

Small-Scale Manufacturing & Production of Place

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Abstract

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The premise of this thesis is that small-scale manufacturing plays a critical role in revitalizing our industrial communities back into productive urban districts. This thesis explores a new phase of urban manufacturing in which city form and industry interact through the promotion of diverse manufacturing uses that are community and industry driven. I examine how planners and policy makers address industrial areas for community revitalization purposes and provide reasoning for a better expanded landscape for small-scale manufacturing uses that promote a resilient urban industrial district in Seattle's Georgetown neighborhood. This work draws lessons from case studies and design principles from current initiatives addressing Seattle's industrial districts to develop a conceptual design vision of the Georgetown campus of South Seattle College.

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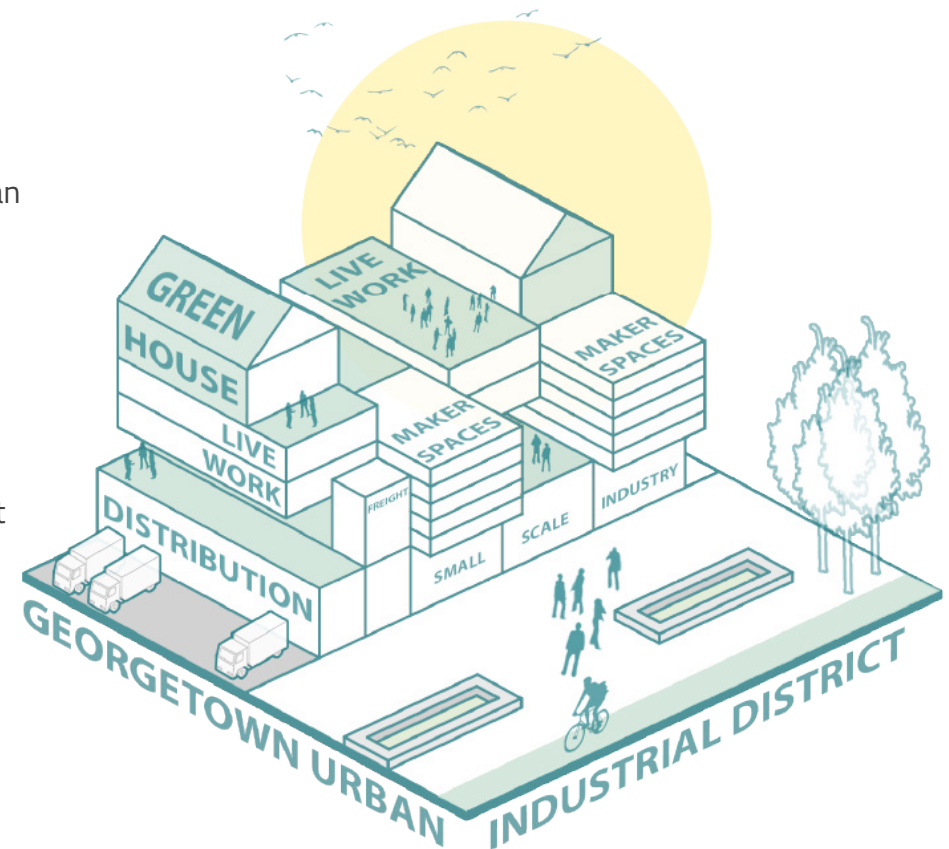
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ABSTRACT

The premise of this thesis is that small-scale manufacturing plays a critical role in revitalizing our industrial communities back into productive urban districts. This thesis explores a new phase of urban manufacturing in which city form and industry interact through the promotion of diverse manufacturing uses that are community and industry driven. I examine how planners and policy makers address industrial areas for community revitalization purposes and provide reasoning for a better expanded landscape for small-scale manufacturing uses that promote a resilient urban industrial district in Seattle's Georgetown neighborhood. This work draws lessons from case studies and design principles from current initiatives addressing Seattle's industrial districts to develop a conceptual design vision of the Georgetown campus of South Seattle College.



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INTRODUCTION

The road map for this thesis is organized into a series of chapters that will allow for a comprehensive approach in exploring the literature, research methods and design elements that inform this work. Chapter one reviews relevant literature examining the role of manufacturing in urban development since the Industrial Revolution, focusing on spatial relationships and how small-scale manufacturing is understood today. Chapter two presents successful case studies for promoting small-scale manufacturing in urban areas, leading to alternative approaches in addressing Seattle's industrial landscape. Chapter three covers Seattle's recently introduced industry and maritime strategies, entailing a series of core design principles that will help guide the application of an urban industrial district proposal. Chapter four introduces Seattle's Georgetown neighborhood and project site location which is where this work will make a case for an expanded urban industrial zone that fosters a robust district for industrial communities to pursue opportunities in small-scale manufacturing. Chapter five will unpack a future vision for what an urban industrial district in Georgetown might begin to look like including how the design proposal was influenced through the application of core design principles identified in Seattle's industrial and maritime strategy and various influences from the selected case studies. Chapter 6 will conclude this work offering reflections on how the components of this thesis have been brought together to inform a cohesive approach in addressing the critical role urban manufacturing

plays in providing a sustainable future for industrial communities such as Georgetown.

During the peak of the COVID-19 pandemic, hundreds of thousands of lives were upended, including the vast majority of businesses in the US shutting down for a series of months if not permanently. More than forty million people filed for unemployment starting in March 2020 [1]. The US economy shrank by 9.5 percent in the second quarter of 2020, the largest drop in modern record [2]. In 2023, cities are facing the difficult task of recovering from the pandemic and must explore new strategies to address the robust urban manufacturing sector. It is crucial to chart these new paths to foster high-quality job growth, boost employment rates, and safeguard industrial land uses from undesirable development. Small-scale manufacturing emerges as a multifaceted solution to these challenges, as it not only helps establish strong community bonds but also enables diverse economies of scale and contributes to local wealth development.

When exploring the dynamic relationship between cities and urban manufacturing, economic and political discourses often dominate the conversation on a nationwide or even regional scale [3]. I believe there is limited information toward the spatial implications of how cities and manufacturing interact with one another especially during the rise of small-scale manufacturing and the socio-economic benefits provided to industrial communities. Small businesses received

more attention during the COVID-19 shutdowns bringing even more focus on the important role they play in our communities. Small-scale manufacturing offers the opportunity to expand this thinking further into integrating these establishments and the benefits they provide into our communities.

The purpose of this research is to explore the spatial implications of small-scale manufacturing and its contribution to the future of resilient urban industrial districts. Taking a closer look at the spatial relationships between urban and manufacturing throughout history is crucial to understanding how development patterns of production have contributed to the evolution of manufacturing in cities. The spatial dynamics of urban and manufacturing sectors have played a significant role in shaping the social, economic, and physical landscapes of cities, influencing their growth, development, and transformation [4]. Understanding the historical spatial relationships between urban and manufacturing sectors is crucial because it provides insights into the challenges and opportunities of integrating manufacturing into modern urban contexts. By examining past spatial patterns, we can begin to recognize the importance of land use planning, zoning regulations, and urban design in creating more sustainable and inclusive manufacturing ecosystems within cities.

The rise of small-scale manufacturing, the maker movement, and the demand for locally produced goods have sparked a renaissance in urban manufacturing. The term *small-scale manufacturing*, however imperfect, is typically referred to as the production of goods on a small and localized level, typically carried out by small businesses or

individuals. This scale of manufacturing often involves the creation of products in relatively smaller quantities, often using traditional or specialized techniques [5]. Terms like *manufacturers* and *businesses* are used interchangeably throughout this thesis. While manufacturers can be private, public or non-profit, they often include typical business operations that function with their own suppliers, clients, a production space and operate with a mix of laborers and technical or administrative staff. The term *making* and *makers* are often associated with artisanal activities and the maker movement however it is used occasionally to refer to manufacturing. 9999

Understanding how small-scale manufacturing is defined today including who, what and where represent this diverse group of businesses and individuals who contribute to local economies and promote innovation will be crucial when identifying the ongoing challenges and barriers small-sale manufacturers encounter both spatially and through policy planning measures. This will include examining both physical and policy related barriers in terms of how cities are handling industrial land where manufacturers (including small-scale) tend to be located. Finally this research will advocate for the creation of small-scale manufacturing in the form of an urban industrial district while identifying potential growth strategies and directions for the advancement of contemporary manufacturing as it relates to the context of Seattle's most prevalent industrial communities.

Throughout the majority of the 19th century, small-scale manufacturing was prevalent throughout cities, towns and villages

all around the United States. For these types of manufacturers, geographical proximity and access to resources mattered most including energy sources, natural resources and access to skilled labor markets [6]. Small communities of production ultimately created a human scaled manufacturing environment that was integrated into the existing fabrics of working class communities. The integrated fabric of small-scale manufacturing during this time relied heavily on clustering near one another to share tangible materials, affordable tools and labor for small production runs.

However the landscape of urban manufacturing in the United States would change drastically in the early decades of the 20th century due to the transformation and expansion of large-scale enterprises. In the early stages of industrialization, urban factories were often located in the heart of cities, with workshops interspersed among residential areas. This close proximity allowed for efficient transportation of goods and easy access to labor. However, it also resulted in negative externalities such as pollution, overcrowding, and poor living conditions for workers [7]. Due to these nuisances, production was eventually moved out of cities to the suburbs in the urban periphery that could better accommodate large scale operations of manufacturing and that would take precedence in the United States for the next 100 years. This transition from concentrated manufacturing activity in specific districts or neighborhoods to spatially expanded factory operations on the outskirts of cities was largely due to increased competition and the globalization of production in search of cheaper goods [8]. This movement was characterized by

large-scale factories and warehouses benefiting from cheaper land and transportation links however led to the decline of traditional manufacturing districts in many cities. As manufacturing activities shifted to suburban areas or relocated overseas, vacant industrial spaces and brownfield sites were left behind in urban cores leaving many working class communities out of work [9].

The present-day landscape of urban manufacturing is marked by significant shifts in the economy and a rise in small-scale manufacturing within neighborhoods. These changes have been influenced by several factors, including advancements in technology, shifts in consumer preferences, and the reduction of barriers to entry for small-scale manufacturers. The digital age has brought about innovations such as 3D printing, computer-aided design (CAD), and automation, which have made it easier and more cost-effective for individuals and small production sectors to engage in manufacturing. These technologies have streamlined production processes, reduced the need for large-scale infrastructure, and increased the accessibility of manufacturing tools and equipment [10]. In addition, the rise of online marketplaces have provided a global reach, connecting small-scale manufacturers with a larger and more diverse customer base. This has opened up opportunities for niche and customized products, as well as fostered direct engagement between manufacturers and consumers [11]. The accessibility of e-commerce platforms has significantly reduced the barriers to entry for small-scale manufacturers, allowing them to establish their brands and sell their products without the need for physical storefronts or extensive

marketing budgets.

Many urban industrial neighborhoods have experienced a decline in traditional heavy manufacturing over the years resulting in vacant industrial spaces and job loss. Small-scale manufacturing provides a pathway to repurpose these spaces while creating employment opportunities and contributing to the local economy. Traditionally, entering the manufacturing industry required substantial capital investment, access to large-scale machinery, and extensive knowledge of supply chains [12]. However, with the advancements in technology, these barriers have been lowered for small-scale manufacturers who now can start their businesses with relatively low upfront costs, leveraging shared production spaces, utilizing on-demand manufacturing services, and accessing a wider range of customers through online engagement.

Urban manufacturing has undergone significant shifts throughout history, characterized by the reduction of traditional heavy industrial operations and the promotion of small-scale manufacturing. However this shift towards small-scale manufacturing has been hindered in recent years due to ineffective land use policies and outdated zoning codes [13]. By examining these historical trends and addressing how small-scale manufacturing is understood today, this thesis will begin to unpack the challenges associated with planning regulations that often prevent the growth of robust urban industrial districts. This will lead to the key objective of this work that will address how recently proposed industrial land use strategies in Seattle can better accommodate small-scale manufacturing through a series

of core design principles and development standards that support a predictable future for industrial communities. In addition, building a case around where exactly small-scale manufacturing can be expanded within Seattle's urban context will be revealed that will include examining an existing industrial-focused neighborhood that is already making strides toward ensuring access to necessary infrastructure and support services that encourage the growth and success of small-scale manufacturers.

To help guide this process, this thesis addresses a series of questions that will assist in building a framework around the past, present and future roles of small-scale manufacturing and the impact toward urban industrial communities.

- What are the historical and contemporary spatial relationships between city and manufacturing?
- How is small-scale manufacturing understood today, including its challenges and benefits?
- How can cities integrate small-scale manufacturing and where?

LITERATURE REVIEW

Small-scale manufacturing in its many contemporary forms has gained significant attention throughout recent years due to the impact on regenerating urban areas and redefining how industry is perceived. The following review of literature confirms that urban production and city form share a dynamic relationship including unique spatial patterns that define the layout of our cities today. In addition, the literature confirms the validity of small-scale manufacturing as a contemporary tool for revitalization of urban industrial zones that comes with its own drivers and barriers.

Historical Spatial Patterns of City + Industry

In order to begin to grasp the dynamic relationship between manufacturing activities and urban form, it is necessary to understand the social forces and theoretical planning efforts that have played a role in the proximity and morphology of manufacturing facilities over history. Experts on this topic begin by emphasizing the changing spatial patterns of manufacturing over historical time periods in cities including the Mercantile City; the Industrial City; the Garden City; and the Composite City [14]. Up until the middle 18th century the primary mode of production was artisan manufacturing within individual households forming strong networks of working-class communities that became local economic engines. Being in close proximity to one another allowed local manufacturers to exchange goods and wholesale products leading to the creation of the merchant's town that became one of the most rapidly emerging patterns of urbanization in Western

civilization. As this pattern progressed, large-scale urbanization soon spurred the Industrial Revolution leading to new technologies in transportation including the water wheel, coal fired steam power and the introduction of railways as the main source of transport [15].

The complex spatial patterns that city and industry have developed from the 1750's onward, has been identified in three phases of industry interactions [16]. The first phase between 1750-1880 can be described as an emergence of the industrial city where steam power enabled machinery led to increased production as in the case of textile manufacturing. The urban core of cities served as production hubs benefiting from diverse labor pools and transportation resources. As the basic needs of shelter, health and waste disposal were not being met, a more balanced lifestyle between living and conflicting industrial activity was necessary to prevent overcrowding and disease outbreaks. This sparked a search for a more suitable industrial city which can be characterized as the second phase taking place between 1880-1970. During this period, mill towns emerged as a prominent feature characterized by the implementation of specific zoning regulations. These regulations effectively controlled the arrangement of industrial and residential areas within the mill towns by determining the location, size, and operation of mills, as well as providing guidelines for housing and community facilities. As industrial towns continued to expand, the implementation of zoning regulations became a regular tool in managing the spatial relationship between industrial and residential

areas [17]. The push for suburban development stemmed from the desire to create healthier and more desirable living environments away from the pollution and congestion of the industrial centers. The use of these codes allowed for the designation of residential areas with restrictions on the types of manufacturing facilities that could operate nearby.

The third phase was greatly influenced by the rapid increase in industrial demand fueled by assembly line production, which led to the development of large-scale factory facilities that could no longer be accommodated within the city limits. These facilities played a significant role in environmental degradation through their emissions, waste disposal, and resource consumption. Industrial activities, such as heavy manufacturing and extraction, led to pollution of air, water, and soil, causing detrimental effects on human health and ecosystems [18]. This period is linked to the process of deindustrialization that occurred from the 1970's onward when cities were reducing investment in heavy industries and implementing stricter regulations to reduce consequences on the environment and public health. Additionally, the emergence of global trade and international competition played a role in the disinvestment of heavy industrial activity within cities. As industries sought to reduce costs and increase efficiency, they often shifted production to countries with lower labor and environmental regulations [19]. This globalization of manufacturing led to a decline in the domestic heavy industrial sector, further contributing to deindustrialization in cities. Although the reasons for this transition are numerous, large-scale manufacturing

facilities faced challenges in complying with environmental standards, and the economic benefits of outsourcing manufacturing to other regions became more attractive.

In the late 1980s, industrial activities began to undergo significant technological advancements, particularly in the realm of lean manufacturing. This systematic approach to manufacturing can be characterized as aiming to eliminate waste and maximize efficiency throughout the production process. The system emphasizes continuous improvement, employee involvement, and the elimination of non-value-added activities with the goal to create a streamlined production system that delivers products of the highest quality, in the shortest lead time, and at the lowest cost [20]. Based on principles such as just-in-time production, continuous flow, pull systems, and visual management, manufacturers began seeing significant improvements in production including reduced costs in inventory needs and enhanced productivity from employees [21]. One of the key principles of lean manufacturing is the reduction of waste, including wasted space. This led to a greater emphasis on optimizing the use of space within manufacturing operations. Manufacturers realized that large warehouses and excessive inventory were no longer essential, as improved production cycles and streamlined material flows reduced the need for expansive storage areas. This shift provided them with more flexibility in choosing locations and allowed them to better adapt to existing industrial facilities that were previously considered unsuitable for manufacturing [22].

Manufacturing Time Scales

Transitions of Industrial Fabrics

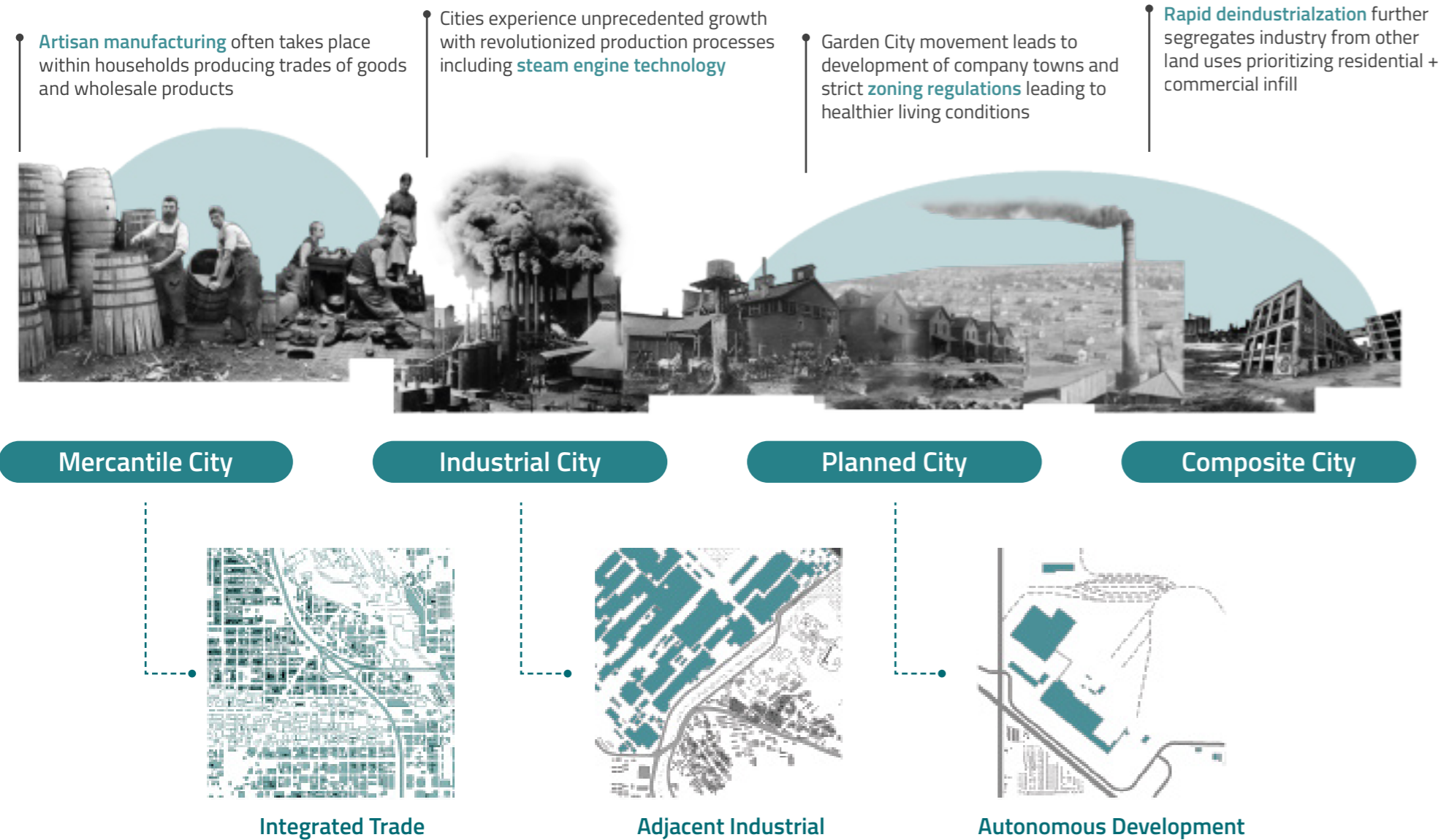


Fig 1.1
Historical Timeline Collage of Manufacturing

Emerging Trends + Challenges

Recent shifts in advanced technology and distribution systems in the 21st century have made manufacturing processes more efficient while being less of a contributor toward environmental pollution and hazard to public health. Experts on the matter go as far to mention this approach to new sustainable manufacturing will spur a demand for specialized workforces and employment opportunities that cities can capitalize on while changing perceptions toward manufacturing [23]. In addition to technological, environmental, and economic shifts, this new face of manufacturing allows more people to sell their own goods and become entrepreneurs themselves. In addition, these entrepreneurs often benefit from being in close proximity to cities similar to 19th century manufacturing. The reduced cost of production and increased accessibility to tools and resources have minimized the turnaround time for manufacturing startups, enabling them to develop into more streamlined businesses while complementing nearby neighborhoods with additional access to jobs in the manufacturing sector [24].

