

Trends in Transitioning Industrial Districts in U.S. Cities¹

The Chicago Department of Planning and Development (DPD) began developing a land use framework for the 700-acre North Branch Industrial Corridor in June of 2016. The North Branch, one of 26 Industrial Corridors in the City, is located in close proximity to the Central Business District and is one of the oldest employment centers in Chicago, dating to 1880. Industrial land uses began to leave the area in the 1980's and the City initiated restrictive industrial zoning to encourage industrial stabilization and new manufacturing. Currently, manufacturing and industrial uses are moving from the area while information and technology office uses are in demand. DPD engaged several consultants to review previous industrial areas in Seattle, Boston, and Pittsburgh to serve as case studies for the evolution of new knowledge-based enterprises or innovation districts in former industrial areas.

Additional research was conducted to identify other cities where traditional industrial areas had been redeveloped and revitalized with non-industrial concentrations and combinations of office, commercial, residential, and recreational space. Four sources were used to identify potential cities for further review: **Knowledge Capitals** as outlined in "Redefining Global Cities: The Seven Types of Global Metro Economies" and cities identified as having a **diversified manufacturing economy** in "Locating American Manufacturing: Trends in the Geography of Production" reports produced by Brookings Institution; cities selected by the U.S. Department of Commerce for **National Network for Manufacturing Innovation (NNMI)** centers; and **Surging City Centers** as identified by the City Observatory which analyzed 41 of the nation's 51 largest metropolitan areas for which data were available between 2007 and 2011, and found that 21 city centers out-performed the surrounding metropolitan areas. The analysis supported the selection of the case studies. In addition, it appears that the North Branch Industrial Corridor is currently unique in the cluster of four anchors focused on aspects of manufacturing.

Background

The innovation economy continues to emerge across the United States and Europe as cities reinvent their employment districts to adapt to the modern economy. The preferences of young workers and their employers have changed in the 21st Century, favoring districts with more collaborative environments that emphasize connectivity, walkability, and a dense mix of uses.

The Brookings Institution defines innovation districts as modern spaces for the strategic concentration of intensive knowledge-based activities. In its landmark 2013 study, ***The Rise of Innovation Districts: A New Geography of Innovation in America,*** They identify three types of innovation districts:

- "Anchor Plus" Model that features large scaled mixed-use development centered on a major anchor institution.
- "Urbanized Office Park" Model that involves densifying and adding a mix of uses in suburban or exurban office parks.
- "Re-Imagined Urban Areas" Model that focus on older industrial or warehouse districts undergoing physical and economic change. These are often located along waterfronts.

¹ This report is a combination of research provided to the Department of Planning and Development by GoodmanWilliams, Smith+Gill and Tetra Tech and AREA in the fall of 2016.

The three case studies described here are examples of successful mixed-use innovation districts in the last category—urban areas that have grown from industrial or warehouse districts along waterfronts. Several also have corporate and/or institutional anchors. The case studies include:

- South Lake Union in Seattle
- The Seaport District in Boston
- Pittsburgh along the north and south banks of the Monongahela River.

These case studies highlight the types of policies and urban planning efforts, as well as private-sector innovations, which are helping to drive economic growth in these districts.

The Brookings Institution found that, uniformly, all successful innovation districts contain a mix of economic, physical, and networking assets. These assets are responsible for maintaining a vibrant environment of innovation and growth. On the economic front, corporations and university leaders have changed strategies from building new facilities only near their existing headquarters or campus buildings. Increasingly, they are willing to seek out new locations and environments that help further their competitive advantage. These knowledge-intensive anchors are locating closer to other firms, research labs and universities to share ideas and practice “open innovation.” In Seattle, much of the growth in South Lake Union occurred following Amazon’s announcement that it was moving its headquarters there in 2007. Since then, the area has also become a hub for biotech and global health research, and in the coming years, Google also plans to expand in the neighborhood. Similarly in Boston’s Seaport District, GE has announced plans to relocate its corporate headquarters, joining other major corporations and small startups.

The physical assets in an innovation district are also paramount to its success. Brookings found that properly planned physical assets, which include public and privately-owned buildings, open spaces, and streets and infrastructure, could stimulate new and higher levels of connectivity, collaboration, and innovation. They found value in mixed-use environments that include residential, neighborhood-serving retail and restaurants, research, and office buildings. This mix of uses creates the opportunities for residents and workers to remain in the area off-hours and feel invested in the community.

In the case studies, the value of “place” rose in areas where open space, cultural activities, retail, housing, and transportation connectivity were all integrated. In Pittsburgh’s South Side Works, the mixed-use planning incorporated the scale of the adjacent South Side Flats neighborhood and knit the block pattern into the surrounding street system. In South Lake Union and Boston Seaport, bicycle commuting, mass transportation, and pedestrian accessibility were all important components of the redevelopment planning.

