented. The necessity of designation of a model district for creating of an age-friendly built environment, the main contents of the model district designation project, and improvement of related laws were proposed. The policy proposals for the creation of an age-friendly

built environment at the daily walking area scale and the establishment of age-friendly community network and a platform have been suggested.

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Key Words: Age-friendly Urban Planning, Age-friendly Community, Age-friendly Built Environment, GPS Tracking Survey

### **COMMUNITY ENGAGEMENT DURING COVID-19: A REVIEW OF THE EMERGING LITERATURE AND A CASE STUDY OF OPPORTUNITY VILLAGE IN EUGENE, OREGON**

Abstract ID: 715

Individual Paper Submission

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This study presents a critical review of emerging literature on pandemic community engagement and a case of a co-design project for Opportunity Village in Eugene, Oregon. Since 2019, a team of faculty and students at the University of Oregon has led a participatory landscape design project with residents at Opportunity Village, a transitional housing community in Eugene, Oregon. The research project focuses on a co-design process and landscape improvements for Opportunity Village. The team is working with the community to improve their living conditions through landscape interventions including an agro-photovoltaic system that will allow for increased food and energy production, on-site water management, and growing plants for income through a series of co-design workshops and co-building. The project scope and engagement process has been significantly impacted by the COVID-19 pandemic and the team is actively working to develop and implement engagement methods appropriate during the pandemic. We emphasize a variety of ethical concerns and considerations involved in engaging with vulnerable communities during this difficult time. To understand how other practitioners and researchers are working with communities during the pandemic, we completed a review of emerging academic and nonacademic literature. Our presentation will demonstrate a series of key themes from our review of approximately 25 texts published during the earlier months of the pandemic from March through August 2020. We will also share the community engagement redesign process we have been undertaking to accommodate the present circumstances. We contrast our new strategy with the co-design process that we had initially employed prior to the pandemic. Lastly, we will share the preliminary results of a series of surveys completed by Opportunity Village residents in 2020 and 2021. The surveys ask residents about their perspectives on how the pandemic has impacted the way they interact with the research team, how they engage with the community outside of Opportunity Village, and their day to day lives. We will discuss specific implications and make recommendations for community engagement with vulnerable populations living in transitional housing.

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Key Words: community engagement, multi-functional landscape design, transitional housing, COVID-19, food-energy-water nexus

## THE ROLE OF MICROCLIMATIC FEATURES OF STREET DESIGN IN THE HEAT - PEDESTRIAN ACTIVITY RELATIONSHIP

Abstract ID: 748

Individual Paper Submission

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The microclimate impact on outdoor activity in urban public space has been explored in numerous studies. The correlation of thermal comfort to the user's attendance, types of activity, and spatial distribution in public space are the major concerns in the studies on environmental behavior and design (Zacharias et al. 2004; Klemma et al, 2017). While parks and plazas are often selected to explore this heat-outdoor activity relationship, urban streets where the majority of pedestrian activities occur have received less attention. Given the increase in extreme heat events resulting in harm to urban street vitality tightly linked to economic and social interactions (Sharifi & Boland 2018), climatic-induced pedestrian behavior related to the thermal comfort of urban street spaces is increasingly important for a safe and favorable walking environment.

To date, the climatic-induced human behavior in relation to urban street design has been discussed in terms of three issues: (1) what meteorological factors determine outdoor thermal comfort, (2) what types of meteorological conditions effect pedestrian activities, and (3) how microclimatic features of street design improve thermal comfort and encourage walking activities. However, in their discussions, most previous studies fail to consider the behavioral thermal adaptation, which conceptually frames how people adapt to given thermal stress by adjusting their behavior (Brager & Dear 1998). While this adaptation process determines the thermal threshold of outdoor activity where people stop walking or choose to stay in a given thermal condition (De Freitas et al. 2007), its empirical relationship with street design features is rarely examined. In this context, this study is guided by the following two questions:

How does thermal comfort impact pedestrian activity, especially for walking and sitting, in terms of behavioral thermal adaptation? And how is it related to different physical features of the microclimatic urban street design?

To address them, this study aims to explore the effects of microclimatic street design features on the relationship between pedestrian activities and outdoor thermal comfort. The key focus lies on (1) revealing the different spatial scales of meteorological effect (weather and microclimate) on two pedestrian activities, walking (active behavior) and sitting (sedentary behavior); (2) measuring the combined effects of microclimate and street design features on the activities at street and block scale; and (3) identifying the thermal threshold of the activities according to five observation spots with different types of microclimatic design features. Panel data analysis and piecewise regression are used to estimate microclimatic street design impacts and identify the associated thermal threshold levels. The Highline' five major leisure activity spots in New York City are chosen as case study sites. For the data collection, on-

site microclimate measurement is adopted and unobtrusive observation using video recording are used to count people who are walking and sitting in each observation spot.

