

# Cities Need Manufacturing, and Manufacturing Needs our Cities.

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anufacturing is flourishing nationally. Across the United States, for the past five years, the sector has been steadily adding jobs, new companies, and re-shoring production as domestic manufacturers have begun to out-compete their counterparts on flexibility, quality, and even cost. The Bay Area is at the center of this renaissance, with growth in manufacturing across our region now outpacing both the nation and California as a whole.

While there are many explanations for the U.S.'s recent success—including technology, rising overseas shipping costs, decreasing domestic energy costs, and consumer “buy-local” interests—none is more remarkable than *where* manufacturing is happening: **this manufacturing revolution is being driven by our cities.**

This is no accident. Cities have the power to bring people, ideas, and innovation together—literally and figuratively—like no other place:

- In cities, a nascent “maker” can access resources including physical space, capital, suppliers, and the skilled talent needed to bring new products to fruition quickly and with less cost.
- Cities promote cross-sector collaboration, facilitating the pollination of new technologies into new products, and the innovative combination of sectors. The development of electric and driverless vehicles, the growing ecosystem of the Internet of Things, and the advent of biomedical devices that can literally be worn as clothing or jewelry are all examples of innovation in the Bay Area that have benefitted from the density of talent, technology, and the manufacturing prowess of our cities.
- Cities are where the customers are—enabling both young and legacy manufacturers to have readymade markets to test and scale new product offerings.
- But most of all, **cities offer the potential for diverse residents—from young people to low-income families to veterans to immigrants—to build livelihoods through employment and entrepreneurship in our growing manufacturing economy;** and conversely, for both designers and manufacturers alike to benefit from the skills, perspectives, and innovative thinking born of that same diversity.

Each city participating in our new *Bay Area Urban Manufacturing Initiative* has already demonstrated leadership in this next generation of manufacturing.

San Francisco was an early leader in President Obama’s “Maker City” initiative. Since its launch in 2014, more than 100 mayors of U.S. cities small and large have signed on to commit to growing their economies by supporting maker-based education, entrepreneurship, and innovation.

San Jose recently led a multi-city bid to successfully win one of the handful of nationally funded Manufacturing Innovation Institutes in the country. As result of San Jose’s leadership, the Bay Area’s new Flexible Hybrid Electronics Manufacturing Institute (NextFlex) will help ensure our region’s ability to be a leader in wearable technology and sensing medical devices.

Oakland continues to serve as a regional role model in its efforts to actively ensure a more inclusive economy, with manufacturing as a front and center industry. Reflecting its highly diversified manufacturing base, Oakland has a multi-layered training and incubation system supporting makers and manufacturers, including the manufacturing technology curriculum at Laney College.

Fremont has shown the entire Bay Area and the rest of the automotive world what it means to dig in and thrive in the face of challenge. Local leaders in government and industry have successfully transitioned what was a potentially disastrous closure of the NUMMI automobile manufacturing plant into the home of Tesla, now the region’s largest and only major automotive manufacturer. Tesla is leading the world in reimagining what cars look like: connected, autonomous, and electric.

Above all, the *Bay Area Urban Manufacturing Initiative* represents the opportunity to galvanize city governments, economic development intermediaries such as SFMade, K-12 and higher education partners, and major private sector sponsors such as Citi Community Development in the service of growing the regional manufacturing ecosystem. **If our cities make things, our cities—and in turn the region—will make it,** reaping the long-term benefits of a stronger, more resilient, inclusive, and interconnected local economy.



Kate Sofis, CEO  
SfMade

Thank you to Citi Community  
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support of this work.



# Bay Area State of Urban Manufacturing

This report is the culmination of the first coordinated regional effort to directly survey urban manufacturers on the topics of workforce, business practices, supply chain connections, real estate challenges, and most importantly, to uncover the opportunities for the largest Bay Area cities to collaborate and grow: San Francisco, San Jose, Oakland, and Fremont.

## MAKING IT IN THE BAY AREA

The Bay Area has deep roots in the development of semiconductors and computer related electronics and while it is currently best known for its software and design prowess, it has a remarkably robust manufacturing sector. The more than 8,000 manufacturers with almost 300,000 jobs, account for over 20% of California's manufacturing sector.<sup>1</sup> Overall, California has the largest manufacturing sector in the country. The Bay Area's four largest cities — San Francisco, San Jose, Oakland, and Fremont — collectively sustain approximately 108,500 manufacturing jobs across 3,200 companies spanning such diverse sectors as electronics and semiconductors, metalworking, apparel, food and beverage, and lifestyle products.<sup>2</sup>

CITY	POPULATION	SIZE (SQ MI)	MANUFACTURING JOBS <sup>3</sup>	MANUFACTURING COMPANIES
San Jose	1,026,908	176.53	65,000	1,200
San Francisco	864,816	46.87	10,000	700
Oakland	419,267	55.79	7,500	450
Fremont	232,206	77.46	26,000	850

Source: Census.gov, Quarterly Census of Employment and Wages, California EDD, 2014 with economic development department adjustments that vary by city.