The presence of residential development in the district enhances the sense of ownership and investment, leading to a stronger physical sense of place with a culturally and educationally enriched environment. Residents activate the space after business hours and lead to the growth of a 24/7 environment. Pittsburgh Technology Center initially excluded residential development, but amended their plan in 2007 to incorporate multifamily units in order to reenergize the riverfront office park. As the physical amenities of innovation districts continue to be attractive for businesses and residents, cities will need to continue to protect and grow the number of workforce housing units.

Networking spaces have also helped innovation districts grow by stimulating new opportunities. “Innovation cultivators”, such as accelerators and incubators, work on a horizontal basis to have entrepreneurs from start-ups, mid-size firms, large firms, and research institutions all interact and work together. In Boston, Mayor Menino made incubator space a key component of the Innovation District plan for Seaport. In the Seaport District today, an estimated 40% of companies are sharing space in lower-cost coworking office and incubators. Seaport is also home to District Hall, the first ever dedicated public space for innovation.

The following pages present more in-depth descriptions of these case studies and the lessons that can be applied to the North Branch Industrial Corridor redevelopment.

South Lake Union

Background: South Lake Union was lush forest land in the early 1800's and, later, home to sawmills and heavy manufacturing industries. The South Lake Union Neighborhood Plan in 1998 intended to preserve much of the land for traditional industrial and manufacturing purposes. However, as the years progressed, land changed ownership and businesses closed. In recent years, more office, biotechnology, and residential development were built in the neighborhood. The updated 2007 South Lake Union Neighborhood Plan set forth guidelines for sustainable urban growth and a housing vision to incorporate diverse land uses in the mixed-use neighborhood. In 2013, an updated Urban Center design framework that included guidelines for waterfront use along Lake Union and an incentive zoning density program was approved for the neighborhood. Key players: Vulcan Real Estate is the major developer and land owner in South Lake Union, the company is credited with much of the vision for the transformation in recent years. Their development portfolio includes 5 million square feet of office, life sciences, residential and mixed use projects in the neighborhood.

Amazon announced it was moving its headquarters to the neighborhood shortly before the South Lake Union Streetcar line opened in 2007. Their move into the area occurred in 2010, and subsequently the firm has purchased all 11 buildings it was leasing from Vulcan. The demand for more tech office, retail and residential units has followed Amazon's move.

Transportation: South Lake Union is a natural extension of Seattle's downtown. One of its strongest assets is that its street and block structure is completely woven in with downtown to the south and adjacent neighborhoods. To supplement the city's primarily bus-based transit system, the 1.3-mile South Lake Union Streetcar line opened in 2007. In the years since its opening, incremental investments to improve service have been made in association with major land development projects in the neighborhood, such as increasing service from 15- to 10-minutes, and providing dedicated lanes. Ridership has grown approximately 10% per year. Parking is primarily underground as the neighborhood was intentionally built to be more pedestrian-oriented. Biking continues to be a popular and encouraged mode of transportation. As part of the city's Commute Trip Reduction transportation demand management program, Seattle has set a goal of achieving a drive-alone mode split of no more than 40% for South Lake Union by 2017

The private sector has invested in public transportation improvements in South Lake Union. Since 2011, Fred Hutchinson Cancer Research Center, Group Health Cooperative, UW

Medicine and Amazon.com have underwritten a third streetcar to operate during peak commuting evening hours. Additionally, in exchange for taking a city-owned alley, Amazon.com paid \$5.5 million for a fourth streetcar on the South Lake Union line that began in 2015 as well as bicycling infrastructure improvements.

Workforce: In 2014, more than 21,000 workers were located in South Lake Union (Figure 1). Professional, Scientific, and Tech jobs increased by 1,300 jobs from 2002-2014 to represent 27% of all jobs in the neighborhood. Manufacturing declined and made up only 1% of the 2014 jobs. The Healthcare and Social Assistance field grew by 300% in the same timeframe to nearly 3,500 jobs. Arts, entertainment and accommodation added 1,500 jobs over the past ten years, further reflecting a shift from the area's industrial past. As of 2016, there were 745 businesses in South Lake Union. The jobs that have been added in South Lake Union comprise a higher share of those earning more than \$40,000. As of 2014, 70% of jobs pay annual salaries of more than \$40,000.

