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Blue Collars in Green Cities: Exploring Transit Oriented Manufacturing

J. Mark Pendras
University of Washington Tacoma, pendras@uw.edu

Yonn Dierwechter
University of Washington - Tacoma Campus, yonn@uw.edu

BLUE COLLARS IN GREEN CITIES: **EXPLORING TRANSIT ORIENTED MANUFACTURING**

SCHOOL OF
URBAN STUDIES

Supervising faculty:
J. Mark Pendras, Ph.D.
Yonn Dierwechter, Ph.D

Dean of the School of Urban Studies:
Ali Modarres, Ph.D.

UNIVERSITY *of* WASHINGTON | TACOMA

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There are many others that we would like to include in a next-stage project. While the excellent contributions of the community members and civic leaders listed above are essential to the findings that follow, any mistakes or misinterpretations are ours.

MA IN COMMUNITY PLANNING CLASS OF 2020

FALL 2020

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BLUE COLLARS IN GREEN CITIES: **EXPLORING TRANSIT ORIENTED MANUFACTURING**

This report contains work produced by the 2020 MACP cohort for their culminating studio project. The Community Planning program and the School of Urban Studies are committed to the potential of academic research to further community interests. In a process of investigation and co-learning, students, faculty, and local partners work to forge meaningful relationships that can confront emerging problems and provide opportunities for equitable development. The culminating studio is a two-term (20-week) course intended to enable students to apply the lessons from their MACP courses to an important community-based project. For 2020, that project was *Blue Collars in Green Cities: Exploring Transit Oriented Manufacturing*.

The Community Planning program and the School of Urban Studies are committed to the potential of academic research to further community interests. In a process of investigation and co-learning, students, faculty, and local partners work to foreground issues and connections that provide opportunities for shared growth and equitable development. In a region that is seeing substantial investment and population increase, there are also widening disparities among different demographic groups, stubborn overall poverty rates, and stagnant or deteriorating environmental conditions (PSRC 2017). These realities require deeper, community-oriented research, analysis, and action. A clearer understanding of the complex challenges facing working waterfronts and the communities they serve will enable local leaders to work proactively with stakeholders, to build strong constituencies for investment, innovation, resource protection, and sustainable growth.

INTRODUCTION

The theme of ***Blue Collars in Green Cities*** seeks to advance inclusive urban economies by confronting longstanding tensions between planning for urban sustainability and planning for urban industry. The legacy of industrial pollution and the erosion of industrial jobs have contributed to perceptions of urban industry as incompatible with vibrant green city visions and healthy urban environments. Consequently, various forms of urban sustainability planning—land use, transportation, economic development—have either ignored or actively discouraged industrial sectors. The resulting antagonisms between industrial interests and sustainability advocates threatens to stall progress in both areas. The 2020 MACP Studio project starts from the assertion that the representation of urban industry and sustainability as incompatible is both inaccurate and unnecessary; it then aims to identify creative new visions for the 'green city' by linking two avenues of research and practice that are commonly addressed separately: urban industrial planning, and transit planning.

The term guiding this Studio course—Transit Oriented Manufacturing—is not one that currently exists in planning research and practice. It is a new term, introduced by the instructors as a way to open new space for thinking about planning for transit and industry simultaneously. Working with a new term in this way has clear tradeoffs. On one hand, it can stimulate curiosity, new ways of thinking, and new forms of planning practice. On the other hand, it can be challenging to work with a new term that requires definition and explanation and that lacks an existing body of scholarship and examples of practice. The students in this Studio deserve recognition for their work defining, exploring, and ultimately making a foundational contribution to a new area of research.

PROJECT BACKGROUND

Recent decades have brought tremendous growth to the Puget Sound region, challenging traditional economic livelihoods and identities and raising important questions about shared benefits, economic inclusion, environmental health, and planning for the future of the region. As decisions made now set in motion trajectories of development with lasting impacts, extra care is needed to make deliberate choices about the way forward. This Studio report emphasizes one key area of concern in this regard: ***industrial retention***.

The post-industrial technology and professional services sectors fueling the region's growth place significant competitive pressures on existing urban industrial spaces, incentivizing building and land use conversions, zoning changes, and other planning efforts to capture perceived growth opportunities. These tensions are especially apparent in the area of transit planning, as efforts to create dense transit-oriented communities have historically contributed to industrial displacement, while knowledge about effective strategies for managing those tensions is lacking. The central aim of this report is thus to clarify emerging lessons that might inform local decision making and help planners and economic development practitioners retain and invigorate spaces for production in the city.

This project is in many ways an extension of the 2019 MACP Studio (Urban Waterfronts and Planning for Industry), building from that project's goal of envisioning and situating manufacturing and industry as key components of Tacoma's sustainability goals, broadly conceived. For this 2020 MACP Studio, the group focused more specifically on the connections between transit planning and industrial planning through the concept of Transit Oriented Manufacturing (TOM). The TOM idea links the research interests from the co-instructors (Mark Pendras and Yonn Dierwechter) by considering how planning for urban industry is often discouraged by common approaches to urban sustainability—particularly Smart Growth and Transit Oriented Development (TOD)—and exploring new strategies that might bring transit and industrial planning into better alignment.

To narrow the field of investigation, the project was loosely focused on an area of Tacoma currently targeted for new transit infrastructure: The Dome District and East Tacoma stations of the regional Link light-rail system. Existing scholarship and preliminary local planning efforts were used to anticipate the likely development trajectory of these station projects and envision potential alternatives. The guiding assumption was that if these stations followed the patterns of traditional TOD projects, existing and future industrial firms and spaces would face the threat of displacement. The task for the students was to consider the consequences of this type of displacement and to make the case for transit planning that actively values and prioritizes the preservation of manufacturing and industrial space.

The ambitious plans outlined by the class in January were significantly impacted by the emergence of the Covid-19 pandemic in week 9 and Black Lives Matter protests in week 17. In addition to the challenges faced by individual students to balance complex demands—securing their own health and well-being, fighting for racial justice, and completing their Studio work—this historical moment constrained the envisioned research by eliminating the possibility of site visits and in-person interviews and by complicating research subject availabilities. The students are to be commended for their dedication and perseverance during these unprecedented circumstances.

PROJECT CONTEXT

As noted before, this report brings together the fields of transit planning and industrial planning in an attempt to overcome unnecessary tensions and find new ways to advance inclusive green economies. Some historical context can help to clarify project goals and objectives.

URBAN INDUSTRIAL PLANNING

While zoning emerged in the early 20th Century as a tool to organize land uses and separate activities that are seen to be incompatible, the urban spaces designated for industrial production remained valued and vibrant in most US cities through the 1970s. Opinions about the appropriate use of urban space began to change with the onset of deindustrialization and the subsequent revitalization of urban centers as spaces of entertainment and consumption. That transition—from industrial to post-industrial—played out in many ways that permeated American life, from the composition of the economy and the workforce, to cultural attitudes and identities. But generally changing patterns of work and leisure 'touch down' and find material expression in our cities, in the ways we plan and manage places where we live, work, and play.

The common narrative of deindustrialization, or the disintegration and departure of traditional industry from cities, has often emphasized broad, sweeping, global scale economic restructuring in ways that make the process appear natural, necessary, and comprehensive. Without denying important aspects of that narrative, more recent scholarship has revealed a more complicated story. In particular, new research highlights the political and partial dimensions of deindustrialization. Emphasis on the politics of deindustrialization clarifies that shifting economic development priorities and investments were not simply responding to changing industrial conditions but also creating them. In this sense, urban development plans have been linked to the active displacement of urban industry through acts of omission and commission that privilege some economic sectors and land uses over others. The research in this report takes this emphasis on politics seriously and considers how planning might prioritize and nurture urban industry and what that might mean for cities and the lives and livelihoods of urban residents. Attention to the partial character of deindustrialization is intended to call attention to the ongoing contributions of traditional industry to cities, to make that activity and contribution visible, and to make room for supporting and expanding that activity in pursuit of more balanced and inclusive urban development.

TRANSIT PLANNING

One of the clearest examples of how urban planning has contributed to industrial displacement and the shifting of urban land use priorities can be found in the area of transit planning. Transit investments have long shaped the structure and character of urban development. But policy efforts to address low-density suburbanization have shaped more recent planning conversations around managing the benefits and burdens of economic and spatial changes in American society. By the mid-1990s, the regional planning theory of "Smart Growth" merged with several other spatial ideas and planning tools, including the sub-concept of "transit-oriented development" (TOD). In broad terms, Smart Growth strategies attempt to push new development into existing neighborhoods through regionwide policy efforts to curb sprawl. These strategies concomitantly seek to mix building types and land uses, encourage more diverse housing stock, and not least, improve local transportation options to neighborhood residents. TOD specifically seeks to encourage sustainable transit ridership around key stations or hubs through specific forms of redevelopment in order to reduce automobile congestion on highways and to mitigate per capita carbon emissions.

While comprehensive in theory, and successful in some respects, Green Leigh and Hoelzel (2012) argue that Smart Growth in practice has consistently suffered from an industrial "blind side." In particular, they show in their research on 14 different cities how the mixed-use commercial and residential redevelopments often associated with TOD projects and other types of Smart Growth initiatives often replace rather than incorporate relatively inexpensive industrial-zoned land. Efforts to promote public transit, reduce sprawl, and mitigate carbon are essential planning goals. However, blue collar livelihoods in key manufacturing sectors do not usually feature in Smart Growth discourses of desirable urban futures. This exposes the planning process for Smart Growth to charges of elitism, while it highlights the importance of innovative planning to incorporate blue collar jobs and spaces into urban sustainability discussions.

These two areas of planning are currently converging in the City of Tacoma in ways that promise to have lasting impacts on the city and region. In terms of industrial planning, the city is currently in the middle of a large-scale 'subarea planning' project intended to establish "a shared, long-term vision, and a more coordinated approach to development, environmental review, and strategic capital investments" (City of Tacoma, 2020) in the Port-Tideflats subarea, the city's primary industrial district. (See Figure 1). The recent history of planning for urban industry discussed above underscores the importance of this moment for the city's industrial future.

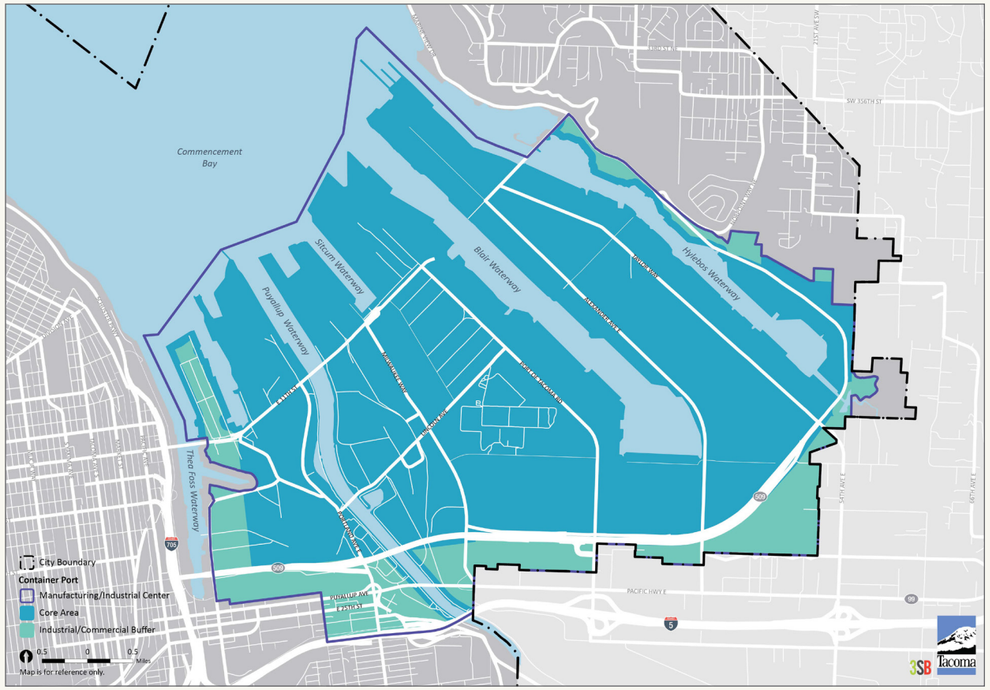

Figure 1: Tideflats MIC, City of Tacoma

PROJECT CONTEXT (CONTINUED)

This is an equally significant moment for transit planning in the city. The region's multi-billion-dollar transit infrastructure project, Sound Transit 3 (ST3), passed by voters in 2016, includes plans to extend the regional light rail network to Tacoma by 2030. The first two station stops planned for Tacoma—the East Tacoma and Tacoma Dome stations—each fall within the Tideflats Manufacturing and Industrial Center (MIC), the same district that is currently engaged in subarea planning. (See Figure 2)

If current and historical planning patterns may be used as a guide, then the overlapping of these two planning processes is likely to introduce new (and reinforce existing) displacement pressures on the city's industrial firms and spaces. As argued in this report, minimizing industrial disruption and displacement will require careful, innovative, and intentional planning and action.

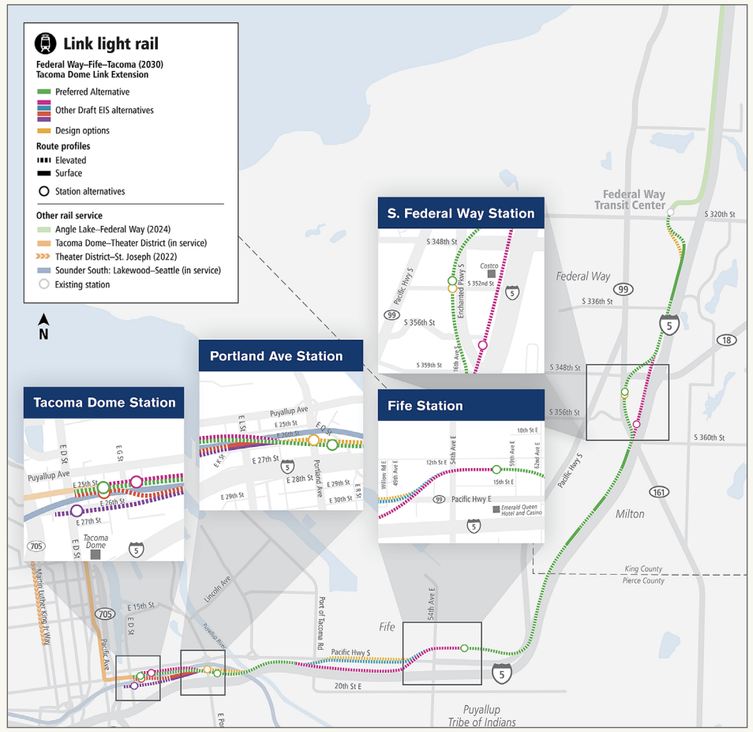

Figure 2: Federal Way—Fife—Tacoma, Tacoma Dome Link Extension, SoundTransit

FIVE KEY FINDINGS FROM THIS RESEARCH PROJECT WARRANT SPECIAL ATTENTION:

ONE

The lack of established terminology linking transit planning and industrial retention limits policy sharing and learning. For this project we have introduced the term "Transit Oriented Manufacturing (TOM)" to reflect the concept of transit investments that intentionally prioritize industrial retention and support. But this term does not otherwise exist in current scholarship and practice, and there is no alternative vocabulary in circulation to capture the same meaning. The terms "Industrial TOD" or "Equitable TOD" are occasionally used, but their meanings vary and the terms are not used widely enough to create a standard vocabulary. Finding or creating appropriate terminology would facilitate learning and help focus and improve planning efforts.

TWO

Innovative efforts to plan for urban industry and to value and prioritize industrial retention in transit planning ***are in abundance around the country***. The varied and uncertain terminology makes it challenging to find such examples, and the scholarship appears to lag significantly behind practice in this area, but intentional searching reveals a wide variety of projects and strategies that could provide lessons for local planners. This report constitutes a preliminary investigation that opens space for future research.

THREE

Planning for industrial retention requires a broad range of actions ***to build and nurture the industrial ecosystem***. In contrast to a narrow focus on defining and defending traditional industrial zones, the concept of the industrial ecosystem emphasizes the importance multiple and overlapping sectors—financial services, workforce development, industrial advocacy, non-profit real estate development—to the success of the local manufacturing sector. While preserving existing industrial zones is a good place to start, it is not enough; if a city wants to help industrial businesses and local manufacturers thrive, it must acknowledge and nurture the interdependencies that fuel the industrial ecosystem.

FOUR

Local planners, practitioners, and manufacturing firms need help. As reflected in the first two chapters of this report, there are numerous local manufacturing firms and workforce development programs that could benefit from additional resources. Focused effort to support existing firms, coordinate and enhance existing services, and share lessons learned throughout the region, is needed in order to preserve and expand a vibrant manufacturing sector.

FIVE

Creating and maintaining space for urban industry is a social justice issue. As the US economy becomes increasingly polarized, investing in living wage jobs is strategy for economic inclusion. Manufacturing jobs are widely recognized as providing better wages, with greater opportunities for career mobility, and fewer entry barriers than the service jobs that have proliferated in recent decades. Without pretending that manufacturing jobs will return to historic numbers, and without ignoring the toxic legacy of some manufacturing activities, it is possible to envision a role for production—for blue collar jobs—in green city futures.

These are just some of the lessons to be gained from this report. Other lessons may be found in the following chapters on the next page.

FOR THIS REPORT, THE STUDENT RESEARCH PROJECTS HAVE BEEN ORGANIZED INTO THE FOLLOWING CHAPTERS:

CHAPTER ONE
PROFILES IN MANUFACTURING 1
Identifies and discusses local examples of manufacturing firms and activities, highlighting existing vitalities and ongoing needs.

CHAPTER TWO
PROFILES IN MANUFACTURING 2
Discusses social justice dimensions of urban industry, clarifies the importance of workforce development to the vitality of the manufacturing sector, and offers a 'map' of the local workforce development ecosystem.

CHAPTER THREE
PROFILES IN MANUFACTURING 3
Identifies and discusses examples of manufacturing firms and activities from elsewhere in the country, clarifying compatibility with urban sustainability and providing lessons for local decision makers.

CHAPTER FOUR
PROFILES IN TOD/TOM 1
Explores the concept of 'Transit Oriented Manufacturing' and interrogates existing and potential opportunities to integrate transit planning and industrial planning in Tacoma and the Puget Sound region.

CHAPTER FIVE
PROFILES IN TOD/TOM 2
Investigates existing efforts to integrate transit planning and industrial planning from elsewhere in the country, revealing a wide variety of examples and providing lessons for local decision makers.

CHAPTER SIX
DEPARTURES FROM THE NORM
Explores new approaches to land use from around the country that depart from traditional zoning norms in order to preserve and expand urban manufacturing.

CHAPTER SEVEN
OFFSITE AND DOWNSTREAM
Considers the possibility of industrial displacement from current local transit projects and explores ideas to help anticipate and manage potential consequences.

CHAPTER EIGHT
FINDING THE TOM CONSTITUENCY
Approaches the integration of industrial planning and transit planning from the perspective of advocacy planning, seeking to gather attitudes and opinions from local interest groups in order to assess levels of support for TOM.

MACP PROGRAM OVERVIEW

The Master of Arts in Community Planning degree is designed to develop civic leaders who are equipped to make change in networks of public and private actors, helping to create more just, sustainable, and livable urban futures. This degree is premised on the following ideas:

1. "Community" is not a singular concept; moreover, less visible and under-resourced urban publics are often in need of specific forms of investment and support in order to engage the political process;
2. "Planning" is about enacting urban socio-spatial futures, through a variety of different professional roles; as such it happens in a number of different organizational settings and job titles;
3. The ways that people act and the social structures within which they are able to act are co-constituted; one creates and re-creates the other, and effective change agents use existing structures to generate new forms of action, and/or take singular, strategic actions to enable, demand, or elicit structural change.

Graduates will be prepared to be competent collaborative professionals who work with and empower community constituents, influencing processes of policy formation, resource generation, community change, and urban development. The program's emphasis on urban social issues, community development, and urban problem solving, and its commitment to training students to think critically and creatively, to work collaboratively in the interest of creating sustainable communities and to effectively communicate knowledge in a variety of ways is a direct expression of the UW Tacoma mission as a higher education institution.

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CHAPTER 1

PROFILES IN MANUFACTURING 1

By: Erica Bartlett

INTRODUCTION

The dramatic impact of 20th century industrial abandonment across the United States is well-documented. That history belies an important, contemporary reality: in the (now second) largest manufacturing economy in the world (Hoelzel & Leigh, 2012) industrial retention remains a vital ingredient for many urban centers. Proponents arguing for a closer examination and support of urban manufacturing posit that these businesses offer cities many opportunities for prosperous, equitable, and sustainable futures. Such futures rely on supporting economic mobility for all residents while developing awareness of the connections between our consumption patterns, transportation, and land use.

INTRODUCTION (CONTINUED)

In part as a response to de-industrialization in the mid-20th century and in part as a response to the growing shift to re-urbanize, select tenets of Smart Growth and Transit-Oriented Development have had significant influence on urban and economic development planning, coinciding with the desire to attract a specific, high-tech, creative class (Chapple & Loukaitou-Sideris 2019b; Hoelzel & Leigh, 2012; Peck, 2005). Strategies have centered on recruiting innovation and design processes, while overlooking production as necessary to a resilient, diversified economy (Brown & Greenbaum, 2017). This narrow scope falls short in building an economy that creates a spectrum of opportunity for residents (Doussard et al., 2016). It also fails to protect residents from exclusion and displacement in the restructuring process, further exacerbating structural inequities threatening the city's population (Curran, 2007; Hum, 2012).

An issue brief from the Pratt Center for Community Development proposes that "A new consensus has emerged that a vibrant manufacturing sector is critical to our nation's efforts to strengthen and expand the middle class and to maintain our economic competitiveness." (nd, p.1). The brief describes how cities like Chicago, Los Angeles, and San Francisco, which have previously focused on capturing the high-paying jobs offered by design and engineering, are now turning their sights toward the national shift to support manufacturing. Cities are recognizing the value of how manufacturing can reinforce economic resilience and mobility. They are preparing to meet a growing demand for innovative production processes with competitive technologies and to partake in a national export strategy (Giloth, 2012). The path towards an equitable, sustainable, urban economic mix that includes manufacturing is simply too beneficial to overlook (Figure 1).

The stigmas of manufacturing – dirty, dangerous jobs and polluting smokestacks - are persistent and inaccurate (Giloth, 2012; Hoelzel & Leigh, 2012). Misperceptions have led us to overlook many realities of a consumer society. American households rely daily on manufactured goods, from the home to the public realm, and have a responsibility to steward those processes. The international and localized "interdependencies among firms…buying selling, innovating, sharing talent" creates a "dense network of relationships among manufacturers" (Giloth, 2012, p.9) in which any displacement sends a ripple effect throughout the system. It is difficult to advance an informed, regional debate about what will make the future more environmentally sustainable without understanding the connection between land use, urban economies and manufacturing.

Land use practices that decouple design from production and convert highly attractive industrial space for residential and office use threaten the clustering activities necessary to the manufacturing sector's success (Doussard et al., 2016; Giloth, 2012), further hindering firms' ability to reach their full potential in urban environments that offer significant benefits for production. Shrinking industrial land inventory and displacement of manufacturing businesses decreases the number of high-wage jobs, creating a "bifurcated labor market that leaves little room for middle-skilled/ middle-class jobs" (Davis & Renski, 2020).

As an established port-industrial city, Tacoma is well-positioned to advance many opportunities in partnership with manufacturing. Washington's Maritime Blue Initiative (Washington State Department of Commerce, 2019) and Puget Sound Regional Council's (PSRC) Amazing Place (Puget Sound Regional Council, 2017) outline key export industries that rely on manufacturing (Figure 2). Tacoma has been recognized as an Etsy Maker City and established a Tacoma Made initiative to focus on scaling local, small scale manufacturers (City of Tacoma, 2017). And an existing, informal industrial reuse economy that offers many shared benefits has also been identified, with interest growing statewide to make that more robust through centralized leadership (Goodwin, 2019).

Figure 1. Manufacturing increases the diversity of career paths available to the city's residents. (Photo credit: Cleyder Duque/Pexels)

Onshoring, job growth, innovation, and environmental and economic sustainability, are long-term development visions. In the short term, it is necessary to question whether the tradeoffs of traditional transit-oriented development – namely, commercial and residential displacement (Chapple & Loukaitou-Sideris, 2019b, 2019a; Curran, 2007; Hoelzel & Leigh, 2012; Lester et al., 2013) - will move us closer to the long-term goals. Manufacturers have been left out of TOD and Smart Growth planning conversations, both locally and nationally (Leigh & Hoelzel, 2012). The omission has prevented a clear evaluation of the potential benefits of integrating modern production processes with mixed-use districts. It is imperative that we examine the manufacturer's perspective to make this evaluation.

To expand prior definitions of TOD and Smart Growth to a new phase of city-building which embraces manufacturing's processes and people - a strategy for "Transit Oriented Manufacturing" (TOM) (Dierwechter and Pendras 2020)– we need a clear image of Tacoma's manufacturing perspectives. This chapter engages manufacturers as stakeholders in transit planning to reveal the "intertwined destiny of older industrial cities and the manufacturing sector" (Giloth, 2012,); balancing the sector's unique needs for land use, workforce development, and transportation with the promise of an equitable, sustainable, and innovative city future (Christopherson, 2012; Leigh & Hoelzel, 2012; Renne, 2018). This research challenges stigmas that have caused active city-builders at all levels to overlook the sector's vital role in preventing displacement (Davis & Renski, 2020) and to instead consider preserving land in Tacoma's Manufacturing/Industrial Centers (MICs) (Tacoma Manufacturing / Industrial Centers Shape Map | Results 253, 2019) as a part of shared visions for equitable participation in a livable economy (City of Tacoma, 2015).

