

NETWORK GOVERNANCE AND LOCAL INDUSTRIAL POLICY: “MAKER” AND MANUFACTURER ECOSYSTEMS IN U.S. CITIES



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2015 study: www.urbanmakeconomy.org

POLICY FOR “MAKERS” VS MANUFACTURERS IN THE U.S.



THE AVENUE

**Five ways the Maker Movement
can help catalyze a
manufacturing renaissance**

Mark Muro and Peter Hirschberg - Wednesday, January 4, 2017

THE AVENUE

“Making” in America

- Driven by changes in production technology & shifts in consumer demand
- Minimally policy-driven – self-organized and decentralized
- Urban



Maker typologies

- Product & technology
 - “Inventors” (hardware, connected devices, “Internet of Things”)
 - “Artisans” (craft goods, local food)
(Wolf-Powers & Levers 2016)

- Employment generation potential
 - *Micromakers*
 - *Global Innovators*
 - *Emerging Place-based Manufacturers*

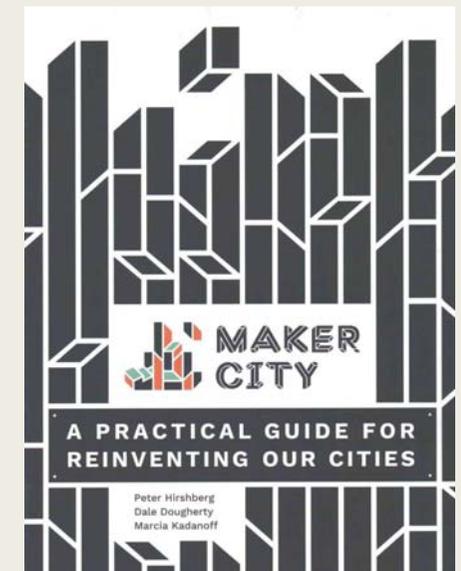
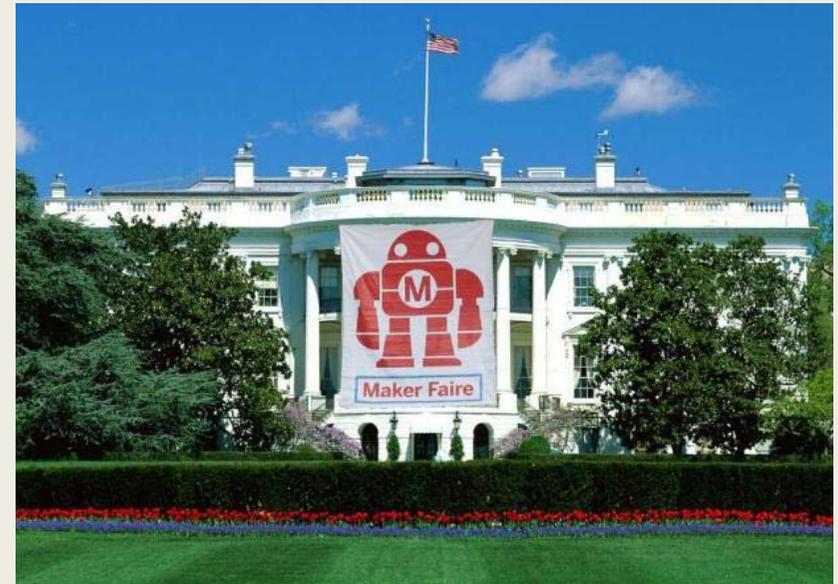
(Wolf-Powers et al 2017)



Policy and governance

- Urban economic governance – networks of mutual dependence; heterarchy (Bailey, Cowling & Tomlinson 2015)
- But real estate focus of local economic development policy can be problematic for manufacturing (Curran, 2007)
- ... and standard “Just Add Makers” approach overlooks linkages between maker ecosystems and existing industrial capabilities.
 - *Opportunities to leverage related variety are lost.*

(Eisenburger et al, 2018)



