UNIVERSITY of WASHINGTON

LIVABLE CITY YEAR 2017–2018
IN PARTNERSHIP WITH
CITY OF TACOMA

CITY OF TACOMA

THEA FOSS PENINSULA MANUFACTURING AND INDUSTRIAL FUTURES STUDY

UNIVERSITY OF WASHINGTON TACOMA
URBAN STUDIES PROGRAM

T URB 490: SPECIAL TOPICS IN URBAN STUDIES

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LIVABLE CITY YEAR

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The Port of Tacoma as seen from a vantage point near the Thea Foss Waterway.
COVER PHOTO CREDIT: JOHN WESTROCK

ACKNOWLEDGMENTS

We would like to thank the City of Tacoma for providing this opportunity for students of UW Tacoma's Urban Studies Program to work on important questions related to planning for urban industry in Tacoma. This is a pivotal moment for urban industry in the city and the students in this class are grateful for the opportunity to become meaningfully involved. In particular, we would like to thank Stephen Atkinson for his time, attention, and guidance. Stephen helped shape this project from conception through completion; none of this work would have been possible without his thoughtful leadership. Lauren Flemister, Pat Beard, and others representing other departments of the City also deserve thanks for their support and feedback on student presentations. This has been a tremendous learning experience and we thank all who helped bring the project to fruition.

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TABLE OF CONTENTS

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ABOUT LIVABLE CITY YEAR

The University of Washington's Livable City Year (LCY) initiative enables local governments to engage UW faculty and students for one academic year to work on city-defined projects that promote local sustainability and livability goals. The program engages hundreds of students each year in high-priority projects, creating momentum on real-world challenges while enabling the students to serve and learn from communities. Partner cities benefit directly from bold and applied ideas that propel fresh thinking, improve livability for residents and invigorate city staff. Focus areas include environmental sustainability; economic viability; population health; and social equity, inclusion, and access. The program's 2017–2018 partner is the City of Tacoma; this follows a partnership with the City of Auburn in 2016–2017.

The LCY program is led by faculty directors Branden Born (Department of Urban Design and Planning), Jennifer Otten (School of Public Health) and Anne Taufen (Urban Studies Program, UW Tacoma), with support from Program Manager Teri Thomson Randall. The program was launched in 2016 in collaboration with UW Sustainability and Urban@UW, with foundational support from the Association of Washington Cities, the College of Built Environments, the Department of Urban Design and Planning, and Undergraduate Academic Affairs.

LCY is modeled after the University of Oregon's Sustainable City Year Program, and is a member of the Educational Partnerships for Innovation in Communities Network (EPIC-N), the collection of institutions that have successfully adopted this new model for community innovation and change.

For more information, contact the program at uwlcy@uw.edu.

LIVABLE CITY YEAR

ABOUT TACOMA

The third largest city in the state of Washington, Tacoma is a diverse, progressive, international gateway to the Pacific Rim. The port city of nearly 210,000 people has evolved considerably over the last two decades, propelled by significant development including the University of Washington Tacoma, the Tacoma Link light rail system, the restored urban waterfront of the Thea Foss Waterway, the expansions of both the MultiCare and CHI Franciscan health systems, and a significant influx of foreign direct investment in its downtown core.

Washington State's highest density of art and history museums are found in Tacoma, which is home to a flourishing creative community of writers, artists, musicians, photographers, filmmakers, chefs, entrepreneurs, and business owners who each add their unique flair to the city's vibrant commercial landscape. The iconic Tacoma Dome has endured as a high-demand venue for some of the largest names in the entertainment industry.

A magnet for families looking for affordable single-family homes in the Puget Sound area, Tacoma also draws those seeking a more urban downtown setting with competitively priced condos and apartments that feature panoramic mountain and water views. The city's natural beauty and proximity to the Puget Sound and Mount Rainier draws hikers, runners, bicyclists, and maritime enthusiasts to the area, while its lively social scene is infused with energy by thousands of students attending the University of Washington Tacoma and other academic institutions.

The City of Tacoma's strategic plan, Tacoma 2025, was adopted in January 2015 following unprecedented public participation and contribution. The plan articulates the City's core values of opportunity, equity, partnerships, and accountability, and expresses the City's deep commitment to apply these values in all of its decisions and programming. Each Livable City Year project ties into the principles and focus areas of this strategic plan. The City of Tacoma is proud of its 2017–2018 Livable City Year partnership with the University of Washington and of the opportunity this brings to its residents.

Tacoma

TACOMA 2025 STRATEGIC PLAN

The *Thea Foss Peninsula Manufacturing and Industrial Futures Study* project supports the Economy and Workforce goal of the Tacoma 2025 Strategic Plan and was sponsored by the City's Planning and Development Services Department and Community and Economic Development Services Department.

Goal #1 Livability
The City of Tacoma will be a city of choice in the region known for connected neighborhoods, accessible and efficient transportation transit options, and vibrant arts and culture. Residents will be healthy and have access to services and community amenities while maintaining affordability.

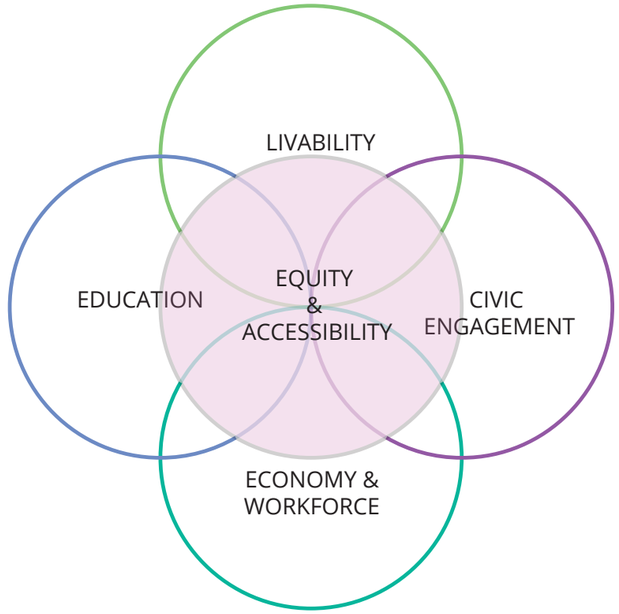
Goal #2 Economy and Workforce
By 2025, Tacoma will be a growing economy where Tacoma residents can find livable wage jobs in key industry areas. Tacoma will be a place of choice for employers, professionals, and new graduates.

Goal #3 Education
Tacoma will lead the region in educational attainment amongst youth and adults. In addition to producing more graduates from high school and college, more college graduates will find employment in the region. Lifelong learning and access to education will be prioritized and valued.

Goal #4 Civic Engagement
Tacoma residents will be engaged participants in making Tacoma a well-run city. The leadership of the city, both elected and volunteer, will reflect the diversity of the city and residents and will fully participate in community decision-making.

Goal #5 Equity and Accessibility
Tacoma will ensure that all residents are treated equitably and have access to services, facilities, and financial stability. Disaggregated data will be used to make decisions, direct funding, and develop strategies to address disparate outcomes.

tacoma2025
shared vision | shared future



RESOURCES

Tacoma 2025 Strategic Plan: https://www.cityoftacoma.org/tacoma_2025

Planning and Development Services Department:
https://www.cityoftacoma.org/government/city_departments/planning_and_development_services

Economic Development Services Department:
https://www.cityoftacoma.org/government/city_departments/community_and_economic_development/economic_development_services

Livable City Year: https://www.washington.edu/livable-city-year/

UW Tacoma Urban Studies Program: http://www.tacoma.uw.edu/urban-studies/urban-studies-home

Executive Summary

The goal of this project was to help the City of Tacoma understand the future of manufacturing and industry in the Thea Foss Peninsula. More specifically, this project aims to inform the ongoing tideflats subarea planning process in the City of Tacoma by providing lessons to create and maintain space for urban industry.

In order to support the City of Tacoma's planning process, students from the University of Washington Tacoma's Urban Studies program focused on specific case studies of urban industry within the United States, as well as three of the common barriers to urban industry: public opinion, financing, and brownfield redevelopment. Students used a mix of qualitative and quantitative data collection methods to identify a number of lessons related to planning for urban industry. Qualitative methods, such as coding public comments, case studies of industrial planning in port districts around the US, and policy and comparative research are supported with quantitative data from feasibility (GIS) research to demonstrate areas of most importance in the tideflats and offer recommendations for planning for urban industry.

Each research method uncovered unique findings – however, a few common themes emerged throughout the project. We found that it is desirable, viable, and feasible to create and maintain space for urban industry in the Tacoma tideflats. Moreover, the other cities that have successfully created and maintained space for urban industry have done so by prioritizing industry, partnerships, and protective policy. We conducted comparative research with planning documents from the City of Tacoma and the Port of Tacoma, which informed our recommendations on how to move the needle on the ongoing tideflats subarea planning process.

It is desirable, viable, and feasible to create and maintain space for urban industry in Tacoma. JOHN WESTROCK

Introduction

Tacoma's waterfront has become increasingly urban, and as such the future viability of urban industry in the city has come into question. However, urban industrialization this may jeopardize sustainable local industry for the South Sound. In this report, we explore these tensions in order to provide the City of Tacoma with guidance that will help them establish industry that is desirable, viable, and feasible. We define urban industry as the processes of production, distribution, and repair within a city-region. The City of Tacoma has laid out specific economic development goals in its One Tacoma Plan. The plan contains two important goals that, we believe, advocate for urban industry:

Goal EC-1: Diversify and expand Tacoma's economic base to create a robust economy that offers Tacomans a wide range of employment opportunities, goods, and services.

Goal EC-2: Increase access to employment opportunities in Tacoma and equip Tacomans with the education and skills needed to attain high-quality, living wage jobs.

Informed by our research, we believe that creating and maintaining space for urban industry is one of the best ways to achieve these goals. This will help to ensure equitable distribution of, and access to, living-wage jobs for residents. It will also strengthen a city's economic base and help cities remain competitive and resilient. By implementing multiple channels of mitigation, we find that urban industry can address many of the challenges and criticisms that are often offered. It is our hope that this report may prove to be helpful in moving forward with the City of Tacoma's Tideflats subarea planning process.

Urban industry will help to ensure equitable distribution of, and access to, living-wage jobs for residents.

We define urban industry as the processes of production, distribution, and repair within a city-wide region.

The Thea Foss Waterway divides the City of Tacoma from the Port of Tacoma. KENDRICK HANG

HISTORY OF TACOMA'S URBAN INDUSTRY

1873: Northern Pacific Railroad comes to Tacoma

1880s: Lumber industry causes an economic boom

1940s: Tacoma's port supports WWII efforts

1983: EPA designates Port of Tacoma part of the Commencement Bay Superfund site

2006: Site cleanup efforts conclude

Industry has helped fuel Tacoma's economy since the 19th century. However, in exchange for increased economic growth, industrialization jeopardized health, environmental safety, and labor standards. Tacoma's industrial history began with the sawmills on Commencement Bay. Local industry was further fueled by the Northern Pacific Railroad's arrival in 1873, which enhanced the city's economy through the provision of lumber, coal, wheat, and labor (Wilma and Crowley 2003). During the late 1880s, Tacoma found itself in an economic boom fueled by the lumber industry. However, the paper factory and other industrial operations caused a foul aroma that filled the air, earning Tacoma a negative reputation as having a 'Tacoma Aroma.'