PIERCE COUNTY MANUFACTURING DATA

GATHERING PERSPECTIVES FROM TACOMA'S MANUFACTURERS

Stakeholder input was gathered through hour-long, semi-structured interviews using the teleconferencing platform, Zoom. A full list of interview subjects and questions is included (Appendix A). Interview subjects fall into two groups:

1. SMALL- TO MID-SIZE MANUFACTURERS

Economic geographer Susan Christopherson (2012) cites the importance of supporting firms at this scale in order to fully realize the opportunities presented by onshoring in the United States. She points to the importance of their role in supply chains desired by manufacturing businesses looking to expand or relocate in a region. Small scale businesses categorized as "makers" are also attributed with high potential for participating in larger-scale manufacturing innovation (Wolf-Powers et al., 2016). Subjects in this group were selected through a combination of snowball sampling and whether the business had some marketing visibility, i.e. an active website with contact information, and if they exemplified themes such as expansion, environmental sustainability, or Tacoma innovators who have been in operation for multiple generations.

2. MANUFACTURING BUSINESS ADVOCATES AND INTERMEDIARIES

Intermediaries are an important source for private sector perspectives as these organizations have established relationships through Business Retention and Expansion (BRE) programs. Originating in the manufacturing sector and now widely used to support many industries (Morse, 1990), BRE programs are collaborative efforts that combine company visits with technical assistance to achieve the following (Lee & Meyer, 2010):

- Increase firm efficiency
- Improve public relations between local government and local businesses
- Improve the community's quality of life
- Offer subsidies for the retention and expansion of firms
- Influence the retention and expansion of state and federal facilities
- Create an early-warning system for plant contractions, closings, and re-locations, and
- Design an overall long-term economic development strategy.

Using prior research as a starting point for inductive coding, the analysis reviews interview data for recurring themes. As different patterns and connections emerged, data points and adapted codes were reorganized to better describe shared stories, resulting in seven core themes. An analysis is presented here, followed by three profiles that highlight salient points from interviews. The chapter concludes with a case study examining the role of local, state, and national support to an expansion project in the historic Nalley Valley.

THEMATIC ANALYSIS OF INTERVIEWS

1) NETWORKS & COMMUNITY

Discussions revealed that a rich, multi-directional network of relationships and connections are foundational to the sector's long-term success. Manufacturers rely on the proximity of nearby support businesses and raw material vendors. Complimentary industries strengthen the market for a company's produced goods, adding value to larger supply chains. Small-scale manufacturers have more influence and visibility as a community than as a solitary business.

Tacoma's manufacturers contribute significantly to the community's workforce development efforts. They participate in apprenticeship programs, allowing people to earn while they learn, and collaborate with schools on training programs. These businesses, even smaller firms, also invest in the community through volunteer hours and other philanthropic measures.

As one informant noted:

"How do you quantify all of the intangible benefits...the community support and the community involvement? My feeling is that they're more likely to give back to the community and [create] living wage jobs because they believe in the community, because they're a part of it."

An established network of support agencies assists local manufacturers in expansion, but the perception is that businesses either have to be at a later-stage to get the help they need or they have to pay-to-play. ***Besides Spaceworks, formal infrastructure (technical assistance, legal support, funding, etc.) for small-scale producers is absent.***

2) INFRASTRUCTURE & ECONOMIC DEVELOPMENT PLANNING

Tacoma's manufacturers enjoy the competitive advantages of publicly owned utilities and rail, and access to existing air, land, and sea logistics infrastructure. The city offers proximity to local markets and access to markets in Alaska and Asia. While their contributions through B&O taxes and permitting costs are substantial, many feel slighted on investment in maintaining industrial areas. ***They would like to see the same energy in attracting investment to the MICs that has been put into downtown and the Tacoma Mall subarea.***

Subjects expressed that they welcome additional transit options as a means for investing in station areas while pointing out that equitable transportation options are vital to equitable work opportunities. For instance, an employer in the port who works with a reentry program notes that once the initial transportation privileges offered by the service provider ends, they struggle to retain the employee. ***Lack of transportation options in the port is a significant barrier to employee retention and equitable access to opportunity.***

Informants emphasized repeatedly that these jobs are valuable to an equitable, local economy. Career paths have a low barrier for entry, opportunities to upskill, and pay good wages. Several individuals posed the question of how we would replace the thousands of jobs lost and what sector will offer those same benefits should manufacturers be displaced by land conversion processes.

A tension was noted where transit expansion aligns with the creative class to make station areas more attractive to wealthier, future residents, decreasing affordability for existing manufacturers and makers. The Dome District was identified as being vulnerable to that pattern.

THEMATIC ANALYSIS OF INTERVIEWS (CONTINUED)

Several subjects indicated that Tacoma is limited in the opportunity for shared manufacturing space. Shared equipment opportunities allow for launching and growing production businesses. Discussions revealed the need for a food manufacturing business incubator and a publicly accessible, advanced manufacturing labs like the one at Bates Technical College.

3) LAND USE

Both Tacoma's deep-water port and flat topography in the port and in Nalley Valley are conducive to manufacturing activities. While residential encroachment is a perceived threat for political and cultural reasons, many interview subjects pointed out light manufacturing can easily exist in mixed use settings with minimum impact.

Innovation spaces, where multiple, small-scale designers work out of the same space, are seen as an opportunity; however, it was expressed that they should not take up the valuable, short supply of existing manufacturing land.

The hardware is as necessary to the innovation cycle as the software:

"You know, the innovation warehouse space where there's 20 businesses in one little space. Well that's great and all… but they still have to deal with manufacturing at some point. You can innovate, but then you've got to go somewhere. You don't want to innovate and have to move someplace else."

The amount of land necessary for manufactures is larger – things like storage and waste stabilization ponds, which filter wastewater, take up a lot of room. Land is not only scarce; Tacoma's manufacturers are finding it difficult to pay the higher premium for leases that marijuana and e-commerce businesses can afford. There is a desire to purchase and redevelop existing vacant properties but the cost of brownfield clean-up is a barrier.

4) THE POLITICAL ENVIRONMENT

Many participants noted that local regulations, permitting processes, and tax structures limit the possibility for expansion and innovations like the industrial reuse economy. Many feel that the hostility of the political environment lengthens permitting times – increasing the risk and cost of expansion projects necessary to onshoring equipment or expanding production. They often feel it is cheaper to maintain than to grow and that current systems fail to weigh the cost and benefits of policies, stifling both environmentally sound practices and innovation. For example, one business was written up for releasing zinc in the water due to the runoff from their roof. Unable to afford a new roof, the business shut down and the roof is still leaking. More appropriate regulatory tools and incentives may be created to enable manufacturers to succeed.

The City's microloan program was cited as a successful intervention to support small-scale producers. Several subjects stated that small-scale makers struggle to be seen as viable and access the support that they need to grow. ***The limited definitions of manufacturing businesses, in particular that NAICS codes do not accurately categorize production, makes it difficult to quantify or track many business' activities, as well as their contribution to the economy.*** Subjects expressed the need to define and quantify production in all forms, then create trends and forecasts for those sectors.

Tacoma's manufacturers do not feel actively engaged in planning processes and feel edged out of conversations by residents. An intermediary referenced a business owner from the port who was chased out of a neighborhood council meeting. Although they are supportive of transportation investment, they do not feel considered in the political process. Lines are drawn through parcels, but the businesses are not informed. Subjects expressed the need for a level of involvement that would better prepare them to make long-term plans.

5) CULTURE

Tacoma has a long history of manufacturing. Subjects expressed pride in the city's blue-collar legacy and strong work ethic. The sense of place contributes to their ongoing success.

They feel that shifts in consumer purchasing patterns shape our expectations for prices that are not reasonable when taking into account the cost to make a product. Local manufacturers want us to know what goes into the production process and value it. They feel that our disconnection prevents us from making informed purchases and stifles potential job creation.

As one informant put it:

"The general public, they don't think of manufacturing. They think of where they're going to order pizza, get a beer, or you know, that type of support… where they can go to Target or one of the stores and buy what they need, not necessarily where it's manufactured. And that's what I'm seeing as a trend. That those are the types of jobs that are more available as opposed to manufacturing."

6) SUSTAINABILITY

The value of urban manufacturing is two-fold. It provides equitable, diverse, employment opportunities to the city's residents. These jobs offer a low barrier for entry and a career with opportunities to upskill. Employers benefit from a large, talented workforce. They desire livability and affordability for their employees. By displacing these businesses, thousands of jobs will be lost as well as significant city revenues.

In terms of environmental legacy, the majority are fully aware of their responsibility as stewards and willing to cooperate with the region's environmental watch groups. Several intermediaries noted that are few manufacturers operating who aren't actively aware of and monitoring their impact. It is felt that opposing residents fail to take the full cost and benefit into account when making demands. For instance, policies like limiting the hours that trucks can come and go ends up creating more pollution as the trucks idle in traffic.

Tacoma's manufacturers are also voluntarily incorporating environmentally sound practices. They are investing in expensive equipment updates, like thermal oxidizers that ensure only steam is released from their smokestacks, and devoting land to stormwater ponds. They have organized an informal, industrial reuse economy and support the centralization of those activities. Processes are greener and jobs are safer than they were in the past. An intermediary pointed out that perceptions about sustainability are incomplete. People want solar panel manufacturing, but do not realize how invasive the production process is. Even green manufacturing can appear dirty at first sight, it is important to understand the role that business plays in the greater supply chain.

THEMATIC ANALYSIS OF INTERVIEWS (CONTINUED)

7) COLLABORATION AND COOPERATION

Local manufacturers see themselves as an integral part of Tacoma's past, present and future. Aspirations that were shared had an underlying theme of collaboration. They take pride in supporting workforce development efforts, mentoring other business owners, and in ensuring a good quality of life for their employees. They support win-win solutions like equipment sharing and the industrial waste economy.

But they expressed concern by the lack of preparation for opportunities like the Maritime Blue initiative and automation. We would improve our readiness with the advance creation of two or three potential projects that could be used to seek grants and attract investment.

Several subjects spoke to the importance of advancing the Tacoma Made initiative. Small-scale manufacturers struggle to be seen as viable and would benefit by the increased exposure to all things made in Tacoma.

While they would like to be engaged with decisions that impact their long-term viability, small- and mid-size manufacturers do not have the dedicated personnel that larger firms often have. Their doors are open, though, and they welcome outreach in any form. Intermediaries made suggestions like hosting targeted events or including "Tacoma" and "Manufacturing Business" in email subject lines to indicate that the information is useful for the business. Courtesy is important. They are unable to drop everything at a moment's notice, so advance notice of in-person visits is preferred.

PROFILE:

THE ART OF CRUNCH

Many manufactured goods that are produced in largely innocuous conditions –food, for example- -easily coexist with, even complement, traditional retail and residential uses in Tacoma.

After taking home a blue ribbon from the Washington State Fair for her biscotti ten years ago, Rhonda Hamlin decided to launch a business. For Hamlin, a single mom with two children, the venture would offer additional stability for her family while allowing her to thrive in the culinary community. Her biscotti and other treats are wholesaled to as many as 30 locations, from North Seattle to Bonney Lake and Gig Harbor, and are also available online. She has five part-time employees.

Food manufacturing, including packaging, is completed at the Gourmet Niche commissary kitchen on 6th Avenue. Credit: The Art of Crunch

> ***Hamlin sees an opportunity in the shortage of spaces. She and a partner have ambitions of establishing a food incubator in Tacoma; a place where businesses could not only access affordable commercial kitchen space, but also accelerate their businesses with a network of mentors.***

The Art of Crunch operates from a commissary kitchen located at 6th and South Oxford Street. The Gourmet Niche supports around 20 other food businesses, including three food carts that carry her products. All preparation and packaging is completed there. These spaces are in high demand in Tacoma, where there are a lot of aspiring food businesses and a shortage of commercial kitchen space. Urban centers offer many advantages for food businesses, including diverse supplier options and proximity to a large customer base.

Hamlin sees an opportunity in the shortage of spaces. She and a partner have ambitions of establishing a food incubator in Tacoma; a place where businesses could not only access affordable commercial kitchen space, but also accelerate their businesses with a network of mentors. An example she pointed to, the Union Kitchen in Washington, DC, has worked with over 500 businesses, created over $250 million of revenue collectively, while opening over 50 storefronts and creating well over 1,000 jobs. Of the companies supported, over 50% are woman- and/or minority-owned (Union Kitchen, ND).

The vision would allow her and other experienced business owners mentor those who are just starting out. "I would love to be able to reach out to the Rhonda eight years ago, take her by the hand, and say 'Hey, let's do it this way. This is how to do it.' Because I have [learned from] the school of hard knocks, the whole way."

PROFILE:

FEED COMMODITIES

"Bakeries' by-product? We like to think of it as bakeries for the bovine and their brethren." (Feed Commodities, n.d.)

Feed Commodities, located just off Portland Avenue, is in its 22nd year of operations in Tacoma's Tideflats. The firm purchases surplus from food manufacturers like bakeries and breweries then recycles it into livestock feed for farmers in Eastern Washington and, more recently, Southeast Asia. Their location offers a nexus of existing transportation infrastructure necessary to Feed Commodities' production and distribution channels.

> ***"Years ago we had...this community of businesses down here and what we were doing is we were working together, say hey look, I've got this kind of equipment, I run it this long...to be able to leverage those assets amongst ourselves so I don't go out and buy the same piece o equipment, the guy down the road has if he's not using it all the time."***

Grain-based by-products are converted into feed for livestock in Tacoma, Washington. Credit: Feed Commodities

Both a recycler and manufacturer, Feed Commodities diverts as much as 6000 tons of food by-products from landfills each month, removing 10,341,905.20 kilograms of greenhouse gases from the atmosphere. According to one source, that is the equivalent of 923,384.39 days of electricity for one household (Watch My Waste, ND). By converting that waste into livestock feed, the process lessens demand on supply chain resources - water, land, and labor – that would be used to grow new feed (Teras & Mikkola, ND).

Feed Commodities' success illustrates how industrial reuse strengthens regional economies while lessening the harms of systems we rely on each day. Synergistic benefits are dependent on clustering manufacturing processes or, at least, ensuring the processes are networked by road and

maritime logistics as they are in urban settings.

President and CEO Jim Seley also sees opportunity in reviving the practice of equipment sharing between Tacoma's manufacturers. "Years ago we had...this community of businesses down here and what we were doing is we were working together, say hey look, I've got this kind of equipment, I run it this long...to be able to leverage those assets amongst ourselves so I don't go out and buy the same piece o equipment, the guy down the road has if he's not using it all the time." A cooperation at that level has the potential to further localize manufacturing processes; thereby reducing transportation burden created by moving materials offsite at different stages of production.

PROFILE:

RITE IN THE RAIN

From a 30,000 square foot plant just outside Tacoma's city limits, Rite in the Rain manufactures proprietary, weather resistant notebooks that stand up in the toughest, wettest conditions. The technology was developed in the early 1900s as a solution for the logging industry and has stayed in place ever since - an exemplary of homegrown innovation being perfected in place (Powers, 2012). The ability to expand production as the business scaled over the last 100 years ensured staying power. After setting up in a shared space with Tacoma Printing and Binding Co, inventors Jerry and Mary Darling moved operations to his neighborhood in Browns Point until 1965 when, with the help of a partner, they were able to acquire property in the port.

Rite in the Rain selected their current, Fife location because it provided enough space to evolve the technology into something more efficient and environmentally friendly. By 2000, they had transitioned from a solvent-based manufacturing

> ***Rite in the Rain selected their current, Fife location because it provided enough space to evolve the technology into something more efficient and environmentally friendly. By 2000, they had transitioned from a solvent-based manufacturing facility to being totally water-based, which also means zero-chemical emissions.***

facility to being totally water-based, which also means zero-chemical emissions. They also shifted to using soy-based inks in the printing process. New owners undertook a significant industrial recycling program for off-cuts, used print plates and processing liquids. Changes to the international recycling industry have recently made such programs more costly and complicated for US manufacturers. Quality Control and R&D Director John Mattingly says he is hopeful that someday

An employee feeds stacks of coated paper into a notebook cutting machine. Credit: South Sound Business Journal

the system will be repaired; in the meantime, the company remains committed to organizing the production process around sorted materials.

The choice to stay in or near Tacoma has been intentional. Mattingly cites the benefits of clustering with other manufacturers and the suppliers who sustain them, the city's blue-collar culture and affordability for their 60 employees. Acknowledging the view that production is a bygone, dirty process, Director of Marketing Ryan McDonald says "We're a decent sized manufacturer, but we're in no way a business that can't thrive within, you know, walking distance to residential areas. Absolutely." Rite in the Rain has a bright future with hopes to expand into an additional 20,000 square feet. If they had the choice, their next move would be to Nalley Valley.

CASE STUDY:

TOOL GAUGE'S EXPANSION IN TACOMA

The spirit of cooperation between firms and intermediary partners offers support to achieving a company's vision for continuing success. These partnerships also play an important role in expanding the national Smart Growth agenda to include planning for urban industry (Leigh & Hoelzel, 2012, p.100). This case study will examine how public-private collaboration guided the expansion of an innovative, Tacoma-grown manufacturer.

COMPANY DESCRIPTION

Tool Gauge fabricates and supplies custom metal and plastic parts to original equipment makers (OEM) in the aerospace industry out of Tacoma's historic Nalley Valley. Tool Gauge stood out to partners at Impact Washington, the Economic Development Board for Tacoma-Pierce County, and the City of Tacoma for several reasons. The first was a hard-earned reputation for quality among lead customers like Boeing. The second was that they put their employees first. Finally, the family-owned company has a culture of tenacity that has rooted them in the area for over 60 years.

> ***The Economic Development Board for Tacoma-Pierce County (EDB) and Impact Washington, a nonprofit that supports manufacturers throughout Washington, aided Tool Gauge in the application process for the Washington State Department of Commerce's Working Washington grant.***

VISION + CHALLENGE STATEMENT

At the 2017 Aircraft Interiors Expo in Hamburg, Germany, company leadership announced a major expansion to Tool Gauge's facility. This expansion would result in a state-of-the-art fabrication facility designed for cobotics, or collaborative robotics,

Apprentice Raquel Taijito operates a five-axis computer numerical controlled (CNC) machine. Credit: Aerospace Joint Apprenticeship Committee (AJAC)

and additional full-time employees. Retooling Tool Gauge's workforce and strengthening the apprenticeship program were among the top priorities for the expansion project.

Manufacturing apprenticeships offer important opportunity paths for local talent like Raquel Taijito, a Stadium High School student who graduated in 2019 with journey-level certification after two years of employment with Tool Gauge (Ferrell & McKay, 2019). At the time of the announcement, Tool Gauge was powered by 125 full- and part-time employees. The expansion would enable growth to 235 full-time employees.

The new facility also offers a customer lobby with an exhibit of the company's history, additional office and conference space, and the installation of 19 additional machines from Austria and South Korea (McIntosh, 2020). The plan was to double the facility's footprint from 49,000 square feet to around 94,000. The adjacent property, however, was owned by Sound Transit and despite numerous attempts at negotiation, long-term lease was not an option. Fortunately, plans were reconfigured, allowing the expansion to proceed.

SOLUTIONS, AGENCIES + SUPPORT ROLES

Due to tight schedules, the sense of urgency and the production schedules manufacturers run on, community engagement can become a lower priority. A collaborative, public-private network is necessary to performing outreach, ensuring that manufacturers know what resources and opportunities are available to support their continued success. In the case of Tool Gauge, this network allowed leadership to be engaged on multiple fronts with local, state and federal partners.

The Economic Development Board for Tacoma-Pierce County (EDB) and Impact Washington, a nonprofit that supports manufacturers throughout Washington, aided Tool Gauge in the application process for the Washington State Department of Commerce's Working Washington grant. A $125,000 grant was awarded, and the EDB with Impact Washington delivered a comprehensive instructional program to the growing employee base in Lean Enterprise and leadership skills.

To further integration of Lean Enterprise and leadership training into the Tool Gauge's organization following the completion of the successful Working Washington grant, an application for a Job Skills Program (JSP) grant was made and $123,420 was awarded. JSP awards are workforce training grants administered by the State Board of Community and Technical Colleges (SBCTC). In this instance, the grant was administered by Invista Performance Solutions, a collaborative of four local community colleges. Separate though no less important, the

Aerospace Joint Action Committee, statewide, nonprofit aerospace and advanced manufacturing registered apprenticeship program, was also integral.

In addition to assisting with site selection, support is available to ensure that risks are minimized to bring a relocation or expansion project to completion. The city's Planning and Development Services manages lots of building permits, so projects are sometimes assigned a lead in Community and Economic Development. This ombudsman helps to ensure that any challenges in the development process are worked through creatively and quickly.

Public-private partnerships have significant impact, bringing jobs and more opportunities to the city's residents. Washington has a national reputation for accountability; the state has been noted for its tight scrutiny and careful stewardship of public assets like workforce grants and tax incentives (Corporation for Enterprise Development, 2002). Localized economic development intermediaries assist with vetting projects to ensure that public investment is used wisely to expand opportunities for Pierce County's residents.

CONCLUSION

The input gathered during interviews substantiates prior research on the value of manufacturing in urban centers. Land conversion is a viable threat as these businesses rely on a dense fabric of small- and mid-size firms in the overall supply chain. Stigmas surrounding the nature of production are no longer valid. Processes are safer and cleaner than in the past, increasing the viability of industry careers. Manufacturers take pride in the places they operate and are eager to be a part of the community's success. They invest in workforce development and desire a high quality of life for their employees.

Researchers have noted the omission of manufacturer's voices from TOD and Smart Growth planning. Firms sense that they are missing important conversations and would like to be a part of them. Bringing their perspectives to long-range planning processes benefits the community by addressing issues with more comprehensive solutions. Increased visibility and awareness also help small- and mid-size production businesses, whose success is necessary to the innovation cycle.

By examining the role manufacturers will play in initiatives like Washington Maritime Blue, PSRC's Amazing Place, Tacoma Made and industrial reuse, we can be better prepared to advance opportunities in onshoring, automation, and innovation for the city's residents.

By examining the role manufacturers will play in initiatives like Washington Maritime Blue, PSRC's Amazing Place, Tacoma Made and industrial reuse, we can be better prepared to advance opportunities in onshoring, automation, and innovation for the city's residents. Inviting them to the process can reveal any shortcomings of current regulatory frameworks and incentives, then advance those messages to state and national agencies to ensure tools are designed for mutual success.

APPENDIX A

This research was made possible by the following, who generously shared their insight and time.

Pat Beard,
*Business Development Manager**
City of Tacoma Community and Economic Development

Gloria Fletcher,
Business Development Manager
City of Tacoma Community and Economic Development

Rhonda Hamlin,
Founder
The Art of Crunch

Gwen Kohl,
Co-Founder
Money Moxy

Geoff Lawrence,
*Account Executive for the South Sound and Peninsula Region**
Impact Washington

John Mattingly,
Quality Control and R&D Director
Rite in the Rain

Ryan McDonald,
Director of Marketing
Rite in the Rain

Maddie Merton,
*Vice President of Business Retention and Expansion***
Tacoma-Pierce County Economic Development Board

Meredith Neal,
Economic Development Manager
City of Puyallup

Jim Seley,
President
Feed Commodities

* These subjects participated in a roundtable discussion on Tool Gauge's expansion and were not individually interviewed.

** Maddie Merton participated in both the roundtable discussion and in an individual interview.

ADDITIONAL ACKNOWLEDGEMENTS:

While data was not included from our conversations, Margo Bergman at the Milgard Center for Business Analytics and Jordan Rash at Sound Transit, also offered their time to this research.

INTERVIEW QUESTIONS

1. What are some of the benefits for manufacturers to operate in Tacoma, especially in an urban center?

2. What are some of the challenges faced by manufacturing businesses in Tacoma?

3. Is there an adequate support system to attract new manufacturing businesses or help existing businesses to expand? Do you see any missed opportunities in this regard?

4. Have you been involved in any of the transportation planning for the Sound Transit Tacoma Dome Link Extension station areas in the Eastside and Dome District? Do you have any comments on that in relation to manufacturing space?

5. What would you like local planners and residents to know about the manufacturing business community in Tacoma?

6. Can you think of any data, research, support programs, or other resources that might help improve the experience of manufacturing or enhance the manufacturing business community in Tacoma?

7. Do you have other contacts you think would be beneficial to speak with?

8. What was the Made in Tacoma project? How did it get started, who was involved, and what is happening with it now? Are you aware of any other similar projects underway in Tacoma?

FALL 2020

CHAPTER 2

PROFILES IN MANUFACTURING 2

By: Jeffrey S. Dade, II

INTRODUCTION

The United States has a long history of uneven development heavily influenced by race and class divisions and intensified by the historic prevalence of systemic discrimination against people of color. Over the decades (hundreds of years for some communities) the barriers to wealth accumulation have grown into persistent economic instability for the working class and other low-income residents. In the face of projected population growth in the Puget Sound region, established patterns of employment stagnation in the economic underclass, and the country's current trend toward a more service-based economy following the poverty-inducing effects of mass deindustrialization, blue-collar work is at risk.

INTRODUCTION (CONTINUED)

To the general populace, manufacturing industries are often equated with mass-production assembly lines, environmentally detrimental practices, and poor work conditions that are vestiges from earlier generations. In our ostensibly service-focused, college-centered economy these labor jobs are not seen as desirable, much less as keys to equitable urban development. However, these industries have continued to change in the post-industrial era, and they are remarkably well-suited with progressive principles that urban developers and planners espouse, such as Smart Growth and Transit-Oriented Development (Dierwechter & Pendras, 2020). Incumbent proponents of manufacturing in Tacoma must reframe industrial work as congruent with innovative urban paradigms to correct inaccurate views of industrial landscapes, challenging the presupposition of manufacturing as harmful and outdated.