Research questions

- Do makers and legacy manufacturers in U.S. cities rely on distinct sets of institutions, affinity groups and support organizations?
- What is **local industrial policy** doing to bridge gaps, encourage collaboration between manufacturers and makers (input sourcing, contract production, design for manufacturability, technology transfer)? Can the developmental network state be localized? (Block, 2008)
- In this context, is policy addressing network failures?
 - *Failures of trust resulting from excessive opportunism*
 - *Failures of competency resulting from isolation from information, or from lack of access to skill*

(Whitford & Schrank, 2011)

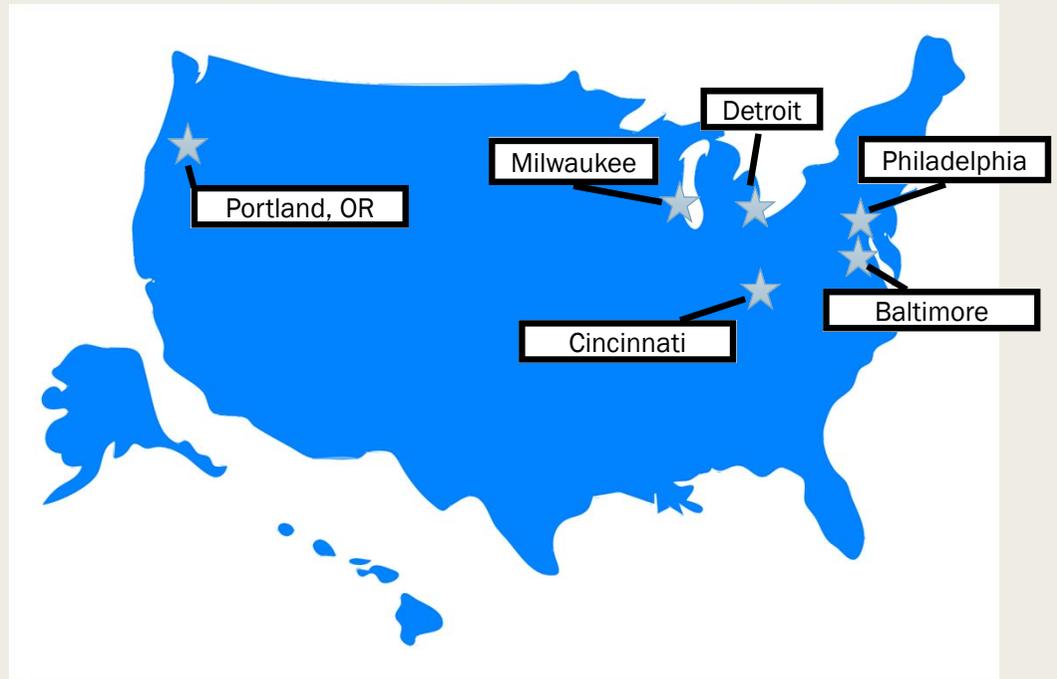
“STATE OF URBAN MANUFACTURING” STUDY



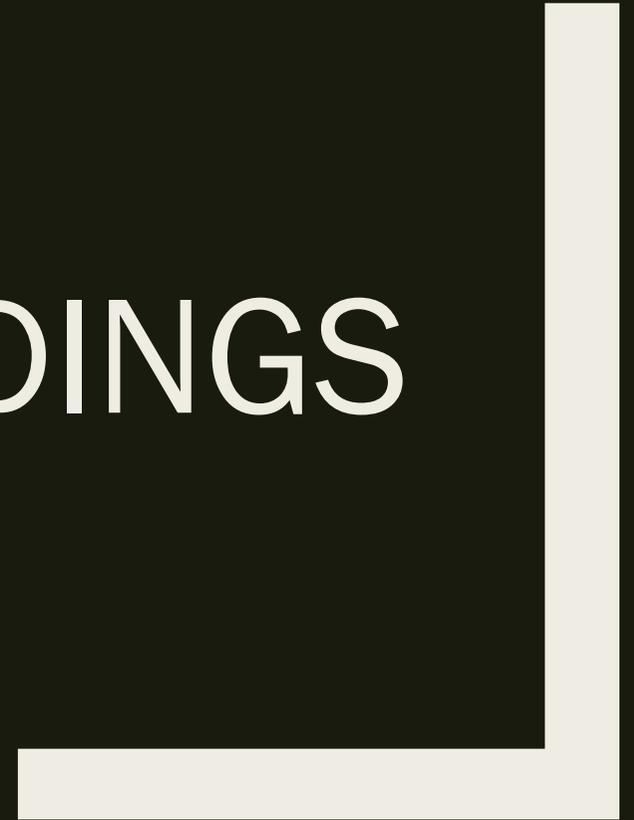
Urban Manufacturing Alliance

<http://www.urbanmfg.org>

- Survey of makers and manufacturers (N=568)
 - *What are their growth barriers?*
 - *For what issues would they seek support?*
 - *What organizations have they worked with?*
- “Ecosystem mapping” survey (N=215)
 - *Whom do they serve?*
 - *What functions do they perform?*

