MADE IN THE EAST BAY

A STUDY OF
ADVANCED MANUFACTURING IN ALAMEDA COUNTY

Made in the East Bay:
A Study of Advanced Manufacturing in Alameda County

Acknowledgements

Design it - Build it - Ship it (DBS) is a 4-year, $14.9 million U.S. Department of Labor-funded initiative in the East Bay (of the San Francisco Bay Area) under the Obama Administration's Trade Adjustment Assistance Community College Career Training (TAACCCT) program. The goal of DBS is to build an integrated, regional, industry-driven workforce and economic development system in the East Bay.

The East Bay Manufacturing Partnership, funded by DBS, is an ongoing regional forum for East Bay companies involved in manufacturing to collectively address issues related to competitiveness and growth. The Partnership was launched in 2014 to be a single table at which to identify industry priorities and work with a host of public-sector partners to address the industry's needs.

The partnership includes over 50 companies involved in manufacturing, 10 community colleges spanning 5 independent districts, 4 workforce investment boards, EASTBAY *Works*, MANEX, and others.

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Executive Summary

According to conventional wisdom, "we don't make things in America anymore." But this is not completely true. "Made in the USA is making a comeback. Climbing out of the recession, the U.S. has seen its manufacturing growth outpace that of other advanced nations, with some 500,000 jobs created in the past three years. It marks the first time in more than a decade that the number of factory jobs has gone up instead of down. American workers are busy making things that customers around the world want to buy — and defying the narrative of the nation's supposedly inevitable manufacturing decline."[1]

America's competitive advantage lies not in low skilled, labor-intensive activities vulnerable to off-shoring, but in manufacturing that leverages advanced skills, technologies, and creativity. To capitalize on these trends toward advanced manufacturing, America needs to draw on the same competitive advantages that fueled manufacturing growth in the past -- process improvements, product innovation, and a deep pool of skilled workers -- to thrive in a new era of global manufacturing.

While the number of U.S. manufacturing jobs has declined over the past 10 years overall, manufacturing output has continued to grow. According to the Bureau of Labor Statistics, the U.S. enjoyed a steady growth of manufacturing jobs from the end of the Depression until the early 1980s, when the number of jobs dropped slightly and remained relatively flat until about 1999. From 1999 to 2009, U.S. manufacturers lost so many jobs that they erased almost all the gains of the previous 70 years as manufacturers' substituted capital for labor, or jobs were off-shored to lower production costs in order to remain competitive. Today there are far fewer people on the factory floor, far greater use of technology, and very different demands placed on the workers.

The East Bay has served as "an industrial-wholesaling-transportation-institutional workplace, rather than an administrative-fiscal one."[2] In recent years Alameda County has suffered some shocks to its manufacturing sector from the recent recession (2007-2009) and major plant closings including the NUMMI automobile assembly plant in 2010 and the Solyndra manufacturing facility in 2011. Despite these setbacks, manufacturing remains a major source of high-wage jobs and continues to play an important role in Alameda County. Since 2010, as the economy recovered, the manufacturing sector has added 1,578 jobs for a net gain of 2%. Tesla Motors has purchased the NUMMI assembly plant and is now building electric cars in the facility.

Historically, the Alameda County shoreline has been the manufacturing heartland for the San Francisco Bay Area. Along with industry came a steady expansion of working class residential districts tied to manufacturing jobs that provided a way of life for local workers and their families. Industrial districts emerged along the waterfront from Fremont, Union City, Hayward, San Leandro and Oakland to Emeryville and Berkeley.

Most of the key industries of the 20th century were located along the East Shoreline of Alameda County including automobiles, ship building, canneries, and chemicals. Canneries once operated where the San Leandro BART transit station is located today, providing seasonal and year-round jobs. As the economy changed, many of these industrial facilities were closed. New industries sprang up to replace jobs lost by industries that were no longer competitive.

[1] Time Magazine, "How Made in America is Making a Comeback", April 11, 2013

[2] James E. Vance, "Geography and Urban Evolution in the San Francisco Bay Area", 1964

Today, Alameda County has a diversified manufacturing base that includes high-tech, life sciences, automobiles, biotechnology, instruments, food processing, machinery, software, digital media, medical devices, and clean technology. Fundamental to Alameda County's industrial base has been the emergence of new manufacturing sectors and major reorientations of older ones.

Locally, manufacturing is important to Alameda County's economy, employing 61,864 workers and making it the 5th largest employment sector with the average annual wages ($80,195)[3] above the median household income ($72,112).[4] Major subsectors include digital & electronic devices & components, food & beverage, biomedical/life sciences, fabricated metals, and machinery. These five subsectors employ 42,882 workers and make-up 69.3% of all local manufacturing employment.

In 2013 the manufacturing sector accounted for 13% ($13.4 billion), and the largest share, of the county's overall Gross Regional Product of $100 Billion.[5] Since 2010, the fastest growing manufacturing subsectors include power generation equipment (43%), aerospace (20%), electric equipment & appliances (20%), machinery (17%), and food & beverage processing (16%).[6] Over the same time period, the five subsectors that have gained the most new jobs include food & beverage (1,459), machinery (720), biomedical/life sciences (472), digital & electronic devices & components (351), and electrical equipment & appliances (295).[7]

Projected Job Openings

Several of the manufacturing subsectors in Alameda County are mature industries and should not be expected to generate significant new job growth. The number of replacement jobs on the other hand is significant as the county's aging workforce creates openings due to older workers retiring and leaving the labor force. The aging workforce creates both challenges and opportunities for manufacturing firms in recruiting and training replacement workers with advanced skills. Unfortunately the younger generation has not viewed manufacturing as an attractive career choice and there are few opportunities (such as vocational education courses in secondary schools) for exposing younger people to viable career pathways in the manufacturing sector.

While Alameda County manufacturing employment in general is projected to decline by 3% over the next five years (2015 – 2019), a number of subsectors are expected to show net new job growth including biomedical/life sciences (762 jobs), food & beverage processing (474 jobs), electrical equipment & appliances (245 jobs), and machinery (194 jobs).[8]

In addition, there is expected to be a significant number of replacement job openings in both traditional and advanced manufacturing firms as baby boomers progress into their retirement years. Approximately 8,960 replacement jobs are projected to open up in the manufacturing sector over the next five years. Most occupational categories are expected to have openings and employers will face challenges in finding enough skilled workers to fill these replacement-based job openings.

[3] EMSI – QCEW Employees
[4] U.S. Census Bureau, 2013 American Community Survey 5-year estimates
[5] EMSI – Input-Output Model
[6] EMSI – 2014.4 QCEW Employees
[7] Ibid.
[8] Ibid.

Difficulty Finding a Skilled Workforce

Manufacturing firms responding to our survey identified a number of job classifications for which they have difficulty finding qualified workers. The occupations identified through this process reflect the presence of skilled labor shortages, skill gaps, or training program deficiencies. As such, they need to be of concern to the workforce development community for two reasons: one, they represent the workforce needs of our employers; and two, they represent employment opportunities for our workers. The most frequently mentioned occupations include:

- Assemblers/Production
- Engineers (various types)
- Machine Operators
- Machinists
- Press Operators
- Quality Assurance/Control
- Sales
- Software Engineers
- Welders

Manufacturers also report that they experience difficulty finding qualified workers with basic academic and technical skills. All modern manufacturing workers need adequate foundational competencies like math, science, reading comprehension, and writing. They need strong workplace competencies like computer literacy, teamwork, and critical thinking. Finding workers with these basic foundational skills and competencies is a challenge for many employers.

On top of these foundational skills, workers also need the education and training for specific skills related to their particular occupation or manufacturing subsector. Manufacturers are having a difficult time finding workers with strong technical competencies in a number of skilled and professional occupations. Workers with advanced skills are also in high demand and are sometimes critical to a company's survival or growth prospects.

Despite the difficulty manufacturers have in finding a skilled workforce, just 18% of those surveyed hire foreign workers to help fill their need for skilled workers. In addition, many of those who do hire foreign workers report that they only use this hiring method occasionally.

Need for Soft Skills/Work Readiness Training

Overall, 74% of the employers surveyed said that they believe there is a need for new or more effective pre-employment or soft skills training. Work ethics and communication skills, including language deficiencies and poor reading comprehension, are of primary concern, as is basic math and computer skills. A number of employers report a need for shop classes and Career Technical Education programs at the secondary school level.

Recommendations

Six recommendations were made by the consultants who conducted this study and developed this report. The recommendations include:

1. Target veterans and women to help meet the employment needs of this sector through outreach and by working collaboratively with key intermediary organizations that have strong connections to those demographic groups. Both groups represent many individuals who can offer both foundational and technical skills needed by industries in this sector. Women pursuing non-traditional employment, however, should be offered workshops and training designed to prepare them for the unique challenges of working in what is often a male-dominated work environment.
2. Grow the East Bay Manufacturing Partnership. Use the partnership to work with public policy makers and other key partners in the East Bay to facilitate solutions so that the sector is supported with the workforce, infrastructure, and other inputs it requires to thrive and be globally competitive.
3. Have the Partnership convene a workgroup to assess the occupations identified in this study for which employers have significant difficulty finding qualified applicants. Determine if there are applicable workforce development system solutions to help meet the workforce needs of business/industry.
4. Have the Partnership convene a workgroup to assess the pre-employment and soft skills needs identified as deficient by employers in our survey. The group would determine if there is a workforce development system solution that would help meet the workforce needs of business/industry.
5. Expand the knowledge base of One-Stop/Job Center staff and secondary/postsecondary school personnel to improve their understanding of this sector's workforce needs, business characteristics, and career opportunities.
6. Collaborate with key stakeholders to promote to the younger generations an awareness of the career pathways available in this sector.

Introduction & Methodology

While this report's focus is Advanced Manufacturing, the study behind this report cannot ignore the larger context which is the whole manufacturing sector. So the report's design is, in general, to first focus on the manufacturing sector as a whole, and then focus on Advanced Manufacturing.

The manufacturing sector is comprised of establishments engaged in the mechanical, physical, or chemical transformation of raw materials, substances, components, and parts into intermediate products and finished goods. Manufacturing also includes the assembly of component parts into new products. While production activities are a core function, manufacturing establishments also employ workers in a wide variety of non-production related occupations. These occupations range from research and development, to engineering design, to logistics, to quality control, to maintenance, to sales and marketing, to administrative operations including accounting, payroll, HR, and management. This diverse range of occupations is all part of a manufacturing firm's operation, although with largest firms, the activities are often at different locations.

Advanced Manufacturing, in contrast, is not an industry sector, nor a collection of industries, and there is no official definition. However, the U.S. Department of Labor's Employment and Training Administration defines Advanced Manufacturing as "the accelerated use of high-tech processes in the manufacturing plant." See the section of this report entitled Advanced Manufacturing for more details.

National Manufacturing Sector Trends

The U.S. Manufacturing Sector is undergoing a dramatic transformation that has profound implications for the incumbent workforce and for the new workers that employers demand. Modern manufacturing facilities bear little resemblance to the traditional factory of previous decades. In the past, manufacturing has had an unfavorable image as being a dangerous, noisy, and unhealthy work environment. "Modern manufacturing is changing. With advances in technology and robotics there are fewer production positions available. More manufacturing jobs require advanced technical skills and higher levels of education. As manufacturing moves further into computer-controlled automation, more workers will need computer skills. Even entry-level positions in warehousing need computer literacy."[9]

Manufacturing workers today require advanced academic, workplace, and technical skills to enable their employers to stay competitive in a global marketplace.

At the same time, employers face recruitment challenges due to fewer workers applying for open positions, especially with regard to the younger generations who do not give consideration to potential careers in manufacturing. As a result, many manufacturers report difficulty finding the skilled employees they need. While the U.S. manufacturing sector has contracted sharply since the early 1980s, employment in high-skill manufacturing occupations has risen by an impressive 37 percent.[10]

Overall, the increasing use of technology and rising productivity has led to declining employment as manufacturers substitute labor for capital equipment and technology. With the decreasing need for large labor pools, cheap labor as a financial consideration in locating a business becomes far less of a critical factor. The U.S. manufacturing sector can compete against cheap foreign labor and reestablish

[9] California Employment Development Department, "Manufacturing Careers", March 2007

[10] Federal Reserve Bank of New York, "A Leaner, More Skilled U.S. Manufacturing Workforce", February/March 2006

itself as a manufacturing hub by focusing on technological innovation and advanced manufacturing to drive business growth and competitiveness.

The process by which new products are designed, developed and introduced represents a significant portion of the manufacturing capacity in the United States. Having engineers located at corporate headquarters and/or at research and development centers in close proximity to manufacturing operations provides the best opportunity to integrate manufacturing and engineering teams in the design and innovation process as well as control access to proprietary intellectual property. In addition, "Last Mile Manufacturing"—the final stages of the supply chain where sub-assemblies, semi-finished goods, and other components come together to form a finished product—is returning to local facilities as a means of controlling intellectual property, as well as providing additional levels of customization and configuration to serve local customers within a relatively short time frame. The predominance of these two specialized parts of the production process has resulted in a complex cluster of manufacturing partners, suppliers and service providers in the region.

Being able to design, test, and redesign a product is at the heart of the manufacturing process that gives the United States a competitive advantage. Once production has moved overseas it is hard to bring it back and eventually research and development activities may follow.

Methodology

This research report is based on a combination of two types of data:

1. Quantitative data, which includes economic, industry and occupational statistics and projections from EMSI Analyst (a proprietary labor market information system), and
2. Qualitative data, which includes results of our Workforce Needs Assessment/Survey.

Additional data sources are indicated when used.

The Workforce Needs Assessment Survey was conducted in the spring and summer of 2014 with businesses representing the manufacturing industries of Alameda County of the San Francisco Bay Region. A total of 76 employers representing 16,747 employees participated in the survey.

The primary research method for the survey was telephone interviews, supplemented by online surveys (depending on the preference of each employer). A survey response rate of approximately 40% was achieved, primarily by phone follow-up with targeted employers until they either completed the survey or declined to participate. The interviews were conducted with a variety of individuals (with various job titles) – all of whom were able to answer our survey questions with our promise of confidentiality. In larger firms, the interviews were often done with a Human Resources Manager, Director or Specialist. In smaller firms, the surveys were often conducted with Owners, General Managers, Operations Managers, or Plant Managers. Oftentimes the responsibility for participating in the survey was delegated upstream or downstream – depending on who was in the best position to answer our questions.

As indicated, confidentiality was promised to all survey respondents. This is standard methodology for labor market surveys because, without confidentiality, few employers are willing to share information that is often considered sensitive or private for strategic reasons. As a result, we are unable to provide a list of the specific survey participants or their firms by name. However, the survey response summaries in this report typically list the survey participants by industry name and number of employees.

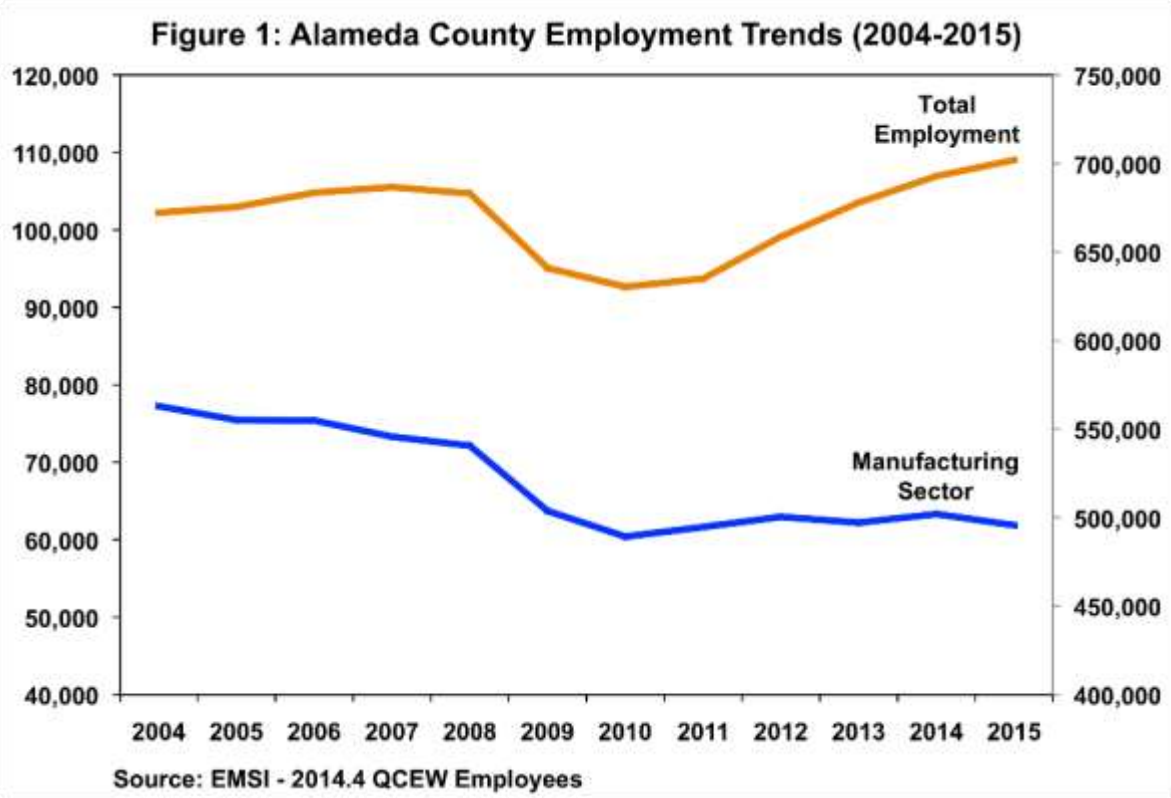
A copy of the workforce needs assessment survey instrument is included in the Appendix of this report.

Contribution of the Manufacturing Sector to Alameda County's Economy

While manufacturing employment nationwide has declined over the past several decades, the U.S. is still a global leader in manufacturing output. Economic development strategies nationwide recognize the continued importance of the manufacturing sector, especially in the context of regional income, wages, and innovation. Most manufacturers export their products outside a region, to another state or country, so that new dollars are brought into the local economy. This has a higher than normal multiplier effect as manufacturers purchase materials and services from local businesses, thereby supporting jobs in other industries. Manufacturers also generally pay higher wages than other industries, on average, which results in greater spending on local consumer goods and services by their employees.

Importance to the Local Economy

Manufacturing is one of the core industries in Alameda County, accounting for 8.8% of all jobs with 1,863 firms employing 61,864 workers in 2015. Over the past ten years, the manufacturing sector has shown a general decline in employment, in part due to the Great Recession of 2007-2009 (see Figure 1). Although the manufacturing sector has lost jobs over the past decade, it still remains a vital part of the local economy. Manufacturing is the 5th largest employment sector in Alameda County, but has not shown the same resiliency in its rate of recovery from the Great Recession.



Average Wage Levels

The average wage for manufacturing workers in Alameda County is $80,195 compared to the average wage of $64,215[11] for all workers in the county and an average household income of $72,112.[12] In 2013, manufacturing firms in the county paid out $4.98 billion in wages,[13] making it one of the top five sectors with total wages paid.

Gross Regional Product

Gross Regional Product (GRP), which measures the size and productive capacity of the regional economy, shows that manufacturing is a major contributor to the local economy. In 2013, the manufacturing sector contributed 13% ($13.4 billion) to Alameda County's total GRP of $100 Billion.

Local Spending & Capital Investment

The manufacturing sector is also important to the local economy due to its high levels of capital investment. Annual capital spending by the manufacturing sector totaled $1.18 billion in 2012.[14] Maintenance and upgrades provide on-going construction jobs at many of the manufacturing plants. Local spending due to operating expenditures generates additional demand for goods and services, thereby creating employment in other sectors. For every job created in manufacturing, approximately 4.4 indirect and induced jobs are created in the local economy.

[11] EMSI – 2014.4 QCEW

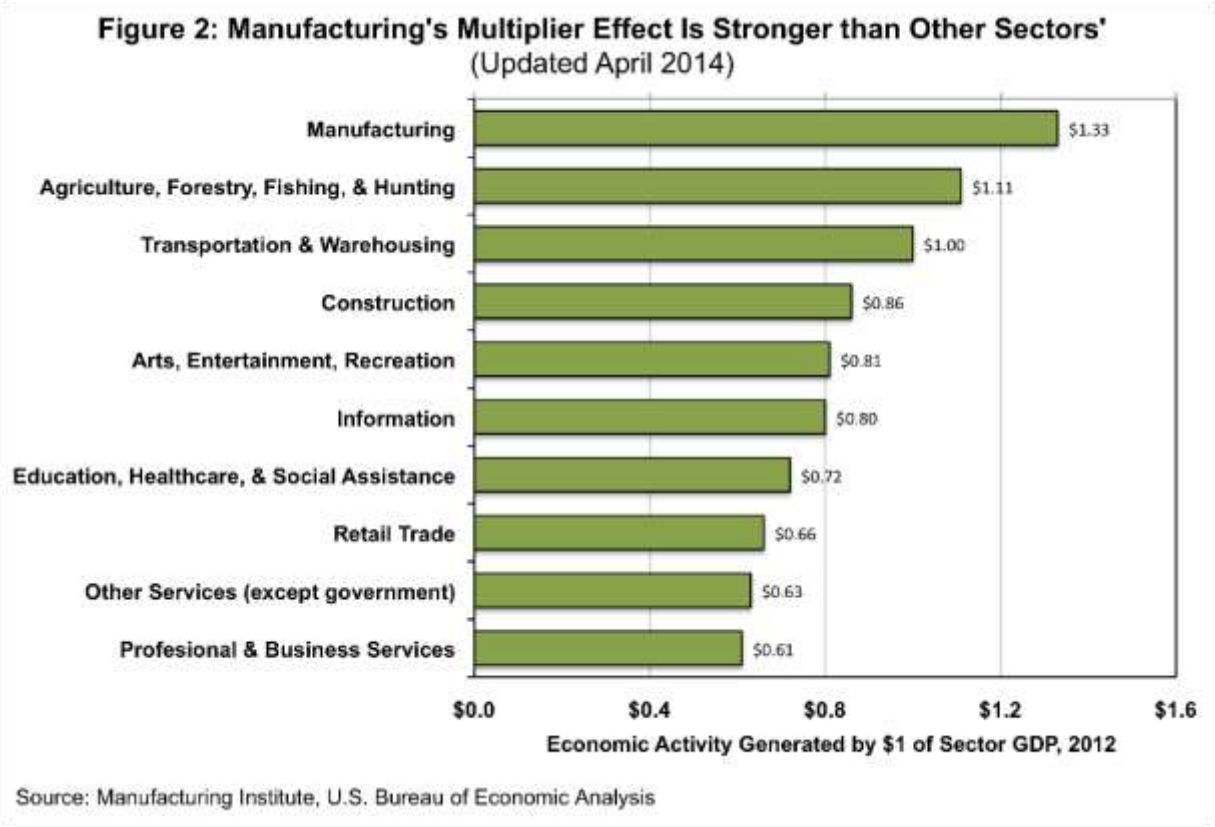
[12] U.S. Census Bureau, 2009-2013 5-Year American Community Survey

[13] California Employment Development Department, Labor Market Information, California Regional Economies Employment Series (CREE)

[14] U.S. Census Bureau, 2012 Economic Census

Multiplier Effect

Manufacturing is complex and its production processes increase the demand for raw materials, energy, construction, and services from a broad array of supplying industries due to spending by manufacturing firms. According to the Manufacturing Institute, the multiplier effect of manufacturing is stronger than other sectors (see Figure 2). Nationally, manufactured products support $1.33 in output from other sectors. This constitutes the largest multiplier of any sector. Alameda's manufacturing sector has a high job multiplier primarily due to the high employment and well above average wages paid to workers in the biomedical/life sciences, machinery, and digital & electronic device subsectors.



By any measure, Alameda's manufacturing sector is a major contributor to the local economy. High wage jobs provide workers with a livable wage well above the median. Property taxes paid and local spending by manufacturing firms support jobs in other sectors. An economically healthy and vibrant manufacturing sector is, therefore, very important to the Alameda County economy.

Industry Analysis

Historically, Alameda County has served as a manufacturing center for the Bay Area and State for over 100 years. While a number of industries established around the turn of the century are still here, many of the older industrial areas have been in decline and transitioning to other uses. As the county's manufacturing base contracted, manufacturing employment has declined, both in absolute terms and as a share of total employment, in part due to the structural shift in the U.S. economy and increasing global competition. Companies that adapted their production and manufacturing processes have remained competitive and increased their productivity with fewer workers. The adoption of advanced manufacturing technologies and processes have enabled many local companies to remain profitable and competitive.

Industry Size and Composition

Sector Employment

The manufacturing industry is the 5th largest employment sector in Alameda County, accounting for more than 61,800 jobs (see Table 1). Although the manufacturing sector showed job growth (1,470 jobs) from 2010 – 2015, it hasn't gained as many jobs as other sectors during the recovery from the Great Recession.

Table 1: Alameda County Industry Sectors Ranked by Percentage of Total Employment

Sector Rank	NAICS Codes	Sector Description	2010 Jobs	2015 Jobs	Change	% 2015 Total Employment	2015 LQ
1	62	Health Care and Social Assistance	77,394	100,574	23,180	14.33%	1.07
2	90	Government	99,813	99,640	(173)	14.19%	0.92
3	54	Professional, Scientific, and Technical Services	57,326	68,415	11,089	9.75%	1.57
4	44	Retail Trade	59,945	67,111	7,166	9.56%	0.86
5	31 - 33	Manufacturing	60,394	61,864	1,470	8.81%	1.02
6	72	Accommodation and Food Services	45,360	55,246	9,886	7.87%	0.86
7	23	Construction	30,299	37,850	7,551	5.39%	1.23
8	42	Wholesale Trade	34,373	37,727	3,354	5.37%	1.26
9	56	Administrative and Support and Waste Management and Remediation Services	31,358	36,491	5,133	5.20%	0.82
10	81	Other Services (except Public Administration)	33,549	23,996	(9,553)	3.42%	1.11
11	48	Transportation and Warehousing	22,281	23,725	1,444	3.38%	1.05
12	55	Management of Companies and Enterprises	15,601	21,816	6,215	3.11%	1.99
13	61	Educational Services	12,976	16,300	3,324	2.32%	1.16
14	52	Finance and Insurance	13,925	13,899	(26)	1.98%	0.48
15	51	Information	14,257	12,738	(1,519)	1.81%	0.93
16	71	Arts, Entertainment, and Recreation	9,020	10,575	1,555	1.51%	0.98

17	53	Real Estate and Rental and Leasing	9,004	9,685	681	1.38%	0.93
18	22	Utilities	1,341	1,465	124	0.21%	0.52
19	11	Crop and Animal Production	732	629	(103)	0.09%	0.10
20	21	Mining, Quarrying, and Oil and Gas Extraction	126	159	33	0.02%	0.04
	99	Unclassified Industry	1,269	2,098	829	0.30%	
		Total - Private Sector	**629,612**	**701,371**	**71,483**	**85.51%**	
		Total - All Industries	**630,344**	**702,000**	**71,656**	**100%**	
Source: EMSI 2014.4 QCEW Employees							

Number of Establishments

Alameda County has a diversified manufacturing base with 1,863 firms spread across 22 subsectors. The number of manufacturing firms has declined over the past several decades. Many of the survivors have become more productive due to the adoption of advanced technology and business process improvements. In 1993, Alameda County had 2,694 manufacturing establishments employing more than 69,806 workers.[15] By 2003, there were 2,412 manufacturing establishments and by 2013 the number of establishments was down to 1,855 firms employing 62,249 workers.[16] New business formations in the manufacturing sector have been rather limited. According to a recent report on the East Bay economy, "*business starts in manufacturing [in the East Bay] play a smaller role than in the broader economy. It is instead growth at established firms that provides the bulk of job creation*."[17]

Size of Firms

A little over half of the county's manufacturing sector is made up of small firms with 54.6% having fewer than 10 employees. Firms with 10-49 employees account for approximately 30.9% of all manufacturing firms, while medium size firms with 100-499 employees make-up 6.5% of the companies. Large firms with 500 or more employees make up less than 1% of all manufacturing firms in Alameda County.

Table 2: Size of Firms in Alameda County's Manufacturing Sector by Number of Employees

	Size of Firm (Number of Employees)								
	1-4	**5-9**	**10-19**	**20-49**	**50-99**	**100-249**	**250-499**	**500-999**	**1,000 +**
# of Firms	671	343	284	289	136	92	28	9	4
% of Total	36.15%	18.48%	15.30%	15.57%	7.33%	4.96%	1.51%	0.48%	0.22%
Source: U.S. Census Bureau - County Business Patterns									

[15] California Employment Development Department, Labor Market Information, California Regional Economies Employment Series (CREE)

[16] Ibid.