The study results indicate that pedestrian activity is significantly determined by meteorological conditions and thermal comfort regulated by microclimatic design features. Walking count is associated with weather conditions, while the sitting count is primarily determined by microclimate conditions, especially for the ratio of shading cover areas. Regarding the microclimatic design features, Sky View Factors (SVFs) have a considerable impact on the thermal threshold for sitting count, but its impact on walking count is relatively minor. This is largely because the shading effect of solar geometry is the most influential factor to determine where pedestrians prefer to stay. It is expected that this study outcome provides practical knowledge and a deeper understating for designing heat-resistant street spaces that maintain and support pedestrian activities during extreme summer heat events.

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Key Words: Urban street design, Outdoor thermal comfort, Pedestrian activity, Behavioral thermal adaptation, Energy budget modeling

#### **STREETSCAPE FEATURES EXPLAINING PEDESTRIAN ACTIVITY: RELIABILITY OF IN-FIELD VERSUS WEB-BASED OBSERVATION USING GOOGLE IMAGERY**

Abstract ID: 920

Individual Paper Submission

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Streets are one of the most significant elements of urban spaces to accommodate the public activity. Streets provide access to many different locations and services. Daily activities, travel to and from work, shopping, and all other active travels occur here. Many studies characterized the built environment in terms of D variables density, diversity, design, destination accessibility, and distance to transit (Cervero and Kockleman, 1997, Ewing and Cervero, 2001). Measurement of four D variables is relatively straightforward, while the D variable, design, is more nuanced. In terms of walking experience, design measures sidewalk (pavement) coverage, building setbacks, street widths, numbers of pedestrian crossings, and presence of street trees. However, pedestrian experience is influenced by the streetscape features. Urban designers believe that these micro features are important for active street life but have little empirical evidence to back the claim. However, unlike macroscale characteristics of the built environment, field observation is required for measuring microscale design elements or streetscape features which is resource-intensive. This study will be the first to determine if twenty streetscape features rated in field observations can be reliably replicated using web-based Google Street View (GSV).

Ewing et al. (2016) identified streetscape features that explain pedestrian traffic volume by measuring D variables and 21 microscale streetscape features for 588 street segments in New York City. First, this study uses negative binomial regression to identify streetscape features that explain pedestrian traffic volume in 179 street block faces in downtown Salt Lake City, Utah, which is arguably a more typical of the auto-dependent United States compared with NYC. We will use GIS to calculate D variables. For measuring 21 streetscape features, a team of graduate students used an illustrated Field Manual (Clemente et al. 2005) and recorded data for each of 21 variables walking all the block faces within the study area and counted pedestrians for half an hour for each block face. Second, this study tests Google Street View (GSV) for efficiency and effectiveness as a method of measuring urban design qualities without having to be present in the field. The same team of graduate students will use the same field manual but will collect data remotely by using GSV. This study will use Cronbach's Alpha, a measure of internal consistency and scale reliability, and also Intraclass Correlation Coefficient (ICC) to evaluate the reliability of the data (Koo et al., 2016) collected from GSV versus the data collected in field. Finally, we will perform an Inter-rater reliability test to capture the degree of agreement among five independent observers/raters who used GSV to measure streetscape features for the same 20 street block faces.

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Key Words: pedestrian activity, streetscape features, urban design measures, walkability

#### **BEYOND #HASHTAG ARCHITECTURE: URBAN DESIGN IN THE AGE OF THE SELFIE**

Abstract ID: 945

Individual Paper Submission

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Scholars and practitioners of urban design today are dealing with a much different public imagination. Urban design - which once suffered from a lack of visibility and public awareness amidst the everyday ubiquity of the object of study – faces a very different context for the public experience and understanding of cities. We find ourselves addressing public officials, property owners and voters over-saturated with digital images, sometimes through their own devices, and sometimes by means beyond their control.

One of the greatest changes to urban design practice in the past decade is the rapid proliferation of the digital image and the exponential growth of social media. To speak of the future of planning and urban design without addressing this phenomenon seems irresponsible – or at least evidence of our “ritual ignorance” (Cuthbert 2020). This paper intends to inspire a reflective discussion of urban design in the age of the selfie and #hashtag architecture.

