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Walking in the City

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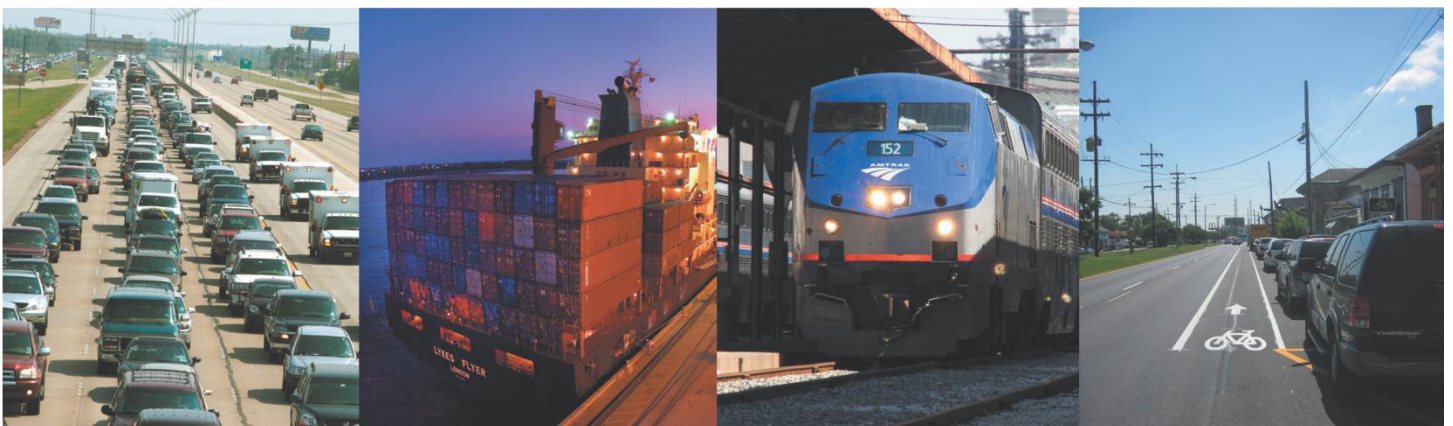
Final Report

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Performing Organization
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GULF COAST RESEARCH CENTER FOR EVACUATION AND TRANSPORTATION RESILIENCY

The Gulf Coast Research Center for Evacuation and Transportation Resiliency is a collaborative effort between the Louisiana State University Department of Civil and Environmental Engineering and the University of New Orleans' Department of Planning and Urban Studies. The theme of the LSU-UNO Center is focused on Evacuation and Transportation Resiliency in an effort to address the multitude of issues that impact transportation processes under emergency conditions such as evacuation and other types of major events. This area of research also addresses the need to develop and maintain the ability of transportation systems to economically, efficiently, and safely respond to the changing demands that may be placed upon them.

Research

The Center focuses on addressing the multitude of issues that impact transportation processes under emergency conditions such as evacuation and other types of major events as well as the need to develop and maintain the ability of transportation systems to economically, efficiently, and safely respond to the changing conditions and demands that may be placed upon them. Work in this area include the development of modeling and analysis techniques; innovative design and control strategies; and travel demand estimation and planning methods that can be used to predict and improve travel under periods of immediate and overwhelming demand. In addition to detailed analysis of emergency transportation processes, The Center provides support for the broader study of transportation resiliency. This includes work on the key components of redundant transportation systems, analysis of congestion in relation to resiliency, impact of climate change and peak oil, provision of transportation options, and transportation finance. The scope of the work stretches over several different modes including auto, transit, maritime, and non-motorized.

Education

The educational goal of the Institute is to provide undergraduate-level education to students seeking careers in areas of transportation that are critical to Louisiana and to the field of transportation in general with local, national and international applications. Courses in Transportation Planning, Policy, and Land use are offered at UNO, under the Department of Planning and Urban Studies. In addition to the program offerings at UNO, LSU offers transportation engineering courses through its Department of Civil and Environmental Engineering. The Center also provides on-going research opportunities for graduate students as well as annual scholarships.

Technology Transfer

The LSU/UNO UTC conducts technology transfer activities in the following modes: 1) focused professional, specialized courses, workshops and seminars for private sector entities (business and nonprofits) and government interests, and the public on transport issues (based on the LSU-UNO activities); 2) Research symposia; transport issues (based on the LSU-UNO activities); 3) Presentations at professional organizations; 4) Publications. The Center sponsors the National Carless Evacuation Conference and has co-sponsored other national conferences on active transportation.

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16. Abstract:
Motivated by traffic congestion, excessive energy use and poor health outcomes, planning and public health researchers have developed an extensive body of research that examines walking and other active transport as well as walking for recreation. In different discussions, walking has become a newly interesting subject and method to understand urban (and non urban) life, and a growing number of researchers have sought to understand mobility, the social experience and functions of walking and its cultural meanings. These areas of research rarely overlap. The latter has the potential for enriching the research about active travel and physical activity and, through doing so, suggest more effective pathways to healthier and less energy intensive life patterns. This project first examines these divergent literatures. It then uses New Orleans to discuss both the pedestrian improvements and the vibrant public life that New Orleans sustained without the new pedestrian infrastructure. It concludes with a discussion about pedestrian oriented research agenda.

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Executive Summary

In the last decades, policy makers and planners have increasingly promoted active transportation. This has been stimulated by divergent concerns. The three main drivers have been traffic congestion, energy consumption and accompanying environmental degradation, and declining health attributed in part to sedentary life patterns. Planning advocates have focused on active transportation as solutions to all three challenges. Walking for shorter trips is a particularly useful intervention because almost anyone can do it and, in the United States, 50% of all auto trips are shorter than three miles.

The research on the determinants of walking for transport and recreation has found that different factors influence walking for travel and walking for recreation. Relative walk rates are associated with sociodemographic differences, motivations to walk and habit. The built environment has some effect on walk decisions but it differs for travel versus recreational trips. As importantly, however, walking has a richer tradition in urban life and has impacts and cultural meanings that extend beyond travel, exercise and energy use. The literature on walking in the city portrays complex relationships among walking, community cultural practices, and societal change, meanings and outcomes. The latter research can enrich the walking for travel and physical activity research.

New Orleans is an example of a city that has been reconfiguring its travel infrastructure to better support active transportation. However, the city also has a rich tradition of street use and informal ways of walking, but the infrastructure provision reflects the same division as the research. As with the research, the street improvements focus on a narrow view of better walking conditions such as crosswalk striping, signalization and some sidewalk repairs, bump outs and seating. The improvements will be beneficial, but it places too much emphasis on pedestrian infrastructure and too little on the potential to use the streets for urban greening and too little focus on social and cultural practices.

The report concludes with three areas for a pedestrian oriented research agenda: the experience of walking and the role of walking in people's lives; the experience of the streets as public green spaces and benefits, costs and responses associated with greening initiatives; and the shifting preferences for multimodal lives which, in conjunction with the research on travel mode choice, can give a more complete understanding in what circumstances people walk.

Abstract

Motivated by traffic congestion, excessive energy use and poor health outcomes, planning and public health researchers have developed an extensive body of research that examines walking and other active transport as well as walking for recreation. In different discussions, walking has become a newly interesting subject and method to understand urban (and non urban) life, and a growing number of researchers have sought to understand mobility, the social experience and functions of walking and its cultural meanings. These areas of research rarely overlap. The latter has the potential for enriching the research about active travel and physical activity and, through doing so, suggest more effective pathways to healthier and less energy intensive life patterns. This project first examines these divergent literatures. It then uses New Orleans to discuss both the pedestrian improvements and the vibrant public life that New Orleans sustained without the new pedestrian infrastructure. It concludes with a discussion about pedestrian oriented research agenda.