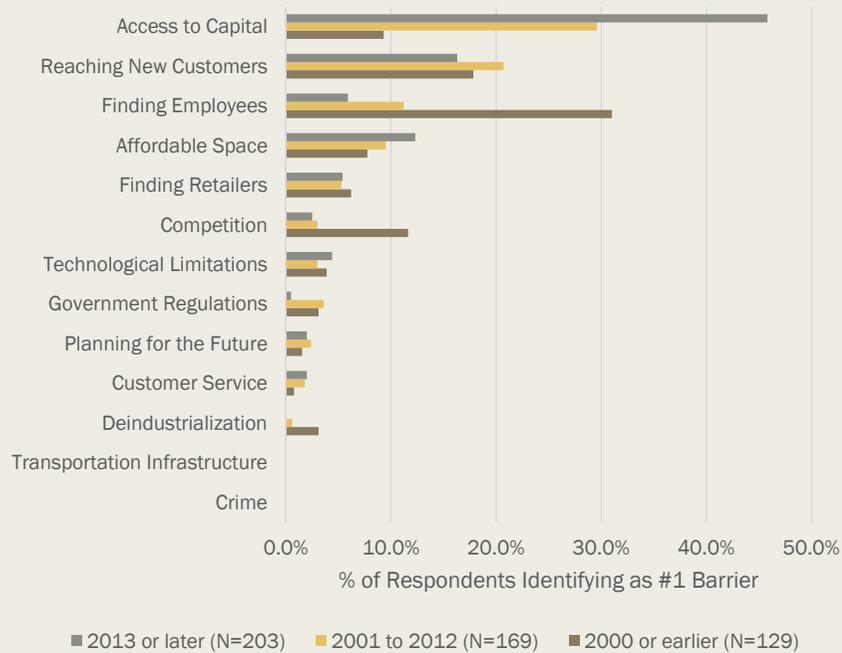


FINDINGS

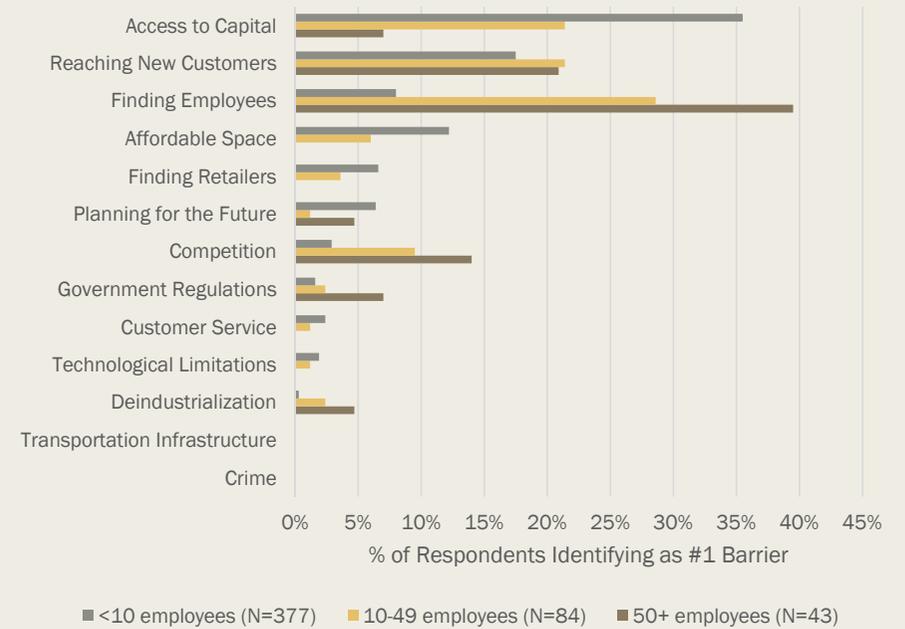


Distinct barriers and challenges

#1 Growth Barrier by Founding Year



#1 Growth Barrier by Company Size



Distinct institutional orbits

Organizations accessed by company founding year

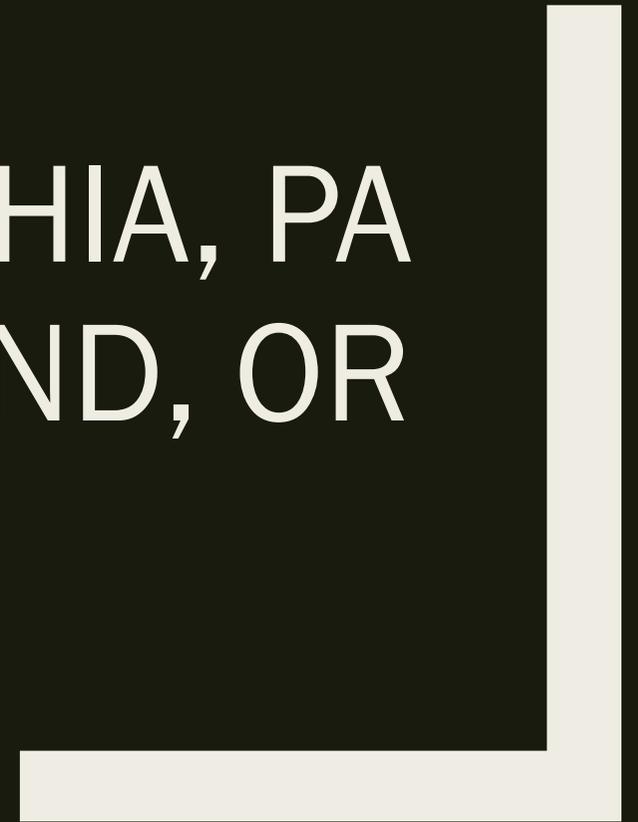
Portland	2000 or earlier (%)	2001-2012 (%)	2013 or later (%)
Oregon Manufacturing Extension Partnership	29	13	0
Worksource Oregon (WD agency)	38	6	0
Prosper Portland (city econ dev org)	8	11	7
ADX Portland (Makerspace)	13	9	21
Portland Made Collective (local brand platform)	8	17	21
Mercy Corps NW (CDFI)	4	11	29

Philadelphia	2000 or earlier (%)	2001-2012 (%)	2013 or later (%)
Manufacturing Alliance of Philadelphia (trade assn)	34	11	0
Delaware Valley Industrial Resource Ctr. (Manufacturing Extension Partnership)	19	11	0
PhilaWorks (WD agency)	13	7	0
Philly Industrial Dev't Corp	28	14	6
NextFab Studio (Makerspace)	13	7	31
Bok Building	0	7	14

Prevalence of for-profit intermediaries in maker ecosystems

Function	Examples
Real estate/co-working spaces	MaKen Studios/Bok Building (Philadelphia) The Platform (Detroit)
Technology access/peer learning	ADX (Portland) NextFab (Philadelphia) The Manufactory (Cincinnati) The Foundry (Baltimore)
Sales & marketing platforms	MadeHere PDX (Portland) Portland Made Collective Milwaukee Makers Market
Advising	NEWaukee (Milwaukee) Portland Incubator Experiment Supply District (Detroit)