Architects, real estate developers and urban designers are (re)designing the urban built environment and civic spaces in ways that take this reality of image saturation into account – either through a position of smug indifference or as complicit participants in the competition to design and build the next-great, Instagram-able-space,

aka #hashtag architecture.

The research is organized in three parts. First, I analyze the conditions that have led to the ubiquity of digital photography, images of cities and how this prevalence of the “Instagrammable” space is changing urban design and the spatial politics of urban development.

#Hashtag architecture is a form of urban design and capitalist production of space rooted in the currency of the digital image, where urban space is now a platform (both physically and digitally) for the proliferation of images. This is not Dolores Hayden’s power of place. Is this the “wilderness of mirrors” forecasted by the poet Octavio Paz?

Next, the paper presents a case study of The Vessel in the Hudson Yards project of New York. Using a wide variety of social media posts, videos, and other digital representations of urban space, the paper asks – what are implications of this new form of urban space and urban design in which an overriding purpose is to produce a space that generates more images?

The Vessel signals the arrival of #hashtag architecture in urban design. A new form of hyper-mediated urbanism in which the citizen experience of the city is not as a civic space of meaning and identity rooted in solidarity and democracy, but rather the city as image-saturated spaces and consumer experiences magnified by thousands, if not millions of digital influencers. #Hashtag architecture is the lens through which we experience the city through the backlit glow of the handheld device. Is their meaning here? Or - have architecture and urban design become empty vessels to be filled, not with meaning, but with other images?

Finally, the paper concludes with a reflection on the challenges of teaching planning and urban design in the age of the selfie and #hashtag architecture. What does the proliferation of #hashtag architecture mean for a new generation of urban designers and planners of urban space?

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Key Words: #hashtag architecture, urban design, placemaking, pedagogy, public realm

#### **VERTICAL GREENING SYSTEMS: HOW IMPORTANT IS CLIMATE TO THE FEASIBILITY OF BIOPHILIC ELEMENTS?**

Abstract ID: 946

Individual Paper Submission

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As cities try to implement strategies to deal with the consequences of climate change, several of them are considering vertical greening systems—along with green roofs and various other biophilic elements—to filter pollutants, absorb greenhouse gases and retain carbon. With the urgency imposed by now evident consequences of climate change, several cities are instituting incentives and programs to encourage the adoption of innovative techniques and the implementation of biophilic systems. Vertical greening systems (VGS) is the most common term used in the literature to describe green building envelopes; green walls is another commonly used term. For the



purposes of this research, we use VGS to refer to green building envelopes, green façades, exterior green walls, living walls, and vertical gardens; in other words, VGS is the umbrella term for any greenery added vertically to the exterior of a building.

Cladding buildings with vegetation is not a novel idea. The mythical Gardens of Babylon, built about 600 years before our current era, are the first notable example despite there being no written records to confirm this hypothesis. In cold climates, vegetation was used to insulate roofs; the Vikings, for example, used turf on their roofs. All across Europe, vines have covered buildings and shaded pergolas and balconies for millennia. This paper considers the feasibility of VGS in contemporary cities in cold climates. We discuss different types of VGS, their adaptability potential to different climates, and the barrier and benefits of installing these biophilic elements in places with less than ideal conditions. We then evaluate the performance of VGS installed in several cities located in climates that are not conducive to maintaining lush greenery 12 months of the year. The intention is to determine which biophilic elements can be adopted by communities seeking to become more sustainable, which ones can be adapted to less than ideal conditions, and which ones should simply be replaced by more feasible alternatives that lead to similar outcomes.

Since most biophilic elements provide ecosystem services, it is necessary to gauge their value within each urban context. Some of the design considerations include: purpose, secondary features, environmental factors, project budget and funding support, anticipated level of maintenance, building characteristics, building codes and bylaws, assessment of risks, and accessibility. Each variable influences the type of VGS, the design of the structure, and the plant selection. In colder climates, certain adjustments must be made for the structure and growing materials to tolerate the temperature and humidity changes.

Beyond their physical properties, biophilic elements can also contribute to the identity of a place and represent the cultures and traditions of their peoples. We recommend that professionals seeking to install VGS and other biophilic elements in urban landscapes draw from the knowledge of locals, particularly indigenous groups, to not only pay homage to native traditions, but also to implement ecosystem services that are better suited to the respective environments.

This work is relevant to urban planners, ecologists, urban designers, landscape architects, architects, developers and builders. The recent debates around climate change suggest that cities need to be part of the solution and increase the number of biophilic elements in their built environments. Providing incentives to designers and builders to incorporate certain elements in their projects is but one way to implement change and start a trend towards greener, healthier, and more energy efficient cities.