1.0 Introduction and objectives

Rapid global mobility and the transport of both goods and people contributed to the economic prosperity experienced in the twentieth century. This prosperity depended on inexpensive and reliable energy. By the late twentieth century, declining oil and uncertain energy supplies in a time when demand continues to grow rapidly shifted attention to energy consumption. In conjunction with global climate change and environmental degradation, these challenges have resulted in an acute need to reduce per capita energy use (Troy, 2012). During the same period, public health crises in the United States with obesity, diabetes and heart disease—problems that can be partially alleviated through exercise—focused attention on the potential for walking and active transportation to increase health and lower health care costs (Maibuck *et al,* 2009). Mass transit, cycling and walking or rolling have been the preferred planning solutions because active transportation are low energy alternatives that can increase health and wellbeing while reducing oil consumption and traffic congestion (Frank *et al,* 2010). Urban and regional planners and transportation researchers have primarily focused on travel behavior to answer questions about travel mode choice.

Nevertheless, walking impacts a wide range of urban experiences from neighborhood safety to entertainment choices, and has a rich history in urban thought. Street infrastructure can also impact neighborhood relationships and energy consumption. Proponents for informal and temporary uses, public spaces and public life, and greener regions envision the city streets as a city's most extensive public space and sites to install green infrastructure.

Integrating these divergent approaches will create more effective pedestrian planning and sustainable transportation practices. This report lays out the state of research and puts forth a research agenda for examining pedestrianism that better frames pedestrian oriented issues. This report has three main objectives: 1) to integrate the interdisciplinary literatures that address or could influence planning for pedestrianism; 2) show what we can learn from studying New Orleans and identify case studies to illustrate pedestrian focused solutions; and 3) outline a pedestrian-oriented research agenda.

2.0 Interdisciplinary literature on pedestrianism

The follow subsections outline the debates in relevant but highly divergent literatures that focus on the pedestrian. What factors influence pedestrianism? What does walking do and how does walking do it? What impacts do pedestrian environments have on urban residents? How significant is the trend towards non motorized travel, and what has influenced this trend?

2.1 Walking for travel and walking for health

Traffic congestion, poor health outcomes and high use of oil are the three major impulses that have stimulated planners' interest in pedestrianism. Since the 1970s, recurrent concerns about oil have also drawn attention to private car use and its alternatives. Because 50% of all trips are 3

miles or less (FHWA, 2006), active transportation, either walking or biking, has been offered as a solution to all three. Advocates hope it can ease traffic congestion, reduce energy use and fossil fuel consumption, and increase exercise. In 2012, the American Automobile Association estimated the costs of annual car ownership and use to be between $6,700 and $11,500 and fewer cars per household could substantially reduce household expenses (AAA, 2012).

Planning research on walking has examined what factors determine travel mode choice (Pooley *et al,* 2001) as well as decision making about active travel (Alfonzo, 2005; Larco *et al,* 2012). Planners have attempted to determine what urban form and design factors influence active transportation. The focus has been on 1) density, or the number of people, residences, jobs, employees or commercial establishments per unit area, 2) connectivity or the ease of travel between two points measured by factors such as intersections and block lengths, 3) pedestrian infrastructure and amenities include street trees, lighting, and sidewalks, and 4) destinations or to where residents or employees walk. Research suggests that residents walk more for travel in areas with higher housing, employment and retail densities and street patterns with more connections and shorter blocks, pedestrian infrastructure and a mix of land uses (Cervero and Kockelman, 1997; Frank and Pivo, 1994; Handy, 2005; Saelens et al, 2003; Saelens and Handy, 2010). The impact of a range of other factors from perceived safety and qualitative pedestrian amenities have been less clear (Saelens and Handy, 2010), and findings about whether new pedestrian facilities increase walking have been mixed (Evenson *et al,* 2005; Fitzhugh, Bassett and Evans, 2010). Sehatzadeh, Noland and Weiner (2011) found the built environment had some small direct effects but also might have indirect effects through lower levels of auto ownership. Evidence suggests that nonwork trip replacement occurs in neotraditional designed neighborhoods, but these impacts were limited to the neighborhood (Greenwald & Boarnet, 2001). For baby boomers in age restricted communities, the built environment had modest impacts on local travel (Zegres, Lee and Ben-Joseph, 2012). Distance, both perceived and observed, influenced walking in transit in older adults. Walking also influenced how residents perceived distance with transit users underestimating distances and non transit users overestimating distance to fixed mode stations (Hess, 2012). To what degree self selection drives observed differences has been difficult to determine (Forsyth *et al* 2008).

For planning researchers, the relationship between urban form and walking or active travel and physical activity has been a robust line of inquiry (Frank, Andresen and Schmid, 2004; Coogan *et al,* 2011). Hoehner *et al* (2005) found that transport walking and recreational walking were associated with different perceived and objective features. Travel was positively associated with destinations and public transit and recreation was positively associated with facilities and aesthetic qualities. Christian *et al* (2011) found that transport walking was sensitive to the land use mix including residential, retail, office, health and community or entertainment whereas recreational walking was sensitive to open space, recreational facilities and rural land uses.

Forsyth *et al* (2008) found that, when controlling for sociodemographic differences, purposeful walk trips might replace other forms of exercise, and in these conditions, overall physical activity did not increase. They found that density was associated with walking purpose, with higher density positively associated with travel walking and lower density positively associated with more recreational walking. Density did not increase walking or exercise overall (Forsyth *et al* 2007). There was no difference in BMI between new urbanist and traditional suburban residents has been found (Brown *et al,* 2008). When measuring differences between perceived and

objective measure, nevertheless, Lin and Moudon (2010) found objective measure captured associations with walking better. Dogs have been associated with walking, and therefore should be controlled for (Sehatzadeh, 2011) but when reviewing 35 that addressed the impacts of dogs in some way, their impacts on both dog owners and non owners are less consistent (Toohey and Rock, 2011).

Socio-demographic differences account for much of the differences among groups of people, and overall, most people walk very little. For example, in an auto-centric college environment, gender, undergraduate status, age were correlated with biking, walking and public transit. Discounted transit was also associated with higher transit use (Zhou, 2012). Attitudes about physical activity are as or more influential than the built environment. There are significant differences among residents in neighborhoods and the effects of local qualities vary by neighborhood. Attitudes toward active travel are poor indicators of active travel behavior but cultural attitudes as a whole were important (Barton, Horswell and Millar, 2012). In a study assessing weight gain and perceptions of walkability over a four year period, Gebel *et al* (2012) found that, in cases when walkability was high, people who perceived it as low reduced transport walking and gained more weight than those who perceived the same environments as more walkable. Motivation, general health, perceived trail safety, neighborhood connectivity and perceived distance from home were positively associated with urban trail use (Wolch *et al,* 2010). For travel choice, habit might be more influential than motivation (Fujii & Gärling, 2003; Klöckner and Matthies, 2004), and past behavior has been the best predictor of current behavior (Thøgersen, 2006). Residents respond to different travel nodes, for example, bus travel is discussed in episodes, usually worse case scenarios, where travelers described car travel more consistently (Guiver, 2007).