In theory, planning professionals support the search for blue collars in green cities in their charge to "seek social justice by working to expand choice and opportunity for all persons, recognizing a special responsibility to plan for the needs of the disadvantaged and to promote racial and economic integration" (American Institute of Certified Planners, 2016). The research in this chapter takes a second look at local manufacturing to gauge the existence and viability of Tacoma's manufacturing complex, while keeping the blue-collar workforce that would be using the proposed Transit-Oriented Manufacturing front and center. Tacoma's manufacturing "ecosystem" matters because it is a significant contributor to the production of socially equitable workforce opportunities able to improve the financial stability of our most vulnerable communities.

Incumbent proponents of manufacturing in Tacoma must reframe industrial work as congruent with innovative urban paradigms to correct inaccurate views of industrial landscapes, challenging the presupposition of manufacturing as harmful and outdated.

The specific objective of this report is to assess the existence and viability of Tacoma's manufacturing ecosystem, despite the stigmas of industrial work. In particular, workforce development pathways for local manufacturing have been associated with positive impacts that may work in tandem with modern advancements to help remediate uneven socio-economic development and allow for equity in blue-collar, urban-industrial futures (Clark & Dawson, 1995). Other themes include quality of life in the workforce pool as well as the changing nature of work from the employers' perspectives. The disucssion is organized in three main sections. First, the Research Overview will offer relevant rationales from scholars and organizations that clarify the position of the subjects being studied. Next, the Tacoma Workforce Development Ecosystem Map (TWDEM) is a visual aid that provides a lens to help reference connectivity among the various elements and entities involved locally. Finally, the Findings area features the results of the examination and analyzes them in association with the research support in the previous sections.

RESEARCH OVERVIEW

Contemporary planning professionals are charged with providing residents solutions that consider equity, economy, and environment. In the throes of transition, contemporary economic conditions continue to challenge how cities adapt these tenets to the built environment, industries, and the people therein. The resulting needs born from a changing world are complex and often multi-layered. This is exemplified in the case of workforce development connected to manufacturing. Though influenced by many authors, the primary impetus for this investigation stemmed from several articles in an issue of Progressive Planning that focused on progressive manufacturing approaches. The pieces that stood out had to do with the changing nature of manufacturing and its effects on jobs and communities. The authors were not just mentioning the death or rebirth of manufacturing. They spoke to the promise of the industry's "development as a component of city and regional well-being" as well as "its importance for neighborhood and city growth" (Giloth, 2012). Perhaps the greatest inspiration to delve deeper came from an article called "Planners and Manufacturing: An Uneasy Alliance".

Three statements stood out (Giloth, 2012):

- *"The equity dimensions of manufacturing—the quality of jobs and the accessibility of jobs in terms of education and geographic location of firms—are consistently favorable but frequently unrecognized"*
- *"manufacturers are still crying loudly about skills gaps and their inability to hire"*
- *"...there is the perennial problem of manufacturing having a bad name—dirty jobs, unsafe work environments and inevitable layoffs and shutdowns. What parents in their right minds would urge their children to make a career in manufacturing? The reality of and prospects for these new jobs, however, is quite different from common perceptions and the word needs to get out."*

Robert Giloth's words stimulated the core queries in this chapter. While far from a panacea, the literature appeared to point to an interesting

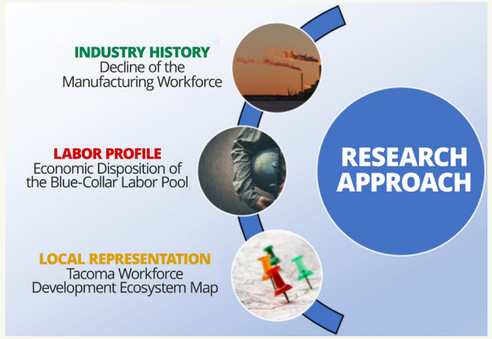


Figure 1: Author's rendering

confluence wherein the unrealized equity potential of manufacturing jobs to provide for unmet needs in local communities is being hampered by the lack of accessible workforce training as well as long-held biases, misconceptions, and a communication void.

Armed with a solid justification for the investigation (see Figure 2 below), my initial research approach was to survey national scholarship in relation to formal workforce development programming in the manufacturing space. I also explored community economic well-being indicators and information on the recent history of the industry to help identify workforce relevant changes. At this point, I began to develop more specific questions to use in the creation of the lens and tools that I would apply to comprehend Tacoma's manufacturing workforce.

INDUSTRY HISTORY	LABOR PROFILE	LOCAL REPRESENTATION
How has manufacturing changed as an industry, relevant to workforce development?	What is the current state of the manufacturing pool of labor?	Is there a way to create a useful visual inventory illustrating manufacturing ecosystem linkages?
Decline of the Manufacturing Workforce	*Economic Disposition of the Blue-Collar Labor Pool*	*Tacoma Workforce Development Ecosystem Map*

Figure 2: Research Approach

THE MANUFACTURING WORKFORCE

There was a time in America when manufacturers were very common. Over the years, the national workforce has transitioned into sectors like healthcare and the retail trades as manufacturing employment has declined (Wilson, 2014). In 1953, approximately one-third of all employment was in manufacturing, but today it has fallen under 10 percent (DeSilver, 2017b). Outsourcing and offshoring (Christopherson, 2012) have been central to the fall, yet another important element was at play because "some of the manufacturing losses were the expression of definitional changes" (Clark & Clavel, 2012). Even so, after hitting and maintaining its peak through the late 1970's when up to "42 percent of jobs were in larger plants", much of the work of big industrial producers was outsourced to smaller businesses and "by 2009 the [large manufacturer jobs] figure was at 27 percent" (Clark & Clavel, 2012).

It is true that manufacturing as an industry has declined over the years, but "manufacturing output - the value of goods and products manufactured in the U.S. - has grown strongly" (DeSilver, 2017b). Recently, there has been a turnaround as domestic energy costs, previous labor costs, and the quality control abroad have softened and promoted an onshoring trend of manufacturing back to the U.S. (Christopherson, 2012). Referencing both the Bureau of Labor Statistics and the Bureau of Economic Analysis, the Pew Research Center reports that manufacturing still supports approximately 8.5 percent of the nation's total employment and produced 18.5 percent of America's gross output, over "5.4 trillion [dollars] worth of goods and products", in 2016 (DeSilver, 2017b). The strength of the sector continues to be a significant stabilizing factor for American workers. In 2017, Christine Lagarde of the International Monetary Fund (IMF) remarked that the high productivity seen in manufacturing "is the most important source of higher income and rising living standards over the long term. It allows us to substantially grow the economic pie, creating larger pieces for everyone" (DeSilver, 2017b). This information points to an American manufacturing industry that is not in permanent state of decline. Instead, it is a securing factor for our economy. Having identified value of manufacturing jobs, when applying these learnings to Tacoma it will be important to pay attention to the "labor supply and 'skills mismatch'" reported by experts (Christopherson, 2012).

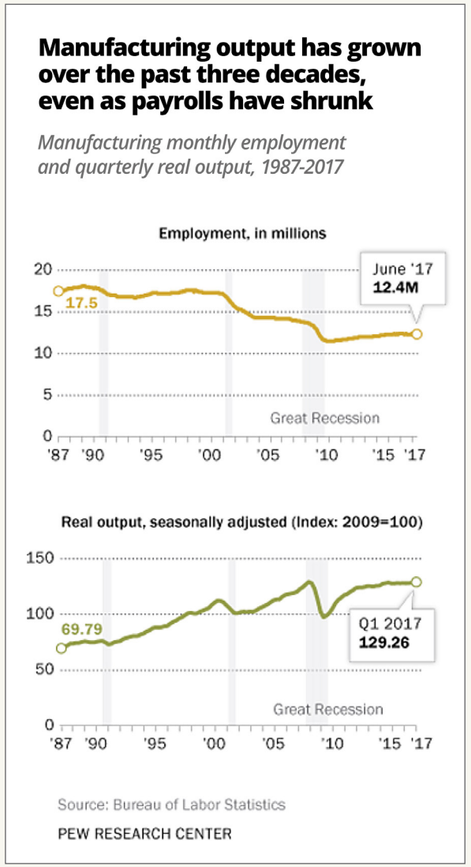


Figure 3: Employment to Output Comparison

ECONOMIC DISPOSITION OF THE BLUE-COLLAR LABOR POOL

There are many aspects that could be covered to describe the increasing burdens blue-collar workers are facing. This study references only a few, namely the interconnection between supply-side (worker), demand-side (employer) and the gap that keeps them apart (Conway, Blair, Dawson, & Dworak-Muñoz, 2007). Labor is often categorized in terms of skill levels ranging from unskilled to professional (Figure 4 below). The truth is that "there has been a continued shortage of 'middle-skill workers' able to fill advanced manufacturing jobs" for years, the so-called skills gap (Christopherson, 2012). In 2020, the CEO of the National Association of Manufacturers called on the group to "come together to solve the most pressing challenge facing manufacturers: our workforce crisis...[we must] narrow the skills gap and inspire a new generation to pursue the high-tech, high paying jobs of modern manufacturing (Hennigan, 2020).

The literature shows that most of America is working in the service industry and now "83.9% of all private-sector nonfarm jobs are classified as service-providing" (Desilva, 2017a). With the rise of retail service employment, it is important to understand that the earnings potential of Americans, especially those on the lower end of the skills spectrum, have fallen considerably. Unskilled workers see relatively low unemployment, but high wage inequality is currently shouldered disproportionately by lower income communities, immigrants, and communities of color (Chapple & Loukaitou-Sideris, 2019a, 2019b; Dawkins & Moeckel, 2016; Hum, 2012). Subsequently, these same groups find it difficult to generate the needed upskill because it is so costly to live in poverty. Problems with affordable housing and living wages coexist with the high costs of education, healthcare, and excessive rent burdens which virtually eliminates any possibilities for social mobility. Testing for these issues in Tacoma is done with various economic indicators developed nationally.

Figure 4: Skill levels in manufacturing

Source: careersnw.org

TACOMA WORKFORCE DEVELOPMENT ECOSYSTEM MAP

Prior to beginning the work of applying the research to Tacoma's manufacturing workforce, a diagram was developed for a clearer model view of the existing ecosystem. The survey of the local manufacturing community included references from state, county, and city levels as well as private and third sector organizations. The diagram is modeled after the Clark Fox Family Foundations work in St. Louis (see: https://clarkfoxstl.com/mapping/).

The ecosystem illustrated above is not exhaustive. Its purpose is to show linkages that exist as pathways and access points for Tacoma's manufacturing workforce. The general hypothesis is that more connections found between the hierarchies and workforce actors involved may indicate a healthy environment that is resistant to the worst of the skills mismatch problem and conducive to local workers' economic mobility powered by upskilling (Workforce Central, 2019). It should also inform the findings and contribute as a useful, community-legible visual.

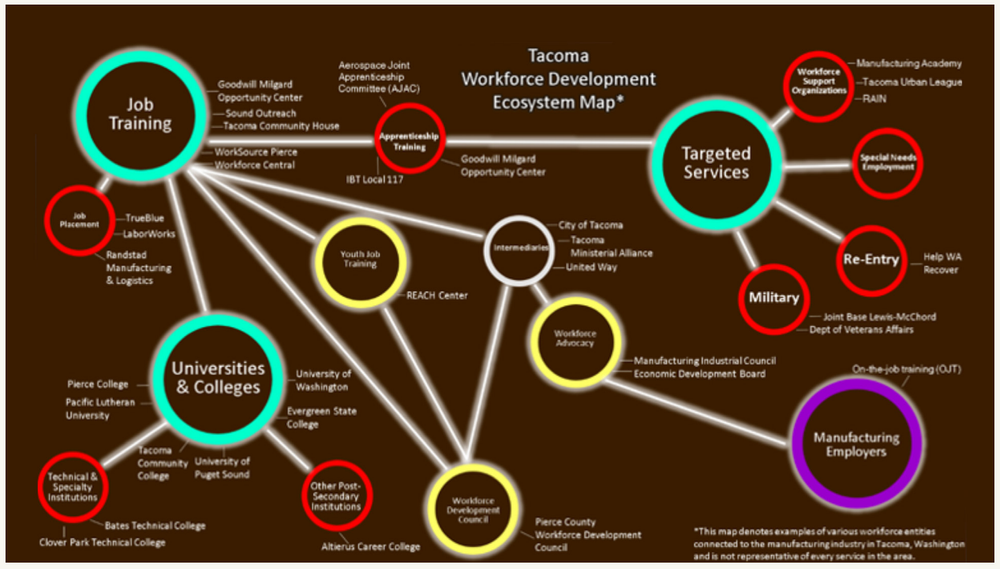


Figure 5: TWDEM
Source: Author's rendering

FINDINGS

Scholarship emphasizes the quality of manufacturing jobs yet points to the skills gap as the shared, primary problem for the supply and demand-side groups. The samples taken to create the snapshot of Tacoma's ecosystem showed a surprising amount of active networking. So, what is the problem exactly? Why aren't workers emerging from training programs and instantly being hired into the good life? While searching for ways to create larger classification groups, two domains rose to the fore: Labor Equity and Workforce Connectivity.

LABOR EQUITY (SUPPLY-SIDE)

The Puget Sound Regional Council (2009) notes that "...the people of the region, our economic prosperity, and our relationship to the planet are tied together in a mutually supportive and interdependent way. Social and environmental goals cannot be achieved without economic prosperity — and achieving prosperity is highly related to social well-being and environmental quality."

Money buys freedom, so raise your income. Labor equity refers to fair access to reliable, "well-paying entry-level jobs with opportunities for social mobility" (Dierwechter & Pendras, 2020). In Tacoma's case, there are serious concerns around the compounded social and financial adversity that leaves half of the city perpetually insolvent, insecure, and vulnerable to displacement. Nearly half of Tacoma households are in trouble because they are working full-time and still struggling to maintain a survival budget (United Way, 2018). In the years since the end of the Great Recession, the unemployment rate has declined much faster than the poverty rate and the relationship between the two has remained relatively constant for over 50 years (see Figure 6). Increasingly more Americans are struggling to find work that allows families to be financially self-sufficient. People are working. However, even full-time work in the lower-income end of the growing service sectors does not provide enough of the income or benefits needed for basic subsistence (Cooper 2018).

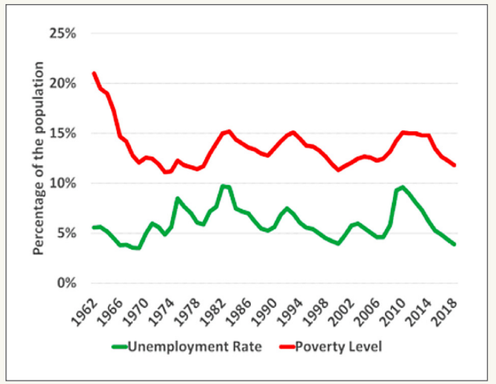


Figure 6: Unemployment Rate Compared to Poverty Rate
Source: http://federalsafetynet.com/us-poverty-statistics.html

As such, income inequality from underemployment (not unemployment) is the local crisis. For example, the current living wage for Tacoma is $27.78 per hour (National Low Income Housing Coalition, 2019). However, 50 percent of all jobs in Pierce County are paying less than $20 per hour (United Way, 2018). In fact, one in nine workers are being paid too little "to escape poverty for their family size (Cooper, 2018).

Assets protect your freedom, so save your money. A.L.I.C.E. is an acronym created by national nonprofit, United Way. It stands for Asset-Limited, Income-Constrained, Employed. Developed as a comprehensive methodology to standardize the assessment of financial hardship, it has been adopted all over the United States. ALICE households in Pierce County work full-time and may have multiple jobs. They are gainfully employed, yet live paycheck to paycheck. These families and individuals typically have low access to credit, are barred from adequate housing, and are generally unable to care for the next generation due to the lack of family-sustaining wages. These vulnerable families and individuals are one missed payment or emergency away from disaster. Underemployment and low service sector wages do not allow for the saving of surplus income that would protect them by providing a cash flow windfall.

FINDINGS (CONTINUED)

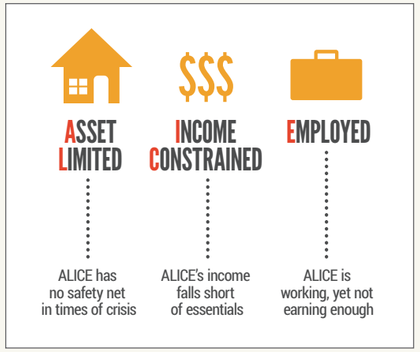


Figure 7: Who is ALICE? Source: UnitedWay.org

Home nurtures freedom, so teach your children. Quality of life indicators confirm the plight of our families. The Prosperity Now Scorecard/Local Outcome Report (see Figure 8 below), which looks at data like rent burden and housing affordability, shows that both are higher than state and national averages. As noted above, urban equity is closely tied to economic and environmental health. Data from third sector organizations like Prosperity Now and government-sourced data paint a bleak picture for low-income, unskilled families, especially if they have low educational attainment.

Low-income households have an increased inability to acquire affordable housing and produce intergenerational wealth. Additionally, in places like Tacoma, their cost burdens are exacerbated by the lack of affordable housing and an ever-increasing rent burden.

> ***ALICE households in Pierce County work full-time and may have multiple jobs. They are gainfully employed, yet live paycheck to paycheck.***

The final indicator comes from the Centers for Disease Control and Prevention. They have long documented the linkage between peak health and "community economic characteristics including income and inequality in income distribution, wealth, poverty, and the geographic concentration of poverty" (Hillemeier, Lynch, Harper, & Casper, 2004). The Center's grand concept, Social Determinant's of Health (SDOH), identifies economic well-being as one of 5 major determinants affecting American longevity and quality of life. Their research has even shown that "home ownership has been associated with reduced morbidity and mortality risk" (Hillemeier, et al, 2004).

Homeownership & Housing

OUTCOME MEASURE	PLACE DATA	STATE DATA	US DATA
Homeownership Rate	50.4%	62.8%	63.9%
Affordability of Homes	4.1x higher than median income		
Housing Cost Burden - Renters	51.4%	47.8%	49.7%
Housing Cost Burden - Homeowners	35.4%	29.1%	27.7%

Figure 8: Prosperity Now Housing Data for Tacoma as July 2019

LABOR EQUITY (SUPPLY-SIDE)

Again, Tacoma has a ready worker supply, while the hard to access employer demand lies fallow. To bridge the gap between vulnerable workers and valued manufacturers, much of the power is in the hands of employers. It appears that there may be disconnects between the hiring manufacturers and the prospective pool of workers in the area. These include lack of residential access to training programs, uninformed residents, ineffective communications between training pathways and employers, and outdated community perceptions regarding the quality of employment that are creating barriers to engagement. In their report, Pierce County's Future of Work, Workforce Central noted that advanced economies are experiencing the Fourth Industrial Revolution (Workforce Central, 2019). They make recommendations for Tacoma's primary barriers that are supported by my research. Finding employees is amongst the highest barriers for manufacturing businesses and each the following solutions have something to do with the infamous skills gap.

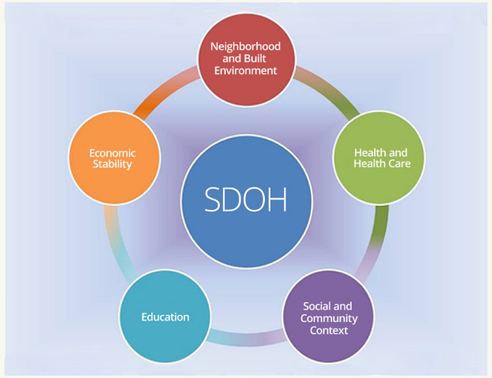


Figure 9: CDC Social Determinants of Health

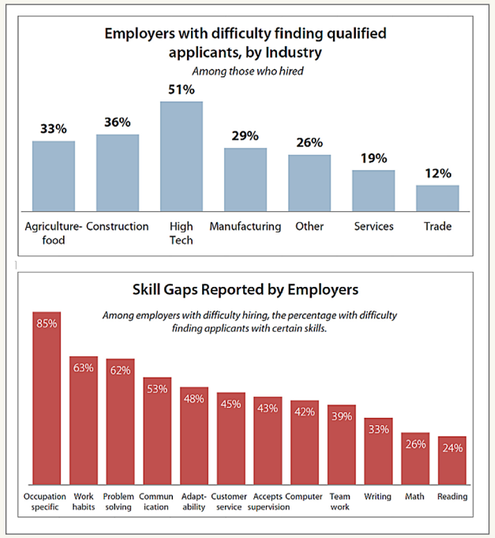


Figure 10: Washington Employer Survey, 2019

FINDINGS (CONTINUED)

THE COMMUNITY WOULD BE BOLSTERED IF MANUFACTURING FIRMS FOCUS ON THREE ADDITIONAL AREAS:

ONE

Increase the quality and frequency of direct messaging to the local labor pool. The prospective skilled and unskilled worker base is unaware that employers are a match for them. About a third of Pierce County's degree holders are underemployed and thousands are commuting outside of the county (Workforce Central, 2019). Long commutes lead to "decreased productivity, increased absenteeism and turnover" (Chicago Metropolitan Agency for Planning, 2016). It is therefore important to activate this latent, extant, proximate group and groom their talent by "promoting access to employment opportunities and digital upskilling resources (Workforce Central, 2019).

Has your firm ever had an arrangement with a community or technical college to provide education and training services to your employees?

Among those who provide or pay for training, workshops, or seminars.

Q17	# of Employers (est.)	Percent
Yes	4,272	9%
No	43,402	91%

Figure 11: Washington Employer Survey, 2019

TWO

The survey of the manufacturing ecosystem shows a high level of connectivity. The actors do not seem to be siloed from a surface point of view, which leads us to another contemporary problem with workforce pathways: "inadequacies in the training and education pipelines to employment" (Conway, et al, 2007). For some organizations, the skills gap remediation is being hampered by scattered information. Successful trainee graduates are not being hired because their sponsored program (external to the manufacturer) is out of date with the employer's required needs. Taking a more active role in the validation of local workforce pathways and engaging with training partners will likely improve hiring efficiencies and "ensure that resources are directed where [they are] needed" (Workforce Central, 2019).

THREE

The last proposal is for manufacturing firms to ensure "demographic representation in all education and pipeline programs" (Workforce Central, 2019). Workers need help to be able to age and wage in place. For instance, historically manufacturing has provided some of the most access to jobs for immigrants who may have lacked English proficiency (Hum, 2012). Industry leaders can also engender loyalty by addressing the intergenerational gap in the legacy of knowledge from older workers (Christopherson, 2012). Demographically inclusive hiring and employee retention are vital for company cohesion, and they promote the organizations leadership role in community economic health while providing restorative impacts to previously marginalized populations.

In an intriguing preface to the solutions section in Pierce County's Future of Work, the authors highlight and acknowledge that we do not lack talent regionally and there is "no apparent dearth of pipelines to these careers, nor do we lack models of education or employer partnerships" (Workforce Central, 2019). The manufacturing labor channels in Tacoma have been excavated and they are operational. The next moves are centered around relationship-building and locking in the efficiencies for better results.

CONCLUSION

We should care about manufacturing workforce development because it has the potential to bring the stabilizing economic chops that so many locals need. Eliminating income disparities increases our economy and reduces the severity of economic downturns. Financial inclusion is both ethically and economically beneficial because healthy, sustainable communities are made up of people who have living wage jobs and feel confident about their economic futures. Layered TOD applications are beneficially synergistic in proximity to focused manufacturing activity and so TOM is born (Jamme et al, 2019). There is also a beneficial synergy to be had for our evolving urban manufacturing businesses who are increasingly onshore and reportedly prepared to add to their teams. To attempt this utopian goal, residents need the skills to advance along a steady path of employment that permits them to manage their money outside of constant crises.

"We will become a majority people of color nation by 2044; already, 46 percent of all youth are of color. Yet those entering the workforce today have fewer opportunities for economic mobility and success than their parents, even as these young people make up the most diverse generation in our nation's history" (Equitable Innovation Economies,2016).

There are certainly more factors, important ones like race, gender, and age, that were outside of the scope of this report. Frankly, to reach significant social justice goals, our people need to have broad access to quality employment. Locally we are seeing increases in population growth, diversity, and the cost of living with coinciding decreases in living wage work and the market share of industries, like manufacturing, that have historically supported blue-collar unskilled and skilled workers. Understanding both the localized human requirements for employment and the nature of the existing manufacturing establishment will be instrumental in strengthening a beneficial workforce praxis for the city. For our Black and indigenous people of color (BIPOC), resident low-income families, the Makers, and the large industrial manufacturers, Transit-Oriented Manufacturing is looking good. It has promise as a practical tool to protect and promote workforce social equity in the blue-collar, green cities we hope to create.

"We will become a majority people of color nation by 2044; already, 46 percent of all youth are of color. Yet those entering the workforce today have fewer opportunities for economicmobility and success than their parents, even as these young people make up the most diverse generation in our nation's history"

FALL 2020

CHAPTER 3

PROFILES IN MANUFACTURING 3

By: Hayley Matthews, Regan Churchill

INTRODUCTION

When imagining the future of a city like Tacoma, where a new green economy values people and the planet at least as much as it does economic growth, some people may have a hard time visualizing how manufacturing fits into the mix. Even the planning profession has too often treated manufacturing and industry as something to be avoided and kept away from people. For many of us, "manufacturing" conjures images of large, dirty factories with billowing smokestacks, reminiscent of the first industrial revolution. There are common misconceptions around the sustainability, viability, and desirability of urban manufacturing. It is thought to be a dirty, dying industry that you don't want near you.