Figure 1. South Lake Union: Jobs by Industry Sector 2014 & 2002					
Jobs by NAICS Industry Sector	2014 Count	2014 Share (%)	2002 Count	2002 Share	% Change
Information	2,222	10.6%	2,766	15.3%	-19.7%
Transportation and Warehousing	27	0.1%	210	1.2%	-87.1%
Administration & Support, Waste Management and Remediation	290	1.4%	569	3.2%	-49.0%
Manufacturing	181	0.9%	804	4.5%	-77.5%
Wholesale Trade	395	1.9%	845	4.7%	-53.3%
Professional, Scientific, and Technical Services	5,614	26.7%	4,300	23.8%	30.6%
Construction	1,212	5.8%	771	4.3%	57.2%
Management of Companies and Enterprises	548	2.6%	803	4.5%	-31.8%
Utilities	0	0.0%	25	0.1%	0.0%
Health Care and Social Assistance	3,427	16.3%	870	4.8%	293.9%
Educational Services	233	1.1%	217	1.2%	7.4%
Real Estate and Rental and Leasing	1,087	5.2%	1,385	7.7%	-21.5%
Finance and Insurance	974	4.6%	1,423	7.9%	-31.6%
Public Administration	26	0.1%	6	0.0%	333.3%
Retail Trade	1,191	5.7%	923	5.1%	29.0%
Accommodation and Food Services	1,641	7.8%	1,035	5.7%	58.6%
Arts, Entertainment, and Recreation	1,538	7.3%	435	2.4%	253.6%
Other Services (excluding Public Administration)	440	2.1%	648	3.6%	-32.1%
TOTAL JOBS	21,046	100.0%	18,035	100.0%	16.7%

Source: OnTheMap, US Census

Industries: Major biotech companies located in South Lake Union include University of Washington Medicine, Fred Hutchinson Cancer Research Center, Seattle BioMed, Seattle Cancer Care Alliance, GroupHealth and PATH. Having a critical mass of biotech firms encourages collaboration and co-tenancy. In addition, the Gates Foundation is located close by, which further ties the area to the cutting edge of global health research.

The growing neighborhood tech and biomed fields also attracted WeWork. The company opened WeWork South Lake Union in 2014 with 55,000 square feet of shared co-working office space. This location currently has more than 1,000 members.

Google announced this year it will be building a new campus with 600,000 square feet of office space, ground floor retail, 150 housing units above its office space, and underground parking. It is expected to bring 3,000-4,000 new employees to the area by 2019. Facebook is also planning to expand in the area, continuing to grow South Lake Union into Seattle's tech frontier.

Residential: In 2014, nearly 3,000 households were living in South Lake Union; roughly triple the number of households in 2000. Vulcan has developed nearly 1,400 units in the past decade and is planning more residential growth. New high-rise projects in the area will add more than 5,000 housing units in the coming years.

Many of the residential units planned are geared to workers in the tech and biomed industries. The new units are primarily rental and geared to childless residents. The residential market is bringing new restaurants and nightlife to the neighborhood, changing the area from a daytime destination into a 24/7 environment. Five large scale affordable housing projects with more than 280 units have been financed by the City of Seattle's Incentive Zoning Program in recent years in South Lake Union.

Future Development: More than 50 new buildings have been constructed in the past decade and more are planned for South Lake Union. The South Lake Union Urban Center zoning changes approved in 2013 allow for increased density through the Incentive Zoning Program that is expected to support the growth of 12,000 households and 22,000 jobs over the next 20 years, exceeding initial growth predictions.

Seaport District - Boston

Background: The Seaport District in Boston contains more than 1,000 acres of waterfront property. Prior to redevelopment, Seaport was a former landfill and a declining port with shipyards, warehouses and surface parking lots. The disconnected and underutilized land was redeveloped as part of Mayor Menino's "Boston Innovation District Plan" launched in 2010 to "create an urban environment that fosters innovation, collaboration and entrepreneurship." The guiding principles of the plan include promoting collaboration, providing public space and programming, and developing a 24-hour neighborhood including new types of housing. Currently the Seaport District includes a mix of industrial space, tech office, "Innovation Labs," retail, residences, hotels, civic space, cultural institutions, and the Boston Convention and Exhibition Center. Since 2000, more than 10 million square feet of development has occurred in Seaport. The prime waterfront real estate overlooking Boston Harbor has been reinvented as a postindustrial destination.

Key Players: Boston Redevelopment Authority in partnership with the Mayor's Office has led much of the planning that has brought about the economic growth in the area. They led a concerted effort to move civic uses to Seaport prior to implementation of the Innovation District Plan.

Developers have been instrumental in re-envisioning Seaport as a mixed-use destination. The Fallon Company was an early investor with the 21-acre Fan Pier development that added three million square feet of office, hotel, marina, open space, retail, and condominiums.

Seaport Square is Boston’s biggest master-planned project. The 23 acres along the harbor are being developed into 20 city blocks. The 6.5 million SF plan includes open space, residential, office, hospitality, retail, restaurant, entertainment, educational, and cultural space. The first phase of construction began in 2012 and continues to shape modern day Seaport.