Events can increase readiness for active transportation, as Rose and Marfurt (2007) found. A ride to work event attracted 20% of riders who were riding for the first time. A quarter of these continued to ride five months later. For cycling to work however, the most effective policy might be daily payment, a factor twice as influential as a completely off road bicycling network (Wardman, Tight & Page, 2007). When deciding to travel to a destination, one be aware of the destination and how to arrive there, which forms a "spatial reach" from which possible destinations are chosen (Mondschein, Blumenberg, & Taylor, 2010).

2.2   Planning for travel

Throughout the twentieth century, streets have been envisioned primarily as sites for travel. Standardizing urban infrastructure and regulating street use became a preoccupation of city councils and municipal professionals when U.S. society industrialized and urbanized in the nineteenth century. Cities quickly professionalized street infrastructure provision, a precursor to transportation planning, but never developed explicit methods to plan for other dimension of street life (Ehrenfeucht, 2012). As streets were increasingly regulated, municipal governments began to plan for the "public" which they defined as the pedestrian. The pedestrian was defined as an active walker and all other activities were challenged (Ehrenfeucht and Loukaitou-Sideris, 2007). This was prior to the time the car was adopted, and municipal officials considered unimpeded travel as the purpose of the street. However, with the car's wholesale adoption, an increasing portion of the street was dedicated to auto travel and the streets became both uncomfortable and dangerous for everyone else (McShane, 1994; Winter, 1993; Jain, 2006).

Transportation planning became focused on movement instead of social dimensions of travel, and the professionals who manage the streets see the streets as spaces for unimpeded travel (Blomley, 2011). In the twentieth century, autos came to dominate urban aesthetic visual, sensory and cognitive experiences both from inside and outside the car (Taylor, 2003).

Transportation researchers have focused primarily on travel as a demand induced from separate activities and as such it has disutility (Mokhtarian, 2005). The response has been to focus on minimizing travel time. However, accounts of travel experience are more nuanced (Basmajian, 2010; Jain and Lyons, 2008; Lyons and Urry, 2005). Anable and Gatersleben (2005) found that travelers placed more importance on instrumental factors during work related travel when compared with the importance placed on both affective and instrumental factors during leisure journals. Active travelers have been found to be more satisfied their commutes (Anable and Gatersleben, 2005; Páez and Whalen, 2010). In the case of children, they placed most importance on social dimensions of travel (Zwerts *et al,* 2010).

2.3   The dominance of the automobile

This contemporary anti-car attitude has come full circle when, after being unpopular toys for the rich, autos became solutions to some perceived problems of urban life. The car became an integral part of twentieth city US cities. The industrial city had a powerful counternarrative epitomized by the suburbs and by modernist planning that intended to clean, order and regulate it. Modernist planning envisioned an efficient city, with uses separated, and the modern reliance on technology that included the car. Urban residents adopted the automobile because it was convenient. It also became affordable to working families and it connoted status and automobile ownership became a visible element of the middle class (McShane, 1994). The car continues to have symbolic and affective as well as instrumental functions (Steg, 2005). However, it also dominates urban streets in ways that negatively impact urban residents (Lutz and Fernandez, 2010; Steg and Steg, 2007). Utilitarian cyclists view behavior by cars that puts them at risk as indicative of anti-cycling culture and their status as outsiders (McCarthy, 2010).

Efforts to reclaim the streets have been limited. A significant body of research has analyzed pedestrian safety behavior, injury and accidents (Miranda-Moreno, Morency and El-Geneidy, 2011), different perceptions of walkers and drivers (Kaparias *et al,* 2012), as well as a variety of comfort level factors (Oka, 2011). Professional guidelines outline what design features make areas pedestrian friendly (ULI, 2010), but these focus on pedestrian improvements and built form interventions. It is important to note also that cities have been slower to envision all streets for pedestrians, and instead often designate pedestrian oriented districts and streets (Ehrenfeucht and Loukaitou-Sideris, 2010). Nevertheless, car free areas can help facilitate active travel and play for children (Melia, 2010), and travel infrastructure influences parents decisions about their children's travel mode choice (Nevelsteen *et al,* 2012).

Pedestrians have also engaged in activism against other street activities, suggesting that although a vibrant diverse landscape is appealing, there are limits to sharing space. The emphasis on infrastructural improvements parallels the public space controls. In liveability initiatives, for example, strong emphasis is placed on visual order (Stevens, 2009).

2.4   The benefits of walking and physical activity

Declining physical activity associated with sedentary daily life is widely considered an important factor in declining health in the United States. Walking offers a range of health benefits and is exercise available to most people (Morris and Hardman, 1997). In the United States, obesity has been declared an epidemic, with an estimated death toll of 200,000 lives each year. Scholars agree that too little exercise is a contributing factor to the obesity crisis (Hoehner et al. 2005; Sallis et al. 2004; Bodea et al. 2008), and as a result, much public health research has focused on determinants to exercise, including the decision to walk (Christian *et al,* 2011; Pal *et al,* 2011). However, the association between the built environment and obesity is sensitive to how age, income and educational attainment is included in the model (Bodea *et al,* 2008). In Perth, only 17.2% of residents sampled walked enough to accrue health benefits, and individual, social and physical environmental factors had almost equal impact (Giles-Corti and Donovan, 2003). Physical activity has positive impacts on numerous physical and mental health situations (Warburton *et al* 2006; Spanier *et al,* 2006). Walking has other benefits such as being associated with reduction in fall rates in the elderly, improved blood sugar control in postal workers, and improved mental health (Morris and Hardman 1997) as well as continued mobility and better health and functioning (Simonsick *et al,* 2005). Walking also has been associated with improved academic performance (Hillman et al. 2009). Nevertheless, in one case, people interviewed did not consider walking proper exercise and instead thought of it as functional (Darker, Larkin and French, 2007).

Obesity has been associated with the reduction of incidental exercise in children, raising a concern that youthful patterns of minimal exercise will carry through later life (Sallis et al. 2004). In the last decades, there has been a 75% decline in the proportion of children of walking to school, with walk travel time being the most directly controllable factor (McDonald, 2008). Active travel for children also might increase energy burned during physical education or sport events (Mackett et al. 2005), and children engaging in active transportation acculumated more steps daily in one study (Pabayo *et al,* 2012). Distance from school has repeatedly been associated with travel mode choice (Jensen, 2008; McDonald, 2008). In Denmark, safe routes to school resulting in high child road safety included reduced auto speeds and increased signalization (Jensen, 2008), and the walking school bus can both be active travel and increase children's independent mobility (Kingham and Ussher, 2007).

2.5   The benefits of green environments

Comfort for pedestrians and other public space users differs greatly than those necessary for drivers. Creating greener streets has many benefits. The micro benefits of urban trees include reducing energy use, air pollutants and volatile organic compounds as well as their visual appeal, water uptake and cooling functions (Dwyer *et al,* 1992; Nowak, 2000). The costs associated with installing and maintaining urban trees was significantly less than the savings accrued from trees to the utilities during peak periods of cooling demand in California (McPherson and Simpson, 2003). Consistent findings show micro scale benefits from trees, however the effects have been less clear when examining a city or region. This could be due to variable quality and intensity of trees and green space across the city (Richardson et al. 2011). The impacts from urban forests

and wooded areas are predominantly from the shading itself, but the cooling impacts can be felt for 100 meters (Shashua-Bar and Hoffman, 2000). Planners and urban managers underestimate both the value of trees to local environments and what is necessary to keep an urban forest healthy (Dwyer *er al*, 1992). Residents respond positively to wildlife sitings in urban parks (Dick and Hendee, 1986), and globally countries and cities are making attempts to reintroduce urban wildlife ecology and conservation (Adams, 2005). In Athens, Georgia, one study found that trees and landscaping increased sales price by 3.5-4.5% (Anderson and Cordell, 1988), and in Missouri, residents expressed strong support for a tax of $14-16 per year for trees (Treiman and Gartner, 2006).