INTRODUCTION (CONTINUED)

While there are still some types of heavy industrial facilities that you wouldn't want to live next door to, there are many more businesses that we should be happy to have in our neighborhoods. They care about their impacts on the planet and provide living-wage jobs without being disruptive or unpleasant to be around. Those stereotypical "big dirty factories" are becoming a thing of the past thanks to advances in technology and years of environmental regulations. There is plenty of data out there to prove these misconceptions wrong, but yet these commonly-held ideas persist.

Urban manufacturing brings many benefits, yet most American cities do a poor job of protecting and supporting these businesses. Due to popular misconceptions and outdated visions of manufacturing and industry, they are not only undervalued, they are seen as something to be avoided. This research aims to contribute to the goal of maintaining and expanding space for manufacturing by investigating exciting examples of how manufacturing is evolving in a way that will enable the transition toward green economies. By providing these examples, we hope to correct the misconceptions about the viability, sustainability, and desirability of urban manufacturing. If we want to preserve industrial lands for the manufacturing sector in Tacoma and support our existing businesses (as discussed in the previous chapter), it is critical that local planners utilize the tools at their disposal (Leigh et al., 2014, p. 35).

Even the planning profession has too often treated manufacturing and industry as something to be avoided and kept away from people. For many of us, "manufacturing" conjures images of large, dirty factories with billowing smokestacks, reminiscent of the first industrial revolution.

RESEARCH OVERVIEW

As the population of the Puget Sound region grows, land is being developed (and redeveloped) to provide housing and commercial spaces for businesses. A regional light rail system is being expanded to provide more transportation options. Increased development and the presence of public transit puts pressure on industrial lands, creating incentives for converting them to more profitable uses. This creates a challenge for urban manufacturers who can't pay the high real estate costs that commercial businesses might otherwise be able to afford. In absence of careful planning, these businesses will be forced to move outside of the city or to close down shop.

These generally small to mid-size manufacturing firms located within our cities produce anything from gourmet cupcakes to semiconductors and provide jobs for the local workforce, often at much higher salaries than jobs with similar educational requirements in other industries (Equitable Innovation Economies, 2017, p. 4). The manufacturing sector currently provides roughly 9% of jobs in the Tacoma area (EDB, 2018), and industrial and manufacturing jobs were projected to increase by 84,000 between 2012 and 2040 across the Puget Sound region (PSRC, 2015, p. E-1). Manufacturing businesses also tend to be more resilient during economic downturns (Overton & Bland, 2017).

Urban manufacturing brings multiple benefits to cities, yet most American cities do a poor job of protecting and supporting these businesses. Due to popular misconceptions, manufacturing and industry are not only not valued, but are seen as something to be avoided, even within the planning profession. Smart Growth planning principles, which gained popularity in the mid-1990s to reduce sprawl and revitalize urban areas, are likely a significant reason for the lack of inclusion of industry in local planning (Leigh & Hoelzel, 2012, p. 89). At best, manufacturing is given a brief mention, while at worst, Smart Growth views industry as a blight on the city, something to be chased out and redeveloped into trendy lofts (Bronstein, 2009). Instead of protecting industrial lands, Smart Growth policies can inadvertently contribute to their displacement and conversion, facilitating urban sprawl. Unfortunately, manufacturing and industry need intentional support and protection through zoning and local initiatives to thrive, as they are especially vulnerable to the market. Many businesses rely on industrial-zoned lands to provide the space necessary for their facilities at affordable prices, which will be converted to more profitable uses if not protected (Bronstein, 2009, p. 30).

Our literature review uncovered the common misconceptions around manufacturing in America, and the need for a more accurate and updated understanding of what urban manufacturing looks like today and how it can be a part of a green economy. Therefore, our research confronts three commonly-held misconceptions around American manufacturing:

MISCONCEPTION #1:

"Manufacturing and industrial uses are inherently dirty and dangerous." When thinking of industry and manufacturing, we often think of large facilities that are filled with loud, dangerous machinery and releasing large amounts of pollution in the air, soil, and water. While some types of heavy industry, such as large mills and refining plants, will still generally need more consideration in where they are sited and what kinds of neighbors are a good fit, improved technology has reduced both the noise and pollution from industrial facilities (PSRC, 2015, p. E-4; Leigh et al., 2014, pp. 5-6). Many modern manufacturers utilize 3-D printing, CNC, and other advanced manufacturing technologies, which do not fit the "dirty and dangerous" vision of manufacturing that many people still hold (PSRC, 2015, p. E-4). The manufacturing and production sector is also becoming more sustainable. New technologies allow us to become "cleaner and greener", such as utilizing large amounts of data to improve efficiency, which reduces waste and pollution while creating products more quickly and at higher quality (PSRC, 2015, p. E-4).

RESEARCH OVERVIEW (CONTINUED)

MISCONCEPTION #2:

"Manufacturing is a dying industry." Many people think that manufacturing is a dying industry in the US due to loss of manufacturing jobs and the many American companies that have moved their production facilities overseas (Naim, 2014). However, manufacturing is resilient and continues to be a significant contributor to the US economy (Leigh et al., 2014, p. 3). One reason for this misconception might be that manufacturing looks much different than it has in recent history. Smaller-scale, specialized and local production facilities are growing at a faster rate than large-scale production that many are used to seeing (PSRC, 2015, p. E-3). Manufacturers are using technologies that were still in development even just ten years ago (PICCED, 2013, p. 1). The increase in production has also not been proportional to an increase in the number of jobs, as production and manufacturing are becoming increasingly automated (Naim, 2014). Much of the current workforce will soon be aging out, leaving many positions to fill as workers retire (Leigh et al., 2014, p. 3). Increases in transportation and foreign labor costs are also making domestic production more desirable (PICCED, 2013, p. 9).

MISCONCEPTION #3:

"Manufacturing is an undesirable land use, incompatible with other land use types." Zoning requirements were established in the U.S. in the late 1800s to keep factories separate from residential development, which were seen as "incompatible" due to the noise and pollution the factories generated (Albemarle County Attorney's Office, 2015, p. 2-1). Even though many of these facilities have changed in the past 200 years, they are still largely treated the same way by the planning community - incompatible with other types of land use. With urban manufacturing's shift away from mass-produced large-scale operations toward local production and artisanal manufacturing, urban industry can now operate in areas beyond those strictly industrial zoned (PSRC, 2015). Advancements in sound, odor and vibration pollution further reinforce the capabilities of manufacturing within mixed-use zoning. Small- to mid-sized manufacturing and production facilities also tend to be quieter and have lower impacts due to smaller scale of production (PSRC, 2015, p. E-4).

Despite the availability of information, many of us still have a very limited and outdated understanding of modern manufacturing, and planners must do more to incorporate it into their work. Many people just don't have a close connection to manufacturing. With a more accurate idea of what urban manufacturing looks like, how it operates, and how it fits in urban spaces, it is more likely to be planned for and protected.

We see a need for additional context around the types of manufacturing that are currently being practiced and the new technologies that are currently emerging as a part of the fourth industrial revolution, what is often called "Industry 4.0". We know that increased automation can improve efficiency and reduce resource usage, but it also comes at the cost of blue-collar jobs. This creates a tension between the environmental protection and social equity. For the best outcomes in Tacoma, these tensions need to be acknowledged and addressed intentionally throughout the planning process and in future economic and workforce development. We frame our research with these considerations in mind while we work to bring companies to Tacoma, or even better, help to nurture home-grown businesses. The examples provided here are intended to enable readers to visualize how manufacturing can fit into the city's green future.

We designed this research project to find out more about what changes need to be seen in manufacturing to be sustainable, taking into account both the environment and social equity, which informed the types of businesses we selected to highlight and profile. We conducted archival research on promising firms, using the B-Corp database and Cradle-to-Cradle Certification listing to help identify candidates for profiles.

FINDINGS

WHAT WERE WE LOOKING TO FIND?

Utilizing the Certified B-Corporation directory as well as the Cradle-to-Cradle certification, we sought companies that are located in urban areas. Proximity to transit was a desirable attribute, but did not disqualify a company from consideration. But, most importantly, we sought out companies that dispelled the three misconceptions surrounding urban manufacturing: manufacturing is inherently dirty and dangerous, manufacturing is a dying industry and that manufacturing is incompatible with other land uses.

PROFILE 1

Company Name	**METHOD PRODUCTS**
Founded & HQ	2000 - San Francisco, CA
Facility Location	Chicago, IL
Goods Produced	Environmentally friendly household cleaning supplies and personal care products.

ABOUT THE COMPANY

Method Products, the maker of colorful and environmentally-friendly household cleaning supplies, says that they care about people and the planet. Later reincorporated as a public benefit corporation. Method was one of the first companies to be endorsed by Cradle to Cradle (C2C), which initially certified 37 of their products as having been designed to be sustainable from production to the end of the product's life. They now have over 60 certified products (Cradle to Cradle, n.d.).

ABOUT THE FACILITY

In 2015, Method opened the first LEED platinum certified soap factory in Chicago's Pullman Historic District, one of America's first model industrial towns. Method estimated the new facility would employ around 100 people in manufacturing positions, with a focus on hiring local residents. The five-acre facility is built on a rehabilitated brownfield site. The remaining 17 acres is restored with native plant species and is preserved and used as park space. The soap factory uses sun-tracking solar panels and a refurbished wind turbine to generate nearly half of their energy, and a stormwater collection system reduces their annual water usage. Greenhouses on the roof provide organic greens to local retailers (Our soap factory, n.d.).

WHY THEY MATTER

Method shows that you can be a profitable business while also working to do good for your community and the environment. They approached a common product in a new way to make it safer to produce, use, and dispose of.

Other companies to consider	SAFT – Bordeaux, FRA Manufacturer of li-on batteries. More than 75% of returned batteries are reused.

PROFILE 2

Company Name	**RICKSHAW BAGWORKS**
Founded & HQ	2017 - San Francisco, CA
Facility Location	San Francisco, CA
Goods Produced	Laptop sleeves, duffel bags, tote bags, etc.

ABOUT THE COMPANY

The company manufacturers most of its products in its own cut and sew production facility in San Francisco. Rickshaw focuses on sustainable design and manufacturing, and offers its own line of custom fabrics manufactured from recycled plastic beverage bottles and woven in the USA.

ABOUT THE FACILITY

A small warehouse in the historic Dogpatch neighborhood that employs 13 people. The Dogpatch neighborhood is partial industrial and partial residential. In the last few years, residential expansion has increased dramatically. Most of the products are created in the cut and sew production facility within this warehouse. The warehouse--which also serves as their commercial Factory Store—is adjacent to a residential building, thus illustrating urban manufacturing can thrive in a mixed-use area (About us, n.d.).

WHY THEY MATTER

They dispel the misconception that manufacturing is incompatible with commercial and residential zoning. They practice environmentally friendly manufacturing by using recycled plastic beverage bottles as crafting material.

Other companies to consider	Gustin – San Francisco, CA Menswear manufacturer. Utilizes crowdsourcing to create one-off apparel lines, reducing over-production waste.

FINDINGS (CONTINUED)

PROFILE 3

Company Name	**NEW BELGIUM BREWING**
Founded & HQ	1991 - Fort Collions, CO
Facility Location	Fort Collions, CO
Goods Produced	Beers, Ales and Lagers.

ABOUT THE COMPANY

3rd largest craft brewery in the United States. Created after a bicycle trip through Belgium. Some core values include kindling social, environmental and cultural change as a business model as well as environmental stewardship and cultivating potential through learning. There is a low annual turnover rate of just 3%, including natural attrition (Core Values, n.d.). The company recently agreed to be sold to Lion Little World Beverages in November, 2019. This resulted in over 300 employees receiving $100,000 in retirement money, with some receiving significantly more (Ferrier, 2019).

ABOUT THE FACILITY

Close to transit with a Bus Rapid Transit stop. The brewery employs approximately 400 employees and is located in a mixed-use neighborhood. Large facility capable of producing over 1 million barrels of beer annually, yet 99.9% of waste is diverted from landfills.

WHY THEY MATTER

This was a private company until last year, but they still take care of their employees as seen by the low turnover rate and retirement compensation after the sale of the company.

Other companies to consider	Lush Cosmetics - Vancouver, CAN Skincare & Cosmetics. Sells products “naked” to reduce packaging, and thus waste.

PROFILE 4

Company Name	**GREYSTON BAKERY**
Founded & HQ	1982 - Yonkers, NY
Facility Location	Yonkers, NY
Goods Produced	Brownies.

ABOUT THE COMPANY

Created the Open Hiring Model that supports community members returning from incarceration They also founded the Center for Open Hiring, which consults other companies on the Open Hiring Model. Currently, there are 78 bakers at Greyston that have been hired through the Open Hiring Model.

ABOUT THE FACILITY

Designed by Maya Lin and built in 2004 and located in a brownfield, the bakery is situated within a 21,000 square foot building that produces 7 million pounds of brownies for Ben & Jerry’s Ice Cream annually, as well as distribution to Whole Foods and online sales. 34,000 pounds of brownies are produced daily. Fifty percent of their light is natural via a skylight atrium as well as a three-story light shaft. The building is LEED® Certified (Our Impact. n.d.).

WHY THEY MATTER

They are providing jobs within the manufacturing industry to otherwise unlikely to be hired blue-collar workers. Jobs in the manufacturing sector pay on average more than jobs in other sectors such as retail and tend to be more stable, especially in times of economic downturn.

Other companies to consider	Cascade Engineering – Grand Rapids, MI Welfare to Career program has helped over 800 individuals off of welfare and into meaningful careers.

FINDINGS (CONTINUED)

HOW (URBAN) MANUFACTURING FITS INTO A GREEN ECONOMY

According to the United Nations University Institute of Advanced Studies, not only can manufacturing fit into a green economy, it is actually a key component for creating one (UNU-IAS, 2012, p.5). In a green economy, it is equally important that manufacturing is environmentally sustainable and socially equitable, along with being profitable (UNEP, 2011).

Manufacturing is one of the five components of urban economies that need to change to enable the shift to a green economy (see box at right). The production of goods is necessary in modern society, and it isn't going anywhere. We will always need goods of some kind that we cannot make for ourselves. However, the manufacturing industry will need to make some changes to be able to properly address the environmental and social aspects of sustainability (Herrmann et al, 2014, p. 286).

Urban manufacturing, specifically, is important to making this shift. Urban cities have a significant amount of power to shift us toward a greener economy due to their "concentration of people, resources, knowledge, political power and economic activities" (UNU-IAS, 2012, p. 5). And while shifting to a green economy will take effort from many actors led by a strong governance system, the manufacturing sector will need to play a significant role (UNU-IAS, 2012, p. 5). In the spaces where cities and production overlap, there is a unique and powerful opportunity to drive this change for a better future.

Five components of the urban economic process that need to change to make the shift to a green economy: (UNU-IAS, 2012, p. 5)

1. **Transformation of space**
2. **Production and consumption**
3. **Trade and transportation**
4. **Social and ecosystem services**
5. **Knowledge generation**

WHAT IS BEING DONE ALREADY AND WHAT CHANGES NEED TO BE MADE?

Fostering a green economy is not the only reason for manufacturers to embrace sustainability – it is increasingly popular with consumers, it can provide cost-savings to businesses, and many companies see it as the right way to do business (NAM, 2019; Herrmann et al, 2014, p. 284). This is why, across the manufacturing industry, companies of all sizes are making changes to improve the sustainability of their facilities and products they make (NAM, 2019).

Current approaches to improving sustainability in manufacturing focus on improving efficiency, reducing resource and energy use, and trying to reduce pollution emissions (Herrmann et al, 2014, p. 287).

Industry 4.0 has recently drawn attention and renewed interest to manufacturing and urban industry (Stock & Seliger, 2016). The increased efficiency that comes with automation and envisioned "smart factories" of the future will have some positive environmental impacts (Stock & Seliger, 2016, p. 539). However, those impacts may not be significant, as they are just minimizing negative impacts instead of rethinking how those impacts could be avoided in the first place. Industry 4.0 will also likely result in a significant loss of blue-collar jobs due to changes in job skill and training requirements for entry- and mid-level manufacturing positions (Madsen, Bilberg, & Hansen, 2016). Good-paying blue-collar jobs in manufacturing need to be preserved and made more accessible, not eliminated with more barriers created.

These approaches have made positive impacts, with manufacturers contributing 19 percent more value to the American economy while releasing 10 percent fewer GHG emissions over the past 10 years (NAM, 2019, p. 3). But this approach is only useful in the short-term. A "damage management" strategy of

> ***Katerra's state-of-the-art cross-laminated timber (CLT) factory in Spokane, WA uses CNC machines and artificial intelligence to make the most out of their materials, reducing waste*** *(Katerra, 2019)*.

focusing on efficiency and minimizing resource use won't be an effective long-term solution; instead, focus must be directed toward strategies like using closed-loop (or "circular") production supply chains, and designing products for longevity, serviceability, disassembly, and recycling (Herrmann et al, 2014, p. 287; Rahimifard et al, 2009, p. 86). With increased public pressure to be more sustainable, as well as "right to repair" and "product take-back" legislation, these ideas are being adopted by an increasing number of companies (Rahimifard et al, 2009, p. 80).

- A closed-loop supply chain reuses recycled material to make new products, eliminating the need to extract new resources from the Earth. Manufacturers are already working toward this by using more recycled materials in their production.
- Designing for longevity means that products are made to higher quality standards with increased durability so that they last longer and need to be replaced less often.
- Designing for serviceability allows for products to be repaired instead of needing to be replaced, and to allow users to repair themselves or take it to an independent repair shop, rather than going directly to the manufacturer.
- Designing with consideration for end-of-life disassembly and recycling has the biggest impact on how resources can be recovered and remanufactured once a product has reached the end of its usable life (Rahimifard et al, 2009, p. 85).

Another beneficial product design change is swapping out dangerous and environmentally damaging materials for alternatives, which makes products safer for the blue-collar workers making them, as well as for the consumers who use them (McDonough & Braungart, 2013). An example from the book "The Upcycle" described how the authors worked with a textile mill to develop a healthful textile by removing toxic materials from the production process and only working with neutral or positive ingredients (McDonough & Braungart, 2013, p. 72-73). This design change resulted in a safer product, as well as a safer production process where workers no longer needed protective gear, the facility didn't need to store hazardous chemicals, and the "waste" water generated from the production of the material was completely clean. Mervin Manufacturing in Sequim, WA has worked to find alternatives to the materials being used in most other snowboard manufacturing facilities, going so far as to develop new processes to allow for using more environmentally friendly materials (Mervin Manufacturing, n.d.). They are able to recycle all of the wood and plastic waste created in their facility and operate without generating any hazardous waste.

> ***Caterpillar has adopted the responsibility of taking their products back from consumers and remanufacturing them in-house*** *(Caterpillar Remanufacturing Services, 2007)*.

Finally, manufacturing can become more sustainable by producing less. It is common for companies to manufacture more items than they can sell, resulting in the excess being sent to landfills, or burned (Cernansky, 2020). This is a significant problem in the fashion industry, which sends large amounts of unsold and returned clothing and excess fabric to landfills every year (Cernansky, 2020). Gustin Menswear tackles this problem using crowdsourcing to identify buyers for product before they make it, ensuring they don't over-produce (Gustin Menswear, ND). For smaller manufacturers, overproduction wastes labor and resources; Gustin's crowdsourcing approach allows them to make high-quality items but still sell them at lower prices because they don't have to make up for that waste (Gustin Menswear, ND)

CONCLUSION

We need urban manufacturing in our cities, and in this paper we showed why we should also want them here. Urban manufacturing is a key component of creating a green economy. The manufacturing industry can lead the way by making changes to the way they design and produce goods. Many companies are already doing this work and are finding ways to retool their production systems to close the loop and become circular. Manufacturing has the greatest ability to make the change to a circular economy, as they can change the types of materials they use, how they are sourced, and how well products are designed for longevity, serviceability, disassembly, and recycling. However, this work can't only be put on manufacturers. We, as consumers, need to change our consumption habits. Buying fewer items, spending a bit more for higher quality, and repairing things before replacing them are all ways we can help reduce the environmental impacts from manufacturing.

Besides helping the environment, manufacturing can also help people by providing them with good jobs that pay a living wage, without having to get specialized or advanced education. As more manufacturers switch to using safer materials, these blue-collar jobs will become even safer for those working on production lines. The rise of Industry 4.0 threatens these jobs, which is something that should be kept in mind when thinking about what kinds of businesses cities want to attract and support. Industry 4.0 also does not provide significant environmental benefits for manufacturing, tough that doesn't mean we should discount it completely. Industry 4.0 can actually be very helpful in the end-of-life processing of goods. Automation and AI can help companies sort through and disassemble products to be resold, repurposed, or recycled (Cernansky, 2020; Rahimifard et al, 2009, p. 84).

Not only do we need and want urban manufacturing, we have it already. And despite common ideas about manufacturing, it is compatible with other land use types. As facilities become more sustainable, they will likely become even better neighbors, with fewer emissions and waste. Companies included in this chapter, such as Rickshaw Bagworks, show how well these businesses can fit into a mixed-use neighborhood. This is great for cities since it helps to create a greater diversity of businesses, which provides diversity of jobs and can allow for creation of industrial ecosystems. Urban locations are also great for businesses because they are closer to suppliers and customers, they have better access to services and to their employment base. Their employees also have shorter commutes and often have better access to public transportation, as shown in the example of New Belgium Brewing.

Looking forward, many of these changes will rely on governance of local cities as well as federal regulations to encourage businesses to start making these changes. Businesses benefit from increasing sustainability, but these kinds of changes are more challenging for smaller businesses. It will be important to find ways to support these businesses so that they can make the changes necessary to change their production processes while still remaining competitive.

> ***"Achieving sustainability and energy-efficiency goals helps strengthen manufacturers' competitiveness and fiscal bottom lines. However, identifying energy-saving opportunities and sustainability strategies can be challenging for small and medium-sized manufacturers. The percentage of companies engaged in sustainable practices decreased for medium-sized businesses (56.3 percent) and small businesses (38.9 percent)."***
>
> ***(NAM, 2019, pp. 5-6)***

FALL 2020

CHAPTER 4

PROFILES IN TOD/TOM 1

By: Doug Carlson and Chris Moradi

INTRODUCTION

The approval of Sound Transit 3 by Washington State voters in November of 2016 further advanced the conversation around transit development in the Puget Sound region. The proposed $53.8 billion Sound Transit 3 plan, “provided fresh funds through new taxes to fully regionalize over time the commuter and light rail system to Tacoma, Everett, and other key urban centers” (Dierwechter, 2017, p. 95). The expansion of the light rail system sparked debate between planners in Seattle and the rest of the Puget Sound region on how best to expand the transportation infrastructure including the “Link” light rail to serve and accommodate the greatest breadth of the total population. Currently, the majority of the conversation in the region revolves around the concept of an “urban center” or “village” where transit hubs are a central focal point around walkable communities with dense housing and ample commercial spaces serving as the foundation of development.

INTRODUCTION (CONTINUED)

This traditional version of Transit-Oriented Development (TOD) has proven beneficial both economically and environmentally, but has struggled to ensure equitable outcomes for more vulnerable members of local communities. Furthermore, traditional TOD fails to recognize the industrial and manufacturing roots of the Puget Sound region and how much of the current transportation system is built around what local planners refer to as "irreplaceable infrastructure" such as deep-water ports, rail hubs, and airfields. It is in an effort to preserve irreplaceable infrastructure and advocate for the most vulnerable community members that an alternative to traditional TOD must be considered (Puget Sound Regional Council, 2015).

The concept of Transit-Oriented Manufacturing (TOM) provides a possible alternative to traditional TOD, where a green sustainable industry becomes part of the Urban Center and thus provides communities with steady and stable employment and housing. The Puget Sound Regional Council (PSRC) advocates for and believes that "aligning and coordinating transportation and utility infrastructure planning and policies at the local, regional, and state levels are key to an effective strategy" (Puget Sound Regional Council, 2015, p.11). For the majority of U.S. cities, manufacturing and industry continues to be a vital contributor to the urban economy. According to Lester, Kaza, and Kirk "despite the long-term deindustrialization of urban areas, central cities still maintain a large number of manufacturing firms and a large inventory of industrial land" (Lester, et al., 2013, p.4). Much of the industrial land-use is not for heavy manufacturing, but for smaller mid-sized operations whose environmental impacts are much less concerning.

The expansion of the light rail system sparked debate between planners in Seattle and the rest of the Puget Sound region on how best to expand the transportation infrastructure including the "Link" light rail to serve and accommodate the greatest breadth of the total population.

Furthermore, manufacturing continues to offer average annual wages that are 22.9% greater than the average private sector jobs and manufacturing jobs normally offer these wages without requiring an advanced degree. This is attractive for urban areas struggling with high unemployment among lower-skilled workers (Lester, et al., 2013, p.4). The industrial sector can also provide "the mainstay of middle-income jobs to individuals without higher education" (Seattle Planning Commission, 2007, p. 14).

RESEARCH OVERVIEW

The economic make-up of today's cities is focused on commercial development to attract upscale jobs, and real-estate investment; this often results in the displacement of industrial areas in favor of urban renewal projects. (Progressive Planners, 2012). As city planners accept to "some of the dominant paradigms of regenerative city building such as attracting the creative class or smart growth and see little need for industrial uses within cities" (Lester, et al., 2013, p. 4), urban industrial space are increasingly threatened.

