

Report - July 2016

Making It Here: The Future of Manufacturing in New York City

A new wave of modern manufacturing companies are adding jobs across New York City, breathing new life into a sector that had been left for dead. Three of the city's manufacturing fields are particularly well positioned for growth in the years ahead: 3D printing, metal and wood fabrication, and food.

by Charles Euchner

- The following is the introduction to *Making It Here*.
- Read the full report (PDF).
- View the recommendations from the report.
- View the data from this report.

New York City's manufacturing sector received another dose of bitter news in January when Cumberland Packing, the maker of Sweet'N Low, announced it was shutting down its Brooklyn factory and eliminating all 300 of its jobs in the borough. The decision was only the latest example of a large New York City–based manufacturer opting to close its doors or relocate operations out of the city, following recent exits by pita manufacturer Damascus Bakery, jewelry maker Frederick Goldman, Inc., matzo baker Streits, and adhesives manufacturer AP&G.

But unlike years past, the departure of traditional manufacturers like Cumberland is now being counteracted by a new wave of modern manufacturing companies that are adding jobs in the five boroughs and breathing new life into a sector that was all but presumed dead as recently as five years ago.

This report is a publication of the **Middle Class Jobs Project**, a research initiative made possible

by the generous support of **Fisher Brothers** and **Winston C. Fisher**.

Previous publications in this series include "Manufacturing in NYC: A Snapshot" (November 2015) and "The Rise (and Fall) of Middle Wage Industries in NYC" (May 2016).

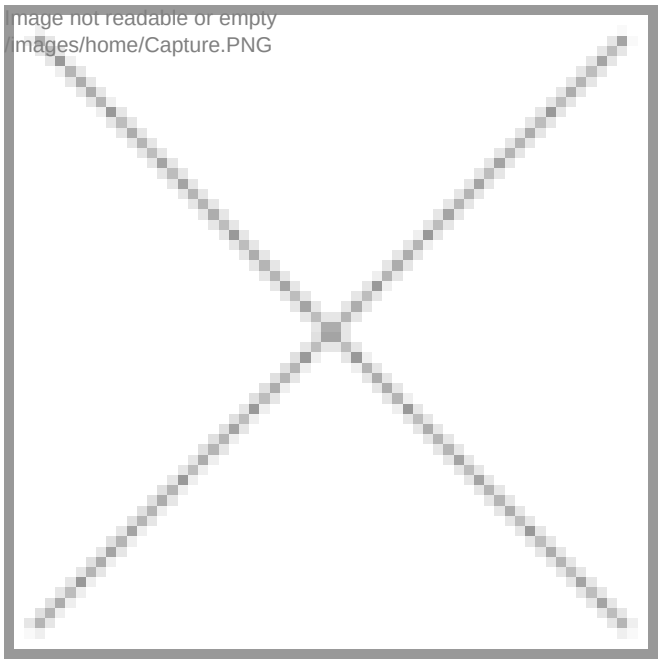
The city lost an average of 8,370 manufacturing jobs a year between 2001 and 2011, bringing the sector's employment total below 75,000 jobs for the first time since the rise of the industrial city. But since then, from April 2011 to April 2016, the city's manufacturing sector has grown by 3,900 jobs, including 1,100 jobs in the last twelve months. This hardly makes manufacturing one of the city's leading growth industries. Manufacturing accounted for just 0.8 percent of the 513,500 new private sector jobs added citywide over the past five years and the sector now makes up just 2.1 percent of all private sector jobs in the city, down from 5.7 percent in 2000 and 9.1 percent in 1990. But it represents the city's longest period of sustained manufacturing growth in several decades and a much-needed shot in the arm for a sector that still provides a crucial source of middle-class jobs.

This report examines whether this growth can continue and which segments of the city's manufacturing sector offer the greatest promise. The report—the latest publication of the Center for an Urban Future's Middle Class Jobs Project, a research initiative funded by Fisher Brothers and Winston C. Fisher—also assesses what obstacles might inhibit additional job creation in the sector and what government policies could help ensure that the city's manufacturing revival continues.