CASES: PHILADELPHIA, PA & PORTLAND, OR



Philadelphia, Pennsylvania

- Loss of 300,000 manufacturing jobs between 1950 and 1980, an additional 79,000 between 1980 and 2000. Hard hit: textiles/apparel, machinery, metals
- City manufacturing employment in 2016 was 21,217 (decline of 44% since 2000 and 23% since 2008)
- Shift in city self-image – eds and meds, , tourism and entertainment, technology and innovation (innovation district meme)

University City Science Center Plans Massive Live-Work Innovation Hub

Wexford Science + Technologies unveiled its grand plans this week.

BY JAMES JENNINGS | JUNE 12, 2015 AT 8:39 AM



The central public square | Rendering: Wexford Science + Technology, Photos: James Jennings

Manufacturing in Philadelphia

- A regional rather than a local ecosystem (job declines have been less dramatic in suburban counties – currently 160,000 jobs in region vs. 21-22K in city)
- Industrial service and advocacy organizations are largely regional
- Remaining strengths in city: chemicals and petroleum, machinery, transportation equipment
- Policy and subsidy have focused on incubating start-ups and creating/facilitating innovation campuses – **but dominated by office properties.**



“Making” in Philadelphia

- Self-organized, yet loosely organized, **and separate**, communities of designer/makers and hardware entrepreneurs
- Most are not connected to public sector resources (in part by choice), though about 1/4 have relied on SBA Small Business Development Centers
- A variety of maker spaces and incubators, and co-working spaces (NextFab, University of the Arts, Drexel) use a variety of revenue models: not-for-profit, for-profit, university-affiliated
- District-building strategies are the remit of real estate entrepreneurs who recognize makers and makerspaces as assets for creating buzz, attracting high-end retail and residential activity



Bridging interventions

- City interest in promoting hardware firms (“inventors”) as part of start-up/innovation strategy
- Incipient effort to connect city-based hardware entrepreneurs with manufacturers regionwide, sponsored by the [Delaware Valley Industrial Resource Center](#)

Four Challenges Facing Philadelphia Hardware Entrepreneurs

Success for hardware entrepreneurs means getting a product to market and achieving financial sustainability or an exit. Entrepreneurs need a wide sphere of relationships to address their many development challenges from product design, to engineering and market validation, to mass production. Philadelphia’s hardware startups lack the ability to collaborate across the ecosystem. SecondMuse learned of four barriers that inhibit entrepreneurs’ ability to build and maintain momentum on their journey towards sustainability:

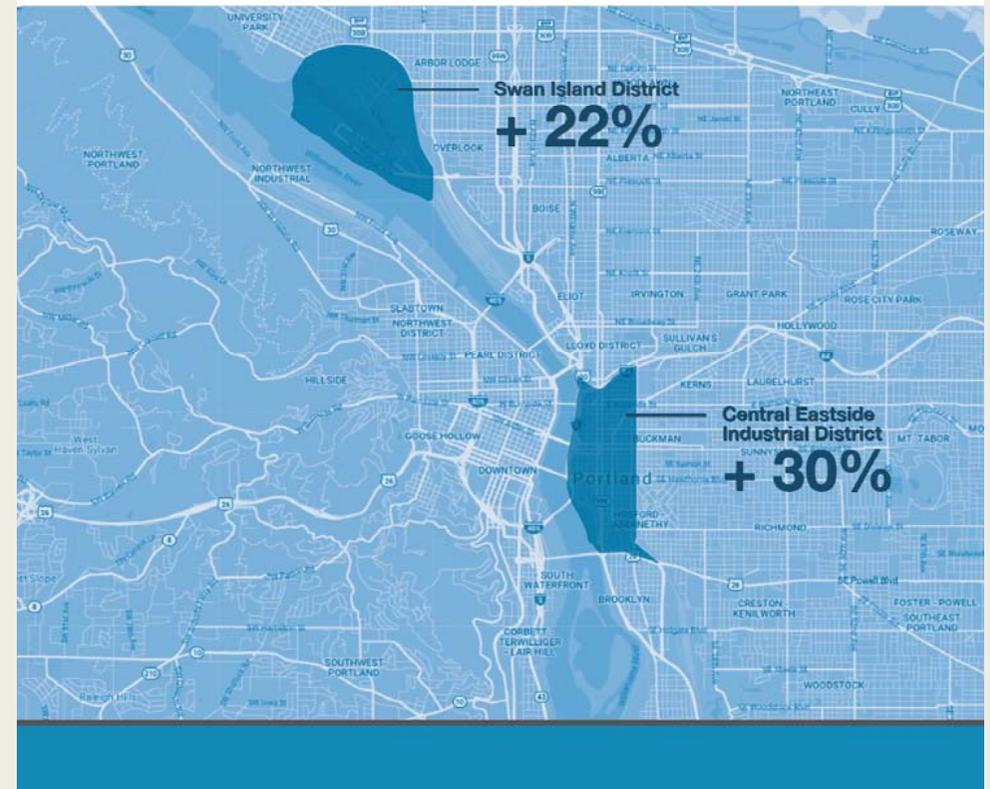
- **Access to Small-Batch Production:** A gap exists for startups in the validation stage of development, where production requirements are too large for labs and makerspaces and yet too small for manufacturers. Even with limited resources, local hardware entrepreneurs said they are willing make a significant investment in small run production because so many other resources are contingent on their ability to do so.
- **Access to Talent:** Funded or not, startups typically cannot afford to pay market-rate salaries for designers, engineers and other product specialists; and the local supply is scarce. As specialists are crucial, early-stage hires a common workaround is to hire them part-time, as needed. Early stage hiring is largely relationship-driven, deepening social barriers to underrepresented groups entering the sector. As startups grow and begin staffing a production line, they value workers’ ability to learn and problem-solve, above all.
- **Access to Manufacturing and Supply Chains:** Entrepreneurs and manufacturers have much to learn and much to gain from one another. Though technological advances have lowered barriers to production, hardware

SecondMuse, *Understanding Hardware Entrepreneurship in Greater Philadelphia: How Local Startups Navigate the Region’s Advanced Manufacturing Ecosystem* (2018)

Manufacturing in Portland

- The City of Portland adopted an “industrial sanctuary” policy in the 1980s that severely limits the extent of non-industrial uses within industrial zones
- Urban Growth Boundary has helped maintain a denser, more urban form that encourages supply chain connections.
- “Advanced Manufacturing” is a focus of the city’s cluster-based economic development strategy. Two other clusters – Athletic & Outdoor equipment and “Cleantech/Green Cities” – primarily focus on service and design functions but include some manufacturers

Figure 6: Portland Industrial District Map



Employment in two industrial districts in Portland grew by 22 and 30 percent respectively between 2010 and 2016
(Source: State of Urban Manufacturing Study, Portland Snapshot)

“Making” in Portland

- As in Philadelphia, largely self-organized, but much institutionalized. [ADX](#), a makerspace and community-building organization, founded in 2010, was pivotal in building a “Portland Made” brand platform
- Artisanal makers have strong ties to the local tech community, Strong network of firms and organizations supporting hardware start-ups
- Retail outlets such as MadeHere PDX and Crafty Wonderland provide retail access for makers in visible downtown and commercial district locations. Patronizing local producers, especially local food makers, is a significant cultural phenomenon.