Civic Uses: The 500,000 SF modern Boston Convention and Exhibition Center (BCEC) opened in 2004 in Seaport, serving as an anchor for future redevelopment and as a buffer between residential and industrial uses. Hotel developers soon followed to capitalize on proximity to the Convention Center, the good views of downtown Boston, and the available land. Last year BCEC hosted nearly 800,000 attendees and generated 615,000 hotel room night stays and \$610 million in economic impact.

The Institute of Contemporary Art opened in 2006 on the waterfront and draws an average of 200,000 visitors annually. The increased visitors have led to an upscale restaurant scene developing on the waterfront.

Transportation: The Central Artery/Tunnel Project, known as “The Big Dig” tore down and rerouted I-93, an outdated, congested elevated expressway, and extended I-90 to the Seaport District and to Logan International Airport. The megaproject was completed after twenty-five years in 2007 at an estimated cost of \$24.3 billion. The project enabled Seaport to be highly accessible and connected to the greater Boston region by private vehicles.

As the public transit component of the Big Dig, the Silver Line BRT was constructed through the Seaport District in a mostly grade-separated underground right of way. The Silver Line provides a connection to Logan Airport and to train service at South Station. The western third of the Seaport District is also walkable to South Station, Boston’s main rail terminus. South Station is serviced by city’s busiest rapid transit line (MBTA red line), 8 of 12 commuter rail lines, and Amtrak Northeast Corridor services. The Seaport Transportation Management Association supports sustainable commute options with programs including carpooling, NuRide & bicycle programs. The Innovation and Design Building has a private shuttle to/from the North Station MBTA and South Station. As more development occurs, there is discussion of expanding the South Station transit hub and adding water transportation to ease congestion.

Workforce: The most recent US Census employment data reports Seaport having more than 34,000 jobs, an increase of 4,000 jobs since 2011 (Figure 3). The largest share of jobs in 2014 was in the professional, scientific and technical services industries with 10,000 jobs, a 42% increase from 4 years prior. 73% of jobs pay more than \$40,000 per year, including many of those added over the past four years. The City of Boston expects 2,500 more jobs to be added to Seaport in the near future.

**Figure 2. Seaport District: Jobs by Industry Sector
2014 & 2011**

<u>Jobs by NAICS Industry</u>	<u>2014 Count</u>	<u>2014 Share (%)</u>	<u>2011 Count</u>	<u>2011 Share</u>	<u>% Change</u>
Information	2,456	7.2%	2,731	9.0%	-10.1%
Transportation and Warehousing	832	2.4%	730	2.4%	14.0%
Administration & Support, Waste Management and Remediation	2,047	6.0%	2241	7.4%	-8.7%
Manufacturing	3,060	8.9%	3031	10.0%	1.0%

Wholesale Trade	1,828	5.3%	1576	5.2%	16.0%
Professional, Scientific, and Technical Services	9,915	28.9%	7003	23.0%	41.6%
Construction	823	2.4%	727	2.4%	13.2%
Management of Companies and Enterprises	678	2.0%	619	2.0%	9.5%
Utilities	0	0.0%	0	0.0%	0.0%
Health Care and Social Assistance	1,001	2.9%	824	2.7%	21.5%
Educational Services	391	1.1%	519	1.7%	-24.7%
Real Estate and Rental and Leasing	1,225	3.6%	927	3.0%	32.1%
Finance and Insurance	3,634	10.6%	4214	13.8%	-13.8%
Public Administration	123	0.4%	798	2.6%	-84.6%
Retail Trade	894	2.6%	754	2.5%	18.6%
Accommodation and Food Services	4,163	12.1%	2981	9.8%	39.7%
Arts, Entertainment, and Recreation	270	0.8%	117	0.4%	130.8%
Other Services (excluding Public Administration)	981	2.9%	652	2.1%	50.5%
TOTAL JOBS	34,321	100.0%	30,444	100.0%	12.7%

Source: OnTheMap, US Census, DPD

Industries: Since the Innovation District plan was completed in 2010; more than 200 new businesses have opened in Seaport. The additions have ranged from major corporations to small startups located within incubator spaces. Major employers in Seaport include Vertex Pharmaceuticals, Manulife Financial, Fidelity Investments, Gillette, PWC and John Hancock. Younger startups include LogMeIn and ZipCar. Manufacturing continues to retain a footprint in Seaport. In 2014, 8.9% jobs were in manufacturing, and Esri estimates there are 75 manufacturing related businesses in Seaport including four breweries. Construction is underway on a 3.5 acre site for a modern manufacturing building. A portion of the Seaport District is still dedicated to maritime and industrial uses including a cruise ship terminal.