Manufacturing not only contributes jobs to the Bay Area, but it has the largest economic multiplier of any sector of the U.S. economy. These four cities alone conservatively drive more than \$55 billion into California's economy.<sup>4</sup> While manufacturing employment is two-thirds what it was in 2000 — a 25-year peak — the decline has reversed since 2010, both for the region as a whole and for all nine of its counties.<sup>5</sup> In this vibrant regional manufacturing ecosystem, each major city plays a distinct role.

This report is based on data gathered by SFMade using a survey instrument based on an SFMade model deployed for the past 7 years to San Francisco manufacturers and more recently in both Los Angeles and New York City. The local economic development departments in each city helped to identify manufacturers and encouraged them to participate in the survey. The survey results were further augmented by a landscape review of the research conducted to date on Bay Area manufacturing, interviews with each economic development department's staff, and tours of industrial areas and spaces in each city. The survey results reflect the responses of those companies willing to participate in the ten question online survey, which can be found on bayareamfg.org.

Unless otherwise noted all data discussed in this report comes from the survey of manufacturers or interviews with the economic development departments in all four cities.

SF

Consumer products are the focus of San Francisco's entrepreneurial manufacturers. The city's largest industries include apparel and sewn products, food and beverage, lifestyle products (such as home goods, furniture, jewelry, body products, and stationary), and a growing consumer electronics sector. San Francisco producers are numerous but small, ranging in size from 1-2 person shops to a handful of larger legacy companies (such as Circa, Anchor Brewing, and Timbuk2), which employ a range of 50-250 people. **Many San Francisco firms are also quite young — reflective of the city's "Maker-Entrepreneurial" culture: almost half of the city's manufacturers are less than five years old.**<sup>6</sup> As a result, companies reported top concerns such as the continued need to develop brand visibility and build effective sales and distribution channels for their largely consumer product offerings.

Approximately 20% of survey respondents in San Francisco are contract manufacturers — companies who manufacture other designer's products — while 60% of companies surveyed manufacture only for themselves. The remaining 20% do both. The largest contract manufacturing sector in San Francisco is apparel and sewn goods, and the strength of this local capacity has facilitated the growth of a myriad of small companies making apparel (Taylor Stitch and Betabrand), bags (Joshu + Vela), and other sewn products. In contrast, most of San Francisco's food and beverage manufacturers control their own production, a byproduct of the fact that San Francisco lacks a strong network of food co-packers and contract bottling facilities.

Of note, in San Francisco's burgeoning hardware design sector, the majority of products launched to date from the city's incubators have not gone on to be manufactured locally or even domestically.

This represents a significant opportunity area, as identified in San Francisco's 2016 *Make to Manufacture* report.

SJ

In contrast, San Jose's manufacturing sector is a regional driver of business-to-business (B2B) products and contract manufacturing. Important sectors identified by the survey include aerospace, industrial and laboratory equipment manufacturing, medical devices, and computers and electronic equipment. While 60% of survey

respondents produce some type of electronics, other industries such as building and construction materials as well as food and beverage are well represented within the city's manufacturing landscape.

Of the four cities, San Jose has the most established manufacturing sector, and their companies often have extensive supply chain connections across the region as well as more secondary manufacturing facilities of their own. **San Jose manufacturers frequently also manufacture in Fremont, San Francisco, or Oakland.** They also more frequently reported "big company" challenges, such as dealing with government requirements, tax burdens, and international competition. These challenges reflect both the size and maturity of the companies, which have more interaction with

**8,000 manufacturers with almost 300,000 jobs account for over 20% of California's manufacturing sector**

state and federal governments than smaller companies in other cities, and the complexity of managing global supply chains. Manufacturers in San Jose tend to be larger than those in the other three cities and many have strong international connections.

Twenty percent of the companies surveyed in the city manufacture internationally as well as locally. Six of the largest international Electronics Manufacturing Services (EMS) providers — including Jabil, Benchmark, and Sanmina — have production facilities in San Jose, in some cases more than one. These large contract manufacturers facilitate the growth of both small startups and large hardware and electronics companies by letting them concentrate on design and sales while also allowing them to keep the same manufacturer as they scale to high volumes.

**OAK** **Oakland has the most varied manufacturing sector of the four cities surveyed,** showing a balance of companies across all sectors seen in the Bay Area, including electronics and metal fabrication, but also with a clear strength in food and beverage and apparel and sewn products. The orientation towards food and beverage can be seen in the large number of companies that make their own products, reflective of the low number of co-packers and bottling facilities in the Bay Area. Of the companies surveyed, almost 70% manufacture their own products. The apparel sector in Oakland has close to 30 contract manufacturers, the most of the four participating cities. Oakland also has a significant number of companies producing metal parts and serving both the contractor industry and smaller maker-based businesses across the region with everything from building and construction materials to bike frames. One of these firms, American Brass & Iron, began operating in Oakland in 1906 and still employs over 200 people today.