Urban green spaces are seen as psychologically beneficial for urban residents, although environmental psychologists and urban foresters have approached this research from different perspectives with different results (Sanesi *et al*, 2004). One study in Tokyo showed that senior survival rates were higher over a five year period when senior residents had access to walkable green space, when controlling for gender and income, known determinants of longetivity (Takano, Nakamura, and Watanabe 2002). When the health benefits of greening has been analyzed at the city scale, no association was found between mortality rates from heart disease, diabetes, lung cancer or auto accidents and green indicators in the US (Richardson *et al*, 2011). In one study that evaluated levels of physical and mental health and perceptions of how green the areas were found that residents in areas perceived to be greener had better mental health and physical health. They also walked more for recreation which accounted for the observed differences in physical health (Sugiyama *et al*, 2008).

Safety on the streets is an ongoing concern for urban residents. The broken window hypothesis—which proposed low level offences lead to more serious crime—resulted in policing practices that targeted minor visible offenses (Taylor, 2001). Although the preponderance of evidence suggests that street level disorder does not lead to serious crime, it also suggests that disorder—even without crime—impacts residents' sense of well being and decisions about how they act in their neighborhoods (Harcourt, 2001; Chappell, Monk-Turner and Payne, 2011). Greening vacant lots greatly increased residents' sense of safety although they were not associated with reductions in total crime or gun assaults (Garvin, Cannuscio and Branas, 2012). In one case, when controlling for demographics in central neighborhoods with comparable housing, green areas were allocated with lower levels of fear, fewer incivilities, and less aggressive and violent behavior (Kuo and Sullivan, 2001). Visual safety measures have less impact on women's sense of safety than men's in transit oriented public spaces (Yavuz & Welch, 2010). Although safety is an expressed concern, in at least one case, murder rates were associated with more moderate to vigorous physical activity (Jago *et al*, 2006).

2.6   Walking as social and cultural practices

The planning and transportation literature has become overly focused on the built environment and instrumental travel choices. Little research has focused on experience of walking (Middleton, 2011). However, pedestrians constantly engage with other people and urban elements. Geographers and sociologists have turned a critical theoretical focus to understand

mobility as an organizing force of urban life (Urry 2007). Streets are the largest public spaces available in the city.

With little focus on walking or health, the world through the eyes of the pedestrian, of the resident on foot, has rich tradition in urban writing. Charles Baudelaire put forth the notion of *flâneur,* the paradigmatic urban figure that made street life a fundamental dimension of urban modernity. An active idle stroller observed the city, being a spectator and participant (Whybrow, 2005; Benjamin, 2006). These early writings identified what has become a commonplace idea about the city, that cities are exciting places where diverse people interact and coexist, that they are sites of possibility and novelty. Legal regulations including segregation practices and social regulations including custom and manners upheld social divisions (Ehrenfeucht and Loukatitou-Sideris, 2007; Winter 1993). Many scholars responded to the *flâneur* because it created a universal character for urban practices that instead both gendered and racialized. Writings responding to the *flaneur* showed although all men and women do not have similar experiences in the city, that city streets were exciting and full of possibility and the city on foot was the city where people interacted and shared space as people with different ethnic and national identities, varying wealth and occupations, women and men, came out (Wilson, 1991). The sociologist Richard Sennett (1970, 1990) also argued that encounters when walking and in urban public spaces with people were fundamental ways of learning about the city and becoming competent urban residents.

In the late 20th century, walking has become a newly interesting urban experience as it became unnecessary for many people. In his history of walking, Joseph Amato (2004) argues that in the last hundred years, walking has become increasingly limited and segmented and yet also associated with choice and identity, health and recreation. Popular writers have engaged with the complex multiplicities that walking embodies. Rebecca Solnit (2000) ode to walking captures a passion for this mundane activity and Geoffrey Nicholson (2008), like Solnit, shows that the urban world unfolds around the pedestrian. Although previous authors, notably Henry David Thoreau (2010), focused specifically on walking, Thoreau spoke of walking as antidote to the city rather than an action that embraced urban potential. Neither these popular accounts nor the transportation literature can show heterogeneous walking experiences (Middleton, 2010), and many popular account romanticize or politicize walking in a way that most people do not interpret their daily routines (Middleton 2009, 2010). Walking interviews have also been used a method to better understand place affect and perceptions (Jones and Evans, 2011).

Recently, scholars in cultural geography and anthropology have focused on walking a constitutive part of activities and relationships (Lorimer, 2010). Emergent research methods both use walking as research practice as well as examine walking as a life practice (Lorimer, 2010). The social benefits of walking have been identified for diverse urban populations. In the case of the Chicago 1995 heat wave, Klinenberg (2002) found a key determinant of survival for seniors living alone (the residents who died in the greatest numbers) was access to shopping destination in walking distance. When comparing neighborhoods with similar demographics, he found that those that retained local shopping experienced significantly lower death rates. This can be attributed to both the fact that residents had cool places to go and that residents in these neighborhoods were less housebound and had regular walking routines that reduced their fear that prevented others from leaving the house. In other cases, trip making or being mobile was associated with reduces risk of social exclusion but not with self assessed measures of wellbeing

(2011). Children understand their environments differently than adults. Proximity is more important and they are more focused on local conditions than more abstract meanings of the spaces (Nordström, 2010).

The evidence linking built form characteristics and community well being are weak (Cummins *et al,* 2005). In one study, walking had a modest impact on residents' sense of community but no association local social interaction, informal social control or social cohesion (Toit *et al,* 2007).For childcare workers in Brooklyn, however, walking and park use were the primary work spaces for adults who otherwise would have no regular adult interaction and they developed a sense of community (Brown, 2011).

2.7   A return to a multimodal urban life?

The emergent walking research that extends beyond transportation reflects current and changing social norms (Edensor, 2000). Even though transportation research has attempted to account for self selection and advocates intend to promote alternative transportation, little transportation research has examined factors influencing travel preference shifts or the meanings that it holds. In the literatures focusing on gentrification and economic restructuring, researchers have found demand for amenity filled urban neighborhoods and residents identifying non motorized transportation as an important option for their choices about where to work and where to live. The emergence of global cities has been attributed to the critical roles cities perform in the global economy (Sassen, 2006). Global cities have experienced increased residential demand in central neighborhoods by an elite professional class. Global restructuring has also led to increased demand for services, global cities also have more service sector workers. Gentrification in cities such as New York can be attributed to its central location in the global economy.