Although local economic development strategies include support for small business growth in the form of retail shops and professional services, small-scale manufacturing is often left out of the conversation between city officials and local economic development practitioners as viable assets for industrial redevelopment initiatives [25]. For instance, typical practices of mixed-use developments often include retail, office and residential; however rarely promote small-scale manufacturing businesses as complementary additions.

This often results in development trends that lead to the removal of valuable manufacturing space for commercial spaces that lack an affiliation to nearby industrial communities [26]. In addition, outdated industrial zoning codes often prevent small-scale manufacturing enterprises from taking advantage of vacant or underutilized spaces. These codes often have rigid restrictions and definitions that are often not aligned with the needs and characteristics of modern small-scale manufacturing. Small-scale manufacturers often seek affordable options for establishing their operations, and repurposing vacant or underutilized buildings can provide an ideal solution.

While questioning the relevance of current planning regulations that dictate land uses throughout industrial lands, new land use approaches that allow for greater flexibility must be brought to the table. One such solution could include the creation of a performance zoning approach where a manufacturing activity can be judged on suitability for its urban location on a case by case basis [27]. With this approach, urban areas that remain abandoned or under-utilized can gain attraction through small-scale manufacturing uses that help to close resource loops. Without a presence of robust industrial land, recycling programs between manufacturing firms are less incentivized, resulting in a lost economic development driver for cities to sustainability address small-scale production opportunities [28]. The status quo of allowing unaffiliated commercial land uses to accommodate industrial zones neglects the significant role urban manufacturing plays in our cities and provides little incentive to consider local industrial policies that protect a predictable future

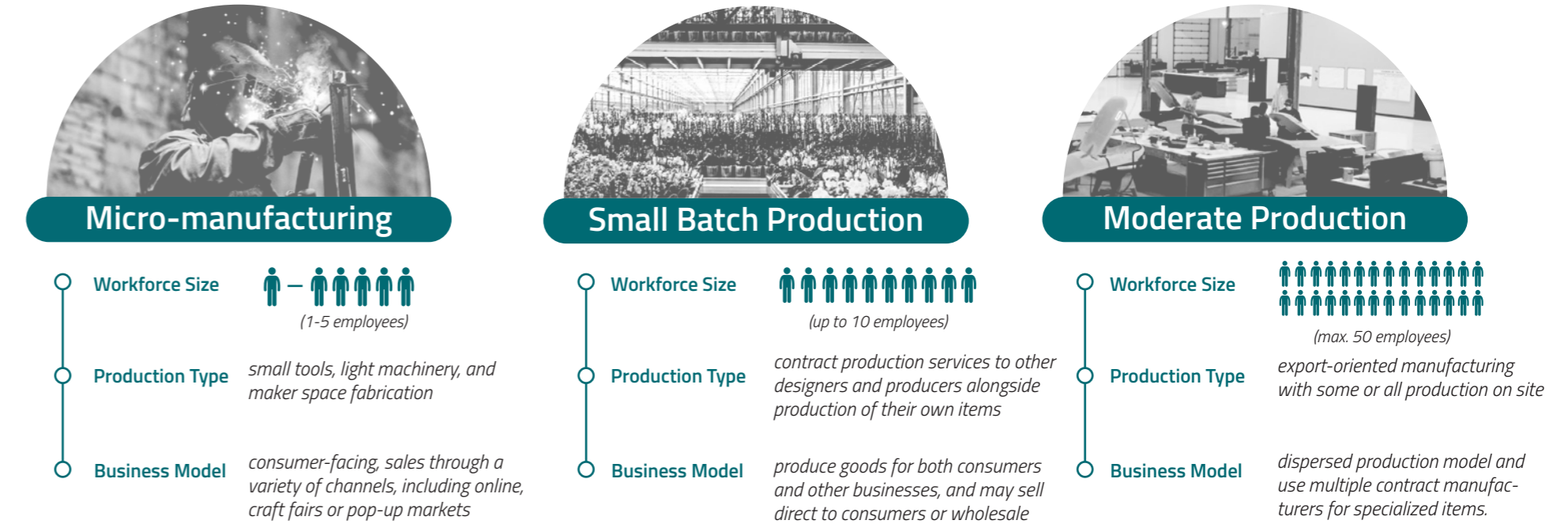
for small-scale manufacturing. Allowing manufacturers to locate in under-utilized industrial areas could partially increase the availability of affordable industrial land for urban manufacturers, as well as provide an opportunity to turn undesirable land into a more human-centered productive landscape.

Small-Scale Manufacturers: Who They Are

Modern age small-scale manufacturing is often referred to as a community of businesses creating tangible products out of almost any material. The products for these businesses vary widely ranging from technology (i.e., 3D printers), artisan made (i.e., hardware fabrication), local food production (i.e., distilleries) and many more. These small-scale enterprises include flexible operations in that they can sell products in a diversity of ways including direct to customer, wholesale retail or business-to-business supply chains [29]. Small-scale manufacturing can largely be defined in three categories based on employee size and operational footprint. The first is artisan industry or a micro-manufacturing business ranging from 1-5 employees who use small hand tools and light machinery to sell products directly to consumers through a variety of channels (i.e., online marketplaces, craft fairs, storefronts). The second are small batch production industries ranging from 6-20 employees where these particular businesses typically provide contract services to other designers in addition to producing their own items that may sell direct to consumer or wholesale. The third is moderate producing industries that are scalable businesses that typically have a maximum of 50 employees producing work ranging from textiles to hardware to food/beverage [30].

Ilana Preuss, whose organization Recast City advocates for and partners with community stakeholders to promote local manufacturing, emphasizes that each category contributes toward community revitalization efforts both economically and socially, but are often left out of local urban development strategies. While the space needed to accommodate small-scale manufacturing may vary depending on product and business model, these businesses benefit from being located near one another as well as existing neighborhood centers [31]. No matter the fit, small-scale manufacturing needs to be well integrated into community redevelopment projects, particularly through zoning reform efforts that align with modern manufacturing methods. These reforms should prioritize the adaptability of production modes and be sensitive to the unique characteristics of industrial communities.

Small-Scale Manufacturing Profiles of Contemporary Production



Types of Small Scale Manufacturing in the City

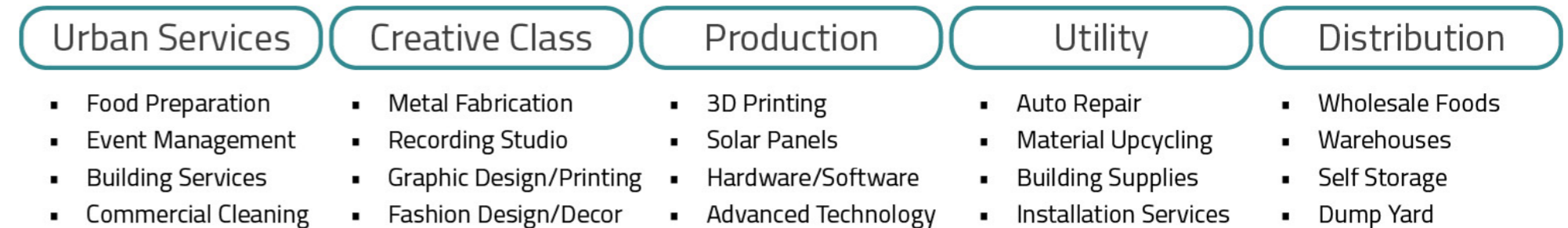


Fig 1.2 Profiles of Contemporary Production

Moving Forward: Encouraging Small-Scale Manufacturing

When contemplating the future of small-scale manufacturing, it is important to explore new approaches that promote sustainable development and preserve productive industrial land. Even in 2023, land-use and planning regulations can often act as barriers in the context of industrial zones. These regulations, which are intended to guide development, may be rigid and outdated, limiting the types of activities and flexibility of industrial operations. Obtaining permits and approvals can be complex and time-consuming, and compatibility concerns between industrial and residential areas may restrict integration. Revisiting and updating regulations, promoting flexibility, streamlining processes, encouraging multi-use developments, and providing incentives can create a more conducive environment for industrial activities. Pursuing these characteristics that align with sustainable urban industrial development should not be an either/or proposition, but rather safeguard productive urban industrial land and encourage small-scale manufacturing [32].

Although development pressures to convert industrial land to commercial mixed use and other uses persist, the recent COVID-19 pandemic has led to a call for strengthening workforces into cities. A greater diversity of small-scale manufacturing businesses were able to stay operating while others closed down due to being located near one another and relying on resources each business type provided. A diversity of manufacturing sectors means that communities are not reliant on one sector (like commercial retail) to bring in local revenue

but can be supported by other scales and types of manufacturing [33]. Industrial cities such as Seattle can begin to take advantage of this pattern of intentionally locating a diversity of manufacturing businesses near one another to encourage the convergence of users and activities to create vibrant urban industrial districts.

To foster local economic development in urban industrial areas, the City of Seattle can begin to address current land use policies that encourage the clustering of small-scale manufacturing enterprises. This process of clustering can be characterized as the intentional concentration of similar manufacturing activities within a geographical area, leading to the creation of a diverse range of industry types [34]. This clustering approach offers numerous benefits, including knowledge spillovers, increased collaboration, reduced transaction costs, and the potential for synergy among manufacturing sectors [35]. The process of clustering also promotes the diversity of industrial specializations meaning innovative manufacturing companies who operate at the intersection of advanced technology can cohabitate with more hands-on forms of manufacturing such as metal fabrication or hardware production. This concentration of diverse manufacturing activities can begin to bring a sense of continuity among small-scale manufacturers resulting in a mixed blend of production modes. The clustering approach begins to illustrate a vision in seeing how industrial cities such as Seattle can start to promote an urban synthesis between modes of manufacturing rather than traditional pathways where hierarchical relationships among industries often create conflicts between cities and manufacturing sectors. The spatial integration of

diverse modes of production can lead to the creation of robust urban industrial districts that have the opportunity to serve independent yet interspersed industrial activities. By combining forces, manufacturing sectors become capable of exerting major local economic development among industrial communities while promoting technological innovation and cultural creativity [36].

As we begin to understand the benefits among clustering diverse manufacturing sectors together, industrial cities looking to implement this approach must also consider the decision making process that manufacturers go through in deciding where to locate operations. Many factors play a role in a manufacturers' decision on where to locate production, and proximity to other related industries in urban contexts plays a major role. The speed of delivery of goods, access to transportation, availability of diverse markets and wide varieties of skilled labor pools all are factors that lead to the success or termination of manufacturing sectors [37]. However regulatory issues such as zoning allowances and land use classifications often dictate where manufacturing can be located further limiting the decision making process. For instance, local governments often adopt and legitimize holistic development standards that are meant to apply to all types of manufacturing without much room for flexibility. This results in a lack of accommodation for new modes of production types that may require revisions in land use codes in order to operate. This overarching approach in evaluating manufacturing as one distinct sector where modes of production must comply with strict guidelines takes away the potential for clustering a diverse

range of manufacturing activities around one another. Government agencies often protect themselves from taking responsibility in evaluating the value of a manufacturing sector on a case by case basis by mandating restrictive land use codes that prevent the integration and convergence of diverse production [38]. In order to recognize the full potential of the clustering approach, cities must begin to rethink how they evaluate manufacturing sectors including greater freedom in the decision making process in which enterprises are allowed to locate. Rather than having strict development standards limit these decisions, manufacturing enterprises should have the opportunity to form symbiotic relationships between residents, workers, and businesses, fostering a sense of community and supporting local economies.

Since these types of restrictive development standards shape and affect physical space, urban planners and landscape architects often find themselves actively pursuing their implementation, despite the growing acknowledgment that many of the current regulatory measures are ineffective. This act of going along with the status quo – the outdated nature of regulations – results in the failure to respond to much needed changes that can accommodate new modes of contemporary manufacturing. Although components of land use policies such as zoning classifications and building codes are implemented differently across cities, most fail to keep up with the new industrial necessities and often hinder manufacturers from locating in cities [39]. To bridge the gap between needs and regulations, industrial cities like Seattle must embrace new

approaches that support the spatial integration and clustering of diverse manufacturing sectors. By revisiting and updating industrial land use measures that promote flexibility and stream processes, cities can encourage the convergence of manufacturing activities and create robust urban industrial districts. This not only would support local economic development but also foster technological innovation and strengthen Seattle's most prevalent industrial communities. By leveraging the benefits of small-scale manufacturing and promoting the convergence of diverse production sectors, industrial cities such as Seattle can unlock the potential of industrial neighborhoods and create thriving, sustainable, and diverse districts that promote a conducive environment for communities and preserve productive industrial land.

21st Century Manufacturing Contemporary City

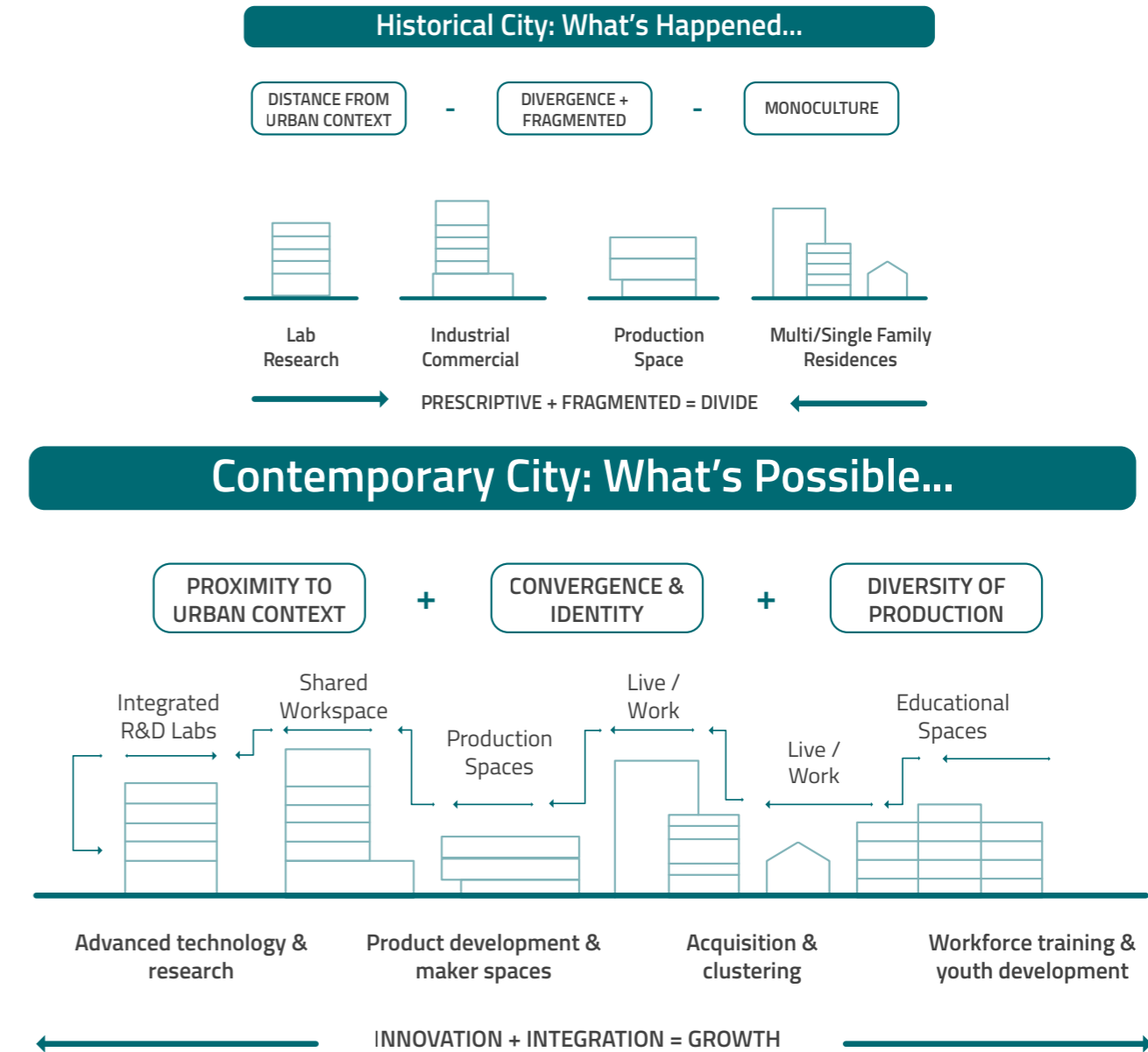


Fig 1.3
This diagram highlights the integration of manufacturing sectors demonstrating shared relationships that promote interaction among a diversity of industry types

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Fig. 2.1: The Steel Yard

Case Studies

CASE STUDIES

This chapter highlights three case studies that provide context around how cities are addressing challenges throughout urban industrial environments and respective strategies taken toward achieving success in the sustainable retainment, development and promotion of small-scale manufacturing. While each case is embedded with its own journey, they all reflect similarities related to Seattle’s current industrial landscape and share qualities that address both spatial and policy related issues centered around urban manufacturing. The case studies are divided into sections that begin with an understanding of where each is located and an introduction to the historic evolution of manufacturing that played a notable role in the cities we will examine. This is followed by a section describing certain strategies in further detail including an analysis on the urban form implications that resulted from the measures taken in each case study. Lastly, a concluding section identifies key lessons from each case that can be taken forward and applied into an urban industrial framework for Georgetown - a neighborhood in Seattle that I explore in this work.



Fig 2.2 Streetview of SE 3rd Ave in Central Eastside Industrial District



Fig 2.3 Mural in Eastern Market, Detroit



Fig 2.4 Featured open space in The Steel Yard



Fig 2.5 Downtown Eastside: Portland's Eastside Industrial District

PORTLAND: CENTRAL EASTSIDE

Introduction

In the late 20th century, the City of Portland housed a diverse range of manufacturing activities that formed the backbone of the city’s industrial sector. Heavy manufacturing, including machinery production and metal fabrication, was prevalent, contributing to the district’s industrial vitality. Woodworking shops, furniture manufacturers, and cabinet makers capitalized on the region’s timber resources. The district also hosted numerous food processing and packaging facilities, benefiting from Portland’s agricultural connections. Printing and publishing businesses thrived, catering to the local demand for newspapers, magazines, and promotional materials. Textile mills, clothing manufacturers, and garment factories were also present, adding to the district’s manufacturing diversity [1].

During the 1970’s, Portland’s traditional large-scale manufacturing facilities began migrating to areas with larger parcels



Fig 2.6 Historic image of the Italian Gardeners and Ranchers Association Market Building
The Italian Gardeners and Ranchers Association was formed at the turn-of-the-century as a cooperative marketing effort by Italian produce peddlers and truck farmers.

and easier access to the regional transportation leaving concern over the loss of Portland’s industrial job force. Recognizing the importance of a strong manufacturing base and the value of inner city industrial areas, the City of Portland created an Industrial Sanctuaries Policy. Under this policy, Portland designated key industrial areas as “ industrial sanctuaries” to encourage the growth of industrial activities in the city by preserving land for manufacturing purposes [2]. One of the primary districts for this policy was the Central Eastside District (CES), a 680-acre subdistrict of Portland’s Central City along the east bank of the Willamette River, which is zoned primarily for industrial and employment land uses [3]. Over the years, this policy has brought major success to the CES resulting in the retention of legacy manufacturing sectors while becoming attractive to other contemporary industries such as technology and industrial design focused manufacturing firms. The area’s evolution as a popular site for a variety of manufacturers can be attributed to the ongoing retention of a collection of unique historic industrial buildings that provide affordable space in a centralized location adjacent to Portland’s downtown core [4].