Incubator space is key to the progress of the tech economy in Seaport. Clustering companies was part of the vision for the District, and today it is estimated that 40% of new companies are sharing space in lower-cost co-working offices and incubators. These offices promote collaboration across a range of industries including nonprofits, clean tech, education, the creative economy, life science companies, research and development institutes, and social entrepreneurs. The innovation economy also has partnerships with Massachusetts Institute of Technology (MIT) and Harvard that have made Seaport an attractive option for early stage companies.

District Hall is the first ever public innovation center. The dedicated civic space opened in 2013. Built as a public-private partnership, the 12,000 SF space sees 150,000 visitors annually. It was envisioned as an anchor of the economy in the Innovation District Plan.

Residential: The number of residents in Seaport has doubled since 2000, and housing units continue to be in high demand. In order to cater to the workers in the startup fields, Boston Redevelopment Authority has implemented policies to preserve affordability and build workforce housing. Micro-apartments or “innovation units” are studio units from 300-450 SF and have been proposed as one solution. The district also added for sale housing units. This helped build a critical mass and attracted grocery stores and pharmacies.

Pittsburgh

Background: Pittsburgh continues to transition from its heavy industrial past into a leader in technology and biomedical entrepreneurship. Along both the north and south sides of the Monongahela River east of Downtown, planning and economic development efforts continue on three separate but related efforts: The Pittsburgh Technology Center, a 48-acre former steel mill site; South Side Works, located across the Hot Metal Bridge, which includes 123 acres of mixed-use development; and the Ecoinnovation District which will revitalize the Uptown neighborhood. While the planning processes for each of these areas has been distinct, the Urban Redevelopment Authority of Pittsburgh (URA) has been instrumental in implementing a new vision for

this part of Pittsburgh over the past thirty years resulting in a resurgence of jobs, young residents, retailers, research & development facilities, offices, and new infrastructure.

Pittsburgh Technology Center (PTC): The PTC riverfront office park, located in the South Oakland neighborhood less than two miles from downtown, was built on the 48-acre former Jones and Laughlin / LTV Steel Mill site. Purchased by URA in 1983, extensive planning and brownfield remediation was necessary to make the site viable. Initial development, which began in 1993, was supported by a \$54 million TIF investment. The first phase of development was completed in 2001 and resembled a closed office campus type design. In 2007, URA undertook a new planning process intended to add 1 million square feet of office space to the site.

The site has direct access from Interstate 376 and the Three Rivers Trail, but otherwise is cutoff from the neighborhood. PTC is bound by the River on one side and steep escarpment on the other with no local street connections, resulting in the campus style design of PTC.

The anchor tenants for PTC are University of Pittsburgh's Center for Biotechnology and Bioengineering, and Carnegie Mellon Research Institute. The universities, as well as both the public and private sectors, joined together to ensure the success of this project, which has helped advance Pittsburgh's R & D and advanced technologies sectors. As of 2014, nearly 1,000 people were employed at PTC: 50% of these jobs were in manufacturing and 25% were in professional, scientific, and technical services. In addition to the universities, other major tenants include Union Switch & Signal and Aristech.

To enhance the environment for the office and tech workers, restaurants, retail, and landscaped open space along the river are important components of the PTC. Multi-family units are permitted only on the far eastern portion of PTC. The first phase of residential development is expected by June 2017 with 192 units and the second phase of the same size will be completed by 2019.

South Side Works: Directly across the Hot Metal Bridge from the Pittsburgh Technology Center is the 123-acre South Side Works redevelopment. The former LTV steel mill located on the site was shuttered and demolished in the early 1990s. URA acquired the property in 1994, and the Preliminary Land Development Plan was approved in 1998. Public investment of \$128 million helped fund extensive brownfield remediation and the construction of new roads, parking garages, bridges, trails and the South Shore Riverfront Park. South Side Works is adjacent to the eclectic South Side Flats neighborhood and was designed to complement the East Historic Carson Street District. The planning process knit the development and block pattern into the surrounding street system, making it part of the existing walkable neighborhood.

Soffer Organization has been the lead developer on the 34-acre SouthSide Works lifestyle center component of this redevelopment plan (outlined in yellow above.) A total of 3.2 million SF of office, retail, residential, hotel, and entertainment have been built.

Earlier this year, the Southside Marina opened with 320 slips. Adjacent to the lifestyle center other sites capitalized on their proximity to medicine and higher education, the University of Pittsburgh Medical Center developed sports medicine facilities, and the Pittsburgh Steelers built their training facility as part of this site redevelopment.