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Key Words: biophilic design, biophilic elements, cold climates, green walls, sustainability

#### EXPLORING OLDER ADULTS' DISCRETIONARY TRIPS AND MENTAL WELL-BEING IN THE 500 LARGEST US CITIES

Abstract ID: 969

Individual Paper Submission

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The World Health Organization firstly introduced the global Age-Friendly Cities program to guide the construction of environments to support active aging in 2007. Among all the topic areas in the guide, older adults' transportation and mobility is a crucial part (World Health organization, 2007). Academics from different disciplines have been probing the relationships between living environment, older adults' mobility, and older adults' well-being for a decade. However, research limitations still exist. First, for older adults' mobility, much attention has been paid to trips and activities for maintenance purposes, such as medical trips and trips to access food, while limited attention has been put on their discretionary trips, such as trips for social and recreational pursuits. The benefits of discretionary mobility for older adults' social connection and well-being still needs further exploration (Siren, Hjorthol, and Levin, 2015). Second, regarding the construction of environment, one of the most heavily examined topics in planning literature is the neighborhood design characteristics related to older adults' walking behavior. However, cohorts of the new aged are healthier, wealthier, and have more extended life-space boundaries than previous generations (Lee and Tan, 2019). Only investigating the effects of within-neighborhood environment on older adults' daily trips and well-being is not sufficient.

This study addresses the above limitations. By applying structural equation model, we feature the relationships between third places, discretionary trips, and mental well-being among older adults in the 500 largest US cities. Third places are social surroundings outside home and work where people may gather, enjoy the company of others, and interact (Oldenburg, 1999), such as pubs, cafes, public libraries, or parks. To extract information of discretionary trips, we use data from a panel of 20 million mobile devices provided by a company named SafeGraph. SafeGraph database covers dynamic human mobility patterns of these anonymous device users. The data sampling correlated highly with the US Census populations. We also selected third places and obtained their geolocations and geometries from the Point-of-Interest (POI) dataset provided by SafeGraph. To compare the effects of third places and neighborhood walkability, we use the National Walkability Index created by the Environmental Protection Agency. We acquired tract-level mental well-being data from the Centers for Disease Control and Prevention, and we obtained tract-level socioeconomic data from the American Community Survey.

This study yields several meaningful findings. First, we find that the accessibility of third places promotes older adults' discretionary mobility and mental well-being. Second, neighborhood walkability shows no significant influence on older adults' discretionary trips and mental well-being as expected when we control for the effects of third places. Third, the accessibility of third places within the neighborhood could increase older adults' discretionary trips but the accessibility of third places beyond the neighborhood may have greater positive impacts on their mental well-being.

Our findings generate some policy recommendations. First, while helping older adults meet basic life requirements are important, more attention should also be paid on promoting older adults' discretionary mobility, creating third places, and reshaping places in terms of their popularity to accommodate the needs of older adults. Secondly, we urge practitioners to extend the planning scope for active aging beyond "increasing neighborhood walkability". Developing and strengthening older adults' social and recreational networks over a wide geographical area is not only necessary but essential.

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Key Words: older adults, discretionary trips, mental well-being, third places

## PROXIMITY MATTERS: HOW MANY MINUTES IS YOUR NEIGHBORHOOD?

Abstract ID: 977

Individual Paper Submission

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Mobility is central to cities – the ability to connect people and goods creates the myriad opportunities that urban life affords. However, with automobiles taking a disproportionate share of mobility, particularly in the U.S., has resulted in uncontained sprawl, environmental degradation, declining sociability, and health and well-being concerns (Handy, 2002). While access is affected by numerous factors, the focus of accessibility studies is heavily on mobility (Proffitt et al., 2015). This research is intended to shift the focus from mobility driven access to proximity-based access. Improving walkable proximity to a diverse range of everyday goods, services and amenities can significantly improve access and thus quality of life, especially in neighborhoods with social and geographic impediments to mobility (Leyden, 2003). The COVID-19 pandemic has further demonstrated the importance of self-sustaining neighborhoods and the relevance of walkability and proximity. We argue that policy makers should pay close attention to proximity-based access to make cities more just, equitable and resilient. In order to do so we ask, if walkable access is afforded only to those with means and if income determines walkable access to everyday goods, services and amenities?