Retaining Industrial Zones in the Urban Context

As we become familiar with the evolution of the CES, we can begin to realize the positive outcomes that come when cities take initiative to preserve mixed industrial zones in urban contexts. While employment decreased in other Central City areas throughout Portland during the economic downturn in the late 20th century, the CES district flourished in large part due to a growing presence of both old and new traded sector industries in the city [5]. A key

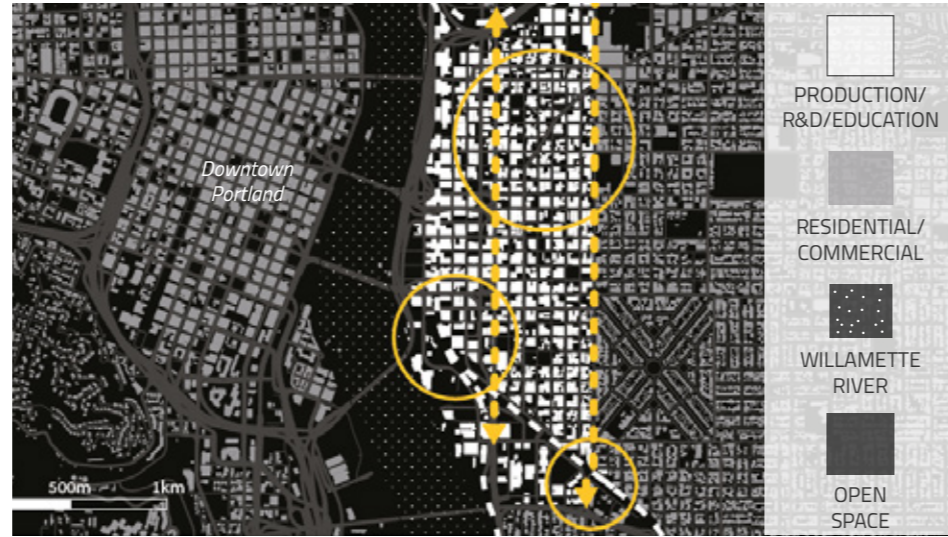


Fig 2.7 Enhancing an existing urban fabric: Central Eastside (Portland)



Fig 2.8 Aerial view of the Central Eastside District

component to take forward from the Industrial Sanctuaries Policy that was instrumental to the ongoing success of the CES was the particular focus on evaluating the existing zoning measures in the district overtime. The policy acknowledged that the industrial land in the Central Eastside was in danger of being repurposed by commercial and office development and aimed to keep land prices lower for manufacturing sectors by limiting speculative pressures from non-industrial uses [6]. The policy implemented multiple sub districts within the CES area which were perceived as having distinct development patterns and needs that reflected the policy’s designation to protect existing uses that supported manufacturing (Fig. 2.9). Through this condition non-industrial uses were subject to a special conditional use review to ensure that there is a steady supply of affordable space for a diversity of industrial incubators and small-scale manufacturing enterprises.

With the growing changes in industrial production and pressure for new types of development, it is crucial for cities to revisit policies in order to address any discrepancies that have developed through its implementation. In Portland’s case, the Industrial Sanctuaries Policy has received modifications since the early 2000’s to create more flexibility by allowing an even greater diversity of businesses that support manufacturing sectors such as digital production and printing, affiliated retail, and gallery art spaces. By relaxing the industrial requirements for manufacturing sectors to locate in the CES district, a series of coding categories were adopted into the existing policy to aid in the spatial arrangement and organization of newly integrated uses.

These codes served as zoning classifications that included categories such as general industrial, heavy industrial, employment, commercial mixed-use with employment, and/or residential and urban parks [7]. As a result, the area saw an increase in restaurants, high-end retail, and knowledge-based businesses that live alongside successful manufacturing sectors creating a diverse industrial community. Although the policy continues to receive updates to control conflicts between legacy industrial spaces and new additions of businesses, the critical takeaway from Portland’s Industrial Sanctuaries Policy is the need to continuously amend restrictions and allow for the changing nature of some industries, while providing a policy framework that will protect and maintain those legacy industrial spaces that are still viable and thriving.



Fig 2.9 Central Eastside Sub District Map

Urban Form Implications

In addition to the policy measures that took place in the CES district, the Industrial Sanctuaries Policy resulted in an improved urban form within the area. While incorporating architectural diversity and open spaces that connect the strong network of manufacturing sectors, the CES encompasses a mix of industrial buildings, warehouses, and adaptive reuse projects that showcase a range of architectural styles. One notable aspect of the district's urban form is the presence of historic brick buildings, which contribute to its character and charm. These buildings often feature large windows, exposed brickwork, and industrial details, reflecting the district's industrial heritage (Fig. 2.11). Additionally, there are contemporary architectural interventions that blend seamlessly with the existing fabric, promoting a harmonious coexistence of old and new. Open spaces also play a crucial role in connecting the manufacturing sectors within the district. For instance, the district is intersected by the Willamette River, which provides a scenic waterfront area that can be utilized for recreational activities and community gatherings. Parks and public plazas are strategically integrated, offering opportunities for events and social interaction among manufacturing sectors. These open spaces serve as catalysts for collaboration and innovation, creating a sense of place and fostering a vibrant atmosphere that promotes knowledge sharing among industries [8].

Overall, the district's urban form highlights the importance of walkability and connectivity that support the successful integration of manufacturing activities. Pedestrian-friendly streets, wide sidewalks,



Fig 2.10
The low-key but enterprising scene is typical of the Central Eastside, where about 1,100 increasingly busy businesses keep more than 17,000 Portlanders employed.

and designated bike lanes facilitate movement within the district and encourage alternative modes of transportation. Additionally, the presence of mixed-use developments and live-work spaces allows for a seamless integration of manufacturing activities and residential or commercial uses, promoting a vibrant and dynamic environment.

Taking Lessons Forward

Throughout this case study review, we have learned how cities can begin to take effective action in the preservation of industrial land and sustainable promotion of strong manufacturing sectors in urban contexts. In the case of Portland's Central Eastside District, the area felt development pressure after the migration of large-scale manufacturing facilities led to concern over the district's industrial job base leading the City of Portland to take a stance to retain the existing industrial fabric of the neighborhood. By implementing effective policy measures, such as the designation of "industrial sanctuaries", other industrial cities such as Seattle can begin to understand how to effectively use zoning classifications as a primary tool to integrate a diverse range of manufacturing sectors. In addition, the CES case study reminds us that cities must always revisit the relevance of industrial land use policies to ensure they are up-to-date with modern manufacturing trends while also protecting existing industrial activity. By paying attention to the ongoing needs of manufacturing sectors in the CES, Portland maintained updates to its Industrial Sanctuaries Policy that resulted in old and new industries blending with new businesses. Cities like Seattle can adopt similar measures when proposing new approaches to preserve and promote manufacturing activity within industrial communities.

As this thesis progresses, we can take key lessons forward from the CES case study that fit into the industrial landscape of Seattle's Georgetown neighborhood. Although many successful strategies were demonstrated in Portland's Central Eastside District, the major



Fig 2.11
Historical building feature large windows, exposed brickwork, and industrial details, reflecting the district's industrial heritage



Fig 2.12
Typical alley way in Central Eastside showcasing manufacturing distribution sectors

implications we can apply to Georgetown revolve around industrial land use policy and revisiting how the City of Seattle is taking initiative to safeguard and preserve industrial areas. By designating specific areas, such as Georgetown, as urban industrial zones and implementing protective measures, Seattle can ensure industrial communities retain existing industrial sectors and attract new manufacturing activities. This includes revisiting Seattle's industrial land use policies to identify discrepancies that may spark unwanted development pressures while addressing the evolving needs of contemporary manufacturing to ensure their relevance in urban contexts. Additionally, Seattle can encourage the clustering of small-scale manufacturing enterprises within the industrial Georgetown neighborhood. This approach proved worthwhile for Portland as a diversity of old and new manufacturing sectors flourished when concentrated next to one another in the CES district, promoting collaboration, knowledge sharing, and synergy among different industry types. Seattle can facilitate the creation of vibrant urban industrial districts that represent flexible and adaptive approaches that promote the spatial integration of both old and new modes of production with emerging technologies and industry supporting businesses.



Fig 2.13 Eastern Market Future Master Plan

DETROIT: EASTERN MARKET

Introduction

The Eastern Market Neighborhood, located in the eastern part of downtown Detroit, Michigan, holds a significant place in the city's history. Dating back to the 19th century when it was established as a central market hub known as Cadillac Square (Fig. 2.14), the market served as a bustling gathering place for local farmers, merchants, and residents, facilitating the exchange of goods and fostering a sense of community [9]. As Detroit experienced rapid industrialization and urban growth in the late 19th and early 20th centuries, the Eastern Market Neighborhood underwent a transformative evolution. The neighborhood's strategic location, situated close to major transportation networks such as rail lines and shipping routes, attracted manufacturing enterprises to set up shop in the area. The proximity to raw materials and efficient distribution channels further contributed to the growth of industrial activities

within the neighborhood. With the rise of the automobile industry in Detroit, the Eastern Market Neighborhood became a focal point for manufacturing, especially in sectors related to automotive production and components. The neighborhood's industrial landscape expanded rapidly, accommodating factories, warehouses, and workshops that played a vital role in Detroit's emergence as the "Motor City" and a global manufacturing center.

In the late 20th century, as Detroit faced major deindustrialization and population decline, the Eastern Market was able to maintain a diverse network of vendors, suppliers, and merchants. Due to the market's strategic location, supportive infrastructure such as highways, rail lines, and the nearby Detroit River served as transportation networks that facilitated the movement of goods and materials playing a crucial role in helping manufacturing

businesses continue their operations despite the challenges of deindustrialization [10]. As the market continues to thrive as a vibrant hub for both food and manufacturing industries, the Eastern Market Neighborhood itself has become a renowned destination for incoming residents and workforce housing opportunities. As the City of Detroit is acknowledging this trend, additional challenges are brought to the table in finding a balance between accommodating existing industrial activity and providing a density of mixed uses that promote a safe pedestrian environment.



Fig 2.14 The downtown market in 1890 on the site that's now Cadillac Square

Finding the Balance: Connecting Industrial Fabrics

The makeup of the Eastern Market consists of a unique blend of historic buildings alongside large-scale food production facilities. Although these spaces are still active and contribute to the industrial character of the neighborhood, the City of Detroit felt constrained

with the upgrading and expansion of the distribution businesses they house [11]. As an industrial environment, the market needed to balance the needs of various stakeholders while ensuring efficient and secure operations within the neighborhood. The market's industrial nature meant that priority was often given to vehicular traffic, leaving pedestrians and residents with limited or unsafe transitions from industrial activity to nearby neighborhoods. This posed a significant risk to the safety and mobility of non-motorized users, hindering accessibility and discouraging active transportation within the Eastern Market neighborhood. Connectivity was another key challenge surrounding the market further conflicting the coexistence of pedestrians, cyclists, and freight truck logistics. The Eastern Market's industrial setting included segments of large, scattered warehouse buildings and sprawling industrial lots, resulting in fragmented spaces and disconnected blocks making it difficult to create a cohesive and integrated pedestrian and cyclist network. Without proper connectivity, the market lacked a sense of continuity, making it less appealing and convenient for pedestrians and cyclists to navigate the area.

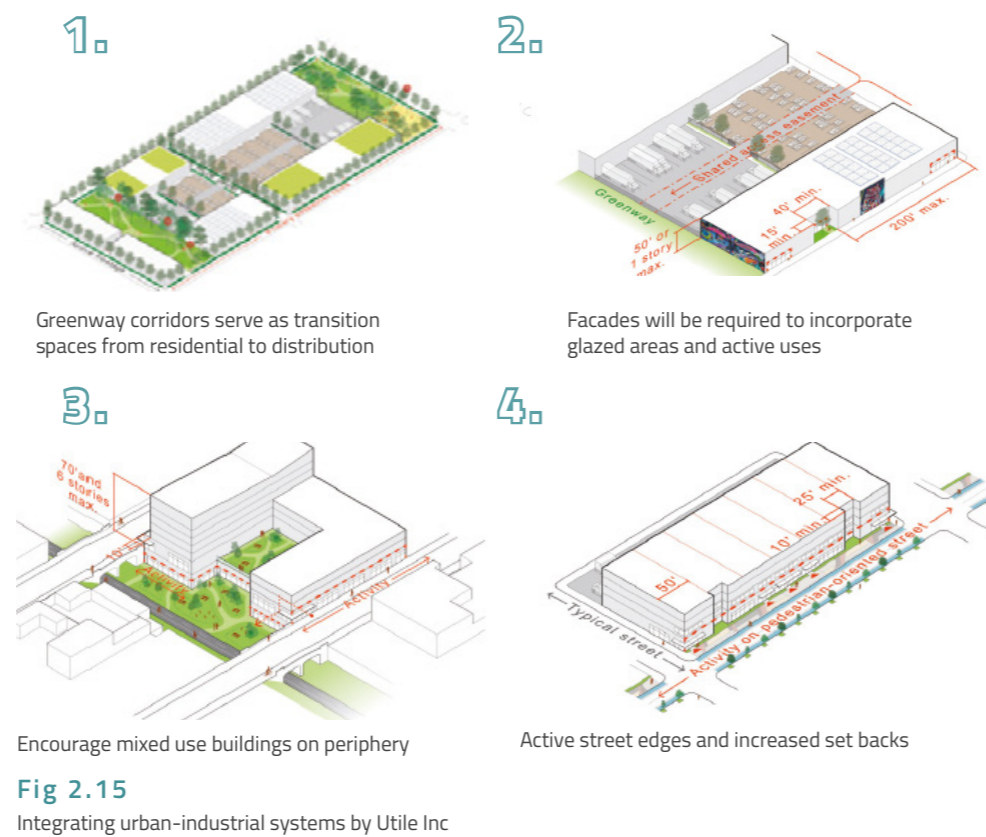
In 2018, to ensure a safer future for the efficient flow of goods while maintaining a pedestrian and mobility-friendly environment, the City of Detroit partnered with Utile Inc, a Boston based design firm, to collaborate on a plan that would chart a vision for the future growth and integration of manufacturing-based businesses and incoming mixed-use projects [12]. Although still ongoing, the team has worked with the community to help guide the expansion of local industry while

exploring streetscape improvements and ecological design strategies.

The City of Detroit projects a surplus of future development will bring increased stormwater runoff into the area's already overburdened sewer infrastructure. To mitigate these negative effects, the project team proposed a design that carefully accounted for planned trucking routes, while introducing a green ecological buffering system. The plan calls for new businesses and manufacturing facilities to be interwoven with greenways that, together with live/work buildings at the edges of the expansion area, buffer any industrial operations from the adjacent residential neighborhoods (Fig. 2.15). The proposal seeks to implement design guidelines to help ensure the future neighborhood creates a human-scale, active street edge that provides opportunities for urban greenways, enhanced plantings, and increased circulation. To take advantage of proximity to future greenways, the plan calls for dense, mixed-use housing developments along these corridors to promote active edges and community interaction throughout the neighborhood.

Urban Form Implications

The urban form of the Eastern Market neighborhood in Detroit is characterized by a unique blend of historic architecture showcasing a rich mix of styles, ranging from late 19th-century brick warehouses and industrial buildings to more contemporary structures. The historic buildings, with their distinctive facades and ornate detailing, reflect the neighborhood's industrial past and add a sense of character and authenticity to the area (Fig. 2.17). Adaptive reuse of these buildings has become a prominent feature, with many being transformed into



lofts, artist studios, galleries, and retail spaces. The Eastern Market itself features open spaces that are integral in providing gathering areas, public markets, and venues for community events. The market includes sheds which serve as open-air marketplaces, creating a vibrant and bustling atmosphere where farmers, artisans, and merchants come together to sell their goods (Fig. 2.16). The sheds also serve as iconic landmarks that define the neighborhood's identity.

While the expansion plan proposed by the City of Detroit

and Utile Inc is still being finalized, the neighborhood surrounding the market hopes to take urban design guidelines forward that would emphasize the importance of promoting enhanced circulation networks and improved mobility around the market district. These guidelines recognize the value in creating healthy transitions for nearby residents that live adjacent to active industrial sectors and hope to seamlessly connect the neighborhood while encouraging exploration. The integration of green stormwater infrastructure in the form of greenways and pedestrian-friendly streetscapes will allow for safe transitions through the neighborhood while promoting ecological design strategies such as permeable paving, bioswales, and rain gardens. These features not only manage future stormwater runoff but would also reduce the neighborhood's environmental impact.

Overall, the historical urban form of the Eastern Market neighborhood features a mix of historical and contemporary buildings that accommodate ongoing manufacturing activity as well as a steady supply of mixed-use developments. As the future of the market district unfolds, the City of Detroit is taking initiative to address conflicts that hinder connectivity among manufacturing activity and surrounding residential areas. This approach by Detroit shines light around the importance of ensuring healthy transitions within industrial communities and begins to lay a roadmap for how other industrial cities can start to revisit connectivity issues in their own industrial areas. In addition, the Eastern Market case study provides reasoning in addressing other aspects such as urban design initiatives which can positively impact the ongoing success of manufacturing. By focusing

on how logistics of industrial operations might impact the walkability or pedestrian experience of a neighborhood, cities can be proactive in taking measures to improve safety and healthier lifestyles among residents in industrial communities.



Fig 2.17
The Eastern Market serves as an iconic landmark that defines the neighborhood's identity featuring year-round markets and industrial activity

Taking Lessons Forward

The approach taken by the City of Detroit to address the future growth of the Eastern Market serves as a valuable lesson for Seattle's Georgetown neighborhood, as both are facing the challenge of balancing manufacturing activity with the needs of industrial communities. Detroit's Eastern Market took a step in the right direction by addressing issues related to pedestrian safety, mobility, and lack of infrastructure that provided healthy transitions for residents living adjacent to industrial activity. By examining the measures taken by Eastern Market, Seattle can gain insights into fostering a supportive environment for manufacturing while prioritizing public realm enhancements in neighborhoods that surround industrial activity. The Eastern Market neighborhood faced connectivity challenges due to fragmented spaces and disconnected blocks within its industrial setting. Seattle's Georgetown neighborhood shares similar characteristics including residential areas being directly adjacent to heavy manufacturing facilities creating unpleasant environments to navigate. By considering the circulation needs that improve the public realm experience in addition to the circulation needs of surrounding industries, Georgetown can start implementing urban design guidelines that emphasize enhanced circulation. After learning from the Eastern Market's success, the City of Seattle can take initiative in creating healthy transitions between manufacturing activity and industrial communities in the Georgetown neighborhood. Enhancing pedestrian safety, improving mobility infrastructure, and prioritizing a safer public realm are crucial first steps. By implementing

design features that promote improved circulation such as urban greenways and green stormwater infrastructure, Seattle's Georgetown neighborhood can strike a balance between supporting manufacturing activity and ensuring the well-being of industrial communities.

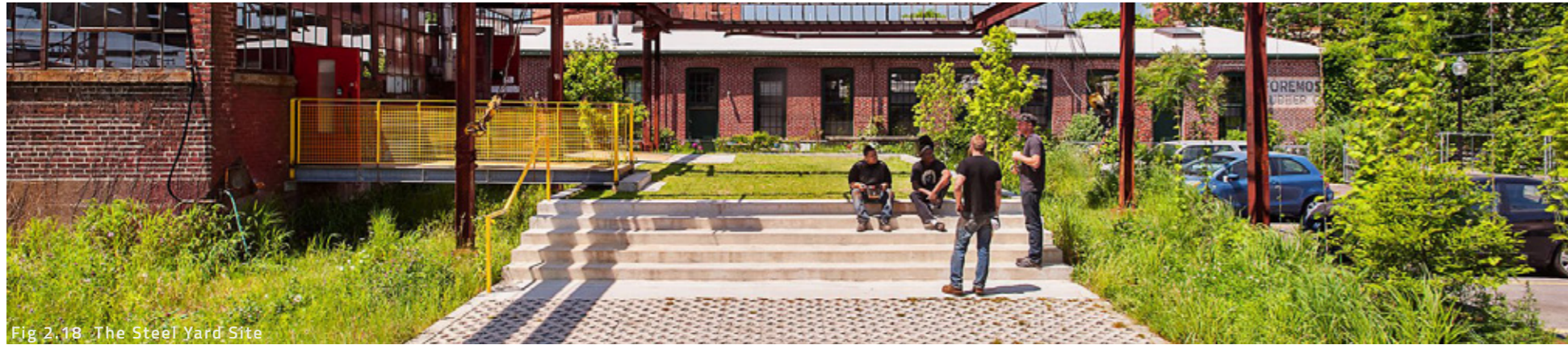


Fig 2.18 The Steel Yard Site

PROVIDENCE: THE STEEL YARD

Introduction

The Steel Yard, located in Providence, Rhode Island, stands as a remarkable case study of an industrial site with historic significance and a transformative evolution into a community gathering space. Founded in 2002 on the former site of Providence Steel and Iron Company (PS&I), the design of this former brownfield site embraces the property's urban industrial history while incorporating innovative approaches to promote continued education in manufacturing among industrial communities [13]. In the 1890's, the City of Providence became an early adopter of electric power resulting in the PS&I complex using electrically driven movable cranes and hoists to manage heavy materials and parts in their fabrication and assembly process. This led to technological innovations in steel manufacturing resulting in increased output of large industrial products such as bridges, trusses, girders, stairs, fences, railings, and grillwork. After serving

as a manufacturing powerhouse for over a century, the PS&I complex closed in 2001 (Fig. 2.19).

