

**POLICY BRIEF**

# FROM MAKING TO MANUFACTURING

**A NEW MODEL FOR ECONOMIC  
DEVELOPMENT IN CITIES AND TOWNS**

NATION OF MAKERS



# OVERVIEW

Urban manufacturing is being reborn in the United States. New small-batch producers are creating well-paying jobs in many cities that were once abandoned by more traditional manufacturers. Increasingly, technology is shrinking the size of factories and reducing their harmful environmental impacts, allowing them to be located close to their consumers to respond quickly to market demands. Greater access to production technologies is making it possible for designers and entrepreneurs to innovate and create jobs by producing small runs, testing markets, refining designs and then launching new businesses.

Moreover, perceptions are shifting; “making,” “producing” and “manufacturing” are becoming more valued and respected activities. That renewed interest is stimulating the growth of a new wave of maker entrepreneurs, inspiring new curricula to support our next generation of manufacturers and encouraging consumers to look for locally made products.

Our cities and states have always been laboratories for testing new programs and policies. Their on-the-ground problem-solving vitality can be used to create new models for capitalizing on the resurgence of making and urban manufacturing. Further, cities are piloting new types of land use and zoning, education and vocational training, technology assistance, financing and procurement programs to stimulate the growth of a new high-value manufacturing sector, address the growth in income disparity and build models for more equitable, inclusive economic growth. In addition, cities and school districts are bringing production and making back into the classroom as a new way of engaging young adults to improve academic performance and to teach entrepreneurship.

With the appropriate support from city, state and federal governments, successful models can be expanded and “lifted up” so that they can be replicated in cities across the country. For example, the Urban Manufacturing Alliance <http://urbanmfg.org>, a network of economic development experts in more than 145 cities, has formed “communities of practice” to bring cities together so that they can share their research, programs and experience in a number of areas including strengthening local supply chains through “Made In” campaigns, modernizing antiquated factories through non-profit ownership and connecting workforce development organizations, businesses and schools to ensure that curriculum and skills meet real business standards.

The policy brief outlines strategies that are being developed, piloted and tested at the local level and which the federal government should help support and replicate. This should be done through a federal competitive grant program that creates opportunities to identify and promote successful examples of local efforts of cities, counties or regions to strengthen their manufacturing sectors and replicate successful programs. The brief also includes a new process to measure success through the creation of a Resilient Jobs Index to be developed by the Brookings Institution <http://brookings.edu>.

The success of the “cities as laboratories” model rests on (1) the diversity of local economies; (2) their ability to coordinate efforts and services to capitalize on local resources and strengths; and (3) the type of comprehensive approach that builds long-term competitiveness. Federal assistance, however, is often siloed by agencies making it difficult to coordinate services for cities seeking to comprehensively address land use, education and other needs. There are examples of agencies coordinating their grant-making (such as HUD, DOT and EDA collectively reviewing and selecting proposals for funding) which can serve as models. Federal agencies will have to collaborate to ensure that cities have both the resources and the flexibility to implement their strategies in a holistic, impactful manner.

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### MEASURE OUTCOMES BY RESILIENT JOBS CREATED

## ABOUT

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In 2016, the Maker City project published a book entitled *Maker City: A practical guide to reinventing our cities* based on the experiments fielded in 100 cities. These experiments were a direct result of an Obama White House Initiative in 2014, a challenge that was coordinated through the President’s Office of Science and Technology Policy.

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# REBUILDING A HIGHLY-SKILLED WORKFORCE

- 1. Bring Production Into The Schools:** Creating new types of technical training that teaches skills in the use of modern production equipment such as 3D printers, CNC routers and laser cutters, along with entrepreneurship is a way to engage more young adults and strengthen academic performance. These educational opportunities can expand access to production jobs at a time when additive manufacturing technologies are requiring a whole new skill-set to enter the sector. For example;
  - Pittsburgh started out by placing a Makerspace inside a single school. From this evolved the Dream Factory: a set of integrated classrooms where young people learn how to use computers, 3D printers and CNC tools to create robots, drones, et. al.
  - In Boston, The Possible Project created makerspaces in a public housing development and public schools, partnering with private sector companies to offer STEM and entrepreneurship training to low-income youth.
  - In Baltimore, the Digital Harbor Foundation runs both a year-round after school program for 3rd-5th graders that gives them hands-on projects at the intersection of art, technology, and making. Their Maker Foundations program for middle and high school youth is a 14-week exploration into emerging technology topics where they design and 3D print their own creations, learn to program games, make a website and produce electronics.
- 2. Capitalize On Communities' Business Leaders To Identify Technology And Training Requirements:** Technology is rapidly evolving and different regional clusters have different educational and training needs, therefore it is essential to bring the business community into the development of educational programming:
  - In Chicago, the Manufacturing Renaissance, an alliance of business and labor, operates a very successful public school which prepares young adults for careers in metalworking.
  - In Denver, CareerConnect, run through Denver Public Schools, engages students through project-based courses and experiential learning opportunities in specialized career pathways, developed and implemented in partnership with manufacturing leaders. Learning about design, engineering, and technology in an applied setting prepares students for both higher education and careers in some of Colorado's highest-growth and highest-opportunity industries.
- 3. Leverage colleges and universities to fuel maker ecosystems.** We can catalyze manufacturing growth by encouraging neighborhood academic institutions to offer training in the modern tools of production (e.g. CNC tools, robotics) and to open up their facilities - particularly Makerspaces - to residents:
  - In Rocklin, CA HackerLab, a private Makerspace, partnered with Sierra College, the local community college, to build a secondary space on campus, for student use. As one of the first community colleges in the United States to establish a public-private partnership with a community Makerspace, they offer a significantly reduced rate for students (\$12.50/month), which grants them use of the space and tools, and access to training and workshops to refine their skills.
  - In Indianapolis, Purdue University is supporting RUCKUS, a brand new Makerspace, by donating some equipment to their facility for general community use. The University is also partnering with Indianapolis Public Schools to create a local high school, Purdue Polytechnic. With a heavy emphasis on learning by doing, the curriculum will give graduates deep knowledge, applied skills, and experiences in the workplace.