Policy

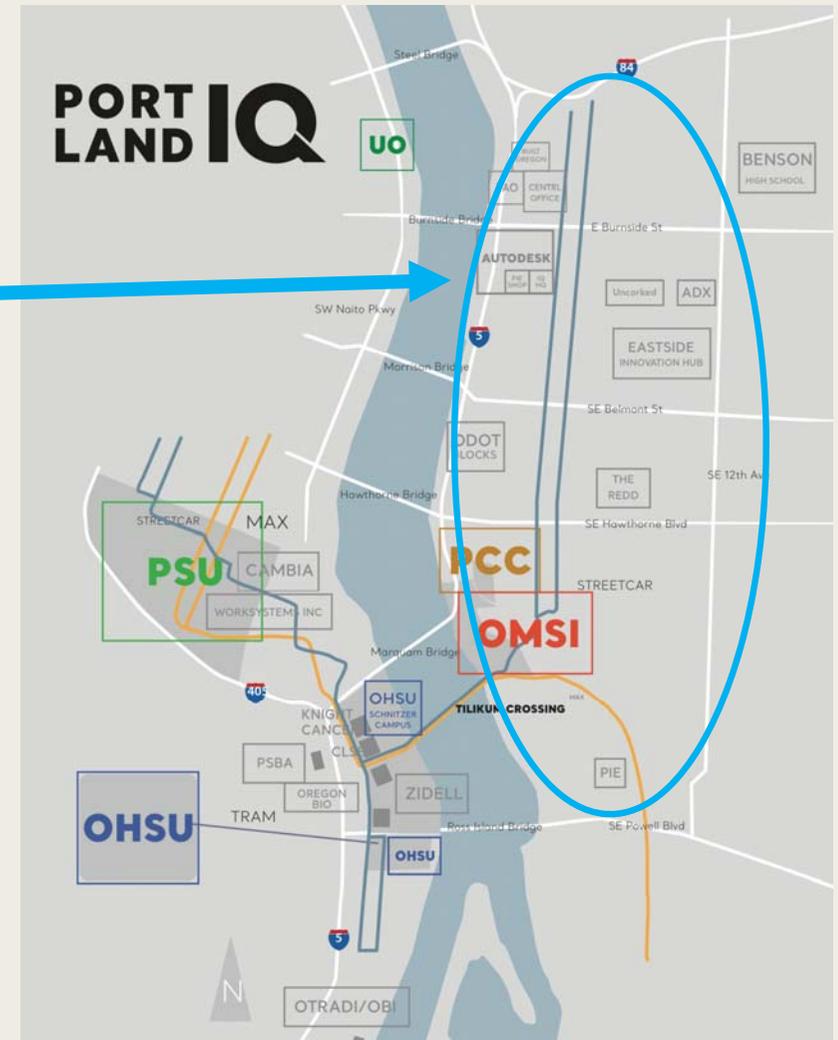


Bridging strategy – Central Eastside Industrial District

- Policy practitioners are trying deliberately to facilitate interaction and exchange among artisanal makers, tech-oriented makers and legacy manufacturers in the **Central Eastside Industrial District (CEID)**,
- **Innovation Quadrant** initiative is university-driven and involves local universities and the Oregon Museum of Science and Industry in an effort to place research, design, product development, early-stage prototyping, and production into geographic proximity.

Challenges:

1. Land market pressures in CEID (Autodesk move)
2. Persistent difficulty for makers in of finding and accessing the capacity of larger manufacturers



Implications for theory and policy

- At the local level, it is possible for government to engage in industrial policies – specifically, brokering and facilitation– that evoke the Developmental Network State identified by Block (2008). **The [scale of the urban district](#) can be a locus for policy efforts to stimulate interaction and cross-fertilization among researchers, designers, fabricators and manufacturers.**
- Maker/manufacturing ecosystems in cities are characterized by forms of network governance supported by the local state. The most significant network failure to overcome is opportunism on the part of real estate market actors. This is difficult considering the strong incentives that local officials in the U.S. have to engage in property-led economic development policy.

Thank you! aw2416@hunter.cuny.edu; gschrock@pdx.edu

POSITIONING INDUSTRIAL LAND FOR INVESTMENT

In addition to updated zoning classifications, industrially-zoned land should be managed with the application of three distinct but complementary industrial policy typologies – Industrial Protection Areas, Industrial Intensification Areas, and Transitioning Areas. These geographically-based typologies represent a set of policy interventions, including zoning. They are based on existing land use conditions and are intended to protect and grow the industrial job base within the city.