The most recent Census employment figures estimate nearly 4,000 jobs have been created as part of the 123-acre site redevelopment. These jobs are in a diverse set of industries and income levels. More than 25% of the jobs are within the retail trade, accommodation, and food service sectors, while another 25% are employed within the professional, scientific, technical services and management fields. The city envisions 5,400 jobs will be created once the site potential is fully built out, as there continues to be developer interest to build more office buildings.

Until 2012, residential uses were restricted to one 270-unit building; since the ban was lifted, more than 500 residential units have been built, for a total of 800 with plans for more. The most recent residential development was a 264-unit building with ground floor retail. This building included affordable "nano" apartments which are 400 square feet.

Pittsburgh is utilizing the EcoDistrict urban regeneration model based out of Portland, Oregon to drive this plan. This plan is intended to upgrade the Uptown-West Oakland, neighborhoods which are currently pass through zones between downtown and Oakland. This area west of the Pittsburgh Technology Center has seen years of disinvestment, blight and population decline. This plan aims to rebuild this neighborhood from the ground up, utilizing community input and considering economic, environmental, and equality issues. The plan aims to bring more residents, jobs and attract new investment to the neighborhood.

Proposed transportation improvements include a BRT line that will connect Downtown to the west and the major Universities to the east, placing Uptown in the middle. BRT will be key to capturing spillover and synergy from both sides into the Ecoinnovation District. Additional improvements include adding more pedestrian and bicycling infrastructure in the neighborhood.

Overview: Over the past fifteen years both PTC and South Side Works have seen resurgence in jobs and incremental growth in residents. The Ecoinnovation district planning process is intended to reverse decades of decline, therefore their demographics and employment data are excluded for the purpose of this analysis. With the first housing units planned for PTC and more units excepted in South Side Works the number of residents and households is set to grow in the near future.

Nearly 5,000 people are employed between PTC and South Side Works in Pittsburgh, almost 3,000 more than in 2002. The former steel mills sites have returned as job centers with a diverse set of industries represented.

**Figure 3. Pittsburgh Technology Center and South Side Works: Jobs by Industry Sector
2014 & 2002**

Jobs by NAICS Industry Sector	2014 Count	2014 Share (%)	2002 Count	2002 Share	% Change
Information	155	3.2%	115	6.7%	34.8%
Transportation and Warehousing	17	0.4%	2	0.1%	750.0%
Administration & Support, Waste Management and Remediation	145	3.0%	116	6.8%	25.0%
Manufacturing	527	11.0%	524	30.5%	0.6%
Wholesale Trade	380	7.9%	147	8.6%	158.5%
Professional, Scientific, and Technical Services	633	13.2%	206	12.0%	207.3%
Construction	164	3.4%	49	2.9%	234.7%
Management of Companies and Enterprises	483	10.1%	0	0.0%	
Utilities	80	1.7%	0	0.0%	
Health Care and Social Assistance	97	2.0%	70	4.1%	38.6%
Educational Services	132	2.8%	28	1.6%	371.4%
Real Estate and Rental and Leasing	269	5.6%	104	6.1%	158.7%
Finance and Insurance	203	4.2%	46	2.7%	341.3%
Public Administration	32	0.7%	1	0.1%	3100.0%
Retail Trade	402	8.4%	51	3.0%	688.2%
Accommodation and Food Services	686	14.3%	17	1.0%	3935.3%
Arts, Entertainment, and Recreation	218	4.5%	69	4.0%	215.9%
Other Services (excluding Public Administration)	170	3.5%	172	10.0%	-1.2%
TOTAL JOBS	4,793	100.0%	1,717	100.0%	179.1%

Source: OnTheMap, US Census

Other Cities

Additional research was conducted to identify other cities where traditional industrial areas had been redeveloped and revitalized with non-industrial concentrations and combinations of office, commercial, residential, and recreational space. Four sources were used to identify potential cities for further review:

1. **Knowledge Capitals.** In its report “Redefining Global Cities: The Seven Types of Global Metro Economies,” the Brookings Institution states that “knowledge capitals” are the world’s leading-edge creation centers, each of which has high value-added segments of the economy and relies on their stock of human capital, innovative universities and entrepreneurs, and relatively sound infrastructure connectivity.² The report identified 17 cities in the U.S, plus Stockholm and Zurich, as knowledge capitals.
2. **Locations for National Network for Manufacturing Innovation.** Research organizations such as the Brookings Institution have identified “advanced industries,” which they define as “industries that display above-average R&D

² Trujillo, Jesus Leal, and Parilla, Joseph, “Redefining Global Cities; The Seven Types of Global Metro Economies,” The Brookings Institution, Metropolitan Policy Program, 2016.