[17] East Bay Economic Development Alliance, "Building on Our Assets: Economic Development and Job Creation in the East Bay", October 2011

Leading Subsectors

The manufacturing sector can be divided into numerous subsectors based on the type of products, material inputs, and production processes employed. The North American Industry Classification System (NAICS) groups manufacturing establishments according to their primary activity and the similarity in the processes used to produce goods. The production of durable goods, which typically last for more than three years are classified under NAICS 31, while non-durable goods, which typically last less than a year, are grouped under NAICS 33. Resource-based goods derived from natural substances are listed under NAICS 32.

For purposes of this study, we have divided the manufacturing sector into 22 subsectors based primarily on their 3-digit NAICS codes (see Appendix for detailed breakdown). Each manufacturing subsector not only reflects differences in the type of products, material inputs, and production processes, but also in the type of occupations that are required.

Although Alameda County has a diversified manufacturing base, several key subsectors dominate. Major manufacturing subsectors based on employment levels include:

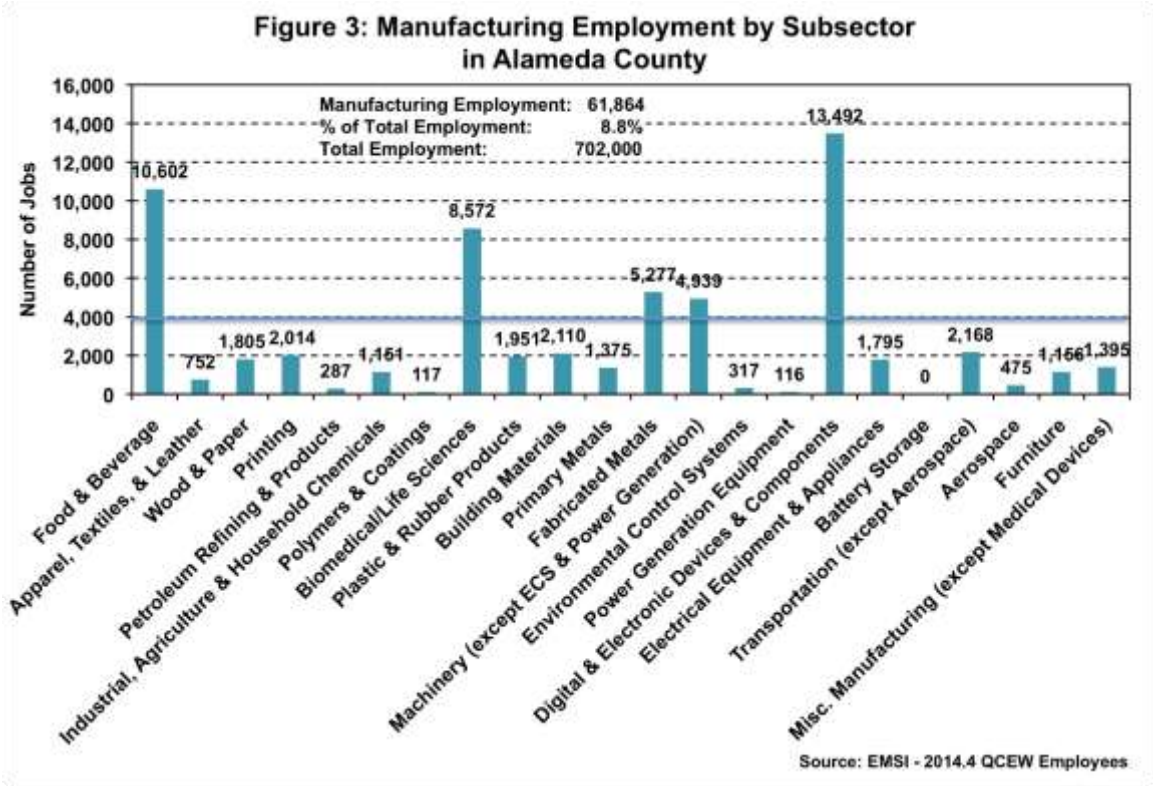
- Digital & Electronic Devices (13,492 jobs)
- Food & Beverage Processing (10,602 jobs)
- Biomedical/Life Sciences (8,572 jobs)
- Fabricated Metals (5,277 jobs)
- Machinery (4,939 jobs)

The top five manufacturing subsectors employ approximately 42,882 workers which accounts for 69.3% of all manufacturing employment.

Table 3: Alameda County Manufacturing Subsectors

	Subsector	# of Firms	2010 Jobs	2015 Jobs	% Change	2015 LQ	Job Multiplier	Wages
1	Food & Beverage	235	9,143	10,602	16%	1.25	2.33	$50,202
2	Apparel, Textiles, & Leather	73	826	752	-9%	0.41	1.33	$32,294
3	Wood & Paper	62	2,154	1,805	-16%	0.50	1.69	$52,443
4	Printing	166	2,028	2,014	-1%	0.93	1.49	$49,718
5	Petroleum Refining & Products	7	323	287	-11%	0.50	7.33	$74,188
6	Industrial, Agriculture & Household Chemicals	52	1,406	1,151	-18%	0.62	7.48	$147,145
7	Polymers & Coatings	14	153	117	-24%	0.15	3.23	$68,744
8	Biomedical/Life Sciences	141	8,100	8,572	6%	2.44	2.54	$109,811
9	Plastic & Rubber Products	61	2,239	1,951	-13%	0.59	1.73	$49,027
10	Building Materials	71	1,872	2,110	13%	1.09	1.74	$58,547
11	Primary Metals	27	1,436	1,375	-4%	0.68	2.09	$59,480
12	Fabricated Metals	318	5,537	5,277	-5%	0.72	1.90	$53,229
13	Machinery (except ECS & Power Generation)	118	4,219	4,939	17%	1.04	3.60	$117,878
14	Environmental Control Systems	26	302	317	5%	0.73	1.59	$71,848
15	Power Generation Equipment	6	81	116	43%	0.22	2.01	$82,764
16	Digital & Electronic Devices & Components	247	13,141	13,492	3%	2.88	2.17	$99,565
17	Electrical Equipment & Appliances	44	1,500	1,795	20%	1.04	2.54	$81,400
18	Battery Storage	0	0	0	0%	0.00	1.38	$0
19	Transportation (except Aerospace)	34	2,859	2,168	-24%	0.41	2.77	$89,819
20	Aerospace	6	395	475	20%	0.19	2.23	$74,509
21	Furniture	74	1,098	1,156	5%	0.64	1.66	$48,235
22	Misc. Manufacturing (except Medical Devices)	82	1,581	1,395	-12%	1.03	2.07	$76,324
	Total Manufacturing Employment	**1,863**	**60,394**	**61,864**	**2%**	**1.02**	**4.38**	**$80,195**
	Manufacturing as a % of Total Employment			**8.8%**				
	Total Alameda County Employment			**702,000**				

EMSI - 2014.4 QCEW Employees

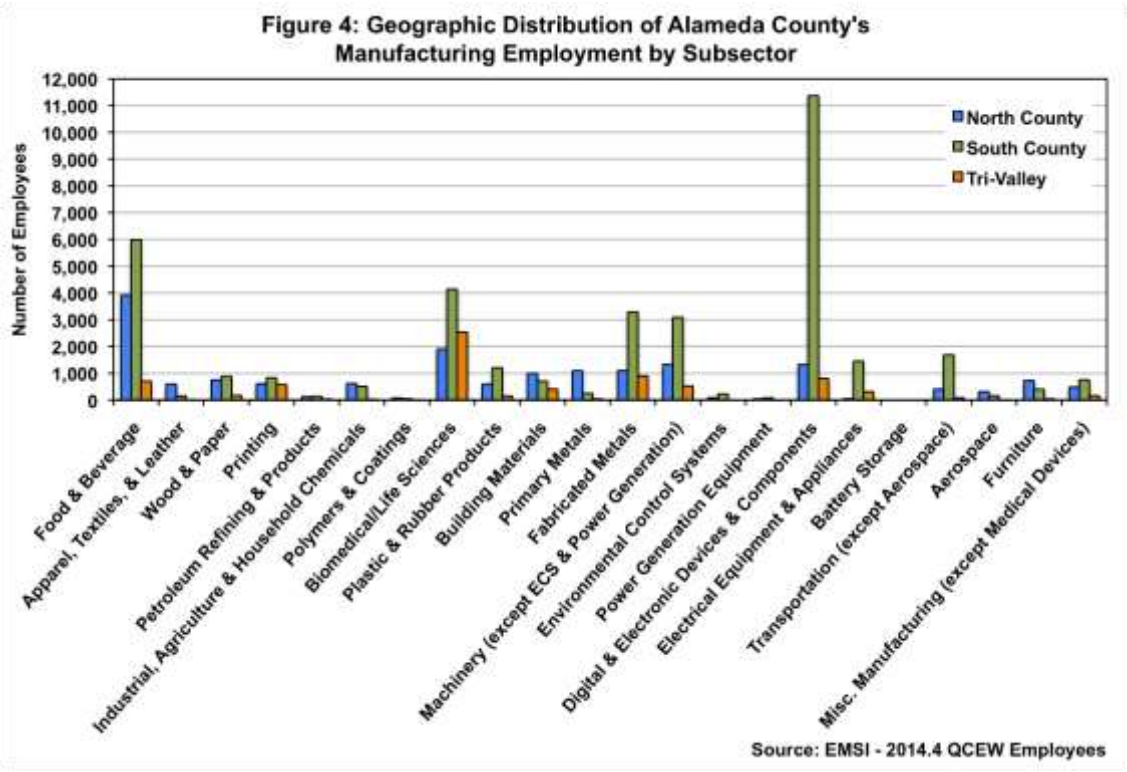


Geographic Distribution of Manufacturing Employment

We have separated Alameda County's manufacturing employment into three distinct sub-regions (North County, South County, & Tri-Valley) - based on the East Bay Economic Development Alliance definition (see Table 4). Manufacturing firms are located throughout Alameda County, but geographically, the manufacturing sector is relatively concentrated, with most of the jobs (88%) located in North and South Alameda County along the I-880 corridor. Being led by the cities of Fremont (19,587 jobs) and Hayward (10,768 jobs), Southern Alameda County is clearly the dominant manufacturing employment hub with more jobs (37,311 jobs) than both North County (17,093 jobs) and the Tri-Valley (7,460 jobs) combined. The City of Oakland (7,168 jobs) and the City of Livermore (4,120 jobs) lead North County and the Tri-Valley in manufacturing employment, respectively.

Not only does Southern Alameda County provide the most manufacturing jobs in 11 out of the 22 subsectors, it also has the highest employment in each of the top 5 manufacturing subsectors (see Figure 4). Digital & Electronic Devices & Components manufacturing, the manufacturing subsector with the largest employment, is overwhelmingly concentrated in Southern Alameda County. Both Northern and Southern Alameda County hold a significant percentage of employment (37% and 57% respectively) in the food and beverage manufacturing subsector. Although South County possesses the highest employment in the biomedical/life sciences subsector, there is a good distribution within the county. Fabricated metals and machinery manufacturing employment is concentrated in South County with most of the remaining employment in North County.

Table 4: Geographic Distribution of Manufacturing Employment in Alameda County		
Subregion*	**Mfg Employment**	**% of Total Mfg Employment**
South	**37,311**	**60.3%**
Fremont	19,587	31.7%
Hayward	10,768	17.4%
Union City	4,375	7.1%
Newark	2,106	3.4%
San Lorenzo	476	0.8%
North	**17,093**	**27.6%**
Oakland	7,168	11.6%
San Leandro	3,856	6.2%
Alameda	2,598	4.2%
Berkeley	2,275	3.7%
Emeryville	1,111	1.8%
Castro Valley	45	0.1%
Albany	36	0.1%
Piedmont	3	0.0%
Tri-Valley	**7,460**	**12.1%**
Livermore	4,120	6.7%
Pleasanton	1,930	3.1%
Dublin	1,340	2.2%
Sunol	69	0.1%
Total	**61,864**	**100%**
Source: EMSI - 2014.4 QCEW Employees		



Major Employers

Alameda County's manufacturing sector includes a number of globally competitive companies. Major Alameda County manufacturing firms based on number of employees are found in Table 5. A majority of the major employers are a part of either the Digital & Electronic Devices or Biomedical/Life Sciences subsectors, which are in Alameda County's top five employment subsectors. It is interesting to note that although the Food & Beverage subsector has the second highest employment in the County's manufacturing sector, there are only three employers with 300 or more employees.

Table 5: Major Manufacturing Employers in Alameda County

Company	Industry Subsector
Firms with 500-Plus Employees	
Abbott Diabetes Care Inc.	Biomed/Life Sciences
Morpho Detection, Inc.	Digital & Electronic Devices & Components
Formfactor Inc	Digital & Electronic Devices & Components
Compudyne Corporation	Fabricated Metals
Bayer Corp.	Biomed/Life Sciences
Thoratec Corp	Biomed/Life Sciences
3par Inc.	Digital & Electronic Devices & Components
Avanex Corp	Digital & Electronic Devices & Components
Schiffenhaus California Inc	Wood & Paper
Asteelflash California, Inc	Digital & Electronic Devices & Components

Asi Corp.	Digital & Electronic Devices & Components
Novartis Vaccines And Diagnostics, Inc.	Biomed/Life Sciences
Mygrant Glass Company Inc.	Building Materials
Roche Molecular Systems, Inc.	Biomed/Life Sciences
Carl Zeiss Meditec, Inc.	Environmental Control Systems
General Dynamics Ots	Digital & Electronic Devices & Components
Rolls-royce Engine Services-oakland Inc.	Aerospace
Thermo Fisher Scientific - Lab Vision Ihc System Solutions	Biomed/Life Sciences
Firms with 300-499 Employees	
Sasol Wax North America Corp	Petroleum Refining & Products
Peterson Holding Company	Machinery
Synnex Information	Digital & Electronic Devices & Components
Plastikon Industries Inc	Polymers & Coatings
Morpo Detection Llc	Digital & Electronic Devices & Components
Galgon Industries Inc.	Fabricated Metals
Abaxis Inc	Biomed/Life Sciences
Corsair Components, Inc.	Digital & Electronic Devices & Components
U.S. Ink Corporation	Indusrial, Agriculture & Household Chemicals
OSIsoft	Digital & Electronic Devices & Components
Solta Medical Inc	Biomed/Life Sciences
Kraft Foods	Food & Beverage
Pacific Coast Retreaders Inc.	Plastic & Rubber Products
Abit Computer Usa Corporation	Digital & Electronic Devices & Components
Leapfrog Enterprises Inc	Miscellaneous Manufacturing
Sca Packaging North America	Plastic & Rubber Products
Tharco Packaging, Inc.	Wood & Paper
Berkeley Farms, Llc	Food & Beverage
Power Bar Inc.	Food & Beverage
Morgan Advanced Ceramics	Building Materials
Source: Equifax Business Data	

Historical Employment Trends

In 1993, manufacturing was a key driver of the local economy, accounting for 14.8% of the county's private sector employment. Over the past several decades, employment in the county's traditional manufacturing sector has contracted, dropping to 13.5% of private sector employment in 2003 and 10.7% in 2013. Although some subsectors have maintained a strong local presence, the county's manufacturing sector in general has diminished in size of employment by about 4% since the early 1990s. Companies that survived have become leaner and more efficient producing more with fewer workers.

Although the number of manufacturing jobs has declined by 11% since 1993, several subsectors have shown an increase in employment since 2003, including Food & Beverage Processing, Biomedical/Life Sciences, Electrical Equipment & Appliances, Machinery, and Petroleum Refining & Products. Several of the county's manufacturing subsectors are mature industries and should not be expected to generate significant new job growth.

Over the long run, manufacturing's share of employment will remain under pressure as a result of "ongoing productivity improvements, the continued growth of services as a share of the economy, and the force of global competition, which pushes advanced economies to specialize in activities requiring more skill."[18]

Regional Performance & Competitiveness

Shift-share analysis identifies a region's most competitive industries by comparing employment changes in each industry of the local economy to employment changes in the same sector of the national economy. When employment in a local industry grows at a faster pace (or declines less) than its counterpart nationally, a shift occurs in the proportion of employment captured by that industry locally, changing the region's competitive position.

During the 2010 to 2015 period, manufacturing employment in Alameda County increased by 1,470 jobs. If the local economy had grown at the same rate as the national economy, Alameda County would have added 4,965 new manufacturing jobs during that period. The manufacturing sector at the national level, however, did not perform as well as the overall economy. In fact, it experienced a slight decline in employment. If the industry composition had been the same locally as nationally, Alameda County's manufacturing sector would have lost 2,471 jobs. Had the local manufacturing sector performed in a similar manner as the national economy and manufacturing sector, Alameda County would have expected to see a net increase of 2,494 manufacturing jobs. Unfortunately, the mix of industries in the manufacturing sector at the local level was not able match the performance of the mix of industries nationally in certain subsectors, especially transportation, fabricated metals, and plastic and rubber products. In large part, these subsectors did not perform as well as their national counterparts due to NUMMI Motors shutting down its Fremont assembly plant and laying off 1,000 workers in early 2010.[19]

[18] McKinsey Global Institute, "Manufacturing the Future: The next era of global growth and innovation", November 2012

[19] NPR, "NUMMI Plant Closure Ends Toyota-GM Venture", April 1,2010, found at http://www.npr.org/templates/story/story.php?storyId=125430405

Table 6: Shift Share Analysis for Manufacturing in Alameda County (2010 - 2015)					
Subsector	**National Growth**	**Industrial Mix**	**Expected Change**	**Competitive Effect**	**Actual Change**
Food & Beverage	752	-388	364	1,095	1,459
Apparel, Textiles & Leather	68	-214	-146	72	-74
Wood & Paper	177	-298	-121	-228	-349
Printing	167	-411	-244	230	-14
Petroleum Refining & Products	27	-18	9	-46	-36
Industrial, Agriculture & Household Chemicals	116	-80	36	-291	-255
Polymers & Coatings	13	-7	6	-42	-36
Biomedical/Life Sciences	666	-367	299	173	472
Plastic & Rubber Products	184	-77	107	-396	-288
Building Materials	154	-93	61	177	238
Primary Metals	118	28	146	-207	-61
Fabricated Metals	455	275	730	-991	-260
Machinery (except ECS & Power Generation)	347	143	490	230	720
Environmental Control Systems	25	-47	-22	37	15
Power Generation Equipment	7	3	10	25	35
Digital & Electronic Devices & Components	1,080	-1,824	-744	1,095	351
Electrical Equipment & Appliances	123	-55	68	226	295
Battery Storage	0	0	0	0	0
Transportation (except Aerospace)	235	353	588	-1,279	-691
Aerospace	32	-13	19	60	80
Furniture	90	-92	-2	61	58
Misc. Manufacturing (except Medical Devices)	130	-113	17	-203	-186
Total	**4,965**	**-2,471**	**2,494**	**-1,024**	**1,470**
Source: EMSI - 2014.4 QCEW Employees					

In general, the shift-share analysis indicates that Alameda County's manufacturing sector is strongly influenced by the performance of the national economy and that a large proportion of local industries lagged behind their national counterparts. Several leading local manufacturing subsectors did outperform their national counterparts**,** including food & beverage processing, biomedical/life sciences, building materials, machinery, and digital & electronic devices and components.

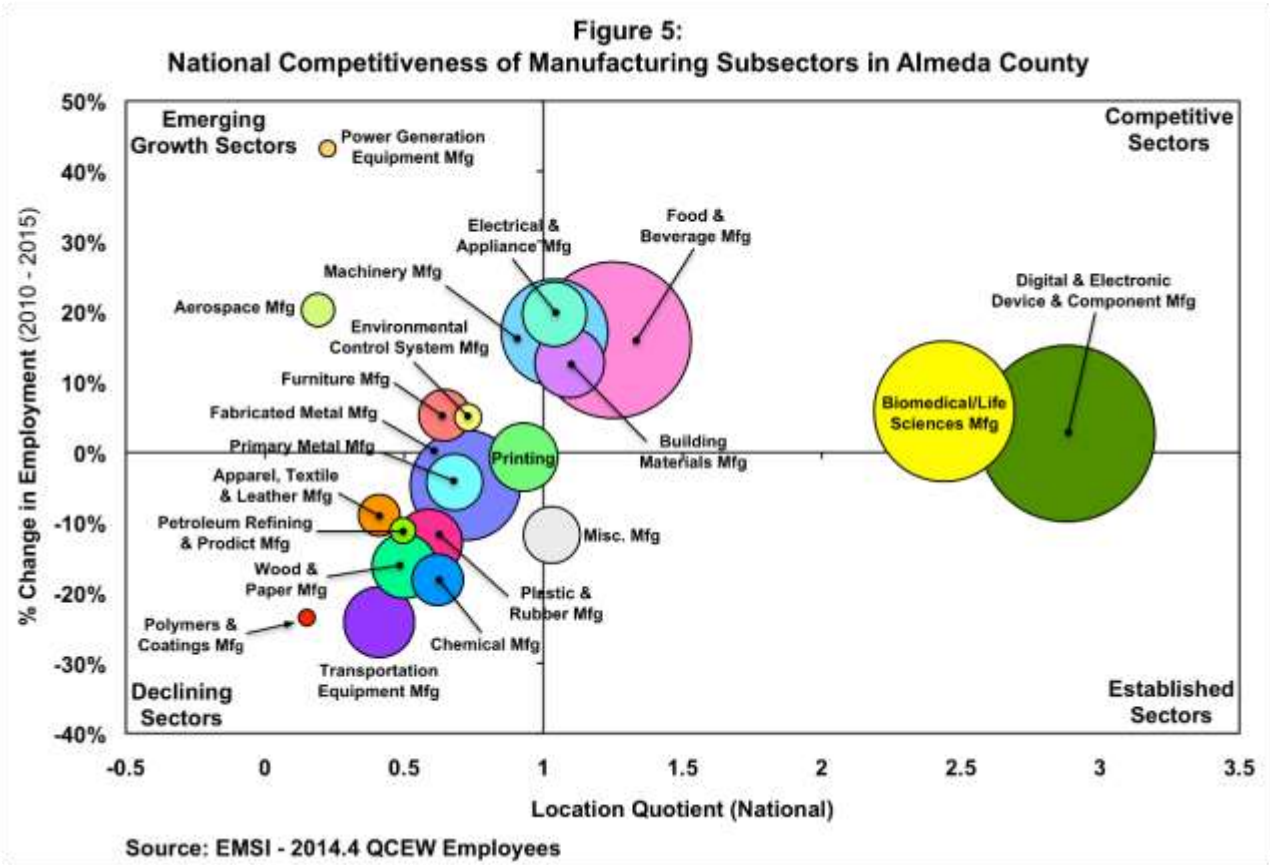
While the shift-share analysis can identify whether the national economy or local conditions contributed to the loss of manufacturing jobs in Alameda County, it cannot explain why certain local manufacturing subsectors were less competitive. Various factors could be the cause, including less competitive companies, market decline, regulatory environment, tax policies, productivity of local labor force, under developed local supply chains, start-up challenges, or other factor**s**. Some of these challenges were identified in a report by the East Bay Economic Development Alliance in October 2011.[20]

[20] East Bay Economic Development Alliance, "Building on our Assets: Economic Development & Job Creation in the East Bay", October 2011

Competitive Strengths

Competitive advantage occurs when a region enjoys a combination of attributes such as access to natural resources, inexpensive power, or a highly skilled workforce that allows it to outperform other economies. To evaluate the competitive strength of Alameda County's manufacturing subsectors, Location Quotients (LQs) were used to identify local strengths, opportunities, and potential industry clusters. LQs measure the relative concentration of an industry within a region compared to the same industry in the national or state economy. LQs greater than 1.0 denote a higher-concentration of employment for an industry within a region than the national or statewide average, which may indicate a possible economic competitive advantage. A LQ greater than 1.25 is also an indicator that the industry is producing more than can be consumed by the local economy and is serving a larger export market. Export oriented industries bring new dollars into the local economy, typically pay higher wages, and support economic and employment growth.

Most employment concentrations in Alameda County's manufacturing sector are below the national average with declining employment in about half of the subsectors (See Figure 5 & Table 3). Alameda County's manufacturing sector shows competitive strengths in several subsectors. Key subsectors include digital & electronic devices & components, biomedical/life sciences, and food & beverage processing. Alameda County is also strong in building materials, machinery, and electrical equipment & appliances manufacturing. Although relatively small, two manufacturing subsectors that appear to be emerging in Alameda County are power generation equipment and aerospace equipment.



Advanced Manufacturing

The U.S. Department of Labor's Employment and Training Administration defines advanced manufacturing as "the accelerated use of high-tech processes in the manufacturing plant." Advanced manufacturing is not industry or subsector specific, although it may be more dominant in certain subsectors. Advanced manufacturing technologies and processes can be utilized by manufacturing firms in any industry or subsector.

According to the President's Council of Advisors on Science and Technology "advanced manufacturing is a family of activities that (a) depend on the use and coordination of information, automation, computation, software, sensing, and networking, and/or (b) make use of cutting edge materials and emerging capabilities enabled by the physical and biological sciences, for example nanotechnology, chemistry, and biology."[21]

> *"The Advanced Manufacturing entity makes extensive use of computer, high precision, and information technologies integrated with a high performance workforce in a production system capable of furnishing a heterogeneous mix of products in small or large volumes with both the efficiency of mass production and the flexibility of custom manufacturing in order to respond quickly to customer demands."*
>
> -National Council for Advanced Manufacturing

Over the past few decades, manufacturing has evolved from a more labor-intensive set of mechanical processes (traditional manufacturing) to a sophisticated set of information technology-based processes (advanced manufacturing). As manufacturing advances, it is increasingly becoming more knowledge-intensive, relying on information-technologies to improve performance and reduce waste. Paramount to Advanced Manufacturing is a highly skilled workforce operating in lean and continuous improvement cultures.

In order to succeed in today's highly competitive global economy, manufacturing firms are increasingly adopting advanced manufacturing technologies and process improvements, especially when they are cost effective and lead to lower cost and increased productivity as a way to create a competitive advantage. A distinguishing characteristic of advanced manufacturing is the use of innovative technologies, processes, or materials in product design and production processes. Firms employing advanced manufacturing processes can be found in both traditional and new emerging industries.

Advanced Manufacturing Processes

Advanced Manufacturing processes, equipment, and technology is used to design and produce everything from automobiles to computer chips in response to customer demands, competitive challenges, and emerging technologies. Recent advances in information systems, business processes, engineering techniques, and manufacturing science now enable companies to produce new and better products more quickly and at a much lower cost than ever before.

[21] Report to the President on Ensuring American Leadership in Advanced Manufacturing

Advanced Manufacturing represents a wide variety of computer-based systems which contribute to the overall improvement of manufacturing processes that enhance a firm's competitiveness. These technologies include, but are not limited to:

- Automated Material Handling Systems
- Computer-Aided Design (CAD)
- Computer-Aided Manufacturing (CAM)
- Computer-Integrated Manufacturing (CIM)
- Computer-Numerically Controlled (CNC) Machines
- Flexible Manufacturing Systems (FMS)
- Just-In-Time (JIT) Production
- Manufacturing Resource Planning (MRP II)
- Optimized Production Technology (OPT)
- Robotics

Through a coordinated production system of people, machines and tools, Advanced Manufacturing extends from the planning and control of the production process, through the procurement of raw materials, parts and components, to the shipment and service of finished products. Advanced Manufacturing allows customization, variety, frequent design changes, and reduced lead times for design, assembly, materials handling, and market feedback. Advanced Manufacturing technologies and processes also allow small firms to develop economies of scale based on low volume and low cost production.

Local Survey of Advanced Manufacturing Firms

Alameda County has a range of businesses in the manufacturing sector including traditional manufacturers and those employing advanced manufacturing processes or technologies. A survey of the manufacturing sector was conducted during the summer and fall of 2014 to assess the workforce needs and other priorities of advanced manufacturing firms in Alameda County.

More than 250 firms were contacted about participating in the survey. Some met our criteria for participating in the survey and some did not. Those who did not meet our criteria included firms that were not actually involved in manufacturing activities locally, and firms that are not using advanced manufacturing processes or technologies. Ultimately, a total of 76 completed surveys were collected from businesses that self-identified themselves as being advanced manufacturers through their use of advanced manufacturing processes or technologies.

Given the firms that were contacted about the survey and the number of firms that could have participated in the survey (based on our criteria), the 76 completed surveys resulted in a survey response rate of 40% and a capture rate of 27% (i.e. the firms that are represented in those 76 surveys employ 27% of the sector's total employment).

While the survey focused on firms with 10 or more employees, a number of small firms with less than 10 employees were included in the survey in order to get a representative sample.

The manufacturers who completed our survey cannot be identified by name because (in order) to get a 40% survey response rate, we had to promise confidentiality. This is standard in labor market studies because some of the information provided is considered sensitive or confidential. In fact, some businesses have policies against participating in any labor market surveys due to confidentiality concerns.

It should be noted that some of the advanced manufacturers could be classified in more than one subsector based on their multiple manufacturing activities. However, for the purposes of our survey, we elected to classify each business in a single subsector based on our understanding of its dominate business activity locally.