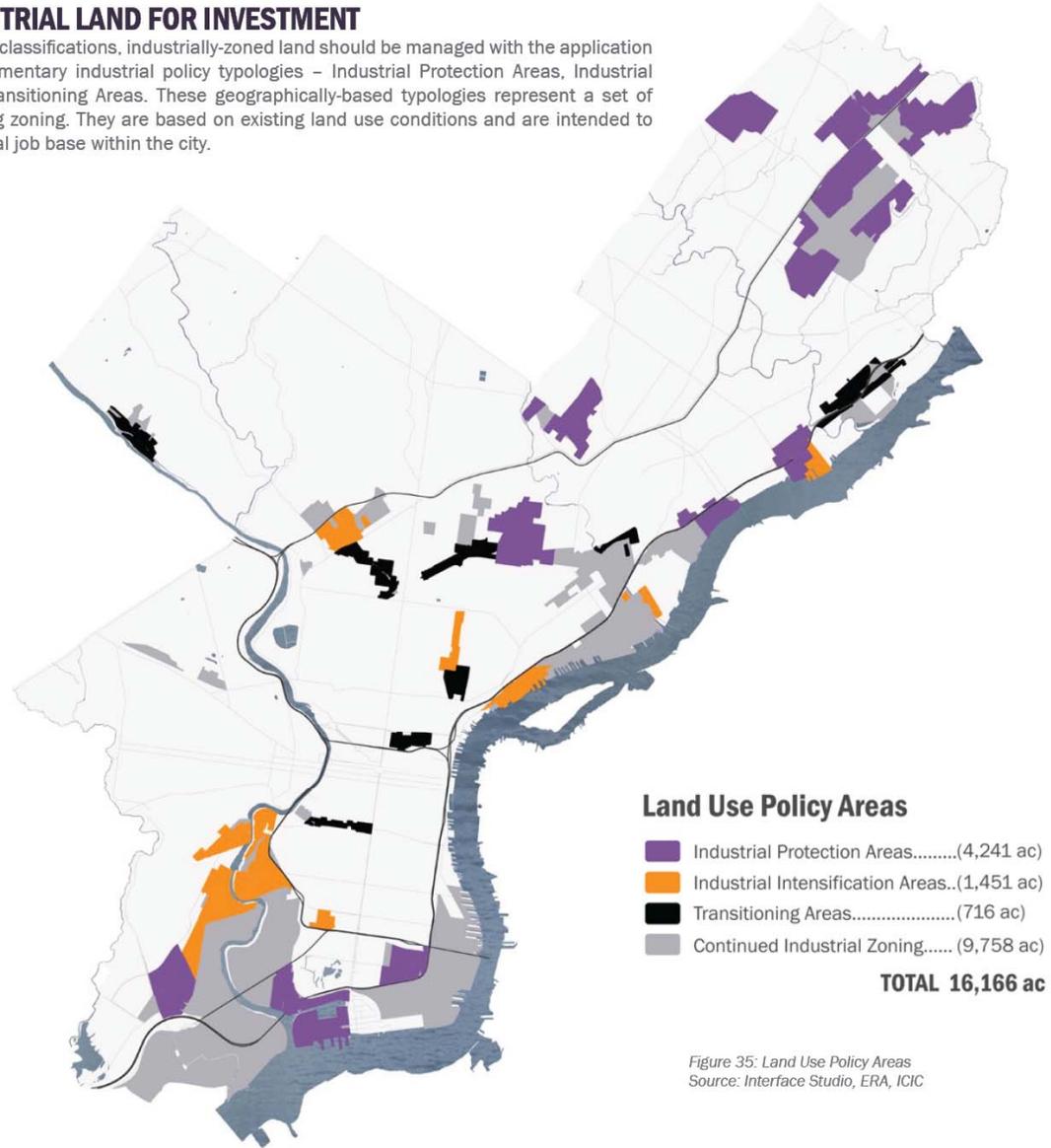


Figure 35: Land Use Policy Areas
Source: Interface Studio, ERA, ICIC