We conclude that there is clear potential for additional manufacturing growth in the five boroughs. However, our research suggests that some parts of the city's manufacturing ecosystem offer significantly more promise than others. In particular, we find that three sectors are well positioned for future growth: 3D printing, metal and wood fabrication, and food manufacturing.

For this report, we asked dozens of industry experts—including company owners, leaders of industry associations and local development corporations, investors, economists, and academics—where they are seeing the most manufacturing growth in the city and which sectors are bestpositioned for future growth.

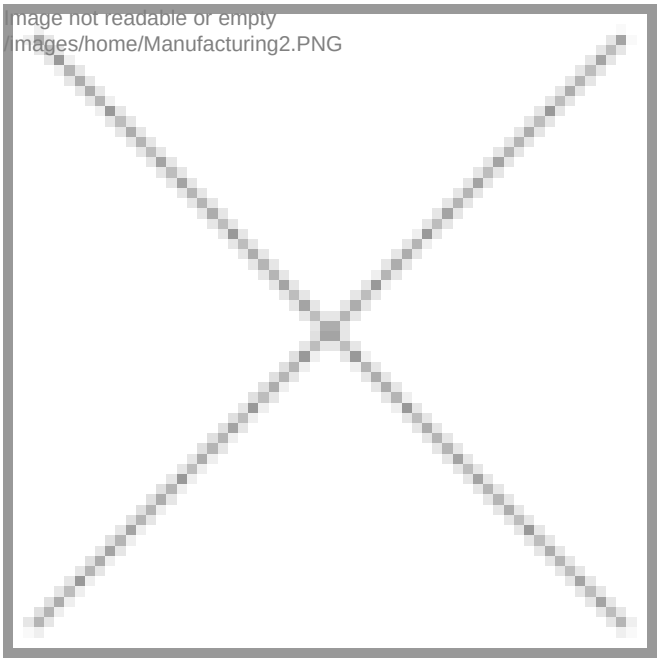
The broad consensus is that the city's recent industrial growth is being driven by a new kind of manufacturing: small, entrepreneurial companies that are making specialty products mainly for individual consumers and businesses in the region. These makers and manufacturers are producing in small batches with quick turnaround times, investing in new technologies, capitalizing on connections to the city's thriving creative industries—including design, fashion, and film—and taking advantage of powerful demographic, economic, and consumer trends. For instance, some are tapping into New York's status as a leading center in the back-to-local movement, where a large and growing mass of consumers are demanding locally made, artisanal products. Others are benefiting from the city's rapid growth in affluent residents, many of whom are willing to pay a premium for custom-made products.



Even the most optimistic manufacturing experts that we interviewed caution that many traditional manufacturers will continue to struggle. Indeed, even as employment in the sector has ticked up in recent years, the number of manufacturing firms

citywide has declined from 5,976 in 2011 to 5,752 in 2015.

What we heard, again and again, is that New York's competitive advantage in manufacturing today—and its best hope for growth in the future—is undoubtedly with small firms that operate in niche markets and take advantage of modern production processes. Labor market data supports this. In 2015, the average manufacturing company in the city had just 13.4 employees (down from 17.3 in 2000) and the average manufacturer in Brooklyn had 12 workers (down from 16.8 in 2000). In comparison, manufacturing companies in New York State employ 26.3 workers on average.



Small specialty producers are thriving in a variety of sectors, including fields where the overall employment trends have been negative, such as apparel manufacturing. With the right policies in place, opportunities exist to scale up companies in many of these sectors.

However, the experts we interviewed suggest that three of New York City's manufacturing fields are particularly well positioned for growth in the years ahead: 3D printing, metal and wood fabrication, and food manufacturing.

3D Printing

There are no longer many manufacturing sectors where New York can boast a competitive advantage, but 3D printing is one of them. One of the industry's leading online platforms, 3D Hubs, reported in July 2016 that New York "continues its reign as the 3D printing capital of the world." According to its data, accessed in mid-July, New York is home to 3,739 makers and 516 3D printers, far ahead of second place Los Angeles (which has 2,557 makers and 410 printers), third place London (3,326 makers and 358 printers), and fourth place Paris (2,069 makers and 313 printers).