At its core, the idea is simple – all residents should have everyday needs (excluding jobs) met within easy walking distance of their residence (Moreno et al., 2021). This premise returns to human-centered place-making and contains the building blocks for sustainability, resilience and inclusivity as defined by the United Nations’ Sustainable Development Goals (UN, 2015). The first step in doing so is to determine proximity at a scale that provides meaningful outcomes. To do so we use geo-spatial data distributed over a one-acre hexagonal grid to model physical proximity to everyday amenities. The one-acre hexagonal grid allows for the redistribution of data collected at various geographic boundaries (parcel, block, block groups, census tracts, zip codes) to a uniformly sized grid. It also neutralizes the scalar and aggregation variations induced by spatial geography and makes the data comparable across various metrics.

Proximity is measured as 15-minute walkability to five categories (with a total of 14 sub-categories) - shopping (grocery stores, convenience stores, restaurants/coffeeshops/bakeries, etc.), care (hospitals, pharmacies), learning (schools, libraries), cultural (museums, theaters, religious centers) and recreational (formal and informal) facilities for walk modes with impedance factors for topography and lack of supportive infrastructure for walking. Using ESRI Business Analyst’s Facilities Data by NAICS codes and Google search, each sub-category is geocoded in GIS. Walk-time network buffers are generated around each sub-category to identify the areas (with population) that have 15-minute walking access to goods, services and amenities. The study area (city of Cincinnati) is divided into one-acre hexagonal tessellations where people live that are assigned a walk score if they fall within the walking buffers for each sub-category. Highest score denotes 15-minute walking access to all sub-categories. Findings from spatial regression analyses show that proximity-based access to certain categories is related to income whereas other categories of amenities are more equitably distributed across the city of Cincinnati. The outcomes of this research are especially relevant for planners and policy makers to address the issues of equitable

distribution of resources including access to everyday needs especially as it relates to populations with mobility challenges. The unique methods used in the research have broad applicability for cities. Most importantly this research shows how the transformation from mobility-based to proximity-based access is possible for community development and urban design thinking that responds to the adaptive planning needs of the 21<sup>st</sup> century.

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Key Words: proximity, access, 15-minute neighborhood, amenities, walkability

#### EXCITING WALK-ONLY PRECINCTS IN ASIA, EUROPE AND NORTH-AMERICA

Abstract ID: 1028

Individual Paper Submission

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Walkable places are assets in cities. They have advantages over vehicle-oriented spaces in terms of economic, social, health, energy and environmental perspectives. Walk-only pedestrian precincts have been built in various parts of the world with different degrees of success. City size, and all the urbanization and planning implications that it brings, is not the main determinant to the building of walk-only precincts, since these can be found in large as well as in small and medium size cities in Asia, Europe and the Americas. The research question asks how and to what extent three pair-wise large and small cities in three distinct continents have recently planned, designed, managed and extended walk-only areas. Therefore, the paper attempts to compare and contrast walk-only pedestrian precincts in these cities: Shanghai (China) and Macau (SAR of PRC); Lisbon and Figueira da Foz (Portugal); and New York City and Miami Beach in the United States. Field work, conducted in all case studies during the last decade and a half, was followed by desk research of specialized literature, popular press, and public policy documents. The field work entailed footfall observations, documentation of subway and transit stations and stops, the location of public buildings, major shopping centers and anchor venues, sketches of pedestrian paths and flows, explorative surveys with photographic investigations, notes about dominant uses in the adjacent built environments and their main commercial transformations, changes in traffic patterns, and functional land uses, among others. The paper builds upon the author's earlier work on walkable cities via the application of an eight-pronged Commercial Revitalization Vibrancy (CRV) theory to centrally located urban precincts. The CRV theory is based on these tenets: (i) location of the streets in the cities and main reasons for their creations, (ii) proportion of the pedestrian precincts in relation to the cities and to other centers and subcenters, (iii) relationships between the streets and the surrounding areas and activities, (iv) accessibility to the pedestrian precincts and movement in the streets, (v) conciliation between the needs of different street users, (vi) strategies to respond to the competition from new and emerging centers, (vii) funding of improvements and continued management activities, and (viii) perpetuation of success and avoidance of decline. Conclusions and key findings for the success of this type of precincts are distilled. The key takeaways are the growing popularity of walk-only precincts in the three continents examined, their preeminence according to their host territories' urban and functional hierarchy, their conception of connecting key destinations in cities, and the

existence of idiosyncratic niche markets capable of distinguishing and individualizing each precinct in the cities' vast urban and metropolitan hinterlands. The paper also suggests ways for walk-only precincts to adapt their revitalization and management strategies to a post-2020 pandemic reality.