Prior to this time, cities across the United States have witnessed the return of middle income residents to central cities, warehouse districts and waterfront redevelopments, the expansive literature on gentrification suggests not only the rise of global cities, but changing preferences for urban life. The 2010 census showed central city areas growing more rapidly than their suburbs in cities such as Denver, Atlanta, Charleston and Washington (Wyatt, 2012). Early gentrification research focused on the land market supply factors such as the rent gap that made central city areas desirable for redevelopment (Smith, 1996) and the potential adverse impacts on lower income residents who had remained in the central city (Newman 2004; Atkinson, 2000, 2004; Blomley, 2004). Sharon Zukin (1982) has provided a detailed account that demonstrated that artists took advantage of large spaces and cheap rents in underutilized warehouses in the urban core but that practice turned into an artist loft aesthetic that led to loft redevelopment and people other than artists eventually seeking downtown locations and forms, or in other words, shifting preferences towards downtown living. Other scholars including David Ley, Japonica Saracino-Brown and others have focused on the demand for urban life, and residents seek historic architecture as well as varied, diverse neighborhoods (Savage, Bagnell and Longhurst, 2005; Brown-Saracino, 2009; Zukin, 2009).

The assumption that mobile professionals are making location decisions based on quality of life factors has been theorized by Richard Florida (Florida, 2002, 2008). Richard Florida's creative class hypothesis influenced this sense of possibility. In his highly influential book *The Rise of the Creative Class* (2002), Florida argues whereas people once followed jobs, jobs in the post-

industrial economy now follow mobile creative workers who base locational decisions on amenities and life quality. Accordingly, if a region attracts creative workers, economic growth follows. Scholars are skeptical of Florida's contentions given the lack of a causal mechanism linking "creatives" with urban growth (Markusen, 2006; Peck, 2005). Others note the associations Florida identified can be attributed to human capital, a well established correlate with economic vitality (see Glaeser, 2005) or better explained through understanding the geographies of production (Storper and Scott, 2009). Since urban areas offer similar amenity packages, amenities do not explain choice among urban areas well (Storper and Manville, 2006) but can still explain return to urban areas.

Local governments have been influenced by Florida's creative class hypothesis, and have focused on amenities to attract mobile professionals including facilities conducive to walking and bicycling and mass transit (Metro Atlanta Chamber of Commerce, n.d.; Michigan State Housing Development Authority, n.d.). In Louisiana, one local lawmaker proposed a bill to eliminate state income taxes for residents ages 18 to 29 who are in college or have a college degree (New Orleans CityBusiness, 2009a). New Orleans' Downtown Development District secured a $750,000 grant from the US Economic Development Administration to facilitate amenity development, social networks, and place branding (New Orleans CityBusiness, 2009b).

In the 2000s, auto trips by people in western countries have declined as a share of all trips for the first time (Newman & Kenworthy, 2011a). In the U.S., the share of 16-39 year olds with driver's licenses has declined (Wyatt, 2012). In Germany from 1976 to 2000, there was a significant increase in car trips, often at the expense of walking trips, but the increase in motorization was significantly less in cities than town. In cities, car owners were more likely to walk similar distances than in towns and rural areas (Scheiner, 2010). Residents report more satisfaction with active transportation than auto travel as measured by the gap in stated perceptions about the benefits of different modes and their use of them (Anable and Gatersleben, 2005), and when they used active travel modes in interesting neighborhoods (Páez and Whalen, 2010). It is important to note however that others argue that re-urbanization is not the only urban that can lead to energy use reductions and changes can be made a local levels and within rural areas (Dujardin *et al*, 2012).

The return to the city has been accompanied by a new appreciation for the informal, spontaneous, temporary activities that characterize dynamic cities. These range from street vending and food sales to outdoor pop up bars and restaurants. They include public and street art, performance, yoga, festivals and consumerist districts (Bishop and Williams, 2012; Hou, 2010; Chase, Crawford and Kaliski, 2008; Franck and Stevens, 2007).

3.0   Methods

The following section outlines the state of pedestrian improvements and infrastructure, and it explains how New Orleanians use the streets and sidewalks. To develop this section, we reviewed the available documents from the City of New Orleans to identify how the city has planning for pedestrian improvements. These documents included the New Orleans' *Plan for the*

21st Century, the Regional Planning Commission's *New Orleans Metropolitan Bicycle and Pedestrian Plan,* and information available from the Public Works department. We interviewed three city officials.

To gather information on the state of planning in New Orleans, the full list of projects on the New Orleans Department of Public Works website at http://new.nola.gov/dpw/projects/ was retrieved. Each project was rated as to whether the scope of work of the project contained various aspects, such as reference to ADA enhancements, the words "may include," plantings, crossings, bicycle facilities, or text indicating that the project was limited to repair and reconstruction. Clarification on the meaning of the phrase "may include" was provided in a telephone conversation by Charon Robles of the Department of Public Works on June 19, 2013 at 3:00 PM.

Pedestrian data was gathered using the US Census Bureau's DataFerrett tool (http://dataferrett.census.gov/) for the urban area of New Orleans using data from the 2005-2009 American Community Survey dataset B08301 Means Of Transportation To Work table, which is compared against the ACS 2007-2011 table of the same type, which gave lower numbers.

The 2005 New Orleans Metropolitan Bicycle and Pedestrian Plan (http://www.norpc.org/assets/pdf-documents/studies-and-plans/rpc_metro_bike_ped.pdf) and the City of New Orleans Plan for the 21st Century, both executive summary and implementation documents (http://new.nola.gov/city-planning/master-plan/) were examined point by point for statements regarding pedestrian, transit, and bicycle planning.

Case studies were identified by looking for descriptions of highly regarded development projects and seeking specific plans from the agencies involved. In the case of the woonerfs, research turned up a bicycling blog which contained a video of a ride through the Providencetown site. This footage revealed a lack of certain features associated with the treatment, but that some features were present. In the case of the Exhibition Road site, historical descriptions of woonerfs led to reading about a different project; Exhibition Road is a newer site using similar principles. Old Pasadena is described in a chapter of Shoup's *The high cost of free parking* as a best practice example.

We conducted observations in four New Orleans neighborhoods. The neighborhoods were chosen to maximize variation. The Irish Channel, the first neighborhood, is a gentrifying neighborhood adjacent to the redeveloped housing project now called River Garden. Demographically and housing type, it is one of the more diverse neighborhoods in New Orleans. Little Woods in New Orleans East is one of the most suburban neighborhoods in New Orleans. Midcity along Carrollton is mixed income and expansive. It is gentrifying and houses diverse residents, but also characterized by bigger streets and more auto oriented fabric than the Irish Channel. Lakeview is characterized by postwar suburbs, but has more elements of urban retrofitting along Harrison Avenue than other suburban neighborhoods. The observations occurred at four times, two on weekends and two on weekdays, for at least an hour. The areas were observed in the early evening between 4 and 6:30 pm. The observations focused on how pedestrians used the street rather than counting the numbers of pedestrians, however the absence or presence of pedestrians was noted. In each neighborhood, informal discussions arose in which the observers asked about the street quality and walking.

4.0   Findings: Learning from New Orleans

4.1   State of pedestrian improvements

Since the flooding after hurricanes Katrina and Rita devastated the city, New Orleans has made great strides in becoming a bicycle and pedestrian friendly city. It has received attention in particular for the growing bicycle facility network. The linear miles of bicycle facilities increased from 7 miles pre-Katrina to over 60 miles centerline in 2013 (interview with J. Ruley, Bicycle and Pedestrian engineer).