[research and development] spending as a share of total sales and employ a workforce in which the average worker is expert in at least one discrete STEM [science, technology, engineering, and math] field.”³ Recognizing the importance of these industries, the U.S. Department of Commerce, working with other federal agencies, created the National Network for Manufacturing Innovation (NNMI).

This initiative, which began in 2012, has funded teams of organizations in several cities including Chicago, to encourage “advanced manufacturing,” which the program defines as “new ways to create existing products and the creation of new products emerging from the use of new technologies.”⁴ Nine nonprofit organizations in nine cities received grants from the National Network for Manufacturing Innovation. Each awardee combines resources—such as local universities and colleges; federal laboratories; and federal, state, and local governments—to create institutes that address high-risk challenges in advanced manufacturing. Although the program planned to select manufacturing innovation institutes in 15 cities for funding before the end of the Obama administration and up to 45 cities over a decade, nine institutes have been selected to date.

3. **Surging City Center Job Growth Locations.** A recent analysis by the City Observatory found that downtown employment centers are recording faster job growth than areas located further from the city center. Based on an analysis of 41 of the nation’s 51 largest metropolitan areas for which data were available between 2007 and 2011, the report found that 21 city centers out-performed the surrounding metropolitan areas. For this analysis, “city centers” were defined as areas within three miles of each region’s central business district and were compared with the remainder or periphery of each metropolitan area.⁵ The analysis focused on the 15 of these cities where employment growth occurred. The remaining six cities out-performed peripheral areas only because their employment losses were less than those in the remainder of the metropolitan areas.
4. **Cities with Diversified Manufacturing.** As part of an analysis of the future of manufacturing in the U.S. and the geographic distribution of various industry categories, the Brookings Institution identified one category of metropolitan manufacturing employment as “diversified manufacturing.” As designated by the Brookings Institution in “Locating American Manufacturing: Trends in the

³Muro, Mark, Fikri, Kenan, and Andes, Scott, “Powering Advanced Industries: State by State,” the Brookings Institution, Metropolitan Policy Program, 2014, page 4.

⁴“National Network for Manufacturing Innovation Program: Strategic Plan,” Executive Office of the President, National Science and Technology Council, Advanced Manufacturing National Program Office, February 2016, page 1.

⁵ Cortright, Joe, *Surging City Center Job Growth*, City Observatory, February 2015.

Geography of Production,” diversified manufacturing areas have a wide range of manufacturing employment and are not focused on specific industry clusters. The report identified seven large metropolitan areas with diversified manufacturing: New York, District of Columbia, Atlanta, Miami, Dallas, Chicago, and San Francisco.⁶

From these sources, 48 cities were examined for additional potential case studies that could provide insights for development of the North Branch Industrial Corridor (see Figure 4).

Figure 4: Cities Considered for Additional Case Study Analysis

Cities	Identified by Key Sources				Other Criteria			
	Brookings Institution "Knowledge	City Observatory - City Centers Growth	National Network for Manufacturing Innovation	Brookings Institution Large	Located in Former Manufacturing Zone	Located in Central City	Innovation/Technology Focus	Mix of Uses**
1 Atlanta	X	X		X				
2 Austin	X	X					Yes	
3 Baltimore	X	X						
4 Boston	X				Yes	Yes	Yes	Yes
7 Charlotte		X						
8 Chicago	X	X	X	X	Yes	Yes	Yes	Yes
9 Cambridge			X		No	Yes	Yes	Yes
13 Dallas	X	X		X				
14 Denver	X	X			Yes	Yes	No	Office/Res id.
15 Detroit			X		Yes	Yes	Yes	New
16 Hartford	X	X						
17 Houston	X	X				Yes		
18 Indianapolis		X						
21 Knoxville			X					
23 Los Angeles		X	X		No	Yes	Yes	New
25 Miami		X		X	Yes	Yes	No	Yes
26 Milwaukee		X			Yes	Yes	Yes	Yes
27 Minneapolis	X	X			Yes	Yes	No	No
28 Nashville		X						
29 New Orleans		X						
30 New York		X		X	Yes	Yes	Yes	Yes
31 Oklahoma City		X						
32 Orlando		X						
33 Philadelphia	X	X			No	Yes	Yes	Yes
34 Pittsburgh		X			Yes	Yes	Yes	Yes
35 Portland, Oregon	X	X						
36 Raleigh			X		No	No	Yes	Yes
38 Rochester		X	X		No (in CBD)	Yes	Yes	No Site
42 San Diego	X	X						
43 San Francisco	X	X		X	Yes	Yes	Yes	Yes
44 San Jose	X	X	X		Yes	No	Yes	New
45 Seattle	X	X			Yes	Yes	Yes	Yes
47 Washington, DC	X			X	Yes	Yes	No	Office/Res id.
48 Youngstown, Ohio			X			Yes	Yes	
*As defined by the Brookings Institution, "Locating American Manufacturing: Trends in the Geography of Production," page 18.								
**Mix of commercial and light industrial uses. May or may not also include residential uses.								
Shading indicates insufficient information.								