A complete summary of the survey responses and a copy of the survey questionnaire are included in the Appendix.

Survey Findings

Business Plan & Most Significant Barriers

What are your business plans in the next 2-5 years?
What is your most significant barrier to achieving your goals?

A majority of the employers surveyed (57%) indicate that they plan to grow locally, either in terms of customers, or jobs, or both. About 25% indicate that they plan to remain stable. A number of firms (9%) reported that, while they expect to grow, that growth will not be in Alameda County. Those firms expect their growth to be in places such as Mexico, Nevada, Taiwan, Costa Rica, the Philippines, and "Outside of Alameda."

Here is what a sampling of the larger employers told us:

We are growing and expanding in every aspect of the operation. A potential barrier to achieving our goals is if we can't find workers with the experience we need, or the aptitude to achieve the needed skill sets.

We are looking at automation to lower our labor costs. We expect 1-2% annual growth, and are considering outsourcing some of our labor to Mexico. New equipment will help increase our productivity and automation. We are looking at all forms of cost savings, processes and technology, labor costs, and market fluctuations.

No significant growth is expected. We are upgrading our site for our best selling products.

We are growing slowly and only expect modest hiring. We are finding qualified people with the experience and education required. We need PhD's in bio chemistry, life sciences, genetics, etc.

We are planning on some growth. Barriers to achieving our objectives include health care costs and difficulty find skilled employees.

We are growing and moving away from the Bay area due to the high cost of doing business there.

We intend to grow within our existing facilities. We have had a huge turnover of our salaried employees. The cost of living makes it hard to recruit new people to the Bay Area.

We have identified new initiatives in data science, advanced materials, and biological engineering. The barriers to achieving our goals include finding and maintaining talent due to the competition with Silicon Valley companies.

We just added a new R&D facility and are growing steadily. Finding employees with the experience and skills we need is our biggest challenge. There is a much smaller pool of qualified workers than there was just 15 years ago.

We'll see some moderate growth due to internal efficiency, and we're expecting some new business as well. National and international economy, and governmental impact are our most significant barriers.

Type of Jobs

The employers surveyed employ a combined total of 16,747 workers at their Alameda County locations. Of those employees, here is how the type of jobs break down:

Full Time Regular:	89%
Part Time Regular:	3%
On Call:	<1%
Temporary, Not Seasonal:	7%
Seasonal:	<1%
Independent Contractors:	<1%

Projected Job Growth

About how many employees do you expect to have working:
6 months from now?
1 year from now?
3 years from now?

Those employers surveyed indicated a 6% job growth rate over the next 3 years (or 2% annual job growth). This compares favorably with a 3.8% growth rate for all industries combined (or 1.3% annual job growth).

New Jobs to be Added

If you expect to grow, what jobs will make up the most new positions over the next 3 years, and how many new jobs do you expect to add?

Here are the titles with the most new jobs based on the survey:

Production	107 jobs to be added
Sales	75
Machine Operators	43
Mechanical Engineers	36
Quality Assurance	34
Process Engineers	33
Chemical Engineers	31
Other Engineers	30
Warehouse/Shipping & Receiving	28
Life Scientists	21
Machinists	12

Replacement Jobs to be Filled

For what jobs do you expect to hire the most replacements when current employees retire or leave your company over the next 3 years, and how many replacements do you expect to hire?

Here are the titles with the most replacement jobs to be filled based on the survey:

Production	129 replacement jobs to be filled
Machinists	72
Chemists	46
Machine Operators	43
Chemical Engineers	22
Sales	19
Warehouse/Shipping & Receiving	16
Mechanical Engineers	15
Life Scientists	14
Other Engineers	14
Quality Assurance	11
Process Engineers	2

Shortages of Qualified Workers

For what jobs do you have significant difficulty finding qualified applicants, and why?

This is a key question in a workforce needs assessment because it directly indicates the workforce needs of our employers, while providing insight into the relationship between occupational supply and demand. When employers indicate that they are having *significant difficulty* finding qualified applicants for certain types of jobs, it raises a red flag over the labor market. For business and industry, it can mean operating at less than peak efficiency because of positions that can't be filled, or can't be filled efficiently. It can mean delays in production or in providing key services. It can mean that recruiting the needed applicants will be more costly and time consuming, or it can mean an increase in training and labor costs.

For the education and workforce development community, the red flag may indicate a shortage of qualified workers, or a skills gap, or a misinterpretation of the workforce needs of our employers.

For job seekers, the red flag may indicate an area of opportunity for those with the right qualifications.

This needs assessment identified a wide variety of positions for which employers report having *significant difficulty* finding qualified applicants, as well as some insights from employers as to why.

Occupations most frequently reported in response to this question:

- Assemblers/Production
- Engineers (various types)
- Machine Operators
- Machinists
- Press Operators
- Quality Assurance/Control
- Sales
- Software Engineers
- Welders

Skills in Short Supply

For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?

First, it should be noted that about 17% of the employers surveyed said "No" in response to this question. The other 83% reported one or more skills that are in short supply.

Of those who indicated they were experiencing some type of a skills gap, many employers were focused on soft skills or basic skills in short supply, such as communication skills, a good work ethic, or basic math or grammar skills. Many other employers were focused on technical or job specific skills that are in short supply (and that vary by occupation). And many employers were equally concerned about both types of skill deficiencies, and/or on other qualifications in short supply, such as work experience.

Soft skill deficiencies include such things as:

- Communication skills
- Basic math skills
- Basic grammar skills
- Problem-solving skills
- Strong work ethic
- Reliability

The complete set of responses to this question can be found in the Appendix.

Current Job Openings

How many current job openings do you have, and for what types of jobs?

About one in three of the employers surveyed (34%) reported that they did not have any current job openings. The other 66% reported that they did have one or more current job openings. Of those with job openings, the typical employer has one or two current job openings, but some employers have up to 20-50 current job openings, and one employer reported having 100 current job openings.

Employers with the most current job openings reflect these four industries:

- Chemical Manufacturing
- Fabricated Metal Product Manufacturing
- Computer and Electronic Product Manufacturing
- Miscellaneous Manufacturing

Top Recruitment Methods and Tools

- Craigslist (16% of employers surveyed)
- LinkedIn (12%)
- Word of Mouth (12%)
- Monster (11%)
- Industry Referrals (9%)
- Temp Staffing Agencies/Temp-to-Hire (9%)
- Company Website (8%)
- Employee Referrals (8%)
- Job Boards (7%)
- College Referrals (7%)
- CareerBuilder (5%)
- Recruiters (5%)
- Union Referrals (5%)

Beverage Manufacturing: Craigslist, Word of Mouth, ProBrewer

Paper Manufacturing: Craigslist, Trade Shows, Temp Staffing Agencies/Temp-to-Hire, Job Boards, Word of Mouth, Networking, Employee Referrals, Monster, LinkedIn

Printing: Job Fairs, LinkedIn, CareerBuilder, Employee Referrals, Craigslist, Company Website, Printing Association, Word of Mouth, Industry Referrals, Temp Staffing Agencies/Temp-to-Hire, Tri Valley Jobs

Chemical Manufacturing: Company Website, LinkedIn, Craigslist, University Job Boards, Association Advertising, Job Boards, Monster, Biospace.com, Indeed, Industry Referrals

Plastics and Rubber Products Manufacturing: Recruiters, Industry Referrals, Social Media, Craigslist, School Job Boards, LinkedIn, Referrals, Networking with Colleges, Temp Staffing Agencies/Temp-to-Hire

Primary Metal Manufacturing: Temp Staffing Agencies/Temp-to-Hire, Monster, Craigslist, Company Website, Networking with Colleges, Internship, Word of Mouth, LinkedIn, Union Referrals, Employee Referrals

Fabricated Metal Product Manufacturing: LinkedIn, Professional Associations, Company Website, Trade/Tech Schools, CareerBuilder, Monster, Head Hunters, EDD (CalJobs), Industry Referrals, Word of Mouth, Craigslist, Ohlone College, Walk-ins (they don't recruit), Industry Referrals

Machinery Manufacturing: Recruiters, Temp Staffing Agencies/Temp-to-Hire, Craigslist, Monster, Company Website, Union Referrals, Word of Mouth, Industry Referrals, Job Boards, LinkedIn, CareerBuilder, Employee Referrals, EDD (CalJobs), Schools Referrals

Computer and Electronic Product Manufacturing: Volt Workforce Solutions (employment agency), Employee Referrals, Temp Staffing Agencies/Temp-to-Hire, Job Boards, Monster, Craigslist, LinkedIn, CareerBuilder, Networking, Customer Referrals, Indeed, Recruiter, College Recruitment, Word of Mouth, Company Website, Word of Mouth, Job Fairs, FeeTrader

Electrical Equipment, Appliance, and Component Manufacturing: Job Boards, LinkedIn, Monster, Craigslist, College Referrals, Union Referrals

Transportation Equipment Manufacturing: Craigslist, Word of Mouth, Employee Referrals

Furniture and Related Product Manufacturing: Craigslist, Monster, Temp Staffing Agencies/Temp-to-Hire, Recruiters, Walk-ins (for most of their factory workers), Union Referrals, Industry Referrals, High School Referrals

Hire Foreign Workers

Do you need to hire foreign workers to fill the need for skilled workers? If so, for what types of jobs?

Of the employers surveyed, 82% report that they DO NOT hire foreign workers to fill the need for skilled workers. Of those employers who do hire foreign workers to fill the need for skilled workers (18%), about one in three report that they only use this option on occasion.

The types of jobs filled by hiring foreign workers is typically engineer and scientist positions.

Need for Pre-Employment Training

Do you see a need for new or more effective pre-employment (or soft skills) training designed to better prepare new hires for the workforce?
If yes, please describe the type of pre-employment training you believe is needed.

About three out of four employers surveyed (74%) report that they see a need for new or more effective pre-employment/soft skills training designed to better prepare new hires for the workforce. This applies to all secondary and postsecondary education schools, training providers and workforce development entities.

Here's a sampling of what some of the largest employers had to say about the type of pre-employment training they believe is needed. Note that the complete set of responses to this question can be found in the Appendix.

Production skills, IT skills, equipment operation, teamwork, honesty, rigorousness, problem solving.

More training on resume development and interviewing skills - directed toward the employer and their needs. After they start, they often need to be more proactive about taking on responsibilities or learning as they begin the job.

More trade schools equipped with machinery that matches industry requirements and current technology.

English as a second language, communication of ideas, soldering skills. Begin at high school level.

Soft skills, communication skills, basic common sense, working in teams, effective cross-functional teams, leading and participating in meetings, scheduling meetings without conflicts, being prepared for a meeting with an agenda, and being on time.

Teach accountability, proper English and phone skills, and practical ways how to be reliable. Teach multitasking on the computer at the same time as being on the phone.

Employee/Incumbent Worker Skill Needs

If you have employees with skill needs that require new or updated training, please describe the type of training that is needed.

The responses to this question provide a wide range of information and insight pertaining to the skill needs of incumbent workers, many of which vary considerably from industry to industry. Some employers described the type of training they are currently providing, either in-house or through vendors. Some other employers described their incumbent worker training needs without specifying whether the training is being provided and, if so, by whom.

The complete set of responses to this question can be found in the Appendix.

Industry Staffing Patterns

The following table lists all occupations with at least 150 jobs in the manufacturing sector in Alameda County, but does not include non-manufacturing related employment. Production occupations constitute the largest percentage of jobs in most manufacturing firms. Other key occupational categories include installation, repair & maintenance; transportation & logistics; quality assurance; and engineering/process development. Research and development and product design are also important. These types of occupations typically represent 85% or more of all manufacturing jobs.

Table 7							
Occupation	**Jobs in Industry (2014)**	**Jobs in Industry (2024)**	**Change (2014 - 2024)**	**% Change (2014 - 2024)**	**% of Total Jobs in Industry (2014)**	**Median Hourly Earnings**	**Typical Entry Level Education**
Team Assemblers	2,887	2,723	(164)	(6%)	4.6%	$14.51	High school diploma or equivalent
Electrical and Electronic Equipment Assemblers	1,886	1,891	5	0%	3.0%	$17.41	High school diploma or equivalent
First-Line Supervisors of Production and Operating Workers	1,740	1,728	(12)	(1%)	2.8%	$30.18	Postsecondary non-degree award
Inspectors, Testers, Sorters, Samplers, and Weighers	1,593	1,598	5	0%	2.5%	$20.03	High school diploma or equivalent
General and Operations Managers	1,395	1,371	(24)	(2%)	2.2%	$55.29	Bachelor's degree
Machinists	1,363	1,457	94	7%	2.2%	$26.91	High school diploma or equivalent
Industrial Engineers	1,193	1,179	(14)	(1%)	1.9%	$47.96	Bachelor's degree
Helpers--Production Workers	1,184	1,186	2	0%	1.9%	$12.79	Less than high school
Packaging and Filling Machine Operators and Tenders	1,145	1,171	26	2%	1.8%	$11.86	High school diploma or equivalent
Shipping, Receiving, and Traffic Clerks	1,133	1,102	(31)	(3%)	1.8%	$15.98	High school diploma or equivalent
Laborers and Freight, Stock, and Material Movers, Hand	1,114	1,104	(10)	(1%)	1.8%	$13.58	Less than high school
Packers and Packagers, Hand	993	1,009	16	2%	1.6%	$10.77	Less than high school
Architectural and Engineering Managers	971	957	(14)	(1%)	1.5%	$77.62	Bachelor's degree
Bakers	954	1,143	189	20%	1.5%	$15.16	Less than high school
Software Developers, Systems Software	950	907	(43)	(5%)	1.5%	$54.59	Bachelor's degree
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	917	914	(3)	(0%)	1.5%	$27.92	High school diploma or equivalent
Computer Hardware Engineers	830	785	(45)	(5%)	1.3%	$50.17	Bachelor's degree
Industrial Production Managers	818	790	(28)	(3%)	1.3%	$53.15	Bachelor's degree
Customer Service Representatives	715	702	(13)	(2%)	1.1%	$18.75	High school diploma or equivalent
Office Clerks, General	715	691	(24)	(3%)	1.1%	$17.65	High school diploma or equivalent
Production, Planning, and Expediting Clerks	697	678	(19)	(3%)	1.1%	$25.03	High school diploma or equivalent
Industrial Truck and Tractor Operators	692	621	(71)	(10%)	1.1%	$20.28	Less than high school
Software Developers, Applications	688	630	(58)	(8%)	1.1%	$51.33	Bachelor's degree

Occupation	Jobs in Industry (2014)	Jobs in Industry (2024)	Change (2014 - 2024)	% Change (2014 - 2024)	% of Total Jobs in Industry (2014)	Median Hourly Earnings	Typical Entry Level Education
Electronics Engineers, Except Computer	666	650	(16)	(2%)	1.1%	$50.05	Bachelor's degree
Purchasing Agents, Except Wholesale, Retail, and Farm Products	643	635	(8)	(1%)	1.0%	$34.17	High school diploma or equivalent
Maintenance and Repair Workers, General	634	639	5	1%	1.0%	$20.64	High school diploma or equivalent
Welders, Cutters, Solderers, and Brazers	633	694	61	10%	1.0%	$21.03	High school diploma or equivalent
Electrical Engineers	616	621	5	1%	1.0%	$53.81	Bachelor's degree
Mechanical Engineers	602	620	18	3%	1.0%	$47.99	Bachelor's degree
Industrial Machinery Mechanics	602	677	75	12%	1.0%	$28.97	High school diploma or equivalent
Food Batchmakers	590	666	76	13%	0.9%	$12.95	High school diploma or equivalent
Electrical and Electronics Engineering Technicians	589	563	(26)	(4%)	0.9%	$31.59	Associate's degree
Assemblers and Fabricators, All Other	579	503	(76)	(13%)	0.9%	$14.31	High school diploma or equivalent
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	562	520	(42)	(7%)	0.9%	$16.36	High school diploma or equivalent
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	557	501	(56)	(10%)	0.9%	$10.07	High school diploma or equivalent
Accountants and Auditors	539	522	(17)	(3%)	0.9%	$35.35	Bachelor's degree
Bookkeeping, Accounting, and Auditing Clerks	520	522	2	0%	0.8%	$21.04	High school diploma or equivalent
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	511	455	(56)	(11%)	0.8%	$17.00	High school diploma or equivalent
Stock Clerks and Order Fillers	501	460	(41)	(8%)	0.8%	$12.83	Less than high school
Printing Press Operators	500	449	(51)	(10%)	0.8%	$20.30	High school diploma or equivalent
Business Operations Specialists, All Other	499	487	(12)	(2%)	0.8%	$36.05	High school diploma or equivalent
Aerospace Engineers	483	513	30	6%	0.8%	$52.80	Bachelor's degree
Semiconductor Processors	464	358	(106)	(23%)	0.7%	$18.41	Associate's degree
Market Research Analysts and Marketing Specialists	439	465	26	6%	0.7%	$37.50	Bachelor's degree
Sewing Machine Operators	433	260	(173)	(40%)	0.7%	$9.21	Less than high school
Sales Managers	422	413	(9)	(2%)	0.7%	$59.83	Bachelor's degree
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	405	418	13	3%	0.6%	$20.04	High school diploma or equivalent
Dental Laboratory Technicians	401	450	49	12%	0.6%	$21.39	High school diploma or equivalent

Occupation	Jobs in Industry (2014)	Jobs in Industry (2024)	Change (2014 - 2024)	% Change (2014 - 2024)	% of Total Jobs in Industry (2014)	Median Hourly Earnings	Typical Entry Level Education
First-Line Supervisors of Office and Administrative Support Workers	398	392	(6)	(2%)	0.6%	$28.48	High school diploma or equivalent
Financial Managers	386	372	(14)	(4%)	0.6%	$60.79	Bachelor's degree
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	372	371	(1)	(0%)	0.6%	$41.42	Bachelor's degree
Structural Metal Fabricators and Fitters	372	408	36	10%	0.6%	$17.10	High school diploma or equivalent
Computer-Controlled Machine Tool Operators, Metal and Plastic	368	432	64	17%	0.6%	$19.53	High school diploma or equivalent
Mixing and Blending Machine Setters, Operators, and Tenders	361	354	(7)	(2%)	0.6%	$17.58	High school diploma or equivalent
Heavy and Tractor-Trailer Truck Drivers	361	444	83	23%	0.6%	$20.00	Postsecondary non-degree award
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	359	342	(17)	(5%)	0.6%	$18.16	High school diploma or equivalent
Electromechanical Equipment Assemblers	359	384	25	7%	0.6%	$17.82	High school diploma or equivalent
Production Workers, All Other	356	365	9	3%	0.6%	$13.02	High school diploma or equivalent
Computer and Information Systems Managers	338	320	(18)	(5%)	0.5%	$72.81	Bachelor's degree
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	338	340	2	1%	0.5%	$16.37	High school diploma or equivalent
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	326	362	36	11%	0.5%	$19.88	High school diploma or equivalent
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	322	303	(19)	(6%)	0.5%	$14.60	High school diploma or equivalent
Computer Systems Analysts	318	312	(6)	(2%)	0.5%	$42.25	Bachelor's degree
Grinding and Polishing Workers, Hand	309	288	(21)	(7%)	0.5%	$15.48	Less than high school
Cashiers	308	331	23	7%	0.5%	$11.09	Less than high school
Executive Secretaries and Executive Administrative Assistants	301	273	(28)	(9%)	0.5%	$30.26	High school diploma or equivalent
Light Truck or Delivery Services Drivers	296	318	22	7%	0.5%	$15.55	High school diploma or equivalent
Retail Salespersons	296	321	25	8%	0.5%	$11.65	Less than high school
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	291	315	24	8%	0.5%	$15.05	Less than high school
Cutting and Slicing Machine Setters, Operators, and Tenders	286	231	(55)	(19%)	0.5%	$13.24	High school diploma or equivalent
Marketing Managers	275	264	(11)	(4%)	0.4%	$72.98	Bachelor's degree
Engineers, All Other	263	257	(6)	(2%)	0.4%	$51.25	Bachelor's degree
Graphic Designers	261	239	(22)	(8%)	0.4%	$30.59	Bachelor's degree
Cabinetmakers and Bench Carpenters	259	201	(58)	(22%)	0.4%	$19.65	High school diploma or equivalent
Biomedical Engineers	243	318	75	31%	0.4%	$50.79	Bachelor's degree

Occupation	Jobs in Industry (2014)	Jobs in Industry (2024)	Change (2014 - 2024)	% Change (2014 - 2024)	% of Total Jobs in Industry (2014)	Median Hourly Earnings	Typical Entry Level Education
Maintenance Workers, Machinery	241	259	18	7%	0.4%	$27.65	High school diploma or equivalent
Computer User Support Specialists	237	221	(16)	(7%)	0.4%	$28.33	Some college, no degree
Chemists	227	221	(6)	(3%)	0.4%	$35.41	Bachelor's degree
Human Resources Specialists	227	209	(18)	(8%)	0.4%	$32.61	Bachelor's degree
Network and Computer Systems Administrators	226	222	(4)	(2%)	0.4%	$43.86	Bachelor's degree
Prepress Technicians and Workers	226	184	(42)	(19%)	0.4%	$19.70	Postsecondary non-degree award
Paper Goods Machine Setters, Operators, and Tenders	219	156	(63)	(29%)	0.3%	$15.08	High school diploma or equivalent
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	218	232	14	6%	0.3%	$12.56	High school diploma or equivalent
Financial Analysts	216	207	(9)	(4%)	0.3%	$42.79	Bachelor's degree
Sheet Metal Workers	213	241	28	13%	0.3%	$26.67	High school diploma or equivalent
Driver/Sales Workers	208	234	26	13%	0.3%	$13.86	High school diploma or equivalent
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	208	240	32	15%	0.3%	$10.51	Less than high school
Order Clerks	205	183	(22)	(11%)	0.3%	$17.94	High school diploma or equivalent
Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	197	195	(2)	(1%)	0.3%	$18.69	High school diploma or equivalent
First-Line Supervisors of Mechanics, Installers, and Repairers	193	189	(4)	(2%)	0.3%	$35.25	High school diploma or equivalent
Print Binding and Finishing Workers	192	178	(14)	(7%)	0.3%	$19.00	High school diploma or equivalent
Purchasing Managers	190	188	(2)	(1%)	0.3%	$59.72	Bachelor's degree
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	186	186	0	0%	0.3%	$25.23	High school diploma or equivalent
Sales Engineers	184	183	(1)	(1%)	0.3%	$50.68	Bachelor's degree
Machine Feeders and Offbearers	184	180	(4)	(2%)	0.3%	$14.51	Less than high school
Molders, Shapers, and Casters, Except Metal and Plastic	180	167	(13)	(7%)	0.3%	$14.58	High school diploma or equivalent
Industrial Engineering Technicians	179	180	1	1%	0.3%	$26.69	Associate's degree
Electricians	178	158	(20)	(11%)	0.3%	$38.07	High school diploma or equivalent
Logisticians	176	186	10	6%	0.3%	$34.62	Bachelor's degree
Electro-Mechanical Technicians	170	165	(5)	(3%)	0.3%	$31.37	Associate's degree
Computer Programmers	170	150	(20)	(12%)	0.3%	$43.66	Bachelor's degree
Chief Executives	162	158	(4)	(2%)	0.3%	$96.61	Bachelor's degree
Management Analysts	155	150	(5)	(3%)	0.2%	$44.01	Bachelor's degree

Source: EMSI - 2015.1 Staffing Patterns

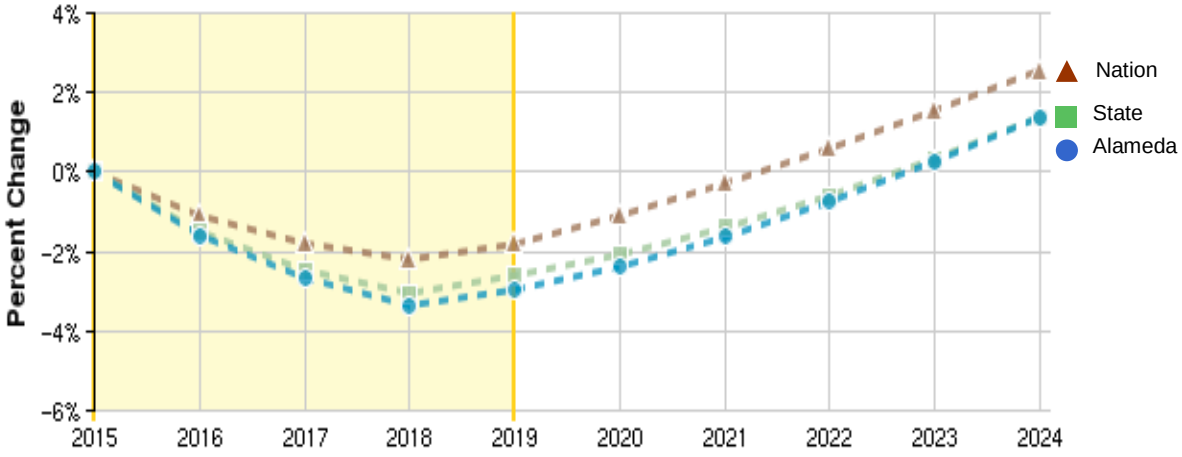
Forecast of Regional Employment and Occupational Demand

Projected Growth of Local Manufacturing Sector

Overall, the manufacturing sector in Alameda County is projected to shed jobs over the next several years, bottoming out in 2018 before beginning an uptick in job growth, which will continue into 2024, reflecting similar trends at the national and state levels (see Figure 6). Although the manufacturing sector in Alameda County and California show similar trajectories over the next 10 years, the county looks to gain manufacturing jobs at a slightly faster rate than the statewide average.

Several manufacturing subsectors will run counter to the general trend with year-to-year net new job growth over the next 5-10 years. Subsectors that are expected to grow include the biomedical (762 jobs), food processing (524 jobs), electrical equipment & appliances (245 jobs), machinery (212 jobs), wood products (96 jobs), petroleum refining (23 jobs), and fabricated metal (17 jobs) subsectors. Computer and electronic products, which is the largest manufacturing subsector, is forecast to lose employment with a slight decline in the number of jobs.

Figure 6: Manufacturing Sector Growth Projections



Occupational Projections

Occupational projections by EMSI indicate that the manufacturing sector is projected to lose jobs primarily in production occupations, but also some losses in office & administrative support, management, computer & math, engineering, and business & financial occupations (see Table 8). Although there are a number of occupational categories that show a net increase in new jobs, those increases are minimal. Despite the loss of jobs, there will be a considerable need to fill replacement jobs with skilled workers due to retirements and people otherwise leaving the labor force. Most occupational categories are expected to have openings and employers will need to find skilled workers that meet their hiring requirements.

Table 8: Projected Job Openings by Occupational Category in Alameda County's Manufacturing Sector (2015-2019)				
SOC Codes	**Occupational Category**	**Net New Jobs**	**Replacement Jobs**	**Total Openings**
11-0000	Management	-202	852	650
13-0000	Business & Financial Operations	-102	548	446
15-0000	Computer & Math	-185	578	393
17-0000	Architecture & Engineering	-145	999	854
19-0000	Scientific	8	159	167
23-0000	Legal	-2	6	4
25-0000	Education, Training, & Library	1	-1	0
27-0000	Arts, Design, Entertainment, Sports, & Media	-40	110	70
29-0000	Healthcare Practitioners & Technical	1	13	14
33-0000	Protective Service	2	4	6
35-0000	Food Preparation & Serving	32	90	122
37-0000	Building & Grounds Cleaning & Maintenance	7	24	31
41-0000	Sales & Related	-31	356	325
43-0000	Office & Administrative Support	-231	966	735
45-0000	Farming, Fishing, & Forestry	1	12	13
47-0000	Construction	-21	111	90
49-0000	Installation, Maintenance, & Repair	-30	300	270
51-0000	Production	-839	3,218	2,379
53-0000	Transportation	-63	615	552
	Total	**-1,839**	**8,960**	**7,121**
Source: EMSI - 2014.4 QCEW Employees - Staffing Patterns, Craft Consulting Group Analysis				

Projected Growth in Advanced Manufacturing

Among Advanced Manufacturers, our survey indicates that few, if any, of their jobs will be lost over the next few years. This suggests that most of the net job loss in the manufacturing sector will be with traditional manufacturers who have not adopted advanced manufacturing processes or technologies.

Table 9: Projected Job Openings in Advanced Manufacturing		
Overall Staffing Level (all sub-sectors)	**Total Jobs**	**Net New Jobs**
Current Jobs	16,747	
In 6 months	16,908	161
In 1 year	17,160	413
In 3 years	17,769	1,022
Source: 2014 Survey of Advanced Manufacturing Firms in Alameda County		

Projected Growth of Largest Manufacturing Subsectors

Digital & Electronic Devices & Components Subsector

Companies in this subsector are directly involved in the manufacture, fabrication, and assembly of electronic parts, components, or finished products for electronic and communication devices, equipment, or peripherals, including computer and network hardware, satellite systems and other communications mediums, or for the storage and transmission of digital media (e.g. video game consoles, video conferencing, mobile communication, digital signage).