Tacoma's economy benefited greatly from the industrial activity leading up to WWII, including the ASARCO Smelter, which operated in Ruston. However, during the operation of the plant, Tacoma and surrounding areas experienced widespread arsenic, lead, and heavy metal contamination, which resulted in exposure to toxins, contamination of locally grown food, and property damage. According to Sullivan (2015), "Research concludes that men who worked at the smelter were between two and eight times (depending on their level of exposure to arsenic) more likely to die of lung cancer in comparison to males in Washington State as a whole." However, despite these documented effects, the smelter remained operating and unregulated until the 1970s.

During World War II, Tacoma's port prioritized activity to support the military effort, providing resources to soldiers fighting in the war. During this time, the military mechanized the port, which decreased port employment by 90%.

The Thea Foss Waterway is an inlet of Commencement Bay and separates downtown Tacoma from the Port of Tacoma. In 1983, the EPA identified the Thea Foss Waterway as a part of a larger 12-acre Commencement Bay Superfund site. As a site for industry for more than 100 years, it fell victim to the waste dumping of industries directly into the waterway. The City of Tacoma, in partnership with agencies, organizations, and property owners removed sediments contaminated by more than a century of these environmentally insensitive practices — and in doing so restored marine habitats around the Thea Foss Waterway. Since the end of the cleanup in 2006, efforts have been focused towards monitoring and keeping the waterway clean.

Based on this history, it is no surprise that many Tacomans have concerns about industrial usage within the community. However, despite the history of contamination from urban industry in Tacoma, changes in practices and technology now can help to mitigate many of these issues.

CHALLENGES

We identified four main challenges through our research on urban industrial planning. They include the perception of viability of industry; opportunity for creativity in industrial fields; environmental sustainability; and negative perceptions around industrial development.

Viability

It is challenging for planners to demonstrate the viability of urban industry, which is largely due to the common assumption that industry is a dying, unfeasible option. As Gibson, Carr, and Warren explain, many assume that "the decline of manufacturing is inevitable... and part of an inevitable and permanent transition." However, there is compelling evidence that global recessions and policy changes that favor more conventionally sophisticated sectors (e.g., banking and tourism) are also largely to blame. These factors can scare companies into locating overseas or frighten cities from investing in urban industry. Planners grapple with these challenges as they encourage residents to welcome industrial growth and companies to settle in their city.

Creativity

According to Gibson, Carr, and Warren, the perception of urban industry "is that the physical manufacture of products is by and large an uncreative, repetitive task undertaken elsewhere." Therefore, in many communities, there is increasing emphasis on the "creative industries," such as design, film, and advertising. This can be threatening to more traditional manufacturing and industrial uses. However, several scholars have noted that industry does not necessarily imply competition with creativity; instead, many workers have creative and manual skills that "respect materials and their reuse." In other words, broadening conceptions of what the 'creative class' entails can help to integrate industry and manufacturing into planning efforts for local economic development.

It is challenging for planners to demonstrate the viability of urban industry, which is largely due to the common assumption that industry is a dying, unfeasible option.

Many assume the future of industry will look like the past, but technological innovations can reduce the environmental impacts of industry.

Sustainability

Many assume the future of industry will look like the past, but technological innovations can reduce the environmental impacts of industry. For example, many industries increasingly use environmental sustainability as an opportunity to compete. In addition, moving industry elsewhere does not necessarily improve sustainability—it only pushes pollution to other places. Planners should focus on using existing technology to create sustainable urban industry in Tacoma, which will allow us to manage environmental impacts and reap the benefits that industry can bring.

Negative Perceptions

Negative perceptions persist around urban industry and often draw from negative outcomes of the past. These perceptions can make it challenging to effectively plan for urban industry. In order to successfully confront negative perceptions, improved communication and knowledge-sharing around the viability, creativity, and sustainability potentials of urban industry is critical.

Later in this report, we highlight public comments regarding urban industry in Tacoma. These comments reveal that many residents have a negative perception of industry due to the city's industrial past and are opposed to fossil fuel industries at the tideflats. Public uncertainty adds to the opposition to urban industry and tideflat development, and this uncertainty is heightened when planning proposals trigger past industrial images and experiences.

In the remainder of the report, we present an analysis of perceptions of urban industry in Tacoma, case studies from other cities, and opportunities for Tacoma to address these challenges. Below, we present current trends in port planning that can also help to confront these challenges and influence better perceptions of desirability, feasibility and viability of urban industry.

EMERGING TRENDS

Since Tacoma's early industrial origins, industry has evolved considerably. In this section, we introduce three important trends, which help to frame our report: sustainable manufacturing, green ports, and industrial advocacy and collaboration. Through these trends, it is clear that work is actively being done to reshape industry, manufacturing, and production. This is not to say that industrial activity is without concern. However, as we discuss below, industry is increasingly able to address issues of environmental stability/sustainability as well as issues of social and economic equity and access.

Moving industry elsewhere does not necessarily improve sustainability—it only pushes pollution to other places.

Sustainable Manufacturing

What do we mean when we say something is sustainable, and how to do we intertwine sustainability with industrial activities like manufacturing? Research by Garetti & Taisch offers a working definition of "sustainable manufacturing," which they describe as "the ability to smartly use natural resources for manufacturing, by creating products and solutions that, thanks to new technology, regulatory measures, and coherent social behaviors, are able to satisfy economic, environmental and social objectives." Due to a heightened awareness of resource and environmental fragility, industry has had to adopt "strategies and tools to assess the economic, social and environmental impacts of their products and their manufacturing chains."

The question then, is how firms and municipalities can establish standards for sustainability. Although methods exist to more environmentally-friendly practices, regulatory framework also matters. In addition, Tonelli, Evans, and Taticchi note that, increasingly, it is "Those industrial organizations that predict and plan for a sustainable future [that] are likely to survive into the next generation." This isn't to imply that the process is one that will be easy, but through assessment, policy change, and the development of new types of products, operations and organization models, the City of Tacoma can achieve "sustainable manufacturing."

Sustainable manufacturing, green ports, and industrial advocacy and collaboration are three important emerging trends in industry.

Green Ports

To combat the all-too familiar criticism that ports and port infrastructure are environmentally unfriendly, the idea of sustainable "green ports" has emerged. Green ports "form their policies and establish an efficient system for monitoring energy and water consumption, including indicators of urban environment quality (air quality, water, energy, and water use)." (Pavlic, Cepak, Sucic, Peckaj, Kandus 2014). This is a process that comes from the top down, meaning that there is a fundamental shift that needs to happen within current management and planning practices of ports if we want to fundamentally transform existing ports.

Partnerships/Advocacy

Globalization has created significant pressure from larger firms whose capital is more mobile than smaller, local firms. The exit of larger firms can have negative impacts on the smaller firms left behind. Organizations and incubators—including city-, regional, and state- government, nonprofit, or for-profit—can step in to help them maintain and facilitate growth.

These efforts on the behalf of planners and individual entities alike help to ensure retention and expansion for local industrial businesses. Incubators can assist these businesses in supplying affordable production space, investment capital, and help to transition these incubators into startups. Through collaboration and community support partnerships stabilize urban industry in their city and organize like thoughts and ideas to meet a shared goal so that companies and the city can thrive together.

The availability of a pre-existing skilled workforce can also be critical in ensuring that industries are viable. With the advancement of technology, there has been a rise in demand for STEM workers within the industrial workforce, which presents both a challenge and an opportunity. While most STEM-related jobs do not require a four-year degree, many do require some training. This training is especially important in low-income communities where the cost and access to higher education is a barrier to higher-wage jobs. It is at this intersection that planners, educators, and workforce developers can collaborate to bridge this gap for potential workers and increase the supply of a skilled workforce for firms. This is discussed further in our case studies from Louisville, Kentucky and San Antonio, Texas.

Equity

Making space for industry through industrial advocacy and collaboration isn't simply about bringing in business for the sake of business—it's also about equipping citizens with the ability to have upward socio-economic mobility and providing an alternative to low-level/low-wage service jobs. Urban economies that do not maintain industrial manufacturing and shift to a reliance on services often experience "highly bifurcated labor markets" and have few moderate-income, blue-collar jobs (Lester, Kaza & Kirk). Therefore, making more room for industry and manufacturing can create improved access to goods and services and provides residents with more opportunities for employment and living wages. This is especially important in cities like Tacoma that experience high unemployment rates and rising housing costs due to other growing technology and skilled service sector jobs. Partnerships between cities, regional organizations, educational institutions, and local enterprises to provide workforce training for manufacturing can create a stable and innovative workforce that promotes equitable community development.

In the sections that follow, we present research that demonstrates a variety of strategies to plan for urban industry through incorporation, partnerships, and policy.

Making Sense of Public Comments Regarding Urban Industry at the Port of Tacoma

INTRODUCTION

Public participation and comments can help to shed light on the public's perspective of urban industry before and during subarea planning for the Port of Tacoma. In this section, we share findings from the coding, sorting, and processing of the public comments regarding urban industry gathered over the past two years, dating back to January 21st, 2016.

Public comments can play an important role in the planning process. According to Burby (2007), "Citizen involvement...can give stakeholders a sense of ownership of planning proposals and ease the formation of coalitions who will work hard for their realization." Acknowledging that the relationship between the City, the Port, and the public can be tense, addressing the public's comments can help to guide future development and ensure that it is feasible. In other words, when the public feels valued, they become an asset to the community and the planning process.

In addition to the analysis of the public comments, this section will also consider how Tacoma's industrial history has impacted the public's perspective. As discussed earlier in this report, negative perceptions are often drawn from negative outcomes in the past. Many residents focus on the soil contamination as a result of the ASARCO smelter and the major Thea Foss Waterway cleanup that had to follow over 100 years of water and sediment contamination. These negative perceptions can make it challenging to effectively plan for urban industry.

Our aim is to draw out and understand any underlying tensions surrounding current industrial development. While these comments only capture a slice of the public opinion, they can help to make sense of the

When the public feels valued, they become an asset to the community and the planning process.

"Citizen involvement can give stakeholders a sense of ownership of planning proposals and ease the formation of coalitions who will work hard for their realization."
– R.J. Burby, *Making Plans that Matter: Citizen Involvement and Government Action*

Public participation will shape the future of the Port of Tacoma. BRORAN

public's views on urban industry and identify common themes, tensions, concerns, and expectations.

METHODOLOGY

Documents were gathered from several different forums, including oral and written correspondence pertaining to the proposed methanol, LNG facility, Tideflats Interim Regulations, and multiple Environmental Impact Statement (EIS) meetings of the proposals. Of 452 comments gathered over the last two years, we opted to randomly generate a representative sample of 136 comments, which we then organized and sorted. While the comments are complex and do not easily fall into strict categories, this categorization allowed us to graph the data and analyze patterns throughout the comments.

Though the 162 analyzed comments are a representative sample, in future a comprehensive analysis could provide researchers with more specific insight and action plans. While this was not feasible in the time allotted, we documented our process with great detail, and—should the City choose to continue this process—there is a strong foundation to build from.

RECENT PROJECTS AND PROPOSALS

Public comments were submitted in response to three planning events connected with urban industry in the tideflats. Here, we provide a brief background of these events:

Methanol Plant Proposal

In 2013, Northwest Innovation Works proposed to build the world's largest Methanol production plant at the Port of Tacoma. In a 45-day scoping period, residents could attend public meetings, held on January 21, February 10, and February 24, and also submit written comments by March 4, 2016. Northwest Innovation Works requested the State Environmental Policy Act (SEPA) environmental review be put on hold, and the last scoping meeting was canceled, resulting in the project application process to be halted.