Key contributors in this regard are transit oriented development projects that seek to improve urban density and walkability. According to the research conducted by Jamme, Rodriguez, Bahl, and Banerjee (2019), TOD projects typically entail a mixed-use community with a core commercial, residential, office space, and retail area within a 10-minute walking distance from a transit hub. A true TOD must also be centered on community life in a planned station area with self-contained housing. What the research connected with TOD literature has found is a focus in either "the economic benefits of land development or on the market demand for TOD living, so as to facilitate the financing and implementation of TOD" (Jamme, et al., 2019, p. 417). Thus, TOD has become much narrower in its approach and has increasingly favored a market-driven approach toward development rather than an approach more centered on the needs of the community (Jamme, et al., 2019).

The enhanced accessibility that TOD possesses may attract new residents to the area and the process of constructing a new transit station and related infrastructure presents the possibility of new public investments. While such investment is desirable, it also places new pressures on existing residents and businesses, often resulting in displacement. Therefore, planners should consider the presence of TOD in relation to the opportunities it can provide for the existing community members in respect to job growth, affordable housing and policies to protect residents. This knowledge can be used to advocate for policies that safeguard housing affordability, sustain industry, and slow the effect of gentrification (Chapple, 2019).

The increased cost of living continues to drive people further away from employment centers. By maintaining industrial and manufacturing spaces, cities like Seattle and Tacoma can provide an increase in living wage jobs, thereby preventing displacement and possible homelessness. For the planning community to continue to conflict with the idea of industry as a viable option and a desirable possibility for the future of cities, they risk a socio-economic decline of the working class. Another challenge for planners to rethink what the "D" (development) in TOD could mean for cities like Tacoma is to enable communities to "rethink urban development strategies that can pragmatically confront both social and economic polarization" (Dierwechter and Pendras, 2019, p. 8). To discuss TOM as a viable alternative for a city like Tacoma and elsewhere in the Puget Sound region, it is imperative, as transit development in the region extends to other communities outside King County, that we imagine alternative futures for what these transit stations could look like, who they serve, and what impact they have on existing residents. Thus, cities and planners must recognize that traditional TOD, no matter how successful, is not universal and should cater to the existing community.

Our methodology was to interview six planners in the Puget Sound region who are actually doing the planning. The six planners which we interviewed were: Diane Wiatr, the Department of Transportation Planner for the City of Seattle; Jim Holmes, the Industrial Planner for the City of Seattle; Lauren Flemister, Community Development Manager working with Sound Transit, for the City of Seattle; Ben Bakkenta, Director of Regional Development for the Puget Sound Regional Council; Stephen Atkinson, Long Range Planner for the City of Tacoma; and Pat Beard, the Economic Development Coordinator for the City of Tacoma, especially development in the industrial and Port of Tacoma areas.

RESEARCH OVERVIEW (CONTINUED)

Through our readings and academic review of Transit-Oriented Development across the U.S., and the blind spot of industrial planning in relationship to TOD, we formulated the following questions:

1. Tell us about your work with Transit-Oriented Development and transit planning more generally?
2. Aside from assuring affordable housing, what do you see as the most pressing challenges associated with transit planning in the Puget Sound region?
3. In your experience, have industrial lands been included in conversations about transit planning and local and regional transit projects?
4. When industrial lands are included, what kinds of problems emerge between transit planning and industrial space?
5. One of the lessons we have learned from urban scholarship about Transit-Oriented Development is that TODs typically focus attention on residential and commercial development but less so on industrial space. Does that fit with your experience here in the Puget Sound?
6. Do you see a place for industry and manufacturing in TOD projects? Would you consider TOD and manufacturing to be compatible or incompatible in the Puget Sound region?

FINDINGS

Our findings in interviewing the above-named six people shed much light on how the Puget Sound (mainly King County and Seattle) have formed their Transit-Oriented Development.

We will develop three key themes which we think are important to the discussion:

1) Ridership Density – are there enough riders to make public transportation work in industrial areas?

2) Industrial Displacement – will there be businesses having to close down or move to undesirable locations far away?

3) The creation of innovation zones - the idea of "multi-use rezoning" of industrial spaces to create buffers between industry, transit, housing and commercial development.

These three themes were consistently reiterated throughout our interviews and have the greatest impact and influence on the entire group project.

Ben Bakkenta, who has been with the Puget Sound Regional Council (PSRC) for 21 years and has worked on the overall transportation plan for the region said that there were no concrete plans to develop major transit stops specifically around an industrial area in the greater Seattle area (Bakkenta, 2020). However, in response to PSRC's 2050 long range growth plan, as the Puget Sound is projected to grow in population by 65% with a 75% increase in employment growth, it is only recently that the city of Seattle began to work with Sound Transit and King County Metro Transit to formulate definitive plans around four stops within close proximity to industrial areas in greater Seattle. According to Bakkenta, "the development of an integrated transportation network has been a really important aspect of our work for many years" (Bakkenta, 2020). However, this does not mean that they are necessarily thinking about Transit-Oriented Manufacturing, or another kind of transportation development centered around industry and manufacturing. For him and several other planners we spoke to, there simply is just not enough demand. The overall problem will still be one of ridership density; there is ultimately little demand for it.

One major hurdle pointed out by a majority of planners we spoke to, is the great majority of people who work in industrial jobs, commute from all areas spread throughout Puget Sound. According to Diane Wiatr from the City of Seattle transportation planning office, "they are coming from all over the region, folks are coming to work from Burien, Tukwila, Shoreline and other counties. There simply isn't enough concentration of riders to justify transit going out to them" (Wiatr, 2020). Another key factor hindering ridership to and from manufacturing and industrial jobs is the high cost of living in the Puget Sound area which has priced the labor force out to areas unfavorable or too impractical to be supported by transit. Most industrial and manufacturing workers can't afford to live close to where they work and are forced further out by high rent and living costs.

Pedestrian safety is another substantial concern where industrial spaces are concerned in relation to ridership. Transit stations should be accessible and most importantly walkable and be able to support patrons who commute via bicycle. According to the majority of planners we interviewed, most of the industrial and manufacturing spaces lack the kind of infrastructure to support safe pedestrian movement. Both Lauren Flemister, a city of Seattle planning manager and Diane Wiatr indicated to the difficulty in getting riders to these kinds of transit stops. These spaces are typically not well lit and are riddled with heavy freight traffic. The amount of redevelopment investment and tax dollars required to transform these areas to support heavy pedestrian traffic is high. Furthermore, scarcity of ridership makes for an even trickier sell to investors and taxpayers.

The notion of the "last mile" to connect a transit patron within walking distance to their homes or final destination is a sizable facet to consider in

FINDINGS (CONTINUED)

respect to transportation planning and industrial spaces. In addition, the lack of close accessible housing in proximity to industrial spaces, as well as pedestrian safety are further barriers to building ridership. Furthermore, workers are reluctant to take a long route, which does not guarantee a good connection to their final destination and has the potential for untold safety hazards in the form of semi-trucks and other industrial traffic. With the amount of trucks moving through an industrial area, the usual pedestrian atmosphere would be hard to endure in an environment that favors heavy freight traffic. When people get off a light rail or bus, one of the normal modes to get to a place of work is by walking. When there are major trucking intersections, and dangerous places in industrial areas, most people will choose to drive their own private cars to those places of work (Flemister, 2020; Wiatr, 2020). So, again we see rider demand as a drawback to Industrial-TOD.

To strengthen this argument, Steve Atkinson, a long range planner from the city of Tacoma, also remarked that there are some people who get out of jail or a recent recovery program, find a job, take public transportation – but then find that the transportation routes are not compatible or are too far away to make the routine a normal route to their place of work. To make this viable, workers would have to live closer to work – and the last mile of their trip would have to be accessible and easier (Atkinson, 2020). As it stands right now, most do not have housing close to transit stops, and the last mile is problematic, as stated above. One of the most viable solutions are shuttles that go from a transit stop to an industrial or large commercial center. Microsoft does this in Redmond, and this works well with their MERGE platform. Would this work at the Port of Tacoma? Would there be enough ridership to justify the cost? Should this be a public or private venture, like Uber or Lyft? There are still problems to be worked on, but these are definitely things to think about.

As Tacoma receives the next two major Link transit stops, linking Federal Way to the downtown core, it is important that the next two major themes are not lost in the shuffle. Patricia Beard stated that transit should be right next to the workplace, or at least very close – so that workers find that public transportation will work for them. As Transit-Oriented Development starts to take shape around these two stops, it will be imperative to remember that manufacturing is an important part of the ecosystem of the greater Tacoma Dome subarea, and that manufacturing needs to have an important role in Transit-Oriented Development. Beard also mentioned that industrial displacement is a major worry for her, in that there seems to be a movement within Sound Transit to develop the Tacoma Dome transit stop and lose some existing business. Some of these businesses have told her that they would permanently shut down or that they would move to other areas of the country – which will ultimately hurt the Puget Sound economy (Beard, 2020).

> ***As ridership increases, then everyone wins – the manufacturing and industrial complex, the retail and commercial spaces, and the residential and housing developments. A synergy would be developed – echoing what Jacobs famously called the "ballet of the city sidewalk" (Jacobs, 1961, p. 51).***

Land values in the Puget Sound play a significant role in potential industrial displacement as well. Diane Wiatr offered a perfect example of this problem when she mentioned the Seattle's Georgetown Brewery near the SODO transit station. The brewery's business has grown significantly over the past few years and Georgetown Brewery will soon need to expand its operation. The problem is, because of high land values in Georgetown and the lack of available space to grow in their existing space, the notion of expanding the brewery from its present location is expensive and implausible (Wiatr, 2020). As a result, the brewery may be forced to move its operation to where land is more abundant and affordable but out of the reach of public transit investments. This creates a problem with not only the displacement of an innovation industry but with creating concentrated ridership as well.

Conversion of industrial lands to accommodate traditional TOD displaces not only industrial and manufacturing jobs but people as well. As the Puget Sound continues to face a homeless crisis, current land zoned as industrial is one of the only places that tolerate the unhoused. According to Diane Wiatr, several of the greater Seattle area industrial spaces are home to "tiny house villages" and "tent cities" that house a large percentage of the region's homeless population (Wiatr, 2020). Sadly, these populations are not tolerated in areas zoned for residential and commercial spaces. Any efforts by the city to rezone theses spaces and change the make-up of them will cause the displacement of a vulnerable community. This is an unfortunate reality faced by planners who are seeking to accommodate employment and population growth around a changing transportation infrastructure.

The difficult balance between maintaining industrial spaces near transit stations and accommodating the pressures from powerful development players such as Sound Transit, T-Mobile Park, Century Link Field in Seattle and Puyallup Tribe in Tacoma create significant challenges for planners vying for equitable spaces near transit. Diane Wiatr offered yet another stark example of the invested interest of both T-Mobile Park and Century Link Field. According to Wiatr, those representing the stadiums would like to see the zoning conversion which favors more retail, restaurants and hotels for their patrons (Wiatr, 2020). Since the land in and around the stadiums are currently zoned industrial, zone conversion would certainly result in industrial displacement.

The other socio-economic link identified by Patricia Beard and others was that if Transit-Oriented Development is built around a transit stop, then the best buffer between heavy industry (the Port of Tacoma) and housing, would be green manufacturing (Beard, 2020). Manufacturing of this sort would be something made and developed on site with low noise emission and no smoke particulates; and then also sold on-site with a front-facing retail shop. One example is the RAD Power Bikes electric bicycle shop and manufacturing showroom in Seattle. Not only do they design, manufacture, and build their bikes on site, but then they also have a front-facing retail store in which they sell to local customers. This type of small to medium-sized manufacturing with retail is an excellent buffer between housing and heavy industry. Other types of manufacturing that currently work well in Seattle are breweries and CBD manufacturing. Both are low-noise and low-emitting on the product end, and both of these types of manufacturing have to be away from K-12 schools and other institutions. There are currently 72 different CBD manufacturers in King County, all producing different types of products (Holmes). Small manufacturing companies of between 10-50 people will thrive in an environment where TOM will be put into place on purpose.

The final theme to spotlight is the opportunity to write zoning code now for the future. As Tacoma prepares for its future, planners have already begun to write code for a more comprehensive city, putting manufacturing, industrial, retail, commercial, and housing development near a transit station. They are doing this by using a zoning method which adjusts the allotted Floor Area Ratios (FAR's) to new innovation zones to create spaces that contain sustainable green industries which are compatible with other land uses such as housing and retail (Wiatr, 2020). If planned correctly, the density of manufacturing on the first two levels of a high rise with residents living above would be excellent as a live/workspace buffer to industrial. Also, as the Port of Tacoma considers adding density to their production and facilities, then this could definitely be what is needed for Sound Transit. As ridership increases, then everyone wins – the manufacturing and industrial complex, the retail and commercial spaces, and the residential and housing developments. A synergy would be developed – echoing what Jacobs famously called the "ballet of the city sidewalk" (Jacobs, 1961, p. 51).

CONCLUSION

Local and regional planners across Puget Sound have their work cut out for them as they look to the implementation of Sound Transit 3 and Link light rail expansion. In our quest to seek out how planners are thinking about industry and manufacturing in relation to Puget Sound's transportation infrastructure expansion we found the answer both refreshing and eye opening. Not only were planners thinking about industry's role in transit expansion, they had already adopted alternative concepts increasingly in vogue like "Equitable" and "Industrial" TOD. Planners we spoke to offered current progress and challenges they face as they struggle to find a balance between transportation development and industrial and manufacturing growth and retention.

The regional planners we interviewed are cautiously optimistic in their approach to finding an equitable equilibrium between transit development and manufacturing. Lauren Flemister noted that, "it would be groundbreaking if we could figure out an ecosystem where transit and industrial space would be successful; the problem is there are not a lot of examples of it here in Puget Sound" (Flemister, 2020). For many planners in this region, the answer lays in different ways we see industry and manufacturing. Much of our time in our interviews with planners concluded that with sustainable and innovative industries being the bridge between transit and residential development in order to make a glimmer of Transit- Oriented Manufacturing possible in Puget Sound. If that is true, then sustainable and innovative industries are the key to the puzzle, and planners must ensure residents and community members have equal footing in the development process.

> ***"...sustainable and innovative industries are the key to the puzzle, and planners must ensure residents and community members have equal footing in the development process."***

FALL 2020

CHAPTER 5

PROFILES IN TOD/TOM 2: TRANSIT DEVELOPMENT AND MANUFACTURING COAST TO COAST

By: Emelyn Hernandez and Kyla Wright

INTRODUCTION

In recent decades, urban planners have followed a transit-oriented development (TOD) model. With transit-oriented development, mixed-use buildings surrounding light rail stations are built as a combination of residential housing units situated above commercial retail space. This model has been replicated in cities across the United States so frequently that there is a template for cities to adopt for their own light rail expansion projects. The stated goal of many transit-oriented development projects is to create walkable living spaces and increase ridership on public transportation. What is generally left out of this planning process is how the manufacturing industry is also proactively incorporated. An alternative to the traditional transit-oriented development projects is transit development that intentionally incorporates the existing urban industrial manufacturing landscape and economy.

INTRODUCTION (CONTINUED)

Transit development that embraces the manufacturing industry can be referred to as transit-oriented manufacturing (TOM). Without intentional, proactive steps to protect industrial areas, manufacturing sites are often rezoned or otherwise eliminated from the developed landscape. Cities that recognize the value of their manufacturing industries but also want to initiate a development project near light rail lines need todevelop strategies beyond the traditional TOD model.

Transit-oriented development is often researched; however, transit-oriented manufacturing does not yet have a robust academic focus. Even in cities which have forward-thinking plans to integrate industrial manufacturing, the planning process is still described as TOD. One possible reason why examples of transit-oriented manufacturing are not studied in detail is because there is no common language to identify this type of development.

Yet we show here that cities have created transit-oriented communities surrounding manufacturing industries, enhanced by transit stop improvements, and increased walkability options for pedestrians. Cities have built multi-use space and new housing stock while making it a priority to not displace current community residents. Transit-oriented manufacturing can bolster these efforts and provide planning opportunities for communities to grow and develop through intentional community input and involvement. Because manufacturing industries could employ residents who live in the community, there may be a greater sense of ownership for transit development. Residents and community stakeholders can be a part of creating the type of urban development to which they feel connected.

Because manufacturing industries could employ residents who live in the community, there may be a greater sense of ownership for transit development. Residents and community stakeholders can be a part of creating the type of urban development to which they feel connected.

Highlighting actual examples of transit-oriented manufacturing is important because it suggests real alternative to traditional transit development. When there is a cache of transit-oriented manufacturing models to reference, it becomes possible for city planners who are interested in maintaining their manufacturing industry to do so by drawing upon ideas and processes that have worked for other cities. Conversely, when examples or an appropriate vocabulary are missing, it can be difficult to learn from the experiences from other times and places.

Though the term 'Transit Oriented Manufacturing' is not used, our research indicates that there are, in fact, many examples of transit-oriented manufacturing across the United States. This chapter highlights several examples of cities that are deliberately incorporating their local manufacturing zones with urban smart-growth transit planning. In two cities, Glendale, California and Charlotte, North Carolina, recent planning processes have a strong focus on community feedback and engagement which has led to innovative development progress.

RESEARCH OVERVIEW

Smart growth frequently includes transit, housing and retail space in mixed-use buildings. Traditional transit-oriented development is not an easy feat, but because it is a reasonably common form of development, there are a number of planning solutions that can be adapted to work in another city. There is widespread understanding of what transit-oriented development entails and the impacts it can have on a growing city. According to Nancey Green Leigh and Nathanael Z. Hoelzel (2012, p. 95), transit-oriented development is frequently mentioned in planning publications offering "... several specific policy recommendations and examples of the type of dense, compact, mixed-use development that attracts the critical mass of transit ridership necessary to support TODs" (ibid.). Green Leigh and Hoelzel make it clear that manufacturing industry in urban development plans is necessary because, "...by not encouraging industrial revitalization in mixed-use, transit-oriented, and infill redevelopment projects, smart growth policies overlook a significant economic sector that contributes to diverse, innovative, and more resilient local economies" (p. 88).

What is apparent in recent scholarship is the idea that smart growth which proactively and intentionally values industrial manufacturing is absent. Green Leigh and Hoelzel assert that "... smart growth literature provides little to no acknowledgment of the need to coordinate urban industrial development practices with other mainstay smart growth activities" (p. 87). One possible reason for the absence has been identified in "Keeping Blue Collars in Green Cities: From TOD to TOM?", by Yonn Dierwechter and Mark Pendras (2020), in that city planners have a lack of experience with transit-oriented development that facilitates industrial manufacturing. Without examples of urban growth and development with industrial manufacturing as a foundational component, it is challenging to envision development opportunities for cities. As Dierwechter and Pendras pose, "[i] n terms of planning practice, the first step is to make TOM 'thinkable', to bring it into the realm of possibility, by demonstrating its conspicuous empirical absence from current planning practices and articulating its normative and theoretical desirability" (p. 3). Traditional transit-oriented development has many examples that make it accessible to cities interested in transit development. Transit-oriented development even with all of the planning, expertise, and financial commitment needed, is a comfortable development option because it can be replicated and modeled from previous examples.

Scholarship finds that cities are reluctant to include industrial manufacturing into urban transit development growth plans because of the complexities of who would need to be involved in the development process. Industrial manufacturing development is "clearly a much wider planning and development challenge than just transit policy" and requires a robust network of knowledge (p 3). Dan Cotter highlights these tensions as "[t]ypical points of friction [that] include security, trash, cleanliness, noise, smoke, odors, parking, signage, and special event nuisances...", in his article, Integrating Light Industry into Mixed-Use Urban Development (2012, p. 46). The challenges put forth by these scholars underscore a need for a collective effort in finding solutions.

The literature states that the manufacturing industry is not a priority for cities when they are planning for transit development, and that if manufacturing zones are near transit development they are passively incorporated or removed. More research on this topic is needed because industrial manufacturing zoned areas are quickly being repurposed for other uses (Green Leigh and Hoelzel, 2012, p. 91). Retaining industrial zoned land for positive, practical uses enhances a city's health and wealth.

The research for this chapter asks if development practices for transit development with manufacturing industry inclusion are, in fact, happening within the United States. The consideration that city planning practice is ahead

RESEARCH OVERVIEW (CONTINUED)

of the literature opens doors to find cities that have seen the value in incorporating manufacturing industry into transit development. By researching and discovering cities making strides in transit-oriented manufacturing, it is possible to gather examples of planning processes. Our research was focused on identifying cities which have made significant progress with transit development that includes the manufacturing industry.

Because transit-oriented manufacturing appears to be absent from the literature, it is important to call attention to the work being done and amplify existing examples of TOM for cities that are considering similar planning projects. By providing a spotlight, it could be possible to develop a manufacturing development outline for cities to use in the same way as TOD, so that manufacturing can hold its place in urban areas. By focusing on the process cities are taking, the planning could seem more accessible and attainable for other cities looking to incorporate similar strategies.

We have found cities across the United States that have some type of manufacturing-oriented transit development planning. These examples were challenging to find, in part because there is no shared language to identify the type of planning that is occurring. One way to find cities which have transit-oriented manufacturing is by identifying cities with an expanding light rail transit system in proximity to industrial manufacturing zones. By cross referencing these two aspects, it is then possible to narrow down cities which have urban growth and development plans. This mapping system, in addition to guidance from our instructors led us to find that there is intentional planning being done in several cities including Glendale, California; Charlotte, North Carolina; Atlanta, Georgia; and Baltimore, Maryland. Both Glendale and Charlotte have innovative transit planning processes that proactively incorporate the local manufacturing industry and both of these cities refer to the planning as transit-oriented development.

To explore the ways cities are moving forward with transit-oriented manufacturing, our research examines the ways in which the cities of Glendale, California and Charlotte, North Carolina are developing planning processes that are designed to involve community stakeholders and city planners to create a strong foundation to develop cutting-edge transit-oriented manufacturing development. As both of these cities are in the preliminary phases of transit development, our research focuses on the process in which city officials and community stakeholders move these development plans forward. In addition to a thorough exploration of these two cities, there are also specific examples pulled from other cities at different stages of the development process to highlight additional practices. The inclusion of these examples aim to shed light on the exciting possibilities and benefits of strategically moving forward with transit-oriented manufacturing.

> ***One way to find cities which have transit-oriented manufacturing is by identifying cities with an expanding light rail transit system in proximity to industrial manufacturing zones. By cross referencing these two aspects, it is then possible to narrow down cities which have urban growth and development plans.***

FINDINGS

While scholarly literature largely fails to demonstrate how transit-oriented manufacturing exists and benefits communities, promising examples exist in many cities. One of these cities is Glendale, California. The city of Glendale has a well-developed, mixed-use space that also includes industrial areas. Transit-oriented manufacturing in the Tropico neighborhood of Glendale is surrounded by commercial use, mixed-housing buildings, and manufacturing industry opportunities. This demonstrates the potential growth transit-oriented manufacturing has to offer to cities that invest in its development.

Becoming "green," or eco-friendly, has become a growing phenomenon in cities' developments. Organizers and developers have become aware of the benefits of going green, and the positive impacts on the environment and local economy. A way to be green is to be mindful of vehicle fuel consumption. To reduce fuel consumption, developers and city planners focused on increasing public transit options resulting in transit development with a manufacturing focus. By doing so, transit is accessible for the public to use instead of their personal cars. Glendale previously lacked a transit hub where people can travel easily between cities. Therefore, the Tropico transit center was developed to connect Glendale to other Southern California cities.

While keeping cities green is important, providing blue-collar jobs is equally valuable. This is another reason as to why cities invest in manufacturing transit development. Transit-oriented manufacturing is an opportunity for economic development and growth by creating and maintaining jobs. As part of the South Glendale Community Plan, one of the objectives was to, "[c]ultivate medical, commercial, industrial, and creative employment opportunities by taking advantage of Glendale's proximity and connections to regional destinations" (City of Glendale, n.d.). Transit-oriented manufacturing offers workers access to their jobs while practicing eco-friendly commuting options, in addition to actively engaging with the manufacturing economy.

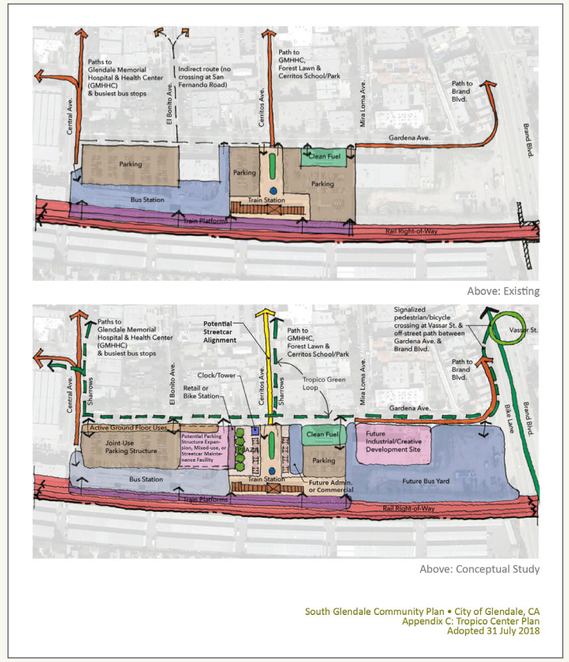


Figure 1. An illustration of an existing Glendale transit station between Central Avenue and Brand Blvd. (top) and a conceptual version (bottom) with the pink sections in the conceptual version designated as "Potential parking structure expansion, mixed-use, or streetcar maintenance facility" (left), and "Future Industrial /Creative Development site" (right).