According to the Bureau of Labor Statistics, national employment in the computer and electronic product manufacturing subsector is expected to decline over the next five years. Although more and more consumers worldwide are using electronics, employment levels are expected to decline as a result of increased productivity growth and the continued off-shoring of high-tech manufacturing operations to low-cost production areas. U.S. employment will also be adversely affected by continued increases in imports of electronic and computer products, including intermediate products such as microchips. Although a great deal of the design work in this industry takes place in the United States, much of the manufacturing process has been moved overseas.

Consistent with national trends, Alameda County employment in this subsector is expected to decline over the next several years with a loss of approximately 1,200 jobs (see Table 10). Beginning around 2018, employment levels in California and across the country are projected to show improvement while Alameda County is expected to continue losing jobs. Despite the overall decline in jobs for this subsector, employment opportunities will continue to exist, especially in southern Alameda County, which is located adjacent to Silicon Valley. Several industries in this subsector are expected to show net new job growth in Alameda County over the next five years including printed circuit assembly manufacturing; electronic connectors; search, detection, navigation, guidance, aeronautical, and nautical system and instruments; and measuring & testing instruments for electricity & electrical signals. Advanced manufacturing companies that responded to the survey also expect net job growth over the next few years. In addition, replacement jobs resulting from workers retiring or otherwise leaving the labor force will create many employment opportunities in this subsector.

Figure 7: Digital & Electronic Devices & Components

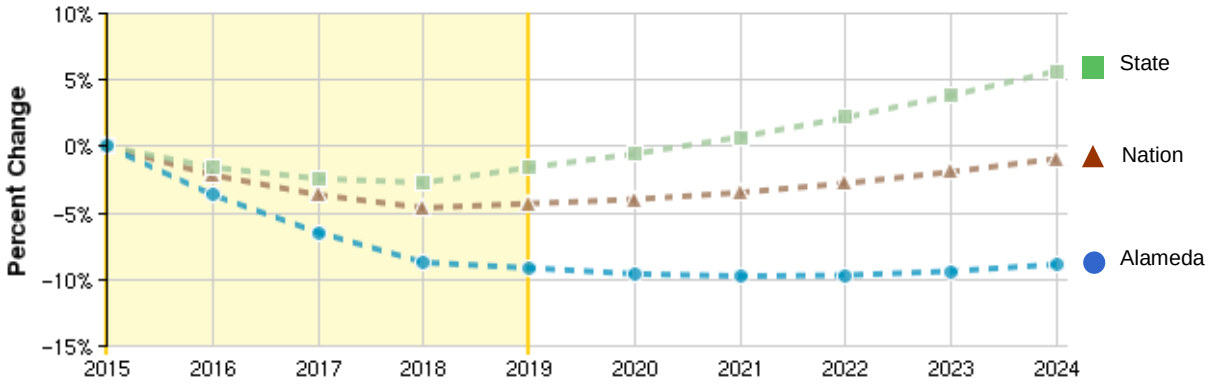


Table 10: Digital & Electronic Devices & Components Subsector Profile							
NAICS Code	**Description**	**# of Firms**	**2015 Jobs**	**2019 Jobs**	**Change**	**Location Quotient**	**Avg. Annual Wages**
3341	Computer & Peripheral Equipment Mfg	33	3,511	3,002	-509	4.37	$133,550
3342	Communications Equipment Mfg	27	1,188	760	-428	2.55	$144,817
3343	Audio & Video Equipment Mfg	10	352	368	16	3.82	$65,417
3344	Semiconductor & Other Electronic Component Mfg	119	6,420	6,142	-278	3.54	$80,703
3345*	Navigational, Measuring, Electromedical, & Control Instruments Mfg	54	1,986	1,988	2	1.40	$73,736
3346	Manufacturing & Reproducing Magnetic & Optical Media	5	35	<10	-	0.41	$78,842
	Total	**247**	**13,492**	**12,259**	**-1,197**	**2.88**	**$99,565**
* Except 334510, 334516, & 334517							
Source: EMSI - 2014.4 QCEW Employees							

Food and Beverage Processing Subsector

The food and beverage subsector includes the processing, canning, freezing, baking, milling, packaging and distributing of fruits and vegetables, meats, dairy, seafood, and other agriculture products. Some food manufacturing firms are involved with harvesting and/or marketing of the final product, but most partner with other organizations that specialize in these activities.

The food & beverage processing industry accounts for 17% of Alameda County's total manufacturing employment with 10,602 jobs (see Table X). The top three food & beverage processing industry groups by employment are bakeries (4,323 jobs), beverage manufacturing (2,032 jobs), and sugar and confectionary products (1,198 jobs). In 2005, there were 202 food and beverage manufacturing companies in Alameda County employing 8,942 workers. Over the past ten years the number of food processing firms has expanded by 16.3%, while the number of jobs has increased by 18.6%.

The food and beverage subsector is expected to show strong job growth over the next five years, outpacing both the national and state's growth rate for this subsector. The food processing industry is expected to grow by 474 new jobs over the next five years with sugar & confectionary products, bakeries, and beverage manufacturing accounting for 70.3% of all new jobs in this subsector. Replacement jobs resulting from workers retiring or otherwise leaving the labor force will also create many employment opportunities in the labor market.

Figure 8: Food & Beverage Subsector Growth

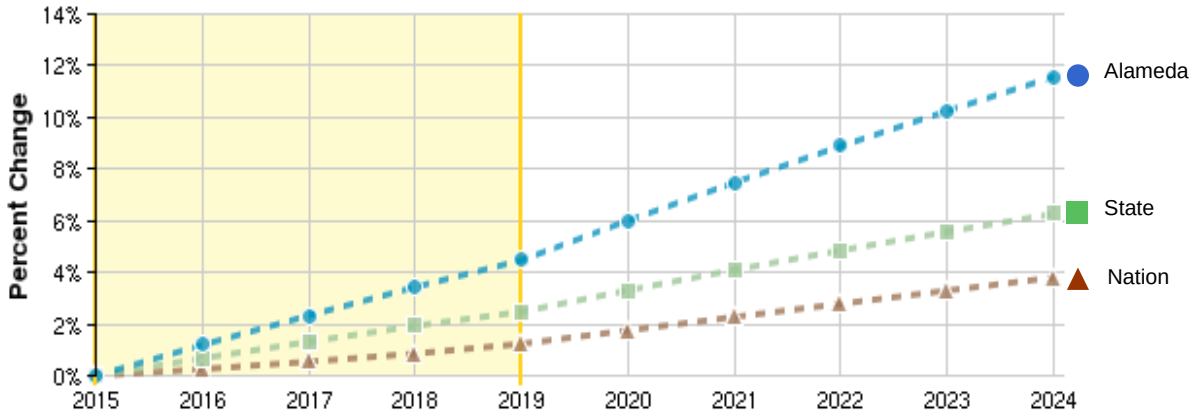


Table 11: Food & Beverage Subsector Profile							
NAICS Code	**Description**	**# of Firms**	**2015 Jobs**	**2019 Jobs**	**Change**	**Location Quotient**	**Average Annual Wages**
3111	Animal Food Mfg	1	21	28	7	0.08	$46,658
3112	Grain & Oilseed Milling	6	104	79	-25	0.34	$59,254
3113	Sugar & Confectionery Products	13	1,198	1,072	-126	3.60	$65,687
3114	Fruit & Vegetable Preserving & Specialty Food Mfg	12	767	874	107	0.89	$35,495
3115	Dairy Product Mfg	9	444	453	9	0.65	$74,239
3116	Animal Slaughtering & Processing	12	581	631	50	0.24	$52,958
3117	Seafood Preparation & Packaging	1	77	59	-18	0.41	$47,800
3118	Bakeries & Tortilla Mfg	97	4,323	4,737	414	2.99	$42,876
3119	Other Food Mfg	36	1,054	1,162	108	1.13	$51,826
3121	Beverage Mfg	49	2,032	1,982	-50	2.08	$53,688
	Total	**235**	**10,602**	**11,076**	**474**	**1.25**	**$50,202**
Source: EMSI – 2014.4 QCEW Employees							

Biomedical/Life Sciences Subsector

The biomedical/life-sciences subsector includes pharmaceutical, medical equipment and supplies, biotechnology and medical technology companies. Careers in the biomedical/life sciences subsector span a wide variety of industries – such as medical and veterinary products, research and development, food processing, agriculture, chemical products, and environmental firms. The jobs performed by workers with a bioscience or biotechnology background can range from lab work to field monitoring, to research & development, to manufacturing, to regulatory affairs, to quality assurance, and to business areas such as sales and technical service.

The biomedical/life-sciences subsector in Alameda County includes 141 firms employing 8,572 workers (see Table 12). Medical equipment and supplies manufacturing industries (NAICS 3391) account for 44.4% of the subsector's employment, while biomedical and analytical instruments contribute 25.9% of the jobs in this subsector. Biotechnology firms producing diagnostic substances, drugs, and other pharmaceuticals employ 29.7% of the subsector's workforce.

The biomedical and life sciences subsector in Alameda County is projected to gain jobs over the next five years, especially in analytical laboratory instrument manufacturing and surgical & medical instrument manufacturing (see Table 12). Some of the largest pharmaceutical and drug manufacturing firms in Alameda County include Bayer Corp, Xoma, Zosano Pharma, Questcor Pharmaceuticals, Novabay Pharmaceuticals, Astex Pharmaceuticals, Approcell, Stem Cells Inc. The largest medical equipment and supplies manufacturing firms include Cooper Vision, Thoratec Corp, Kontron America, Alere Home Monitoring, Baxter Healthcare, Tyco Healthcare, Thermo Fisher Scientific, Roche Molecular Systems, Mizuho Orthopedic Systems, DTI Dental Technologies, Carl Zeiss Meditec, Boston Scientific Corp. The largest biomedical instrument companies include Abbot Diabetes Care, Solta Medical, Microgenics Corporation, IntegeneX, and Aesthera Corp, and Abaxis.

Figure 9: Biomedical / Life Sciences Subsector Growth

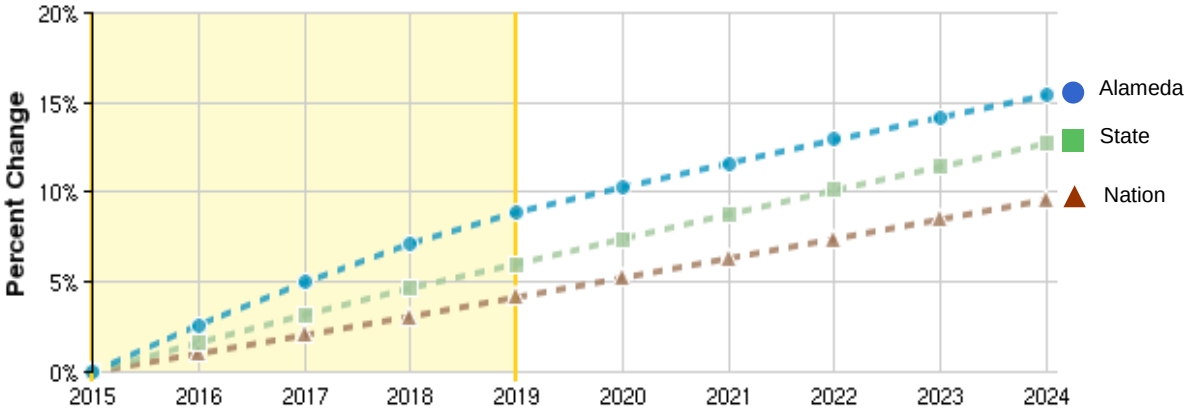


Table 12: Biomedical / Life Sciences Subsector Profile							
NAICS Code	**Description**	**# of Firms**	**2015 Jobs**	**2019 Jobs**	**Change**	**Location Quotient**	**Ave. Annual Wages**
325411	Medicinal & Botanical Mfg	3	<10	<10	-	0.04	-
325412	Pharmaceutical Preparation Mfg	14	1,797	1,866	69	1.70	$112,420
325413	In-Vitro Diagnostic Substance	4	717	770	53	5.79	$86,977
325414	Biological Product (except Diagnostic)	2	63	52	-11	0.43	$80,774
334510	Electromedical & Electrotherapeutic Apparatus	14	671	756	85	2.37	$153,128
334516	Analytical Laboratory Instrument	17	1,268	1,585	317	7.37	$86,422
334517	Irradiation Apparatus Mfg	5	243	271	28	3.48	$100,607
339112	Surgical & Medical Instrument	25	2,517	2,722	205	4.13	$115,761
339113	Surgical Appliance & Supplies	12	459	512	53	0.90	$85,297
339114	Dental Equipment & Supplies	2	103	124	21	1.23	$53,664
339115	Ophthalmic Goods Mfg	7	490	538	48	3.69	$179,300
339116	Dental Laboratories	37	240	138	-102	1.08	$51,358
	Total	**141**	**8,572**	**9,334**	**762**	**2.44**	**$109,811**
Source: EMSI - 2014.4 QCEW Employees							

Fabricated Metals Subsector

Fabricated Metals is the fourth largest manufacturing subsector in terms of employment. Most establishments tend to be small shops that make a limited range of products due to the high cost of equipment and the specialized nature of the manufacturing process involved. The specialized nature of many products enables small companies to compete effectively in certain niches. Although the fabricated metals subsector is not a high growth industry, it is important to other growing industries such as high tech, biomedical, machinery, and construction sectors. Employment can be found at both large industrial plants and small specialized shops. Skilled crafts and semi-skilled production account for the bulk of the employment within the industry.

The metal fabrication subsector makes a wide range of products from small individual pieces to large-scale structures including ornamental and structural metals, metal valves and fittings, precision turned components, containers, springs, broilers, tanks, engine parts, and jewelry.

Net new job growth within the metal fabrication subsector over the next five years will be minimal, slightly outpacing this subsector's growth at the state level. Advanced manufacturing firms anticipate an increase of 9.5% in net new jobs along with 221 openings for replacement jobs. The projected long-term outlook for this subsector is bright, starting in 2018 with county job growth outpacing state growth rates.

Figure 10: Fabricated Metals Subsector Growth

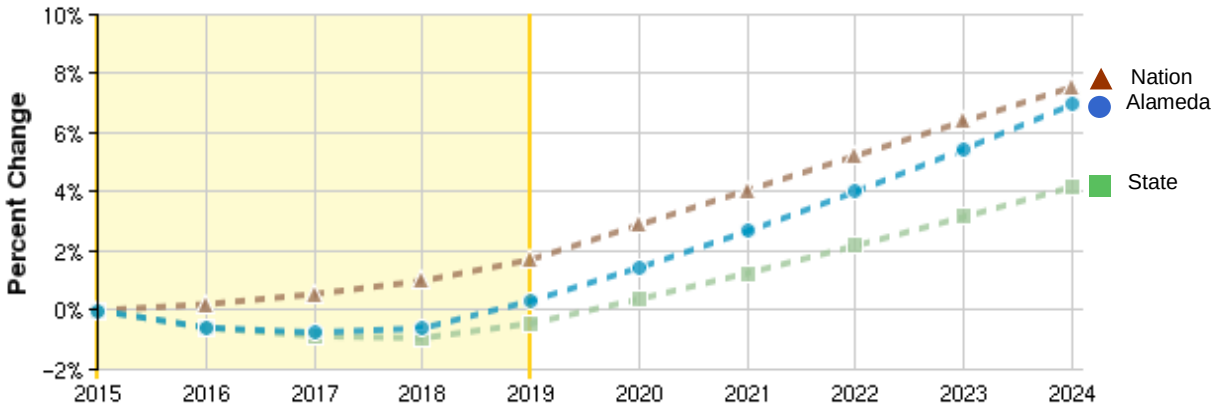


Table 13: Fabricated Metals Subsector Profile							
NAICS Code	**Description**	**# of Firms**	**2015 Jobs**	**2019 Jobs**	**Change**	**Location Quotient**	**Avg. Annual Wages**
3321	Forging & Stamping	13	232	189	-43	0.46	$61,635
3322	Cutlery & Handtools	9	29	<10	-	0.16	$36,209
3323	Architectural & Structural Metals	70	1,530	1,572	42	0.85	$51,031
3324	Boiler, Tank, & Shipping Container	6	32	19	-13	0.07	$61,392
3325	Hardware Mfg	3	11	<10	-	0.10	$76,136
3326	Spring & Wire Product Mfg	5	103	105	2	0.51	$52,128
3327	Machine Shops; Turned Product; & Screw, Nut, & Bolt	150	2,239	2,213	-26	1.18	$57,019
3328	Coating, Engraving, Heat Treating, and Allied Activities	40	676	700	24	0.96	$45,286
3329	Other Fabricated Metal Products	24	424	489	65	0.30	$48,584
	Total	**318**	**5,277**	**5,294**	**17**	**0.72**	**$53,229**
Source: EMSI - 2014.4 QCEW Employees							

Machinery Subsector

The Machinery subsector manufactures end products that apply mechanical force, such as gears and levers, to perform work. Forging, stamping, bending, forming, machining, welding, and assembling are some of the important processes used to shape or join individual pieces of metal. Although these processes are similar to those used in metal fabricating establishments, machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine. Moreover, complex assembly operations are an inherent part of the production process in this subsector.

Machinery manufacturing employment in Alameda County is dominated by industrial machinery, which represents 58% of the subsector's employment. However, over the next 5-years the subsector's growth will mainly be led by HVAC manufacturing, with a projected job increase of 171. While the machinery manufacturing subsector nationally is expected to grow over the next 10-years, the subsector locally will outperform both the nation and state in the short and long-term, with the growth rate only increasing its gains year after year against the growth rates of the other two regions.

Figure 11: Machinery Manufacturing Subsector Growth

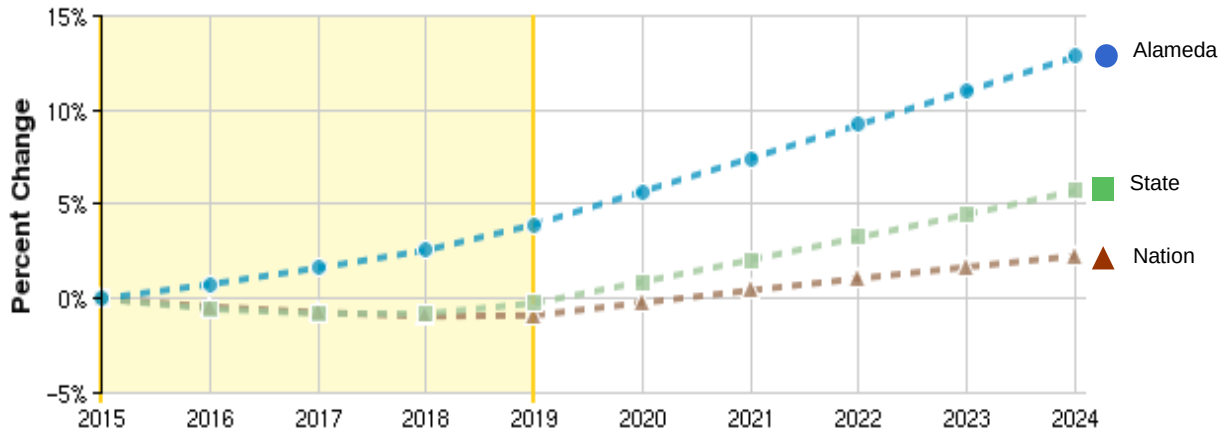


Table 14: Machinery Manufacturing Subsector Profile							
NAICS Code	**Description**	**# of Firms**	**2015 Jobs**	**2019 Jobs**	**Change**	**Location Quotient**	**Avg. Annual Wages**
3331	Agriculture, Construction, & Mining Machinery Mfg	4	41	45	4	0.03	$60,966
3332	Industrial Machinery Mfg	41	2,867	2,869	2	5.23	$141,021
3334	Ventilation, Heating, Air-Conditioning, & Commercial Refrigeration Equipment Mfg	16	642	813	171	0.98	$88,636
3335	Metalworking Machinery Mfg	32	471	448	-23	0.52	$62,595
3339	Other General Purpose Machinery Mfg	26	916	958	42	0.69	$94,766
	Total	**118**	**4,939**	**5,133**	**194**	**1.04**	**$117,878**
Source: EMSI - 2014.4 QCEW Employees							

In-Demand Occupations

Job Openings

Projections of job growth provide valuable insight about future employment opportunities. Job openings also arise when workers leave the labor force and need to be replaced due to retirement and other factors. In most occupations, replacement needs provide more employment opportunities than job growth by itself. Because workers entering an occupation often need training, these replacement needs, added to new job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for the occupation. This estimate of replacement needs does not count the turnover, or workers who change jobs but remain in the same occupation.

In-demand occupations include those with the most job openings due to net new job growth and replacement jobs from workers leaving the labor force or retiring. In-demand occupations also include the "fastest growing" occupations with the largest percent change. The tables that follow in this section show the top in-demand manufacturing occupations for Alameda County.

Despite the overall decline in manufacturing employment within Alameda County, there are a number of occupations with job openings due to new job growth or replacement needs that will provide opportunities for job seekers. While manufacturing jobs have declined over the past several decades, a number of production occupations (SOC 51) have seen an increase in jobs due to the use of new technologies and process improvements that reduce costs from product redesign, excess materials, and inefficient supply chains. The incorporation of automated equipment and lean manufacturing processes, however, requires a highly skilled workforce proficient in applied math and science, team building, problem solving, and critical thinking abilities.

The training level for 13 of the top 50 manufacturing occupations in Alameda County either requires no training or short-term training, while long-term training is required for 5 of the top 50 occupations. Most of the top 50 manufacturing occupations require either a post-secondary education or moderate-term training.

Top 25 Occupations with the Most Job Openings

1. Team Assemblers (SOC 51-2092)
2. Laborers and Freight, Stock, and Material Movers, Hand (53-7062)
3. Bakers (51-3011)
4. General and Operations Managers (11-1021)
5. Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)
6. Machinists (51-4041)
7. Industrial Engineers (17-2112)
8. Packers and Packagers, Hand (53-7064)
9. Packaging and Filling Machine Operators and Tenders (51-9111)
10. Shipping, Receiving, and Traffic Clerks (43-5071)
11. Mechanical Engineers (17-2141)
12. Architectural and Engineering Managers (11-9041)
13. Software Developers, Systems Software (15-1133)
14. Food Batchmakers (51-3092)
15. Customer Service Representatives (43-4051)
16. First-Line Supervisors of Production and Operating Workers (51-1011)
17. Industrial Machinery Mechanics (49-9041)
18. Electrical and Electronic Equipment Assemblers (51-2022)
19. Sales Representatives, Wholesale and Manufacturing (41-4012)
20. Helpers--Production Workers (51-9198)
21. Software Developers, Applications (15-1132)
22. Aerospace Engineers (17-2011)
23. Welders, Cutters, Solderers, and Brazers (51-4121)
24. Production, Planning, and Expediting Clerks (43-5061)
25. Dental Laboratory Technicians (51-9081)

Top 25 Occupations with the Most Replacement Jobs

1. Team Assemblers (SOC 51-2092)
2. General and Operations Managers (11-1021)
3. Laborers and Freight, Stock, and Material Movers, Hand (53-7062)
4. Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)
5. Industrial Engineers (17-2112)
6. Software Developers, Systems Software (15-1133)
7. Shipping, Receiving, and Traffic Clerks (43-5071)
8. Architectural and Engineering Managers (11-9041)
9. First-Line Supervisors of Production and Operating Workers (51-1011)
10. Software Developers, Applications (15-1132)
11. Packers and Packagers, Hand (53-7064)
12. Machinists (51-4041)
13. Electrical and Electronic Equipment Assemblers (51-2022)
14. Computer Hardware Engineers (17-2061)
15. Customer Service Representatives (43-4051)
16. Packaging and Filling Machine Operators and Tenders (51-9111)
17. Mechanical Engineers (17-2141)
18. Sales Representatives, Wholesale and Manufacturing (41-4012)
19. Helpers--Production Workers (51-9198)
20. Industrial Truck and Tractor Operators (53-7051)
21. Sewing Machine Operators (51-6031)
22. Production, Planning, and Expediting Clerks (43-5061)
23. Assemblers and Fabricators, All Other (51-2099)
24. Office Clerks, General (43-9061)
25. Stock Clerks and Order Fillers (43-5081)

Top 25 Occupations Adding the Most New Jobs

1. Bakers (SOC 51-3011)
2. Biomedical Engineers (17-2031)
3. Food Batchmakers (51-3092)
4. Heavy and Tractor-Trailer Truck Drivers (53-3032)
5. Computer-Controlled Machine Tool Operators, Metal and Plastic (51-4011)
6. Dental Laboratory Technicians (51-9081)
7. Machinists (51-4041)
8. Industrial Machinery Mechanics (49-9041)
9. Aerospace Engineers (17-2011)
10. Counter Attendants, Cafeteria, Food Concession, and Coffee Shop (35-3022)
11. Cashiers (41-2011)
12. Food Cooking Machine Operators and Tenders (51-3093)
13. Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic (51-4012)
14. Driver/Sales Workers (53-3031)
15. Food Preparation Workers (35-2021)
16. Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders (51-3091)
17. Food Processing Workers, All Other (51-3099)
18. Combined Food Preparation and Serving Workers, Including Fast Food (35-3021)
19. Janitors and Cleaners, Except Maids and Housekeeping Cleaners (37-2011)
20. Retail Salespersons (41-2031)
21. Electromechanical Equipment Assemblers (51-2023)
22. Jewelers and Precious Stone and Metal Workers (51-9071)
23. Cleaners of Vehicles and Equipment (53-7061)
24. Sheet Metal Workers (47-2211)
25. Meat, Poultry, and Fish Cutters and Trimmers (51-3022)

Top 25 Occupations Adding the Most New Jobs & Are the Fastest Growing

1. Bakers (SOC 51-3011)
2. Biomedical Engineers (17-2031)
3. Food Batchmakers (51-3092)
4. Heavy and Tractor-Trailer Truck Drivers (53-3032)
5. Computer-Controlled Machine Tool Operators, Metal and Plastic (51-4011)
6. Dental Laboratory Technicians (51-9081)
7. Machinists (51-4041)
8. Industrial Machinery Mechanics (49-9041)
9. Counter Attendants, Cafeteria, Food Concession, and Coffee Shop (35-3022)
10. Aerospace Engineers (17-2011)
11. Food Cooking Machine Operators and Tenders (51-3093)
12. Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic (51-4012)
13. Driver/Sales Workers (53-3031)
14. Cashiers (41-2011)
15. Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders (51-3091)
16. Food Preparation Workers (35-2021)
17. Food Processing Workers, All Other (51-3099)
18. Jewelers and Precious Stone and Metal Workers (51-9071)
19. Combined Food Preparation and Serving Workers, Including Fast Food (35-3021)
20. Cleaners of Vehicles and Equipment (53-7061)
21. Janitors and Cleaners, Except Maids and Housekeeping Cleaners (37-2011)
22. Retail Salespersons (41-2031)
23. Electromechanical Equipment Assemblers (51-2023)
24. Meat, Poultry, and Fish Cutters and Trimmers (51-3022)
25. Slaughterers and Meat Packers (51-3023)

Source: EMSI - 2014.4 QCEW Employees - Staffing Patterns

In-Demand Occupations for the Largest Alameda County Manufacturing Subsectors

- Digital & Electronic Device & Component Manufacturing
- Food & Beverage Manufacturing
- Biomedical / Life Sciences Manufacturing
- Fabricated Metals Manufacturing
- Machinery Manufacturing

Source: EMSI - 2014.4 - Occupations & Staffing Patterns, Craft Consulting Group Analysis

Table 15: Digital & Electronic Device & Component Manufacturing							
SOC Code	**Occupation**	**Growth**	**Net New Jobs**	**Replacement Jobs**	**Total Job Openings**	**Median Hourly Earnings**	**Education Level**
	Production Occupations						
51-2022	Electrical & Electronic Equipment Assemblers	-8%	-99	170	71	$17.45	High school diploma or equivalent
51-9141	Semiconductor Processors	-13%	-55	92	37	$18.43	Associate's degree
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	-8%	-27	64	37	$20.06	High school diploma or equivalent
51-2092	Team Assemblers	-5%	-17	38	21	$14.56	High school diploma or equivalent
51-1011	First-Line Supervisors of Production & Operating Workers	-7%	-14	27	13	$30.13	Postsecondary non-degree award
	Installation, Maintenance, & Repair Occupations						
49-9071	Maintenance & Repair Workers, General	-6%	-4	12	8	$20.76	High school diploma or equivalent
49-9041	Industrial Machinery Mechanics	-2%	-1	9	8	$28.90	High school diploma or equivalent
49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equipment	-9%	-4	8	4	$28.99	Postsecondary non-degree award
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	-11%	-2	5	3	$35.15	High school diploma or equivalent
49-2011	Computer, Automated Teller, & Office Machine Repairers	-13%	-2	3	1	$17.09	Some college, no degree
	Engineering Occupations						
17-2061	Computer Hardware Engineers	-9%	-69	137	68	$50.40	Bachelor's degree
17-2112	Industrial Engineers	-7%	-28	83	55	$47.97	Bachelor's degree
17-2072	Electronics Engineers, Except Computer	-8%	-41	89	48	$50.25	Bachelor's degree
17-2071	Electrical Engineers	-8%	-28	75	47	$53.94	Bachelor's degree
17-2011	Aerospace Engineers	-13%	-27	65	38	$52.84	Bachelor's degree