Pedestrian improvements are less visible and more segmented. They have not been counted in centerline miles. The post Katrina street rehabilitation projects were extensive enough to trigger the need to install accessibility components such as curb ramps. The Federal Highway Administration Emergency Relief funds did not allow for betterment, and therefore neither bikeways nor pedestrian facilities could be added. However, because these facilities were planned for, pedestrian facilities were able to be included when the American Recovery and Reinvestment Act of 2009 economic stimulus package funded "shovel ready" projects. From a variety of funding sources, in addition to the curb ramps, since 2005 pedestrian-oriented infrastructural improvements and markings have been installed along street including Magazine Street, Oak Street, Mirabeau Avenue, along numerous streets in the French Quarter among others (interview with J. Ruley, Bicycle and Pedestrian engineer), such as figure 1 below.
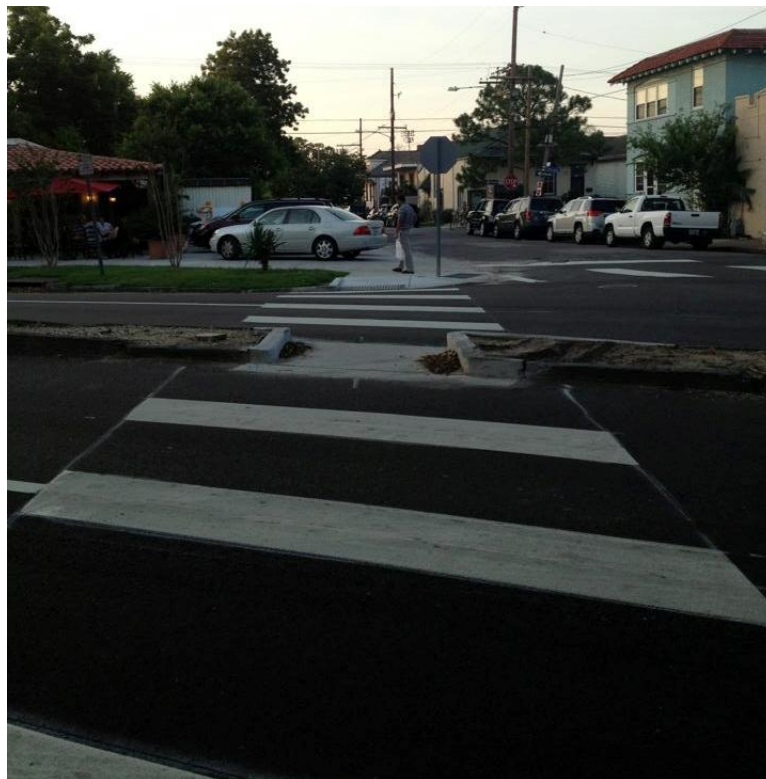

Figure 1: New improvements along Esplanade Avenue

In 2012, New Orleans received a bronze-level designation from Walk Friendly Communities because of the city's efforts to improve the pedestrian environment and engaged the community in the process. It highlighted the wayfinding signs and an online interactive map. In 2013, New Orleans received a bronze-level bicycle friendly community award from the League of American Bicyclists. It received this award for its involvement in bicycling promotion, education programs, infrastructure and pro-bicycling policies.

In the list of street projects available from the City of New Orleans in 2013, 200 of the 285 projects contained some pedestrian and bicycle facility elements. These projects totaled an estimated $462 million in improvements. Approximately ¾ or $316.4 million add the qualifier "may" indicating that additional streetscape improvements using Community Development Block Grants were possible. Many of the pedestrian improvements focus on ADA accessibility (153 projects or $375.5 million), 99 ($316.4 million) of which were prefaced by the modifier "may," 22 ($22.8 million) contained an improved crossing, 21 ($34.9 million) contained bicycle facilities, 34 ($81.8 million) involved a sidewalk, 7 ($10.4 million) included tree or shrub planting, and 19 ($34.8 million) were markings and striping. 104 projects ($346.8 million) were repair work only, with no expansion of facilities. Only one project listed will construct new pedestrian facilities: The Mirabeau-Pelopidas path from St Anthony and Gentilly to I-610 ($609,660). All other projects are repairs or modifications of existing facilities or better lighting (City of New Orleans, n.d.).

Numerous departments impact street provision and maintenance. The Department of Public Works addresses street infrastructure, the Planning Commission and Planning Department implements the master plan and guides development throughout the city, Parks and Parkways manages street trees, the Regional Planning Commissions funds and plans for street improvements. The Department of Public Works has been aided by staff assistance from the Louisiana Public Health Institute and the Tulane Prevention Resource Center. The city has numerous advocacy organizations that focus on active transportation. Bike Easy is general advocacy organization that promotes bicycling. The Kids Walk Coalition focuses on walking to school. The Friends of the Lafitte Corridor concentrate on a linear park and train proposed through the city.

The city added pedestrian oriented improvement in its master plan and the Regional Planning Commission developed a specific *New Orleans Metropolitan Bicycle and Pedestrian Plan.* New Orleans' *Plan for the 21st Century* added elements of a multimodal city with pedestrian oriented destinations and localized shopping. The following provisions support pedestrian infrastructure.

For economic development, the following provisions address pedestrian life.
> Goal: 3. Preservation and expansion of established industries; Strategy: 3.a. Preserve and expand the tourism industry; short term action 4. Improve connectivity in downtown and among tourist areas with transit and pedestrian improvements.

> Goal 9. A 24-hour downtown to support its role as an economic driver - 9.b. Enhance transit, pedestrian and bicycle access to and within downtown. Action: 2.

Improve the pedestrian environment throughout downtown. Action 3. Enhance bicycle connectivity to downtown through the provision of bike infrastructure including the construction of the Lafitte Greenway. (p. 81)

For transportation, the *Plan* includes the following goals.

Roadways that integrate vehicle transportation with bicycling and walking.

Evaluate sidewalk repair and maintenance ordinances and develop mechanisms for enforcement and betterment system options for property owners.

Establish and adopt "Complete Streets Policy" that moves people and freight safely by integrating various transportation modes.

Establish a permanent multi modal accommodation position within DPW.

Develop a pedestrian plan for the City of New Orleans.

Provide significant infrastructure investment to make major boulevards and corridors more attractive and pedestrian-friendly particularly at transit stops.

Provide significant infrastructure investment to make neighborhood streets more attractive and pedestrian friendly.

Develop a bicycling strategy for the City of New Orleans.

As part of the comprehensive bicycling plan, create a comprehensive, connected citywide network of bike lanes, multi-use paths, and bike boulevards to safely accommodate bicyclists.

Provide fixed infrastructure to further bicyclist safety and security and to encourage bicycling as an alternative mode of transportation.

Develop programs that address enforcement, education and encouragement of bicycling. (*Plan for the 21st Century*, executive summary, page 95-97)

The Department of Public Works has issued a draft "City of New Orleans Americans with Disabilities Act Transition Plan for Public Rights-of Way" which outlines proposed improvements for streets throughout the city, most of which will be curb cuts (Department of Public Works, 2013).

The city adopted a complete streets ordinance in October 2011 which Mayor Landrieu signed in December 2011. The ordinance had a year implementation time frame. The Department of Public Works developed a policy that specifies goals and metrics, but as of June 2013, the management plan has not yet been adopted and the city has not convened the required bicycle

and pedestrian advisory committee. In 2012, a complete streets implementation workshop was held that included representatives of the departments that will be involved in implementation of the ordinance. The 2011 Complete Streets Ordinance included no surface water management policies even though the city had been discussing how to live more effectively with water since 2005, and street flooding impacts all transportation modes. The Complete Streets Ordinance makes no mention of the city's rich street life or street traditions. The tools and standards proposed—the best practices—are consistent with those proposed across the U.S. to create a pedestrian realm alongside and subordinate to the auto realm even by pedestrian advocates (for example, This Big City, n.d.).