LNG Facility Proposal

The City of Tacoma initiated an environmental review of the Tacoma Liquefied Natural Gas (LNG) Project in September 2014, based on a proposal by Puget Sound Energy. Following a scoping period and several months of detailed review, the City issued a Notice of Availability for the draft Environmental Impact Statement (DEIS) on July 7, 2015. This was followed by a 30-day public comment period ending on August 6, 2015.

During this period, two meetings were held regarding the attributes of the LNG project and the DEIS. A public meeting was held on July 16, 2015, for community members, at the Port of Tacoma. According to the Port of Tacoma website, LNG, and other natural gases are used frequently in transportation and identified as a cleaner burning fuel source (2015).

Tideflats Interim Regulations

The City determined a Subarea plan would be the best course of action to comprehensively plan for land use at the Port of Tacoma and tideflats. During this time, the City introduced the Tideflats Interim Regulations on May 9, 2017. The Tideflats Interim Regulations are a collaboration between the City, Port, and the Puyallup Tribe, to limit industrial development, to create a NE Tacoma buffer zone, and implement the Container Port Element of the City's Comprehensive Plan. The interim regulations also paused new development in an effort to "create clear policy and long-term vision for the tideflats area" (2017). Public hearings were held August 2, 16, September 13, and written comments were accepted until the 15. The Tideflats Interim Regulations were accepted by the city on November 21, 2017.

COMMON THEMES

In the following section, we present some of the common themes, along with representative quotes, identified in our analysis of the comments.
Pollution that Affects Community and Environmental Health
"More than 30 years ago [was the establishment of the Superfund sites in Tacoma] and it's stunning to me that we have not learned from the past, but that we are considering repeating it" (comment 82 2/10/16 EIS).
"What do we want to be the quality of the water, of the air, of the life cycle of plants and animals, of the salmon when we are gone?" (comment 4 2/10/16 EIS).

Safety, Risk, and Responsibility

"Some insurance policies cover acts of God; some don't. But in this case, it really doesn't matter since the Port of Tacoma signed a 30-year ground lease with the applicant, holding them harmless for damages...

Put another way, a critical incentive to maintain safe operations has been undermined and rendered largely useless" (comment 85 2/10/16 EIS). "Specifically, I am a strong supporter of maintaining an industrial base called the tideflats here, from the Foss Waterway over to the Hylebos. We need to preserve that as heavy industrial area. If you look at what is happening in Seattle, has happened to SODO, Georgetown, those areas, that light manufacturing, heavy industry is being pushed out by urbanization and gentrification." (comment 47 2/10/16 EIS).

Opposition to Fossil Fuel Industry
"Please work quickly to immediately implement interim regulations to pause new fossil fuel projects now. With this protection in place, we can then take the necessary time to address other issues and long-term solutions." (comment 170 Tideflats Interim Regulations - part one).

"Since the citizen opposition to a methanol plant in Tacoma, it is very obvious to me that the Tacoma community, my community, wants their city's economic future to look different than the past. We want a cleaner and sustainable future where the inherent value of the environment is recognized, protected and leveraged. " (comment 144 Tideflats Interim Regulations - part one).

Data reflects a significant disconnect between the planning process and the public.

Pro-Fossil Fuel Industry
"I strongly believe that LNG is going to serve an important role in our transportation systems here and across the country in the future, due to its unique physical characteristics and transport advantages, cost-benefit advantages, and environmental benefits compared to other fuels." (comment 9 LNG EIS)

"When we protest business in an industrial area, we essentially are saying that we are closed for business, that we don't want a thriving and diversified community" (comment 9 1/12/16 EIS).

Transparency and/or Trust
"There are gaps in the discussions related to existing contamination at the Occidental Chemical site, and it is unclear if future sea level rise has the potential to impact the facility and the environment during extreme events such as King tides and flooding." (comment 27 LNG EIS).

Economic Benefits
"The building and operation of the LNG facility represent hundreds of millions of dollars of private investment in the state-of-the-art facility. The Tacoma LNG facility will create 150 construction jobs and 18 permanent jobs. It will contribute millions of dollars in new tax revenue...and result in $120.4 million economic activity. (comment 8 LNG EIS)

"It is encouraging to see TOTE taking a leadership role in converting its vessels to LNG. Clearly, this project will provide important environmental and economic benefits for the people of Tacoma and Pierce County as a whole." (comment 15 LNG EIS).

Many residents' comments are complex. For example, many wonder who will assume responsibility for any safety, environmental, and health hazards, but may not necessarily be opposed to all new development. Lastly, the data reflects a significant disconnect between the planning process and the public. Public uncertainty is one driver of opposition, and this uncertainty is heightened when proposals trigger past industrial images and experiences. The City has, and will likely continue to receive, strong reactions from the public if the relationship with the public remains stagnant.

Lessons Learned

Based on our review of public comments, we draw the following summaries of public viewpoints and perspectives on urban industry in the tideflats:

1. Many residents have a negative perception of industry due to the city's industrial past and are opposed to fossil fuel industries at the tideflats.

2. Opinions are mixed regarding industrial development. While some emphasize the need for economic benefits from new industries, many others raise concerns about who will be responsible for the output of their operations.

3. Health and safety hazards are of primary importance to residents.

Workforce Training

INTRODUCTION

Because of its potential to contribute to local economic development, local industrial job creation is a priority for many economic development planners. A well-trained manufacturing workforce can have a significant economic impact due to its utilization of other sectors, and manufacturing is often at the forefront of innovation, research, and development (Leigh n.d.). In addition, these employment opportunities are often high paying, and the completion of a short-term certification program is often sufficient to access employment in the sector, promoting equitable community development for residents without a college degree (Wiederwohl 2016). However, the notion that manufacturing and vocational training are no longer applicable in today's society has led to a disinterest in the sector, resulting in a shortage of high-skilled workers that manufacturers are seeking (Means 2018).

This is where local partnerships between cities, regional organizations, educational institutions, and local enterprises can fill the gap. By prioritizing workforce development, particularly in advanced manufacturing, cities have the potential to act as innovative leaders while establishing themselves as global competitors. In the two following cases, cities developed partnerships with outside organizations and institutions to promote and provide workforce training for manufacturing. In presenting these two cases, we emphasize the benefits of implementing training programs to build a stable and innovative workforce.

> By prioritizing workforce development, particularly in advanced manufacturing, cities have the potential to simultaneously act as innovative leaders and establish themselves as global competitors.

CASE STUDY: PORT SAN ANTONIO

Port San Antonio is a multi-use industrial complex. The Port "collaborate[s] with an array of nationally-renowned educational partners to help customers identify and recruit new talent, as well as develop customized training programs" (Port San Antonio 2018). This collaboration is the backbone of the complex and has been directly responsible for the success of the operation.

Future Employers

By facilitating training programs with the very industries that plan to employ the workforce, the program becomes a direct feeder into the workplace, placing graduates in high-paying jobs that provide a return on their efforts. According to Port San Antonio (2018), the Alamo Aerospace Academy has graduated more than 300 students, 60% of whom are employed at the Port.

Local Educational Institutions

Another important player in this training program is Alamo Colleges, a local educational institution. According to Port San Antonio, "Alamo Colleges can pay the $5.1 million market value of the property by providing customized training and re-training of aerospace workers at Kelly Field, based on the needs and determinations of the Port's customers. Under the terms of this initiative, aerospace customers receive $12,000 in credit for training each new or existing employee, and this credit is applied toward Alamo Colleges' debt for purchasing new property." Close cooperation and planning are a large part of this program, requiring that city, port, and college operate on the same page.

Applicability to Tacoma

By providing middle-class jobs, and by giving access to those jobs through a workforce training program, Port San Antonio has improved both the regional economy and the economic standing of its employees. Workforce training programs are beginning to become more commonplace as cities and counties notice how successful and beneficial it is to incorporate advanced manufacturing into the industrial plan for a city. According to Means (2018), "Up to 72.9% of manufacturing companies surveyed listed recruitment and retention of a workforce as their number one business challenge." However, this type of program usually works best when it is done in conjunction with industry partners.

CASE STUDY: LOUISVILLE, KENTUCKY

According to Kotkin (2017), Louisville-Jefferson County is the number one manufacturing city in the United States. Therefore, in order to remain globally competitive, workforce development is a major priority for the city, particularly in advanced manufacturing (Wiederwohl 2016). Currently, about 12% of the city's workforce is employed in the manufacturing sector (Selko 2017). Primary players in Louisville's manufacturing workforce development includes KentuckianaWorks, the parent organization of the Kentucky Manufacturing Career Center, (KMCC) and the Kentucky Federation for Advanced Manufacturing Education (KY FAME). Jefferson County Public Schools (JCPS) has also made extended efforts at the high school level to train and promote manufacturing as a possible career path, as has Louisville Forward, the city's economic and community development department.

KentuckianaWorks

KentuckianaWorks defines itself as "the workforce development board for the Louisville Region" with a mission to "engage employers, educators, and job seekers with resources to build a stronger community through the dignity of work" (KentuckianaWorks, n.d.). Louisville is one of the regional cities within the state of Kentucky that uses KentuckianaWorks to address local workforce development goals. It is funded at the federal, state and local levels, including from the Louisville Metro Government. The organization is the founder of the Kentucky Manufacturing Career Center (KMCC), which according to KMCC (2017), is the organization's "first industry focused career center." Programs offered include:

- Manufacturing Training and Employment Connection: A 2-week program that allows potential employees to earn valued certificates such as an OSHA 10 Card, certification in forklift driving or lean manufacturing, with the potential to connect with area employers.
- Certified Production Technician: This month-long program focuses on the safety and quality of manufacturing process and maintenance.
- Manufacturing Training for English Language Learners: A 3-week program offering English language learners the opportunity to earn certifications to pursue supervisory roles in manufacturing settings.

City of Louisville reports that since opening in 2013, KMCC has awarded 3,000 certificates. The center also caters to manufacturing employers by offering talent recruitment, hosting hiring events, and offering other services such as skill testing and employee counseling. Currently, there are about 50 industry members, many of whom are employers that meet monthly to guide and tackle workforce concerns.

KY FAME

KY FAME is another resource used by Louisville. Established in Louisville through collaboration between manufacturers, KY FAME defines itself as "a partnership of regional manufacturers whose purpose is to implement dual track, apprenticeship-style training that will create a pipeline of highly skilled workers." Inspired by the City of Lexington's partnership with KY FAME, in 2015, G.E. and 11 other Louisville manufacturers partnered with Jefferson Technical and Community College to establish the Louisville chapter. The partnerships between local educational institutions and KY FAME allow individuals to earn a Manufacturing Technician certificate that readies them to enter the advanced manufacturing workforce. Students attend classes for up to 10 hours per week and work about 24 paid hours per week with one of the program sponsors. According to City of Louisville, KY FAME has a 98% job placement rate with 15 different companies. Collaboration between employers and educational institutions in establishing programs help to fill skill gaps and combat the negative perceptions of the manufacturing industry.

Jefferson County Public Schools

Louisville's Jefferson County Public Schools has established academies in 11 of the city's local high schools. One goal is to promote manufacturing and other industrial careers as viable options for younger generations to pursue. The Academies of Louisville operate an array of different programs, many of which cater to science, technology, engineering and math, manufacturing and other industrial trades. Each school's academy offerings differ, but the overall goal of district's academies is to aid students in creating a path towards post-secondary education or certification, while also expanding the local workforce. Now, the City now has "best-in-class credentialing programs in advance manufacturing and coding" (Wiederwohl 2016).