In 2002, two local artists and entrepreneurs from Brown University purchased the property but were met with additional challenges in addressing the site's toxic environmental legacy. As part of their operations, PS&I sprayed lead-based paint onto steel beams resulting in elevated lead levels in the soil. In 2007 the Steel Yard began a brownfield cleanup in compliance with the Environmental Protection Agency (EPA) that involved a careful process of removing, containing and rigorously testing soils to determine the extent of lead contamination and develop an effective remediation strategy [14]. Upon a successful clean up, the new owners started to recognize the potential of the Steel Yard as a valuable community cooperative space that could breathe new life into the industrial landscape after facing

challenges of abandonment and neglect over the years. The vision of the site was to create a space that not only celebrated the site's historical significance but also provide a platform for education and collaboration among the surrounding industrial neighborhood.



Fig 2.19 Providence Steel and Iron Company (PS&I) upon closing in 2001

Promoting Industrial Education and Community Engagement

Through collaborative efforts involving community organizations, artists, educators, and local stakeholders, the Steel Yard was repurposed into a vibrant community gathering space. The site serves as a hub for creative and educational activities centered around the arts and manufacturing offering workshops, classes, and apprenticeships that empower individuals with practical skills in metalworking, ceramics, and other crafts [15]. The Steel Yard's

transformation goes beyond providing a space for continued education in manufacturing and artistic pursuits as it has become a catalyst for local economic and community development, offering opportunities for individuals to learn, create, and collaborate. By offering accessible and affordable programs, the Steel Yard promotes inclusivity and bridges the gap between industrial heritage and contemporary creative practices. The site also acts as a catalyst for social cohesion and interaction hosting a vast array of events, exhibitions, and public gatherings, bringing together diverse individuals and fostering a sense of belonging [16]. Through its initiatives, the Steel Yard strengthens the connection between the site and the surrounding neighborhoods, promoting a shared understanding and appreciation of Providence's industrial history.



Fig 2.20 Students participating in The Steel Yard's Public Projects program that promotes community-based public art while borrowing from the tradition of guild apprenticeship.

Urban Form Implications

The Steel Yard, situated on a historic industrial site, showcases a mix of industrial buildings, workshops, and artist studios. The architecture within the site embraces the industrial heritage of the area while incorporating contemporary design elements. Many of the buildings feature a combination of brick and steel construction, with large windows that allow ample natural light to penetrate the spaces (Fig. 2.21). This architectural blend creates a visually engaging environment that celebrates the site's industrial roots while accommodating modern manufacturing activities. In addition, open spaces play a vital role in connecting the manufacturing sectors within the Steel Yard. The site boasts expansive outdoor areas that serve as collaborative zones, event venues, and exhibition spaces. These open spaces, including courtyards and plazas, provide opportunities for artisans, craftsmen, and manufacturers to interact, share ideas, and showcase their work (Fig. 2.22). The Steel Yard's emphasis on creating communal spaces encourages a sense of community and fosters collaboration among the different sectors operating within the site.

Furthermore, the Steel Yard's urban form emphasizes the importance of sustainability and ecological design. The site incorporates sustainable practices such as rainwater harvesting and green infrastructure through a series of moats that direct stormwater into a bioswale that captures, stores and filters water before it percolates into the soil [17]. These elements not only contribute to the overall aesthetic appeal of the site but also promote environmental stewardship toward a site that has overcome significant challenges

in ensuring the safety of the site and its surrounding community. In terms of land use, the Steel Yard serves as a dedicated industrial space that prioritizes manufacturing and creative enterprises. The site's protective zoning measures ensure the preservation of industrial land and prevent incompatible uses from encroaching on the manufacturing sectors [18]. This approach supports the growth and sustainability of the manufacturing community within the Steel Yard, fostering a conducive environment for small-scale manufacturing businesses to thrive.



Fig 2.21

The Steel Yard features the preservation of historical brick buildings and retains existing gantry cranes onsite that are integrated into the landscape also defining edges.



Fig 2.22

Elevated central carpet, bridges across the moat and permeable pavers – raised beds to capture stormwater

Taking Lessons Forward

Seattle's Georgetown neighborhood can draw inspiration from the Steel Yard's journey and implement similar measures to increase education and employment among manufacturing sectors and industrial communities. Georgetown, with its own rich industrial history, has the potential to transform underutilized areas into a vibrant hub for creative and educational activities that celebrate its heritage while fostering economic growth and community engagement. Georgetown has the opportunity to build upon the historic significance of its industrial landscape and embrace the unique character that manufacturing brings to the neighborhood. By preserving and repurposing existing industrial spaces, the neighborhood can create a similar cooperative model for education, collaboration, and innovation. Like the Steel Yard, Georgetown can repurpose vacant or underutilized industrial land and integrate workshops, studios, and educational spaces for manufacturing-related activities.

To promote education, Georgetown can establish partnerships with local schools, community colleges, and trade organizations to develop programs that provide practical training and apprenticeships in manufacturing disciplines. Much like the collaboration between the Steel Yard and Brown University, these programs should be accessible and affordable, ensuring that individuals from diverse backgrounds can participate and acquire valuable skills for employment in the manufacturing sector. By offering a range of classes, workshops, and apprenticeships, Georgetown can empower its residents with

the knowledge and expertise needed to thrive in the evolving manufacturing landscape. As this thesis continues, we will examine how Georgetown can embrace an urban industrial district that includes the establishment of community hubs and makerspaces that provide shared resources and equipment for local manufacturers, artisans, and students. These shared spaces would facilitate collaboration, knowledge exchange, and the development of new ideas and products making the Georgetown urban industrial district a gathering "co-op" inspired space for workshops, lectures, and community events that promote the exchange of skills, ideas, and experiences.



Fig 2.23

Open spaces provide event space for artisans, craftsmen, and manufacturers to interact, share ideas, and showcase their work



Fig 2.24

A trained crew participates in the annual Iron Pour event at the Steel Yard featuring the power of a custom-built iron tilt-furnace that pours more than 2,000 pounds of luminous, molten iron.

Case Study Chapter Conclusion

The case studies of Portland’s Central Eastside (CES), Detroit’s Eastern Market, and the Steel Yard provide valuable insights into how cities are embracing small-scale manufacturing and integrating sustainable practices that promote a more predictable environment for industrial communities. These case studies emphasize the importance of retaining industrial land within urban contexts, enhancing the public realm surrounding industrial activity, and promoting increased education within manufacturing sectors. By taking key lessons forward from each case study, we can start to make a case for how Seattle’s Georgetown neighborhood can implement a robust urban industrial district that embraces new approaches in industrial land use, urban form, and workforce development. By adopting flexible and adaptive approaches that promote the spatial integration of old and new modes of production, Georgetown can expand its rich industrial fabric through the promotion of a vibrant and inclusive industrial community that thrives in an urban context.

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Fig. 3.1: Puget Sound with City of Seattle in background

Seattle Industrial & Maritime Strategy

Seattle's industrial and maritime policies are more than 35-years old, and during that time, the trends and technologies impacting industrial and maritime users have experienced significant change. To reflect those changes, this chapter will first provide context around Seattle's most prevalent industrial areas and the crucial role they play in providing long-term predictability to stakeholders that rely on their continued investment. By highlighting recent challenges and land use discrepancies, we will learn how Seattle is looking to position industrial areas to respond competitively to new processes and practices through newly proposed industrial land use concepts.

Seattle's Industrial Landscape

The majority of industrial land in Seattle is located within two Manufacturing Industrial Centers (MIC). Seattle's Greater Duwamish Manufacturing and Industrial Center (MIC) and the Ballard Interbay Northend Manufacturing Industrial Center (BINMIC) contain about 12 percent of Seattle's total land area. MICs are characterized as components of regional and statewide supply chains and are home to the city's thriving industrial businesses [1]. Seattle's industrial areas employment is about 100,000, representing roughly 15% of total employment in the City. Historically, Seattle's industrial lands have captured about 6-11% of the city's employment growth. Seattle's industrial area employment grew at a compound annual rate of about 1.6% between 2010 and 2018 with some sectors like food-and beverage production growing even faster. While maritime and logistics had slow and steady growth, only the aerospace manufacturing sectors saw minor declines [2].

Seattle currently has four industrial zoning designations spread across its two major industrial centers in the Duwamish and Interbay/ Ballard. The current zoning regulations, although intended to support various scales of industry, are described in a loose, broad-ranged manner, leading to unregulated land uses in inappropriate zones and exploitation of loopholes in the land use code. This not only disrupts the consistency of industrial development patterns but also results in the emergence of unaffiliated commercial and retail activities, which contradict shared city-wide goals to strengthen protections for industrial lands. To address these conflicts, the City of Seattle recently proposed strategies to include the establishment of an updated industrial land use framework that provides clear intent and rationale for new industrial zoning classifications. Although still in development and yet to be adopted, the City of Seattle hopes to aim these strategies toward preserving its valuable industrial land and ensure the long-term viability and sustainability of its industrial sectors.

Since 2019, the City of Seattle has started to engage a broad range of industrial neighborhood subareas and a diverse range of stakeholders including maritime and industrial businesses, labor, residents of adjacent neighborhoods, developers, a City Council member, and industry groups. The stakeholder group is focused on providing equitable access to workforce housing, affordable small-industrial workspaces, increased entrepreneurship and reinforcing mixes of activities at the transitions between industrial areas and residential neighborhoods. After years of deliberation the stakeholder group came to a general consensus toward recommending a series

of early land use strategies that would strengthen protections around industrial land while encouraging the development of modern manufacturing sectors. These strategies would foster increased employment and entrepreneurship opportunities with a vibrant mix of affordable, small-scale places for light industry, maker spaces, creative arts, as well as industry supporting ancillary retail.

After engaging in further dialogue and reaching a consensus, the stakeholder group focused on determining the appropriate spatial implementation of these strategies within existing industrial lands and identifying the most effective approach to concentrate investments in key locations. In March 2023, the stakeholder group released a new land use proposal that provided guidance for the strategies based on specific conditions suitable for increased investment. The proposal recognized the importance of generating a significant number of living wage jobs from industrial lands and emphasized that the city's overall approach to industrial land should prioritize employment-dense zones. These zones would cater to emerging industries that require greater flexibility in manufacturing activities and employ more compact operations compared to traditional industrial practices. Furthermore, the proposal recommended directing investment strategies towards areas at the intersection of industrial zones and adjacent residential neighborhoods. This approach aimed to support the development of healthy industrial communities, reduce environmental impact, and minimize conflicts with heavy industry.

In general, the Maritime, Manufacturing and Logistics (MML) Zone would consolidate the existing Industrial General 1 (IG1) and

Industrial General 2 (IG2) zones that currently hold over 80% of industrial land uses in the city, this would afford industrial activity in this zone stronger protections to support clustering industries and legacy heavy manufacturing sectors. In the majority of cases, the Industry and Innovation (II) Zone would replace the existing Industrial Commercial (IC) zone and in some cases portions of the Industrial Buffer (IB) zone. This zone would be intended to leverage major investments in transit to create high density employment and transit oriented industrial nodes. The zone would encourage multi-story buildings with a greater mix of production and office uses than traditional industrial operations while implementing an incentive structure to ensure employment-dense development. Key locations for this zone would be placed within a half-mile of transit stations with limited parking available.

This thesis centers on the Urban Industrial (UI) zone that looks to replace the existing Industrial Buffer (IB) zone and portions of Industrial Commercial (IC) zones. This zone would prioritize neighborhoods near industrial areas, such as in Georgetown, that experience negative impacts from industrial activities given their immediate proximity than other neighborhoods do. The goals of this zone resemble the idea that improved transitions between residential areas and industrial areas are necessary to building an equitable balance in supporting industrial communities while simultaneously maintaining investment in Seattle's highly valued small-scale manufacturing sector. The Urban Industrial zone begins to pivot away from a mindset of buffering or separation and towards an integrated

Seattle's Proposed New Industrial Zones

The three proposed industrial zoning designations brought forward by the City of Seattle stakeholder group acknowledge the changing needs of industry and realize how crucial retaining employment is within industrial lands. Most notably, the new zones are established to respect existing legacy industries while opening opportunities for new modes of manufacturing at various scales that require different space needs.

PROPOSED LAND USE CONCEPTS

Maritime Manufacturing and Logistics (MML)

Function and Purpose:

The purpose of the MML zone is to strengthen land use protections for core legacy industrial and maritime areas to prevent encroachment by unwanted development. This zone is particularly applicable near the shoreline or deep-water port, rail and freight infrastructure, and around existing clusters of industrial or maritime suppliers and services.

Industry and Innovation (II)

Function and Purpose:

The purpose of the II zone is to encourage new development in multi-story buildings that accommodate industrial businesses mixed with other high density employment uses such as research + development, advanced technology and office space that supports design. Modern industrial development would support high-density employment near Sound Transit light rail stations and commercial areas.

Urban Industrial Zone (UI)

Function and Purpose:

The purpose of the UI zone is to foster increased employment and entrepreneurship opportunities with a vibrant mix of affordable, small-scale spaces for light industry, maker spaces and creative arts that can be supported with ancillary retail and industry-supportive housing creating integrated neighborhoods and healthier transitions along the edges of industrial and adjacent residential areas.

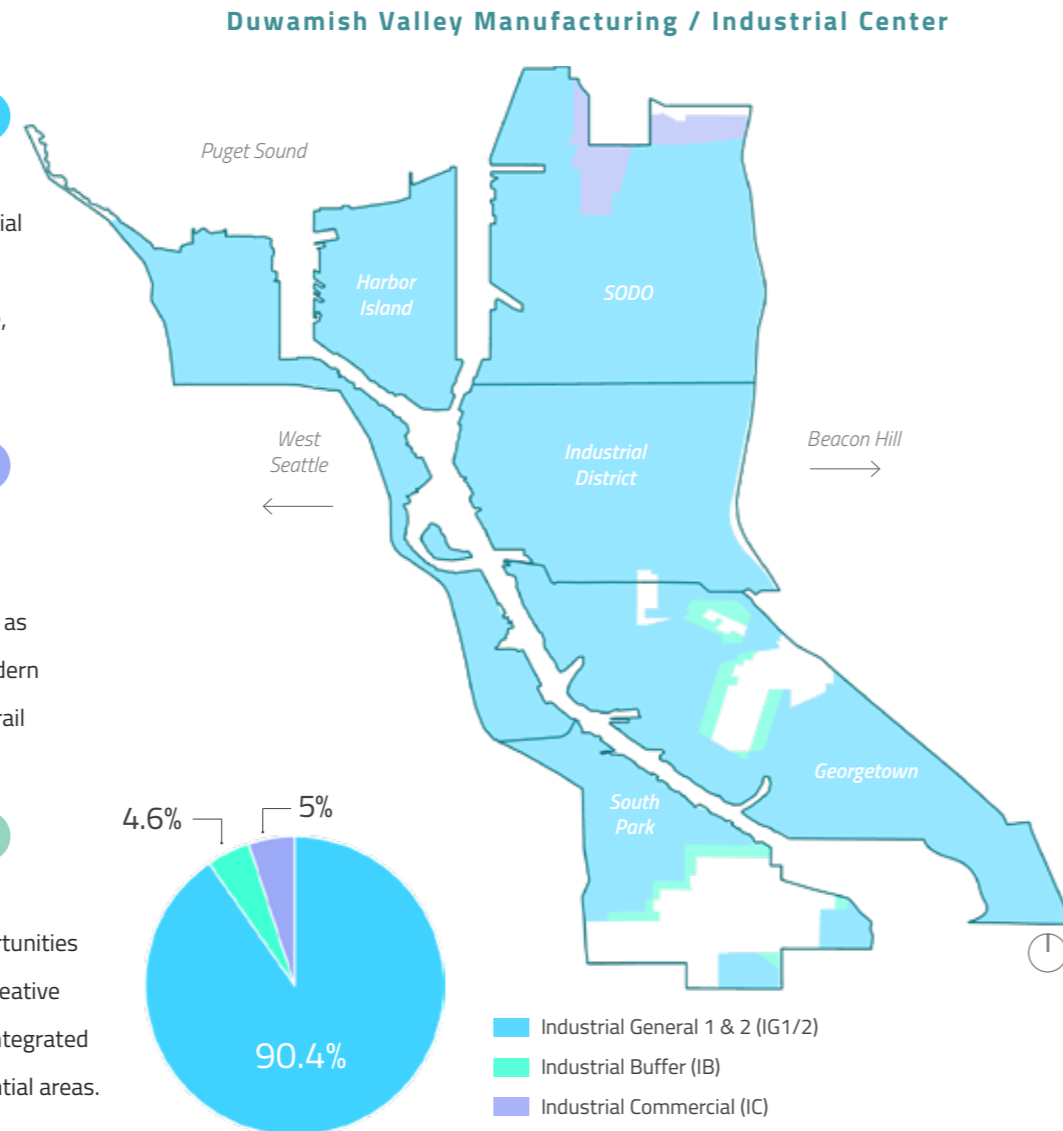


Fig 3.2
Map of the Duwamish Valley Manufacturing/Industrial Center featuring designated industrial zoning areas

relationship at the transition between neighborhoods and industrial areas.

In addition to prioritizing neighborhoods near industrial activity, the Urban Industrial Zone (UI) recognizes these areas have seen an increase in investment from adjacent neighborhoods in the form of new businesses that resemble the character of the neighborhood and draw interest from nearby residents. Establishing a designated industrial zone that supports opportunities such as small-scale manufacturing, entrepreneurship and artistry can create seamless transitional areas that are compatible with relevant industrial activity and speak to the interests of the adjacent neighborhoods.

Addressing the Buffer

PROPOSED URBAN INDUSTRIAL ZONE

The proposed Urban Industrial Zone intends to replace existing Industrial Buffer Zones that are currently outlined in the city's industrial land use code. According to the code, these buffer zones are intended to serve as a safeguard around residential communities resembling a pedestrian character offering an appropriate transition. However these zones often take shape as vacant land or storage yards serving heavy industrial needs resulting in an unpleasant environment for adjacent communities. A major Industrial Buffer Zone can be found in the heart of Georgetown that surrounds the neighborhood's primary residential area consisting of single-family homes and multi-dwelling units. The western portion of the buffer zone consists of South Seattle College's Georgetown Campus on the south side with publicly-owned transportation storage yards in the north. The eastern portion of the buffer zone is dominated by Boeing Airfield's storage yards and distribution network. Other active industrial buildings are present as well including automotive operations, commercial warehouses and public utility services. The map displays existing land use parcels currently in the industrial buffer zone that sit near or adjacent to the site outlined in purple, South Seattle College Georgetown Campus (Fig. 3.3)

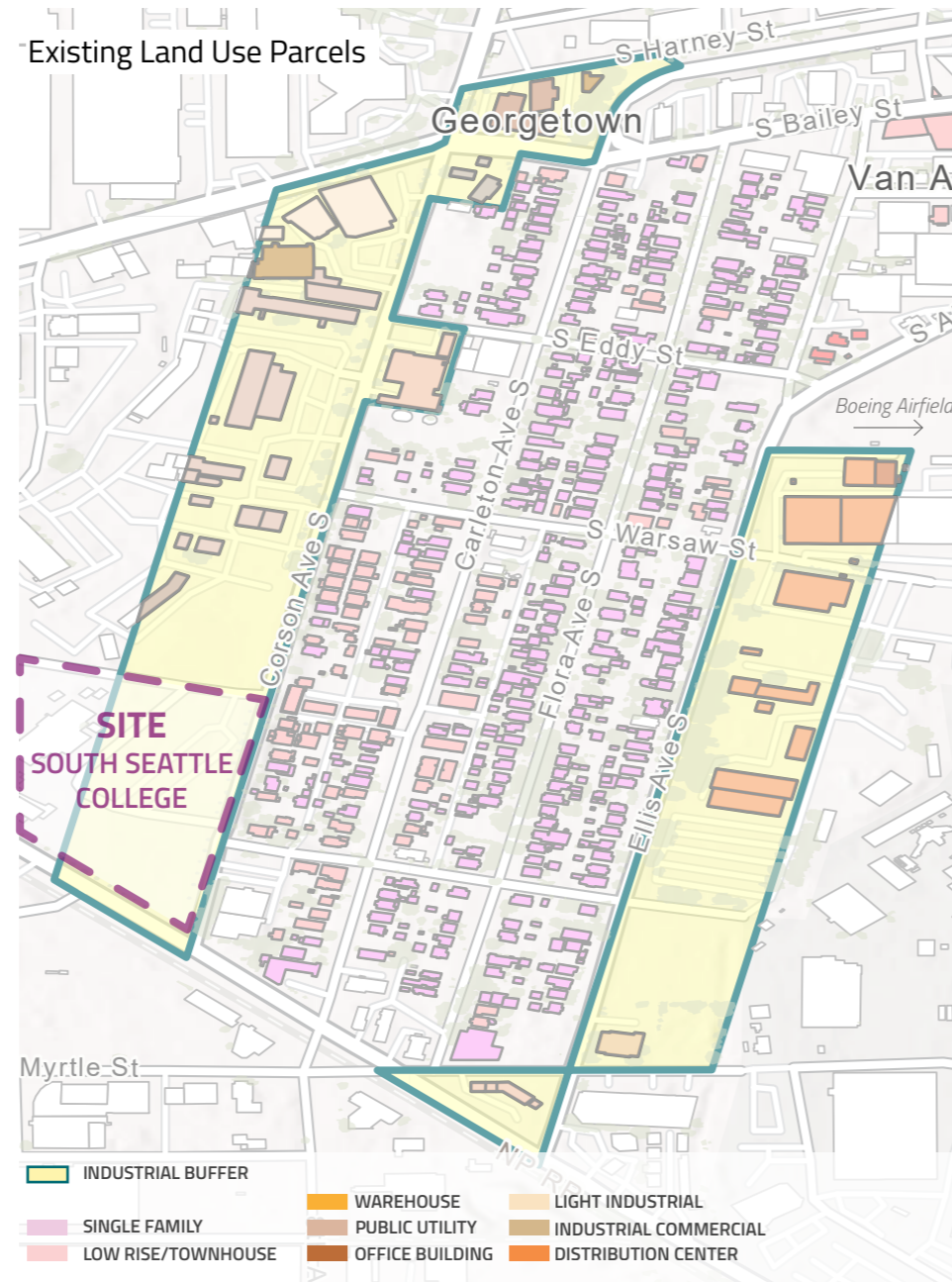


Fig 3.3
Map of the current Industrial Buffer Zone in the Georgetown neighborhood featuring existing land use parcels