Overall, diversity is also seen in the size and age of companies in Oakland, with a mix of small companies of 1-5 employees just starting to manufacture through a strong middle ground of companies like Hodo Soy, a tofu manufacturer, to larger, and more established companies such as Creative Wood, a furniture manufacturer that employs 150 workers.

Oakland companies are closely linked to those in San Francisco

due to proximity and overlap in sectors. Manufacturers in Oakland were much more likely to have secondary manufacturing facilities in San Francisco — and vice versa — than in either Fremont or San Jose. Conversely, Oakland and San Francisco companies are far less likely to manufacture elsewhere in the Bay Area or internationally—just 4% of the companies surveyed do either.

**FRE** Manufacturing in Fremont is centered on electronics contract manufacturing. Seventy-five percent of survey respondents in Fremont identify as electronics manufacturers, the majority of which produce medical devices and medical equipment, complementing other core competencies including semiconductors, cleantech, and advanced manufacturing. In addition, more than half of all respondents in Fremont are exclusively contract manufacturers, and do not make any products for themselves.

Fremont also has a growing transportation sector due in large part to Tesla, the single largest manufacturing employer in the Bay Area, with over 6,500 employees, the majority of whom are at their Fremont plant.<sup>7</sup> The rise of Tesla has led transportation equipment manufacturing to be the fastest growing sector in the Bay Area from 2010-2014.<sup>8</sup>

Facilities in Fremont are frequently secondary locations of larger manufacturing firms, both domestic and international. Within the Bay Area, Fremont is most closely aligned with San Jose. If a company manufactures in Fremont, that company is twice as likely to also manufacture in San Jose as they are in San Francisco or Oakland. Due to their proximity to the large hardware companies of Silicon Valley, many of these contract manufacturers, such as Essai, focus on high-end prototyping and short run production.

**While some of the larger cities have a higher number of international manufacturers, 44% of Fremont companies surveyed also manufacture internationally.** Of all four cities, Fremont has the highest percentage of international companies, likely due to the combination of reasonable real estate prices, favorable land use policies, and access to the Silicon Valley workforce.

## MANUFACTURING MIDDLE INCOME JOBS

In 2015, **manufacturing jobs grew or held steady in all four cities according to the survey.** Fremont and San Francisco had the highest annual full-time job growth rates at 17% and 10% respectively for survey respondents. San Jose showed modest gains at 2%, while reported jobs at Oakland survey respondents remained stable. The fastest growing sector of job expansion reported was

**According to the survey, companies across all four cities sustain an average 35-45% of their workforce in middle-wage jobs.**

electronics, with over 20% growth in either full-time or part-time jobs in all four cities. Jobs at surveyed companies also grew in food and beverage in 3 of the 4 cities — San Francisco, San Jose, and Oakland.

Consistently across all four cities, manufacturing continues to provide well-paid jobs for a diverse group of workers. Historically,

the public sector focus has been on jobs that create and sustain work for individuals from low-income households. On average, **50% or more of the workforce of manufacturers, across all cities surveyed, is comprised of individuals from low-income households.**<sup>9</sup> In the four surveyed cities, 40-50% of the manufacturing jobs are production jobs, typically the first access point for workers without a four-year degree or with barriers to employment.

As significant is the advancement potential available to individuals once they secure a manufacturing job. Entry-level workers are up-skilling and progressing into “middle-wage jobs” and ultimately pathways to economic stability.<sup>10</sup> According to the survey, companies across all four cities sustain an average 35-45% of their workforce in middle-wage jobs.

**SF** **San Francisco manufacturers posted a 10% job growth rate in 2015, representing a 6th straight year of double-digit job growth based on the survey.** The fastest growing sector in San Francisco is electronics at 24%, followed closely by food and beverage with a 19% increase in jobs. Thirty-six percent of jobs at San Francisco manufacturers are middle-wage jobs.

The manufacturing workforce in San Francisco is comprised of 46% production and distribution jobs. Respondents in this city also had the highest percentage of retail workers, at 15%, due to the preponderance of consumer facing products made in San Francisco. Manufacturers in San Francisco benefit from retail or restaurants co-located with (often equally visible) production. The city’s industrial zoning permissions further support this trend towards hybrid retail/production facilities by allowing up to 1/3 accessory retail in industrial spaces and conversely also allowing small production spaces in the back of retail shops — referred to as “trade shops” — in neighborhood commercial districts.