Louisville's success in collaborating with companies that are already present has allowed it to promote advanced manufacturing as a viable and innovative career path and maintain its ranking as the number one manufacturing city in the US.

Green Ports

INTRODUCTION

Green ports originated in Europe in the 1990s, and the concept has become increasingly popular in the United States (Mayet 2017). Typically, the greening of ports includes both a process and ongoing evaluation to ensure that environmentally-friendly standards are created and maintained. In addition to promoting sustainable development, green ports also highlight economic efficiency (Thermal Science 2014). Usually, this process requires major players to come together and agree on the green port concept and how to implement it. In addition, several cities that have worked to green their ports have been more successful in gaining community support for port projects.

This section discusses two sustainability certifications that may be relevant for the Port of Tacoma: Green Ports and the Leadership in Energy and Environment (LEED) program.

BACKGROUND

In 1992, the European Commission adopted the Habitats Directive, which was the first step that Europe made towards creating a green port. In 1994, the European Sea Port Organization (ESPO) went further to create standards and management systems to decide when a port is to be declared as a green port.

During this time, a Self-Diagnosis Method (SDM) was proposed to help ports to assess their environmental situations and plan for the future. The SDM checklist helps to measure a port to declare whether or not it meets green port standards, or Environmental Management System (EMS) and from this test certifications were created. International standards, called the Port Environmental Review System (PERS) were also set. Ports that want to be certified as green ports now can attain these certifications and standards. After ports are certified, they are formally recognized on the website of the independent, neutral nonprofit ECOSLC and become part of the global Eco Ports network.

Internationally, Eco Ports has been recognized by the American Port Authorities Association (AAPA) in 2013 and thereafter by the African Ports Association, the Taiwan Ports International Cooperation (TIPC), the United Nations Environmental Program (UNEP), and the World Bank.

ELEMENTS OF GREEN PORTS

According to Rijeka (2007), the following eight elements should be addressed in green ports:

- **Air Pollution:** Ports should establish an air quality improvement plan and reduce the emissions triggered by operations.
- **Noise Pollution:** Many ports set limits of the activation of sirens, horns and other sources of disruptive noise.
- **Soil and Sediment Pollution:** It's important to monitor groundwater quality and conduct pre-construction surveys to identify and manage any hazardous waste.
- **Water Quality:** A stormwater pollution prevention program can manage stormwater from industrial construction.
- **Marine Life Protection:** Ports conduct studies to understand how to best preserve and restore the surrounding natural ecosystem.
- **Energy Savings:** Ports conduct energy consumption studies, enforce energy efficient policies, and support new strategies to develop renewable energy technology.
- **Weather Monitoring:** When ports establish weather station networks, they contribute to the reliability, quality, and safety of the services, staff and infrastructure.
- **Sustainability:** Sustainable practices involve recycling and reuse policies, as well as energy efficient building management plans.

WHY GREEN PORTS

Green ports can improve environmental sustainability, commercial and operational activities, and development of the overall economy. In Europe, the green ports offer a way to mitigate negative impacts of emissions, air pollution, and habitat loss. In addition, the standardization of green ports establishes participating ports as environmentally conscious, which often attracts more business to the port.

Green ports can improve environmental sustainability, commercial and operational activities, and development of the overall economy.

Heritage, History, and Regional Identity in Urban Industry

INTRODUCTION

Many regions possess resources and skills that attract specific businesses throughout history, creating a connection between regional identity and economic productivity (Romanelli 2005). Appreciation for a city's culture and history tends to bring residents together, which creates social and economic benefits (Treado 2010). In our research, we identified examples of cities and ports that reinvented and gave new life to the industries closely linked with their historical and regional identity.

Regional characteristics and industrial trends are often closely linked. For example, in the wine industry, vineyards and processing facilities benefit from locating in regions that are known for wine, because there are more accessible shared resources and because they are more easily able to market their product, due to regional recognition (Beebe 2012). Regional industrial identities are typically associated with the types of organizations that root themselves in the region, or have been a significant part of the region's heritage. Industries and industry clusters inform both internal and external audiences about the kinds of organizations that are likely to thrive in that region (Romanelli 2005).

In this section, we draw on a case study from Pittsburgh to: (a) determine how heritage and local identity impact industry, (b) understand the importance for current industry to connect with industrial heritage, and (c) understand how urban industry and industrial heritage can connect.

CASE STUDY: PITTSBURGH, PENNSYLVANIA

Pittsburgh's "Golden Age" was between 1870 and 1910, when the city was producing 60% of the United States' steel—a feat that earned it the nickname the "Steel City" (Robbins 2016). However, in 1959, steelworkers went on an industry-wide strike. The halt in production forced cities to import their steel from elsewhere, which in turn drove many steel mills to bankruptcy. This resulted in a massive downfall of the steel industry. By the late 1980's, 75% of the city's steel companies disappeared.

This major blow to Pittsburgh, however, did not end Pittsburgh's relationship with the steel industry. Rather than crumbling, Pittsburgh has undergone a successful transformation from a steel maker to an advanced manufacturing cluster. The success of that transition is due to the collaboration of several interests and stakeholders, including the City's universities, medical centers, philanthropic foundations, and advanced manufacturing firms, as well as the redevelopment of under-used industrial areas. Pittsburgh is home to two major universities—Carnegie Mellon University and University of Pittsburgh—both of which have steel research centers housed within their engineering departments. This appears to be a significant contributor to the success of Pittsburgh's transition. Furthermore, the University of Pittsburgh Medical Center (UPMC), the major medical center in Pennsylvania, is a facilitator of innovation all its own, and is the largest employer in the city.

Additionally, Pittsburgh has several foundations that contribute heavily to the transformation of scientific and technological work from the universities into start-up businesses, serving as a vital "middle man," in the process (Andes 2017). As for industrial redevelopment, the Regional Industrial Development Corporation of Southwestern Pennsylvania addressed infrastructure issues in the city through renovations of old factories, which in turn attracted innovative businesses. The mission of the RIDC is to create and nurture economic growth and high quality job creation. It does this through real estate development as well as public interest projects meant to accommodate regional economic growth opportunities. According to representatives of The Minerals, Metals & Materials Society, it would be difficult to find another US city that had a similar combination of industry and university knowledge in materials engineering (Treado 2010). The collaboration of these organizations—as well as Pittsburgh's historical legacy as a steel town—are critical factors in facilitating the transition of Pittsburgh's failing steel industry to one that can compete in a modern global economy.

According to Treado (2009), the traditional industrial path of a region can serve as a source of positive industrial transformation, and thus as a source of regional resilience. In the case of Pittsburgh, the use of collaborations that honored the heritage of the region allowed for a positive industrial transformation. In addition, the case study represents an example of how collaboration resulted in regional resiliency and continued global competition in advanced manufacturing.

Rather than crumbling, Pittsburgh has undergone a successful transformation from a steel maker to an advanced manufacturing cluster.

Industrial Intermediaries and Advocates

INTRODUCTION

As discussed in the previous section, intermediaries and advocates play a critical role in planning for urban industry. Often, they serve as the clearinghouse or catalyst for ideas and policies that enable cities to regain a foothold on manufacturing and regional sector growth. Advocates and intermediaries can be single people, firms, or collective organizations who have been successful in revitalizing local manufacturing efforts. They often serve as the "middle-man" for local community members and policymakers, and specialize in "re-branding" markets. In many successful cases of urban industrial rebirth, including Pittsburgh, Brooklyn, and San Francisco, intermediaries and advocates are present to foster partnerships, offer guidance and technical assistance, and to find solutions that work for all parties involved. When their work is successful, it is innovative, locally-contextual, sustainable, and responsive to the changing needs of consumers, allowing Community Economic Stability to take hold (Urban Manufacturing Alliance 2018).

This section looks in depth at two case studies that include Intermediary and Advocate firms to better understand how these organizations collaborate for successful urban industry, restructure the market, and support communities to reinvest in themselves.

CASE STUDY: SF MADE

San Francisco Made (SFMade) is a nonprofit organization that works to enhance the manufacturing industry in the City. It aims to construct and maintain a manufacturing sector that retains vitality and offers more opportunities to a diverse workforce. SFMade works directly with 600 small business owners and entrepreneurs to connect them with resources, education specific to industry-based needs, networking opportunities, and a regional branding strategy under the SFMade branding umbrella.

SFMade also priorizes equitable opportunity. They create opportunities for low-income areas and individuals that do not have traditional education achievements by offering educational workshops and tours that provide insight on manufacturing. SFMade seeks to restructure how the public perceives manufacturing as an industry, and how the public connects with and supporting manufacturing in their community.

San Francisco has chosen to take on a creative edge by enabling a new generation of thinkers to "incubate" smaller creative working spaces. This has enabled smaller firms, also known as "niche firms," to enter into the industrial market to produce a new wave of industry. Often, many nice firms share a larger industrial space, which is divided into smaller compartments. These centers, called "incubators," serve as a start-up operational base. In doing this, multiple niche firms are able to operate in one location.

This new model of industrial advocacy blurs the lines between creativity, fabrication, design, and production. Incubators allow multiple small businesses to engage with one another and even achieve succeed together. SFMade has been innovative with their "Local Branding" platform, and has revitalized industry by changing the visual perception of how the public views local productions. Intermediaries and advocates can strategize many ways to redesign the public opinion about manufacturing and how the community supports that industry in their region.

CASE STUDY: BROOKLYN NAVY YARD

The Brooklyn Navy Yard has a rich history within the New York City area. The mission-driven nonprofit organization serves as a nationally acclaimed model of the viability and positive impact of modern, urban industrial development. Their mission is to fuel New York City's economic vitality by creating and preserving quality jobs, growing the City's modern industrial sector and its businesses, and connecting the local community with the economic opportunity and resources of the Yard. According to their website, Brooklyn Navy Yard believes that the industrial sector can still flourish in New York and offer career pathways to a diverse cross-section of residents by creating "a vibrant and dense, modern manufacturing community where businesses are provided the stability needed to invest, grow, and thrive."

To achieve this vision, the Brooklyn Navy Yard manages 300 acres of industrial property, which they use to welcome and support new businesses. They strive to anchor New York City's modern industrial sectors and its businesses by providing a stable and predictable real estate environment that allow tenant businesses to invest and flourish, and they are currently home to over 400 businesses and 7,000 jobs. In addition to cultivating a thriving industrial tenant base by retaining and attracting manufacturing businesses, they also fostering strategic growth in other key sectors such as technology, design, production, and media.

Brooklyn Navy Yard also invests in the local community. They advance economic opportunity at the Yard by "reaching out to and partnering with the local community to create meaningful connections with the residents and the jobs." They collaborate with stakeholders to expand the types and quality of opportunities available by ensuring that local, minority, and women-owned businesses have access to the development and construction opportunities the Yard presents.

The Brooklyn Navy Yard continues to expand its manufacturing offerings, including a recent emphasis on wind and solar powered energy manufacturing, which led to their support of Duggal Eco-Solutions, a tenant that helped to create the multi-tenanted green industrial building. In 2011, the Brooklyn Navy Yard rehabilitated Building 92, turning it into a LEED-platinum exhibition, visitor, and employment center, which provides enhanced job placement services. The historic landmark achieves their community engagement goals, teaching visitors and residents about the history of the Brooklyn Navy Yard and their efforts.

By serving as a multi-purpose facilitator and incubator, the Brooklyn Navy Yard has successfully promoted manufacturing and urban industrial opportunities in New York City.

Lessons Learned

Community Driven: These case studies illustrate the importance of focusing on benefits to existing residents and communities through workforce development and employment opportunities.