New York is widely known as the home base for 3D printing pioneers MakerBot and Shapeways. However, New York today is home to dozens of companies and thousands of makers in the 3D printing space. This includes companies that moved here from elsewhere—including Matter, a firm founded at MIT that relocated to Brooklyn in 2014—as well as a growing number of start-ups that were established by former staffers of MakerBot and Shapeways.

Although New York's 3D printing industry has undoubtedly suffered setbacks in the past year—MakerBot recentlyannounced that it would be outsourcing production and eliminating 200 Brooklyn jobs—the industry experts we interviewed are optimistic that the city is poised for additional growth. Indeed, many of those experts say that the industry is entering a new phase of growth, going beyond the production of individual products to develop applications for a wide range of businesses, from aerospace to healthcare. Overall, the 3D printing industry is expected to grow from $4.98 billion in 2015 to $30.19 billion by 2022, according to private research firm MarketsandMarkets. As we detail in this report, New York is well positioned to capture some of this growth.

Fabrication

Metal and wood product fabrication is hardly the best known industrial sector, but it is the city's third-largest manufacturing industry, and one of a handful that has experienced employment growth in recent years. From 2011 to 2015, employment in the sector increased by 6 percent, from 6,570 to 6,980 jobs.

The city's metal and wood fabrication companies have benefited from growing demand for high-end interiors, finishes, and furniture. Much of this has been fueled by the city's sharp rise in affluent residents, whose luxury condos and second homes

in the Hamptons often include custom furniture, metal railings, contemporary chandeliers, spiral staircases, and other handcrafted wood and metal furnishings. The explosion in high-end retail stores and restaurants has created additional market opportunities for New York's skilled fabricators, as has the booming office market, the thriving film and television production sector, and a healthy museum and gallery sector.

As the city's massive luxury consumer market continues to grow, there are ample opportunities for New York's metal and wood fabricators to expand further.

Food

Of the twenty largest American cities, only two experienced a greater percentage increase in food manufacturingemployment between 2005 and 2015 than New York. In the five boroughs, employment in the sector increased by 27 percent during this period, from 13,929 jobs in 2005 to 17,682 in 2015. That's a faster rate of growth than Houston (where food manufacturing jobs increased by 15 percent), Seattle (+10 percent), San Francisco (-3 percent), Los Angeles (-11 percent), Chicago (-11 percent) and every other large U.S. city other than Phoenix (+45 percent) and San Jose (+28 percent).

Also benefiting from a growing luxury market, food became the city's largest manufacturing sector, as measured by jobs, surpassing the apparel manufacturing industry in 2014. Food now comprises 28 percent of all manufacturing jobs in Brooklyn, 27 percent in the Bronx, 26 percent in Staten Island, 21 percent in Queens, and 16 percent in Manhattan.

A growing number of the city's food and beverage manufacturers have succeeded in distributing their niche products beyond the five boroughs. However, there are clear opportunities to scale up more of the city's food production companies.

Each of the three manufacturing sectors profiled in this report—3D printing, metal and wood fabrication, and food—have the potential to add hundreds if not thousands of additional jobs in the years ahead. There are also opportunities for growth in other manufacturing sectors, especially among small-batch manufacturers that cater to the local market and invest in technology.

But as we heard in our interviews, none of this growth is certain. Given that so many of the most successful manufacturers in the city are making products for consumers and businesses in the region, a slowing local economy could easily erase many of the recent employment gains. At the same time, manufacturing firms in the city face enormous hurdles. Some of the barriers—such as the diminishing availability of affordable industrial space—have plagued local companies for years. But other obstacles are fairly new. For instance, many of the manufacturing company executives interviewed for this report—particularly in 3D printing and fabrication, but also in apparel manufacturing and other sectors—cited challenges finding employees who have the advanced skills required for the kinds of jobs that are currently growing.