Addressing the Buffer

PROPOSED URBAN INDUSTRIAL ZONE

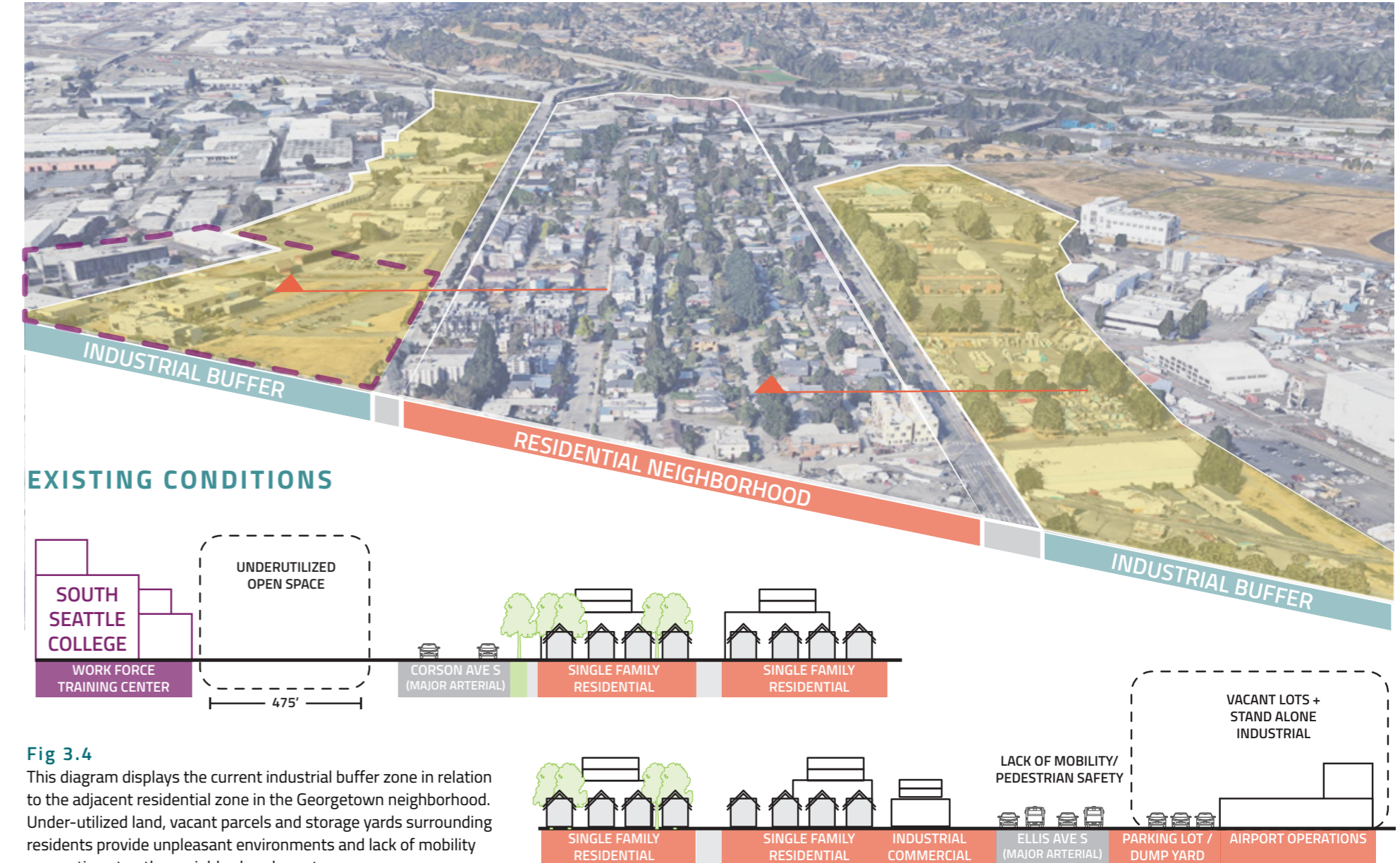


Fig 3.4
This diagram displays the current industrial buffer zone in relation to the adjacent residential zone in the Georgetown neighborhood. Under-utilized land, vacant parcels and storage yards surrounding residents provide unpleasant environments and lack of mobility connections to other neighborhood assets.

Urban Industrial Zone

CORE DESIGN PRINCIPLES

As part of the proposal, the City of Seattle stakeholder group has identified potential development standards that would further characterize the Urban Industrial Zone. These key development standards that are specific to this zone are expanded upon below and will serve as core design principles for how the site design component of this thesis will begin to unfold. While the City of Seattle stakeholder group intends to revisit these standards, it is important for this thesis work to move this momentum forward and provide a vision to support how this particular zone can be brought to life through intentional design and planning mechanisms.

1. Small-Scale Industrial Spaces

Affordable spaces for small-scale manufacturers, entrepreneurs and artists are scarce. The UI zone would provide districts characterized by a range of multi-use buildings with maker spaces and small manufacturing businesses where entrepreneurs, artists and students could design, prototype and manufacture products. These spaces would feature open floor plans and flexible layouts to accommodate a range of production needs and allow for collaboration and experimentation. In addition, these spaces would have supporting ancillary uses that are directly tied with the production happening onsite. Examples include breweries or metal fabrication shops which conduct industrial processes on site but also have tasting rooms or art galleries that are important components of their business.

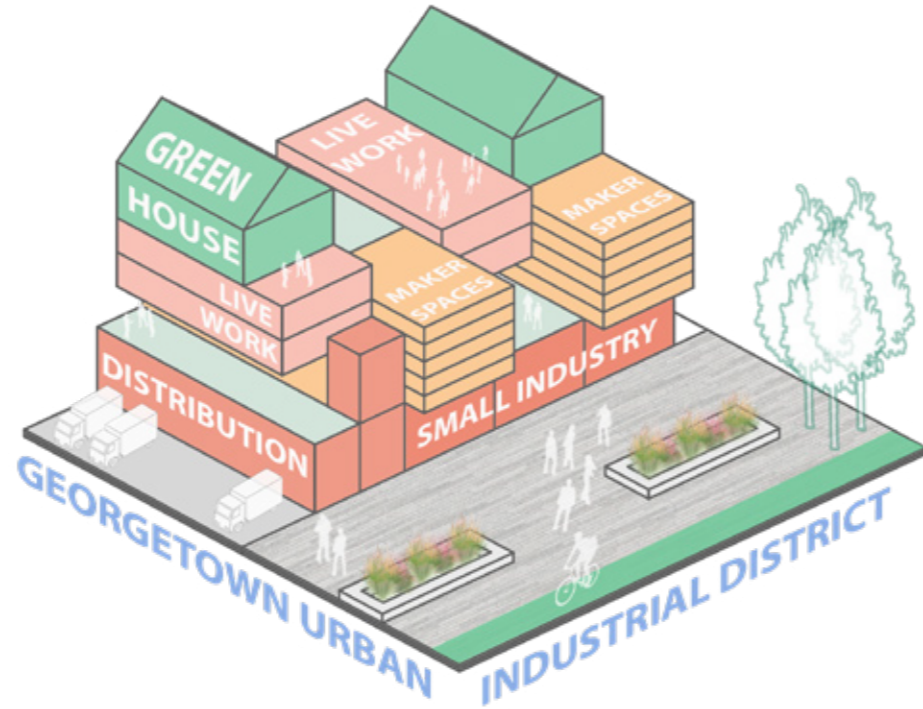


Fig 3.5
Georgetown Urban Industrial District conceptual diagram

2. Affordable Workforce Housing

Entrepreneurs and small manufacturers struggle to find affordable homes near their jobs. To accommodate this need the UI zone would allow restrictive live/work housing meant for residents who directly work or own a small-scale manufacturing business on the same site. The workforce housing would honor affordable rents for a period of 75 years to occupants making below 60% of the median income as well as be available to students completing nearby apprenticeship or vocational programs at local industrial focused institutions. With the cost of living in Seattle being among the highest

Urban Industrial Zone

CORE DESIGN PRINCIPLES

in the country, providing affordable workforce housing allows workers to live closer to their place of employment, reduce commute times and cost, and help support the local manufacturing sector. Furthermore, the Georgetown neighborhood can also retain its diverse character and ensure that workers from a range of socioeconomic backgrounds have access to the same opportunities.

3. Increased Education, Employment & Entrepreneurship

In recent years, there has been a growing interest in the development of small-scale manufacturing and maker spaces in Georgetown, with a focus on promoting local entrepreneurship and job creation. The Georgetown campus of South Seattle College has played an important role in this effort, offering training programs and apprenticeships that are closely tied to the needs of the local manufacturing sector. The UI zone looks to develop around already existing industrial institutions in order to provide a pipeline of trained workers for local manufacturing businesses. Through its vocational programs, the South Seattle College Georgetown campus provides students with the skills and knowledge needed to succeed in the manufacturing industry, including hands-on experience with the latest tools and technologies. As a result, local businesses can rely on the campus to provide a steady stream of skilled workers, helping to support the growth and sustainability of the local manufacturing sector.

4. Improved Pedestrian Transitions

The UI zone is expected to see a greater mix of freight and pedestrian activity. For this reason, key development standards point to providing full street improvements that are similar to existing urban villages. These improvements would include new and improved construction of curbs and sidewalks and mobility focused bike lanes and greenways. These improvements are intended to minimize conflicts between freight and pedestrian movement while providing new modes of mobility that would work to develop a street type that reflects a solution for the current relationship nearby communities have with surrounding industrial activity. In addition, enhanced landscape requirements will improve the transition from core industrial areas to nonindustrial areas. New requirements would expand existing street tree requirements and offer the potential for community greenways that support walkability and mobility as well as assist stormwater mitigation efforts. Applying green factor requirements to future projects such as green roofs, vegetated walls/fences and rainwater capture are other goals outlined that would help soften or screen outdoor storage areas.

In summary, Seattle’s vision for an Urban Industrial (UI) zone begins to align with the core design principles that address scarcity of affordable small-scale industrial spaces, the need for affordable workforce housing, the importance of increased education, employment, and entrepreneurship, and the implementation of improved pedestrian transitions.

As the City of Seattle stakeholder group continues the development of the proposal, we can begin to draw inspiration from Portland’s Central Eastside, Detroit’s Eastern Market, and Providence’s Steel Yard which provide tangible examples and practical strategies that can shape Seattle’s industrial landscape into a thriving, innovative, and sustainable hub for creativity, entrepreneurship, and economic growth. For instance, in the Portland Central Eastside, the emphasis on integrating new industrial land use policies to retain legacy industries while creating affordable spaces for small-scale manufacturers, entrepreneurs, and artists resonates with Seattle’s goal of addressing the scarcity of such spaces. Seattle can draw inspiration from Portland’s industrial sanctuary policy and begin to identify specific areas that already have thriving manufacturing sectors while making room for multi-use buildings with maker spaces and small manufacturing businesses that foster collaboration, experimentation, and product development. By implementing similar initiatives, Seattle can support the growth of its local creative and manufacturing sectors while nurturing innovation from existing industries.

Similarly, Detroit’s Eastern Market offers valuable lessons in improving pedestrian transitions and the integration of urban green buffers to enhance overall circulation and safety within communities that live and work around heavy industrial activity. In addition, Seattle’s plan to incorporate live/work housing within the urban industrial zone aligns with Detroit’s efforts to accommodate workers in close proximity to their jobs. Seattle can learn from Detroit’s success in maintaining affordable housing near newly enhanced pedestrian corridors, thereby ensuring a safe environment for a diverse workforce and vibrant industrial community. Furthermore, the case study of Providence’s Steel Yard showcases the importance of fostering increased education, employment, and entrepreneurship. Seattle can draw inspiration from the Steel Yard’s focus on developing around existing industrial institutions and creating a pipeline of trained workers for local manufacturing businesses. Seattle’s collaboration with educational institutions, can mirror the Steel Yard’s success in offering vocational programs and apprenticeships that align with the needs of the local manufacturing sector. By providing students with hands-on experience and equipping them with the necessary skills, Seattle can ensure a skilled workforce that supports the growth and sustainability of its industrial community.

Endnotes

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2. Seattle Industrial & Maritime Strategy, Director’s Report and Recommendation, March 2023



Neighborhood + Site

Fig. 4.1: Aerial view of South Seattle College's Georgetown Campus

As Seattle advances its proposal for new industrial land use concepts, it is crucial to identify potential locations where the application of an Urban Industrial (UI) zone can effectively take place. This chapter aims to introduce the Georgetown neighborhood as a promising and suitable location to lay the groundwork for a thriving urban industrial district. Georgetown's unique characteristics make it a viable choice for implementing the core design principles that drive this vision. Additionally, South Seattle College's Georgetown campus emerges as a compelling site with a rich history of promoting education in diverse manufacturing sectors. This campus presents a compelling case for spearheading the implementation of the proposed urban industrial district. By exploring the potential of Georgetown and the college campus, we can unlock the region's potential for fostering innovation, education, and economic growth within a well-defined urban industrial framework.

Georgetown Neighborhood: A History of Making

Seattle's Georgetown neighborhood is located within the traditional territory of the Duwamish Tribe, who have lived in the Duwamish River valley for thousands of years. The Duwamish people have a rich cultural history and strong ties to the land, including the area that is now Georgetown. The Duwamish people were the original stewards of the land and waterways in the area, with a deep understanding of the natural resources and ecology of the region. They relied on the river and surrounding forests for food, shelter, and medicine, and maintained a sustainable way of life that was in harmony with the natural world [1]. However, the arrival of European

settlers in the mid-19th century brought significant changes to the region, including the displacement and marginalization of the Duwamish people. The Treaty of Point Elliott in 1855 forced the Duwamish people to cede their land to the US government, and many were forcibly relocated to reservations.

The Georgetown neighborhood became a haven for industrial and manufacturing activity that dates back to the early 20th century. Named by white settlers in 1851, Georgetown was primarily an agricultural community until the arrival of the Seattle and Walla Walla Railroad in 1878. This provided a crucial connection to the port of Seattle, which spurred the growth of industrial and manufacturing businesses in the area. One of the earliest and most significant industries in Georgetown was the brewing industry. In 1890, the Seattle Brewing and Malting Company opened a large brewery in the area, which became one of the largest employers in the neighborhood. The brewery produced popular brands such as Rainier and Lucky Lager, and continued to operate until it was purchased by the Pabst Brewing Company in 1985 [2].



Fig 4.2
Historical image of Rainier Brewery, 1886

During World War II, Georgetown emerged as a vital contributor to the war effort, witnessing a significant transformation in its industrial landscape. Numerous businesses in the area redirected their operations to support military endeavors, with notable contributions from Boeing, which established a substantial aircraft manufacturing plant in the neighborhood. Alongside Boeing, numerous other enterprises dedicated their resources to producing materials and equipment for the war. In the post-war era, Georgetown sustained its status as a thriving manufacturing hub, accommodating a diverse range of industries such as steel mills, machine shops, and furniture

manufacturers [3]. However, as the economy gradually shifted towards service-based sectors and technology-driven enterprises, many of these traditional manufacturing businesses experienced a decline or chose to relocate to more suitable locations.

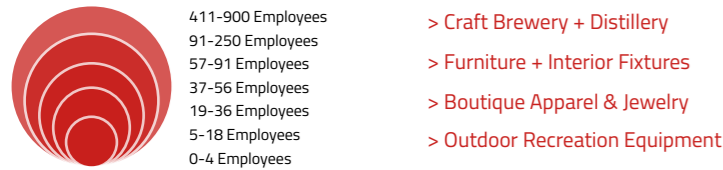


Fig 4.3
Looking south toward Boeing Airfield through much of Georgetown in the 1940's before the Seattle-Tacoma freeway (I-5) was built.

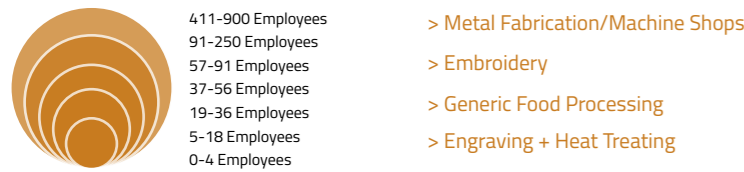
Georgetown Production: Industrial Segments

Over the years the Georgetown neighborhood has become home to a diverse range of manufacturing sectors that represent both old and new forms of production. The neighborhood's industrial landscape reflects its historical significance of transportation and warehousing activities while also serving as a hub for small-scale manufacturing and trade. Within the local manufacturing sector in Georgetown, fabricated metal production is a prominent industry, encompassing the production of various metal goods such as

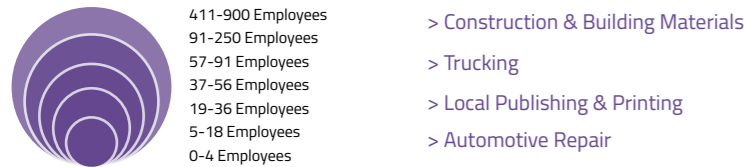
1a) Local Production: Artisan-Craft Establishments



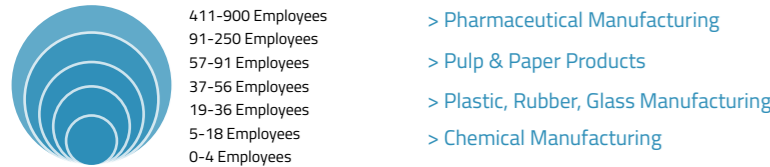
1b) Local Production: Other Establishments



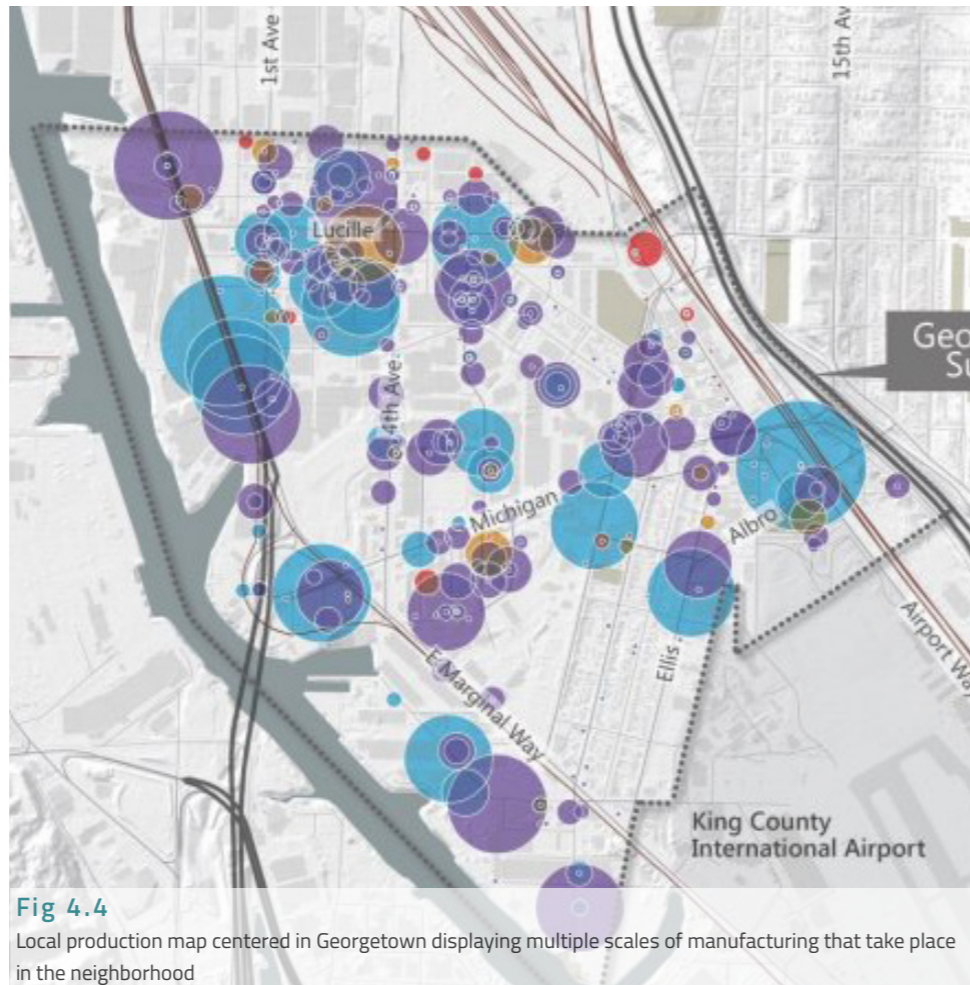
2) Moderate Production Industrial Services (Distribution + Repair)



3) Small Batch/Export Oriented Industrial Establishments



structural steel and fabricated metal products for construction and machinery that play a crucial role in supporting the region's construction and infrastructure development [4]. Machinery manufacturing is another significant sector in Georgetown. It involves the production of machinery and equipment used in various industries, including industrial machinery, commercial appliances, and specialized equipment. The presence of machinery manufacturers highlights the neighborhood's capability to produce advanced machinery and technologies.