**SJ** San Jose survey respondents posted 2% job growth in full-time jobs, slower growth than some of the other cities perhaps due to the relative maturity of the sector. At the same time, part-time and temporary jobs posted double-digit growth potentially connected to the use of staffing agencies in the robust contract-manufacturing sector. **Interestingly, the food and beverage sector in San Jose, while still small, reported a growth rate of 16% and is the fastest growing sector in the**

**city, primarily driven by new jobs in beverage manufacturing.** While full-time job growth in electronics was flat, part-time jobs grew 23%. Overall, middle-wage jobs account for 45% of the jobs in San Jose manufacturing.

New product development is a vanguard of the San Jose manufacturing community and allows local firms to rapidly develop and scale technology products.<sup>11</sup> The co-location of design and manufacturing puts them at a distinct advantage when developing products. Notably, 14% of jobs reported at San Jose manufacturers are in research and product development positions. At the same time, San Jose firms also posted the highest percentage of production and distribution jobs of all four cities, at 56%.

**OAK** In Oakland, survey respondents reported that jobs remained steady over the last year. The largest sector with over 1,200 employees is the food and beverage sector, which is also the second fastest growing according to survey data.<sup>12</sup> Other sectors in Oakland with high levels of employment include fabricated metals, produced at companies such as Nor Cal Metal Fabricators, computers and electronic products, and furniture manufacturing, at companies like Woodtech. Middle-wage jobs account for 36% of jobs in Oakland manufacturing.

Oakland has the second highest retail job intensity behind San Francisco. At 7% of the manufacturing workforce, this is indicative of the city’s heavy concentration of consumer facing products. **Oakland’s hybrid manufacturing/retail businesses offer the added advantage of an additional onramp for many communities by allowing workers to enter through a more familiar environment** like retail and then learn about the back of house manufacturing business.

**FRE** **Fremont companies reported a 17% job growth rate, the highest of the surveyed cities.** The fastest growing sector in Fremont is electronics, which Fremont’s economic development staff attributes to the growth of existing companies as well as companies moving into Fremont from other locations or opening second locations in the city. Middle-wage jobs account for 45% of manufacturing jobs. Similar to San Jose, in Fremont, production and distribution jobs are 54% of the manufacturing workforce, with nearly 15% in research and product development positions.



Wood Connection, San Jose.



Hodo Soy, Oakland.



Circa, San Francisco.

## PLACES TO MAKE (AND MOVE)

Bay Area manufacturers are growing and hiring and **the sector overall continues to be at the forefront nationally of electronics and**

**semiconductor manufacturing.** As the third most important trade gateway on the West Coast, the Bay Area's strength in distribution bolsters the manufacturing sector. The Bay Area houses the fifth largest port in the United States, the Port of Oakland, as well as three international airports, two Class 1 rail main lines, and six major truck routes.<sup>13</sup> While the Port of Oakland focuses on containerized goods, other smaller ports throughout the Bay Area, including the Port of San Francisco, specialize in bulk commodities. The San Francisco International Airport focuses on international airfreight while the Oakland International Airport is the primary inlet for domestic airfreight. **As a whole the Bay Area system supports an internationally oriented distribution ecosystem.** In fact, the Port of Oakland is the only port in California where exports outweigh imports.<sup>14</sup>

However, the Achilles Heel of our vibrant regional sector—reported across all four cities—is physical space constraints. While there is certainly a range of real estate opportunities across the four cities, the manufacturers surveyed had some striking similarities when asked about real estate challenges. The **high cost** of renting/buying industrial or hybrid space was the top ranked concern in all four of the cities. **Lack of availability** of expansion space ranked a close second real estate concern in all four cities. The **safety** of employees and/or assets was also a concern in all the cities. And finally the **cost of housing** for their employees was commonly cited as a concern for many manufacturers, especially in San Francisco.

The concerns are justified. Industrial vacancies are nearly zero for Class A space across all jurisdictions.<sup>15</sup> Asking rents range from \$6.80 to over \$23.00 per square foot annually for all types of industrial space, up from last year in all four cities surveyed.

CITY	Average Asking Rent ANNUAL \$ per SQ FT	Average Asking Rent % CHANGE YEAR OVER YEAR
Oakland	\$6.80	16%
Fremont	\$11.30	18%
San Jose	\$12.50	4%
San Francisco	\$23.00	19%

Source: JLL, Q3 2016 Bay Area Industrial Market Report, rounded.

**SF** Much of San Francisco's manufacturing takes place in neighborhoods situated in the eastern part of the city, including the Bayview District, which has the largest amount of industrial land, as well as in the inner-ring neighborhoods of the Mission, SoMa and Potrero Hill/Showplace Square. The city's industrial neighborhoods are well placed near both highway 101 and 280, providing goods movement and access south and east towards the inland distribution hubs. Much of the industrial land is transit accessible either by BART and/or Muni, although manufacturers in the Bayview report higher

**Industrial vacancies are nearly zero for Class A space across all jurisdictions.**

levels of dissatisfaction with public transit and safe pedestrian and bike routes into that community.