To its credit, the de Blasio administration has taken several important steps to address some of these barriers and support manufacturing. But more could be done. This report lays out ten recommendations to strengthen and support the kinds of manufacturing that have the strongest growth potential in the years ahead.

With the right support, New York can benefit from ongoing job growth in manufacturing—a sector that continues to provide New Yorkers from a range of backgrounds with a crucial pathway to the middle class.

The following are the recommendations from *Making It Here*.

Read the full report (PDF).

The new wave of manufacturing in New York City looks very different than its predecessors. Old-style manufacturing produced goods in mass quantities for sale at low prices. But technology and globalization have pushed mass production out of the city. In its place, a smaller and more inventive manufacturing scene is growing, creating a dizzying variety of products in smaller batches for more discerning consumers.

The initial successes of manufacturing's new wave hold promise not just for creating thousands of new jobs, but also for incubating companies that take advantage of New York's growing diversity, exceptional creative industries, boutique financiers, and strategic location. To support and expand the new manufacturing, policymakers should focus on the demands of the twenty-first century rather than attempt to recover a lost age.

Refocus New York City's industrial strategy on the kinds of manufacturers poised to grow here.
If the future of manufacturing in New York City lies in small-scale companies making niche products, then city and state economic development officials should refocus its industrial toolkit to target these kinds of businesses. For example, the average manufacturing company in the city today has 13.1 employees, down from 17.4 employees in 2000. In Brooklyn, the average manufacturer has twelve workers. Unfortunately, city and state industrial programs are not always aimed at businesses of these sizes. Although city and state economic development agencies both have important programs to support local manufacturers, more could be done to reorient their industrial strategies to support small makers and manufacturers.

Revise the state's Excelsior Jobs Program to support small manufacturers.
In 2010, New York State replaced the much-maligned Empire Zone tax incentive program with the Excelsior Jobs Program, which is more focused on supporting high-growth companies in manufacturing, tech, biotech, and clean-tech. Although the switch made sense in most respects, the Excelsior program has one huge downside: its requirements put city manufacturers at a big disadvantage.

Unlike the Empire Zones program, Excelsior requires participating manufacturing companies to create ten new jobs to qualify for tax credits. But most new manufacturing companies in the city cannot project that many new jobs at once. Even established manufacturers would struggle to qualify for the program. Excelsior's quarterly report for September 2015, for example, shows 753 companies that qualify for Excelsior benefits; only 133 are from the city, and of those only 30 are manufacturing companies.

Develop a scale-up strategy for city manufacturers.
In recent years, scores of new makers and manufacturers set up shop in the five boroughs. Today, there is a tremendous opportunity to help some of these entrepreneurial businesses, many of which have fewer than ten employees, to expand to a level where they have 15, 25, or even 50 employees. Growing beyond the start-up stage will not only increase the overall number of jobs, it will widen the opportunities for middle-income positions that are accessible to workers from low-income backgrounds.

A scale-up strategy should include new and expanded programs to help small manufacturers export their products to new markets, including cities in the United States with similar population dynamics to New York, as well as markets overseas. A support program could also target makers who primarily sell their products at food markets and street fairs by providing technical assistance and financing support to help them open permanent facilities or simply scale up their operations.

Pair local manufacturers with New York–based industrial designers and engineers.
The nation's largest manufacturers typically have in-house industrial design and operations teams that help streamline and improve their production and distribution processes. But few of New York City's small manufacturerstake advantage of industrial designers and engineers in this way. Given that so many manufacturers in the city operate on razor-thin profit margins and face increasingly intense competition, overlooking the opportunity to tap existing resources is a missed opportunity. These companies could greatly benefit from design-focused efforts to improve efficiency and productivity.

City economic development officials should consider launching a new program that pairs local manufacturers with New York-based industrial designers and engineers. Such a program would take advantage of the city's large and growing population of designers, and could be developed in partnership with the local chapter of the Industrial Design Society of America and design universities such as Pratt, School of Vision Arts, Parsons School of Design, Fashion Institute of Technology, and New York Institute of Technology, as well as the industrial engineering departments at Columbia University and New York University.