⁶ Helper, Susan, Krueger, Timothy, and Wial, Howard, "Locating American Manufacturing: Trends in the Geography of Production," The Brookings Institution, Metropolitan Policy Program, April 2012, page 18.

Findings

- **Many of the cities that received Manufacturing Innovation program funds do not yet have facilities in place in specific districts or have only limited facilities.** Of the nine funded Manufacturing Innovation Institutes, none are located in established areas that were previously industrial and now have advanced manufacturing facilities. For example, America Makes—the National Additive Manufacturing Innovation Institute in Youngstown, Ohio—is located in a small building near downtown, but it does not appear to be part of a broader industrial area that has similar manufacturing activities. Similarly, Lightweight Innovations for Tomorrow, in Detroit, is housed in an industrial building in the Corktown neighborhood, west of the central business district, and there are plans for an offshoot of the Knoxville-headquartered Institute for Advanced Composites Manufacturing Innovation to locate in the same building. However, other related activities have not yet located in the Corktown area.
- **There appear to be limited case study options in metropolitan areas with diversified manufacturing.** None of the seven cities identified by the Brookings Institution as having diversified manufacturing were deemed to merit further research. For example, the Brooklyn Navy Yards in New York City has redeveloped a previous industrial area with a mix of commercial and residential uses, but does not include comparable manufacturing facilities. Also, San Francisco's 5M Project plans to redevelop four acres adjacent to the central business district with commercial and residential uses; however, only a small section of the project area was previously industrial. In Washington DC, several riverfront developments plan mixed commercial and residential uses, some of which are on previously industrial sites, but none include advanced manufacturing uses.
- **We found no additional case study options among "knowledge capitals."** The initial case studies already identified in Seattle and Boston appears to be the best examples of innovation districts in the 17 cities that the Brookings Institution identified as knowledge capitals in the U.S. Some cities, such as San Jose, are not major central cities for metropolitan areas and have suburban-style innovation areas. Information on developments in other major metropolitan cities did not reveal innovation districts that focus on manufacturing. Districts in Houston and Dallas, for example, are largely focused on medical- and health-related activities, and a redevelopment area adjacent to downtown Denver has only commercial and residential development.
- **Center city job growth locations that we examined do not appear to have innovation centers.** We did not find additional case study options among the 15 cities that the City Observatory identified as having substantial recent central city job growth. For example, Nashville has a former industrial area that now has residential, office, and arts-related uses but minimal industrial uses and no

advanced manufacturing uses. Similarly, Milwaukee's former Menomonee Valley industrial area now has added some new industrial office, commercial, and arts and recreational uses while preserving and enhancing environmental wetlands; however, the area could not be considered an innovation district.

Industrial/Manufacturing Tech Anchors

South Lake Union in Seattle, the Seaport District in Boston, and districts outside of downtown Pittsburgh serve as case studies for the evolution of new knowledge-based enterprises in former industrial areas and as noted earlier these districts meet the Brookings Institution's definition of "innovation districts." In reviewing other cities, it appears that these are the examples. In addition, it appears that the North Branch Industrial Corridor is currently unique in the cluster of four anchors focused on aspects of manufacturing.

WRIGLEY'S GLOBAL INNOVATION CENTER (GIC): Opened 2005

- High-performing associates in a state-of-the-art facility spark creativity and foster collaboration.
- Three levels of flexible lab and office space and Winter Garden.
- Adjoining Pilot Plant tests new machinery and manufacturing processes, and samples produced are used for screening prototypes, consumer testing and analytical evaluations.

UI LABS and its 300+ partners: Opened 2015

- A first-of-its-kind innovation accelerator addressing problems too big for any one organization to solve. Issues in manufacturing and smart cities: computing, big data, & the Internet of Things.

mHUB: Opened 2016

- Chicago's first Innovation Center focused on physical product development and manufacturing working to ensure Chicago's legacy as a region that builds products, and also the future.

GE FUSE at mHUB: Opened in 2017

- A first-of-its-kind partnership, with a combined vision for innovation, and to connect people and technologies to solve some of the world's biggest problems through rapid prototyping and small scale manufacturing.

Currently, these four anchors provide the core of an innovation district focused on industrial technology/advanced manufacturing. These anchors are more similar to research and university institutions than they are to a manufacturing company and are compatible and similar to many companies in the information and technology sector. More importantly the research and design work of these anchors can be used by manufacturers throughout Chicago Industrial Corridor System, the region and possibly the nation.