**In San Francisco, the City has taken bold steps to protect industrial**

**space, zoned as Production, Distribution and Repair (PDR) throughout the eastern neighborhoods and into the Bayview** by prohibiting residential and office development in protected PDR districts. While the protections are important, strong market demands have provided incentives for other competing uses to encroach on PDR space, and the city has seen a steep rise in the volume of zoning enforcement requests in PDR Districts over the past year. The industrial districts in the Mission and SoMa have been most adversely impacted and also remain in the highest demand by manufacturers, due to both the proximity to transit for workers and ease of access to freeways for goods movement.

**SJ** San Jose has the second largest acreage of industrial land, with major centers of manufacturing in North San Jose around the North First Street Corridor, on the Monterey Corridor, and in Edenvale. San Jose is well served by vehicular access as it sits at the intersection of highways 680, 101, and 880, giving freight access to the international freight hubs of the Port of Oakland and the San Francisco Airport, along with the domestic distribution centers in the Central Valley. San Jose International Airport serves the sector by providing easy access to small package carriers. San Jose's industrial areas are well served by public transit through a combination of Caltrain and VTA light rail with a new BART station opening in 2017.

**However San Jose's economy is experiencing accelerating pressure to evolve into an office market.** While San Jose has pro-



Blackbird Guitars, San Francisco.



Bestronics, San Jose.



Sinto Gourmet, San Francisco.

tected industrial land, the city also has a relatively high proportion of less protected “mixed-use” industrial zoning, called Industrial Park. Industrial Park allows for more office uses, is intended for research and development, and makes up about 7% of all land in San Jose, three times more space than is zoned pure industrial.

**OAK** In Oakland, manufacturing is concentrated in East Oakland, along the San Leandro Street corridor and in the Airport Business Park, and in West Oakland, north of downtown. Each of these major manufacturing areas is served by one BART station (Coliseum and West Oakland respectively) with connecting AC Transit bus lines. Throughout the inner East Bay (along the bay) manufacturing clusters along both 880 and 580, giving access to these major truck routes.

Oakland is the traditional home of the western terminus of the transcontinental railroad, though industrial spurs with rail access are rare these days. **The Port of Oakland acts as the international freight portal to all four cities in this report — and the city is home to the region’s primary intermodal transit facilities, used to move cargo between the sea, rail, and truck transit systems.**<sup>16</sup>

Of the four cities in this report, Oakland has the largest acreage of industrial land, inclusive of the port and airport, even while some of the land has converted to other uses, as is the case in all the cities. The city’s wealth of legacy industrial real estate presents both a challenge and opportunity for reuse in many forms. The West Oakland Plan and the Coliseum Area Plan both seek to accommodate new land uses while allowing for continued industrial use in a mixed-use urban plan.

**FRE** Fremont has some of the most extensive and protected industrial land of all four cities: in Fremont, virtually all land west of the 880 is industrially zoned and protected from other uses. At this time Fremont has a low amount of pressure from office uses, which has facilitated a steady growth in industrial users. **Fremont also has the largest square footage of new industrial development in the four cities, a direct result of having more available land at affordable prices with adjacency to Silicon Valley.**

Like the rest of Alameda County, the industrial land in Fremont clusters around 880, except for the Warm Springs District, which sits between 880 and 680, and Ardenwood — accessible from

highway 84. With the opening of the Warm Springs BART Station, Fremont will gain an important public transit connection near the largest manufacturer in the Bay Area. One goal of this station is to increase two-way traffic within the system, linking jobs centers outside of the urban core to the existing system.

## TOWARDS A BAY AREA URBAN MANUFACTURING REGION

As the four lead cities of the Bay Area Urban Manufacturing

Initiative lay the groundwork for a sustained multi-city regional effort, the results of the inaugural 2016 survey suggest four initial threads of work.

## GROW larger and more regionally networked manufacturers

The Bay Area clearly has many advantages — from venture capital to engineering talent to the regional ethos of being the enterprising home to the “Maker Movement” — that form the basis of its current manufacturing strength. At the same time, many of the area’s younger manufacturers are not scaling in the Bay Area once they expand beyond early stage prototyping and production. This is especially true of earlier-stage, venture-backed electronic hardware companies. If the Bay Area is to sustain its place as a nationally-competitive manufacturing region — and one that can add more manufacturing jobs — **it is essential that cities focus on building supports to help more nascent companies stay and grow in the region.**

*Develop a clearer understanding of native contract manufacturing resources and make those resources more transparent to designers and small manufacturers throughout the region*

The rich culture and business of electronics contract manufacturing in the Bay Area means there is a significant opportunity to connect innovation companies who are designing and prototyping in the Bay Area to these existing resources, creating connections between sectors and across city boundaries where relationships may not yet exist.