Intermediaries: These organizations bring nonprofits, communities, and firms together to enable manufacturers to flourish. They also organize common ideas shared between companies and city organizations to meet a common goal.

Collaboration: Strong connections between people and resources is the only way to enact change. Being able to have partners who can provide goods and services is necessary to promote more change.

Financing Urban Industry

INTRODUCTION

Urban industry in America has suffered from decades of disinvestment from cities. This has resulted in the shift to overseas manufacturing and central regional distributors to save on costs, which further contributes to the decline of industry in the urban landscape (Leigh & Hoelzel 2012). As discussed elsewhere in this report, urban industry has significant benefits for local economies—but does often require significant front-end investment. Therefore, financing is a significant component of a viable urban industry.

Our research on sustainable financing for urban industry centers on two themes: investing in both people and place. By emphasizing these themes, we seek to highlight the importance of funding both the infrastructure required for business, as well as the relationships that make these industries successful. Planning for both people and place ensures that economic development addresses the needs of all who call the region home, maximizing the benefits to existing communities.

A diversified economy that includes industry is an important component to the city's long-term economic goals (One Tacoma), and the Tideflats Subarea planning offers an important opportunity to consider reinvestment options that support urban industry. Investment in people and place complement Tacoma's overall economic goal to "Create a city brand and image that supports economic growth and leverages existing cultural, community and economic assets (One Tacoma p 6-2)." In addition to the case studies presented below, Appendix B: Financial Investment includes a comprehensive table of financial tools that the City of Tacoma might consider as financing options.

Planning for both people and place ensures that economic development addresses the needs of all who call the region home, maximizing the benefits to existing communities.

INVESTMENT IN PLACE

Investment in infrastructure promotes urban environments that can support viable urban industry. This section highlights Industrial Revenue Bonds and creative financing.

Industrial Revenue Bond

Industrial Revenue Bond (IRB) is a financial mechanism in Washington State that supports infrastructure financing for local urban industry. The IRB offers manufacturing and processing companies below-market interest rates for eligible uses, such as constructing buildings, upgrading existing facilities, and purchasing land/equipment. There are multiple benefits to using industrial revenue bonds rather than market financing:

- Bonds range from $1 million to $10 million
- Bonds are available in fixed, variable rate, or long-term repayment
- Bonds are tax-exempt, which reduces the interest rate

The IRB was established under Washington State Law in order to promote employment, support capital investment in industry, and attract environmentally sound industry to the state (RCW 39.84.010). It has been used to promote local industries in both the Port of Bellingham and the Port of Port Townsend, who have successfully used this financial mechanism for industrial infrastructure to promote local job creation.

Investment in place can build a stronger infrastructure for industry to thrive. HEDWIG IN WA

Investment in people makes local businesses more resilient and workers better suited for the employment needs of local industry.

Creative Financing with Grant Writing and Collaboration
For the past 20 years, the fate of the Lander Street Overpass has remained uncertain as both the Port of Seattle and the City of Seattle have struggled to find common ground. Recently, Senator Maria Cantwell stepped in to help advocate for federal grants and funding and move the project forward. Senator Cantwell collaborated with both the Port of Seattle and the City of Seattle to create the Lander Street Overpass Plan, ensuring that all necessary criteria was met in order to secure federal funding. The plans estimate that the cost of the Lander Street Overpass is $123 million.

Shortly afterwards, the Lander Street Overpass project was approved for $45 million of Federal funding, and although the FASTLINE grant was short of the $123 million goal, it stimulated additional contributions from other agencies and stakeholders, including the Port of Seattle, the National Highway Freight Program, the Move Seattle Levy, Connecting, BNSF Railway awarded $2.5 million, the Puget Sound Regional Council Surface Transportation Program, the Freight Mobility Strategic Investment Board, and the City Appropriation of 2016. Total contributions amounted to $123 million. The Seattle Department of Transportation is leading the project, and construction is expected to start by the end of 2018. Collaboration, communication, and a planning process that established shared responsibility between stakeholders, policymakers, and leaders was essential in moving this project forward (Office of the Mayor 2017).

INVESTMENT IN PEOPLE

Investment in people makes local businesses more resilient and workers better-suited for the employment needs of local industry. The case studies below demonstrate how businesses and communities are supported by investing in people.

Disadvantaged Business Enterprise Program
The Disadvantaged Business Enterprise (DBE) program is a partnership between the Port of Seattle and minority vendors. The DBE program helps ensure that traditionally underserved business owners, including people of color, women, and the LGBT community, get a fair chance to bid for Port-appointed contracts. Small businesses who fit the minority criteria apply to be placed into the DBE program. Following their acceptance into the program, vendors have opportunities to a vast amount of resources, such as financial counseling mentorship. The mentorship program is run by participants within the DBE program who have experienced business success. Some of the services provided include discussion of expected etiquette, bidding strategies, and assistance with legal paperwork. The Port of Seattle has a special quota set aside for only DBE vendors; with rules in place to ensure that a certain numbers of contacts are given to vendors within the DBE program. Through its suite of services and support, the DBE program attempts to promote a more equitable environment in the Port of Seattle and provide more contract opportunities for minority vendors (Port of Seattle DEB website).

Career Connect Washington
In December of 2017, $6.4 million in Federal grants were awarded to fund internships and apprenticeships within Washington State (Workforce Training and Education Coordinating Board). The Career Connect program is designed to connect firms with employees, and the awards provide funding for meaningful career-related training experiences for youth and adults in eight different regions in Washington state. Within each target region, the funds will go towards programs tailored to the needs of the local community. In Tacoma-Pierce County, for example, the grants will fund training in sectors targeted for growth, in addition to apprenticeships and other learning opportunities.

Investing in people through workforce training can make the city more competitive and attractive to PDR firms and may prevent the job/skill mismatch that necessitates the recruitment of skilled workers from other regions. Increased collaboration between employers and educators helps to prepare the local labor force for career success in urban industry. It is also an investment in the community, as increased access to training for local workers promotes higher wages and a better quality of life for residents. Our local labor force is a vital asset, that, if sufficiently cultivated, can promote economic sustainability in our region.

Investing in Manufacturing Communities Partnership
The Investing in Manufacturing Communities Partnership (IMCP) was created by the US Economic Development Administration (EDA) in 2013 to “incentivize and facilitate collaboration among private and public communities” (US Economic Development Administration n.d.). The program seeks to increase the federal role in regional economic

development while still making use of local stakeholders' vision. Numerous other national agencies participate in the program and support projects, such as Department of Education, Department of Labor, Small Business Administration, and the Environmental Protection Agency by providing preferential consideration for manufacturing applications that are part of the program's national communities (US Economic Development Administration n.d.).

One interesting example from the program comes from Oregon and lower Washington State. The area, which spans 16 counties, has a strong regional economy in the timber industry and chose to focus on using innovation to meet the increased need for environmentally friendly wood products. The Pacific Northwest Manufacturing Partnership is a federally recognized IMCP region. Headed by Oregon Best, the state's primary economic development organization, the group chose cross-laminated timber to become the catalytic project that initiated the collaborative partnerships to increase the regional manufacturing workforce. (Oregon Best 2017). The partnership supported workforce development, adequate production, financial tools, and research. Parties involved with the partnership gave varying levels of financial commitments in addition to funds given by the EDA. Oregon and other IMCP regions demonstrate the importance of cultivating a region-wide approach to economic development.

The public-private partnerships fostered through the program's efforts created the necessary foundation to support nearby industrial firms. The IMCP designation helped to bolster the viability of the product and encouraged a regional investment strategy that did not rely on attracting outside firms for economic success. While the IMCP does not usually provide enough funds to be considered a comprehensive financial mechanism, the partnerships it creates sometimes provide a financial reward. By building regional economies, areas can recognize their comparative advantages, use it to invest inwardly, create successful business environments, and provide better returns to taxpayers (US Department of Commerce n.d.).

FIGURE 1: Pacific Northwest Manufacturing Partnership Strategy

TOPIC	SOLUTIONS	PARTNERSHIPS
Workforce & Training	· Change generational perception against manufacturing · Workforce development · Certification program · E-Learning	· Communities · Universities · Technical · Institutions
Supplier Networks	·Connectivity between buyers and sellers · Supply chain knowledge	· Business Oregon · Portland Development Commission · Manufacturing 21
Research & Innovation	· Sustainable architecture · Forestry · Research centers · Lab networks	· University of Oregon · Oregon State University · Accelerators · Incubators
Infrastructure & Site Development	· Repurposed lumber mills · Regional land inventory · Industrial land study · Integrated investments	· West Coast Infrastructure Exchange
Trade & Investment	· Producing locally · Exports over imports · Global trade · Foreign direct investment	· Business Oregon · Greater Portland area
Operational Improvement & Capital Access	· Lean manufacturing · Smaller companies · Startup companies · Closing capital gaps	· Oregon Growth Board

Trade Adjustment Assistance for Firms Program
The Trade Adjustment Assistance for Firms (TAAF) Program is part of the Economic Development Administration, designed to help manufacturing, production, and services businesses impacted by imports. The TAAF program connects firms with consultants, who in turn provide the firm with technical assistance and funding. The consultant can also act as a financial intermediary to find other financing sources; they apply for other federal grants or locate local investments. Administered by a national network of 11 Trade Adjustment Centers (TAACs) shown below, the program focuses on firms experiencing layoffs and decreased sales by creating a business recovery plan. (Economic Development Administration US Department of Commerce 2016).

A noteworthy example of a firm that successfully used the TAAF program is Lawrence Fabric & Metal Structures Inc., a company in Missouri that makes awnings and other metal industrial products. In 2013, the company's sales had decreased by 36%, forcing it to lay-off many workers in a two-year span. Coupled with the economic recession in 2008, Lawrence Fabric & Metal Structures Inc. was unable to compete with imported and cheaper products. The company applied to become part of their local TAAC. To begin, the TAAC applied workforce training and focused on production improvements. Next, they provided support with technological upgrades, product development, and marketing assistance. Within a couple of years, Lawrence Fabric & Metal Structures Inc. was able to use their TAAF support funds to achieve ISO certification to handle new purchasing contracts from Boeing. Their sales increased by 96% since starting the program, and their employee base grew by 68%. (Missouri Business Development Program 2013).

The TAAF program underscores the importance of investing in people to make urban industry successful.

The support of the TAAF program from the Economic Development Administration can be the difference between an American manufacturing business achieving long term or only short-term success. By providing a responsive financial mechanism to help with current trade choices, American manufacturers have a better chance to succeed by not having to worry about a main burden to competitiveness. While some industrial firms have instant viability in the current global marketplace, some require targeted support. This reliance on key relationships to build financial investments reiterates the importance of investing in people for urban industry to be successful.

New Markets Tax Credit Program
The New Markets Tax Credit (NMTC) Program is part of the Community Development Financial Institution (CDFI) Fund to help generate economic growth for distressed communities. It incentivizes investment through programs like the NMTC, which provides federal tax credits to investors. Their investment must be towards a Community Development Entity (CDE), who then in turn invests the Qualified Equity Investment (QEI) into local projects to help low income communities. Total credit ends up equaling 39% of the original investment. The NMTC program involves community stakeholders in revitalizing their own community using federal funds. This, coupled with the economic diversification that the industrial sector brings, provides a viable options for cities to consider sustainable development. For detailed information and example of this financial mechanism please see Appendix B: Financial Investment.