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- 4. Create An Apprenticeship Training System:** Other advanced industrial countries have developed expansive apprenticeship models that coordinate education (through institutions similar to our community colleges) with on-site training with subsidized wages. Many business owners prefer to do their own training, particularly where they have developed a relatively unique produce or process that requires a sophisticated, nuanced skillset.

# STRENGTHENING SUPPLY CHAINS TO SCALE AND ANCHOR COMPANIES

- 5. Leverage Services From Anchor Education Institutions:** Many schools now help launch new businesses through incubation and technical assistance programs that provide faculty, grad students and low cost space. These initiatives tend to be concentrated in the sciences and business schools and have not been adopted by schools with strengths in industrial and product design, graphic and digital communications, (including marketing) and even environmental science and management, all of which may be critical to the success of a manufacturing business:

- In Brooklyn, NY, Pratt Institute, one of the nation's premier schools of art and design, has created the Made In NYC Fellowship program which assembles teams of faculty and students to provide companies with a wide range of "communications" assets, from digital photography, videos and logos to package design, marketing plans and websites. While numerous cities are implementing "made in" campaigns to encourage consumers to buy locally made products to strengthen their local economies, none except Made In NYC are using local university talent.
- In Holland, the RDM Rotterdam uses a waterfront industrial park to combine opportunities for industrial companies to both try the latest technologies and to use the expertise from faculty and students in the surrounding universities to address specific challenges the companies are confronting and to prototype new products. <https://www.rdmrotterdam.nl/en/about-rdm/>

- 6. Support "Made In" And "Place-Based" Campaigns Capitalizing On Local Strengths And Heritage:** Cities across the country are witnessing the launch of "Made In" campaigns that encourage residents to shop for locally made products. Some cities, such as Portland, include city procurement policy to encourage local purchasing. Such efforts both provide a way for entrepreneurs to reach their markets and anchor companies to their home cities by creating value and competitiveness out of the company's location. A related strategy supports business branding efforts based on an area's heritage or renown industry clusters:

- In Cincinnati, a city with a celebrated history of beer brewing, a local community development corporation recognized the neighborhood's strategic position for both small-batch production and local tourism. The Over The Rhine Brewery District now works to bring craft brewers and beer lovers together to support the local economy.
- In Nashville, a Fashion Alliance was launched to serve the needs of the 150-odd fashion brands within the city. By creating the infrastructure to support and grow the local fashion industry, they are driving economic development as well as providing support for their members as they grow their businesses.
- In the Bay area, San Francisco, Oakland, San Jose and Fremont are collaborating on programming that will strengthen several of their regional supply chains which will benefit each city.

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# ENSURING MODERN SPACE FOR MANUFACTURING

The manufacturing sector has restructured – where large manufacturers that made “commodity” products have largely left, smaller manufacturers that make high-value, customized and small-run products or that are part of strong regional supply chains are growing. Older factories designed to be owned and occupied by a single large company need to be modernized as multi-tenanted, rental buildings that have a mix of companies that can be curated to create synergies between the companies and that recruit locally. Finally, industrial space needs to be affordable and stable to offer long term leases such that manufacturers feels secure and can reinvest in their plant, equipment and workers.