All of these benefits can be seen in Tropico, Glendale, Tropico is a mixed-use community, where housing and manufacturing share neighborhood space (Figure 1). Glendale city planners seek to create industrial areas that prioritize "light manufacturing, assembly, wholesale/warehousing, sound stages, and various entertainment-related and creative craft trades with pedestrian-scaled features..." (City of Glendale, 2018, p. 14). Since keeping blue collar jobs in green cities is important, Glendale offers industrial and manufacturing businesses in its neighborhood. Current examples are textile companies, air and heating manufacturing, auto body manufacturing, bronze manufacturing, and distribution services. All

FINDINGS (CONTINUED)

these types of manufacturing spaces are accessible from the transit center, making it convenient for blue collar employees. While residents can use the transit system to travel for leisure, it is also possible for others to have accessible transportation to their jobs. In addition to being eco-friendly, the City of Glendale offers clean energy at a natural gas station.

A strong manufacturing presence in Glendale demonstrates that manufacturing is still present in communities. It is therefore important for urban manufacturing to be taken seriously. It is assumed that manufacturing is a dying industry that does not need intentional planning to maintain a presence in cities, however, that is not the case. Transit-oriented manufacturing makes it possible for manufacturing jobs to be present in a green, sustainable city. Larry Zarian, a former Mayor and Council Member of Glendale, saw manufacturing potential in the City of Glendale and was "committed to the continuous improvement of the Glendale community and the development of transportation infrastructure throughout the State of California" (Larry Zarian transportation center, 2011).

In other cities across the United States, transit-oriented manufacturing planning is occurring in other ways. Dan Cotter identifies twelve existing mixed-use industrial districts in the United States (2012, p. 23). Atlanta, Georgia, according to Cotter, "has a track record of progressive and forward-thinking interpretation of its code", was taking steps as early as 2012 to "enhance the feasibility and profile of light industrial, mixed-use development" within the city (2012, p. 23). Fulton County, where Atlanta is located, made it a priority in 2016, 2017, and 2018 to review "zoning districts to further maintain the integrity of all industrial areas" (Figure 2). ("Fulton County 2016, p. 128). Similarly, in 2006, Baltimore, Maryland city planners implemented zoning protections as part of their transit planning, recognizing that otherwise "industrial uses can be out-competed and will leave the City in a shortage of consolidated industrial core areas" (City of Baltimore, n.d., p. 164).

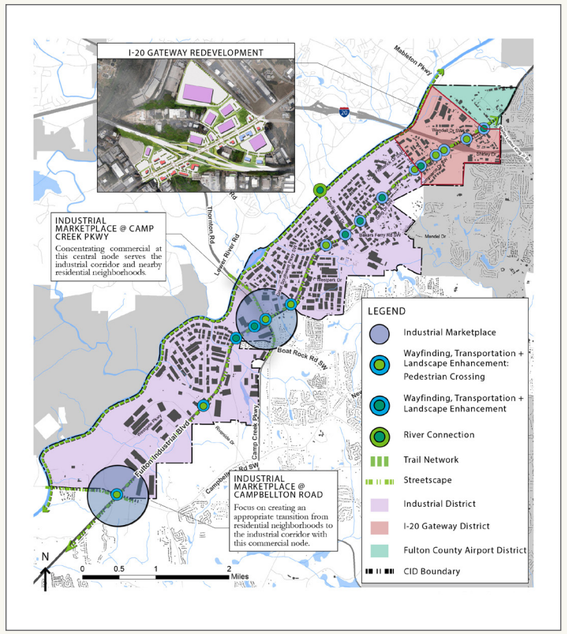


Figure 2. A map of Fulton County's Industrial Marketplace zones (dark purple circles) situated to serves as a transition between residential neighborhoods and the industrial corridor. Source: (Fulton County 2016, p. 34.)

In Charlotte, North Carolina, the city planning department is also implementing transit development that incorporates the local manufacturing industry, particularly through a Unified Development Ordinance Advisory Committee and zoning realignment ("City of Charlotte, 2019) (Figure 3). As identified on charlotteudo.org, *"[t]he Unified Development Ordinance Advisory Committee (OAC) is a volunteer committee composed of individuals representing neighborhood and sustainability interests as well as design and development professionals. OAC members provide a wide range of technical expertise and community perspectives. The committee's primary role is to provide advice and feedback, helping City staff and consultant teams evaluate and test elements of the Unified Development Ordinance prior to their inclusion in the draft UDO." (2019).*

While scholarly literature largely fails to demonstrate how transit-oriented manufacturing exists and benefits communities, promising examples exist in in many cities. One of these cities is Glendale, California. The city of Glendale has a well-developed, mixed-use space that also includes industrial areas. Transit-oriented manufacturing in the Tropico neighborhood of Glendale is surrounded by commercial use, mixed-housing buildings, and manufacturing industry opportunities. This demonstrates the potential growth transit-oriented manufacturing has to offer to cities that invest in its development.

Becoming "green," or eco-friendly, has become a growing phenomenon in cities' developments. Organizers and developers have become aware of the benefits of going green, and the positive impacts on the environment and local economy. A way to be green is to be mindful of vehicle fuel consumption. To reduce fuel consumption, developers and city planners focused on increasing public transit options resulting in transit development with a manufacturing focus. By doing so, transit is accessible for the public to use instead of their personal cars. Glendale previously lacked a transit hub where people can travel easily between cities. Therefore, the Tropico transit center was developed to connect Glendale to other Southern California cities.

While keeping cities green is important, providing blue-collar jobs is equally valuable. This is another reason as to why cities invest in manufacturing transit development. Transit-oriented manufacturing is an opportunity for economic development and growth by creating and maintaining jobs. As part of the South Glendale Community Plan, one of the objectives was to, "[c]ultivate medical, commercial, industrial, and creative employment opportunities by taking advantage of Glendale's proximity and connections to regional destinations" (City of Glendale, n.d.). Transit-oriented manufacturing offers workers access to their jobs while practicing

Figure 3. An image included in all the OAC meeting minutes for the first year of meetings in Charlotte.

eco-friendly commuting options, in addition to actively engaging with the manufacturing economy. The OAC met monthly from December 2016 to December 2018 to discuss many of the issues and concerns such as cleanliness and noise, as mentioned in Cotter's Integrating Light Industry into Mixed-Use Urban Development (2012, p. 46). Not only did the diverse and knowledgeable OAC meet to provide expertise to city planning staff, but they also were a part of developing the Unified Development Ordinance (UDO), which is,

"a regulatory tool meant to guide future development so that it results in the types of community and places defined by Charlotte's Place Type policies. The UDO will also be instrumental in implementing other City policies such as the Transportation Action Plan, the Urban Street Design Guidelines, and the Urban Forestry Master Plan" ("What is the unified development ordinance (UDO)? -," n.d.).

A draft of this document is expected to become publicly available in early 2021 according to charlotteudo.org. In theory, by including representatives from various neighborhood associations, community organizations, design

FINDINGS (CONTINUED)

groups, Public Health officials, and other advisory committees, there is a greater opportunity for community support and agreement on retaining industrial zoned areas.

In an effort to maximize the productivity of existing industrial zoned areas, and the livability and design of the neighboring areas, in 2019 the Charlotte City Council "approved four new TOD zoning districts. These new districts are designed to encourage and enable the development of moderate to high-intensity, mixed-use neighborhoods near rapid transit stations and streetcar stops." (City of Charlotte, 2019). The Alignment Rezoning Guide identifies the four rezoning sites as the Transit Urban Center (TOD-UC), which is districting nearest the transit stations and allows for taller buildings; Transit Neighborhood Center (TOD-NC), for lower building heights in existing residential neighborhoods; Transit Community Center (TOD-CC), which accommodates more forgiving design standards for future market development; and Transit Transition (TOD-TR), which has "relaxed" design standards to "preserve the existing neighborhood character and scale", and is where most of the industrial zoning can be found (2019, p. 6). These four zoning districts comprise over 1,500 parcels (Figure 4). The goal is that all four of the transit rezoning sites be within walking distance to a light rail station and generally be pedestrian friendly. Of the eighteen light rail station areas on Charlotte's Lynx Blue Line, as detailed in the 2019 Alignment Rezoning Guide, ten of those areas were recommended to be at least partially rezoned as TOD-TR. By rezoning the areas, Charlotte's planning department has moved towards their goal of "defin[ing] the places [they] want to create and establish[ing] the rules to create them." City of Charlotte, 2019).

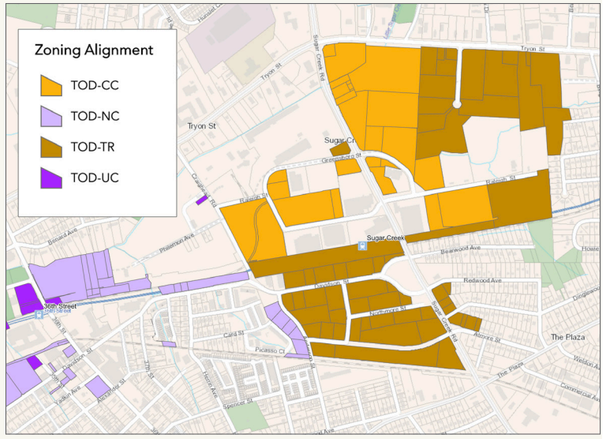


Figure 4. An image of the Sugar Creek and 36th St. light rail stops in Charlotte, North Carolina which shows the proximity of the four different alignment zones in this location. Retrieved from https://charlotte.maps.arcgis.com/apps/webappviewer/index.html?id=154674c8ea364da687ce0f3248ffdac6, April 13, 2020.

CONCLUSION

Cities across the United States that are planning transit-oriented development while incorporating the local manufacturing industry are ahead of current literature regarding transit development. From examples such as Glendale, California and Charlotte, North Carolina we see that cities have seen the value of retaining and growing their manufacturing sector to support local job growth while reducing local vehicle traffic and have taken steps through community advisory committees and creative zoning practices to ensure manufacturing industry has a place in their urban development. The type of development noted by scholars as being ignored has actually been developing for years. These transit-oriented manufacturing developments have been grouped with traditional transit development making it difficult to identify this alternative branch of manufacturing development practices. With a common, shared language we could better identify and differentiate traditional transit-oriented development from more innovative, transit-oriented manufacturing planning practices. The innovative examples that are underway can be used to develop a blueprint for future development.

It is important to understand that transit-oriented manufacturing is occurring, despite the lack of recognition in the literature regarding transit-oriented planning. Transit-oriented manufacturing development practices have encouraged cities to maintain green, eco-friendly growth while still providing blue collar, manufacturing jobs. Transit-oriented manufacturing planning processes demonstrate that it is possible to encourage a vibrant industrial economy that benefits the city and its residents. Manufacturing has the ability to thrive in green cities with the help of innovative manufacturing industrial transit development. By using Atlanta, Baltimore, Glendale, and Charlotte as examples it is possible to develop a template of innovative ideas for other cities across the United States to initiate manufacturing industrial development. Further research can more closely follow cities such as Glendale and Charlotte which are at the beginning stages of their development processes. Continuing to explore cities at various stages of transit-oriented manufacturing will help to create a more extensive template. This template combined with establishing common language such as the phrase transit-oriented manufacturing to distinguish when cities make the shift towards actively incorporating manufacturing, there is great potential to make transit-oriented manufacturing the new standard in transit development.

With a common, shared language we could better identify and differentiate traditional transit-oriented development from more innovative, transit-oriented manufacturing planning practices. The innovative examples that are underway can be used to develop a blueprint for future development.

CHAPTER 6

DEPARTURES FROM THE NORM: INNOVATIVE PLANNING FOR CREATIVE MANUFACTURING

By: Adam Nolan & Ashleigh Williams

INTRODUCTION

Planning for urban industry and transit-oriented development (TOD) has been viewed historically as an attempt to mix oil and water. Community planners and urban scholars have closely linked TOD to the Smart Growth movement, which emphasizes walkable, transit-oriented, mixed-use and green urban spaces. TOD and smart growth planning aim to protect residential uses by promoting mixed residential and commercial developments, viewing industrial land as incompatible with its goals. Manufacturing and industrial land use considerations and protective policies have not been adequately factored into planning discourse, initiatives, and studies, especially within TOD and Smart Growth. This has led to high levels of industrial land conversion and the displacement of manufacturing businesses in urban areas. As noted by Leigh & Hoelzel (2012), planners have a duty to recognize the changing patterns of development and types of urban industry.

INTRODUCTION (CONTINUED)

"To expand the smart growth dialogue," they argue, "planners should focus greater attention on the impacts of smart growth policies on productive urban industrial land and on developing local measures to protect urban industry while pursuing smart growth" (p. 97). Current literature on TOD and industrial displacement suggests that planners need to further explore the reasoning behind industrial land conversion and how to strengthen preservation policies. Industrial/manufacturing companies can and should have a place in urban, green spaces and thus need to be preserved and enhanced.

This chapter examines how innovative planning can maintain, and possibly expand, space for creative manufacturing businesses in urban areas. Our research covers the history of zoning and its effects on industrial lands as well as examples of how innovative planning has been used across the United States in ways that depart from traditional urban industrial planning norms. Leigh and Hoelzel's (2012) claim that "urban industrial development and smart growth should not be an either/or proposition" is a centerpiece in our research as planners have often taken the either/or approach to industrial development. Industrial businesses and manufacturing firms provide a wealth of benefits to a city's workforce and economy. The preservation of urban industry is also the preservation of blue collar jobs that serve "important and urban niche markets and [provide] employment for a less-educated and largely immigrant and minority workforce" (Curran, 2007, p. 1428). Urban industry is needed to combat displacement while also economically uplifting workers and businesses in urban areas.

This chapter examines how innovative planning can maintain, and possibly expand, space for creative manufacturing businesses in urban areas. Our research covers the history of zoning and its effects on industrial lands as well as examples of how innovative planning has been used across the United States in ways that depart from traditional urban industrial planning norms.

RESEARCH OVERVIEW

Seeing industry as undesirable or antiquated has facilitated the conversion and continued squeezing of industrial lands and opportunities. However, modern light manufacturing can fit with other uses and is worthwhile in providing means to bolster equitable opportunities and local economic developments (Lester, Kaza, & Kirk; 2013; Leigh & Hoelzel, 2012; Curran, 2007). Considering the argument that "providing a space and place for urban manufacturing is essential for equitable jobs, sustainable economies, and diverse vital cities," it is necessary to explore examples of planners enhanced in different levels of creative industrial land use planning intended to preserve and expand industrial space and opportunities (Rappaport, 2020, p. 190).

Land-use control and zoning play an important role in our everyday lives. Municipalities use land use ordinances and zoning to govern how land is to be used. The 1926 Supreme Court case Euclid v. Ambler and the Standard Zoning Enabling Act set powerful regulatory standards in legalizing land use separation through single-use zoning, especially in protecting residential landowners' investments from undesirable uses, including industry (Hirt, 2007, p. 439). Manufacturing became an incompatible use for residential and commercial districts, leading to standalone facilities or industrial parks (Smart Growth America, 2017, p. 3).

Despite separation by zoning districts, industry has had an important place in urban economies. Unfortunately, deindustrialization, suburbanization, and offshoring in the second-half of the twentieth century have gradually eroded urban industrial land in cities (Sugrue, 2005). This was not inevitable. Dierwechter and Pendras (2020) note that "deindustrialization was never a neutral response to the natural workings of the market, but rather instead a deeply political process with clear winners (real estate investors and corporate elites) and losers (traditionally industrial workers, cities, and neighborhoods)" (p. 2). Cities have come to prioritize post-material spaces that privilege and prioritize forms of consumption (services, entertainment, etc.) over the production of material goods (ibid.).

While much has been made of the devastation resulting from deindustrialization, urban areas are still attractive for manufacturing for a number of reasons including proximity to markets, transport networks, and access to other goods and services that facilitate efficient operations (Lester et al., 2013). Manufacturing sectors help to create healthier, diversified urban economies; typically produce higher wages and more jobs than commercial counterparts; and hold potential for advancing urban equity goals and outcomes (Lester et al., 2013, p. 297; Leigh & Hoelzel, 2012, p. 89). Importantly, modern manufacturing activities have transcended traditional notions of "heavy" industrial development, being smaller in scale, more sustainable and environmentally-friendly, and generally less of a nuisance (Leigh, Hoelzel, Kraft, and Dempwolf, 2014).

Urban manufacturing futures hold promise but require proactive initiatives to break free from traditional zoning and planning trajectories that have helped to diminish industrial space and production opportunities.

Though moving beyond older industrial practices, modern manufacturing largely remains confined to industrial districts in traditional zoning areas that face intense conversion pressures, especially when competing against residential and commercial property interests that can command prices several times higher than industrial property (Rast, 2012, p. 22). Echoing these limitations, Rappaport (2020) states that "a twentieth-century zoning ordinance focused on strictly segregating uses will never be able to achieve the urban typologies that will define the twenty-first-century city" (p. 198). While effective in providing some protections for urban industrial activities, traditional zoning fails to ensure adequate surplus or the right kind of spaces for modern manufacturing.

As different priorities, trajectories, and challenges must be weighed, especially with population growth

RESEARCH OVERVIEW (CONTINUED)

and an expanding service economy, Howland (2011) suggests that cities must also determine where industrial land should be preserved and protected, or where it should be released for alternative uses; if industry is economically healthy, strategies to preserve industrial land should be pursued. Lack of regulatory enforcement can lead to non-industrial uses (service-sector, commercial, etc.) that crowd out of industrial uses. Rast (2012) stresses the importance of carefully planning, targeting, and permitting manufacturing uses in industrial districts, with quality jobs that serve local residents as a priority. As an example, innovation districts have gained attention with potentials to attract creative manufacturing firms, create new jobs, and drive economic growth, but "for cities already confronting the loss of middle-wage jobs and widening economic and racial disparities, they have failed to reach low-income communities and communities of color," (Equitable Innovation Economies, 2014, p.3) and could actually be a "harbinger of industrial displacement through market-driven mixed-use redevelopment" (Lane, 2020, p. 37). Traditional zoning has largely limited manufacturing uses to industrial districts, but these districts currently face pressures that make it difficult for manufacturing businesses to find affordable space for potential expansion that could create more middle-class jobs and benefits for cities. Creative industrial land use policies that serve as departures from the norm are needed so that cities and residents can attract, maintain, and grow manufacturing industries.

Our research shows that despite these challenges, significant industrial planning experimentation is now occurring in a number of cities and regions. This work appears to range between the balancing of two intentions: first, efforts to preserve existing industrial zoned districts and, second, efforts to expand manufacturing opportunities into mixed-used or other zoning districts (Lane, 2020, p. 36). Lane and Rappaport (2020) suggest that the focus of industrial district planning and design (as seen in places like Chicago, New York City, and San Francisco) is on "redeveloping legacy manufacturing areas to protect, enhance, transform, or transition them into new modes of manufacturing" (p. 14). These efforts appear to be more successful when backed by strong regulatory zoning and enforcement, although conversion pressures and other challenges persist, especially in ensuring that industrial lands are being used for industrial purposes (Rast, 2012; Grodach & Gibson, 2019). Additionally, these industrial districts, which in many cases replicate low-rise suburban industrial parks, often fall short in providing access to affordable spaces for smaller-scale manufacturers and room for businesses to grow (Lane, 2020, p. 34).

> ***As an example, innovation districts have gained attention with potentials to attract creative manufacturing firms, create new jobs, and drive economic growth, but "for cities already confronting the loss of middle-wage jobs and widening economic and racial disparities, they have failed to reach low-income communities and communities of color," (Equitable Innovation Economies, 2014, p.3)***

Planners are therefore also now considering creative ways to expand manufacturing uses beyond traditional industrial zoning districts. Bingham and Shapiro (2020) note that many city planners are turning to mixed-use zoning, "believing that single-use zoning is not sustainable given that industry is often not able to compete financially or politically with alternative land uses"; it is also clear that attempts to create industrial mixed-use spaces face many of those same challenges (p. 204). Light manufacturing is already allowed in many mixed-use zoning districts, but without using ancillary measures like "mandatory inclusionary manufacturing" many industrial uses are at a spatial and development disadvantage when competing with residential and commercial uses in "highest and best use" trajectories (Chapple, 2014; Lane & Rappaport, 2020, p. 6; Becker & Friedman, 2020, p. 212).

Planners, officials, and communities must engage in deep interrogations to envision and craft sustainable urban futures that align appropriately with local contexts (Frug & Barron, 2008). Urban manufacturing futures hold promise but require proactive initiatives to break free from traditional zoning and planning trajectories that have helped to diminish industrial space and production opportunities. The literature supports the need for research on creative industrial planning aimed at preserving and expanding urban industry and the economic and social benefits it can offer to cities and regions.

Our research examined examples of cities that have "departed from the norm" of traditional zoning limitations in their efforts to preserve and expand industrial spaces, and identified potential patterns in how those departures were developed and/or implemented. These examples demonstrate that other avenues are available for planners to consider creative industrial zoning and land use policies in urban areas. From these examples we selected two cities for more in-depth case studies to examine their creative industrial planning efforts; why and how they initiated these efforts; and what lessons could be learned. Through our research we have discovered that, contrary to common assumptions about 'deindustrialization', planners are making strides in the preservation of urban industrial lands while also attempting to integrate urban industry into smart growth planning. Our research demonstrates that as urban spaces and the economy evolve, so must the planning of cities. This includes consideration of how to preserve and expand industrial spatial opportunities and the jobs they create, people they employ, and urban spaces they can benefit.

FINDINGS

Planners are experimenting with and implementing creative approaches to urban manufacturing beyond traditional zoning norms. As noted above, this work could be understood as a balancing of two intentions: efforts to preserve existing industrial zoned districts and efforts to expand manufacturing opportunities into mixed-used or other zoning districts. Our research findings and case studies are organized with this overall theme in mind.

PRESERVATION OF INDUSTRIAL ZONED LAND

With large amounts of converted and rezoned industrial lands, planners have recognized the growing urgency of preserving what still remains. This recognition goes hand-in-hand with the acknowledgement that industry is more suitable for urban spaces than ever before as modern manufacturing now entails smaller, more environmentally friendly and technologically savvy firms. The preservation of industrial spaces in urban areas allows for the growth of manufacturing firms and the economic presence they provide. Grodach, O'Connor and Gibson (2017) discuss the detrimental economic and social effects of rezoning industrial zoned land to mixed-use zoning by stating it leads to "missed economic opportunities that stem from the revival in manufacturing and 'making' cultures, but also for the degree to which they intersect negatively with urban labor market characteristics, exacerbating social inequalities" (p. 18). Industrial zoned lands provide spaces for manufacturing firms to create jobs and incomes that contribute to the local residents and urban economy.

While many modernized manufacturing businesses have the ability to operate on land that isn't zoned for industrial use, we still need to preserve industrial lands, especially parcels with unique assets and large infrastructure investments for heavy industrial uses (Puget Sound Regional Council, 2015, p. E-4). Industrial uses are nuanced and must be treated and zoned as such to gain the maximum benefit from their presence.

The Brooklyn Navy Yard serves as a successful example of planners taking this into consideration when preserving industrial lands. The Brooklyn Navy Yard is a large industrial park amidst the urban area of Brooklyn, New York City, that provides spaces for a range of light to heavy and small to large manufacturing firms at affordable rates. Due to its proximity to residential areas, the Brooklyn Navy Yard also has retail spaces that attract patrons and provide spaces for employees to patronize.

Baltimore, Maryland has found a creative way to preserve and reinvigorate its industrial center that dates to 1850. The site was once home to Maryland's "largest and most productive machine manufacturing complex" (Philipsen, 2019) and is now home to Clipper Mill, a mixed-use community comprising of attached homes, apartments, office spaces, and 47,500 square feet of arts and craft studio space. The redevelopment was kicked off in 2002 when the Struever Brothers purchased the land with the intent to provide a residential community that also served as a hub for local artists.

Creative manufacturing firms also often prefer to locate in urban spaces as they are often highly specialized and reliant on adjacency to similar businesses, skilled laborers, and a large consumer market (Grodach et al., 2017, p. 21). However, one of the biggest and most destructive effects of integrating industrial spaces into urban areas is the looming threat of displacement and gentrification. While proximity to urban areas can lead to benefits for manufacturing businesses and residents in the neighborhoods in which they are located, it can also lead to the displacement of those businesses and residents as makers have the tendency to "contribute to gentrifying the places they seek to preserve for production" (Grodach et al., 2017, p. 22). While the preservation of industrial spaces can provide many benefits to urban areas, if not done in a manner that also preserves the surrounding neighborhood (including residents and businesses), it can also lead to destruction through displacement.

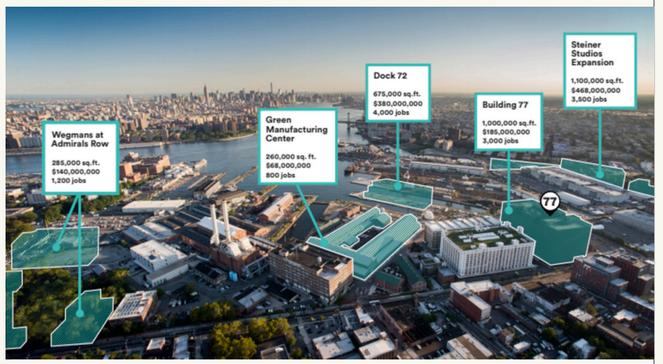
CASE STUDY: BROOKLYN NAVY YARD

The Brooklyn Navy Yard (BNY) is publicly owned property that supports protected and subsidized manufacturing spaces. Sitting upon 300 acres that span the East River, the Brooklyn Navy Yard is:

> *A mission-driven industrial park that is a nationally acclaimed model of the viability and positive impact of modern, urban industrial development. BNY is now home to more than 450 businesses employing more than 11,000 people and generating over $2.5 billion per year in economic impact for the city. Building on BNY's history as the economic heart of Brooklyn, the 300-acre waterfront asset offers a critical pathway to the middle class for many New Yorkers (Brooklyn Navy Yard Development Corporation, n.d.).*

While the land that the BNY is situated on is owned by the City of New York, BNY is operated by the Brooklyn Navy Yard Development Corporation (BNYDC)--a non-profit corporation which serves as a property manager and real estate developer for the BNY campus.