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Key Words: Walk-only areas, Pedestrian precincts, China, Portugal, North-America

#### **PANDEMIC RELATED STREET CLOSURES AND THE FUTURE OF THE PEDESTRIAN MALL**

Abstract ID: 1066

Individual Paper Submission

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Historically, pedestrian malls have generally not been particularly successful in American cities. Originally introduced from European cities in the post-war period, pedestrian malls were conceived as a means to address the urban crisis in US cities of the 1960s and 1970s. Often ill-conceived and without broad political support, many of these malls failed and were subsequently removed (Matuke et al, 2020; Amos, 2019). However, over the last decade there has been increasing interest in closing off streets to automobile use (Times Square in NYC for example). This trend has only accelerated due to the pandemic closures of 2020, as declining traffic volumes encouraged many cities to experiment with street closures. This research explores these Covid induced closures (Combs et al, 2020) and ongoing discussions regarding whether to make the closures permanent. The goal of this research is to conduct a series of case studies to better understand the political, social, and economic dynamics behind these developments through interviews with local officials and advocates and compare and contrast the differences with the previous generation of pedestrian malls. We find that there is significant support among the business community to make some of the closures permanent. The support of the local business community is in stark contrast with the earlier generation of pedestrian malls, which were often opposed by local retailers.

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Key Words: pedestrian mall, street closure

## NEARNESS TO OPEN SPACE AND ASTHMA OUTCOMES: A STUDY IN CONNECTICUT, US

Abstract ID: 1069

Individual Paper Submission

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Neighborhoods have an intimate relationship with human well-being. Past research has found that several aspects of human health are linked to the place they live in. For example, residents are less likely to be obese and experience better cardiovascular functions if they live in walkable neighborhoods. Similarly, people who live near a park or access nature are more likely to experience better mental health and express feelings of well-being.

In recent years, respiratory health has emerged as an important area of research. Razavi-Termeh et al. (2021) studied several asthma-prone areas in Tehran, Iran. Among several environmental indicators, the authors found a strong spatial correlation between pediatric asthma and nearness to parks. This research identifies that by simply providing access to open space, children with asthma are benefitted. There is a greater possibility of asthma flare-ups in places where parks are either far away from residences or altogether absent within walking distance. Similar associations have also been found by Chang et al. (2015).

In this study, I dig deeper into the relationship between open space and asthma outcomes. The study characterizes 'open space' by a) city parks, b) other municipal open space, c) privately owned open space, and d) trails. Asthma outcomes are measured by five-year asthma hospitalization rates (2010-2014) in selected towns in Connecticut, United States. Ankrah (2019) found that higher physical activity in specific locations in a county in the United States is correlated to lower asthma-related emergency hospital visits, while lesser physical activity is correlated to more asthma-related emergency hospital visits. Asthma flare-ups are lesser when the patient engages in mild to moderate physical activity, and physical activity can be achieved by active living within one's neighborhood. This research hypothesizes that nearness to at least one of the four open spaces encourages active living, thus reducing the risk of asthma flare-ups. Consequently, greater distance from open spaces discourages active living, thus increasing the risk of asthma flare-ups. In summary, the study explores the link between access to open space and asthma flare-ups, the reason for asthma-related hospitalizations.

Past literature has identified several determinants of asthma such as suspended particulate matter, ozone levels, humidity, and built environment factors such as road density and nearness to highways. The research will take a quantitative approach to address the research objective, controlling all the above factors. The study will use a combination of spatial (ArcGIS) and statistical (R) software. It will analyze the relationship between asthma hospitalization data in selected towns in Connecticut and access to open space within the towns.

There are several important outcomes of the research. First, this research will quantify the link between respiratory health and nearness to green space in towns and expand academic knowledge and scholarship on the topic. Second, the results of this research will have future implications in public health strategies in urban areas. The next possible steps of the research will expand on the results of this research and explore neighborhood residents' well-being in relation to open spaces.

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Key Words: Public health, Asthma outcomes, Neighborhood planning, Open space

## TYPOLOGICAL INDEX OF ALLEYWAYS: MAPPING FORGOTTEN URBAN FORM ELEMENT

Abstract ID: 1074

Individual Paper Submission

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Cities are complex systems that are agglomerations of a variety of components (Batty, 2009). The physical characteristics of a city are often labelled into one of the umbrella terms such as ‘urban form’ (Anderson et al., 1996), ‘urban typology’ (Reinhold, 1994), or ‘urban pattern’ (Lynch, 1981). The elements of urban form include buildings, street patterns, urban blocks, lot configuration, landscape, layout of public spaces, etc. (Wiedmann, 2008). However, one of the critical components, alleyways, has been marginalized when discussing the elements of urban form, despite their major role in shaping pedestrian network system and cities. In most cases, the network of alleyways is not accounted while defining, assessing, or interpreting the urban forms of cities. Thus, this research aims to contribute to the existing literature by carrying out a typological index of alleyways.