Lessons Learned

Investment in People
- **Creative financing:** Grant writing and collaboration between local and regional stakeholders affords greater opportunity to compete for Federal funds.
- **Focused efforts:** Economic development are most effective when addressing a community's distinct assets and challenges.
- **Industrial Revenue Bonds:** Using these bonds for infrastructure financing effectively supports investment in both people and place.
- **Collaboration:** Clear communication and ongoing planning between stakeholders, policymakers, and leaders is critical in funding infrastructure projects for urban industry.

Investment in Place
- **Collaboration:** Strong relationships between the public and private sector is critical to realize economic goals that go beyond current market demands.
- **Capacity building:** Generating capacity for local investment tools by utilizing financial intermediaries can create sustainable economic development.
- **Reaction:** Policies and reactive measures exist so businesses can meet local needs, even if they would not otherwise succeed among global competition.
- **Investment:** Purchasing habits can be a small but meaningful change for nearby entities to support the businesses they want to thrive.

FIGURE 2: Financial Mechanism Quick Reference

MECHANISM	AGENCY/ DESCRIPTION
Industrial Revenue Bonds (IRB)	For economic development from infrastructure to job creation.
Clean Energy Fund (CEF3) State Grants	For modernization of utility grids and public transportation (R&D), renewable energy systems (R&D), including solar.
Disadvantaged Business Enterprise Program	For underserved business and groups to have access to city and state contracts. Offers vast resources from financing to guidance and contract location
Career Connect Washington Grant Funding	For internships and apprenticeships (Workforce Training and Education Coordinating Board).
Investing in Manufacturing Communities Partnership	Economic Development Administration (EDA) Connects public and private entities to develop the manufacturing sector and its workforce within a region. Provides funding to initiate the partnership and help identify relevant stakeholders
Trade Adjustment Assistance for Firms	Economic Development Administration (EDA) Program that helps connect failing American manufacturing firms impacted from imports with consultation to help regain global competitiveness with no initial charge. Program funds majority of consultant help to carry out recovery plan, who can act as a financial intermediary to collect further funds.
New Markets Tax Credit Program	Community Development Financial Institution Fund (CDFI) Program to help spur investment into low income communities despite hardship. Program distributes tax credits through community development entity that ensures capital for private investors to increase willingness to invest.

When local people are involved in revitalizing their own community with the support of federal funds, cities have more viable options to enable the long-term success of sustainable industrial development.

By leveraging existing infrastructure and economic development strategies, Port of Tacoma can use the Thea Foss Waterway to support strong and lasting industry. DAVID SADDLER

INTRODUCTION

Tacoma's identity and economy have been shaped by the shipping and manufacturing industries connected with the Port of Tacoma. As indicated in previous sections, this identity is a potential asset to Tacoma's future urban industrial redevelopment. But this legacy has also taken an environmental toll over time; some of the land in the Tideflats is contaminated, under-used, or abandoned. Most areas require significant environmental cleanup before it could be used again.

The City and Port of Tacoma have significant experience with brownfield redevelopment due to the decades-long cleanup of the Foss Waterway. As evidenced by this project, remaining brownfield sites present both an opportunity and a significant challenge. However, smart growth principles encourage planners to look at a city's central core for new manufacturing and other industrial purposes to avoid urban sprawl (Green Leigh and Hoelzel 2015). Because of the challenges of brownfield remediation, financing redevelopment is often an uncertain process that requires broad stakeholder support.

This section presents a potential process to ease brownfield redevelopment in the Tideflats, as well as the financing implications of such a process. Finally, it will examine the area around the Port of Tacoma that presents the best options for industrial development.

The City and Port of Tacoma have significant experience with brownfield redevelopment due to the decades-long cleanup of the Thea Foss Waterway. WALTER SEIGMUND

BROWNFIELDS AND THEIR ROLE IN URBAN INDUSTRIAL PLANNING

While there are many successful examples of urban industrial brownfield redevelopments that support non-industrial uses, examples of renewal for continued industrial usage are less common. Cities with ports can have a particularly hard time. Efficient port operations require inland storage and handling facilities and connective infrastructure, which can create conflict with new, non-industrial usage (Hall 2016).

The Port Adelaide Waterfront in Australia and the Dublin Dockyards in Ireland serve as examples of cities that altered the character of the large brownfields in their central core. In the process, both places lost the maritime legacy that was an important part of the economic and cultural fabric (Oakley 2005; Moore 2002). As discussed in other sections, several cities, including Chicago, have encouraged residential development as a replacement for manufacturing, but tit has impacted the provision of living-wage jobs (Rast 2012).

In Tacoma, there is an opportunity to do things differently. The City has already taken steps to ensure that the Tideflats and Tacoma's shipping and manufacturing heritage not be lost by keeping a container port as one of its core policy elements (One Tacoma: Comprehensive Plan n.d.). In addition, using brownfield remediation to support small- to medium-sized enterprises (SMEs) can be a way to encourage the co-location and economic viability of continued industrial usage. Typically, cities benefit from SMEs, because these firms operate using middle-technology, rather than either emerging technologies or ones that are in decline. In addition, a critical mass of these firms can help foster innovation and market delivery (Christopherson 2012; Clark 2012).

Financing for Brownfield Remediation

All incentive mechanisms to finance brownfield remediation and redevelopment developers fall under one of two categories: direct and indirect, and come from a variety of potential sources. (See Appendix D for a summary table of funding sources.)

Direct Funding

Federal Funding

Federal funding is primarily made available through the Environmental Protection Agency and the Economic Development Administration. Funding comes in the form of grants and loans, which can be applied to the different stages of brownfield remediation and redevelopment.

Although other federal stakeholders and programs such as the Brownfield Economic Development Initiative (BEDI) and the Formerly Utilized Sites Remedial Action Program (FUSRAP) undertaken by the Army Corps of Engineers may be present during the remediation process of certain sites, the vast majority of federal brownfield assistance is provided by the EPA and EDA (Hamilton 2007).

Funding by the EPA usually is granted to sites for specific stages of remediation, such as EPA assessment and cleanup grants, whereas the EDA provides a broader scope of funding to facilitate the process of brownfield redevelopment throughout the entirety of the lifecycle of the process (Types 2018). EDA packages focus on improving site characteristics such as infrastructure and planning capacity. This includes providing funds for assessment as well as capital to complete the site's transition to a working parcel (Kukovich).

State Funding
To supplement federal direct funding, the Washington State Department of Commerce oversees the Brownfields Revolving Loan Fund, a mechanism that can provide up to $500,000 towards redevelopment. The loan is disbursed at a variable interest rate that is capped at 3% for a maximum of 5 years, under the condition that cleanup must be completed within 1 year from the start of the project (Washington State 2017).

Indirect Financing
Direct funding mechanisms are often less effective for private sector involvement, since direct incentives often do not necessarily improve the market condition for redevelopment or make remediation profitable. In contrast, indirect methods like tax credits and environmental insurance appear to encourage private sector redevelopment, serving as peripheral incentives for brownfield redevelopment in hopes to improve market conditions.

Numerous indirect fiscal mechanisms have been developed to incentivize private redevelopment of brownfields. The difficulty of these market-based policy approaches has been ensuring profitability for private developers to redevelop what are often seen as riskier sites (Eckerd 2015).

Tax Credits
The most obvious indirect incentives come in the form of direct tax credits offered by Federal and State entities. The largest of these tax-credit programs are EPA tax deductions, managed by the Department of Community Trade and Economic Development in Washington State. This tax incentive cannot be used to fund a project and only occurs once at the end of the fiscal year cleanup efforts concluded. However, tax deductions may be of limited effectiveness in incentivizing redevelopment due to the prevalent use of LLCs by developers to mitigate risk. LLCs, while effectively sheltering private entities from the often-substantial liability risk of brownfield remediation, often negate the financial benefit of a tax deduction because of the often low incomes of newly remediated properties (Hamilton 2007).

Environmental Insurance
In addition to tax benefits, the emergence of specialized environmental insurance has provided a substantial boon to developers looking to mitigate risk. Environmental insurance policies are offered for four categories: pollution, cost-cap, lender-pollution liability and finite/blended risk. These highly-tailored policies allow developers, depending on the policy negotiated, to be sheltered from uncertainty with the transfer of up to 100% of costs and liability to insurers.

While progress has been made to reduce the liability impact of the Superfund program (CERCLA) for prospective brownfield developers—notably, through the Brownfields Revitalization and Environmental Restoration Act of 2001, which served to distinguish brownfields from Superfund sites—brownfield redevelopment continues to be a challenging financial proposition. Currently, the Federal government is proposing the extension of private redevelopment liability relief to state and municipal governments that would not have been previously eligible under CERCLA to encourage governmental agents to initiate and complete remediation.

USING COMMUNITY DEVELOPMENT CORPORATIONS TO REDEVELOP BROWNFIELDS

The goal of any brownfield redevelopment is to turn city burdens into community assets. Achieving this goal reduces blight, increases economic activity, and if done well, adds to the social capital of the city. Cities that have succeeded in achieving large-scale goals have done so by utilizing community development corporations (CDCs). A well-run CDC may be the only organizational actor who can promote revitalization in heavily polluted brownfields where city governments lack the resources to do the creative financial planning, oversee developers, or the marketing of the sites to potential industrial partners. Because they are usually quasi-governmental, they can involve citizens directly, serve as a mediator between the private and public sectors, and create the network of resources necessary to look at the entire effort holistically. In addition, few governmental organizations can afford permanent in-house expertise in all the relevant skill areas required, making adequate oversight of developers and other contracted services challenging.

On the other hand, a CDC can recruit board members from city residents who remain intimately involved with the decision-making throughout the project. They can bring in experts as needed and maintain the continuity necessary for such large projects. CDCs can also support ongoing communications efforts to avoid community pushback. Given election cycles and the pressure on private entities to obtain quick economic returns on their investments, a CDC can also provide continuity for the considerable duration of brownfield development.

Building CDC capacity for industrial brownfield development has only been tried a handful of times in the United States (Solitaire & Lowrie 2012). However, CDCs have successfully achieved many other large-scale urban redevelopment goals. Ideally, creating a CDC for brownfield redevelopment would allow the City to effectively conduct citizen involvement, promote long-term project sustainability, and achieve project goals that may be otherwise challenging to accomplish.

> The goal of any brownfield redevelopment initiative is to turn city burdens into community assets.

CASE STUDY: BROWNFIELD REMEDIATION COMMUNITY DEVELOPMENT CORPORATION

PIDC
Driving growth to every corner of Philadelphia

Sixty years ago, Philadelphia created a CDC to emphasize industrial development that would meet the city's economic needs (Green Leigh and Hoelzel 2015). Called the Philadelphia Industrial Development Corporation (PIDC), it has worked to offset the loss of traditional manufacturing and other industrial activity throughout the city. It serves as a conduit for federal, state, and local grant money, brokers real-estate transactions with developers, helps locate funding for small business, and issues tax-exempt bonds through a subsidiary (PIDC 2018). Because of its efforts, Philadelphia has not seen as much decline in industrial activity as some other cities in the same timeframe. But that all changed when the Base Realignment and Closure Commission decided to close the 1,200 acre Department of Defense-owned shipyard in Philadelphia.

The Philadelphia Shipyard was the US Navy's first shipyard, and operated from 1801 to 1995 (Woodard 2016). At its peak in 1993, it employed 12,000 people – but just 2,000 workers were employed there when it closed. The PIDC assumed full ownership of the entire property from the Navy the year of its closure and began looking for ways to deal with nearly 200 years of waste, decrepit buildings, and empty housing. Today, the former naval base is home to a Norwegian shipbuilding company and a myriad of other business entities, which conduct research and development, engineering, manufacturing, and distribution (Green Leigh and Hoelzel 2015). Some companies have purchased land from the PIDC and constructed their own new, state-of-the-art complexes that provide employees spaces to work, eat, and engage in exercise. Others occupy buildings that the PIDC itself has renovated under long-term lease agreements.