The Brooklyn Navy Yard has preserved production and manufacturing spaces that serve a variety of industries, including, but not limited to, food, furniture, film, printing and engraving, arts and media, architecture, design, woodworking and transportation. As previously stated, industry and industrial jobs have moved away from the traditional conceptualization as dirty and incompatible with modern visions of urban areas as walkable, transit-oriented, and environmentally friendly spaces. The lighter and cleaner industry demonstrated throughout suggests that industry is compatible with modern approaches to urban space. In addition to industrial spaces, BNY has also incorporated retail spaces. Building 77, BNY's newest and largest building, is 1 million square feet and houses several food manufacturing businesses that plan to sell retail at the building's ground level. The integration of retail sales for manufacturing businesses sited at Building 77 shows how mixed-use development can aid in preserving and expanding industrial spaces. The Brooklyn Navy Yard has emerged "as a successful model for urban industrial development, with an emphasis on sustainability, that other cities can evaluate and use to inform their own efforts to retain and grow industrial jobs" (Pratt Center, 2013, p. vi).



Brooklyn Navy Yard, Photo Credit: NY Curbed (Leonhardt, 2017)

The presence of the BNYDC helps to combat industrial displacement - a looming problem in the world of planning and redevelopment. Because BNYDC serves as the property manager, they control their tenant's rents and cultivate an alluring mix of manufacturers in the BNY campus. The Brooklyn Navy Yard also supports two centers of workforce development to help withstand the displacement of the immediate area's residents: the Albert C. Wiltshire Employment Center (the EC) and the Brooklyn STEAM Center. The EC helps to sustain a continuous flow of high-quality employment opportunities for local residents in and around the BNY campus. The Brooklyn STEAM Center starts to develop these relationships even earlier; it is a vocational education program that specializes in manufacturing, technology and creative fields for 11th and 12th grade students in eight local high schools (Brooklyn Steam Center, n.d.). The Brooklyn Navy Yard is an admirable example of a space that has worked to preserve industrial land while also developing the local workforce's skill set, growing businesses and fostering lasting relationships between local communities and business owners.

FINDINGS (CONTINUED)

EXPANDING SPACE FOR LIGHT MANUFACTURING

Planners and officials are also experimenting with creative land use and zoning as a way to expand spaces for urban manufacturing. A few of the ways they are doing this is through new land use and zoning designations, and "mandatory inclusionary manufacturing" tools, intended to permit and better incorporate light industrial uses into mixed-use spaces (Rappaport, 2020, p. 192).

Planners have used Artisan or Craft Manufacturing zoning and land use designations as tools that can break through negative associations with manufacturing, and the limitations of traditional zoning. Artisan zoning can be defined as "an approach to land use and development that provides space for small-scale manufacturers that produce little to no vibration, noise, fumes, or other nuisances, meaning they can fit within a wide variety of industrial, commercial, and even residential districts" (Local Progress, 2019, p. 4). Planners have approached artisan or craft manufacturing in different ways—reflecting localized contexts, needs, and strategies. For example, Somerville, MA transformed spatially-limited industrial districts into Fabrication Zones intended to be spaces for artisan manufacturing, makerspaces, "work/live," and innovation (UMA, 2016). In addition, Nashville, TN, Bozeman, MT and Fairfax County (VA) have each adopted artisan manufacturing zoning, which permits artisan manufacturing uses in more zoning districts (Local Progress, 2019; Fairfax County, 2018). These examples (and especially the Indianapolis case study, discussed below) provide a glimpse into ways that planners may use artisan and craft manufacturing zoning strategies to make use of underutilized or vacant land, and to create jobs and other opportunities to boost economic development and the local tax base.

The key is strategically proactive rather than tactically reactive measures. Becker and Friedman (2020) note that in strong market cities "it will take deployment of a full array of public policy interventions including zoning, financial incentives (and disincentives), urban design, and strong, consistent communications to influence property owners to resist market forces and preserve mixed use" (p. 212). Light manufacturing generally cannot compete in real estate markets driven by "highest and best" that privileges uses that can pay the most for space, rather than consideration of uses that may generate wider community benefits such as jobs, taxes, or other resources (Chapple, 2014; Pratt Center, 2015, p. 5). Industrial businesses face additional competition from non-industrial uses permitted under Light Industrial (M1) land uses (hotel, office, retail, and self-storage, etc.) (Pratt Center, 2015, p. 5). Setting limits or ratios to maintain a mix of land uses is also important to consider as demonstrated by the City of Philadelphia's 2012 zoning revision that created Industrial Mixed-Use classifications; in this case, industrial uses were labeled as optional, resulting in many mixed-use development projects providing no space for manufacturers (Local Progress, 2019, p. 4).

While there are clear challenges in this work, different strategies of "mandatory inclusionary zoning" are being explored as ways to ensure Industrial-Mixed Use zoning creates sufficient space for manufacturing. Some of these strategies include use of tax credits or subsidies (high density residential, etc.), transfers of development rights, requiring a specific percentage of industrial uses in buildings, amortizing the cost of constructing new industrial space, or providing lower industrial rents necessary for emerging manufacturers (Rapaport, 2020, p. 192; Becker & Friedman, 2020). The use of cross subsidy mechanisms is increasingly viewed as an important potential resource to promote light manufacturing within mixed-use districts (Pratt Center, 2016; Becker & Friedman, 2020).

Cross subsidy policies incentivize developers to build light manufacturing space alongside high rent-generating uses like residential, commercial, or office space (UMA, 2018, p. 16). These policies can help keep light manufacturing jobs within mixed-use areas and subsidize rents, but need to be matched with enforcement measures (UMA, 2018, p. 16). San Francisco is one example of how this has worked because planners effectively used cross-subsidy as a means to leverage market demand for higher paying office uses in creating new affordable manufacturing space with the developments of 100 and 150 Hooper (Grodach & Martin, 2019, p. 172).

These findings demonstrate that some cities, their planners, and industrially-oriented community organizations, are proactively working to expand spaces for manufacturing. Manufacturing can and does have an important place in urban areas and economies, yet simply relying on traditional zoning is not nearly enough. Though cities and regions will have obvious localized contextual differences to consider in this work, these findings suggest that with imagination and political will, departures from the norm are possible and can expand manufacturing opportunities and their benefits to communities.

CASE STUDY: INDIANAPOLIS ARTISAN ZONING

In 2012, the City of Indianapolis began a comprehensive zoning code overhaul with the intention to make the city more livable and sustainable, arguing that "there's not a community in the country that is sustainable without jobs" (UMA, 2016). In looking at the local context, Indianapolis planners determined that urban manufacturing had a lot of important benefits for the city and region. Out of these considerations and needs, planners created the new and creative land use categories of Artisan Manufacturing and Artisan Food and Beverage.

City planners considered new urban manufacturing strategies for several reasons. The perceived benefits of manufacturing included potentials for job creation, reducing crime and opportunities for crime, and providing job opportunities closer to residents' homes (UMA, 2016). In monitoring the local job environment, planners grew concerned that they did not have enough of "the higher-end jobs" and viewed manufacturing as "a way to allow the creation of good jobs that could potentially take off and be something phenomenal" (T. Tracy, personal communication, May 9, 2020). Manufacturing uses could also be paired well with realities of the city's built environment.

Indianapolis had a surplus of vacant rustbelt-era buildings in the core of many neighborhoods; by allowing manufacturing uses into vacant buildings, they could generate tax revenue (UMA, 2016). With respect to sustainability, the city prioritized the reuse of legacy industrial buildings rather than demolition and potential redevelopment that involved greater expense; "the greenest building is the one that is already there" (UMA, 2016). This also allowed the city to make use of existing infrastructure (roads, utilities, etc.) (UMA, 2016). By repurposing buildings and efficiently using existing infrastructure, the city could better ensure that spaces could be kept affordable for manufacturing businesses to get off the ground.

In order to expand manufacturing uses, planners determined and defined what it was that they wanted to do and how this served as a departure from traditional industrial use limitations (UMA, 2016). The city adopted Artisan Manufacturing and Artisan Food and Beverage as land-use categories, specifically defining their smaller scale manufacturing intensities (minimal automation, space limitations, etc.) and including opportunities for direct sales to the consumer as an accessory use (UMA, 2016). These artisan uses then could be allowed in more districts (commercial, mixed-use, central business district) beyond industrial districts with the intention that the expansion of these uses "enable good paying urban manufacturing jobs in and close to our existing neighborhoods" (UMA, 2016).

To further eliminate barriers to job creation and facilitate the reuse of buildings, the city also created a "permitted where vacant" or "V" option (UMA, 2016). This expands opportunities for Artisan Manufacturing and Artisan Food and Beverage to set up shop in commercial, mixed-use, and industrial district buildings that have been vacant for at least five consecutive years (UMA, 2016). This creative flexibility addresses the need for affordable start up spaces for artisan businesses.

Finally, Indianapolis planners and officials engaged with a comprehensive rezoning that included extensive community participation. Out of this the city and its residents could better define some of their pressing needs and consider how zoning could help accomplish overall livability and sustainability goals. The artisan zoning efforts of Indianapolis planners represent a second major example of creative planning that departs from the norm to expand spaces for manufacturing.

CONCLUSION

Our research demonstrates that planners are experimenting with creative land use and zoning for urban manufacturing. This has been carried out in different ways but can generally be understood as distinguishing between efforts of preserving existing industrial districts for industrial uses and expanding light industrial uses into other districts. In consequence, we conclude that the realities of modern manufacturing present the need to reevaluate the position of manufacturing in urban planning movements, a specific reiteration of Leigh and Hoelzel's (2012) suggestion that "urban industrial development and smart growth should not be an either/or proposition" (pp. 96-97).

Smart Growth and TOD developments have inadequately incorporated manufacturing concerns; this only contributes to views that these planning movements are too often a source of light manufacturing displacement, especially "as new transit can drive up property values, and make the spaces untenable for light manufacturers" (UMA, 2018, p. 21). Critically, this need not be the case: creative land use tools can support and integrate light manufacturing into sustainable planning objectives. Our research makes it clear that without creative land use tools, however, cities run the risk of diminishing space for light manufacturing as these uses face formidable barriers in "highest and best use" real estate scenarios; once industrial space is gone, it is very difficult, if not in most cases impossible, to get back (Chapple, 2014; Leigh & Hoelzel, 2012, p. 94).

Our research has also shown that planners need to consider the different angles of their local and regional contexts. Industrial land use studies are essential in helping determine industrial land inventory, what to retain or possibly rezone, and how it might best be utilized (Howland, 2011; Lester et al, 2014). Along with this, cities should consider what kinds of industries best fit with their local industrial landscape and then build strategic plans to maximize opportunities for successful industrial policy, business development and retention, and collaboration with mission-driven organizations.

Our research makes it clear that without creative land use tools, however, cities run the risk of diminishing space for light manufacturing as these uses face formidable barriers in "highest and best use" real estate scenarios; once industrial space is gone, it is very difficult, if not in most cases impossible, to get back *(Chapple, 2014; Leigh & Hoelzel, 2012, p. 94).*

This strategy should also include building coalitions and constituencies, as well as workforce development programs to suit local manufacturing needs, and to help cultivate and expand access to equitable and living-wage manufacturing job opportunities. Finally, cities need to assess the potential for gentrification for all development they pursue, including creative zoning for urban manufacturing and mixed-use projects.

We recognize that traditional zoning does have its place, is needed, and can be effective. This is especially true as some heavier industrial uses should logically continue to be located in districts not adjacent to residential and lower-intensity uses. However, as we have discussed, traditional zoning alone has not been effective in warding off conversion pressures or encroachment from non-industrial uses, so urban industrial lands continue to be squeezed. What space is available may not be suitable for the needs or price point of light manufacturing businesses. In some cases, this leaves industrial lands underutilized and underinvested, and this can further bolster political and development-backed pressures for conversion.

In recognizing some of these limitations presented by traditional zoning, and in believing manufacturing is necessary and beneficial to urban areas, planners in "manufacturing-aware" cities are choosing to depart from the norm in efforts to preserve and expand manufacturing space and opportunities (Leigh et al., 2014, p. 4). This is not a clean break from traditional zoning, nor should it be. Instead, it represents choosing to push the boundaries of possibility for planning urban manufacturing futures.

FALL 2020

CHAPTER 7

OFFSITE AND DOWNSTREAM

By: Bradon Rothschild and Madeline Pattin

INTRODUCTION

This chapter considers the potential implications of displacement on industry resulting from transit infrastructure. In the case of industrial and business displacement in urban spaces, two general types seem prevalent:

- Intentional or planned displacement, wherein developers or governments reconfigure the zoning structure of an area to preclude certain business activities; and
- Market displacement, wherein cost and other economic pressures reduce competitive advantages for established firms and make the location untenable and financially unfeasible.

Both types of displacement are prominent fixtures with regards to industry and manufacturing in Transit Oriented Development projects. Both also come associated with potential outcomes and trickle-out effects. However, they are not equally likely scenarios. In order to model potential outcomes of constructing transit infrastructure in East Tacoma and Tacoma Dome District, it is important to know how each form of displacement manifests and what factors are included.

For the purposes of this chapter, we assume that at least by one form or another the industrial uses prominent in the East Tacoma neighborhood, as identified throughout this document, will experience one form of displacement or another. We outline what those forms of displacement entail, how they are implemented, and what their common effects are. We also proffer tools which may be successful at ameliorating some identified impacts. Finally, we consider the offsite and downstream effects of the development in the Tacoma Dome District, or how the development of the site will impact manufacturing and other factors in the rest of the city.

RESEARCH OVERVIEW

Initial research into this subject focused on defining transit-oriented development (TOD), its intent, and its impacts on business and industry. The primary focus was to create a basis for understanding TOD and what has been historically understood. In addition to archival research to gather existing scholarship on the topic, two primary interviews were conducted: 1) Stephen Atkinson, a senior planner with the City of Tacoma, and 2) Deirdre Wilson, a senior planning manager with the Northwest Port Seaport Alliance, an agency which plans and coordinates between the ports of Tacoma and Seattle and municipal and state agencies. These interviews supplemented research findings and added great detail of context to the issues facing industry in the South Puget Sound.

Finally, we performed area surveys to provide a basis for modeling of features of competitive advantage and industrial access resources regionally. This helped in clarifying potential impacts of development on traffic and property access in the City of Tacoma and regionally.

FINDINGS

TOD AND DISPLACEMENT, AND THE CONDITIONS OF INDUSTRY IN TACOMA

TOD can be defined as "compact neighborhoods centered around transit with efficient land use, diversity, density, street connectivity, and walkability that encourages residents, workers, and customers to ride mass transit more than driving their cars" (Zandiatashbar, 2019, 430). The efforts of TOD seek to provide transit for those with the least access but can often gentrify a neighborhood (Bullard, 2007). An analysis of TOD conducted by Jamme, Rodriguez, Bahl, and Banerjee found the most recurring of references throughout literature was "density, diversity, design, destination accessibility, distance to transit, and demand management" (2019, 415). The themes and framework give the definitions for TOD to then look into the effects and potential implications of TOD. The positive benefits of TOD have been claimed since the term was coined in 1993: TOD is intended to foster mixed income communities, promote racial diversity, increase density, and encourage transit ridership (Chappel, 2019). However, recent research has also identified a number of concerns with TOD projects, including the gentrification and displacement of residents and a decrease in small, minority owned business (Zandiatashbar, 2019). This displacement is not specific to residential but also commercial

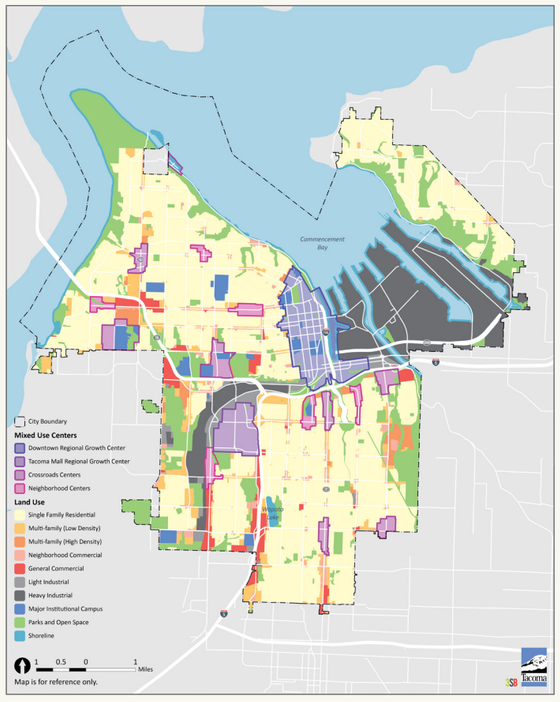


Figure 1: Future Land Use Zoning. Note the East Tacoma Neighborhood zoning remains "light industrial". (Source: City of Tacoma, 2019)

and industrial uses. Increasing rents, changing demographics, and heightened competition can lead to commercial displacement (Chappel, 2019). This type of industrial and commercial displacement often goes unnoticed by communities and impacts transit node neighborhoods and those adjacent (Chappel, 2019).

FACTORS OF PLANNED DISPLACEMENT

With planned, or intentional, displacement, governing agencies either rezone land use--changing use policies or regulations—or implement major construction projects and purchase land for such purposes. For the East Tacoma and Tacoma Dome District neighborhoods, several governing agencies have strong influences over the fate of land use. The City of Tacoma has regulatory authority to zone and place environmental regulations on property use. The Port of Tacoma is the prominent large leasing agent for industrial lands in and around East Tacoma and the Tacoma Dome District with the authority to manage tenants (Port of Tacoma, N.D.).

The property surrounding the East Tacoma Light Rail Station is currently zoned as a mix of "light industry" and "general commercial use". Most of the light industrial zoned land sits on the northern side of Interstate-5, with the general commercial use zoned land just south of the highway. The general commercial use land is occupied by the Puyallup Tribe of Indians and houses the Emerald Queen Casino south of the highway, with the War Pony Smoke Shop just north of the highway. At the present, there are no plans to rezone land in East Tacoma to exclude light industry in the foreseeable future (City of Tacoma, 2019).

The Port of Tacoma and City of Tacoma have both expressed interest in maintaining the economic vitality of the port properties. Rezoning land within port boundaries has been generally off the table, and light industrial buffer zones around the port have maintained separation of utility. The East Tacoma neighborhood falls within a space between the port and Interstate 5, seen as a vital freight link (Wilson, 2020). For these reasons, it is unlikely that intentional displacement will be a significant factor in removal of industrial space in East Tacoma.

While it is not the focus of this chapter, redevelopment plans for the neighboring Tacoma Dome District, which will be the next stop on the subject light rail line, include a transit-oriented entertainment and mixed-use center. This center will include residential and commercial spaces, as well as planned maintenance of some industrial space (City of Tacoma, 2019).

Though planned displacement via rezoning or reconfiguration of the East Tacoma neighborhood is not a significant threat, regulations regarding what constitutes "industrial use" have historically been open to interpretation. In an interview, City of Tacoma Principle Planner Stephen Atkinson stated that industrial spaces have often incorporated a wide variety of uses, many of which might not include what we traditionally think of as functioning as industrial productivity. "Not all industrial uses are Methanol plants" Atkinson said. Some industrial uses are more compatible with both residential and commercial land uses and can easily and safely be constructed in close proximity (Atkinson, 2020).

Without clear regulations and guidelines concerning what is appropriate use for "industrial" zoned land, uses which may fall outside traditionally considered industrial use can be incorporated and potentially push out other uses. This was the case in the subarea plan in Kent, where the City of Kent outlined a process to create an industrial subarea and a Manufacturing and Industrial Center (MIC) with support of Puget Sound Regional Council (City of Kent, N.D.). However, as Deidre Wilson of the Northwest Seaport Alliance stated in an interview, many of the new firms which entered the subarea were warehouses and research and design offices with production labs (Wilson, 2020). Likewise, Atkinson pointed to an historically born trend of cities placing "anything they don't want near residential areas" in industrial areas, which has sometimes

FINDINGS (CONTINUED)

included medical facilities as well as fabrication and design centers with lots of office space (Atkinson, 2020).

In the case of unclear zoning regulations and use guidelines, even protective zoning patterns can lead to some measure of market displacement. Office spaces, warehouses, and other higher value added and broadly defined "industrial" uses can effectively displace important, though lower value added more traditionally defined "industrial" uses. For this reason, regulations in industrial spaces near transit facilities and TOD should be made clear so as to protect and encourage the appropriate industrial use.

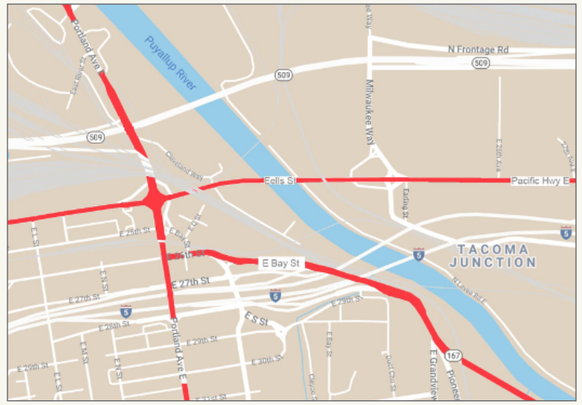


Figure 2: Freight heavy surface streets in the East Tacoma industrial area, highlighted in Red (Source: Google Maps, 2020)

FACTORS OF MARKET DISPLACEMENT

Market displacement is more often referred to colloquially as "gentrification", wherein certain economic factors make current land use unfeasible. This often occurs in business and industrial focused centers when consumption patterns change, or nearby land use shifts (Curran, 2007; Dong). With regards to transportation-oriented development in its impacts on industrial spaces, there are several factors that could lead to market displacement/gentrification. Most often industrial gentrification results from lower value or lower revenue firms losing economic vitality and either ceasing operations or relocating to less expensive properties (Dong, 2017; Chappel, 2019; Curran, 2007).

Of the factors which lead to industrial gentrification displacement, especially related to TOD, Deirdre Wilson of the Northwest Seaport Alliance highlighted the concept of "traffic crowding out". As stated earlier, transportation-oriented development intentionally increases population and utility density in target neighborhoods. The density of utility, be it office space, retail commerce, or residential, invariably brings more traffic: more density of use brings more density of traffic. Wilson stated that one of the concerns of the Northwest Seaport Alliance is that this low-or-single occupancy-vehicle traffic would interfere with and crowd out freight traffic (Wilson, 2020).

As nearby neighborhoods, such as McKinley Hill and Tacoma Dome District, densify as a result of TOD, the increased population and use density may cause increased traffic in and around the East Tacoma neighborhood, even without active development in that area. This would be most concerning on the identified freight paths of Portland Avenue, which connects the Port of Tacoma with Highway 509 and Interstate 5; East Bay Street, which connects East Tacoma with Interstate 5; and Puyallup Avenue - Elles Street, which connects to Pacific Highway and Interstate 5 through Fife and the Tideflats.

A second displacement concern is land value and pricing out. As TOD spurs higher density land use, areas around transit stations and planned TOD districts experience increased property speculation and development demand (Curran, 2007; Dong, 2017). While zoning regulations can stave off some aspects of this effect by limiting potential uses, the lack of clarity and specificity of what can and cannot be incorporated into industrial, and especially light industrial zoned spaces, can effectively price out lower revenue firms.

Figure 3: South Tacoma unoccupied industrially zoned land. (Source: Google Maps, 2020)

As Stephen Atkinson further noted, industrial spaces have historically been insulated from this effect. However, over the past several years' speculation and development have increased the value of industrially zoned land in the greater Puget Sound (Atkinson, 2020). With increased demand for warehouses and petroleum based heavy and light industrial facilities, industrial realtors have stated that industrially zoned land in the Puget Sound has seen significant increases in land values (Atkinson, 2020).

As some amount of gentrification led industrial displacement will occur, the most likely firms to experience displacement will be those with lower incomes which cannot bear the increased costs associated with either increased land values or freight efficiency decreases through crowding out. Though the City of Tacoma and many other governing agencies in the Puget Sound region aspire to a "no net loss" of industrial zoned land practice, as lower revenue generating industries are priced out or pressured out of certain areas through a loss of competitive advantage, there is a possibility that even with adequate access to other suitable properties these firms may simply shut down, which would lead to a loss of equity as well as significant job losses (Atkinson, 2020; Curran, 2007; Dong, 2017; Zandiatashbar, 2019)

Even with the concerns about property value and market displacement, the City of Tacoma has identified and protected through zoning regulations many spaces within the City limits for industrial use — both manufacturing and light industrial. These spaces include portions of the Port of Tacoma and Nalley Valley, both of which are zoned for heavy manufacturing as well as light industrial (City of Tacoma, 2020).

Though there are areas in the City with adequate space zoned for industry that are underutilized, much of this property is owned by larger industrial leasing agencies, specifically the Port of Tacoma and Burlington Northern Santa Fe Rail. According to Stephen Atkinson, these agencies prefer industrial uses that will yield the "highest and best value" for their property. This means that they prefer tenants that will utilize their infrastructure — i.e.: the port prefers industries that will use and pay for the utility of port facilities, and BNSF will prefer the same for rail (Atkinson, 2020). Not all industrial spaces utilize these facilities and may therefore not be good fits, even if the land is available and within financial feasibility.