Invest in intermediaries that help strengthen local manufacturers.
In addition to design and engineering services, low-margin manufacturers could greatly benefit from technical assistance in areas such as technology, management, and logistics. The city already has an organization with this mission: the Industrial and Technology Assistance Corporation (ITAC). ITAC provides below-market consulting assistance to help companies create a growth plan, invest in innovative technologies, find reliable workers, improve the work culture, manage the supply chain for costs and agility, and use financing wisely.

The services ITAC offers are arguably more important than ever, given that the city's manufacturing sector is showing more promise than at any time in decades, but its funding has been cut in recent months. In January 2016, the state announced a 54 percent cut in its contribution to ITAC. After the cuts, the state now provides $166 per manufacturer in the city, compared with $800 per company statewide, according to Crain's New York. This disinvestment is a blow to New York's resurgent manufacturers.

Zeynep Ton of the Massachusetts Institute of Technology argues that most companies are rife with inefficiencies that erode their competitive edge. By optimizing operations manufacturers can significantly increase their margins with little additional investment. To boost manufacturing in the city, the state and city should restore ITAC's funding or create new providers of subsidized consulting to meet the needs of companies with growth potential

Expand and improve job training programs that help New Yorkers develop the advanced skills needed by today's manufacturing firms.
Manufacturing has long provided opportunities for low-income New Yorkers with limited educational credentials or language skills to access decent paying jobs with career ladders. But many of the jobs being added in the sector today, in fields such as 3D printing and metal fabrication, require an advanced level of skills that many New Yorkers from low-income backgrounds are missing.

To ensure that a diverse mix of New Yorkers can access jobs in the sector—and that the city's manufacturing companiescan find the skilled workers they need to grow—city and state economic development should invest in new and expanded workforce development programs. Policymakers should support workforce training programs whose curricula are informed by strong connections to employers in the field and programs that teach both soft skills and technical skills for jobs in specific sectors. In particular, these programs should expand on the intensive training centers established in recent years at industrial campuses such as the Brooklyn Navy Yard, Industry City, Brooklyn Army Terminal, and Liberty View Plaza.

To its credit, the de Blasio administration has already taken some important steps, including the creation of a newWorkforce1 Industrial and Transportation Career (ITC) Center at the Brooklyn Army Terminal in Sunset Park. But policymakers should

seize opportunities to expand these training initiatives and create similar workforce development programs at manufacturing hubs in other boroughs.

Build new career and technical programs that teach advanced manufacturing skills.
New York City should create and support hands-on training programs that prepare young people for careers in advanced manufacturing. Many school districts in upstate New York offer technical education programs that train students for these jobs. For instance, a precision machining training program in Sullivan County trains students "to design, create, and machine creations using computers and high tech tools." Class topics include shop math, precision measurement, blueprint reading, shop safety, bench tool skills, and layout skills. Then students learn how to use factory-level machines, often under the guidance of employees from local manufacturers. They also work in internships or apprenticeships with local companies.

New York City could benefit from programs like these that have strong buy-in from local manufacturers and teach young people in-demand skills that are portable in today's technology-driven economy. One such program is on the way. The city's Department of Education (DOE) is working with the Brooklyn Navy Yard to develop a promising model for job training called the STEAM Center. STEAM—Science, Technology, Engineering, Arts, and Math—will offer students from eight city schools hands-on learning and work-based opportunities at the Navy Yard. STEAM is developing advisory groups for six industry sectors: culinary arts, systems technology, computer science, structural engineering, engineering, and media design. The program will also provide after-school programs and professional development for teachers.

Pooling students from several schools into different programs, according to Navy Yard CEO David Ehrenberg, allows "better and more intensive resources" than school-based programs. "A lot of kids will graduate high school with a credential which will allow them to enter the workforce at a totally different level than a standard high school degree or one of the current CTE credential, which is improperly conceived for today's industry," says Ehrenberg.