Shift in Perception Downsizing Production

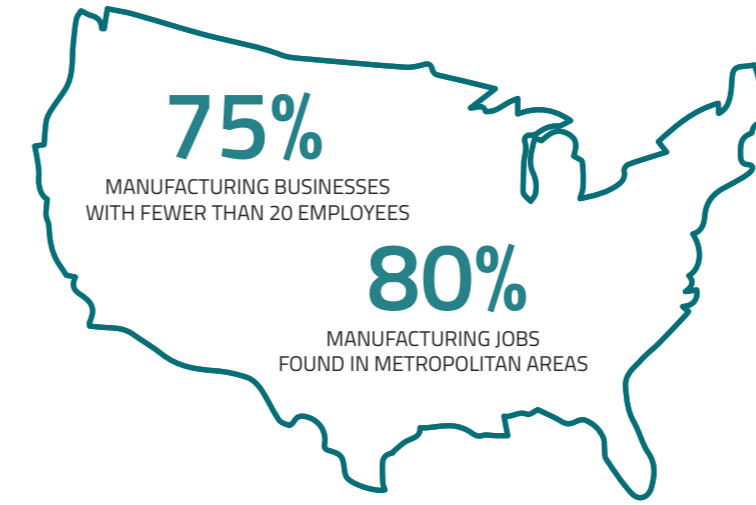
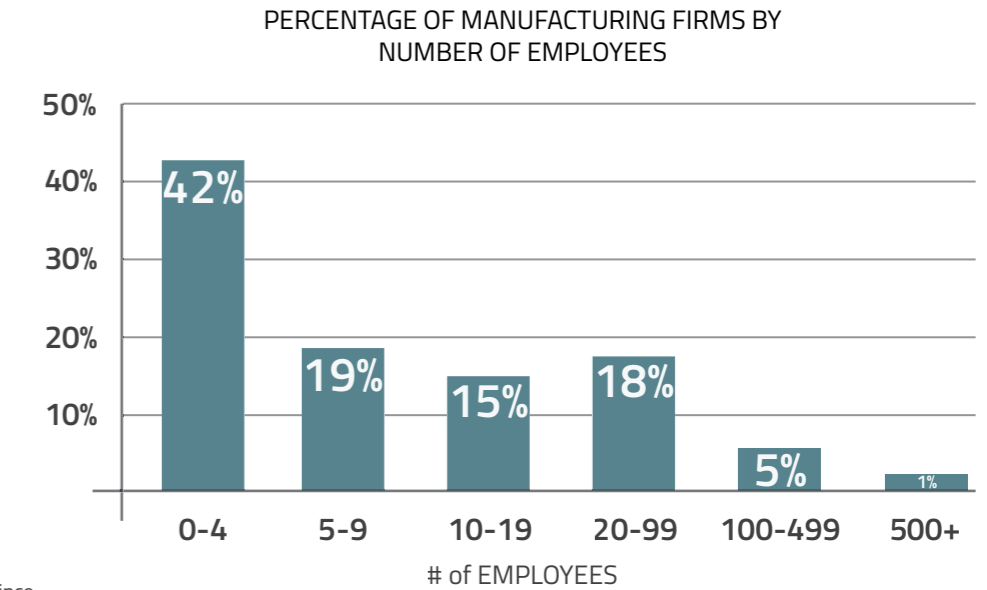


Fig 4.5
Small-scale manufacturing businesses are a key piece of building the local small business sector. Since 2014, over 75 percent of manufacturing businesses in the U.S. had fewer than 20 employees



Seattle's Most Established Industrial Zones

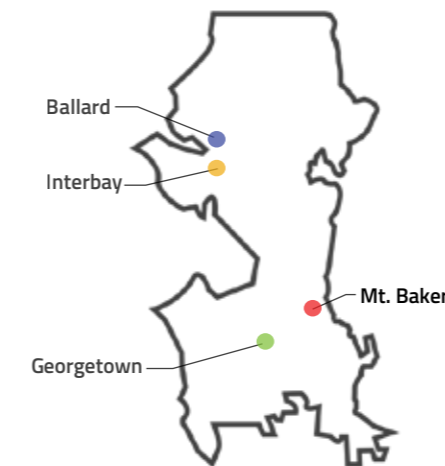
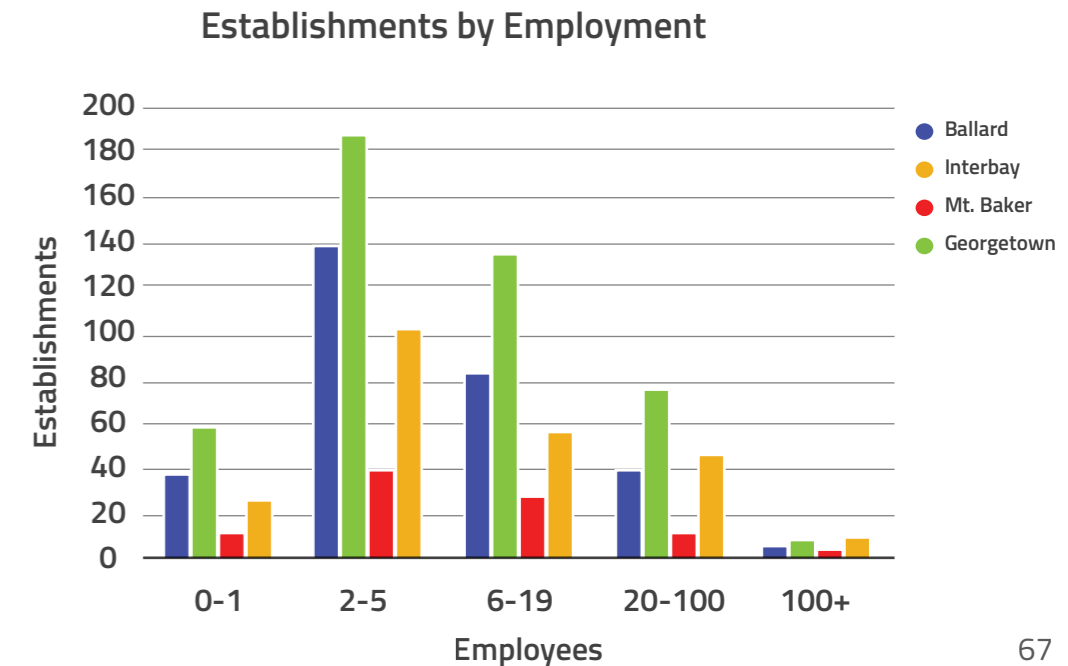


Fig 4.6
The pattern of manufacturing employment density throughout Seattle's major industrial subareas shows Georgetown having a significant amount of small to mid-size employers



Historically, industrial zoning measures in Georgetown have provided designated areas for heavy industries and manufacturing activities. This zoning aimed to concentrate industrial operations in specific zones, attempting to ensure compatibility among similar industries and minimizing conflicts with other manufacturing sectors or commercial areas [5]. However, as the economic landscape has shifted away from traditional heavy manufacturing, new challenges have emerged in reconciling the demands of legacy industries with the spatial needs of contemporary manufacturing. The rise of small-scale manufacturing, technology-driven industries, and creative production spaces has brought a need for more flexible zoning and land use classifications that accommodate these evolving sectors. While balancing the preservation of legacy industrial infrastructure is still top of mind in Georgetown, the spatial integration of new industries that represent the small-scale manufacturing sector have become a critical trend taking place in the neighborhood.

In 2023, Georgetown is home to a diverse range of manufacturing and industrial businesses. One notable company is Franz Bakery, which has been producing bread and pastries in the neighborhood since 1906. Other businesses include Metal Quest, which specializes in precision metal fabrication, and Seattle Wholesale Growers Market, a cooperative owned by 13 flower growers in Washington, Oregon and Alaska, opening in 2011 [6] (Fig. 4.8). Georgetown has also become a hub for artisanal and craft production, with many small businesses specializing in everything from brewing beer to roasting coffee to making handmade goods. The neighborhood

is home to a number of popular craft breweries, including Georgetown Brewing and Machine House Brewery. There are also several makerspaces and co-working facilities, such as Equinox Studios, which provide resources and support for small-scale manufacturing and independent design businesses (Fig. 4.7).



Fig 4.7 Equinox Studios is a vibrant and dynamic art community located in the Georgetown neighborhood of Seattle. It is a hub for creativity, innovation, and collaboration, attracting a diverse range of artists, artisans, and makers. The studios occupy a sprawling industrial complex, providing artists with ample space for their studios, workshops, and galleries.



Fig 4.8 Seattle Wholesale Growers is a prominent organization located in the Georgetown neighborhood serving as a collective of local flower farmers providing a vital link between flower growers and the floral industry.

Georgetown Demographics

Ethnicity | Employment | Education

Seattle's industrial land is known for its high employment rates, but the density of employment within manufacturing sectors remains relatively low. The Georgetown neighborhood, in particular, showcases this dynamic. As of 2021, Georgetown boasts a significant workforce of 30,000 individuals during the day, while its residential population stands at only 1,500 residents. The neighborhood's racial and ethnic composition is predominantly White, comprising 65.8% of the population. The Hispanic or Latino population represents the second-largest group, accounting for 16.9%, followed by Asian (11%), Black or African American (1.9%), and individuals identifying with two or more races (2.5%) [7].

Notably, recent data from the 2021 American Community Survey highlights a shift in the neighborhood's workforce composition. Georgetown has seen a transition away from a historically split workforce between white and blue-collar jobs. Currently, approximately 80% of the employed population in the neighborhood works in management, business, science, and technology occupations, which are generally considered white-collar jobs [8]. This transformation reflects a changing landscape in the neighborhood's employment dynamics, with a greater emphasis on professional and knowledge-based industries.

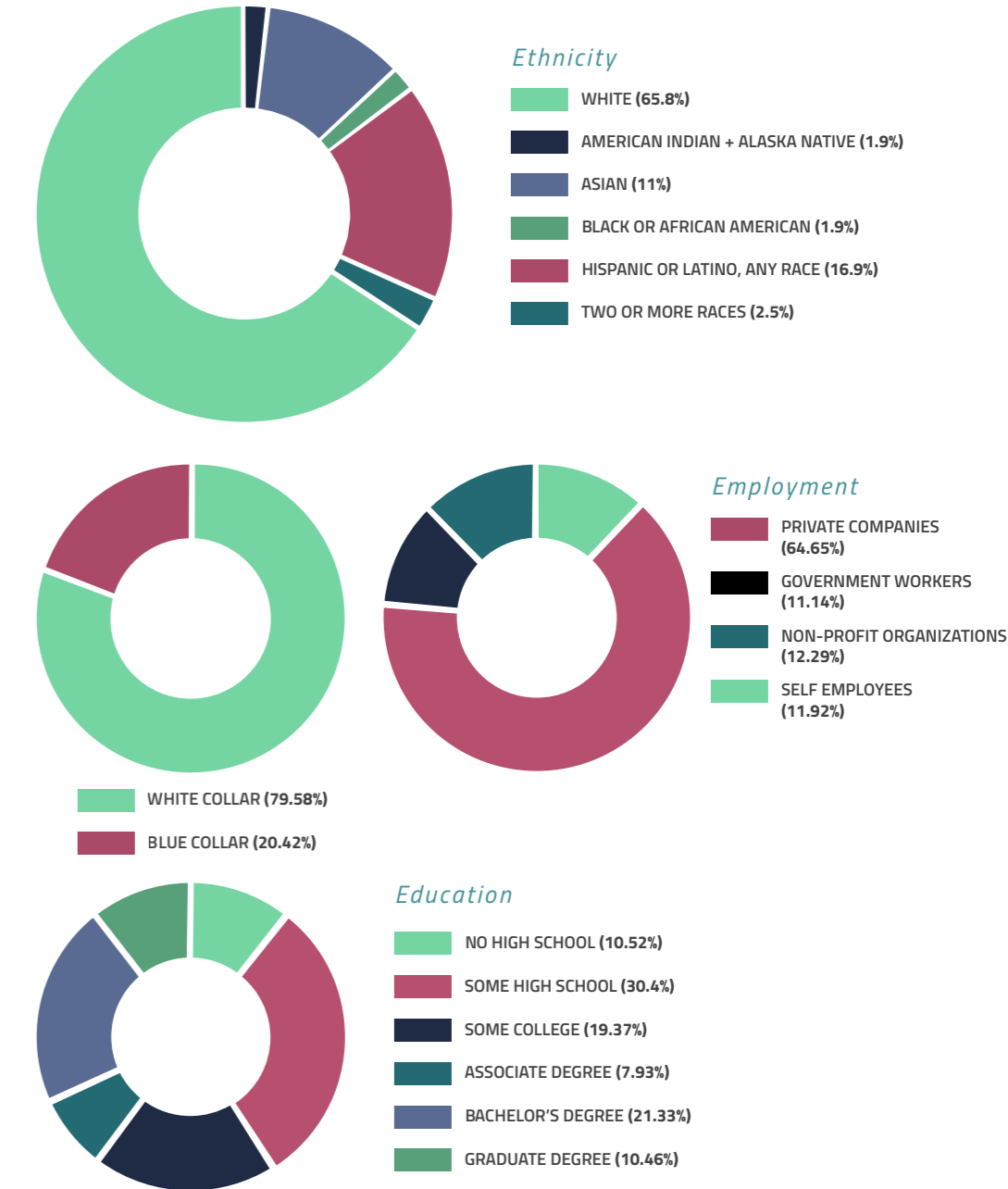


Fig 4.9 Georgetown demographic data representing the neighborhoods ethnic makeup, employment diversity, and education status

Site Analysis

SOUTH SEATTLE COLLEGE (Georgetown Campus)

Industrial and maritime jobs provide pathways to stable careers that are accessible to a broad swath of community members. In Seattle, nearly two thirds of all jobs in industrial sectors are accessible without a traditional four-year college degree, and more than half of all jobs in the maritime sector are available with no formal education [9]. One local institution, South Seattle College, has provided trades-focused education through Georgetown since its inception. Located on the west side of the Duwamish River, it was established in 1942 as a training facility for workers in the defense industry during World War II [10]. After the war, the campus was converted into a vocational school, and incorporated into the Seattle Community College system in the 1970s, offering a wide range of programs and workforce training opportunities.

One of the most notable aspects of South Seattle College is the Georgetown campus extension. Originally known as the Duwamish Center, it focused on providing apprenticeship education and training. Decades later, the name would change to Georgetown Campus and undergo a multi-million dollar renovation project designed to provide new education and workforce training facilities that are closely tied to the needs of the local community. The campus offers a range of programs in fields such as advanced manufacturing, welding technology and automotive/aviation maintenance. In addition to these programs, the Georgetown Campus also offers a variety of

apprenticeships in fields such as sheet metal work, plumbing, and electrical work [11]. These apprenticeships provide students with on-the-job training and classroom instruction, allowing them to gain valuable skills and experience in their chosen field.



Fig 4.10
Duwamish Apprenticeship Center in Seattle's Georgetown neighborhood from 1969

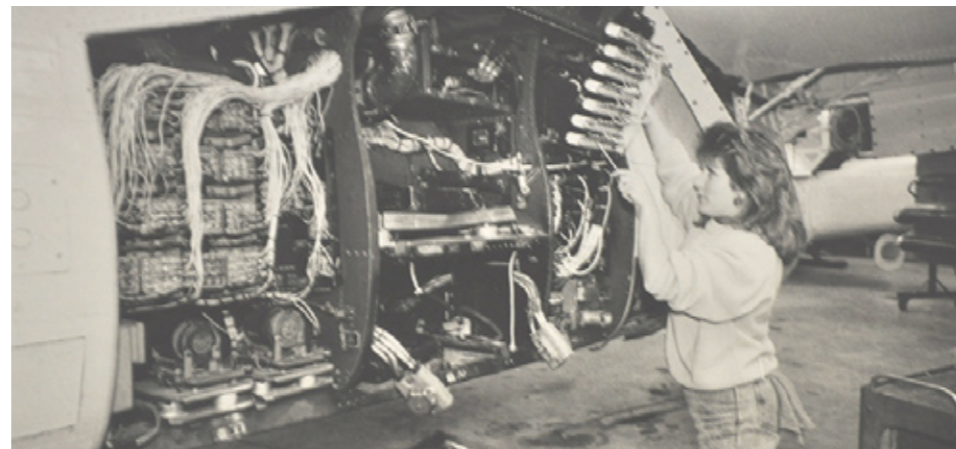


Fig 4.11
South Seattle College aviation student from the 1980's

In 2023, the South Seattle College Georgetown campus stands on a 13-acre site located in the Duwamish Valley watershed. The parcel resides in the Industrial Buffer zoning area which is meant to provide an appropriate transition between industrial areas and adjacent residential zones. To the north, the campus is adjacent to heavy manufacturing facilities and storage yards including the Washington State Department of Transportation's (WSDOT) Corson Facility that houses a portion of traffic operations. The entire eastern and southern edges of the parcel abuts multiple distribution centers. The western edges provide vehicular access to the site and are flanked by single family and multi-family housing (Fig. 4.14).

The current campus construction plan, led by South Seattle College President Robert C. Smith in 1970, was a network of buildings to house aircraft mechanics, automotive mechanics, and heavy duty equipment programs. Additional phases throughout the decade included classroom buildings, laboratories, libraries, faculty offices and student activity areas. Despite these additions, the character of the campus is generally unchanged. Surrounding the network of buildings at the center of the site is nearly 2 acres of surface parking (Fig. 4.17). The southeastern end of the site is largely unused as mowed fields. There is a spacious workyard and material storage area, overflow parking and public plaza space in the back of campus.



Fig 4.12
South Seattle College campus under construction in the 1970s



Fig 4.13
Heavy Duty Equipment classroom in the 1970s.



Fig 4.14
Location of South Seattle College in Georgetown



Fig 4.15
SSC Georgetown campus entry driveway looking northbound with education buildings in background



Fig 4.16
SSC Georgetown campus southeast parking lot



Fig 4.17
Aerial view of SSC Georgetown campus looking southbound with single family residential in background

Georgetown Campus Map

APPRENTICESHIP & EDUCATION CENTER



A GENE J COLIN EDUCATION HALL

- > Administration Offices
- > Conference Rooms
- > Flagging Class
- > Sustainable Building Science
- > Student Services



B TROWELL TRADES BUILDING

- > Cement Masons Classrooms
- > Labs Tile Setters Office
- > Bricklayers Office



C BOILERMAKER LAB

- > Composites Lab
- > Construction Skills Lab
- > Labor Education Center
- > Youth Build Center
- > Meatcutters Classroom



D BUILDING D

- > Classrooms
- > Computer Lab
- > Manufacturing Lab
- > Safety Lab



E ALLIED TRADES BUILDING

- > Apprentice Offices
- > Classrooms/Labs
- > Drywall
- > Floorcovering
- > Glaziers



Fig 4.18
SSC Georgetown: Campus Program

Proposing an Urban Industrial zone on the South Seattle College Georgetown campus presents a strategic and forward-thinking opportunity to establish a mixed-use urban industrial district. The campus's location within an industrial buffer zone provides a unique context that can contribute to the vitality of the site. Embracing the industrial character of the surrounding area, the college can forge strong connections with the local business community, fostering collaboration and innovation. By leveraging the surplus of educational programs in the Georgetown neighborhood, such as apprenticeships and vocational programs, the South Seattle College Georgetown campus can expand its offerings and provide students with valuable hands-on training and real-world experience.

The presence of on-site workforce training programs establishes a mutually beneficial relationship with the neighborhood. Local businesses can benefit from a skilled workforce, while students gain practical skills that align with the needs of the industrial sector. Moreover, a mixed-use urban industrial district can create a dynamic and vibrant environment. By incorporating diverse uses such as educational facilities, manufacturing spaces, research and development centers, and creative studios, the campus can become a bustling hub of activity. This not only enriches the college community but also contributes to the economic development of the Georgetown neighborhood, attracting businesses and fostering job growth.