In apparel and sewn goods, another area of contract manufacturing strength, manufacturers are experienced in working with small, design centric firms with low volumes. However, accessing these manufacturers can be very difficult because the vast majority of them are not online and are extremely hard to find. Facilitating these interactions, as SFMade and the City of San Francisco do through FashionSF, encourages the growth of both demand and supply.

*Attract and support the establishment of “connector” contract manufacturing nodes that are missing in the supply chain*

Contract manufacturing is already well established in the Bay Area in electronics and apparel. But it is severely lacking in food and beverage, hampering the full growth of this high production job driven sector. Only 18% of food and beverage manufacturers in the four cities surveyed design, manufacture, or distribute products for others. Working together, the cities could build on



Boehringer Ingelheim, Fremont.

existing models and attract more food and beverage co-packers to the region, helping sustain the sector's growth and allowing smaller companies to start and grow here. Even in electronics, there is a lack of mid-size contract manufacturing firms that have both the inclination to work with newer companies and to provide a diversity of services supporting smaller production runs. Cities could work together to publicize the local demand for both of these types of manufacturing and to develop economic levers to entice these businesses to our region.

### **Deepen linkages across sectors**

The Bay Area is poised to benefit from its current strengths in electronics, apparel, medical devices, and lifestyle goods. Deliberate collaboration can forge new strengths between the sectors creating diversity in ways that will solidify the region's manufacturing stake for decades to come. One clear opportunity area for collaborative leadership is in the emergent Internet of Things (IoT) and wearable electronics industries. The Bay Area is already a center for the design of these products, with companies such as Fitbit, Misfit, Nest, and August located throughout the region. At the same time, the Bay Area is one of the few locations in the United States with an overlap in electronics and apparel manufacturing sectors, allowing for the local manufacture of these products. An early potential market for wearables in particular is in medical applications, neatly fitting into the Bay Area's strength in biotechnology and medical devices. Taken together, the region has a strong potential to lead in both the design and manufacture of emerging wearables and IoT products in multiple sectors: medical, lifestyle, and industrial.

### **Leverage the region's technology expertise to help legacy manufacturers in each city become more productive**

Manufacturing in the Bay Area is an interesting mix of artisanal hand processes and highly advanced manufacturing and laboratory methods. The region has an opportunity to leverage knowledge from one sector to help modernize others. While not every manufacturer and industry is interested in modernizing, there are several sectors that would benefit greatly including the apparel industry and segments of the food and beverage industry.

The cities could prioritize developing financing solutions to assist small manufacturers with the capital expenses of new equipment

and retraining and retooling their employees. More informal educational spaces, such as commercial kitchens or manufacturing incubators could be utilized as intermediaries to enhance such efforts. In addition, many companies in the region are looking to improve contract manufacturing through the creation of new technologies. The Bay Area has the technological prowess to pilot a replicable urban factory model in many different industries.

## **DEVELOP intentional training pathways for all Bay Area residents to secure jobs in manufacturing**

Creating inclusive, equitable employment opportunities is essential to a sustainable and diverse Bay Area. Given the recent growth of poverty and income inequality, it has never been more important to ensure that there are well-paid jobs in the ever-shrinking middle band of the regional economy. **Manufacturing provides these middle-wage jobs and by expanding the sector we can grow the number and concentration of these jobs.** At the same time, more intentional pathways must be built to ensure that more individuals from the most challenged urban communities have the opportunity to secure employment in manufacturing. There are already signs of progress across these issues and cities have an opportunity to collaborate to help address them.

### **Link regional training efforts to neighborhoods and jobs within cities**

Two recent area studies from SFMade and Work2Future, the *Industrial Jobs of the Future Study* and *Contract Manufacturing in Silicon Valley* respectively, reported the need for both soft skills and technical training. Indeed, one recommendation of SPUR's *2014 Economic Prosperity Strategy* was to establish industry-driven, sector-based regional training partnerships.

Training programs already exist in the Bay Area and there is a regional coordination body, Bay Area Community College Consortium (BACCC), to strengthen collaboration between community colleges and cities. The BACCC identified several manufacturing or manufacturing adjacent industries as primary areas of focus in an internal planning process and has supported building out facilities and training programs to that end. Separately



Bay Area Circuits, Fremont.



OCHO Candy, Oakland.



Therma Corporation, San Jose.

from the community college system, the Workforce and Innovation Opportunity Act (WIOA) provides training and marks success with job placements.

Individual cities can help integrate these two systems to create a more complimentary post-secondary approach to preparing workers for middle-wage jobs in manufacturing.