	Logistics Occupations						
53-7062	Laborers & Freight, Stock, & Material Movers, Hand	-12%	-11	26	15	$13.62	Less than high school
53-7064	Packers & Packagers, Hand	-10%	-3	7	4	$10.82	Less than high school
53-7063	Machine Feeders & Offbearers	-12%	-2	4	2	$14.51	Less than high school
	Computer & Mathematical Occupations						
15-1133	Software Developers, Systems Software	-11%	-79	169	90	$54.83	Bachelor's degree
15-1132	Software Developers, Applications	-13%	-61	128	67	$51.54	Bachelor's degree
15-1121	Computer Systems Analysts	-11%	-18	43	25	$42.41	Bachelor's degree
15-1151	Computer User Support Specialists	-12%	-16	37	21	$28.41	Some college, no degree
15-1131	Computer Programmers	-14%	-11	24	13	$43.91	Bachelor's degree

Table 16: Food & Beverage Manufacturing							
SOC Code	**Occupation**	**Growth**	**Net New Jobs**	**Replacement Jobs**	**Total Job Openings**	**Median Hourly Earnings**	**Education Level**
	Production Occupations						
51-3011	Bakers	8%	82	92	174	$15.15	Less than high school
51-3092	Food Batchmakers	4%	27	85	112	$12.91	High school diploma or equivalent
51-9111	Packaging & Filling Machine Operators & Tenders	3%	24	59	83	$11.88	High school diploma or equivalent
51-9198	Helpers--Production Workers	5%	19	13	32	$12.84	Less than high school
51-3099	Food Processing Workers, All Other	6%	8	17	25	$11.14	Less than high school
	Installation, Maintenance, & Repair Occupations						
49-9041	Industrial Machinery Mechanics	10%	20	12	32	$28.90	High school diploma or equivalent
49-9071	Maintenance & Repair Workers, General	5%	8	10	18	$20.76	High school diploma or equivalent
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	4%	2	5	7	$35.15	High school diploma or equivalent
49-9043	Maintenance Workers, Machinery	7%	5	1	6	$27.56	High school diploma or equivalent
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	-5%	-1	3	2	$28.51	High school diploma or equivalent
	Engineering Occupations						
17-2112	Industrial Engineers	0%	0	5	5	$47.97	Bachelor's degree
	Logistics Occupations						
53-7064	Packers & Packagers, Hand	5%	27	46	73	$10.82	Less than high school
53-7062	Laborers & Freight, Stock, & Material Movers, Hand	3%	11	45	56	$13.62	Less than high school
53-3031	Driver/Sales Workers	4%	9	20	29	$13.95	High school diploma or equivalent
53-7051	Industrial Truck & Tractor Operators	0%	1	25	26	$20.30	Less than high school
53-7061	Cleaners of Vehicles & Equipment	7%	7	12	19	$9.90	Less than high school
	Science Occupations						
19-1012	Food Scientists & Technologists	4%	2	12	14	$37.53	Bachelor's degree
19-4011	Agricultural & Food Science Technicians	4%	1	5	6	$18.49	Associate's degree
19-2031	Chemists	-8%	-1	3	2	$35.40	Bachelor's degree

Table 17: Biomedical / Life Sciences Manufacturing							
SOC Code	**Occupation**	**Growth**	**Net New Jobs**	**Replacement Jobs**	**Total Job Openings**	**Median Hourly Earnings**	**Education Level**
	Production Occupations						
51-9081	Dental Laboratory Technicians	5%	22	58	80	$21.57	High school diploma or equivalent
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	9%	26	2	28	$20.06	High school diploma or equivalent
51-2092	Team Assemblers	9%	33	-7	26	$14.56	High school diploma or equivalent
51-9111	Packaging & Filling Machine Operators & Tenders	3%	5	15	20	$11.88	High school diploma or equivalent
51-1011	First-Line Supervisors of Production & Operating Workers	7%	14	-2	12	$30.13	Postsecondary non-degree award
	Installation, Maintenance, & Repair Occupations						
49-9041	Industrial Machinery Mechanics	13%	7	2	9	$28.90	High school diploma or equivalent
49-9071	Maintenance & Repair Workers, General	7%	5	4	9	$20.76	High school diploma or equivalent
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	5%	1	2	3	$35.15	High school diploma or equivalent
49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equipment	16%	5	-2	3	$28.99	Postsecondary non-degree award
49-9043	Maintenance Workers, Machinery	12%	2	-1	1	$27.56	High school diploma or equivalent
	Engineering Occupations						
17-2031	Biomedical Engineers	14%	33	30	63	$50.90	Bachelor's degree
17-2112	Industrial Engineers	11%	26	6	32	$47.97	Bachelor's degree
17-2011	Aerospace Engineers	24%	33	-7	26	$52.84	Bachelor's degree
17-2141	Mechanical Engineers	12%	10	8	18	$48.02	Bachelor's degree
17-2071	Electrical Engineers	20%	15	-6	9	$53.94	Bachelor's degree
	Logistics Occupations						
53-7062	Laborers & Freight, Stock, & Material Movers, Hand	7%	6	7	13	$13.62	Less than high school
53-7064	Packers & Packagers, Hand	6%	4	5	9	$10.82	Less than high school
53-3033	Light Truck or Delivery Services Drivers	7%	3	0	3	$15.54	High school diploma or equivalent
53-7051	Industrial Truck and Tractor Operators	4%	1	1	2	$20.30	Less than high school
	Science Occupations						
19-2031	Chemists	4%	7	24	31	$35.40	Bachelor's degree
19-1042	Medical Scientists, Except Epidemiologists	4%	5	20	25	$48.28	Doctoral or professional degree
19-4021	Biological Technicians	3%	2	13	15	$22.51	Bachelor's degree
19-4031	Chemical Technicians	0%	0	11	11	$24.33	Associate's degree
19-1022	Microbiologists	4%	2	9	11	$41.16	Bachelor's degree

Table 18: Fabricated Metals Manufacturing							
SOC Code	**Occupation**	**Growth**	**Net New Jobs**	**Replacement Jobs**	**Total Job Openings**	**Median Hourly Earnings**	**Education Level**
	Production Occupations						
51-4041	Machinists	1%	8	70	78	$26.98	High school diploma or equivalent
51-2041	Structural Metal Fabricators & Fitters	3%	5	31	36	$17.19	High school diploma or equivalent
51-4121	Welders, Cutters, Solderers, & Brazers	1%	2	31	33	$21.10	High school diploma or equivalent
51-4011	Computer-Controlled Machine Tool Operators, Metal & Plastic	3%	5	22	27	$19.58	High school diploma or equivalent
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	0%	0	17	17	$20.06	High school diploma or equivalent
	Installation, Maintenance, & Repair Occupations						
49-9071	Maintenance & Repair Workers, General	2%	1	5	6	$20.76	High school diploma or equivalent
49-9041	Industrial Machinery Mechanics	6%	2	4	6	$28.90	High school diploma or equivalent
49-9098	Helpers--Installation, Maintenance, & Repair Workers	6%	1	2	3	$11.09	High school diploma or equivalent
49-9043	Maintenance Workers, Machinery	0%	0	2	2	$27.56	High school diploma or equivalent
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	0%	0	2	2	$35.15	High school diploma or equivalent
	Engineering Occupations						
17-2141	Mechanical Engineers	-2%	-1	10	9	$48.02	Bachelor's degree
17-2112	Industrial Engineers	0%	0	7	7	$47.97	Bachelor's degree
17-3013	Mechanical Drafters	-5%	-1	3	2	$33.61	Associate's degree
	Logistics Occupations						
53-7062	Laborers & Freight, Stock, & Material Movers, Hand	1%	1	13	14	$13.62	Less than high school
53-7064	Packers & Packagers, Hand	0%	0	5	5	$10.82	Less than high school
53-7051	Industrial Truck & Tractor Operators	-6%	-2	5	3	$20.30	Less than high school
53-3032	Heavy & Tractor-Trailer Truck Drivers	0%	0	2	2	$20.07	Postsecondary non-degree award
53-3033	Light Truck or Delivery Services Drivers	0%	0	2	2	$15.54	High school diploma or equivalent
	Construction & Extraction Occupations						
47-2211	Sheet Metal Workers	2%	3	19	22	$26.53	High school diploma or equivalent

Table 19: Machinery Manufacturing							
SOC Code	**Occupation**	**Growth**	**Net New Jobs**	**Replacement Jobs**	**Total Job Openings**	**Median Hourly Earnings**	**Education Level**
	Production Occupations						
51-4041	Machinists	4%	10	23	33	$26.98	High school diploma or equivalent
51-4121	Welders, Cutters, Solderers, & Brazers	6%	11	12	23	$21.10	High school diploma or equivalent
51-2092	Team Assemblers	11%	35	-15	20	$14.56	High school diploma or equivalent
51-2041	Structural Metal Fabricators & Fitters	3%	2	11	13	$17.19	High school diploma or equivalent
51-4011	Computer-Controlled Machine Tool Operators, Metal & Plastic	12%	8	4	12	$19.58	High school diploma or equivalent
	Installation, Maintenance, & Repair Occupations						
49-9041	Industrial Machinery Mechanics	9%	5	5	10	$28.90	High school diploma or equivalent
49-9071	Maintenance & Repair Workers, General	5%	2	3	5	$20.76	High school diploma or equivalent
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	6%	1	1	2	$35.15	High school diploma or equivalent
49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equipment	5%	1	1	2	$28.99	Postsecondary non-degree award
49-9044	Millwrights	10%	1	0	1	$33.73	High school diploma or equivalent
	Engineering Occupations						
17-2141	Mechanical Engineers	3%	5	34	39	$48.02	Bachelor's degree
17-2112	Industrial Engineers	2%	2	15	17	$47.97	Bachelor's degree
17-2071	Electrical Engineers	2%	2	9	11	$53.94	Bachelor's degree
17-3027	Mechanical Engineering Technicians	4%	1	3	4	$28.01	Associate's degree
17-3023	Electrical & Electronics Engineering Technicians	0%	0	4	4	$31.66	Associate's degree
	Logistics Occupations						
53-7062	Laborers & Freight, Stock, & Material Movers, Hand	8%	5	4	9	$13.62	Less than high school
53-7051	Industrial Truck & Tractor Operators	9%	2	0	2	$20.30	Less than high school
53-7064	Packers & Packagers, Hand	7%	1	1	2	$10.82	Less than high school
	Computer & Mathematical Occupations						
15-1132	Software Developers, Applications	0%	0	8	8	$51.54	Bachelor's degree
15-1133	Software Developers, Systems Software	0%	0	3	3	$54.83	Bachelor's degree
15-1151	Computer User Support Specialists	0%	0	3	3	$28.41	Some college, no degree
15-1142	Network & Computer Systems Administrators	0%	0	3	3	$43.93	Bachelor's degree
15-1131	Computer Programmers	-6%	-1	4	3	$43.91	Bachelor's degree

Workforce Demographics of the Manufacturing Sector

Alameda County's manufacturing workforce is predominately male with 65.5% of the production occupations being held by men (see Table 20). Hispanic males account for 21.9% of the production workers, followed by Asian males (16.6%), and white males (14.3%). Very few African-Americans are working in the manufacturing sector in Alameda County. Females account for approximately 34.5% of the manufacturing workforce with Asians (13.5%) and Hispanics (11.1%) holding the largest percentage of production jobs for females.

Table 20: Demographic Composition of Production Workers Who Reside in Alameda County

Race / Ethnicity	Male	% of Total	Female	% of Total	Total
White	5,472	18.6%	1,031	3.5%	6,503
Black	1,124	3.8%	197	0.7%	1,321
Hispanic	7,096	24.1%	3,939	13.4%	11,035
Asian	5,712	19.4%	3,967	13.5%	9,679
Other	843	2.9%	34	0.1%	877
Total	**20,247**	**68.8%**	**9,168**	**31.2%**	**29,415**

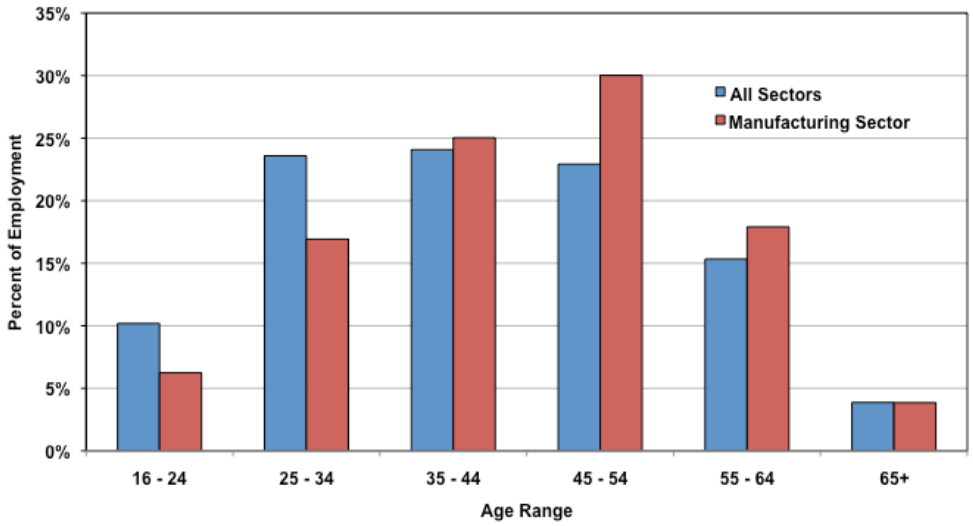
Source: U.S. Census Bureau, 2013 American Community Survey

Age Profile

The age profile of Alameda County's workforce (age 16+) shows that 58% of workers are under the age of 45 compared to 48% employed in the county's manufacturing sector (see Figure 12). Approximately 42% of the county's working population and 52% of those employed by the county's manufacturing sector are over the age of 45. Over the next ten years, older workers age 55-64 will be the fastest growing segment of the county's workforce. Like most industries in Alameda County, the manufacturing sector is facing the demographic reality of an aging incumbent workforce and the pending retirement of the baby boom generation.

With the baby boom generation approaching retirement age, Alameda County's manufacturing sector faces a potential skills gap unless it is able to attract younger workers. The pending wave of retirements will leave the industry with a shortage of skilled experienced workers along with a need to recruit and train new employees to replace incumbent workers who are retiring. Currently, 6% of those employed in the county's manufacturing sector are under the age of 25 compared to 10% of the county's workforce overall. There is, therefore, a need to attract younger workers to careers in the manufacturing sector to meet both the projected new job growth as well as fill the replacement job openings created by workers retiring or otherwise leaving the labor force. Unfortunately, the younger generation is not choosing manufacturing careers for a variety of reasons. The aging workforce creates both challenges and opportunities for manufacturing firms in recruiting and training younger workers with advanced skills.

Figure 12: Age Distribution of Alameda County's Workforce & Manufacturing Sector

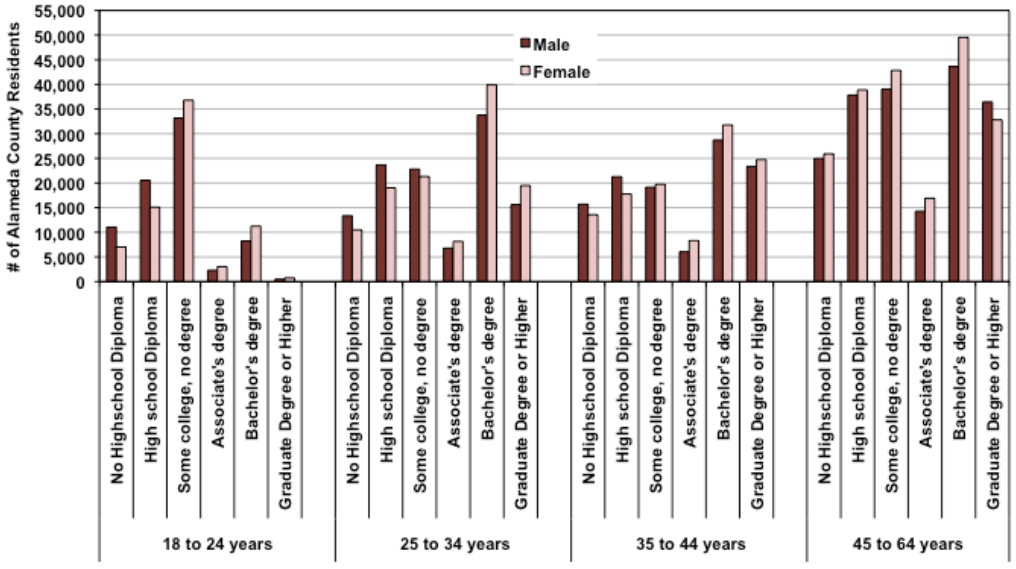


Source: U.S. Census Bureau, EMSI 2014.4 QCEW Employees

Educational Attainment

Approximately 87% of the residents in Alameda County 18 and older have a high school diploma or equivalent, which is above the statewide average. Approximately 22% of the residents had attended some college but earned no degree. Almost 45% of the residents over the age of 18 have a bachelor's degree or higher.

Figure 13: Educational Attainment in Alameda County by Age & Gender



Source: U.S. Census Bureau, 2009-3013 5-Year American Community Survey

Recommendations

Six recommendations were made by the consultants who conducted this study and developed this report. The recommendations include:

1. Target veterans and women to help meet the employment needs of this sector through outreach and by working collaboratively with key intermediary organizations that have strong connections to those demographic groups. Both groups represent many individuals who can offer both foundational and technical skills needed by industries in this sector. Women pursuing non-traditional employment, however, should be offered workshops and training designed to prepare them for the unique challenges of working in what is often a male-dominated work environment.
2. Grow the East Bay Manufacturing Partnership. Use the partnership to work with public policy makers and other key partners in the East Bay to facilitate solutions so that the sector is supported with the workforce, infrastructure, and other inputs it requires to thrive and be globally competitive.
3. Have the Partnership convene a workgroup to assess the occupations identified in this study for which employers have significant difficulty finding qualified applicants. Determine if there are applicable workforce development system solutions to help meet the workforce needs of business/industry.
4. Have the Partnership convene a workgroup to assess the pre-employment and soft skills needs identified as deficient by employers in our survey. The group would determine if there is a workforce development system solution that would help meet the workforce needs of business/industry.
5. Expand the knowledge base of One-Stop/Job Center staff and secondary/postsecondary school personnel to improve their understanding of this sector's workforce needs, business characteristics, and career opportunities.
6. Collaborate with key stakeholders to promote to the younger generations an awareness of the career pathways available in this sector.

Appendix

- Occupational Employment Projections for Top In-Demand Occupations
- Workforce Needs Assessment Survey Results
- Workforce Needs Assessment Survey Instrument
- Manufacturing Sector Description

Occupational Employment Projections for Top In-Demand Occupations

Top 50 In-Demand Occupations for the manufacturing sector in Alameda County with employment data reflecting all industries (manufacturing and non-manufacturing).

Occupation	Jobs in All Industries (2014)	Jobs in All Industries (2024)	Change (2014 - 2024)	% Change (2014 - 2024)	Replacement Jobs (2014 - 2024)	Median Hourly Earnings	Typical Entry Level Education
Aerospace Engineers	2,721	3,279	558	21%	1,275	717	$52.80
Architectural and Engineering Managers	2,260	2,467	207	9%	785	578	$77.62
Assemblers and Fabricators, All Other	1,274	1,343	69	5%	341	272	$14.31
Bakers	1,562	1,861	299	19%	720	421	$15.16
Biomedical Engineers	511	690	179	35%	336	157	$50.79
Cashiers	17,031	18,694	1,663	10%	9,378	7,715	$11.09
Cleaners of Vehicles and Equipment	1,817	2,176	359	20%	915	556	$9.90
Combined Food Preparation and Serving Workers, Including Fast Food	12,242	15,349	3,107	25%	8,466	5,359	$9.46
Computer Hardware Engineers	1,567	1,666	99	6%	463	364	$50.17
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	134	165	31	23%	73	42	$27.08
Computer-Controlled Machine Tool Operators, Metal and Plastic	380	448	68	18%	182	114	$19.53
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	3,610	3,859	249	7%	2,537	2,288	$10.51
Customer Service Representatives	9,112	10,496	1,384	15%	4,042	2,658	$18.75
Dental Laboratory Technicians	430	481	51	12%	208	157	$21.39
Driver/Sales Workers	2,605	3,131	526	20%	988	462	$13.86
Electrical and Electronic Equipment Assemblers	2,107	2,150	43	2%	373	330	$17.41
Electromechanical Equipment Assemblers	380	410	30	8%	78	48	$17.82
First-Line Supervisors of Production and Operating Workers	2,443	2,527	84	3%	493	409	$30.18
Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	44	62	18	41%	32	14	$15.72
Food Batchmakers	666	759	93	14%	325	232	$12.95
Food Cooking Machine Operators and Tenders	137	166	29	21%	69	40	$11.00
Food Preparation Workers	3,916	4,513	597	15%	1,819	1,222	$9.45
Food Processing Workers, All Other	204	245	41	20%	101	60	$11.11
General and Operations Managers	13,012	14,902	1,890	15%	4,506	2,616	$55.29
Heavy and Tractor-Trailer Truck Drivers	6,467	7,670	1,203	19%	2,325	1,122	$20.00
Helpers--Production Workers	1,958	2,128	170	9%	539	369	$12.79
Industrial Engineers	1,767	1,897	130	7%	666	536	$47.96
Industrial Machinery Mechanics	1,083	1,266	183	17%	518	335	$28.97
Industrial Truck and Tractor Operators	3,074	3,195	121	4%	880	759	$20.28
Inspectors, Testers, Sorters, Samplers, and Weighers	2,526	2,717	191	8%	776	585	$20.03

Occupation	Jobs in All Industries (2014)	Jobs in All Industries (2024)	Change (2014 - 2024)	% Change (2014 - 2024)	Replacement Jobs (2014 - 2024)	Median Hourly Earnings	Typical Entry Level Education
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	8,378	9,192	814	10%	2,464	1,650	$15.05
Jewelers and Precious Stone and Metal Workers	138	147	9	7%	41	32	$15.50
Laborers and Freight, Stock, and Material Movers, Hand	12,476	14,138	1,662	13%	5,732	4,070	$13.58
Machinists	1,683	1,845	162	10%	565	403	$26.91
Meat, Poultry, and Fish Cutters and Trimmers	170	214	44	26%	92	48	$11.71
Mechanical Engineers	1,346	1,564	218	16%	719	501	$47.99
Office Clerks, General	16,246	17,848	1,602	10%	5,178	3,576	$17.65
Packaging and Filling Machine Operators and Tenders	1,634	1,750	116	7%	515	399	$11.86
Packers and Packagers, Hand	3,357	3,749	392	12%	1,316	924	$10.77
Production, Planning, and Expediting Clerks	2,079	2,249	170	8%	706	536	$25.03
Retail Salespersons	18,458	21,870	3,412	18%	10,257	6,845	$11.65
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	7,281	8,220	939	13%	2,432	1,493	$27.92
Sewing Machine Operators	540	376	(164)	(30%)	20	184	$9.21
Sheet Metal Workers	1,239	1,494	255	21%	512	257	$26.67
Shipping, Receiving, and Traffic Clerks	4,535	4,709	174	4%	1,446	1,272	$15.98
Slaughterers and Meat Packers	101	120	19	19%	47	28	$10.41
Software Developers, Applications	6,063	7,587	1,524	25%	2,410	886	$51.33
Software Developers, Systems Software	4,075	4,909	834	20%	1,413	579	$54.59
Stock Clerks and Order Fillers	9,570	10,352	782	8%	3,779	2,997	$12.83
Team Assemblers	3,962	4,026	64	2%	1,006	942	$14.51
Welders, Cutters, Solderers, and Brazers	1,135	1,304	169	15%	468	299	$21.03

Source: EMSI - 2015.1

Workforce Needs Assessment Survey Results

Business plan & most significant barriers

Industry	Employees	What are your business plans in the next 2-5 years?	What is your most significant barrier to achieving your goals?
312 Beverage and Tobacco Product Manufacturing	4	Bootstrap method - increased revenues, space, staff.	Capital is the biggest barrier.
322 Paper Manufacturing	250	They are growing and expanding in every aspect of the operation.	They could have a barrier if they can't find workers with experience they need or the aptitude to achieve the skill set they need.
322 Paper Manufacturing	125	They are looking at automation to lower their labor costs. They expect 1-2% growth, and are considering outsourcing some of their labor to Mexico. New equipment will help increase their productivity & automation. They are looking at all forms of cost savings processes & technology.	Labor costs, and market fluctuations. They have a diverse business serving the tech industry to wine labels. When one market is up, the other may be down. The fluctuations aren't always easy to predict.
322 Paper Manufacturing	120	They plan to grow. The digital printing on corrugated paper process is relatively new in the US. They just added a new printer & expect to add another in the next 3 months.	Getting qualified people to work on the new printing process on corrugated. It's a new industry & they have to steal people from other companies. The corrugated industry has gotten stagnant.
322 Paper Manufacturing	40	They expect to remain stable in a very competitive industry.	The Labor Unions can make it difficult for small business to stay in business. They come around and offer "protection" to the employees, which is unnecessary. The business is too transparent to need a 3rd party. It kills small companies.
322 Paper Manufacturing	35	Considering moving all manufacturing to Mexico.	Customer's desire to maintain manufacturing in US & CA versus the cost.
323 Printing And Related Support Activities	85	Growth by sales.	Competition and printing is a declining industry.
323 Printing And Related Support Activities	85	Trying to stay in business in California, may go to Nevada, and plans to move at least part of the business there. They have invested in more efficient equipment to replace workers in order to offset the expenses related to taxes, fees, and energy costs.	Power costs are prohibitive. They spend $35,000.00 per month on power, which is too expensive. The culmination of taxes & fees. Use taxes, property taxes, Bay Area Air Quality, Alameda Recycling fees, etc. Businesses are leaving, which means customers are leaving California.
323 Printing And Related Support Activities	75	Growing sales force	Qualified sales people who know the industry
323 Printing And Related Support Activities	40	They anticipate no growth.	The newspaper business is dealing with a shrinking market. Government agencies, bureaucracy
323 Printing And Related Support Activities	35	Newer technology, growth by adding web development team.	Finding skilled workers, health care costs, CA taxes. Keeping costs in check.
325 Chemical Manufacturing	1450	No significant growth expected. They are upgrading their site for their best selling products.	None
325 Chemical Manufacturing	254	Growing slowly with modest hiring expected.	Finding qualified people with the experience and education required. They need PHD's in Bio Chemistry, life sciences, genetics, etc.
325 Chemical Manufacturing	200	Growth/Expansion	Finding skilled, Experienced Engineers
325 Chemical Manufacturing	83	They plan to grow slowly with plans of some future expansion.	They will need another building.

Industry	Employees	What are your business plans in the next 2-5 years?	What is your most significant barrier to achieving your goals?
325 Chemical Manufacturing	65	They expect to maintain with no significant growth.	Finding qualified people to fill technician positions (i.e. Production Operator)
325 Chemical Manufacturing	40	Product growth, clinical trials	Finances, FDA approvals, regulations
325 Chemical Manufacturing	35	Depends on the trials of the new drugs.	Barriers are outcome of the trials, and cash flows to pay for trials.
326 Plastics and Rubber Products Manufacturing	350	Some growth.	Health care costs. Difficult to find skilled employees.
326 Plastics and Rubber Products Manufacturing	150	They are growing and moving away from the Bay area.	The barrier is that there are not enough companies in the Bay area that manufacture goods and services. There is a high cost of doing business there.
326 Plastics and Rubber Products Manufacturing	80	They hope to stay the same. They have already downsized & have cross-trained their existing staff.	None that they know about.
327 Non-Metallic Mineral Product Manufacturing	121	Expand operations in Taiwanese location and to increase silicon raw material production in the United States.	Training and lack of available resources in Taiwan.
331 Primary Metal Manufacturing	200	They intend to grow within the same facilities.	They have had a huge turn-over of their salaried employees, which has been creating a lot of extra work. The cost of living makes it hard to recruit new people to the area.
331 Primary Metal Manufacturing	60	Slow growth or none at all. Remain the same.	No significant external barriers other than time constrains.
331 Primary Metal Manufacturing	57	Expand manufacturing floor space and increasing business.	Permitting process, even on the local city level. Finding qualified, skilled workers in a highly specialized field.
331 Primary Metal Manufacturing	46	They intend to increase sales, but no other actual growth. They plan to add just a few jobs.	The economy will determine whether they grow their sales. There aren't a lot of trained skilled workers to choose from because the Molding Training course that used to be taught at Laney college is no longer being offered.
331 Primary Metal Manufacturing	45	To survive	The economy; if customers do well, the company does well.
331 Primary Metal Manufacturing	43	To remain level with business.	Barriers are competition from China and India.
332 Fabricated Metal Product Manufacturing	6800	In the next year, have identified new initiatives in data science, advanced materials and manufacturing initiative, biological engineering.	Barriers are finding and maintaining talent, due to Silicon valley competitiveness.
332 Fabricated Metal Product Manufacturing	600	They just added a new R & D facility in Fremont. They are growing steadily.	Finding employees with the experience and skills that they need. Manufacturing has left the area in droves over the last 15 years and there is a much smaller pool of qualified workers with the experience they need.
332 Fabricated Metal Product Manufacturing	200	Always hopeful for growth	Orders and recruitment
332 Fabricated Metal Product Manufacturing	200	They hope to win more bids so that they can remain viable & healthy as a business. They do not know what kind of growth to expect & refused to speculate on new jobs they might create.	None other than wining bids for future jobs.