- 7. Clarify Zoning To Protect Industrial Space:** Many cities have antiquated zoning that allows many non-industrial uses such as superstores, hotels and mini-storage facilities that compete for space, and push out more job-intensive manufacturers. San Francisco and other cities have developed zoning focused on preserving space for manufacturing. Non-industrial uses which fuel real estate speculation are not allowed, just like a large apartment building would not be permitted in a neighborhood of single-family homes. And alongside protecting industrial areas, creative zoning mechanisms can be used to thoughtfully design mixed-use neighborhoods with opportunities for light manufacturing. For example, Nashville, TN, Indianapolis, IN, and Somerville, MA. have pursued zoning strategies that create more space for production in a wider variety of neighborhoods. Artisan zoning can encourage a hybrid of production and retail, which may help generate more revenue for some manufacturers.
- 8. Support Non-Profit Community Ownership Of Manufacturing Space:** Non-profit ownership has proven to be a successful model for the redevelopment and management of space. First, while rents have to cover costs, they are insulated from real estate speculation which creates long-term stability so companies have the confidence of knowing they will not be evicted and can invest in plant, equipment and workforce training. Second, the non-profit managers can select tenants based on a variety of policy goals including strengthening a regional cluster, adopting environmentally sustainable business practices or committing to hire locally or from disadvantaged groups such as ex-offenders. Third, public capital funds can be used to subsidize the cost of space and equipment to both make it more affordable and to create assets for the community. In New York, the Brooklyn Navy Yard, the Greenpoint Manufacturing and Design Center and other smaller non-profits now manage more than 4 million square feet of industrial space and have experienced tremendous job creation. To build on that success, the City has established an Industrial Development Fund that provides grants and loans to non-profit organizations to help them purchase and renovate old industrial buildings.
- 9. Prepare Innovation Districts For Long-Term Success:** Many cities are adopting “innovation strategies” that seek to capitalize on their artistic and other intellectual assets to stimulate new business and job creation by establishing Innovation Districts that bring together a mix of uses, from artists, artisans, designers, architects and other creative sectors to manufacturers and residents. These uses can afford different levels of rent and as a district “succeeds,” rent levels often increase pushing out the lower rent uses and undermining both the eclectic qualities that make the area attractive and the public policy rationale for the district. Cities need to ensure a diversity of spaces and rents through mixed use zoning that protects the mix, through non-profit ownership that preserves the lower-rent uses and building the mix into any publicly funded projects.

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## 10. Make high-speed broadband low-cost internet access a municipal priority:

Ensuring access to the internet in all areas of a city helps make an entire city ready for business, which both opens up more space for makers and other businesses and brings jobs into more neighborhoods, but helps eliminate the “homework divide” that is becoming an obstacle to academic performance. Chattanooga efforts to expand internet access illustrate one city’s approach.

# MEASURE OUTCOMES BY RESILIENT JOBS CREATED

The success of economic development efforts should be measured by their ability to create “resilient jobs.” City, state and federal programs should be encouraged to adopt metrics that ensure that public funds are spent responsibly to help workers to move into the middle class, to help businesses make investments that they would not otherwise be able to make, and to help cities increase their competitiveness and to adopt programming that advances equity and inclusion. For example, some of the metrics might include the extent to which the jobs are part of a local supply chain (such that at least 50% of the product is made locally), that pay at least \$20/hour and where the employer has a demonstrable commitment to collaborating with his city or county to recruit a diverse workforce and to up-skilling workers on an ongoing basis.

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## ADDITIONAL RESOURCES

### Urban Maker Economy

<http://www.urbanmakereconomy.org>

### Prototyping Equity

<http://prattcenter.net/eie/strategies/>

### Maker City: A practical guide to reinventing our cities

<http://makercitybook.com> - FREE online version

<http://mcbook.me/amaz100> - available for purchase on Amazon

### How to Start a Locally Made Brand Toolkit

<http://urbanmfg.org/uma-content/uploads/2013/05/UMA-Local-Branding-Toolkit-Final1.pdf>

### Non-Profit Real Estate Development Toolkit

<http://urbanmfg.org/uma-content/uploads/2013/03/NonProfitRealEstateDevelopmentToolkitFINAL.pdf>

### Maker-to-Manufacturer Toolkit (by SFMade)

<http://www.sfmade.org/blog/make-to-manufacture-advanced-manufacturing-playbook/>

© 2017 Maker City Project on behalf of itself and its partner organizations. Our non-profit fiscal sponsor is Gray Area Foundation for the Arts. Our partners in this effort include: Nation of Makers, Pratt Center for Community Development, and the Urban Manufacturing Alliance. The Maker City Project wrote the book on the Maker City (2016), with support from the Ewing Marion Kauffman Foundation, and works to accelerate economic opportunity inside our cities and towns, to create jobs capable of lifting people into the middle class. One of our core projects in 2017 is to work with U.S. News to create a ranking of Maker Cities in the U.S.

### To reach us and our partners:

Brookings Institution  
- <http://brookings.edu>

Nation of Makers  
- <http://nationofmakers.us>

Maker City Project  
- <http://makercity.com>

Pratt Center for Community  
Development  
- <http://prattcenter.net>

Urban Manufacturing Alliance  
- <http://urbanmfg.org>

Ewing Marion Kauffman Foundation  
- <http://www.kauffman.org>