### ***Coordinate the expansion of apprenticeship opportunities***

On the one hand, some manufacturers report an increasingly difficult time attracting and retaining workers. In some legacy sectors an aging skilled workforce comprised primarily of first generation immigrants looms large. On the other hand, in the more technology-driven sectors, an increasingly tight labor market in the Bay Area for both engineering and technician skills combined with the lack of technical and soft skills in many communities of need, poses a double challenge.

Low-income workers are at a disadvantage when preparing for careers in manufacturing due to the opportunity cost of lost wages during training programs. The Bay Area's existing strength in emerging technology sectors presents a possible opportunity. These companies are facing the same pressures as manufacturers have historically but do not have a history of on-the-job training. The cities could assist a few larger companies to pilot a new type of training program, one that draws from existing training and community college certificate programs to create paid on-the-job training to supplement this post-secondary system. Using the BACCC these companies could direct the preparation of trainees by the community colleges. However, these companies would also need to create a new tier of trainees within their own companies, one outside of the current new employee training system. By demonstrating the viability of the apprenticeship model in non-traditional manufacturing fields such as electronics and food and beverage, the Bay Area could lead the charge in integrating communities of need directly into manufacturing jobs.

## **PROTECT and create more, and more affordable, industrial building stock**

Industrial land is precious and clearly a regional solution must be considered, but at the end of the day, each city controls local zoning. **As real estate prices continue to rise, manufacturing is not guaranteed a home unless cities across the Bay Area solidify a commitment to the sector through land preservation, protection, and mechanisms for ensuring affordability.**

### ***Coordinate industrial land use strategy across the cities***

The Association of Bay Area Governments (ABAG) commissioned a study documenting the region's industrial land inventory in depth. The *Industrial Land and Jobs* study found that while the supply of industrial land exceeds predicted demand overall, that future demand will exceed supply in the urban cores.<sup>17</sup> ABAG is considering a potential designation of Priority Production Areas of industrial lands across the Bay Area where manufacturing,

warehousing, distribution, and repair services would be a priority consideration in determining future land use.

But ultimately as specific land use control lies largely at the city level, having a Bay Area program with city support for production areas would bode well for the preservation of one of the most fundamental needs of a manufacturing company—the space to make. With the revitalization of several large military bases across the Bay Area and other public land with transit and highway access, municipalities and their stakeholders have an opportunity to designate space specifically for manufacturing and associated industrial uses just as New York, Chicago, and Philadelphia did decades ago.

The probable cannabis production boom will also impact industrial land use and the manufacturing sector as new products and manufacturing methods are introduced. Just how existing industrial users will feel this increased demand remains to be seen. If Colorado teaches us anything, urban industrial lands will be the first location of growing and making cannabis products—and a regional effort to coordinate each city's response to this growing sector would be wise.

### ***Share and adopt best practices from other cities in the region to protect and create more affordable stock***

At this moment in the Bay Area economy, and as manufacturing companies get priced out of central locations in each city, the region must not only preserve land for manufacturing and related industrial uses but **must also start to focus collectively on mechanisms to make industrial space affordable.** San Francisco has experimented with cross-subsidization of industrial with office space and Oakland Makers is exploring a shared acquisition model between investors who are the primary backers in partnership with a group of artisans who would over time grow their capacity and obtain full ownership of the property.

Other resources are needed. Working together, cities could advocate at the state level to create tax breaks—similar to those for affordable housing—for spaces providing affordable industrial real estate, provide funding directly to industrial development, or support current efforts to reform Proposition 13 by having commercial office and retail users pay a more proportional amount of property taxes.

### ***Improve transit accessibility to industrial areas—city by city and across cities***

Transit accessibility is important to the manufacturing industry on two fronts. The first is from a goods movement standpoint. To continue to be a goods movement hub, the region must support the modernization of distribution infrastructure such as the Port of Oakland, San Francisco International Airport, and the existing highway system. There are concrete efforts underway at the Port of Oakland to greatly modernize facility infrastructure, including enhanced rail and logistics capacity on the site of the former Oakland Army Base.

Secondly, the increase in the Bay Area's population combined with the dispersal of production employees throughout the region as

the cost of living increases, in all cities, means that transportation has become a key business need. *Commute length* and *access to public transit* for employees were in the top five most pressing real estate challenges throughout the four cities, after *cost of space* and *room to grow*.

While BART and Caltrain are seeing record high numbers of passengers, public transit is not currently a viable mode of transit for many manufacturing employees.<sup>18</sup> Manufacturing tends to cluster around truck routes on the periphery of cities while regional public transit clusters either in residential neighborhoods or in commercial centers. It is also true that where excellent transit access and connections exist, so too may development pressure on existing industrial land be greatest.

Balancing these two transit accessibility concerns for goods movement and employee transportation across the region has become an increasing priority. As existing infrastructure ages and needs replacement, the region has an opportunity to increase accessibility for both needs by rehabilitating and reallocating existing infrastructure.