Alleyways and streets are similar in many respects. Both are thoroughfares of movement and exist as a vast web of interconnected segments. However, streets are considered more important as circulation elements, utility holders, as well as arenas for heterogeneous social encounter and political expression (Rapoport, 1987; Lefebvre, 1996; Mehta, 2013). The importance of streets is attributed to three factors. First, they are the initial point of design and hence heavily impact city form as well as city vitality (Victor and Masegale, 2013; Jacobs, 1961). Second, streets are ubiquitous as they sometimes occupy over 50% of urban land (Moudon, 1987). Consequently, the seemingly minor changes in street standards augment and eventually impact the number of blocks, access points, route options, trip lengths, and even transportation mode choice (Ben Joseph and Southworth, 2003). Third, a copious amount of research is dedicated to how streets are, in effect, social spaces which promote place-making, tolerance, and innovation (Mehta, 2013).

Despite alley’s novelty and rising importance, studies on street networks often omit alleys or label them as a single type without identifying their shapes and patterns. Scholars classified streets based on their pattern and function such as gridded streets, fragmented, looping, curving, and dendritic. Similar to streets, not all alleys are identical. Alleys can be motorized or non-motorized, they can be overlooked by building fronts/ sides/ backs, they can be located in zones of varying uses and densities, and they vary in width and morphology (Doty, 1983; Fialko and Hampton, 2011; Hage, 2014). Thus, an in-depth understanding of the typologies of alleys is lacking in the literature.

The article takes Abu Dhabi and Dubai’s urban evolution as case studied and intends to explore how the morphology of alleys evolved over the years within different street patterns. This study takes a total of twelve neighborhoods, six each from Dubai and Abu Dhabi. Dubai neighborhoods include: like Dubai Creek, Al Satwa, Al Badaa, Al Rashidiya, Al Quoz, and Al Warqa whereas, Abu Dhabi neighborhoods include West Island, Baniyas, Khalifa City, Al Bahya, MBZ, and Al Falah. The selected neighborhoods represent different growth phases such as Inception (1967-1980), and Dispersion (1980-2007) in both cities, while the Redemption (2007-Present) is applicable only for Abu Dhabi. Previous studies have calculated the street network’s efficiencies (Hillier, 2007; Peponis et al., 2008; Rashid, 2017), and the contribution of alleyways in improving the efficiency. However, the alleyways were not differentiated, and all alleys were treated the same. Thus, this study explores and categories the alleys according to their differing morphologies by answering the following research questions: - What are the different typologies of alleyways? How have the typologies of alleys varied across different growth phases in Abu Dhabi and Dubai in terms of pattern?

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Key Words: alleyways, urban form, urban design, gulf urbanism

## **POSTERS**

### **PLANNING AND DESIGN OF THE SITE SYSTEM FOR STREET VENDORS IN COMMUNITIES OF DOWNTOWN CHONGQING, CHINA**

Abstract ID: 404

Poster

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In April 2020, after China's prevention of Covid-19 became gradually stable, the "street vendor economy" was proposed as a "catalyst" to stimulate economic recovery. Important and basic work was to select a series of suitable sites for street vendors scientifically so that they not only meet the everyday needs of residents but also meet the requirements of epidemic prevention. This paper takes Chongqing, one of the cities with the richest everyday urban activities in China, as an example and examines how to use GIS, POI data, suitability evaluation of the land, and other techniques and methods to establish a system of sites for street vendors in communities.

First, this paper reviews related theories and practices and proposes three steps for the selection of sites: a) Preliminarily determine the demands of each community based on the local demographic structures; b) Determine the principles, goals, and criteria in the selection of sites, evaluate and give scores to the suitability of all the available plots, and select the most suitable ones as sites; c) Determine the number of street vendors and the range of goods in each site with the help of local communities and design how to manage these sites. Next, this paper elaborates on how these steps are carried out:

Estimate communities' needs and screen candidate plots: Analyze community plans and the demographic characteristics of each community, and estimate the total number of street vendors and the main types of goods required. Screen all the available plots in GIS according to the plan of public space, including street open spaces, small green spaces, squares, etc., and exclude plots that obstruct traffic or threaten public safety. The design uses 10m\*10m as a unit of plot, which can accommodate about 10 market stalls.