Industry	Employees	What are your business plans in the next 2-5 years?	What is your most significant barrier to achieving your goals?
332 Fabricated Metal Product Manufacturing	140	They'll see some moderate growth due to internal efficiency, and are expecting new business as well.	National and international economy, and governmental impact are barriers.
332 Fabricated Metal Product Manufacturing	115	Maintain and increase sales by 10-15%.	In the US the government security restructure, such as ITAR. In the global environment, that other companies/countries have more favorable tax breaks, making the cost structures uncompetitive, specifically in Europe and China. Locally, employees cannot afford to live, so there is a brain drain with younger people leaving. They now have older employees, which results in higher health costs.
332 Fabricated Metal Product Manufacturing	100	To remain the same. No real job growth expected.	None
332 Fabricated Metal Product Manufacturing	52	They expect to double their business in 5 years time.	The tax difference between Oakland and SF is almost 30% more, and this is a barrier. Working with the city is a nightmare, like closing Telegraph to cars.
333 Machinery Manufacturing	110	Add refrigeration manufacturing.	Health care and California's taxes.
333 Machinery Manufacturing	110	They have been busier than ever since 1965. They anticipate future growth and intend to hire people soon for upcoming projects.	Finding trained people with the skills needed. The Union needs to produce enough trained people to meet their contractual agreements.
333 Machinery Manufacturing	100	They own 2 buildings in Livermore and plan to add more jobs in the future; they are growing.	None
333 Machinery Manufacturing	100	Growth, hiring additional labor, and plan to increase profits by investing in new manufacturing tools and efficiencies.	Finding skilled labor/machinists.
333 Machinery Manufacturing	85	Adding new technology to track the parts through the cleaning process in the plant. Expanding cleaning room,	Health Care costs and hiring qualified workers who will work for minimum wage.
333 Machinery Manufacturing	66	Continued steady growth. It is a very small industry.	It is difficult to recruit people with boiler experience. It is a very expensive. High cost of living in the East Bay.
333 Machinery Manufacturing	30	They hope to grow and add a few jobs in the future.	The local cost of living. It's difficult to compete with other manufacturing companies that operate with less overhead.
334 Computer And Electronic Product Manufacturing	250	They plan for some growth, slow and steady. They were recently acquired by Corning and were downsized considerably. The company moved a lot of jobs to Pennsylvania.	They have staffing issues. They used to be able to hire production workers who didn't have a high school diploma, but after merging with Corning, their hiring practices require a diploma.
334 Computer And Electronic Product Manufacturing	200	Some growth. They do not intend to hire, rather their growth will be through the acquisition of other companies when needed.	None known.
334 Computer And Electronic Product Manufacturing	170	They plan to grow and are expecting to add another location in Alameda County within the next few years.	Finding the right people. They are facing more competition acquiring human assets.
334 Computer And Electronic Product Manufacturing	115	They have new products coming out of development. Growth in sales and staff.	None

Industry	Employees	What are your business plans in the next 2-5 years?	What is your most significant barrier to achieving your goals?
334 Computer And Electronic Product Manufacturing	103		
334 Computer And Electronic Product Manufacturing	70	They expect modest growth over the next 2 years, with greater growth over the next 5 years.	Finding qualified people. Technologists are in demand. It's difficult to attract talent to the bay area due to expenses. The air quality issues due to the dump nearby make it a less attractive place to work. Water rationing is also a problem.
334 Computer And Electronic Product Manufacturing	65	Do more in house (less subcontracting). One stop shop. More automation.	Affordable labor, job expertise, competitive job market, off shore competition.
334 Computer And Electronic Product Manufacturing	63	They hope business picks up. It has been flat and they expect to stay the same with small growth in the future.	Acquiring orders, and recruiting. It's difficult to compete with large companies that can pay better and offer more benefits.
334 Computer And Electronic Product Manufacturing	48	They plan to stay the same with a slight staff increase.	They constantly have to adjust to the business levels which are affected by the economy.
334 Computer And Electronic Product Manufacturing	38	Stay the same	none
334 Computer And Electronic Product Manufacturing	35	Possible slow growth	Hiring qualified, skilled labor.
334 Computer And Electronic Product Manufacturing			
335 Electrical Equipment, Appliance, And Component Manufacturing	90	Staying put, they expect to remain the same	None that they know about.
335 Electrical Equipment, Appliance, and Component Manufacturing	80	Growth is possible and expected.	Lack of sales would be the only barrier.
335 Electrical Equipment, Appliance, And Component Manufacturing	25	They hope to grow their sales and staff. The last 3 years have been frustrating with the business fluctuating between being very busy & not busy enough.	Having more opportunities. They are part of the construction industry. They depend on engineers & architects who spec their products, and the number of jobs is smaller and all of the lighting companies are fighting for the same business. They need more sales & depend on independent reps' orders from around the country, which fluctuates.
336 Transportation Equipment Manufacturing	40	Stay the same	The economy and hiring skilled workers.
336 Transportation Equipment Manufacturing	14	To stay the same size, and not grow.	Barriers are not having a painting booth for the vehicles due to regulatory issues. That takes quite a bit of profit away from their company, but there were so many issues with it that they have decided not to pursue it.
336 Transportation Equipment Manufacturing	10	They are trying to grow. They attempt to create new products as fast as possible.	The biggest problem is the time it takes to develop new products.
336 Transportation Equipment Manufacturing	5	They are downsizing due to the economy. They plan to move soon but hope to stay within Alameda County.	
337 Furniture And Related Product Manufacturing	200	Stay the same	Outside competition and the economy.

Industry	Employees	What are your business plans in the next 2-5 years?	What is your most significant barrier to achieving your goals?
337 Furniture And Related Product Manufacturing	120	They intend to utilize the building they own, and plan to re-build their staff. They had over 200 employees, but had to let a lot of them go. They intend to remodel their offices to accommodate more sales people and other manufacturing staff.	None. They feel very positive and upbeat.
337 Furniture And Related Product Manufacturing	80	They are trying to stay the same and steady.	Getting work. It's getting harder to operate in the Bay Area due to outsourcing to other states & countries. Cabinet shops from all over the world are competing for work in the Bay Area. They are a Union shop & it's difficult to compete with companies that have less overhead & are located in a less expensive business climate.
339 Miscellaneous Manufacturing	350	Growth will be overseas in Costa Rica.	No barriers to growth.
339 Miscellaneous Manufacturing	285	Always growth, and to stay in the bay area.	Economy, overseas production competition, changing technology skill sets, keeping good employees.
339 Miscellaneous Manufacturing	250	They grow by acquisition. All the growth is happening outside of Alameda.	The cost of living makes it difficult to get qualified dental tech's, so they are limited to recruiting from the surrounding area.
339 Miscellaneous Manufacturing	250	They are planning to stay in the area. They are in a growth mode and do not have a lot of turnover at these sites, which are primarily administrative and R&D in Alameda County.	With the economic recovery, they are finding it is a bit more difficult recruiting & retaining highly skilled employees.
339 Miscellaneous Manufacturing	250	They plan to grow. Their existing business in Livermore will be expanding in the Philippines, and downsizing locally (about 10-15% with no replacements expected), but they intend to grow new business opportunities in the same location. New jobs will be in Manila for this particular business.	
339 Miscellaneous Manufacturing	220	Gradual growth and possibly adding new products to manufacturing along with hip/spinal surgical tables.	Finding skilled workers, primarily engineers, assemblers and sewers.
339 Miscellaneous Manufacturing	100	To stay the same.	Competition and the economy.
339 Miscellaneous Manufacturing	100	Growth	FDA approvals, results of clinical trials, skilled workers.
339 Miscellaneous Manufacturing	40	Growing as new projects arise. Becoming more involved with new and cutting edge products.	Immigration issues. Need to look outside US for qualified engineers.
339 Miscellaneous Manufacturing	25	To stay in business in this county, and California in particular.	The California climate has made it business unfriendly and even the city of Hayward has been causing issues. They're trying to move their building into a smaller one, and that's been a problem.
561 Administrative and Support Services	75	They are looking to stay the same and have maxed-out their employee roster.	None really; any future growth is dependent on sales.

Type of jobs

Industry	Employees	% FT	% PT	% On Call	% Temp	% Seasonal	% Independ. Contractor
312 Beverage and Tobacco Product Manufacturing	4	25	75				
322 Paper Manufacturing	250	100					
322 Paper Manufacturing	125	80				20	
322 Paper Manufacturing	120	96			4		
322 Paper Manufacturing	40	100					
322 Paper Manufacturing	35	100					
323 Printing And Related Support Activities	85	98	2				
323 Printing And Related Support Activities	85	100					
323 Printing And Related Support Activities	75	89	10		1		
323 Printing And Related Support Activities	40	95	5				
323 Printing And Related Support Activities	35	97	2		1		
325 Chemical Manufacturing	1450	100					
325 Chemical Manufacturing	254	91			9		
325 Chemical Manufacturing	200	100					
325 Chemical Manufacturing	83	100					
325 Chemical Manufacturing	65	78					22
325 Chemical Manufacturing	40	80	2				18
325 Chemical Manufacturing	35	80	5	15			
326 Plastics and Rubber Products Manufacturing	350	80			20		
326 Plastics and Rubber Products Manufacturing	150	100					
326 Plastics and Rubber Products Manufacturing	80	60			40		
327 Non-Metallic Mineral Product Manufacturing	121	99				1	
331 Primary Metal Manufacturing	200	100					
331 Primary Metal Manufacturing	60	100					
331 Primary Metal Manufacturing	57	97	1		2		
331 Primary Metal Manufacturing	46	100					
331 Primary Metal Manufacturing	45	100					
331 Primary Metal Manufacturing	43	98	2				
332 Fabricated Metal Product Manufacturing	6800	80	5		15		

Industry	Employees	% FT	% PT	% On Call	% Temp	% Seasonal	% Independ. Contractor
332 Fabricated Metal Product Manufacturing	600	100					
332 Fabricated Metal Product Manufacturing	200	100					
332 Fabricated Metal Product Manufacturing	200	100					
332 Fabricated Metal Product Manufacturing	140	65	10			25	
332 Fabricated Metal Product Manufacturing	115	93			7		
332 Fabricated Metal Product Manufacturing	100	100					
332 Fabricated Metal Product Manufacturing	52	98	2				
333 Machinery Manufacturing	110	98			2		
333 Machinery Manufacturing	110	100					
333 Machinery Manufacturing	100	100					
333 Machinery Manufacturing	100	98	1	1			
333 Machinery Manufacturing	85	100					
333 Machinery Manufacturing	66	100					
333 Machinery Manufacturing	30	100					
334 Computer And Electronic Product Manufacturing	250	100					
334 Computer And Electronic Product Manufacturing	200	98	2				
334 Computer And Electronic Product Manufacturing	170	94	6				
334 Computer And Electronic Product Manufacturing	115	98	2				
334 Computer And Electronic Product Manufacturing	103	100					
334 Computer And Electronic Product Manufacturing	70	100					
334 Computer And Electronic Product Manufacturing	65	99			1		
334 Computer And Electronic Product Manufacturing	63	100					
334 Computer And Electronic Product Manufacturing	48	100					
334 Computer And Electronic Product Manufacturing	38	99					1
334 Computer And Electronic Product Manufacturing	35	90	9				1
334 Computer And Electronic Product Manufacturing							
335 Electrical Equipment, Appliance, And Component Manufacturing	90	90	10				

Industry	Employees	% FT	% PT	% On Call	% Temp	% Seasonal	% Independ. Contractor
335 Electrical Equipment, Appliance, and Component Manufacturing	80	100					
335 Electrical Equipment, Appliance, And Component Manufacturing	25	100					
336 Transportation Equipment Manufacturing	40	100					
336 Transportation Equipment Manufacturing	14	100					
336 Transportation Equipment Manufacturing	10	70	30				
336 Transportation Equipment Manufacturing	5	100					
337 Furniture And Related Product Manufacturing	200	100					
337 Furniture And Related Product Manufacturing	120	100					
337 Furniture And Related Product Manufacturing	80	60	40				
339 Miscellaneous Manufacturing	350	86	1		13		
339 Miscellaneous Manufacturing	285	99	1				
339 Miscellaneous Manufacturing	250	95	5				
339 Miscellaneous Manufacturing	250	99			1		
339 Miscellaneous Manufacturing	250	100					
339 Miscellaneous Manufacturing	220	92	1		6		1
339 Miscellaneous Manufacturing	100	99	1				
339 Miscellaneous Manufacturing	100	88	2		9		1
339 Miscellaneous Manufacturing	40	100					
339 Miscellaneous Manufacturing	25	98					2
561 Administrative and Support Services	75	100					

Projected Job Growth

Industry	Employees	Employees in 6 Months	Employees in 1 Year	Employees in 3 Years
312 Beverage and Tobacco Product Manufacturing	4	8	16	32
322 Paper Manufacturing	250	270	275	285
322 Paper Manufacturing	125	125	125	125
322 Paper Manufacturing	120	125	130	150
322 Paper Manufacturing	40	70	70	70
322 Paper Manufacturing	35	35	35	35
323 Printing And Related Support Activities	85	85	87	87
323 Printing And Related Support Activities	85	40	25	20
323 Printing And Related Support Activities	75	80	100	125
323 Printing And Related Support Activities	40	40	40	40
323 Printing And Related Support Activities	35	39	40	40
325 Chemical Manufacturing	1450	1450	1450	1450
325 Chemical Manufacturing	254	274	274	424
325 Chemical Manufacturing	200	210	215	230
325 Chemical Manufacturing	83	90	100	100
325 Chemical Manufacturing	65	65	65	65
325 Chemical Manufacturing	40	80	80	100
325 Chemical Manufacturing	35	35	35	35
326 Plastics and Rubber Products Manufacturing	350	350	360	360
326 Plastics and Rubber Products Manufacturing	150	153	153	153
326 Plastics and Rubber Products Manufacturing	80	80	80	80
327 Non-Metallic Mineral Product Manufacturing	121	121	121	121
331 Primary Metal Manufacturing	200	225	225	225
331 Primary Metal Manufacturing	60	60	60	63
331 Primary Metal Manufacturing	57	57	57	60
331 Primary Metal Manufacturing	46	49	49	50
331 Primary Metal Manufacturing	45	45	45	45
331 Primary Metal Manufacturing	43	43	43	43
332 Fabricated Metal Product Manufacturing	6800	6200	6200	6200
332 Fabricated Metal Product Manufacturing	600	650	650	655
332 Fabricated Metal Product Manufacturing	200	200	220	220

Industry	Employees	Employees in 6 Months	Employees in 1 Year	Employees in 3 Years
332 Fabricated Metal Product Manufacturing	200	200	200	200
332 Fabricated Metal Product Manufacturing	140	140	140	140
332 Fabricated Metal Product Manufacturing	115	115	126	151
332 Fabricated Metal Product Manufacturing	100	100	100	103
332 Fabricated Metal Product Manufacturing	52	57	57	70
333 Machinery Manufacturing	110	115	120	125
333 Machinery Manufacturing	110	165	165	165
333 Machinery Manufacturing	100	100	105	120
333 Machinery Manufacturing	100	105	110	130
333 Machinery Manufacturing	85	85	93	93
333 Machinery Manufacturing	66	75	75	80
333 Machinery Manufacturing	30	30	30	45
334 Computer And Electronic Product Manufacturing	250	250	250	250
334 Computer And Electronic Product Manufacturing	200	200	200	200
334 Computer And Electronic Product Manufacturing	170	175	180	200
334 Computer And Electronic Product Manufacturing	115	115	130	165
334 Computer And Electronic Product Manufacturing	103	113	123	143
334 Computer And Electronic Product Manufacturing	70	70	70	90
334 Computer And Electronic Product Manufacturing	65	65	73	78
334 Computer And Electronic Product Manufacturing	63	63	63	68
334 Computer And Electronic Product Manufacturing	48	48	50	50
334 Computer And Electronic Product Manufacturing	38	38	38	38
334 Computer And Electronic Product Manufacturing	35	35	35	35
334 Computer And Electronic Product Manufacturing				
335 Electrical Equipment, Appliance, And Component Manufacturing	90	90	100	110
335 Electrical Equipment, Appliance, and Component Manufacturing	80	86	86	86
335 Electrical Equipment, Appliance, And Component Manufacturing	25	28	30	40
336 Transportation Equipment Manufacturing	40	40	40	40

Industry	Employees	Employees in 6 Months	Employees in 1 Year	Employees in 3 Years
336 Transportation Equipment Manufacturing	14	14	14	14
336 Transportation Equipment Manufacturing	10	12	15	20
336 Transportation Equipment Manufacturing	5	6	7	7
337 Furniture And Related Product Manufacturing	200	200	200	200
337 Furniture And Related Product Manufacturing	120	120	150	200
337 Furniture And Related Product Manufacturing	80	80	80	80
339 Miscellaneous Manufacturing	350	360	360	300
339 Miscellaneous Manufacturing	285	315	345	390
339 Miscellaneous Manufacturing	250	250	250	250
339 Miscellaneous Manufacturing	250	250	250	275
339 Miscellaneous Manufacturing	250	250	250	250
339 Miscellaneous Manufacturing	220	225	225	230
339 Miscellaneous Manufacturing	100	100	100	100
339 Miscellaneous Manufacturing	100	525	550	600
339 Miscellaneous Manufacturing	40	44	50	50
339 Miscellaneous Manufacturing	25	25	25	25
561 Administrative and Support Services	75	75	75	75
TOTAL:	**16747**	**16908**	**17160**	**17769**

New Jobs to be Added

Industry	Employees	If you expect to grow, what jobs will make up the most new positions over the next 3 years, and how many new jobs do you expect to add?				
312 Beverage and Tobacco Product Manufacturing	4	Assistant Brewers (6)	Purchasing Workers (2)	Distribution Workers (2)		
322 Paper Manufacturing	250	Bag Machine Operator (10)	Press Operator (10)	Press Helper (10)	Shipping and Receiving Worker (5)	
322 Paper Manufacturing	125	Tech-Process Engineers				
322 Paper Manufacturing	120	Customer Service (3)	Machine Operators (18)	Graphic Artists (5)	IT Position, HR Assistant	Accounting (2)
322 Paper Manufacturing	40	Production Line Workers (5)	Machine Operators (5)	Gluers (5)	Strippers (5)	Heat Sealers (5), Set Up Personnel (5)
322 Paper Manufacturing	35					
323 Printing And Related Support Activities	85	Press Operator	Digital Operator	Production Floor	Business Solutions Representatives (2)	
323 Printing And Related Support Activities	85	None				
323 Printing And Related Support Activities	75	Advertising and Commercial Sales (40)	Print Production Managers (4)	Press Operators (4)		
323 Printing And Related Support Activities	40	None				
323 Printing And Related Support Activities	35	Web Developers (3)	Quality Assurance Specialist			
325 Chemical Manufacturing	1450	None				
325 Chemical Manufacturing	254	Life Scientists (21)	Molecular Biology (21)	Chemical Engineers (21)	Bio Chemists (22)	Finance, Legal & HR (85)
325 Chemical Manufacturing	200	Chemical Engineers (10)	Mechanical Engineers (10)	IT Workers (10)		
325 Chemical Manufacturing	83	Senior Chemists (5)	Synthesis Chemists (5)	Purification Chemists (5)	Inventory Specialist	Business Development Associate
325 Chemical Manufacturing	65	None				
325 Chemical Manufacturing	40	Research & Development Executives (2)	General Administration Staff (3)	Process Development Engineers (5)	Equipment Engineers (5)	Manufacturing Technicians (20)
325 Chemical Manufacturing	35	None				
326 Plastics and Rubber Products Manufacturing	350	Mechanical / Industrial Engineer (3)	Process Engineer (2)	Tool Makers (2)		

Industry	Employees	If you expect to grow, what jobs will make up the most new positions over the next 3 years, and how many new jobs do you expect to add?				
326 Plastics and Rubber Products Manufacturing	150	Sales (4)				
326 Plastics and Rubber Products Manufacturing	80	Production Staff				
327 Non-Metallic Mineral Product Manufacturing	121	Machinist (5)	Silicon Grower (4)			
331 Primary Metal Manufacturing	200	Production Line Workers (21)	Sales Contract Administrating	Development Engineer	Process Engineer	
331 Primary Metal Manufacturing	60	Laborer	Project Manager	Welder		
331 Primary Metal Manufacturing	57	Mechanical Manufacturing Technician (3)	Acoustic Industry Sales Manager	Inside Sales Representative (2)		
331 Primary Metal Manufacturing	46	Foundry Workers (4)				
331 Primary Metal Manufacturing	45	Inspector	Machinist			
331 Primary Metal Manufacturing	43	None				
332 Fabricated Metal Product Manufacturing	6800	Data Science	Advanced Materials Manufacturing	Biological Engineering		
332 Fabricated Metal Product Manufacturing	600	Inspectors (10)	CNC Mechanics (20)	Detailers (20)	General Mfg. Positions (2)	
332 Fabricated Metal Product Manufacturing	200	Laborers (6)	Machinists (4)			
332 Fabricated Metal Product Manufacturing	200	None				
332 Fabricated Metal Product Manufacturing	140	None				
332 Fabricated Metal Product Manufacturing	115	Direct Manufacturing (15)	Computer Technicians (5)			
332 Fabricated Metal Product Manufacturing	100	Grinders (2)				
332 Fabricated Metal Product Manufacturing	52	Installers (16)	Fabricators (2)			
333 Machinery Manufacturing	110	Production Workers (15)				
333 Machinery Manufacturing	110	Sprinkler Fitters (45)	Shop Workers/Pipe Threaders, Cutters (4)	Welder	Pipe Assemblers (3)	
333 Machinery Manufacturing	100	Manufacturing Assembly Production (15)	Manufacturing Bulk Products/Mixers (5)			

Industry	Employees	If you expect to grow, what jobs will make up the most new positions over the next 3 years, and how many new jobs do you expect to add?				
333 Machinery Manufacturing	100	Machinists (2)	Welders (2)	General Production Workers (2)	Administrative Staff (2)	
333 Machinery Manufacturing	85	Production Line Worker (2)	Shipping Receiving Clerk (2)	Clean Room Technician (2)	Chemist	
333 Machinery Manufacturing	66	Business Developers (5)	Sales Engineers (5)	Service Technicians (4)		
333 Machinery Manufacturing	30	Manufacturing Factory Workers (10)	Engineers (3)	Machine Operator	Welder	
334 Computer And Electronic Product Manufacturing	250	None				
334 Computer And Electronic Product Manufacturing	200	None				
334 Computer And Electronic Product Manufacturing	170	Sales Associates (10)	Engineers (5)	Warehouse Operations (5)	Administration (5)	
334 Computer And Electronic Product Manufacturing	115	Production/Assembly (35)	Engineers (7)	Sales (3)	HR	
334 Computer And Electronic Product Manufacturing	103	Manufacturing Assembler	Final Test Technician	Field Service Engineers-Outside CA	Material Handler	Finance and Accounting
334 Computer And Electronic Product Manufacturing	70	Technologists (4)	Analog Engineer (4)	Software Quality Engineer (4)	Firmware Engineer (4)	VLSI Design Engineer (4)
334 Computer And Electronic Product Manufacturing	65	Machine Operators (5)	Programming Technicians (2)	Procurement/Purchasing (2)		
334 Computer And Electronic Product Manufacturing	63	Accountant	Purchaser	Manufacturing Worker (2)	Engineer	
334 Computer And Electronic Product Manufacturing	48	Engineering (2)				
334 Computer And Electronic Product Manufacturing	38					
334 Computer And Electronic Product Manufacturing	35					
334 Computer And Electronic Product Manufacturing						
335 Electrical Equipment, Appliance, And Component Manufacturing	90	Electronic Technicians (12)	Engineers (8)			
335 Electrical Equipment, Appliance, and Component Manufacturing	80	Cable Manufacturing (6)				

Industry	Employees	If you expect to grow, what jobs will make up the most new positions over the next 3 years, and how many new jobs do you expect to add?				
335 Electrical Equipment, Appliance, And Component Manufacturing	25	Factory Workers for Mfg/Assembly (8)	Production Support Crew (2)	Sales (3)	Clerical (2)	
336 Transportation Equipment Manufacturing	40					
336 Transportation Equipment Manufacturing	14	None				
336 Transportation Equipment Manufacturing	10	Sales (5)	Warehouse Workers (5)			
336 Transportation Equipment Manufacturing	5	Auto Mechanic/Electrician	Welder/Mechanic			
337 Furniture And Related Product Manufacturing	200					
337 Furniture And Related Product Manufacturing	120	Finishing Department Workers (35)	Sales (5)	Customer Service Assistants (5)	Order Entry Assistants (5)	
337 Furniture And Related Product Manufacturing	80					
339 Miscellaneous Manufacturing	350	Process Engineers (10)				
339 Miscellaneous Manufacturing	285	Machine Operators (15)	Quality Assurance Specialist (25)	Production Operators (25)	Program Management (2)	Design Operator
339 Miscellaneous Manufacturing	250	None				
339 Miscellaneous Manufacturing	250	Technical Level Positions (5)	Scientific Research Associate (8)	Scientists (8)	General Admin/Clerical (4)	
339 Miscellaneous Manufacturing	250	Customer Service (3)	Call Center Staff			
339 Miscellaneous Manufacturing	220	Electrical Engineers (3)	Systems Engineers (2)	Master Scheduler	Human Resource	Financial Analyst
339 Miscellaneous Manufacturing	100					
339 Miscellaneous Manufacturing	100	Electro Mechanical Assemblers (8)	Test Technicians (8)	Quality Assurance Inspectors (8)	Mechanical Engineers & Electrical Engineers (25)	General Administration (50)
339 Miscellaneous Manufacturing	40	Sustaining Engineers (5)	Test Engineer	Electrical Engineer	Mechanical Engineer	
339 Miscellaneous Manufacturing	25	None				
561 Administrative and Support Services	75					

Replacement Jobs to be Filled

Industry	Employees	For what jobs do you expect to hire the most replacements when current employees retire or leave your company over the next 3 years, and how many replacements do you expect to hire?				
312 Beverage and Tobacco Product Manufacturing	4	Tasting Room Workers (2)				
322 Paper Manufacturing	250	Bag Machine Operator (5)	Press Operator (3)	Press Helper (5)	Shipping and Receiving Worker (5)	
322 Paper Manufacturing	125	Manufacturing Direct Label Laborer (7)	Process Engineers (2)			
322 Paper Manufacturing	120	Manufacturing Machine Operators (4)	Manufacturing Forklift Drivers (5)	Woodshop Employees (5)	Graphic Artist	Accounting
322 Paper Manufacturing	40	Workers, Entry Level				
322 Paper Manufacturing	35					
323 Printing And Related Support Activities	85	Business Solutions Representative				
323 Printing And Related Support Activities	85	None				
323 Printing And Related Support Activities	75	Advertising and Commercial Sales (2)				
323 Printing And Related Support Activities	40	Joggers, Entry-Level (Paper bundling off the printing press)				
323 Printing And Related Support Activities	35	Quality Assurance Specialists (2)	Accounts Receivable	HR Generalist	Product Development Specialist	
325 Chemical Manufacturing	1450	Technical Positions (3)	Management, Upper (3)	Technical Positions, Lower (3)		
325 Chemical Manufacturing	254	Life Scientists (14)	Molecular Biology (14)	Chemical Engineers (14)	Bio Chemists (14)	Commercial Jobs - Accounting, Legal, HR (45)
325 Chemical Manufacturing	200	Chemical Engineers (5)	Mechanical Engineers (5)	IT Workers (4)	Finance, Admin	Marketing (2)
325 Chemical Manufacturing	83	Chemists (45)				
325 Chemical Manufacturing	65	Chemical Production Operator (13)	Chemical Engineer (3)			
325 Chemical Manufacturing	40	Chief Scientific Officer				
325 Chemical Manufacturing	35	None				