## PROMOTE the Bay Area as a center for manufacturing and manufacturing as a viable career

While the Bay Area is a center for manufacturing in California, the largest manufacturing state in the nation, the region is not recognized as such. Increasing international awareness of the Bay Area as a power in manufacturing can only help the region grow its manufacturing sector. In addition, **the sector is facing a two-pronged workforce PR problem: lack of awareness of what modern manufacturing is, combined with a lack of faith in the sector's ability to provide sustainable jobs.**

### Launch a multi-city PR campaign focused on three areas: workforce, supply chain, and real estate

This is the moment for the Bay Area to position itself as the center for manufacturing innovation that it is. By displaying the links made between cities and industries the Bay Area can continue to attract the varied manufacturers that make our regional economy so strong.

One way to do this is to come together as a region to amplify the career opportunities in manufacturing for both youth and experienced employees. Through initiatives like *San Jose Works* and SFMade's *YouthMade* and *Inside Manufacturing* programs, high

school students are getting direct experience through paid internships and other forms of exposure to manufacturing companies. But a coordinated PR effort deployed simultaneously across all four cities would be powerful.

## NEXT STEPS

Innovation has been a hallmark of the Bay Area economy for decades. Now the manufacturing sector with the major players of apparel, food and beverage, metalworking, and electronics is ready to lead another phase of innovation. Neither the growth of the sector nor the jobs promised are guaranteed. Other strong manufacturing regions across the country — New York, Chicago, Los Angeles, North Carolina—and globally are also actively developing their strategies.

But this is the Bay Area and a city-led collaborative initiative can ensure a strong, resilient, and inclusive regional manufacturing ecosystem that will ultimately drive regional economic equity. The pieces are all here. The future is ours to make. And our cities will lead the way.

For links to resources and more information see [BayAreaMfg.org](http://BayAreaMfg.org)

<sup>1</sup> California Manufacturing Technology Consulting Report, 2016. Sourced from *County Business Patterns*, 2013-14 and Bureau of Labor Statistics, *Quarterly Census for Employment and Wages*, Q3 2015.

<sup>2</sup> Quarterly Census of Employment & Wages, California EDD, 2014.

<sup>3</sup> The count of manufacturing jobs and companies in each city includes companies with only an administrative footprint, in addition to those with production facilities.

<sup>4</sup> Includes an estimated \$24 billion direct economic impact and an additional \$35.5 billion of "indirect" economic impact. Direct economic impact data from Economic Census, *American Fact Finder*, 2014.

<sup>5</sup> Association of Bay Area Governments. *San Francisco Bay Area's State of the Region 2015: Economy, Population, Housing*. Oakland: Association of Bay Area Governments; 2015: 23

<sup>6</sup> Analysis of data collected for *State of Local Manufacturing 2015*. San Francisco: SFMade; 2015

<sup>7</sup> Bay Area Council on Science and Innovation Consortium. *Reinventing Manufacturing: How the Transformation of Manufacturing is Creating New Opportunity for California*. San Francisco: Bay Area Council Economic Institute, April 2016: 34

<sup>8</sup> Ibid. 72

<sup>9</sup> Low-income household is defined as individuals making below 80% of area median income of the county income.

<sup>10</sup> Middle-wage includes jobs paying over \$18 per hour and up to \$33 per hour. The range was surveyed to align with ABAG's *Industrial Land and Jobs* study locating middle-wage jobs and SPUR's Economic Prosperity Report, which both define middle-wage as \$18-30 per hour. This survey extended that wage to \$33 in order to capture San Francisco's low-income threshold as well.

<sup>11</sup> BW Research Partnerships. *Contract Manufacturing In Silicon Valley*. work2future; 2012: 7

<sup>12</sup> California Economic Development Department, 2015.

<sup>13</sup> Metropolitan Transportation Commission. *San Francisco Bay Area Goods Movement Plan*. Oakland, California: Metropolitan Transportation Commission; 2016: 24-26

<sup>14</sup> Cambridge Systematics, Inc. *San Francisco Bay Area Freight Mobility Study*. Sacramento: California Department of Transportation; 2014: ES 13-15

<sup>15</sup> Jones Lang LaSalle. *Bay Area Industrial Market Report*; Q3 2016.

<sup>16</sup> Cambridge Systematics, Inc.; 2014: ES 16

<sup>17</sup> Chapple, Karen. *Industrial Land and Jobs Study*, Draft. Berkeley, California: University of California; September 2016: 1.

<sup>18</sup> Vital Signs. *Commute Mode by Choice and Transit Ridership*. Metropolitan Transportation Commission; 2015. Available at: <http://www.vitalsigns.mtc.ca.gov/>. Accessed November 2, 2016.

Photographs courtesy of: the cities of Fremont, Oakland, and San Jose, Hodo Soy, and SFMade.

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