In New Orleans, as is the case in most U.S. cities, property owners are responsible for maintaining the sidewalks. In New Orleans, the city rarely enforces sidewalk maintenance and many property owners do not realize that they are responsible for sidewalk maintenance. This has been addressed in the city's *Plan for the 21st Century*. A 2010-2014 goal under "Enhanced character and livability for neighborhoods" includes "6. Create a program to notify property owners about their sidewalk maintenance responsibilities and offer a betterment program to promote sidewalk repair and maintenance in neighborhoods." and "7. Create sidewalk maintenance notification, enforcement and betterment programs" (p. 58).

Many sidewalks are in poor condition or impassible. Figure 2 shows a passable sidewalk for most walkers, but a sidewalk not in adequate repair for pedestrians with limited mobility or in wheelchairs. Although the efforts to install curb rapms are critical, in some cases these do not provide accessibility if they are not connected to sidewalks such in figure 3.

Figure 2: Typical New Orleans sidewalk

Figure 3: ADA curb ramp with dead end sidewalks

4.2   Walking in New Orleans

New Orleans can make to particular contributions to understanding the pedestrian realm. According to the US Census Bureau's 2007-2011 American Community Survey, 7,756 of New Orleans's working population walked to work, 5.5% of all 140,766 work commutes. This places New Orleans above the national average of 2.8%. In part this can be attributed to the situation in which many New Orleanians live. In New Orleans, 27% of the population lives in poverty, almost twice the national rate of 15%. 37% live in "'asset poverty,' defined as not having the financial means to support a household for three months at the federal poverty level should they lose their main source of income." In addition, 10% of working households do not have access to a vehicle (CFED, 2012, quote in report summary). The 2012 Pedestrian and Bicycle Count Report found that between 2010 and 2011, the number of bicycle trips increased by 20% although pedestrian trips remained stable (Fields, 2012). Active transportation can be attributed to both need and changing preferences.

Observations across in the four neighborhoods showed an informal informal pedestrian realm where residents out of both necessity and habit walk on and off the sidewalks. The ways that residents use urban streets and sidewalks reflects how street conditions but does not end there. The two photographs below show an example of pedestrian who likely need to use the street because of the lack of sidewalks and another pedestrian walking in the street who could walk along the grass.

Figure 4: Resident rolling on the street with interrupted sidewalks

Figure 5: Residents walking in the street with interrupted sidewalks

The casual walking on and off the sidewalks occurs throughout the city as the figure below shows.

Figure 6: Walking in the street in the French Quarter

When asked about walking in the street, one Irish Channel resident shrugged and looked over at the sidewalk. His response "I guess that I didn't think about it." However the sidewalks were also interrupted and along the very block, one segment was blocked by a car parked over the sidewalks. In Little Woods and Lakeview, the walking was more orderly. The very few walkers stayed on the sidewalks. The sidewalks were clear and delineated from both the roadway and the abutting front yards. In Midcity, walking varied by size of street. On major roads such as Carrollton, pedestrians stayed on the sidewalks and primarily crossed at corners. On side streets, however, informal pedestrianism took over.

Although residents walk in the streets and in many neighborhoods including the Irish Channel, children play in the streets and on the sidewalks. In these cases, cars must respond to pedestrians and recreationists. Cars do not stop for pedestrians, even when they are crossing in marked crosswalks. The Regional Planning Commission has attempted to address the informal walking practices and unresponsive drivers through a humorous billboard, bus shelter and sidewalk

marking campaign featuring the 610 Stompers to help residents "strut safely" by addressing both walkers and drivers.

As notably, New Orleans is a city of festivals. Much life in New Orleans occurs on the streets. Mardi Gras Indians (figure 4), second lines, Mardi Gras, holidays on the neutral grounds characterize the city's local culture. Weekend events occur throughout the city. Social aid and pleasure clubs hold second lines during a nine month second line "season." Mardi Gras welcomes over two weeks of parading. Coming across an outdoor public event is a regular occurrence. There are parades for Easter, St. Patricks Day, Decadence and Pride, Super Sunday and others. Different groups host the parades. Related organizations include New Orleans Needs More Food Trucks and Sweet Home New Orleans which advocates for musicians, among others. Despite this, no planning documents mentioning pedestrianism speak to the cultural street practices, the need for trees in the hot and rainy climate or other dimensions of public life.

Figure 7: Mardi Gras Indians walk in the streets

4.3 Case studies for an open pedestrian realm

4.3.1 Belleview raised sidewalks

Problem: In Belleview, WA, local citizens complained about excessive traffic speed on residential streets and increased pedestrian fatalities.

Background: Five school locations, with high pedestrian traffic concentrations, were chosen to have traffic calming improvements.

Solution: The crosswalks were raised to sidewalk level. This created speed tables, a visual pedestrian priority effect, and made the curb within 30 feet of the crossing unusable as parking, increasing the sight lines available. Additional measures were applied simultaneously in the surrounding area.

Results: Average vehicle speed near the treated areas decreased by 3 mph. Public reaction to the treatment has been positive; the city intends to repeat the treatment for other intersections.

4.3.2   Missoula Pedestrian Safety Campaign

Problem: Excessive pedestrian-motorist collisions occurred because drivers not stopping for pedestrians in crosswalks.

Background: Grant funding was used to fund a safety campaign by the Missoula Bicycle and Pedestrian Program.

Solution: Cultural change was sought through a sustained program of media campaigns, signage, and targeted police stings. Media statements were released as part of all facility improvements, resulting in a sustained media presence. Police stings with plainclothes police officers crossing in front of oncoming traffic with ample stopping distance were carried out. Drivers who did not stop were pulled over and fined $140, with judges instructed to be strict.

Results: Pedestrians report that the culture of drivers has changed with cars now stopping for them.

4.3.3   Abita Springs Roundabout

Problem: A four way intersection near the town center and a school was exceeding its capacity; high traffic speeds alternated with traffic jams.

Background: A roundabout was proposed as an experimental intervention.

Solution: A building was acquired and the land used to construct a roundabout. The roundabout contains a brick area that creates the visual effect of road narrowing while allowing trucks to use the space if needed.

Results: Traffic capacity was increased, and average vehicle speed near the facility was reduced. Similar facilities are associated with reduced pedestrian/vehicle collisions, among other benefits.

4.3.4   Oudehaske Village

Problem: in 1985, the village of Oudehaske in the Netherlands was having problems with high traffic speeds of vehicles traveling through the city.

Background: An experimental intervention was used on the road, based in part on reduced funding for other common traffic calming techniques

Solution: The grade difference between the sidewalk and road was removed. The road was resurfaced with cobblestones; curb and sidewalk-colored cobblestones were extended closer to the center of the roadway, reducing the apparent width of the road. All traffic signage and signalization was removed.

Results: Traffic speed was reduced from 60kph to 40kph with increases in pedestrian safety.

4.3.5   Exhibition Road, London

Problem: Businesses along the street were not being visited; cars passed without stopping and pedestrian traffic was confusing.

Background: The Royal Borough of Kensington and Chelsea acquired funding to redevelop the streetscape.

Solution: The street and sidewalks was replaced with a single checkerboard-patterned surface. Barriers and signs were removed. A 20 mph speed limit was posted. Lighting was improved. Pedestrian and vehicle spaces were separated by differences in road texture and color.