Furthermore, an Urban Industrial zone within the South Seattle College Georgetown campus creates opportunities for collaboration between the college and local businesses. Joint ventures, partnerships, and research initiatives can thrive, leading to innovation and

advancements in various industrial sectors. By cultivating a supportive ecosystem that encourages entrepreneurship and collaboration, the Georgetown campus can serve as a catalyst for economic growth and development in the surrounding area. This holistic approach benefits both the college and the broader community, establishing a thriving urban industrial district that propels the region forward.

Endnotes

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Site Design

Fig. 5.1: South Seattle College Students on Georgetown Campus

Design Concepts

GEORGETOWN CAMPUS MASTER PLAN

The following concept proposals seek to integrate the core design principles and lessons learned from case studies with the existing site context of South Seattle College's Georgetown Campus. The central intentions of the concept proposals laid out in this framework are to integrate the existing Georgetown campus and proposed Urban Industrial Zone into one cohesive district centered around the success of small-manufacturing and healthy transitions for the surrounding neighborhood. The network of small-scale manufacturing relationships that exist in the Georgetown neighborhood between producers, entrepreneurs, artists and students will be encouraged to continue and grow in the Georgetown Urban Industrial District. By embracing and advancing Seattle's proposed industrial land use concepts, Georgetown's Urban Industrial Zone has the potential to thrive as a prominent hub for innovation and creativity within the city's flourishing small-scale manufacturing sector. Through strategic changes to land use and zoning regulations, the aim is to create an environment that fosters the growth of this sector, attracting entrepreneurs, artists, and makers to the area. The enhanced Urban Industrial zone will provide a platform for collaboration, knowledge sharing, and the development of groundbreaking ideas. This transformation will not only bolster Georgetown's reputation as a center for manufacturing excellence but also contribute to the overall economic vitality and vibrancy of Seattle as a whole.

Similar to the Detroit Eastern Market case study, this design proposal recognizes the growing need to protect Georgetown's industrial land from encroaching development pressures. In addition to safeguarding the area, improving mobility infrastructure is crucial to ensure seamless transitions for both people and goods within the neighborhood's residential areas. Inspired by the success of urban greenways, this proposal seeks to designate similar pedestrian-friendly pathways adorned with enhanced planting areas and increased street trees. Moreover, a proposed expansion of the bike network aims to install protected lanes along major arterial streets, mirroring the emphasis on bike-friendly infrastructure observed in the Eastern Market. By prioritizing pedestrian and cyclist needs, Georgetown's mobility and pedestrian corridors are thoughtfully designed to minimize conflicts and harmonize with existing truck and freight routes, ensuring equal accessibility by foot, bike, car, or truck throughout the vibrant Georgetown Urban Industrial District.

Most proposed street improvements are focused on enhancing the pedestrian experience and facilitating neighborhood transitions from the single-family residential zone to the Georgetown Urban Industrial District. Carson Avenue S and East Marginal Way South are the primary arterial streets that surround the Georgetown campus and should be complemented by improvements that represent enhanced pedestrian corridors. Improvements along Carson Avenue South

will be prioritized that will include sidewalk repair and street tree plantings in addition to an urban greenway that would span the length of the corridor. Increased sidewalk widths would form a pedestrian promenade along Carson Avenue South with the addition of a protected bike lane and green stormwater infrastructure (GSI) planting beds to serve as a buffer between the street corridor and expanded campus green. East Marginal Way South would largely maintain its role in serving as a primary freight route for trucks however the urban greenway would be maintained along the arterial corridor to the west. These improvements are intended to minimize conflicts between freight and pedestrian movement while providing mobility for both modes. It should be noted that these street improvements are in line with Duwamish Valley Safe Streets initiatives that collaborate with SDOT to coordinate key locations in the neighborhood that require enhanced street improvements.

Drawing inspiration from both the Portland Central Eastside and Steel Yard case studies, the Georgetown campus master plan embodies an urban industrial character by integrating smaller-scale production and distribution activities alongside ancillary retail and affiliated office spaces. To ensure a smooth transition from neighboring single-family housing, the plan allows for increased building heights, enabling the placement of housing units above industrial buildings. Similar to the Portland Central Eastside, the

housing units in Georgetown may cater to a combination of workforce housing and true live/work units, prioritizing individuals or businesses working directly on-site and meeting specific income criteria. Given Georgetown's desirability as a hub for small-scale production and the city's rising real estate market pressures, it is imperative that future multi-use developments within the Urban Industrial zone prioritize opportunities for small-scale manufacturers. The inclusion of affordable workforce housing in newly constructed buildings is encouraged, provided it does not exceed 50% of the building's floor area ratio. These housing units would be designed with key considerations, such as sound-insulating windows and reduced conflict with adjacent industrial businesses, mirroring the approach taken in the Steel Yard case study.

Master Plan

SITE PROGRAMMING

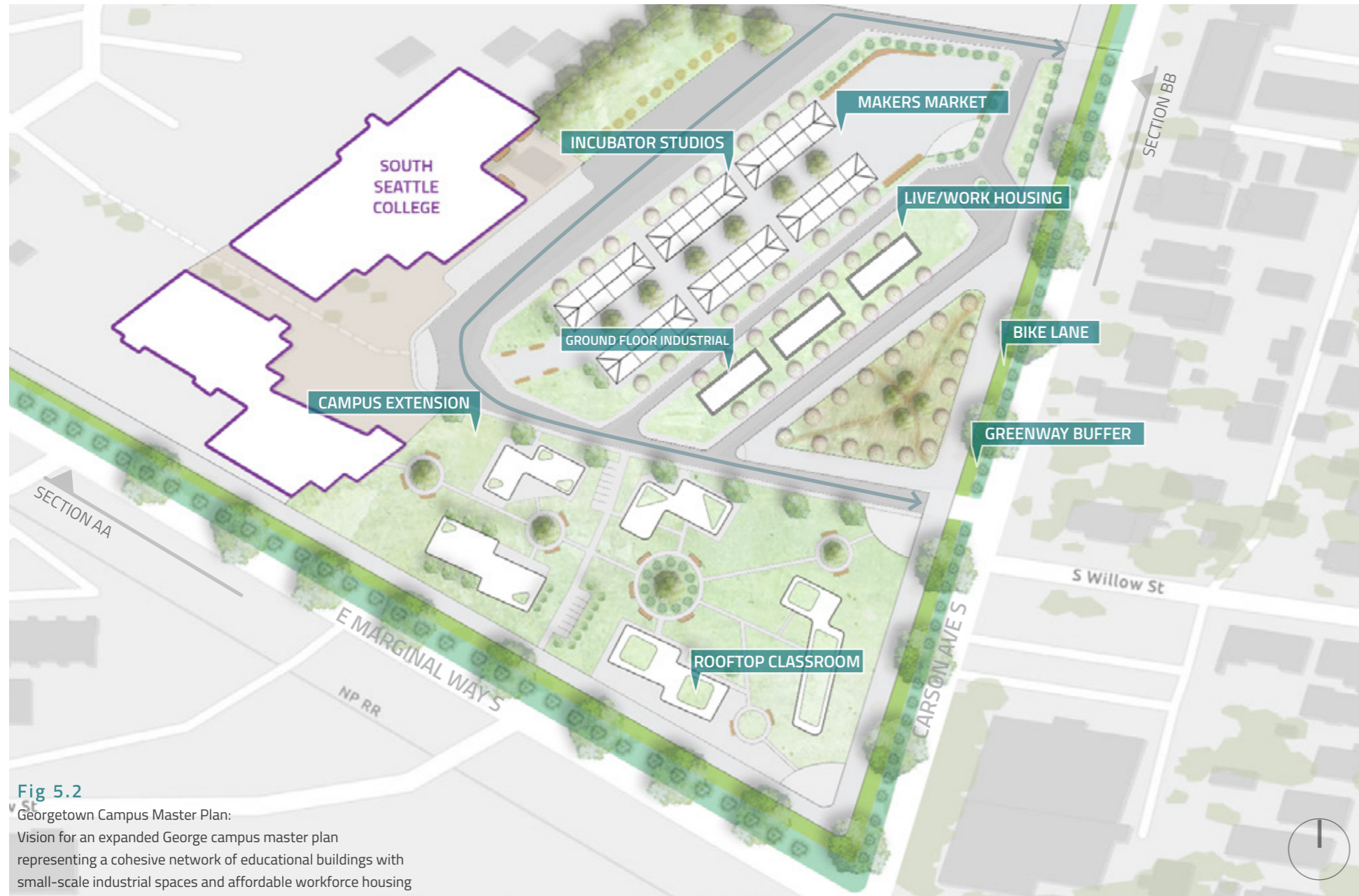


Fig 5.2
Georgetown Campus Master Plan:
Vision for an expanded George campus master plan
representing a cohesive network of educational buildings with
small-scale industrial spaces and affordable workforce housing

Master Plan

SITE SECTIONS

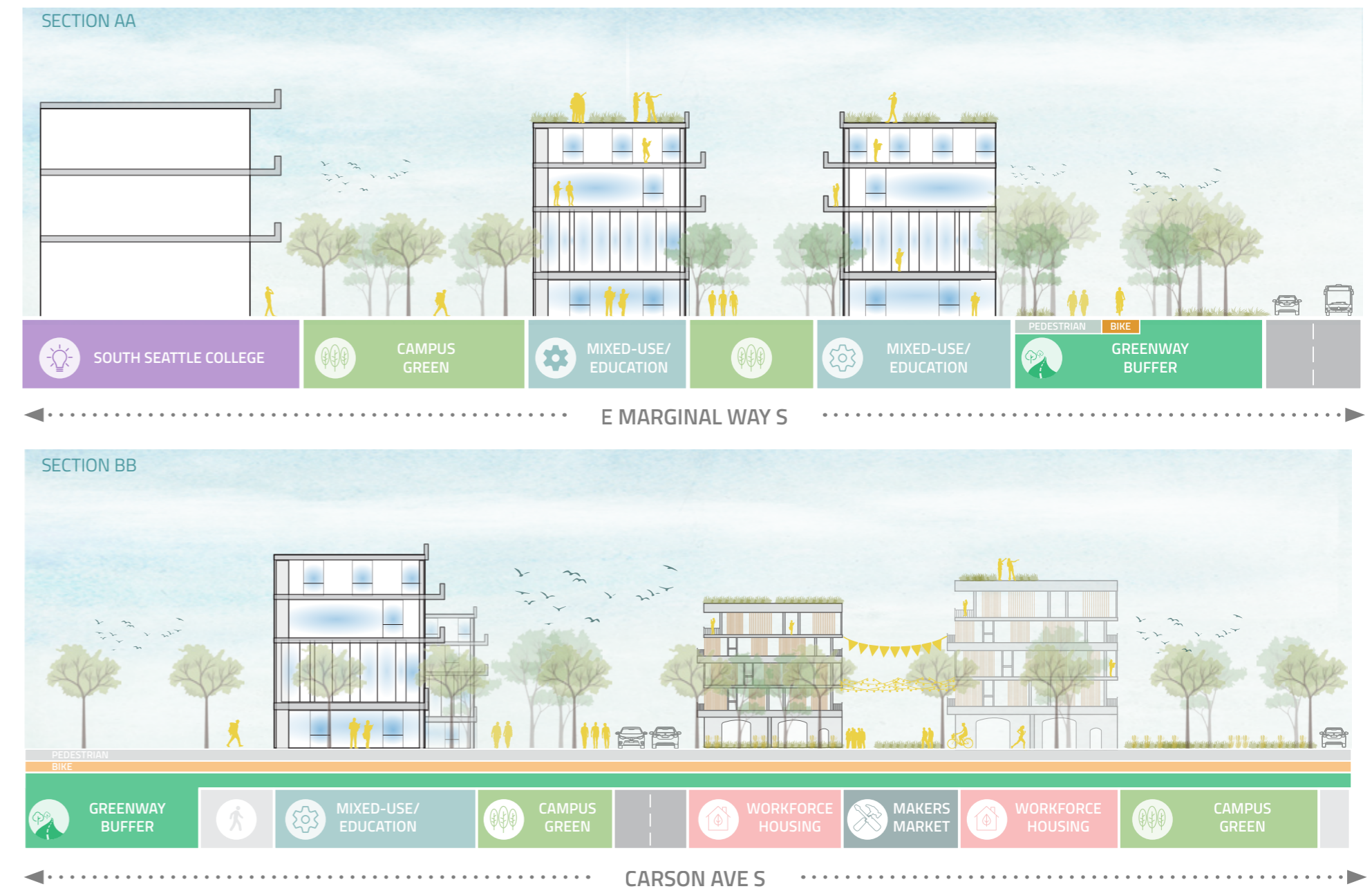


Fig 5.3
Georgetown Campus Master Plan: Site Sections

Design Concepts

GEORGETOWN CAMPUS MASTER PLAN

The Georgetown neighborhood has historically been characterized by constant freight traffic, heavy industrial operations and lack of green stormwater infrastructure (GSI) that support the hard working streets. These conditions can be detrimental to health and well-being of nearby residents including increased air pollution and flood risk. To be effective, the proposed urban greenway along Carson Ave S and E Marginal Way S can improve safety for students and residents by creating separate spaces for biking and walking, away from busy streets with vehicular freight traffic (Fig. 5.4). This not only reduces the risk of accidents and injuries but also encourages active transportation and a healthier lifestyle.

In addition to improving safety, urban greenways can also create healthy neighborhood transitions by providing attractive and accessible public spaces that connect the Georgetown campus with the surrounding community. These greenways can incorporate public art, seating areas, and landscaping to make the space more inviting and functional. This can promote social interaction and community engagement, while also encouraging physical activity and outdoor recreation. Moreover, the proposed urban greenways will serve as a catalyst for economic development by attracting new manufacturing businesses and students to the area. By creating an attractive and safe environment for people to walk, bike, and socialize, urban greenways can help create a sense of place and community identity, which can be

appealing to entrepreneurs looking to establish new manufacturing headquarters in the area. This can result in increased foot traffic and economic activity, which can benefit the Georgetown campus and the surrounding community.

Expanding South Seattle College's Georgetown campus into an urban industrial district that fosters small-scale manufacturing and continued education could have a significant impact on the surrounding industrial community. The college could leverage its existing facilities, resources, and expertise to create a vibrant ecosystem that supports entrepreneurs, students, and local manufacturers. This would include a campus green extension that would promote collaboration and innovation, with shared spaces for networking, prototyping, and showcasing new products (Fig. 5.6).

Urban Greenway

HEALTHY NEIGHBORHOOD TRANSITIONS



Fig 5.4
Section perspective view of the re-imagined campus greenway along Carson Ave supporting multi-mobility and safe transitions for adjacent residential areas

Georgetown Campus Extension

INCREASED EDUCATION, EMPLOYMENT & ENTREPRENEURSHIP

To make this vision a reality, South Seattle College could work with local manufacturing sectors, neighborhood stakeholders and city leaders to secure funding, identify development needs and create a plan for expanding workforce training programs, apprenticeships, and certifications. To facilitate small-scale manufacturing, future expansions could include a variety of maker spaces that cater to different industries and skill levels. These spaces could be equipped with the latest tools and technologies, such as 3D printers, CNC machines, and laser cutters, and staffed by experienced technicians and instructors.

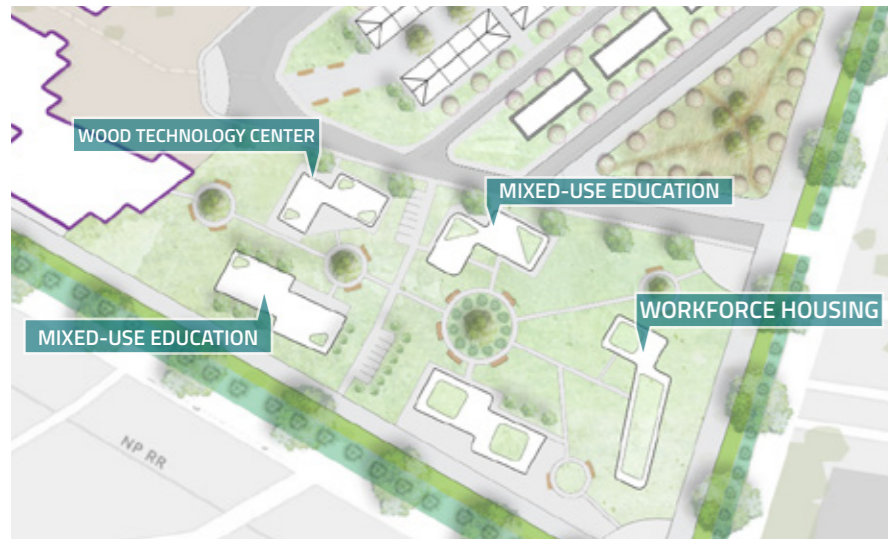


Fig 5.5
Enlarged map of Georgetown campus master plan

Potential Expansion Programs:

- Wood Technology Center
- Boat Craft & Design
- Carpentry Certification

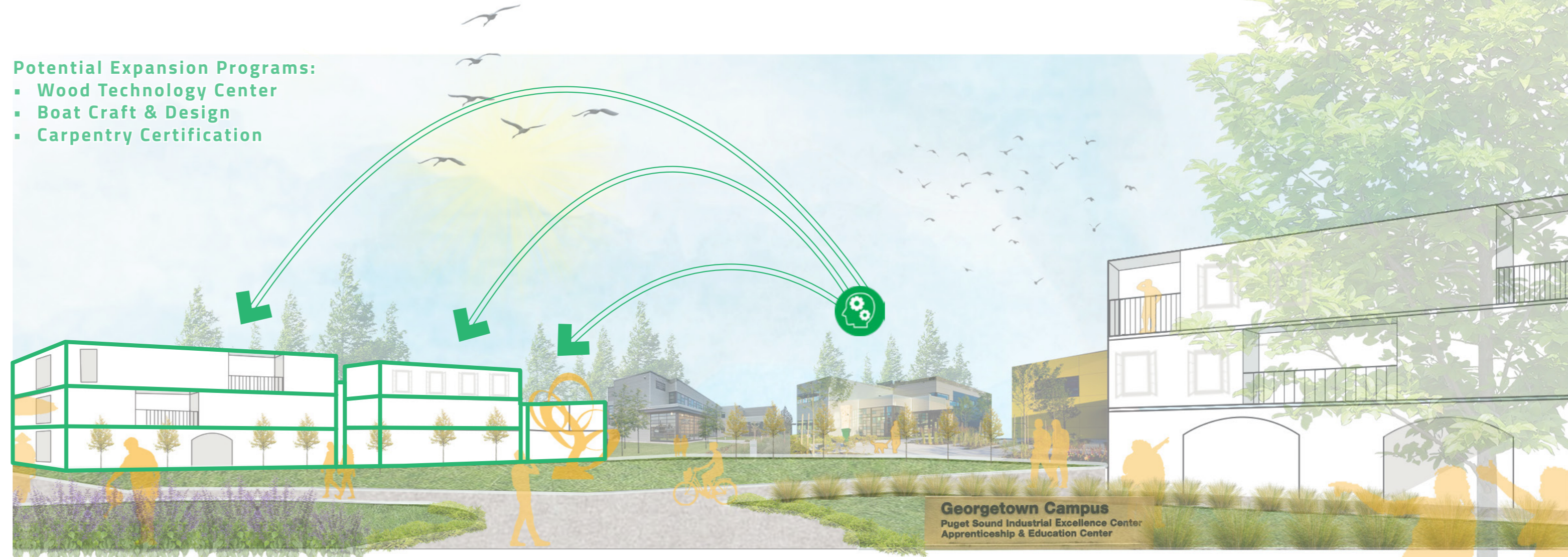


Fig 5.6
The expanded campus green accommodates new building development supporting a surplus of educational buildings adjacent to existing campus structures. Affordable workforce housing and maker spaces promote enhanced activity to bring the space to life

Live / Work Units

AFFORDABLE WORKFORCE HOUSING

To support entrepreneurs and students pursuing a career in small-scale production, the master plan will include a variety of workforce training housing units that are affordable, accessible, and designed to meet the needs of creative professionals. These units would be located above or in close proximity to new educational buildings and maker spaces, and could include flexible floor plans, shared amenities, and access to other production shops where tools, materials and overall knowledge can spill over (Fig. 5.7). In this model, multiple small-scale manufacturing businesses can begin to cluster around one another spurring further activation and programming. Design guidelines will create vibrant corridors that encourage active ground level uses and articulated facades that will break up the scale of the district and add visual interest to any larger spaces that surround them. Since tenants who occupy these living units will be encouraged to work or own a business on-site, this allows an organic community of makers, artists and students to form a unified district that reflects the authenticity and community character of the Georgetown neighborhood.



Fig 5.7
The addition of affordable live/work housing units with productive spaces for manufacturing on the ground floor promote an inclusive environment where a diversity of industries can thrive while encouraging interaction and knowledge sharing among residents and businesses



Fig 5.8
An industrial corridor featuring ground-floor businesses highlights the flow of goods between businesses. The space is centered around community events, markets, and art installations promoting a creative environment that supports activation and programming.