Local educators and economic development officials should continue to support the development of the program at the Navy Yard, measure its outcomes, and consider the potential to replicate the model at other manufacturing campuses in the five boroughs. DOE and the Navy Yard should also commit to keeping open the STEAM center in the evenings, so that adults looking to upgrade their skills can take advantage of the facility's equipment and teaching opportunities when high school students are not using it.

Expose students to new technologies.
City schools should introduce new technologies to students as early as middle school. Jack Plunkett of Plunkett Research argues: "Policymakers should show people that additive manufacturing can make a real difference. That means boosting education and training—skills like CAD-CAM and hands-on work. If you visit college libraries like Purdue University, they have two, three 3D printers in the library. College kids on well-funded campuses are getting their hands on it, so it's not intimidating to them. I would make the experience possible all the way down to junior high school."

To encourage skills development for all ages, the city might consider giving all learners a skills dossier— an electronic record that documents the skills students have demonstrated in classroom and on-the-job work. This dossier, which can be maintained by smartphone and via web-based apps, could help people share their abilities with employers throughout their careers. It could also indicate what new skills people need to learn to advance to new positions. With appropriate privacy filters, the dossier could be connected to the city's municipal ID card.

City officials should offer platforms for employers to connect existing training programs and dossiers to companies searching for labor. By working with online jobs databases such as Indeed or Monster, the city can ensure that companies and workers find each other.

Clear unnecessary barriers to manufacturing.
New York's multigenerational web of rules and codes makes navigating the city's regulatory hurdles a difficult process. The

de Blasio administration should establish a citywide commission, with members from all manufacturing sectors, to identify ways to eliminate and streamline unnecessary and duplicative regulations, particularly those that undermine start-ups and the scaling of enterprises both old and new. The commission should identify regulations that impose unnecessary costs and delays and propose specific ways to streamline and simplify processes for building facilities; installing power, water, heat, and other systems; investing in capital equipment; getting products to market; protecting the environment; and safeguarding workers' health and rights.

The commission should undertake detailed analyses of the value chains for manufacturing businesses to identify the bottlenecks that undermine competitiveness. The successful effort to modernize New Jersey's housing rehabilitation subcode offers a good model for this difficult work. Over several years, the state's code officials conferred with a wide range of stakeholders to develop simplified guidelines that did not undermine health or safety. The changes opened long-dormant buildings to a wide range of new uses, boosting local businesses and tax rolls.

Use cutting-edge manufacturing processes to upgrade New York's aging infrastructure.
New York City and regional authorities spend billions every year on infrastructure. To strengthen New York manufacturers, public agencies should identify companies that can play roles in updating buildings and infrastructure to meet new standards for resiliency, safety, security, environmental impact, and Internet connectivity.

"Look at the transportation infrastructure," says Michael Simas, executive vice president of the Partnership for New YorkCity. "You can 3D print a piece of pipe, and that's an opportunity we can do locally. It's an endless task to take care of our city. If we can 3D print a part for an airplane, we can 3D print a part for a transit system. If we can do that in the Navy Yard, we can create lots of jobs. Think of all the infrastructure that can be in play—the MTA, the Port Authority. If we can use drones to paint the George Washington Bridge, that makes maintenance better and safer and could create new kinds of jobs."

New York and regional authorities should maintain a comprehensive database of production and maintenance projects, with detailed specifications and scopes of work. State, city, and regional officials should reach out to New York manufacturers—from 3D printing to engineering and design to metalworking—to determine what roles they can play in this ongoing work. These public entities should also sponsor regular "Rebuilding New York" events to detail the long-term process of updating and retrofitting the city, and identify ways that private property owners and facility managers can use New York manufacturers to maintain and improve their properties.

Center for an Urban Future (CUF) is a catalyst for smart and sustainable policies that reduce inequality, increase economic mobility, and grow the economy in New York City. An independent, nonpartisan policy organization, CUF uses fact-based research to elevate important and often overlooked issues onto the radar of policymakers and advance practical solutions that strengthen New York and help all New Yorkers participate in the city's rising prosperity.

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