By 2015, 10,000 workers were coming to the former DoD property every day (Green Leigh and Hoelzel 2015). In order to provide adequate amenities and housing for workers, the PIDC is also leading an expansion to a very large group of brownfields that borders the shipyard; however, most of these businesses support the industrial functions, and the long-term development visions do not include luxury waterfront housing. Eventually, the goal is to have a planned industrial and manufacturing center that provides employment to 30,000 people by 2025.

GIS-BASED LAND INVENTORY ANALYSIS

In order to help Tacoma better understand the scope and number of brownfields in the Tideflats, we conducted the following land inventory, which is typically part of Phase I in any brownfield remediation.

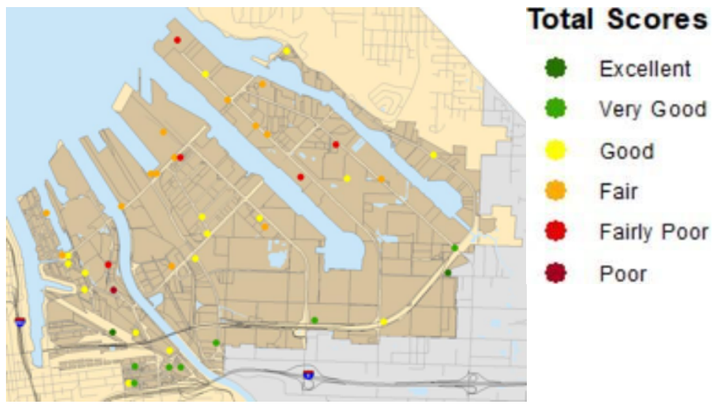
Tacoma Land-Use Inventory

We joined two data sets to analyze the brownfields: the points and parcels within the Port MIC, and the brownfields with contamination limited to the soil. This matched the parcel data to its corresponding brownfield point. We also applied the following classifications:

- Brownfield contaminant content (petroleum, metals, arsenic, lead)
- Brownfield acreage using natural breaks
- Half-mile proximity to a major road
- Land use

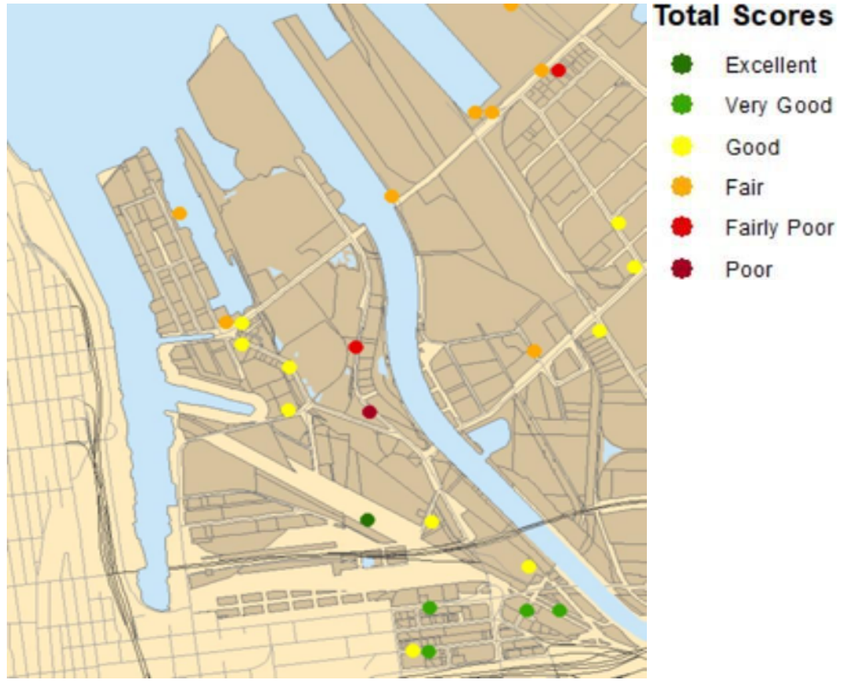
We created a scoring method to incorporate these attributes into a final analysis. We based this on the number of types of contamination, road access, and land uses most conducive to brownfield redevelopment. In this case, the lower the total score, the better the potential for redevelopment. A numerically lower scored brownfield may have fewer contaminant types, better road access, and a preferred land use. A higher scored brownfield may have a higher number of contaminant types, less access to major roads, and non-preferred land use.

FIGURE 3: Land-Inventory Analysis of Port of Tacoma



As interim regulations have taken effect in the Port of Tacoma, much focus has fallen on the side of the Port along the Thea Foss Waterway. There are no brownfields that have waterfront along the Thea Foss; however, there are brownfields on the inner portion of that area of land. The western side of the Port has a higher concentration of brownfields. This area also contains brownfields that scored poorly. There are two dark red sites along the Puyallup River. These sites are within 1.5 miles of I5. Both sites are zoned for industry or manufacturing. The smaller of the two sites is 1.75 acres and the larger of the two is 3.5 acres. Both sites are contaminated by petroleum products. The 1.75-acre site is also contaminated by arsenic and lead.

FIGURE 4: Presence of Brownfields Around Thea Foss Waterway



Lessons Learned

- **Community Development Corporations** (like PIDC) can offer a way to move lengthy, complex, or controversial brownfield remediation projects forward.
- **Direct funding** availability means that efforts for redevelopment will require the attraction of private entities to undertake brownfield projects.
- **Soil remediation** needs are more attractive, and more expedient, for private developers to redevelop compared to those with water contamination.
- **Priority brownfields** are located on the western side of the Port of Tacoma. Examining either site for redevelopment potential may prove prudent to Tacoma's planning for urban industry interests.

By combining place-based planning and already-tested best practices, Port of Tacoma can create a space fo a new wave of industry to thrive. OLICHEL

Conclusion

URBAN INDUSTRY IS DESIRABLE, VIABLE, AND FEASIBLE

There are a number of challenges facing urban industry in the United States today: viability, creativity, sustainability, and negative perceptions all work against the sector. In response to these challenges, a number of trends are emerging within urban industry: sustainable manufacturing, lean manufacturing, green ports, advocates and partnership. While the challenges facing urban industry are complex, the emerging trends within urban industry are combating these barriers. We believe that planning for urban industry in Tacoma's tideflats can promote equitable economic development, aid in the creation of sustainable cities, and maintain local identity and heritage.

Equitable Economic Development

Increasingly, economic development programs in urban places have been tailored towards promoting the creative class. However, this shift has often come at the expense of living-wage manufacturing jobs, which in turn perpetuates uneven development. By investing in workforce training, the City of Tacoma could move towards establishing a more socially inclusive economy.

Sustainable Manufacturing

As innovations in clean manufacturing and green technology increase, urban industry can contribute to a city's sustainability goals by promoting local production and ensuring that externalities are not merely shifted elsewhere. In addition, modern manufacturing requires a workforce that consists of skills, ingenuity, innovation, and experimentation.

Identity and Heritage

Creating and maintaining space for urban industry can retain the local identity or heritage of a place, and regional identity and industrial heritage influence the future development capacities of regions, promoting regional resilience. It can also build public support for urban industry by connecting it to community appreciation for a city's culture and history.

Based on the case studies and research presented throughout our sections, we believe that the City of Tacoma should create and maintain space for urban industry in the Tideflats because it is desirable, feasible, and viable.

Urban industry in Tacoma's tideflats can promote equitable economic development and create a sustainable and vibrant city. BRANDON KOCH

RECOMMENDATIONS: PRIORITIZATION, PARTNERSHIPS, AND PROTECTIVE POLICY

Our research suggests that cities—including City of Tacoma—can create and maintain space for urban industry through three mechanisms: prioritization of industry in the planning process, partnerships and collaboration, and protective policy.

Prioritization of Industry in the Planning Process

Prioritizing industry in the planning process can successfully create and maintain space for urban industry. Hall (2016) recommends that cities and ports prioritize one another in the planning process, given their mutual interests and spatial proximity. It is also important to incorporate the viewpoint of industry to better understand the complex factors that go into the selection of industrial land for business owners, such as land price, rents, availability, proximity of resource inputs, distribution networks, anchors, and markets.The viability of urban industry relies on cities to prioritize industry in the planning process.

Partnerships and Collaboration

Partnerships and collaboration between public, private, and community interests is a best practice for cities seeking to create and maintain space for urban industry. Creating formal and informal structures for this collaboration between cities, ports, industrial firms, and other major stakeholders can help to minimize conflict and rivalries and remove

barriers to implementation. This collaboration goes beyond land use regulation and includes workforce development, marketing, advocacy, branding, training, and retention services.

Coordination with communities and members of the public are also critical remove barriers to implementation of urban industry. As outlined in Chapter 2, when given the opportunity, citizens can be a resource rather than an inconvenience. Partnerships with both the public and with major stakeholders can ensure support for the success of a project during and after its completion.

Protective Policy
Protective policies can either harm or help urban industry. Evidence of the support that protective policies can give for urban industry can be seen in the One Tacoma Comprehensive Plan (2017) Policy CP-1.1, which calls on policymakers to "Prioritize, protect, and preserve existing and planned port uses." Protective policies are important for they are able to create and maintain urban industrial space in the current climate of industrial displacement. Supporting examples of protective policies in action can been seen in Chapter 5, specifically with the case study of the City of Liverpool. Examples are also seen in Chapter 4, with its discussion of green port certification policies. Both of these chapters illustrate how protective policies are used to create and maintain space for urban industry by ensuring its viability and feasibility.

IMPLEMENTATION FOR TACOMA'S TIDEFLATS

We conducted a comparative analysis with planning documents from the City of Tacoma and the Port of Tacoma. This enabled us to create three recommendations for the implementation of planning for urban industry: prioritization of industry in the planning process, partnerships and collaboration, and protective policy.

Strengths
Upon examining the protective policies in place, we concluded that they serve as a strength for Tacoma. The goals and policies listed in *One Tacoma: Comprehensive Plan* help to protect industry from a variety of potential challenges outlined previously in our research.
Recommendation: Maintain protective policies.

Opportunity for Improvement
Tacoma could stand to improve the degree to which it priorizes industy. The land-use of industry and its barriers, specifically in the port, are not clearly defined in One Tacoma: Comprehensive Plan (City of Tacoma 2017).
Recommendation: Prioritize Industry in the Planning Process

Weakness
While the City of Tacoma expresses a desire for partnership, the Port of Tacoma's Strategic Plan doesn't yet reference the city. Therefore, Tacoma should invest time in forging partnership and collaborative relationships.
Recommendation: Partnerships and Collaboration

We recognize the need for further study in these three areas and their implications in the context of Tacoma. (See Appendix E for complete chart and the different criteria used for each lesson.)

We hope the City of Tacoma will take the lessons of this report into consideration as they move forward in the Tideflats Subarea planning process. Urban industry is desirable, viable, and feasible for Tacoma and will assist in achieving its development goals and providing stability for residents in this period of rapid growth. Tacoma has shown that it already has plans in place that assist in creating and maintaining space for urban industry. With improvements in the prioritization of industry, as well as partnerships and protective policy maintenance, Tacoma can continue to be a successful case of creating and maintaining space for urban industry.