Results: Pedestrian use of the space is dramatically increased, with corresponding benefits to businesses and institutions along the street.

4.3.6   Sunday Streets

Problem: Popular events had no venue; more public space was needed in an already built up central city area.

Background: Devised in Bogota, Columbia in 1976 as a community improvement project, the Sunday Streets concept has since been copied worldwide.

Solution: Every Sunday, select streets in the central city are closed to vehicular traffic and used as public space.

Results: The street closures are popular gatherings for residents; residents get more exercise. Business owners along the closures report significantly increased revenue on Sundays on account of increased foot traffic.

4.3.7   Old Pasadena Metering Project

Problem: Run down commercial district with limited tax revenues and old building stock with limited parking supply.

Background: Limited funding available to fund improvements in the neighborhood. Concerns were raised about any attempts to raise money from the area.

Solution: Coordinated parking metering was instituted throughout the neighborhood, with all meter revenue going directly to the neighborhood to fund public works and improvements. Two parking garages, also on the same system, were installed to handle parking beyond the capacity of the streetfront. Parking requirements for businesses were waived in return for a fee.

Results: In 2001, the meters generated $1.2 million in revenue which was used for improvements. The existence of meter readers increased security. The ability to fund regular cleaning and improvements transformed the area to a popular commercial center.

4.3.8   West Palm Beach Traffic Calming

Problem: Citywide problems with traffic.

Background: Following a variety of problems with excessive speed and traffic danger, the city attempted to address the issues at a systemwide level.

Solution: The city's laws and policies were modified: any repair or reconstruction of a roadway in the city must include some form of traffic calming and pedestrian improvement measures, unless a waiver is specifically acquired.

Results: Steady improvement across the city.

4.3.9   Woonerfs/"Living Streets"/"Home Zones" in America

Problem: Excessive separation of use between vehicles and pedestrians creating barriers to travel and increased danger, such as roads with fast moving traffic in residential areas.

Background: Dutch homeowners, upset at excessive speed in cars, tore up the pavement of the street in a way that forced cars to weave back and forth instead of traveling straight. The results were seen to have much less ill effect on traffic volume and average speed than had been suspected, and safety improved.

Solution: The concept was expanded into a conscious treatment which involves removing the separation between pedestrian and vehicular space; the preferred design is a surface containing no traffic signs, a flat surface without separated curbs or sidewalks, and irregularly placed pedestrian furniture such as trees, benches, and the like placed in such a way as to make a straight travel line impossible and to maximize interaction with pedestrians. This results in cars reducing their speed substantially; average speeds are affected less because stops at intersections were reduced.

Results: A number of projects similar to this have been seen in the U.S. However, they have often been criticized. One of the streets considered to be a good example, Commercial Street in Providencetown, appear accidental and no different than the situation experienced by cars trying to travel along Bourbon Street in the French Quarter (figure 8). Other examples include streets in

West Palm Beach (see above), Brookline, MA (criticized for including a designated car lane), Pike Place Market in Seattle, and cordoned off areas in Washington, DC.
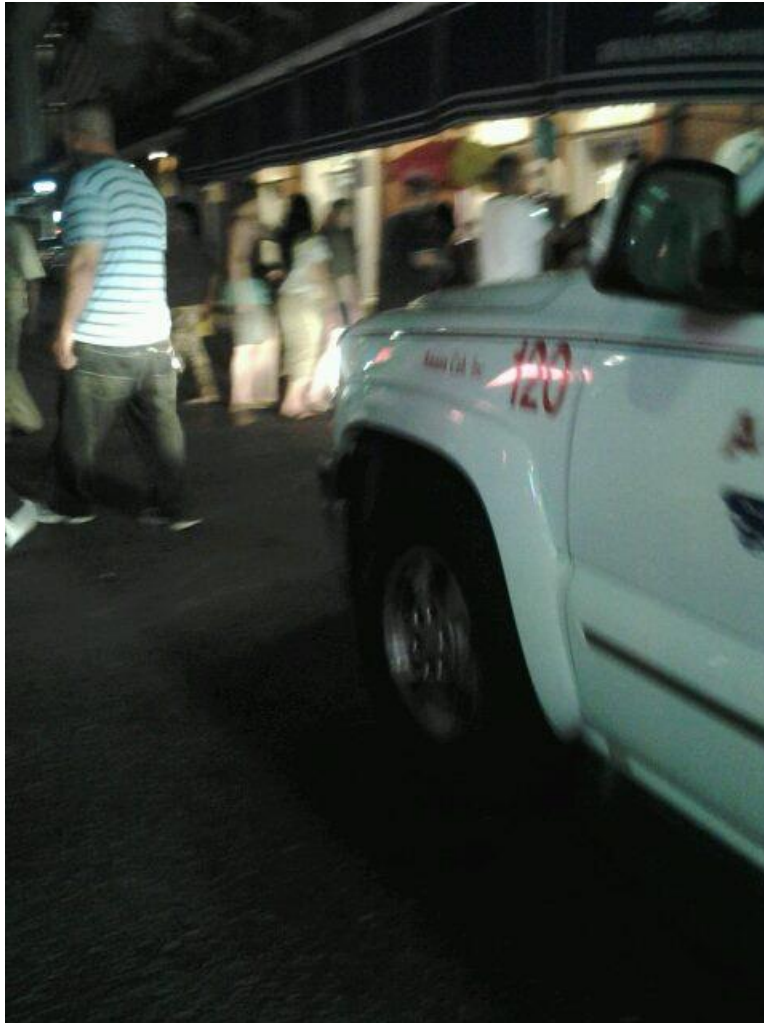
Figure 8: Cars and people share the road along Bourbon Street

4.3.10 Portland Green Streets

Problem: Run-off rainwater was creating flooding issues and entering the Willamette River, creating pollution issues.

Background: The Bureau of Environmental Services and DOT worked together to devise water mitigation measures. These received public support when phrased in terms of improving water quality, a local point of pride.

Solution: Bulb-outs were constructed along roadways at points prone to flooding and excessive water run-off during rainstorms. These bulb-outs contain a channel to direct water flow into

them, and contain porous soil and native plants. During rainstorms, the facility stores water and filters it into the ground.

Results: Portland estimates that $11 million in green swale facilities has saved $60 million dollars in drainage piping. Effects of rain flooding is decreased, and the facilities are considered to be attractive by residents.

5.0   Conclusions: A pedestrian oriented research agenda

The existing research and observations on the street and institutional changes suggest some areas for future study.

5.1   Walking in urban and non urban life

Little research has focused on the phenomenological dimensions of activity and sedentariness. The recent "mobility turn" in the social sciences has shifted focus the mobility as a fundamental part of all life and began to decenter settlement. This approach can help better understand the sedentary lives and the ongoing and renewed importance of walking.

5.2   Pedestrian infrastructures

Streets are simultaneously transportation corridors, the largest urban public spaces, the most common neighborhood parochial spaces and straight forward locations for green infrastructure. Research and professionals that address these diverse components collaborate infrequently. Conceptual frameworks and practical interventions to reinvent the street need to be proposed and evaluated. This includes the need for ethnographies about the institutions that shape the pedestrian realm, such as public works departments, regional planning bodies, and state departments of transportation.

5.3   Shifting preferences for multimodal lives

Increasingly residents are seeking authentic urban areas, connections with other residents and the convenience of cities. Better explaining how these shifting preferences interact with the built environment, travel habits and motivations, and other daily life choices can better explain how these might become counter trends to increased automobile use.

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