Industry	Employees	For what jobs do you expect to hire the most replacements when current employees retire or leave your company over the next 3 years, and how many replacements do you expect to hire?				
326 Plastics and Rubber Products Manufacturing	350	Machine Operators (8)	General Administration (3)	Engineers (3)		
326 Plastics and Rubber Products Manufacturing	150	Warehouse Workers (5)	Clerical Workers (2)	Management		
326 Plastics and Rubber Products Manufacturing	80	Administrative Position	Customer Service Representative	Accounting	Production Staff	
327 Non-Metallic Mineral Product Manufacturing	121	Machinists (5)	Accounting (2)			
331 Primary Metal Manufacturing	200	Manufacturing Floor Line Workers (75)	Office Workers (10)			
331 Primary Metal Manufacturing	60	Skilled Tradesman	Laborer			
331 Primary Metal Manufacturing	57	Mechanical Technicians (2)	Quality Assurance Engineer			
331 Primary Metal Manufacturing	46	Foundry Worker				
331 Primary Metal Manufacturing	45	Machine Programmers (2)	Machinists (2)	Die Casters (2)	General Office Staff (2)	
331 Primary Metal Manufacturing	43	Production Workers (5)				
332 Fabricated Metal Product Manufacturing	6800	Executive Management (5)	Technician Management (5)			
332 Fabricated Metal Product Manufacturing	600	Machinists (50)	Inspectors (50)	Detailers (50)		
332 Fabricated Metal Product Manufacturing	200	Laborers (2)	Machinists (2)			
332 Fabricated Metal Product Manufacturing	200	Field Iron Workers (5)	Detailers (2)	Shop Helpers (2)		
332 Fabricated Metal Product Manufacturing	140	Drivers (2)	Assembly Machine Operators (10)	Administrative Assistant		
332 Fabricated Metal Product Manufacturing	115	Manufacturing (2)	Quality Assurance (2)			
332 Fabricated Metal Product Manufacturing	100	Grinders (2)				
332 Fabricated Metal Product Manufacturing	52	Installers (12)	Fabricators			
333 Machinery Manufacturing	110	VP Finance	VP Sales & Marketing	VP Production - Plant Manager	Welders (5)	

Industry	Employees	For what jobs do you expect to hire the most replacements when current employees retire or leave your company over the next 3 years, and how many replacements do you expect to hire?				
333 Machinery Manufacturing	110	Designer	Office Manager			
333 Machinery Manufacturing	100	Bulk Products Worker	Assembly Production Worker			
333 Machinery Manufacturing	100	Machinists (13)	Welders (3)	General Production Workers (2)		
333 Machinery Manufacturing	85	Chemist	Production Line Worker (2)	Shipping Receiving Clerk (2)	Clean Room Technician (2)	
333 Machinery Manufacturing	66	Business Developers (3)	Sales Engineers (5)	Service Technician		
333 Machinery Manufacturing	30	Engineer	Welder	Factory Workers (3)		
334 Computer And Electronic Product Manufacturing	250	Molding Technicians (2)	Automation Technicians (2)	Assembly Department Workers (2)	Machine Operators (12)	
334 Computer And Electronic Product Manufacturing	200	Design Engineers (6)	Test Engineers (6)	Marketing (6)	Applications Engineer (6)	
334 Computer And Electronic Product Manufacturing	170	Credit (2)	Shipping (3)	Production (10)	Receiving (2)	Engineers (5)
334 Computer And Electronic Product Manufacturing	115	Production/Assembly (4)	Engineering (4)	Sales (4)	Customer Service (4)	Tech Support (4)
334 Computer And Electronic Product Manufacturing	103	Operations Worker (3)				
334 Computer And Electronic Product Manufacturing	70	Technologist	Analog Engineer	Software Quality Engineer	Firmware Engineer	VLSI Design Engineer
334 Computer And Electronic Product Manufacturing	65	Machine Operators (2)				
334 Computer And Electronic Product Manufacturing	63	Marketing	Accountant	Executive Chairman		
334 Computer And Electronic Product Manufacturing	48	Engineer	Customer Service	Manufacturing/Production Line Worker		
334 Computer And Electronic Product Manufacturing	38	Panel Technician (Wireman)				

Industry	Employees	For what jobs do you expect to hire the most replacements when current employees retire or leave your company over the next 3 years, and how many replacements do you expect to hire?				
334 Computer And Electronic Product Manufacturing	35	Electronic Technician	Electronic Assembler	Maintenance Supervisor		
335 Electrical Equipment, Appliance, And Component Manufacturing	90	None				
335 Electrical Equipment, Appliance, and Component Manufacturing	80	None				
335 Electrical Equipment, Appliance, And Component Manufacturing	25	None				
336 Transportation Equipment Manufacturing	40	Welders (10)				
336 Transportation Equipment Manufacturing	14	None				
336 Transportation Equipment Manufacturing	10	None				
336 Transportation Equipment Manufacturing	5	None expected				
337 Furniture And Related Product Manufacturing	200	Assembly Workers (20)				
337 Furniture And Related Product Manufacturing	120	Finishing Department Workers (15)				
337 Furniture And Related Product Manufacturing	80	Cabinet Makers (5)	Installers - Carpenters (10)	Machinery Operators (5)	Project Managers (3)	
339 Miscellaneous Manufacturing	350	Operators (8)				
339 Miscellaneous Manufacturing	285	Material Handler	Hardware 2nd Operations (4)	Quality Assurance Specialist (3)		
339 Miscellaneous Manufacturing	250	Dental Technicians (19)	Production Support, Entry Level (5)	Dental Assistants (5)	Finance (2)	Marketing

Industry	Employees	For what jobs do you expect to hire the most replacements when current employees retire or leave your company over the next 3 years, and how many replacements do you expect to hire?				
339 Miscellaneous Manufacturing	250	Scientists (6)	Clinical Scientists (6)			
339 Miscellaneous Manufacturing	250	None				
339 Miscellaneous Manufacturing	220	Sewer	Assembler	Materials Handler	Buyer	
339 Miscellaneous Manufacturing	100	Machine Operators (3)				
339 Miscellaneous Manufacturing	100	Electro Mechanical Assemblers (4)	General Administration (30)	Mechanical Engineers & Electrical Engineers (10)	Test Technicians (4)	Quality Assurance Inspectors (4)
339 Miscellaneous Manufacturing	40	Test Engineers (2)				
339 Miscellaneous Manufacturing	25	Machine Operator (2)	Inspectors (2)			
561 Administrative and Support Services	75	Production Line, Non-Skilled Entry Level Workers (4)				

Shortages of Qualified Workers

Industry	Employees	For what jobs do you have significant difficulty finding qualified applicants, and why?			
312 Beverage and Tobacco Product Manufacturing	4	Brewers (w trade experience)			
322 Paper Manufacturing	250	Press Operator (w printing knowledge and machining experience lacking)	Pouch Machine Operator (w technology skills)		
322 Paper Manufacturing	125	Process-Related Engineers (competitive position & applicants want more than what they can pay)	Customer Service (w good communication skills)	Process Engineers (w industry knowledge & multiple task proficient)	
322 Paper Manufacturing	120	Customer Service (w specialized skills and knowledge)	Machine Operators (need to retain after 3 months of training)	Structural Engineers (design boxes) (competitive position)	
322 Paper Manufacturing	40	Office Personnel (w good communication skills & ESL)	Workers, Entry Level (applicants want more than what they can pay & who will enjoy their job)		
322 Paper Manufacturing	35	None			
323 Printing And Related Support Activities	85	Press Operators (skilled labor)	Client Services (skilled labor and industry knowledge)		
323 Printing And Related Support Activities	85	None			
323 Printing And Related Support Activities	75	Advertising and Commercial Sales (w print business knowledge)	Print Press Operator (w industry knowledge)		
323 Printing And Related Support Activities	40	Joggers, Entry-Level - Paper bundling off the printing press (willingness to work hard & gain loyalty)	Pre-Press Workers (w specialized skills & prior training)	Pre-Flight Workers (w specialized skills & no prior training)	
323 Printing And Related Support Activities	35	Quality Assurance Specialist (w specialized skills & too few applicants)	Flexographic Operator (w specialized skill set)		
325 Chemical Manufacturing	1450	Lab Technicians (w soft skills, honesty, 2-4 year degrees, able to work w a schedule)	Quality Control (competitive position & not enough to go around)	Supply Chain Management (competitive position, w soft skills, honesty)	
325 Chemical Manufacturing	254	Life Scientists (w college degree)	Finance Professionals (competitive position & not enough to go around)		
325 Chemical Manufacturing	200	Engineers (properly documented, local high cost of living, willingness to commute if not local)	IT Workers (properly documented, w specialized skills, local high cost of living, willingness to commute if not local)		

Industry	Employees	For what jobs do you have significant difficulty finding qualified applicants, and why?			
325 Chemical Manufacturing	83	Synthesis Chemists (w specialized experience in the BioTech industry)	Business Development (w sales experience & product knowledge)	Senior Chemists (w specialized experience in the BioTech industry)	Purification Chemists (w specialized experience in the BioTech industry)
325 Chemical Manufacturing	65	Chemical Production Operators (w specialized skill, strong science, technology, engineering & mathematics, 2-year process technology degree preferred)			
325 Chemical Manufacturing	40	Regulatory Executive (w experience, knowledge & biotech skills)			
325 Chemical Manufacturing	35	None			
326 Plastics and Rubber Products Manufacturing	350	Tool Makers (few skilled workers available)			
326 Plastics and Rubber Products Manufacturing	150	Sales (structure of the company makes it very challenging)			
326 Plastics and Rubber Products Manufacturing	80	None			
327 Non-Metallic Mineral Product Manufacturing	121	Machinists (w CNC qualifications)	CNC Repair Technicians (lack of qualified applicants)	Cost Accountants (lack of qualified applicants)	
331 Primary Metal Manufacturing	200	Production Supervisors (evolving industry & competitive industry salary)	Testing Technicians, Non-Destructive (w qualifications, highly skilled including x-raying parts that have been dipped in a penetrant that glows in the dark)		
331 Primary Metal Manufacturing	60	Technical Positions (w advanced math skills)	Project Managers (w basic math and English skills)		
331 Primary Metal Manufacturing	57	Mechanical Technician (skilled labor and multi-tasking skills)	Acoustics Sales Manager (specialized knowledge of acoustics)		
331 Primary Metal Manufacturing	46	Foundry Workers (competitive position & not enough to go around)			
331 Primary Metal Manufacturing	45	CNC Machinists (lack of programs to teach the skill)	Inspectors (lack of training)	Die Casters (lack of training)	
331 Primary Metal Manufacturing	43	None			

Industry	Employees	For what jobs do you have significant difficulty finding qualified applicants, and why?			
332 Fabricated Metal Product Manufacturing	6800	Computation Science (competition in Silicon Valley)			
332 Fabricated Metal Product Manufacturing	600	CNC Machinists (over a decade of relocating business outside of the US has created a 15-year skill gap due to the labor costs here vs Malaysia, Mexico, etc)	Detailers (over a decade of relocating business outside of the US has created a 15-year skill gap due to the labor costs here vs Malaysia, Mexico, etc)	Cost Estimators (over a decade of relocating business outside of the US has created a 15-year skill gap due to the labor costs here vs Malaysia, Mexico, etc)	Inspectors (over a decade of relocating business outside of the US has created a 15-year skill gap due to the labor costs here vs Malaysia, Mexico, etc)
332 Fabricated Metal Product Manufacturing	200	Machinists (competitive position & skilled)			
332 Fabricated Metal Product Manufacturing	200	None			
332 Fabricated Metal Product Manufacturing	140	Assembly Machine Operator (w experience and skills)			
332 Fabricated Metal Product Manufacturing	115	Photolithography (w experience)	Management (w management training)		
332 Fabricated Metal Product Manufacturing	100	None			
332 Fabricated Metal Product Manufacturing	52	Fabricators - Locksmith (w experience, skills and knowledge)	Fire Alarm Technician (few and far between & extensive training required)		
333 Machinery Manufacturing	110	Production Workers (w basic math skills & clean record)	Manufacturing Engineers (w blue print reading skills)	Aero Space Engineers (competition for good engineers)	
333 Machinery Manufacturing	110	Fire Sprinkler Designers (w specialized skills & advanced math skills)	Accountants (competitive position & not enough to go around)	Sprinkler Fitter Apprentices (must be union w good work ethic)	
333 Machinery Manufacturing	100	R & D (specialized field & need new product developers)			
333 Machinery Manufacturing	100	Machinists (w specialized training)	Welders (w specialized training)		
333 Machinery Manufacturing	85	Waste Treatment Operator (willing to work with chemicals)			
333 Machinery Manufacturing	66	Business Development & Sales (w industry background)	Service Technicians (w boiler experience)	Quotation Developers (Estimators) (w industry background in HVAC boilers & pumps)	
333 Machinery Manufacturing	30	Machine Operators (w local talent)	Welders (w local talent)		
334 Computer And Electronic Product Manufacturing	250	Automation Technicians (experienced, w HS diploma & applicants want more than what we can pay)	Molding Technicians (experienced w HS diploma & applicants want more than what we can pay)		
334 Computer And Electronic Product Manufacturing	200	Test Engineers (w specialized skills)	Design Engineers (w specialized skills)	Applications Engineers (w specialized skills)	Product Engineers (w specialized skills)

Industry	Employees	For what jobs do you have significant difficulty finding qualified applicants, and why?			
334 Computer And Electronic Product Manufacturing	170	Engineers (competitive position & applicants want more than what they can pay)	Sales (competitive position & applicants want more than what they can pay)		
334 Computer And Electronic Product Manufacturing	115	Engineering (competitive position & not enough to go around)	Sales (no commissions salesforce)		
334 Computer And Electronic Product Manufacturing	103	None			
334 Computer And Electronic Product Manufacturing	70	Analog Engineers (competition for good engineers)	Software Quality Engineers (competition for good engineers)	Firmware Engineers (competition for good engineers)	VLSI Design Engineer (competition for good engineers)
334 Computer And Electronic Product Manufacturing	65	Quality Control (w good eyesight, attention to detail & applicants want more than what they can pay)			
334 Computer And Electronic Product Manufacturing	63	Software Engineers (w specific skill sets regarding hardware for test equipment; competitive position & applicants want more than what they can pay)			
334 Computer And Electronic Product Manufacturing	48	Inside Sales (skilled labor)	Customer Service & Support (skilled labor)	Engineers (w experience & competitive position)	
334 Computer And Electronic Product Manufacturing	38	Software Engineer (specific specialized qualifications & willingness to travel)	Electrical Engineer (specialized qualifications & willingness to travel)		
334 Computer And Electronic Product Manufacturing	35	Electronic Technicians (w specialized skills working with analog systems)	Electronic Assemblers (w specialized skill working with microscopes)		
334 Computer And Electronic Product Manufacturing		Electro Mechanical Assemblers (lack experience & at an inconvenient location)			
335 Electrical Equipment, Appliance, And Component Manufacturing	90	Assemblers (loyal & dedicated)			
335 Electrical Equipment, Appliance, and Component Manufacturing	80	None			
335 Electrical Equipment, Appliance, And Component Manufacturing	25	None			
336 Transportation Equipment Manufacturing	40	Welders (amount of skilled applicants)			
336 Transportation Equipment Manufacturing	14	None			
336 Transportation Equipment Manufacturing	10	Designers (w the right style & work ethic)			

Industry	Employees	For what jobs do you have significant difficulty finding qualified applicants, and why?			
336 Transportation Equipment Manufacturing	5	Auto Mechanic/Electrician (need to be able to troubleshoot custom designs)	Fabricator (need to be able to determine appropriate solutions within a budget)		
337 Furniture And Related Product Manufacturing	200	Maintenance Technicians (skilled labor & few applicants)			
337 Furniture And Related Product Manufacturing	120	Engineers (w experience & willing to commute if not local)			
337 Furniture And Related Product Manufacturing	80	All skilled jobs (getting younger people with craftsman skills is nearly impossible)	Machine Operators (need technically savvy craftsmen)	Cabinet Makers (few skilled applicants)	
339 Miscellaneous Manufacturing	350	None			
339 Miscellaneous Manufacturing	285	Hand Assemblers (w soldering and other manual skills)	Quality Assurance (w soldering and other manual skills)		
339 Miscellaneous Manufacturing	250	Dental Technician (w experience)	Dental Finishers (w metal finishing experience)	Dental Service Representatives (w dental & sales backgrounds)	
339 Miscellaneous Manufacturing	250	Chemical Engineers (w industry experience & specialized skills)	Chemists (w chemistry & physics backgrounds)		
339 Miscellaneous Manufacturing	250	Patient Outreach Representative (w medical experience & different working environment preferences)	AR Follow-Up Staff (need strong medical assistance and clinical backgrounds & different working environment preferences)		
339 Miscellaneous Manufacturing	220	Sewer (w skills & reading English)	Electrical Engineers (competitive position in high demand)	Systems Engineers (competitive position in high demand)	Mechanical Engineers (competitive position in high demand)
339 Miscellaneous Manufacturing	100	Rework Operators (experience in soldering & able to read and follow instructions)			
339 Miscellaneous Manufacturing	100	Senior Engineers (w medical device experience)	Marketing Managers & Directors (w highly specific industry experience)		
339 Miscellaneous Manufacturing	40	Sustaining Engineers (immigration issues)	Mechanical Engineers (immigration issues)	Test Engineers (immigration issues)	Electrical Engineers (immigration issues)
339 Miscellaneous Manufacturing	25	Machine Operator (experience w particular machinery used in-house)			
561 Administrative and Support Services	75	Machine Operators (competitive position & not enough to go around)			

Skills in Short Supply

Industry	Employees	For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?				
312 Beverage and Tobacco Product Manufacturing	4	Not relevant right now				
322 Paper Manufacturing	250	Plant Manager (w management skills)				
322 Paper Manufacturing	125	Customer Service Representative (w HS degree though college preferred, w communication skills, ambition, willingness to work hard)	Advertising Representative (need ambition & willingness to work hard)	Piecework Worker (need ambition & willingness to work hard)	Quality Control (need ambition & willingness to work hard)	
322 Paper Manufacturing	120	Woodshop Positions (attendance & insubordination)	Machine Operators (w industry knowledge, attendance & insubordination)	Reception (attendance & insubordination)	Customer Service (w industry knowledge & computer skills)	Sales (w computer skills)
322 Paper Manufacturing	40	None				
322 Paper Manufacturing	35	None				
323 Printing And Related Support Activities	85	Press Operator (industry experience w work ethic & good hygiene)	Client Services (industry experience)			
323 Printing And Related Support Activities	85	This is not a problem.				
323 Printing And Related Support Activities	75	Advertising and Commercial Sales (ability to form relationships with customers)				
323 Printing And Related Support Activities	40	Joggers, Entry-Level (Paper bundling off the printing press) (need basic math skills)				
323 Printing And Related Support Activities	35	Customer Service (need Microsoft Office computer skills)	Product Development Specialist (need Microsoft Office computer skills)			

Industry	Employees	For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?				
325 Chemical Manufacturing	1450	All Positions (teamwork, flexibility, willingness to respond to change, rigorousness and willingness to admit mistakes & fix them immediately)				
325 Chemical Manufacturing	254	All Jobs (education in the science, technology, engineering & math fields)				
325 Chemical Manufacturing	200	Sales & Marketing (w a willingness to learn more & advance themselves)	Engineers (properly documented w aero-space industry experience)			
325 Chemical Manufacturing	83	None				
325 Chemical Manufacturing	65	Chemical Production Operator (w ability to follow a schedule, w safety knowledge, w basic computer and math skills)				
325 Chemical Manufacturing	40	Manufacturing Associates (need better communication skills)	Project Managers (need better communication skills)			
325 Chemical Manufacturing	35	None				
326 Plastics and Rubber Products Manufacturing	350	Machine Operators (need ESL, self-motivation, ability to learn new skills & basic math skills)				
326 Plastics and Rubber Products Manufacturing	150	None				
326 Plastics and Rubber Products Manufacturing	80	Production Staff (willingness to work hard & stay on the job as temps)				
327 Non-Metallic Mineral Product Manufacturing	121	CNC Repair Technician (need experience)	Cost Accountant (need experience in quartz and silicon industries)			
331 Primary Metal Manufacturing	200	None				

Industry	Employees	For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?				
331 Primary Metal Manufacturing	60	Technicians (w a willingness to learn & positive attitude)	Welders (w a willingness to learn & positive attitude)	Project Managers (w a willingness to learn & positive attitude)	Painters (w a willingness to learn & positive attitude)	Draftsmen (w a willingness to learn & positive attitude)
331 Primary Metal Manufacturing	57	Mechanical Technician (need work ethic & experience in big business)				
331 Primary Metal Manufacturing	46	Foundry Workers (need sufficient training)				
331 Primary Metal Manufacturing	45	Production Workers (lack of knowledge about the trade)				
331 Primary Metal Manufacturing	43	None				
332 Fabricated Metal Product Manufacturing	6800	High Performance Computing (experience)	All Positions (w innovation and creativity, ability to maintain work relationships, negotiation tenacity, self-development, qualitative and quantitative analysis & politically savvy)			
332 Fabricated Metal Product Manufacturing	600	Machinists (w skills, industry knowledge & experience)	Detailers (w skills, industry knowledge & experience)	Cost Estimators (w skills, industry knowledge & experience)	Inspectors (w skills, industry knowledge & experience)	General Manufacturing Positions (w skills, industry knowledge & experience)
332 Fabricated Metal Product Manufacturing	200	Machinists (need better math skills & mechanical aptitude)				
332 Fabricated Metal Product Manufacturing	200	None				
332 Fabricated Metal Product Manufacturing	140	Inside Sales (need skills to match resume)				
332 Fabricated Metal Product Manufacturing	115	All jobs (computer skills, grammatical skills)				
332 Fabricated Metal Product Manufacturing	100	None				

Industry	Employees	For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?				
332 Fabricated Metal Product Manufacturing	52	Fabricators - Locksmith (w technical & interpersonal skills)	Fire Alarm Technician (job specific knowledge)			
333 Machinery Manufacturing	110	Production Workers (attendance, safety knowledge & applicants want more than what they can pay)				
333 Machinery Manufacturing	110	Sprinkler Fitter Apprentices (must be union, w good work ethic)	Journeymen Fitters (able to follow directions & learn new technology)	Secretary (needs good work ethic & willingness to work)		
333 Machinery Manufacturing	100	Assembly Production Workers (w basic math and English skills & applicants want more than what they can pay)	Bulk Product Workers (w basic math and English skills & applicants want more than what they can pay)			
333 Machinery Manufacturing	100	Machinists (w skills, work ethic, loyalty, basic math and blue prints skills)	Welders (w skills, work ethic, loyalty, basic math and blue prints skills)	General Production Workers (w skills, work ethic, loyalty, basic math and blue print skills)		
333 Machinery Manufacturing	85	Production Line Workers (w English/bilingual skills, communication skills, computer skills, work ethic, attendance)	Clean Room Technician (w communication skills & works well with others from different backgrounds)	Shipping Receiving Clerk (professionalism)		
333 Machinery Manufacturing	66	Inside Sales (need industry skills & knowledge in customer care)	Outsides Sales (all skills needed)			
333 Machinery Manufacturing	30	Factory Workers (need good work ethic)	Welders (need to be managed & w good work ethic)	Machine Operators (need good work ethic & attendance)		
334 Computer And Electronic Product Manufacturing	250	None				
334 Computer And Electronic Product Manufacturing	200	Test Engineers (need skill sets that are specific industry)	Design Engineers (need skill sets that are specific to industry)	Applications Engineers (need skill sets that are specific to industry)	Product Engineers (need skill sets that are specific to industry)	

Industry	Employees	For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?				
334 Computer And Electronic Product Manufacturing	170	Higher skilled Jobs (Loyalty & good work ethics)				
334 Computer And Electronic Product Manufacturing	115	Sales (w qualifications, self-motivation, experience & able to work independently)	Engineers (w qualifications, self-motivation, experience & able to work independently)	Customer Service (w qualifications, self-motivation, experience & able to work independently)	Tech Support (w qualifications, self-motivation, experience & able to work independently)	Production (w qualifications, self-motivation, experience & able to work independently)
334 Computer And Electronic Product Manufacturing	103	Operations (SAP system knowledge)				
334 Computer And Electronic Product Manufacturing	70	Analog Engineers (need good communication and people skills & setting goals)	Software Quality Engineers (need good communication and people skills & setting goals)	Firmware Engineers (need good communication and people skills & setting goals)	VLSI Design Engineer (need good communication and people skills & setting goals)	
334 Computer And Electronic Product Manufacturing	65	Purchasing/ Procurement (w Excel analytics & other computer skills)				
334 Computer And Electronic Product Manufacturing	63	None				
334 Computer And Electronic Product Manufacturing	48	Customer Support & Data Prep (learning from mistakes)	Manufacturing Front Line People (need motivation to work)			
334 Computer And Electronic Product Manufacturing	38	None				
334 Computer And Electronic Product Manufacturing	35	RF Technicians (w schematics, components & diagrams skills)				
334 Computer And Electronic Product Manufacturing		Electro Mechanical Assemblers (w experience & good attitude)				
335 Electrical Equipment, Appliance, And Component Manufacturing	90	None				
335 Electrical Equipment, Appliance, and Component Manufacturing	80	Cable Manufacturing (ESL)				
335 Electrical Equipment, Appliance, And Component Manufacturing	25	None				
336 Transportation Equipment Manufacturing	40	Welders (need willingness to do hard work & common sense)				
336 Transportation Equipment Manufacturing	14	None				

Industry	Employees	For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?				
336 Transportation Equipment Manufacturing	10	Warehouse Workers (willing to work hard)				
336 Transportation Equipment Manufacturing	5	Mechanic/Electrician (w good memory & able to follow directions)				
337 Furniture And Related Product Manufacturing	200	Assemblers (attendance)				
337 Furniture And Related Product Manufacturing	120	All Departments (people don't seem to care & don't appreciate having a job)				
337 Furniture And Related Product Manufacturing	80	All Entry Level Jobs (need etiquette & a willingness to work hard)				
339 Miscellaneous Manufacturing	350	Process Engineers (need motivation to work, communication & teamwork skills)	Manager (need motivation to work, communication & teamwork skills)	Operators (need motivation to work, communication & teamwork skills)		
339 Miscellaneous Manufacturing	285	Quality Assurance (need good communication skills, willingness to learn new methods & soldering skills)	Hardware 2nd Operations (need good communication skills, willingness to learn new methods & soldering skills)			
339 Miscellaneous Manufacturing	250	Dental Ceramicist (need knowledge & training, so as to not re-train)				
339 Miscellaneous Manufacturing	250	Lab Workers (need soft skills, effective communication written & oral, conflict management skills)	Chemists (need soft skills, effective communication written & oral, conflict management skills)	Engineers (need soft skills, effective communication written & oral, conflict management skills)	Scientists (need soft skills, effective communication written & oral, conflict management skills)	Managers (need soft skills, effective communication written & oral, conflict management skills)
339 Miscellaneous Manufacturing	250	Call Center (attendance & work ethic)				
339 Miscellaneous Manufacturing	220	Sewer (need ESL & better communication skills)	Assembler (need better communication skills)	Accounting (need better communication skills)		

Industry	Employees	For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?				
339 Miscellaneous Manufacturing	100	Buyers (w Microsoft Office computer skills & attention to detail)				
339 Miscellaneous Manufacturing	100	Electro Mechanical Assemblers (need better communication skills, soldering skills)	Test Technicians (need better communication skills, soldering skills)	Quality Assurance Inspectors (need better communication skills)		
339 Miscellaneous Manufacturing	40	None				
339 Miscellaneous Manufacturing	25	None				
561 Administrative and Support Services	75	Production Line, Non-Skilled Entry Level Workers (willingness to work for the pay & communication skills)				