Evaluate the suitability of the plots in GIS: Divide all the candidate plots into a 5m\*5m grid, and set three goals for the evaluation of plots: a) Select plots with good traffic accessibility. The criteria include plots' distance from main streets, plots' distance from bus stations, the density of surrounding bus stations, and plots' distance from the entrances of the metro. b) Select plots with high urban vitality. The criteria include the POI kernel density of surrounding commercial facilities, the POI kernel density of surrounding social and cultural facilities, and the density of people at the gates of surrounding schools, residential and industrial compounds. c) Combine sites with historical and landscape resources as much as possible to shape cultural assets and promote the development of communities. The criteria include the point density of surrounding historical buildings and community parks and



plots' distance from them. After that, it standardizes scores of each criteria map, calculates their weights by using the AHP method, overlays all the criteria maps, and weights the maps. After several adjustments and the sensitivity analysis, it will obtain the result of the suitability evaluation.

Community management and the selection of goods: Considering the coverage rate and uniformity of the site system, the plan selects 1 or 2 most optimal plots from each community as the final sites for street vendors. The plan draws their 300m buffer zones (the 5-minute walk), analyzes the POIs and population in the buffer zones, and thereby determines the main types of goods and numbers of street vendors on each site. This part of the work is completed with the help of community committees. Many other issues are discussed as well.

To sum up, this paper reflects the new trends of Chinese urban planning under the current background of China's reform of territory spatial planning and the rise of community planning and urban design.

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Key Words: Street vendor space, Suitability evaluation of the land, Community development, the Five-minute walk, POI

## **ANALYZING THE EFFECTS OF WALKABLE ENVIRONMENTS ON COMMERCIAL PROPERTY VALUES BASED ON DEEP LEARNING APPROACHES**

Abstract ID: 627

Poster

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Walking behavior, which can be encouraged from surrounding environments in neighborhoods, substantially affects the quality of urban residents' life. Walkable environment not only enhances public health and social outcomes regarding individual physical health and social interaction, but also promotes environmental outcomes in terms of reducing air pollution and improving streetscape (Talen & Koschinsky, 2013). Hence, there is a growing consensus among urban planners, policymakers, and public health leaders that the promotion of walkability and walkable environments is a significant issue for residents in current society (Pivo & Fisher, 2011).

Along with social, environmental, and public health benefits, walkable environments may provide multifaceted economic outcomes in neighborhoods, particularly in terms of increasing property values and tax revenues, and decreasing transportation costs (Li, W. et al., 2015). Particularly, as various benefits of neighborhood walkability can be capitalized and reflected into surrounding property values, many studies empirically examined the associations between walkable environments and surrounding property values. Despite some studies examining the impacts of neighborhood walkability on residential property values, there is a limited understanding of the relationships

between walkable environments and ‘commercial’ property values. Neighborhood walkability may play a significant role in economically affecting neighboring commercial properties because commercial business may be more sensitive to pedestrian (i.e., potential customer) volume that may be directly resulted from the quality of walkable environments. Hence, this study focuses on specifying the associations between neighborhood walkability and commercial property values.

In terms of empirically measuring walkable environments, many previous studies used the Street Smart Walk Score and/or various elements of the 3Ds (e.g., density, diversity, and design) in neighborhoods although there are no standard approaches to measuring neighborhood walkability. For instance, Li et al. (2015) identified neighborhood walkability based on Street Smart Walk Score obtained from walkscore.com while Yin et al. (2020) used an accessibility-walkability index (AWI). However, previous approaches may not account for individual perception of the street image from the pedestrian’s perspective and the harmonization of various built environments along streets (Yin, L., & Wang, Z., 2016). Our research fills this gap by employing deep learning techniques—allowing to objectively measure street view image at the eye level of pedestrians—to identify neighborhood walkability.

This study empirically examines the spatial effects of walkable environments on commercial property values in Seoul, Korea. Based on around 8,000 commercial sales transactions between 2017 and 2019, we employ the spatial hedonic price model to clarify the relationships between neighborhood walkability and commercial property values. Particularly, this study estimates walkable environments through the Deep Learning technology: Semantic Segmentation based on Google Street View panorama images. Beyond the traditional measures on neighborhood walkability (e.g., 3Ds in terms of the accessibility to subway stations, bus stops and parks, the density of intersections and crosswalks, and land use mix), the deep learning measures may specify the visual preference and satisfaction of pedestrians at the street-level walkability. The results of this study may suggest a variety ways to encourage walkable environments positively increasing the economic values of commercial properties.

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**Key Words:** Walkable environment, Commercial property values, Google Street View image, Deep Learning, Semantic Segmentation

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