A mixed-use industrial corridor adjacent to the campus green would provide an ideal environment for small manufacturing businesses, artists studios, and makerspaces. This kind of corridor would feature ground floor spaces designed for flexibility to accommodate a variety of production types. These spaces would have large windows that allow for natural light and ventilation, high ceilings to accommodate larger equipment, and concrete floors for durability. The design of the industrial corridor would include communal spaces such as a shared courtyard or gathering space, where residents and visitors can come together for events and activities (Fig. 5.8). This would help create a sense of community and promote collaboration between different businesses and local organizations. These spaces can also be designed to demonstrate sustainable design and promote the reuse of resources on site. One way to promote sustainable design is through the use of passive solar design strategies, such as positioning buildings to maximize sunlight exposure and using materials that absorb and store solar energy (Fig. 5.10). This can help to reduce energy use and costs associated with heating, cooling, and lighting. Additionally, solar energy can help reduce reliance on fossil fuels and lower greenhouse gas emissions, contributing to efforts to combat climate change.

Multi-use buildings can be designed with green roofs, which can help reduce the amount of runoff and stormwater that flows into the city's sewer system. Moreover, additional applications of green stormwater infrastructure (GSI) can take place on-site that provide insulation, reduce urban heat island effects, and provide habitat

for birds and insects. Together, these sustainable design features reduce the environmental impact of industrial activities on-site while promoting a resilient urban industrial district that supports a predictable future for manufacturing and regenerative design.

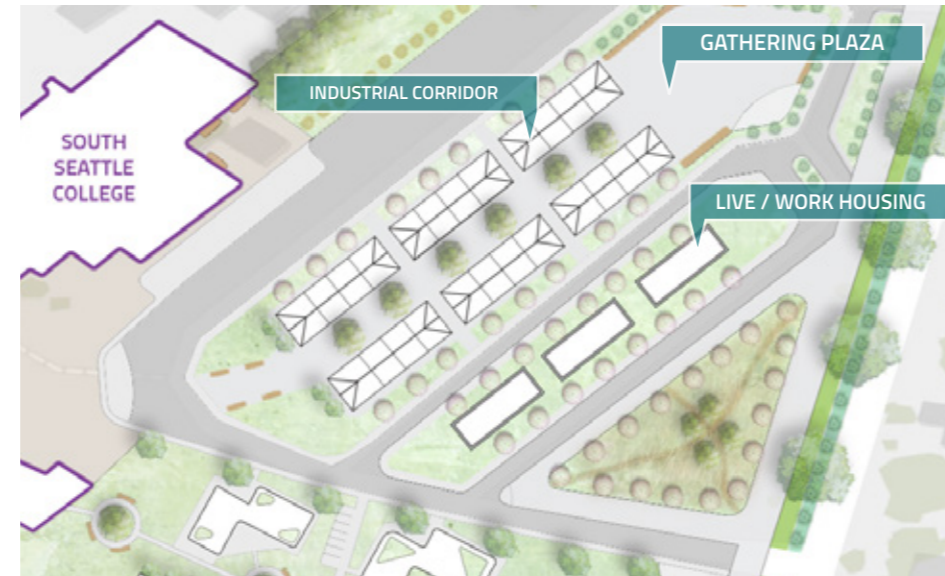


Fig 5.9
Enlarged map of Georgetown campus master plan

Maker Space Community

SMALL-SCALE INDUSTRIAL SPACES



Fig 5.10
Affordable maker spaces, art studios and fabrication centers through the district offer opportunities for enhanced learning and skill development among a variety of industries

The proposed Georgetown campus master plan combines core design principles from Seattle's proposed Urban Industrial zone and lessons learned from case studies, incorporating characteristics from the Portland Central Eastside, Detroit Eastern Market, and the Steel Yard. The plan aims to create a cohesive district that prioritizes small-scale manufacturing and promotes healthy transitions for the surrounding neighborhood. Similar to the Portland Central Eastside, Georgetown recognizes the need to protect its industrial land from encroaching development pressures. By promoting an urban industrial district into the South Seattle College Georgetown campus valuable industrial land is able to be preserved for ongoing manufacturing uses and educational facilities. The emphasis on improving mobility infrastructure, such as urban greenways and protected bike lanes, echoes the focus observed in the Detroit Eastern Market neighborhood.

Additionally, inspired by the Steel Yard case study, the plan integrates expanded educational programs, encourages workforce development, and emphasizes the inclusion of affordable opportunities in manufacturing while considering the needs of adjacent industrial businesses. By leveraging these similar characteristics, the Georgetown urban industrial district promotes a vibrant hub for innovation, creativity, and sustainable manufacturing, contributing to the economic vitality and vibrancy of Seattle as a whole.

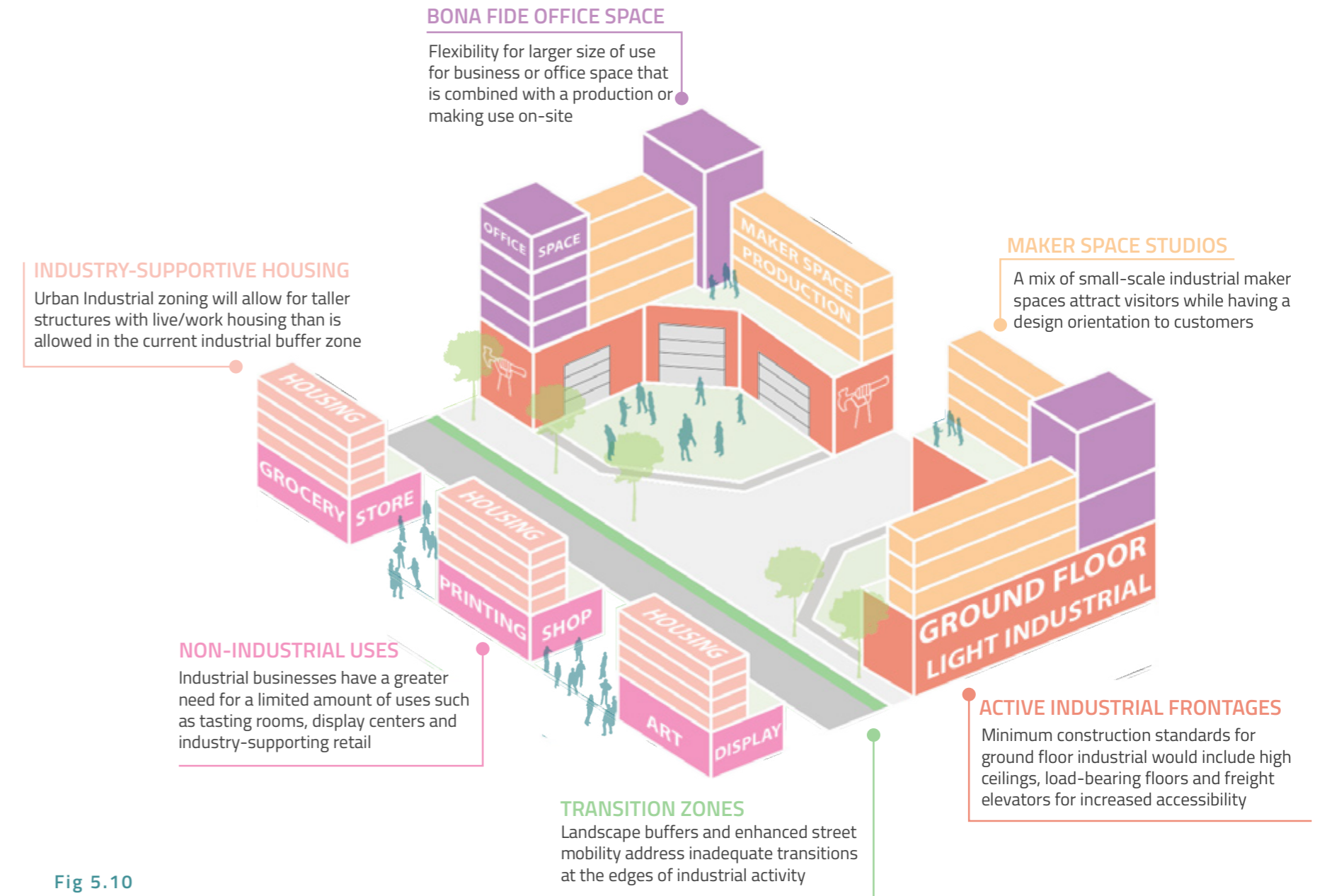


Fig 5.10
This conceptual diagram highlights the design principles of the Georgetown urban industrial district, which aims to integrate creative approaches to promote affordable opportunities in both manufacturing and housing



LIVE/WORK
HOUSING

LAB RESEARCH

INDUSTRY SUPPORTIVE
OFFICE SPACE

MAKER SPACE

ADAPTIVE REUSE

Conclusions

Fig. 5.11: Georgetown Urban Industrial District: Diagram Section

This thesis begins to lay the groundwork when exploring new opportunities to revive urban manufacturing sectors that play a crucial role in the vitality of industrial land. Throughout this work, we've gained a better understanding of how small-scale manufacturing is understood today, including its potential to emerge as a multifaceted solution that has the ability to foster a vibrant urban industry district that supports a mix of local manufacturing, production, education, and a sense of place. By understanding the historical and contemporary spatial relationships between cities and manufacturing, addressing the challenges faced by small-scale manufacturers, and strategically implementing effective lessons learned from case studies, we can begin to imagine how the City of Seattle can move forward with the integration of a robust urban industrial district that reflects a resilient yet predictable future for the Georgetown neighborhood.

We began by examining the historical spatial dynamics between cities and manufacturing that have played a significant role in shaping the social, economic, and physical landscapes of urban industrial areas. Small-scale manufacturing was prevalent in cities, towns, and villages during the 19th century, creating human-scaled manufacturing environments integrated into existing working-class communities. The landscape of urban manufacturing changed drastically in the early 20th century with the rise of large-scale enterprises and the globalization of production overseas. This transition led to the decline of traditional manufacturing districts in cities, leaving many working-class communities out of work. The landscape of urban manufacturing in the 21st century is marked by significant shifts in the economy,

including the revival of small-scale manufacturing. Advancements in technology, such as automated production, computer-aided design, and online engagement, have made it easier and more cost-effective for individuals and small production sectors to engage in manufacturing. These changes have lowered the barriers to entry for small-scale manufacturers, allowing them to establish their businesses with relatively low upfront costs and access to a wider range of customers. In addition we've learned how modern small-scale manufacturing encompasses a diverse community of businesses creating tangible products using various materials and trade skills. These enterprises operate with flexibility, selling their products through different channels, including direct-to-customer, wholesale, and business-to-business supply chains.

The decline of traditional heavy manufacturing in urban industrial neighborhoods has left behind vacant industrial spaces and under-utilized land. Small-scale manufacturing provides an opportunity to repurpose these spaces, create employment opportunities, and contribute to ongoing efforts to promote education in urban production sectors. Despite the significant contributions to industrial communities both economically and socially, these enterprises are often overlooked in local urban development strategies. We have learned that ineffective industrial land use policies and outdated zoning strategies have hindered the growth of small-scale manufacturing due to strict development standards that lack flexibility. To address these challenges, cities must reevaluate and consider updates to industrial land use codes that prioritize shared

production spaces, and support the growth of affordable maker spaces and incubators. By striving for this vision, local governments and organizations have the opportunity to offer resources, training programs, and financial support to encourage entrepreneurship and skill development in small-scale manufacturing.

Drawing inspiration from successful case studies located in urban contexts, the industrial Georgetown neighborhood in Seattle can learn valuable lessons about integrating small-scale manufacturing, repurposing existing industrial buffer areas, and fostering a vibrant urban manufacturing sector. The case studies of Portland's Central Eastside, Detroit's Eastern Market, and Providence's Steel Yard offer insights into how the experiences and lessons learned from these cases can be applied toward a conceptual framework that supports a robust urban industrial district in Seattle's Georgetown neighborhood. From Portland's Central Eastside (CES), we learned the significance of retaining industrial zones in an urban context. The Industrial Sanctuaries Policy in Portland played a vital role in preserving land for manufacturing purposes, protecting affordable spaces for industrial incubators, and small-scale manufacturing enterprises. Seattle can adopt a similar approach by designating Georgetown as an urban industrial zone and implementing protective measures to safeguard existing industrial sectors and attract new manufacturing activities. By periodically revisiting industrial land use policies and updating zoning classifications, Seattle can ensure the relevance of these policies to the changing nature of industries while preserving legacy industrial spaces.

The Eastern Market case study in Detroit highlights the

challenges of balancing industrial activity with pedestrian-friendly environments. Detroit's partnership with Utile Inc. to develop a plan for the Eastern Market neighborhood provides valuable lessons for Georgetown. By integrating design guidelines and ecological buffering systems, Detroit aims to create a human-scale, active street edge that promotes urban greenways, enhanced plantings, and increased circulation. The Georgetown Urban Industrial District begins to draw inspiration from these strategies to enhance connectivity, improve mobility, and create healthy transitions between industrial sectors and nearby residential areas. Finally, the Steel Yard case study emphasized the importance of continued education in manufacturing and the integration of shared spaces for collaboration and knowledge sharing. The Georgetown Urban Industrial District seeks to embrace increased education in manufacturing by integrating shared spaces for production that promote collaboration, knowledge sharing, and inclusive workforce training programs. By fostering a supportive environment for skill development and collaboration, Georgetown can attract and retain a diverse range of manufacturing sectors while expanding inclusive workforce training programs by working in partnership with South Seattle College.

In addition to taking key lessons forward from case studies, the concept proposals included in the Georgetown Urban Industrial District highlight the opportunities that could arise from implementing core design principles laid out in the Seattle Industry and Maritime Strategy. Applying these strategies to South Seattle College's Georgetown Campus allows the proposals to come to life at the human scale and

provide an environment where industrial focused development and small-scale manufacturing can share a symbiotic relationship. By developing a district with these relationships in mind, designs can integrate a diverse range of manufacturing activity in ways that create sustainable futures in continued education and industrial employment. In the Georgetown campus master plan, the proposed concepts integrate with the existing character of the neighborhood and promote a future where the built environment and robust urban manufacturing sectors of a site work together to push the boundaries of what it means to sustainability protect industrial lands and transform them into resilient productive landscapes.

The creation of urban industrial districts, such as the proposed district in South Seattle College's Georgetown Campus, can help provide necessary infrastructure and support services to encourage the growth and success of small-scale manufacturers. As we've learned throughout this proposal, small-scale manufacturing holds great potential in reviving urban industrial communities. By understanding the historical and contemporary spatial relationships between cities and manufacturing, addressing the challenges faced by small-scale manufacturers, and implementing effective planning and land use policies, cities can create resilient urban industrial districts that foster high-quality workforce training, expanded education programs, and contributions to local wealth development. Small-scale manufacturing not only helps establish strong community bonds but also enables diverse economies of scale, promotes innovation, and contributes to the overall well-being of industrial communities in the modern urban

context.

Future Considerations

The application of a robust urban industrial district that promotes small-scale manufacturing in the Georgetown neighborhood can serve as a model for other industrial areas within the Puget Sound area. By examining the key principles and strategies implemented in the Georgetown neighborhood, similar approaches can be adapted, applied and scaled upward to foster local economic growth and further promote the potential of small-scale manufacturing among industrial communities. Seattle as a whole can begin to address other concerns that are related to industrial economic growth on a broader neighborhood or even regional scale by offering future considerations to expanding a robust urban industrial zone throughout the city. A crucial first step would be the adoption and implementation of Seattle's new industrial land use zones that would solidify the support for the creation of urban industrial districts. By designating specific areas for manufacturing activities and ensuring the compatibility with residential zones, this model has potential to serve as a blueprint for other industrial communities looking to retain and promote their own unique urban industrial sectors. When identifying industrial areas that are suitable for transformation, adequate infrastructure such as transportation networks, utility systems, and access to reliable energy sources need to be prioritized in order to attract and support a vast array of manufacturing businesses. As future industrial areas look to find a balance between preserving older manufacturing sectors while promoting new forms of production, aiding waste reduction, recycling

programs and clean manufacturing technologies will be imperative to environmental sustainability while encouraging collaboration among environmental agencies and organizations that can help provide guidance and support in achieving these goals. As we've learned in this work, collaboration between the public sectors, private businesses, and local institutions are essential. Engaging with local stakeholders in other industrial communities to understand their needs may bring new insights in creating a supportive environment for growth. Establishing partnerships with other education institutions across the region that may differ in focus or specialization can foster skill development in new sectors of manufacturing and provide necessary training programs to support a broader range of skilled workforces. Regulatory incentives and continued financial support to attract and retain small-scale manufacturing sectors should be strongly considered by municipalities looking to adopt a similar system to Georgetown. These incentives might be represented as increased tax benefits or grants that would provide funding opportunities to assist with navigating challenging permitting processes that are often time-consuming and expensive to achieve. Finally, as cities continue to embrace the challenges of blending traditional manufacturing sectors with a mix of contemporary manufacturing businesses, industrial areas can see a reduced presence of a single dominating sector and begin to embrace startups and innovative industries that utilize new advancements on technology. This can result in an increased presence of entrepreneurship among business incubators and manufacturing sectors resulting in increased connections to foster knowledge sharing and continued education.

Limitations

As this thesis work begins to speculate what a robust urban industrial district might begin to look like in the Georgetown neighborhood, it's important to note several limitations and assumptions that may play a role in actively pursuing updates to Seattle's industrial zoned areas. Although the Seattle Industry and Maritime strategy is still in the early stages of development, its adoption will require a lengthy and complex approval process. Overcoming bureaucratic hurdles, engaging multiple stakeholders, and navigating through various regulatory procedures are several speculative assumptions that can delay decision making around moving this plan forward. City-level support and coordination could also experience obstacles in allocating the necessary resources and funding mechanisms to update Seattle's industrial zoned areas with new land use concepts. These hurdles may include dedicating staff, administrative support, and expertise to facilitate the necessary research, analysis, and community engagement that will allow the advancement of this plan. The City of Seattle would also need to streamline interdepartmental coordination to ensure efficient decision-making and implementation is being had throughout the remainder of the approval process. The success of implementing an urban industrial district in Georgetown would rely heavily on active engagement from the local community, including residents, businesses, and community organizations. Speculative assumptions involve ensuring strong participation in public consultations, fostering a sense of ownership, and addressing any potential resistance or concerns from stakeholders.

Garnering support at the neighborhood district level will be crucial in overcoming challenges and maintaining the momentum of the initiative.

As Seattle continues to advance industrial land use concepts forward, the design related elements in this work can be revisited to accommodate future decisions that would further refine a vision for an urban industrial district. As specific details continue to get flushed out such as building codes, housing requirements and lot size requirements, future planning regulations can implement these decisions into the urban industrial zone framework. Alas, as the plan moves forward incentives for participation from private enterprises, institutions and developers might be necessary and can be brought into consideration to ensure a collaborative approach that works benefits all parties. Future planners can begin to get familiar with existing infrastructure that is already contributing to prosperous manufacturing environments and leverage further investment along those same values with future development that resembles similar characteristics.

Thesis Reflections

Throughout the development and process of this thesis work, I was determined to take a leap into learning how our perspectives toward urban manufacturing and industrial activity can be influenced through the promotion of small-scale manufacturing and the positive implications it can have on industrial communities. It was imperative to take a different approach throughout this work that was intentional about expressing the benefits of an increased presence

of urban manufacturing and the positive ripple effects it can have on industrial neighborhoods. Rather than seeing this work through a 'post-industrial' lens, my intent was to shine light on what a 'plus-industrial' future might look like when small-scale manufacturing is prioritized when addressing the future of industrial areas. This way of thinking allowed me to move forward with a mindset to bring awareness around the untapped potential of urban manufacturing when viewed as a necessity to industrial communities rather than a burdensome activity. By taking this approach, I was able to take a step back and learn how the historical spatial patterns of city and urban manufacturing were dominating forces in the development of cities since the 18th century. Understanding the influences manufacturing had on these development patterns allowed me to gain perspective when learning how the evolution of industries changed over time bringing along new challenges in policy planning and spatial integration when accommodating for a diverse range of manufacturing sectors. Becoming familiar with the sector of small-scale manufacturing including who, what and where represent this group of enterprises leading a renaissance in the rival of human-scaled production encouraged me to dive deeper into the challenges they face and opportunities presented when seen as a valuable asset.

It was also fascinating to see the fields of urban planning and landscape architecture combine in the development of this thesis. I've gained a significant understanding of how both fields can fuse together to bring thoughtful approaches to address our built environments' most complex problems. In my case, leveraging a thesis

that brings urban industrial policy and design related interventions to the table allowed my work to develop in a way that provided me several opportunities to engage with professional planners, landscape architects, and community members that left a major impact on me. By taking on the challenge of addressing real-time issues that involve the collaboration between multiple disciplines, I was able to gain a better perspective on where I see my own career heading in the future and how I can position myself to play a bigger role in advancing solutions forward that promote the integration of both planning and design.

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