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APPENDICES

APPENDIX A: COMMENTS, GROUPS, AND CORRESPONDING NUMBERS

The following list presents the seven documents the public comments, analyzed in Section 2: Making Sense of Public Comments Regarding Urban Industry at the Port of Tacoma. Each set had a specific date or multiple dates, the number string of the comments, the total number of comments from each set, and the specific comment number.

Document, date, number string, total number of comments pulled from the document.

Doc. 47 - Variety of dates (123-147) (10 total)
123, 126, 127, 130, 133, 135, 136, 140, 144, 146

Doc. 42 - Variety of dates (148- 172) (10 total)
152, 155, 157, 158, 160, 162, 164, 167, 170, 172

Tideflats Interim Regulations - Part One (1- 172) (29 total)
3, 5, 6, 11, 15, 19, 23, 66, 69, 72, 81, 85, 86, 89, 95, 108, 110, 124, 125, 129, 136, 139, 148, 149, 150, 154, 159, 161,166

Environmental Impact Statement - January 21, 2016 (1-80) (21 total)
5, 9, 14, 15, 21, 23, 38, 39, 40, 45, 48, 51, 52, 55, 57, 58, 66, 64, 71, 76, 79

Environmental Impact Statement - February 10, 2016 (1-86) (22 total)
4, 7,10, 11, 15, 16, 19, 33, 34, 36, 44, 45, 47, 49, 57, 64, 65, 66, 69, 75, 82, 85

Tideflats Interim Regulations Part Two - September 20, 2017 (1-89) (21 total)

2, 4, 5, 8, 13, 17, 19, 29, 30, 33, 34, 37, 50, 53, 66, 70, 73, 77, 78, 82, 83

DEIS/FEIS for PSE Proposed LNG Plant - February 11, 2018 (1-27) (23 total)
1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27

APPENDIX B: FINANCIAL INVESTMENT

The table below shows the range of mechanisms that we researched that can finance urban industry.

MECHANISM	AGENCY	DESCRIPTION
Regional Innovation Strategies Program	Economic Development Administration (EDA)	Competition based program to help entrepreneurs see their projects through. Provides technical assistance to reach commercialization and direct grants to winners through the latter part of the competition in the form of a seed fund.
University Centers Economic Development Program	Economic Development Administration (EDA)	Program that helps nearby universities be part of long term economic development plans and connect other public and private organizations together. Funding comes mostly from universities who provide the technical assistance to support business ventures.
Community Development Block Grant Entitlement Program	Housing and Urban Development (HUD)	Program to help develop sustainable living environments and economic development for low income communities. Funding in the form of formula based grants that are award to cities and dispersed down to appropriate public and/or private organizations for a variety of projects.
Indian Community Development Block Grant Program	Housing and Urban Development (HUD)	Similar to general CDBG program, but allocates funds for federally recognized native tribes to received direct grants to develop their communities.
Bank Enterprise Award Program	Community Development Financial Institution Fund (CDFI)	Program that helps depository institutions develop low income and highly unemployed areas. Funding provided by awards to institutions who invest in distressed communities.

APPENDIX B: FINANCIAL INVESTMENT (CTD.)

CDFI Bond Guarantee Program	Community Development Financial Institution Fund (CDFI)	Program to provide assistance to institutions that invest directly or indirectly to economic and community development purposes. Funding provides long term capital by subsidizing federal credit.
Native American CDFI Assistance Program	Community Development Financial Institution Fund (CDFI)	Program to provide assistance to institutions that serve Native communities. Funding goes directly to provide financial and technical assistance to community development financial institutions.
Building Blocks for Sustainable Communities	Environmental Protection Agency (EPA)	Program that provides technical assistance to communities wanting to find solutions to revitalize their economies with sustainable practices. Program provides funds to the organizations/experts that provide consultation work to the community.
Environmental Justice Collaborative Problem-Solving Cooperative Agreement	Environmental Protection Agency (EPA)	Program that brings together stakeholders in promoting environmental and public health for underserved communities. Program funds its own ability to help implement model to community projects.
Environmental Justice Small Grants Program	Environmental Protection Agency (EPA)	Similar to agreement program. Funding in form of grants given to intermediaries that are part of seeing community development project through.
American Apprenticeship Initiative Grants	Department of Labor (DOL)	Helps create and expand apprenticeship programs by supporting public-private partnerships. Funds direct grants to applicants.
Industrial Assessment Centers	Department of Energy (DOE)	Program to provide technical partnerships with nearby universities to help industrial firms be more energy and productive efficient.

APPENDIX B2: FINANCIAL MECHANISMS AVAILABLE TO INVEST IN PEOPLE

FUNDING SOURCES	BRIEF DESCRIPTION	WEBSITE ADDRESS
Craft3 Fund	$25k-5 million Traditionally Underserved Entrepreneurs including indigenous, women, people of color and veteran owned business.	https://www.craft3.org/
Federal Grant Opportunities - Reconnecting America	Millions available for a variety of uses, including community planning, affordable housing finance, technical assistance, research, and capital infrastructure investments.	http://www.reconnectingamerica.org/resource-center/federal-grant-opportunities/
Port of Seattle Tax Levy	Taxes and Levies imposed On property owners in local jurisdictions. Secondary use is for infrastructure financing.	https://www.portseattle.org/About/Financial-Info/Pages/Tax_Levy.aspx
The W Fund	For start-ups out of the universities to drive the state's innovation economy and job creation.	http://www.thewfund.com/
Collateral Support Program	Offers collateral support for bridge loans that is paid off within 18 months.	http://www.commerce.wa.gov/growing-the-economy/business-loans/small-business-credit-initiative/collateral-support-program/
Disadvantaged Business Enterprise Program	For underserved business and groups to have access to city and state contracts. Offers vast resources from financing to guidance and contract location	https://www.portseattle.org/About/Organization/Pages/DBE-Program.aspx
Local Infrastructure Financing Tool Program (LIFT)	State investment in public infrastructure project and the program expires 6/30/44	http://app.leg.wa.gov/rcw/default.aspx?cite=39.102&full=true
Industrial Revenue Bonds (IRB)	For economic development from infrastructure to job creation.	http://app.leg.wa.gov/rcw/default.aspx?cite=39.84

APPENDIX B2: FINANCIAL MECHANISMS AVAILABLE TO INVEST IN PEOPLE (CTD.)

Real Estate Excise Tax - All counties eligible to levy 0.25% (REET 1), while those planning under GMA authorized an additional 0.25% (REET 2).	Tax levied on property sales. REET 1 - For Capital projects, ie. public works. REET 2 - Primarily for infrastructure projects, but may also fund some public works projects.	http://mrsc.org/getmedia/4865001b-1f63-410a-a5ed-8d1ad8d752f3/Revenue-Guide-For-Washington-Counties.pdf.aspx?ext=.pdf https://www.warealtor.org/docs/default-source/ga-resources/citizen_guide_reet.pdf?sfvrsn=4
B&O New Employee Credit - Community Empowerment Zone (CEZ) Incentive. (Applies to Tacoma Tideflats)	For manufacturing, R&D, and commercial testing facilities within CEZs. $2000 tax credit per new position, $4000 if annual wages exceed $40,000.	https://dor.wa.gov/find-taxes-rates/tax-incentives/incentive-programs
Clean Energy Fund (CEF3) State Grants	For modernization of utility grids and public transportation (R&D), renewable energy systems (R&D), including solar.	http://www.commerce.wa.gov/energy-blog/clean-energy-fund-3-program-2017-2018-capital-budget/
State Cost Recovery Program	Rebate for energy production of solar, wind, and methane.	http://makeittacoma.com/wp-content/uploads/2018/01/CED-Flexible-Incentives-Descriptions.pdf
State Sales and Use Tax Exemption	Rebate for purchases of equipment and machinery that generate renewable electricity.	http://makeittacoma.com/wp-content/uploads/2018/01/CED-Flexible-Incentives-Descriptions.pdf
Career Connect Washington Grant Funding	For internships and apprenticeships (Workforce Training and Education Coordinating Board).	http://wtb.wa.gov/Documents/CareerConnectWAfundscareerconnectedlearning.pdf
State B&O Tax Credit for Customized Training	Training allowance accessible without interest until course completion. Can claim tax credit of up to 50% of training.	http://makeittacoma.com/wp-content/uploads/2018/01/CED-Flexible-Incentives-Descriptions.pdf
Job Skills Program - State Board for Community and Technical Colleges (SBCTC)	For training new employees, retraining, or upgraded training. Provides 50% of funding.	https://www.sbctc.edu/for-employers/job-skills.aspx

APPENDIX C: NEW MARKETS TAX CREDIT PROGRAM

The New Markets Tax Credit (NMTC) Program is part of the Community Development Financial Institution (CDFI) Fund to help generate economic growth for distressed communities. It was created from the Community Renewal Tax Relief Act (2000) to help areas bounce back from disinvestments through the tax code rather than relying on grants. By incentivizing investment through programs like the NMTC, which provides federal tax credits to investors. Their investment must be towards a Community Development Entity (CDE), who then in turn invests the Qualified Equity Investment (QEI) into local projects to help low income communities. Total credit ends up equaling 39% of the original investment.

An example of the NMTC program being used for manufacturing is in Marion, IN as featured in the 50 Projects- 50 States report (2008) by the New Markets Tax Credit Coalition. Indiana has a history birthing the paper plate industry, but has seen its production leaving the area. As other production failings left the area in an economic hardship, a CDE affiliate of the Indiana Bankers Association, CBAI Community Development Inc. gave $2.4 million in NMTC to loan to a startup paper plate manufacturing company. The company, Winterfield LLC.. revitalized a 30-year vacant plate facility and purchased new equipment needed for a high-tech distribution assembly line. By 2005, over 65 jobs were created with a higher than $12 an hour compensation package, 89% of these workers being from the local community. (New Markets Tax Credit Coalition, 2008, pg 22.) The overall success of the NMTC program is impressive, with over $156 billion of economic activity generated in mostly low-income communities since the first project in 2003 to 2015, as reported by an NMTC Economic Impact Report (2017). At the time of a 2008 report for the program, it was shown that 88% of investors that were surveyed wouldn't have invested without the credit and 69% hadn't made an investment into low-income communities before.

(New Markets Tax Credit Coalition, 2008, pg 4). Involving community stakeholders in revitalizing their own community using federal funds, coupled with the economic diversification that the industrial sector brings, offers a viable option for cities to consider for development visions to be able to sustain themselves.

APPENDIX D: BROWNFIELD REMEDIATION

Methods

This analysis only includes brownfields with soil-based contamination, because remediation of ground or running water is more costly and often challenging to viably finance. Based on the research that we conducted on remediation techniques and financing, in the GIS analysis: the presence of key contaminants,1 access to a major road, size in acres, and land use. To conduct the analysis, we joined multiple sets of data to analyze these factors at the parcel level. In total, 48 brownfield parcels were analyzed based on the following points:

- We classified if each brownfield contains petroleum, metals, arsenic, lead, or other contaminants, in addition to counting how many types of contamination they have.
- The acreage of each brownfield was classified using natural breaks and putting the brownfields into five different classes.
- Each brownfield was classified on if it is within 0.5 miles of a major road, such as Interstate 5 or Highway 509.
- Each brownfield was listed with the most recent land use.

Next, we created a scoring method based on these categories. A numerically lower scored brownfield may have fewer contaminant types, better road access, and a preferred land use. A numerically higher scored brownfield may have a higher number of contaminant types, less access to major roads, and a non-preferred land use.