Displacement of these firms would likely mean that the City of Tacoma would lose these jobs. And this brings the greatest concern with regards to industrial displacement: the loss of moderate income and low barrier jobs. Industrial jobs are seen as "working class" and often described as "blue collar" as shorthand for the trend that most industrial jobs require lower barriers to employment entry, but offer moderate to living wages (Chappel, 2019; Gallager, 2020). The industrial firms in the East Tacoma and Tacoma Dome District neighborhoods generally provide such moderate-income opportunities (Atkinson, 2020).

In the case of industrial gentrification, wherein old

FINDINGS (CONTINUED)

industrial jobs are displaced through gentrification and replaced with new "industrial" jobs, one of the biggest concerns is an inequitable replacement ratio. New industry jobs, as Atkinson and Wilson both indicate, may provide higher pay, but also higher barriers to entry (Atkinson, 2020; Wilson, 2020). These jobs, such as those seen in the Kent MIC, might take the form of office or warehouse jobs. Currently, the assumption is that the jobs facilitated by industrial firms in East Tacoma provide the moderate income, low barrier jobs typically seen in traditional industrial settings (Atkinson, 2020).

Even when new industrial jobs move into gentrified neighborhoods, the mix typically does not match that of the old industry. Often the new jobs are either higher pay and higher barrier, or, as is often the case when commercial and entertainment or hospitality establishments enter the space, they are similar pay low barrier jobs that are far less stable (Atkinson, 2020; Curran, 2007). This latter is likely to be the case in the Tacoma Dome District, where mixed-use development has been planned.

Job losses from industry tend to cause a job loss multiplier effect, where vendors who either sell to the industry or purchase from the industry see revenue drops and contract as a result. Businesses that serve industrial workers either in the industrial neighborhood or in the residential neighborhoods that house workers also see job losses. Even if jobs relocate and are not lost, the dynamics may shift and move economic activity from one area to another. Most of the potential job losses, including the trickle-out losses, experienced by such displacement are exactly those which support economically marginalized communities (Gallager, 2020).

CONCLUSION

Not all aspects of how TOD interplays with industrial space are threats. In fact, Deidre Wilson of the Northwest Seaport alliance believes that density, transit, and housing near but not in industrial spaces are positive when well managed because such developments provide housing and resources for industrial district employees, and support mass transit use, which in turn reduces traffic and reduces regional freight crowding out effects. Wilson also mentions that it is important to consider what features are included in the transit facility, the alignment, and how traffic to and from transit facilities is managed, also in order to manage non-industrial traffic interference with freight.

Implementing transit and TOD near industrial sites does not have to impede, and can effectively enhance, industry when executed cautiously. However, to ameliorate negative economic impacts, metrics for what employment opportunities develop along with the redevelopment must also be incorporated. To prevent or adequately adjust for displacement of industry, the City of Tacoma, Port of Tacoma, and Puget Sound Regional Council can protect freight paths in and around industrial sites that are close to planned transit hubs.

Ultimately, the primary concern of displacement should be to protect against inequitable opportunity outcomes. New industry, non-traditional industry, warehouse jobs, and entertainment or mixed-use retail district jobs provide different opportunities, different income levels, and different employment barriers. These represent a departure from the perceived and experienced stability of traditional industrial jobs. The displacement of these traditional industrial jobs may represent growing economic inequity.

Though it is unlikely that East Tacoma will see any planned or intentional displacement, market displacements and industrial gentrification may displace some blue-collar industrial jobs. While the new jobs within the neighborhood and neighboring Tacoma Dome District may be either industry or similarly positioned moderate-income and low barrier employment, the mix will be different.

Protecting against displacement requires concerted effort, especially in the consideration of industrial displacement. Market pressures and intentional design through zoning practices are more likely to remove industrial space than residential or commercial spaces.

As discussed earlier, these jobs are often less stable, more seasonal, and provide fewer benefits.

Wilson also noted that beyond the concerns over TOD and the potential incursion of non-industrial uses into port spaces, market shifts have impacted the vitality of those spaces. She noted E-Commerce as a potentially bigger threat to productive industrial space. As the e-commerce industry grows, it fuels the demand for warehouse facilities, which in turn drives up property values for industrially zoned spaces. E-commerce also increases traffic with first-and-last mile freight traffic, which has the potential to drive out some long-haul traffic (Wilson, 2020).

Protecting against displacement requires concerted effort, especially in the consideration of industrial displacement. Market pressures and intentional design through zoning practices are more likely to remove industrial space than residential or commercial spaces. Government agencies in the Puget Sound have voiced a desire to support industrial use as well as transit and TOD, and have strong policies to prevent or ameliorate the impacts of displacement and gentrification. However, these do not include any direct reference to prevention of industrial displacement (Sound Transit, 2019). Unfortunately, industry is a blind spot in this process. Incorporating the needs of industry in planning future developments will aide in preservation of productive capacity, and equitable employment opportunities.

FALL 2020

CHAPTER 8

IDENTIFYING A CONSTITUENCY

By: Anthony Hoffmann, Hannah Miner, Phil Paulson

INTRODUCTION

Located in Downtown Tacoma, the Tideflats Industrial Area is positioned on the estuary delta of the Puyallup River where it enters Puget Sound. This urban space is home to the Puyallup Tribe of Indians, who practice traditional treaty rights on these waters. It features a naturally occurring deep water port, managed by the Port of Tacoma and operated by the International Longshore and Warehouse Union (ILWU) Local 23. This container gateway is the fourth largest of its kind, connecting Asia and major distribution points throughout the United States. The Tideflats Area is also a significant industrial center for the Puget Sound Region, with rail yards, empty container storage yards, maintenance and repair facilities, and other industrial and manufacturing uses in addition to the shipping terminals. In 1986, the Environmental Protection Agency identified 12 acres of Commencement Bay as a Superfund site and work began to remove and mitigate more than a century of contamination. Clean up of the Thea Foss Waterway was completed in 2006 and this space is now being developed as a mixed-use neighborhood with access to entertainment and recreational resources including the Foss Esplanade and marine trails.

INTRODUCTION (CONTINUED)

In looking closely at the history of this space and the breadth of current uses, the Tideflats Industrial Area emerges as a sight of tension and convergence for many different interests and stakeholders. As a publicly oriented asset, the Port of Tacoma and the surrounding Tideflats Industrial Areas are deeply intertwined with the regional, state, and global economies, which contribute to its importance to broad and geographically widespread constituencies. The preservation and growth of urban industry by either linking it to public transit or by deploying innovative planning strategies that complement both urban industry and public transit could benefit a diverse array of groups that may not typically see their interests align. In examining the viability and potential synergies of planning for both transit and industry in this context, it is necessary to explore multiple perspectives. Given that this approach represents a potential new urban form that could be difficult to envision, diverse stakeholders contribute to building ideas and developing strategies that were previously unimaginable.

In examining the viability and potential synergies of planning for both transit and industry in this context, it is necessary to explore multiple perspectives. Given that this approach represents a potential new urban form that could be difficult to envision, diverse stakeholders contribute to building ideas and developing strategies that were previously unimaginable.

In the preceding chapters of this report, our colleagues have provided different ideas for how these two ideas could be combined into a new type of development called Transit Oriented Manufacturing (TOM). However, it is unclear if there is interest in preserving and bolstering manufacturing or public transit in Tacoma, much less development that deliberately seeks to integrate them. Our research seeks to investigate the interests of community stakeholders related to industrial development and transit investment in order to understand if and how these interests could support the planning and potential creation of urban spaces that integrate industrial development and public transportation infrastructure in Tacoma.

LITERATURE REVIEW

To explore such possibilities locally, we connect with local organizations who may not be explicitly concerned with manufacturing and/or public transportation to better understand if and how planning for industrial development and transit could support other planning goals and public interests. Our research approach is rooted in the tradition of "equity planning" (Krumholz 1982) and deliberative practice (Forester, 1999). We also recognize that this topic has a significant regional dimension drawing on the work of Swanstrom and Banks (2009), who consider how regional coalitions are better positioned to advocate for their goals through advocacy as well as through more collaborative regional governance processes. In addition, we draw from a more applied report by PolicyLink (2002), which recommends "community-based regionalism" to foster regional equity. Planning must seek to understand the perspectives of a diversity of constituents and reflect this diversity in the resulting planning processes and documents. In the following sections, we describe our research methodology and situate our approach in the existing planning literature.

Cities across the US are deploying innovative planning strategies that consider manufacturing in the context of economic and workforce development, environmental planning, and other domains that are often treated as separate in traditional planning practice (Clark and Clavel 2012). These potential synergies warrant further investigation to identify what linkages and benefits may be possible in the context of opportunities in local spaces where plans for industrial development converge with public investment in transit.

In their introduction to Progressive Planning Magazine's special edition on manufacturing, Clark and Clavel (2012) make the case that industry and manufacturing could—and in many contexts already does—support progressive planning goals. Jobs in the manufacturing and industrial sectors tend to have higher wages, better benefits, and are more likely to be unionized. As such, fostering local industry and manufacturing could have a redistributive impact and support local agencies to achieve more equitable outcomes. Cities across the US are deploying innovative planning strategies that consider manufacturing in the context of economic and workforce development, environmental planning, and other domains that are often treated as separate in traditional planning practice (Clark and Clavel 2012). These potential synergies warrant further investigation to identify what linkages and benefits may be possible in the context of opportunities in local spaces where plans for industrial development converge with public investment in transit. To accomplish this, we consider some of the best practices for meaningful public engagement in planning and apply these considerations to our research approach.

Sherry Arnstein's (1969) influential concept of the "ladder of citizen participation" illustrates different degrees of citizen participation, ranging from non-participation to citizen control. In part, her work critiques how citizen participation can be superficial and gives us language to understand how citizen participation can take different forms and have varying impacts. Meaningful citizen participation is important to ensure that plans reflect the needs, visions, and interests of the public rather than the interests of well-resourced groups that are able to exert their influence on these processes. As such, our research sought to prioritize the voices of citizen groups and other non-governmental organizations. Additionally, some recent research shows that sincere and purposeful public engagement practices that foster social learning environments during planning processes actually lead to an increase in the quality of the final plans that are produced (Brody 2003).

Many of the challenges faced by the Puget Sound Region as a whole result from significant income

LITERATURE REVIEW (CONTINUED)

disparity. At the core of this income disparity is the sizable gap in job opportunities between lower-wage jobs, including seasonal construction and service work, and higher-wage tech and white-collar jobs with greater barriers to entry. As pressure builds to address the growing need for housing and jobs in urban cores, it becomes imperative to develop innovative solutions that seek to address issues from multiple vantage points in an equitable way.

Norman Krumholz is credited with establishing equity planning, which has long sought to prioritize the needs of the most vulnerable by seeking "to provide a wider range of choices for...residents who have few, if any choices" (Krumholz 1982). Planning with equity as a core consideration means that policies and programs should seek to redistribute commonly shared resources to the most vulnerable members of a community (Metzger 1996). To pursue that goal locally, it is necessary to first understand and examine what opportunities exist and to explore how planning for industry and transit together could benefit the most vulnerable and/or most economically disempowered members of our community. While our research does not represent a formal public participation process, we hope to bring our findings into larger planning conversations, including processes for the Link Light Rail Extension and the Tideflats Subarea, to better understand how these projects can support the needs of marginalized communities.

One challenge to meaningful citizen participation and authentic and respectful social learning is that many stakeholders hold values and interests that are in conflict with one another. John Forester's (1999) "more deliberative practice" offers guidance to planners undertaking the complex work of balancing and cultivating rich community-driven decision making through shared learning. Before this work can take place, it is necessary to first acknowledge how planning has tended toward adversarial "either/or choices." In processes grounded in deliberative practice, planners are directed to act as managers of learning processes, guiding individuals and organizations to co-create previously un-imaginable alternatives and build ownership through the group learning and negotiation process. Planners and participants alike should work to establish spaces where participants are encouraged to see others' perspectives and values as legitimate as their own beliefs and opinions (Forester 1999). Although we are not overseeing any formal planning processes, it is important for us as researchers to approach our interviews in a manner that is informed by this practice. We see our findings as an opportunity to contribute to the community dialogue, a tool in fostering shared learning.

> ***In processes grounded in deliberative practice, planners are directed to act as managers of learning processes, guiding individuals and organizations to co-create previously un-imaginable alternatives and build ownership through the group learning and negotiation process. Planners and participants alike should work to establish spaces where participants are encouraged to see others' perspectives and values as legitimate as their own beliefs and opinions (Forester 1999).***

To address these issues meaningfully requires a regional lens and a recognition of the relationships between planning domains that are often treated as separate on a policy level. Organizations like the Puget Sound Regional Council are important and support coordination between different municipalities and other government agencies in the region. While recognizing the potential benefits of formal regional coordination through the creation of these types of government bodies, notions of "community-based regionalism" counter-propose that organizations forming coalitions across community borders may be the most effective way to advocate for reform on this scale (Swanstrom and Banks 2007). Community-based regionalism is "premised on the understanding that the future of low-income communities is tied to broader regional, social, political, and economic factors" (PolicyLink 2002, p. 7). In recognition of this strategy for advocacy in regional planning efforts, our research endeavors to explore how different community groups may identify opportunities for their interests in local planning processes. If overlapping interests and common goals may represent latent coalitions, regional alliances between community groups could better position them to advocate for community needs in geographically dispersed areas.

By considering manufacturing in relation to transportation, housing, economic opportunity, etc. on a regional scale, we are better equipped to realize planning goals in these domains than by planning for each in geographical and conceptual isolation. There is an opportunity to explore how development in this part of the region can be transit-oriented while also considering how these developments fit into and synergize with the existing urban industrial environment in ways that benefit the disadvantaged communities throughout the Puget Sound. Rather than pitting important regional assets and goals against one another, it may be possible to co-create new development strategies that support broader regional economic development goals, transit connectivity, and more to benefit local communities in the surrounding areas and elsewhere in the region.

Accoriding to Clark and Clavel (2012)), it has been difficult to identify a constituency for planning for manufacturing and industry or for public transit, respectively—much less planning that creatively combines the two (Pearsall, 2013). By connecting with diverse stakeholders, we are best equipped to explore these issues from a variety of perspectives—specifically prioritizing those who are not engaged in the traditional planning processes or do not clearly see how they might have a stake in the outcomes. Through capturing insights and sharing diverse perspectives with stakeholders, it is possible to create co-learning environments and further investigate if support for industrial development adjacent to planning in coordination with transit infrastructure, "Transit-Oriented Manufacturing," could lead to more equitable, mutually beneficial outcomes.

METHODOLOGY

We developed the following set of criteria to guide which organizations and individuals to reach out to as interview subjects:

- *If/how the individual or organization has participated in the process—with higher priority given to those who have not been engaged.*
- *Connection to the planned East Tacoma Link Light Rail Station and surrounding area*
- *Organizations with missions that connect in some way with transportation planning or industrial development*

Initially, our inclination was to include criteria that prioritized stakeholders with a physical presence in proximity to the planned East Tacoma Station. However, we determined that it was necessary to consider the Tideflats Industrial Area as a regional asset and expand the list of potential interview subjects beyond those with physical ties to the location.

We conducted interviews that were approximately an hour in length; interviews were recorded and transcribed. In an effort to use this time efficiently, we created a unique interview guide for each subject to connect with insight related to our research focus, prioritizing what we did not already know or could not find from existing materials. Every interview did include these four foundational questions:

- *What is [organization or individual]'s connection to the Dome District and Tide Flats Areas?*
- *What role, if any, do you see the manufacturing sector playing in the Puget Sound Region's future?*
- *In your mind, what is the relationship between manufacturing or industry and sustainability?*
- *How important is maintaining local urban industry to [organization or individual]?*

RESEARCH TIMELINE AND CONTEXT

The research timeline for this project followed the University of Washington's Spring Quarter calendar in 2020, with instruction beginning March 30 and ending June 5. Many larger institutions, including the University of Washington, began to close physical locations and encourage those who were able to work and learn from home to do so in response to the COVID-19 outbreak during the early weeks of March 2020. Governor Jay Inslee's Stay Home Stay Healthy order was put in place on March 23, 2020.

We believe the coronavirus outbreak significantly impacted our ability to connect with the community stakeholders we sought to reach. Many of the requests we sent out for interviews were met with a lack of response. Some of the organizations we had hoped to connect with are service providers, like the Korean Women's Association, whose staff were likely working to meet an increased need for services during the time we were conducting our research. We had also intended to include insight from staff at the Summit Charter School, an organization that had to close its doors on March 13th after schools were shut down by another order from Governor Inslee. It is unclear why we were not able to connect with others, but as the Stay Home Stay Healthy order was extended, many organizations were put in a position where they were unable to pay or provide work for staff and as a result many people were laid off or furloughed. It is possible that many requests for interviews were not received by employees who are not able to work.

We designed our research with the aim of connecting with and elevating new and diverse perspectives with the intention of fostering more robust community dialogue to encourage new ideas. Given the circumstances, we do not feel that we have been able to achieve the research goals we set for ourselves. We were able to conduct four interviews with the individuals listed:

- ***Andrew Strobel**, Puyallup Tribe of Indians Director of Planning and Land Use*
- ***Brendan Nelson**, Hilltop Action Coalition Board President*
- ***Jared Faker,** International Longshore and Warehouse Union (ILWU) Local 23 President*
- ***Hally Bert**, Downtown on the Go Community Partners Manager*

There is still more work to be done to understand if and how community priorities converge at the intersection of transit planning and the vision for industrial and manufacturing development in the Puget Sound Region.

FINDINGS

The Tideflats Area is a site of both convergence and tension for many different interests and stakeholders. It is easy to oversimplify this space, as Jared Faker shared in our interview, by calling on the Port of Tacoma's favored catchphrase: "the economic driver of Pierce County" (J. Faker, Personal Interview, April 27, 2020). However, he, Andrew Strobel and Brendan Nelson encouraged us to look closer and see how unique and important this resource is and the potential it has to be a part of solutions to address the issues that are plaguing the region. Each demonstrated the need for balancing the need for space set aside for industry with other priorities and values in their interviews:

We're extremely protective and mindful of what happens in our backyard and what happens in our neighbor's back yard. I'm not saying that everything has to be a heavy industrial use [...] Once you see [industrial displacement] start to happen, like in Seattle, it can start to displace the entire sector and force it off its footprint that it might have had for a long, long time... And then you've got another Top Golf but you've just lost a lot of jobs that might not come back.

-Jared Faker, ILWU Local 23 President (Personal Interview, April 27, 2020)

I think there's a balance, but this whole, 'you can just do anything down there' mentality needs to stop [...] we need to have a hard look at the types of uses that are down there because once upon a time, Pierce County's air quality was so bad that it was considered non-attainment. That doesn't just impact the tribe, that affects everybody in Pierce County. We have increased levels of lung cancer and other types of cancer. We really need to look at what type of port we want to be and what type of industry we want to support.

-Andrew Strobel, Puyallup Tribe of Indians (Personal interview, May 4, 2020)

We've seen so much loss in the community over years. You know, major entities that have, you know, and particularly that were folks of color or minority owned businesses that have to shut their doors for a variety of reasons. And so, for us, it's extremely important that we see this urban development, this urban piece still have some legs.

-Brendan Nelson, Hilltop Action Coalition (Personal interview, April 30, 2020)

One specific challenge to balancing divergent community needs and priorities in shaping how the vision for this piece of public land takes shape is how "industry" is defined and operationalized. The perception is that "we've gotten a little too desperate" and "We're Tacoma, we'll accept anything" (Strobel, A. Personal Interview, May 4, 2020), an approach to development that is believed to have led to the proposed Methanol and LNG plants. Grassroots resistance to these projects demonstrates that this approach to planning in the Port of Tacoma is out of touch with community priorities and needs.

In John Forester's (1999) view, in order to foster deliberative processes where stakeholders can learn about each other and issues in tandem, it is necessary to first acknowledge how planning has tended toward adversarial "either/or choices." The points of tension that were exposed in the conversations regarding the proposed Methanol and LNG plant projects are useful in highlighting a false dichotomy that is at play in how development takes shape in the Port of Tacoma. It suggests a choice between priorities like environment stewardship or public safety and local economic development. Planners can play an important role in building a more inclusive vision for the Tideflats Industrial Area by encouraging stakeholders to think beyond these "either/or choices" to establish spaces for different conversations and consider new possibilities.

In order for efforts to integrate planning for industrial development and transit infrastructure to manifest, it is necessary to engage with stakeholders and experts from both fields. In our interviews with Brendan Nelson, a community development advocate, and Hally Bert, a transit advocate, both acknowledged learning to understand and build partnerships with the individuals and organizations that are planning for industrial and manufacturing development:

I honestly couldn't tell you about development and partnerships and anything in the industry that was being formed because it was almost like that wasn't an area of importance as it is now.

-Brendan Nelson, Hilltop Action Coalition (Personal interview, April 30, 2020)

I don't have that great of a grasp on the right kind of size of manufacturing, how big manufacturing needs to be to be profitable but also maintain sustainability and local strength.

-Hally Bert, Downtown on the Go (Personal Interview, April 23, 2020)

Nelson and Bert are both well-versed in other aspects of planning and development. This awareness and ownership of what they don't know and where they see opportunities for more learning and collaboration is a well-established pattern as planning for public transportation and planning industrial development and/or manufacturing have often operated in silos (Guthrie, Burga, Fan 2015).

Though this knowledge gap can prevent easy collaboration across fields of planning, other interviews revealed the ways in which public transit already indirectly supports industry, while fostering other community benefits.

We look at the value of taking people off of the road and that also supports freight movement, you know, the less cars on the road the more freight can move you know we have congestion in Pierce County and we think it's going to increase air quality.

-Andrew Strobel, Puyallup Tribe of Indians (Personal interview, May 4, 2020)

Historically, unions are major partners in support of transit ballot measures because they result in loads of work hours.

-Hally Bert, Downtown on the Go (Email Correspondence, April 27, 2020)

The opportunities for partnership mentioned by Strobel and Bert have focused on framing issues or seeking to build support in language that resonates with existing and explicit priorities, such as calling in the labor community to support ballot measures to fund transit because of the job opportunities that construction will create. Based on our interviews, it is unclear if those who are ultimately sought out for support are engaged in how planning for these projects takes shape from the beginning or in connection to a specific need, like a public endorsement.

FINDINGS (CONTINUED)

When prompted to consider how industry and transit planning could be integrated, Bert demonstrates that it can be difficult to imagine bringing the stakeholders engaged in the work of planning for these issues together given how the current processes are structured:

I think it's hard for me to picture it, I suppose. I don't see a government process or a development process right now that's pliable enough to involve the stakeholders involved in manufacturing as part of that process to ensure that the resulting TOD would actually serve that community.

-Hally Bert, Downtown on the Go (Personal Interview, April 23, 2020)

This insight demonstrates that while stakeholders might come together and support one another where interests appear to align, they are not investigating each other's interests with the aim of achieving goals holistically. Additional work needs to be done to dismantle and integrate the conversations and processes that seek to address issues related to planning for development and the transportation system. Significant energy and resources are being put towards developing visions and plans for the futures of an industrial space that is geographically significant and of the regional transit system. However, stakeholders are not yet coordinating with each other in a comprehensive way. More work needs to be done to break down these silos.

Again, Forester offers guidance about the role of planners in fostering better community dialogue, to support participants to hear each other, or more specifically to see others' perspectives and values as legitimate as their own beliefs and opinions. Planners are in a position to access different ideas and perspectives; they must prioritize shared learning by structuring the planning environment in ways to support the exchange of ideas through dialogue and respectful investigation in order to create opportunities for new ideas to emerge. In this way, the planning processes for the Tideflats Subarea and the Tacoma Dome Link Light Rail Extension and other efforts to envision and plan for the future of the Tideflats Industrial Area could be an important space to establish a more deliberative approach in order to engage ideas that have previously been unimaginable, such as Transit-Oriented Manufacturing.

CONCLUSION

Given the context of our research and the complexities of these ideas, we see the need for further investigation. The Tideflats Industrial Area is a regionally significant space with a multitude of important assets. Inevitably, the Tideflats is a space where the interests of a diversity of stakeholders converge. While this has sometimes created tension around the most appropriate ways to develop and utilize these spaces, this convergence also represents an opportunity for collaboration. Through deliberative processes, it is possible to generate new urban forms and new planning strategies that have yet to be realized. Although there are obvious stakeholders with direct geographical and organizational ties to these spaces—such as the Port of Tacoma, the Puyallup Tribe of Indians, ILWU Local 23, among others—the Port of Tacoma and the surrounding Tideflats Industrial Areas are deeply entwined with the regional and state economies. As such, there are community groups throughout the region that have a stake in what happens to these spaces. Because planning for industry in particular ways has the potential to support economic mobility for workers as well as broader economic and community development, among other public benefits, there is potential to build a broad and powerful constituency to advocate for new, yet to be developed, strategies that combine industrial planning with other local and regional concerns. While there is still more work to be done to understand if and how community priorities converge at the intersection of transit planning and the vision for industrial and manufacturing development in the Puget Sound Region, the context is ripe with opportunities for collaboration.

Finally, it is likely that the COVID-19 pandemic will result in significant shifts in thinking related to our research topic. For example, as COVID-19 impacts production and distribution in different parts of the world at different times, vulnerabilities in the global supply chain come to light. Reliance on overseas production of essential items like personal protective equipment and the lack of infrastructure to shift domestic production could change opinions about the relevance and viability of domestic manufacturing. Public transit planning and construction will also likely be impacted if there is a significant economic recession or ridership declines in the face of a pandemic that is more likely to spread in enclosed spaces.

APPENDIX

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