Current Job Openings

Industry	Employees	How many current job openings do you have, and for what types of jobs?
312 Beverage and Tobacco Product Manufacturing	4	Brewer Assistant, Tasting Room Staff
322 Paper Manufacturing	250	Laminator, Bag Machine Operator, Press Operator, Press Helper, Shipping and Receiving
322 Paper Manufacturing	125	Piecework, Production Support, Screen-Printing Operator
322 Paper Manufacturing	120	CFO, Digital Printing Operators (2)
322 Paper Manufacturing	40	None
322 Paper Manufacturing	35	None
323 Printing And Related Support Activities	85	Business Solutions Representative
323 Printing And Related Support Activities	85	None
323 Printing And Related Support Activities	75	Advertising and Commercial Sales (5)
323 Printing And Related Support Activities	40	Pre-Press Worker
323 Printing And Related Support Activities	35	None
325 Chemical Manufacturing	1450	High-Tech Manufacturing Positions in: Cleaning, Fermenting, Quality Control, Management Positions (100 total)
325 Chemical Manufacturing	254	Life Scientists (10), Commercial People i.e. Finance (4)
325 Chemical Manufacturing	200	IT Worker, Chemist, Research Engineer, Technical Engineers (2)
325 Chemical Manufacturing	83	Facilities Maintenance Technician
325 Chemical Manufacturing	65	None
325 Chemical Manufacturing	40	None
325 Chemical Manufacturing	35	None
326 Plastics and Rubber Products Manufacturing	350	Manufacturing Engineers (2), Administration Assistant, Program Manager
326 Plastics and Rubber Products Manufacturing	150	General Sales Manager, Sales Representatives (2)
326 Plastics and Rubber Products Manufacturing	80	None
327 Non-Metallic Mineral Product Manufacturing	121	Accounting Clerk, CNC Programmer, Cleanroom Packaging, Cost Accountant
331 Primary Metal Manufacturing	200	Wax Department (9), Process Engineer, Product Engineer, Sales Representative, Production Supervisor
331 Primary Metal Manufacturing	60	None
331 Primary Metal Manufacturing	57	Acoustics Sales Manager
331 Primary Metal Manufacturing	46	None
331 Primary Metal Manufacturing	45	None
331 Primary Metal Manufacturing	43	None
332 Fabricated Metal Product Manufacturing	6800	Computational Engineers (15), Systems Administrator (15), Executive Management/Science and Technicians (10)
332 Fabricated Metal Product Manufacturing	600	Machinists, Detailers, Programmers, Inspectors (50 total)

Industry	Employees	How many current job openings do you have, and for what types of jobs?
332 Fabricated Metal Product Manufacturing	200	Machinists (2)
332 Fabricated Metal Product Manufacturing	200	Detailer, Shop Helper
332 Fabricated Metal Product Manufacturing	140	Receiver, Maintenance Mechanic, Assembly Machine Operators, Entry Level (10)
332 Fabricated Metal Product Manufacturing	115	CAD Drafter, Stock Clerk, Engineering Clerk, Photolithography Fab Operator, Production Supervisor, Production Control Manager, Quality Assurance Inspector and Process/Assembly Operator
332 Fabricated Metal Product Manufacturing	100	None
332 Fabricated Metal Product Manufacturing	52	Fire Alarm Technician, Fabricator-Locksmith (2)
333 Machinery Manufacturing	110	Accounting Supervisor, Sales Engineer, VP of Marketing and Finance
333 Machinery Manufacturing	110	None
333 Machinery Manufacturing	100	Procurement Specialist in Supply Chain Management, Quality Control Manager
333 Machinery Manufacturing	100	Quality Control Worker, Machinist
333 Machinery Manufacturing	85	Production Line Worker
333 Machinery Manufacturing	66	Service Technicians, Sales Engineer
333 Machinery Manufacturing	30	Engineers, Machine Operators, Welders. If they are qualified & appear to be a good fit, they will hire them. They are always looking for skilled quality employees.
334 Computer And Electronic Product Manufacturing	250	Automation Technician, Molding Technician
334 Computer And Electronic Product Manufacturing	200	Application Engineers (5), Design Engineers (2), Product Engineers (2), Sales positions (2)
334 Computer And Electronic Product Manufacturing	170	Sales Positions (as many as possible), Industrial Engineering Manager
334 Computer And Electronic Product Manufacturing	115	Sales, Engineer, Master Planner-Production
334 Computer And Electronic Product Manufacturing	103	Technical Support, Senior Supply Chain Director, Finance, Field Service Engineers, Product Marketing
334 Computer And Electronic Product Manufacturing	70	Lab Manager, Senior Manager Embedded Software, Systems Architect, Senior Hardware Engineer
334 Computer And Electronic Product Manufacturing	65	Procurement/Purchasing
334 Computer And Electronic Product Manufacturing	63	None
334 Computer And Electronic Product Manufacturing	48	None
334 Computer And Electronic Product Manufacturing	38	None
334 Computer And Electronic Product Manufacturing	35	None
334 Computer And Electronic Product Manufacturing		Electro-Mechanical Assemblers (20)
335 Electrical Equipment, Appliance, And Component Manufacturing	90	IT Support, Assembler, Electrical Technician, Electro-Mechanical Assembler

Industry	Employees	How many current job openings do you have, and for what types of jobs?
335 Electrical Equipment, Appliance, and Component Manufacturing	80	None
335 Electrical Equipment, Appliance, And Component Manufacturing	25	None
336 Transportation Equipment Manufacturing	40	Welders (always looking)
336 Transportation Equipment Manufacturing	14	None
336 Transportation Equipment Manufacturing	10	None
336 Transportation Equipment Manufacturing	5	Auto Mechanic/Electrician
337 Furniture And Related Product Manufacturing	200	Maintenance Technician, Production Supervisor
337 Furniture And Related Product Manufacturing	120	None
337 Furniture And Related Product Manufacturing	80	Machine Operator
339 Miscellaneous Manufacturing	350	Process Engineers (10)
339 Miscellaneous Manufacturing	285	Quality Assurance (6), Hardware 2nd Operations (6), Service Mounts (4)
339 Miscellaneous Manufacturing	250	Staff Accountants (2), New Client Service Representative, Production Support Clerk
339 Miscellaneous Manufacturing	250	R&D Principle Mechanical Engineer, Temp Technicians (5)
339 Miscellaneous Manufacturing	250	IT Person, Finance (2)
339 Miscellaneous Manufacturing	220	Quality Assurance, Engineers, Quality Assurance Manager, Mechanical Engineers, Soft Goods Supervisor (20 total)
339 Miscellaneous Manufacturing	100	None
339 Miscellaneous Manufacturing	100	Soldering, General Manufacturing, General Administration (44)
339 Miscellaneous Manufacturing	40	Sustaining Engineer, Senior Software Engineer, Senior Hardware Engineer
339 Miscellaneous Manufacturing	25	None
561 Administrative and Support Services	75	None

Recruitment Methods

Industry	Employees	What are your most common recruitment methods for finding prospective job applicants?
312 Beverage and Tobacco Product Manufacturing	4	Craigslist, word of mouth, ProBrewer
322 Paper Manufacturing	250	Craigslist, trade shows, temp staffing agencies
322 Paper Manufacturing	125	Job boards and temp-to-hire, through temp staffing agencies
322 Paper Manufacturing	120	Temp staffing agencies, word of mouth (particularly via their vendors)
322 Paper Manufacturing	40	Networking & employee referrals
322 Paper Manufacturing	35	Nidec HR job boards; Monster; LinkedIn
323 Printing And Related Support Activities	85	Job fairs at community college, LinkedIn, CareerBuilder, employee referrals, Craigslist, company website, printing association
323 Printing And Related Support Activities	85	Word of mouth
323 Printing And Related Support Activities	75	Industry referrals
323 Printing And Related Support Activities	40	Temp staffing agency, then they get moved to their permanent staff if they work out; They hire from within for upper level jobs
323 Printing And Related Support Activities	35	Employee Referrals, Tri Valley Jobs
325 Chemical Manufacturing	1450	Company website
325 Chemical Manufacturing	254	LinkedIn, Craigslist, university job boards, ads with various associations
325 Chemical Manufacturing	200	Internet job boards, online sources & outside agencies
325 Chemical Manufacturing	83	LinkedIn, Craigslist
325 Chemical Manufacturing	65	Company website, Monster & LinkedIn
325 Chemical Manufacturing	40	Biospace.com, Indeed, Monster, Craigslist, company website, industry referrals
325 Chemical Manufacturing	35	LinkedIn, Craigslist, Biospace websites
326 Plastics and Rubber Products Manufacturing	350	Recruiters, industry referrals, social media, Craigslist, school job boards, LinkedIn
326 Plastics and Rubber Products Manufacturing	150	Referrals, networking through colleges that generate degrees that are linked to their profession
326 Plastics and Rubber Products Manufacturing	80	They use a temp staffing agency for temp-to-hire
327 Non-Metallic Mineral Product Manufacturing	121	Craigslist
331 Primary Metal Manufacturing	200	Temp staffing agency (for hourly employees); Open-hire, Monster, Craigslist and posting internally (for salaried employees); They also hand pick from local colleges and recruit prospective employees that they rotate through their plants in what is a type of internship
331 Primary Metal Manufacturing	60	Word of mouth
331 Primary Metal Manufacturing	57	Corporate website, LinkedIn, Craigslist, Monster, recruitment services
331 Primary Metal Manufacturing	46	The union
331 Primary Metal Manufacturing	45	Word of mouth, referrals, recruitment, Craigslist
331 Primary Metal Manufacturing	43	Employee referrals
332 Fabricated Metal Product Manufacturing	6800	LinkedIn and professional organizations

Industry	Employees	What are your most common recruitment methods for finding prospective job applicants?
332 Fabricated Metal Product Manufacturing	600	Company website, agencies, trade/tech schools, resume data sites (i.e. CareerBuilder, Monster, etc)
332 Fabricated Metal Product Manufacturing	200	Job boards, head hunters
332 Fabricated Metal Product Manufacturing	200	CareerBuilder, EDD
332 Fabricated Metal Product Manufacturing	140	Industry connections, word of mouth
332 Fabricated Metal Product Manufacturing	115	Internal postings, word-of-mouth, Monster, Craigslist, EDD, Ohlone, CEO in Oakland
332 Fabricated Metal Product Manufacturing	100	Walk-ins (they don't recruit)
332 Fabricated Metal Product Manufacturing	52	Reputation through the industry, Craigslist, and manufacturer reps that find workers at other locations
333 Machinery Manufacturing	110	Recruiters, Temp staffing agency, Craigslist, Monster, company website
333 Machinery Manufacturing	110	The union; word of mouth within the fire/sprinkler community
333 Machinery Manufacturing	100	Job boards, LinkedIn and their own website
333 Machinery Manufacturing	100	Craigslist, CareerBuilder, employee referrals
333 Machinery Manufacturing	85	Craigslist, EDD CalWorks
333 Machinery Manufacturing	66	Recruiting from schools with a focus on HVAC, employee referrals, and Craigslist
333 Machinery Manufacturing	30	Craigslist, then they interview
334 Computer And Electronic Product Manufacturing	250	Volt (an employment agency)
334 Computer And Electronic Product Manufacturing	200	Employee network, agencies & job boards
334 Computer And Electronic Product Manufacturing	170	Monster, Craigslist, LinkedIn
334 Computer And Electronic Product Manufacturing	115	LinkedIn, Craigslist, CareerBuilder
334 Computer And Electronic Product Manufacturing	103	Employee referrals
334 Computer And Electronic Product Manufacturing	70	Networking, LinkedIn, employee referral, managers' previous business contacts
334 Computer And Electronic Product Manufacturing	65	Referrals - employee and customer
334 Computer And Electronic Product Manufacturing	63	Indeed, LinkedIn, and if that doesn't work they use a recruiter
334 Computer And Electronic Product Manufacturing	48	Word of mouth, in-house referrals
334 Computer And Electronic Product Manufacturing	38	Referrals, college campus recruitment, word of mouth
334 Computer And Electronic Product Manufacturing	35	Company website, word of mouth, referrals
334 Computer And Electronic Product Manufacturing		Job fairs, college recruitment, online sites such as indeed.com, career builder, monster, feetrader
335 Electrical Equipment, Appliance, And Component Manufacturing	90	Job boards, LinkedIn, Monster
335 Electrical Equipment, Appliance, and Component Manufacturing	80	Craigslist, local college referrals

Industry	Employees	What are your most common recruitment methods for finding prospective job applicants?
335 Electrical Equipment, Appliance, And Component Manufacturing	25	Union, Craigslist
336 Transportation Equipment Manufacturing	40	Craigslist, word of mouth
336 Transportation Equipment Manufacturing	14	Employee referrals
336 Transportation Equipment Manufacturing	10	Referrals, friends of friends
336 Transportation Equipment Manufacturing	5	Referrals, word of mouth
337 Furniture And Related Product Manufacturing	200	Craigslist, Monster.com, temp staffing agencies, recruiters
337 Furniture And Related Product Manufacturing	120	Walk-ins (for most of their factory workers)
337 Furniture And Related Product Manufacturing	80	The union is the largest source, then referrals and high schools
339 Miscellaneous Manufacturing	350	HR Dept recruits people, mostly from word of mouth, Monster.com and sometimes through recruiters
339 Miscellaneous Manufacturing	285	Word of mouth, company website, social media, Craigslist, Monster.com
339 Miscellaneous Manufacturing	250	Internet, Craigslist, LinkedIn, Monster; They use local colleges to recruit production support staffers from the dental technology programs
339 Miscellaneous Manufacturing	250	They post all their full time positions on their site, which is indexed by Indeed & LinkedIn; They also use social media and are moving away from using 3rd party recruiters
339 Miscellaneous Manufacturing	250	Internet app for job postings that goes out to a variety of search engines such as Indeed.com and CareerBuilder
339 Miscellaneous Manufacturing	220	LinkedIn, Craigslist, Monster, Cal Jobs Fair in July
339 Miscellaneous Manufacturing	100	Internet, Craigslist
339 Miscellaneous Manufacturing	100	Company website, temp staffing agencies, LinkedIn, employee referrals
339 Miscellaneous Manufacturing	40	Corporate website
339 Miscellaneous Manufacturing	25	Temp staffing agency
561 Administrative and Support Services	75	They recruit from within for their skilled workforce using employee referrals as their preferred method of acquiring new employees for entry level jobs; They post on their internal job board

Hire Foreign Workers

Industry	Employees	Do you need to hire foreign workers to fill the need for skilled workers? If so, for what types of jobs?
312 Beverage and Tobacco Product Manufacturing	4	No, but they are considering this for German-style beer brewers
322 Paper Manufacturing	250	No
322 Paper Manufacturing	125	No, but they have been considering outsourcing to Mexico in order to reduce labor costs
322 Paper Manufacturing	120	No
322 Paper Manufacturing	40	No
322 Paper Manufacturing	35	No
323 Printing And Related Support Activities	85	No
323 Printing And Related Support Activities	85	No
323 Printing And Related Support Activities	75	No
323 Printing And Related Support Activities	40	No
323 Printing And Related Support Activities	35	No
325 Chemical Manufacturing	1450	Yes, skilled manufacturing process operations workers
325 Chemical Manufacturing	254	Yes, life scientist jobs
325 Chemical Manufacturing	200	No
325 Chemical Manufacturing	83	No
325 Chemical Manufacturing	65	No
325 Chemical Manufacturing	40	No
325 Chemical Manufacturing	35	No
326 Plastics and Rubber Products Manufacturing	350	No
326 Plastics and Rubber Products Manufacturing	150	No
326 Plastics and Rubber Products Manufacturing	80	No
327 Non-Metallic Mineral Product Manufacturing	121	No
331 Primary Metal Manufacturing	200	No
331 Primary Metal Manufacturing	60	No
331 Primary Metal Manufacturing	57	No
331 Primary Metal Manufacturing	46	No
331 Primary Metal Manufacturing	45	No
331 Primary Metal Manufacturing	43	No
332 Fabricated Metal Product Manufacturing	6800	Yes, they have a foreign nationals program, but most jobs require citizenship and top secret security clearance. They fill physical and life science post doc positions with H1-B.
332 Fabricated Metal Product Manufacturing	600	No

Industry	Employees	Do you need to hire foreign workers to fill the need for skilled workers? If so, for what types of jobs?
332 Fabricated Metal Product Manufacturing	200	No
332 Fabricated Metal Product Manufacturing	200	No
332 Fabricated Metal Product Manufacturing	140	No
332 Fabricated Metal Product Manufacturing	115	No
332 Fabricated Metal Product Manufacturing	100	No
332 Fabricated Metal Product Manufacturing	52	No
333 Machinery Manufacturing	110	Yes, production workers
333 Machinery Manufacturing	110	No
333 Machinery Manufacturing	100	No
333 Machinery Manufacturing	100	No
333 Machinery Manufacturing	85	No
333 Machinery Manufacturing	66	No
333 Machinery Manufacturing	30	No
334 Computer And Electronic Product Manufacturing	250	No
334 Computer And Electronic Product Manufacturing	200	Yes, technical engineers
334 Computer And Electronic Product Manufacturing	170	Yes, engineers
334 Computer And Electronic Product Manufacturing	115	Yes, on occasion they have hired engineers this way
334 Computer And Electronic Product Manufacturing	103	Occasionally; internal transfers from global offices
334 Computer And Electronic Product Manufacturing	70	Yes, engineers
334 Computer And Electronic Product Manufacturing	65	No
334 Computer And Electronic Product Manufacturing	63	No, but they used to, and now it's too expensive and the paperwork is cumbersome
334 Computer And Electronic Product Manufacturing	48	No
334 Computer And Electronic Product Manufacturing	38	Yes, software engineer
334 Computer And Electronic Product Manufacturing	35	No
334 Computer And Electronic Product Manufacturing		No
335 Electrical Equipment, Appliance, And Component Manufacturing	90	No
335 Electrical Equipment, Appliance, and Component Manufacturing	80	No

Industry	Employees	Do you need to hire foreign workers to fill the need for skilled workers? If so, for what types of jobs?
335 Electrical Equipment, Appliance, And Component Manufacturing	25	No
336 Transportation Equipment Manufacturing	40	No
336 Transportation Equipment Manufacturing	14	No
336 Transportation Equipment Manufacturing	10	No
336 Transportation Equipment Manufacturing	5	No
337 Furniture And Related Product Manufacturing	200	No
337 Furniture And Related Product Manufacturing	120	No
337 Furniture And Related Product Manufacturing	80	Yes, a lot of skilled workers
339 Miscellaneous Manufacturing	350	Yes, occasionally, if it's a specialty scientist or engineer
339 Miscellaneous Manufacturing	285	No
339 Miscellaneous Manufacturing	250	No
339 Miscellaneous Manufacturing	250	Yes, for some scientists and research associates
339 Miscellaneous Manufacturing	250	No
339 Miscellaneous Manufacturing	220	No
339 Miscellaneous Manufacturing	100	No
339 Miscellaneous Manufacturing	100	No
339 Miscellaneous Manufacturing	40	Yes, for all types of engineering positions
339 Miscellaneous Manufacturing	25	No
561 Administrative and Support Services	75	No

Need for Pre-Employment Training

Industry	Employees	Do you see a need for new or more effective pre-employment (or soft skills) training - designed to better prepare new hires for the workforce? If yes, please describe the type of pre-employment training you believe is needed:	
312 Beverage and Tobacco Product Manufacturing	4	Yes	Better training, team building, communication, project management, reliability, work ethic, etc.
322 Paper Manufacturing	250	No	
322 Paper Manufacturing	125	Yes	ESL, diversity training, behavior in the workplace, work ethics, teach them how to conduct themselves at work. Show up, be on-time, get along with others. Teach them the basics & if you can teach them ambition, willingness to learn and competitiveness, it would help.
322 Paper Manufacturing	120	Yes	More manufacturing training. Manufacturing has been outsourced for so long that it's no longer even on the "radar" of young people. Teach them to be punctual & reliable. Attendance is important. Companies rely on people to show up & work, not to have a sense of entitlement. Cal Poly has a packaging degree program, but there aren't any here.
322 Paper Manufacturing	40	Yes	ESL. "Nova" in Sunnyvale has a good model. They have an organization that they staff with volunteers that they train to be office staff. They offer seminars once a week on various topics like 'How to sell yourself'. Help them discover how they will excel & be happy with their work.
322 Paper Manufacturing	35	Yes	Lack of maturity, basic math skills, computer skills, speak & read English. They should begin teaching computer skills in jr. high school.
323 Printing And Related Support Activities	85	No	
323 Printing And Related Support Activities	85	Yes	Kids need to understand basic mathematics and have better reading comprehension skills. They need to be able to use a multitude of tools (i.e. in a shop class).
323 Printing And Related Support Activities	75	Yes	Core business principles such as letter writing, personal communication, understanding of basic marketing. These should begin in high school and higher levels of education. Nor Cal needs a college other than Cal Poly with excellent marketing classes.
323 Printing And Related Support Activities	40	Yes	Entry level stuff. Basic math skills. They need to be reliable. They need to get to work. They need to understand that lack of transportation is not the employer's problem.
323 Printing And Related Support Activities	35	Yes	Basic and advanced computer skills. Would like to see it taught at jr. high and high school.
325 Chemical Manufacturing	1450	Yes	Production skills, IT skills, equipment operation, teamwork, honesty, rigorousness, problem solving.
325 Chemical Manufacturing	254	Yes	STEM education
325 Chemical Manufacturing	200	Yes	Computer skills. Software knowledge. Learn to use computer programs quickly.
325 Chemical Manufacturing	83	No	
325 Chemical Manufacturing	65	Yes	They need a strong education in STEM (Science, Technology, Engineering & Math) related courses.
325 Chemical Manufacturing	40	Yes	Ability to communicate clearly and maturely, language barriers, math, exposure to biotech processes at community college level.
325 Chemical Manufacturing	35	No	
326 Plastics and Rubber Products Manufacturing	350	No	
326 Plastics and Rubber Products Manufacturing	150	Yes	Computer skills for management, clerical, sales people, design and operational staff. Excel and Powerpoint are the two needed most.
326 Plastics and Rubber Products Manufacturing	80	Yes	Train for the new "SAP" manufacturing program that a lot of businesses are starting to utilize. They all need staff who are familiar with SAP. Teach customer service skills. Computer skills, Excel, MS programs.
327 Non-Metallic Mineral Product Manufacturing	121	No	
331 Primary Metal Manufacturing	200	No	

Industry	Employees	Do you see a need for new or more effective pre-employment (or soft skills) training - designed to better prepare new hires for the workforce? If yes, please describe the type of pre-employment training you believe is needed:	
331 Primary Metal Manufacturing	60	Yes	Educate them with math and writing skills.
331 Primary Metal Manufacturing	57	Yes	Basic math, basic blueprint reading, more than basic computer skills. Better training at high school and college level.
331 Primary Metal Manufacturing	46	No	
331 Primary Metal Manufacturing	45	Yes	Community college level training: machinist programs, blue print reading, fluent in GDDT, tool knowledge.
331 Primary Metal Manufacturing	43	Yes	Most shops are looking for people that can run a CAD system, so train people in that, and programming CNC. Also, some training programs for machining, and manual machining. Prefer trade schools over colleges.
332 Fabricated Metal Product Manufacturing	6800	Yes	More training on resume development and interviewing skills - directed toward the employer and their needs. After they start - many expectations but often need to be more proactive about taking on responsibilities or learning as they begin the job.
332 Fabricated Metal Product Manufacturing	600	Yes	More trade schools equipped with machinery that matches industry requirements and current technology.
332 Fabricated Metal Product Manufacturing	200	Yes	Math, mechanics programs
332 Fabricated Metal Product Manufacturing	200	No	
332 Fabricated Metal Product Manufacturing	140	Yes	Math skills are important, and English language competency.
332 Fabricated Metal Product Manufacturing	115	Yes	Down to the high school level, need to teach listening, speaking, influence.
332 Fabricated Metal Product Manufacturing	100	Yes	Computer training
332 Fabricated Metal Product Manufacturing	52	Yes	Mechanical training would help, and then OJT to learn about the high security products before they start.
333 Machinery Manufacturing	110	Yes	Basic math skills, responsibility such as showing up for work on time, basic safety knowledge. This is best learned in high school, or at least junior college.
333 Machinery Manufacturing	110	Yes	Teach work ethics and manners. Some need better language skills and to be fluent in English. Some write illegibly, which causes a problem on work orders, etc. Tool recognition. Basic skills in a shop environment.
333 Machinery Manufacturing	100	No	
333 Machinery Manufacturing	100	Yes	More skilled trades in High School (ROP). Better science, math skills and blue print reading.
333 Machinery Manufacturing	85	Yes	Resume writing, basic computer, ESL. Would like to see these skills taught at the 8th or 9th grade level.
333 Machinery Manufacturing	66	Yes	Mostly they need people with HVAC industry knowledge and manufacturing knowledge.
333 Machinery Manufacturing	30	Yes	They all need a better high school education, which would help everyone.
334 Computer And Electronic Product Manufacturing	250	No	
334 Computer And Electronic Product Manufacturing	200	No	
334 Computer And Electronic Product Manufacturing	170	Yes	Work ethic. People need to learn to behave at work. They need to show up for work, and expect to work. They need to learn to give notice when they aren't going to show up or quit.
334 Computer And Electronic Product Manufacturing	115	Yes	Teach professionalism. They need to present themselves well, manage things well and speak well. They need good reading and writing skills, and need to speak proper English.
334 Computer And Electronic Product Manufacturing	103	No	

Industry	Employees	Do you see a need for new or more effective pre-employment (or soft skills) training - designed to better prepare new hires for the workforce? If yes, please describe the type of pre-employment training you believe is needed:	
334 Computer And Electronic Product Manufacturing	70	Yes	Good communication skills, basic educational skills; math; MS Office.
334 Computer And Electronic Product Manufacturing	65	Yes	Basic computer skills & basic math, starting at least in high school.
334 Computer And Electronic Product Manufacturing	63	Yes	The kids need trade skills. Machine shop in school, teach them how to work with tools. Clerical skills & office skills would be beneficial.
334 Computer And Electronic Product Manufacturing	48	Yes	Develop computer skills. Help people to become self-motivated, free thinkers. Teach bright people how to be more willing to work. Instill a good work ethic.
334 Computer And Electronic Product Manufacturing	38	Yes	Communication skills, English as second language, basic understanding of real jobs such as benefits, 401K, getting along with coworkers, work ethic (showing up to work on time & doing a good job), computer skills. Training should start in jr. high school.
334 Computer And Electronic Product Manufacturing	35	Yes	Community college level basic computer (Word, Excel) skills, English as a second language, reading and written communications. This means they are understanding instructions.
334 Computer And Electronic Product Manufacturing		Yes	Interviewing skills, computer skills
335 Electrical Equipment, Appliance, And Component Manufacturing	90	Yes	The basics such as computer skills, communication skills.
335 Electrical Equipment, Appliance, and Component Manufacturing	80	No	
335 Electrical Equipment, Appliance, And Component Manufacturing	25	No	
336 Transportation Equipment Manufacturing	40	Yes	Mechanical, welding and metal classes, communication skills, basic math. Begin training in high school.
336 Transportation Equipment Manufacturing	14	Yes	Fabrication with steel needs to be trained in more high schools.
336 Transportation Equipment Manufacturing	10	Yes	Common sense is lacking in this generation of workers (under 30 yrs old). Writing and verbal skills are sorely lacking, possibly due to their preoccupation with texting and computer gaming.
336 Transportation Equipment Manufacturing	5	Yes	Welders that can fabricate beyond the production level. They either have the innate skills or they don't. Schools need to help them determine whether they should proceed toward production line work or if they have the skills to do custom fabrication.
337 Furniture And Related Product Manufacturing	200	No	
337 Furniture And Related Product Manufacturing	120	No	
337 Furniture And Related Product Manufacturing	80	Yes	They need to train a lot of smart kids who are clueless about what it means to work. They need to learn how to use their common sense (i.e. how to balance a checkbook, basic life skills).
339 Miscellaneous Manufacturing	350	No	
339 Miscellaneous Manufacturing	285	Yes	English as a second language, communication of ideas, soldering skills. Begin at high school level.
339 Miscellaneous Manufacturing	250	No	
339 Miscellaneous Manufacturing	250	Yes	Soft skills, communication skills, basic common sense, working in teams, effective cross-functional teams, leading and participating in meetings, scheduling meetings without conflicts, being prepared for a meeting with an agenda and being on time.

Industry	Employees	Do you see a need for new or more effective pre-employment (or soft skills) training - designed to better prepare new hires for the workforce? If yes, please describe the type of pre-employment training you believe is needed:	
339 Miscellaneous Manufacturing	250	Yes	Teach accountability, proper English and phone skills, and practical ways how to be reliable. Teach multitasking on the computer at the same time as being on the phone.
339 Miscellaneous Manufacturing	220	Yes	Interview techniques such as being able to answer interview questions in specifics, Blue Print reading, ESL.
339 Miscellaneous Manufacturing	100	No	
339 Miscellaneous Manufacturing	100	Yes	Effective communication skills, resume writing and interview skills, technical (such as soldering) skills. Start teaching at high school & community college levels.
339 Miscellaneous Manufacturing	40	Yes	At least a 4 year computer engineering degree.
339 Miscellaneous Manufacturing	25	Yes	In the Bay Area it seems like the deficiencies are hands on type job skills (i.e. machinist, operator). They have skills that aren't found in California. A lot of training programs have died out (i.e. machining skills, and hard, hands on skills). When they get people they do a lot of OJT in relation to their prior experience, and that prior experience seems to get less and less every year because manufacturing isn't a big thing in California anymore.
561 Administrative and Support Services	75	Yes	ESL, many people can speak English but not very well. They need good communication skills. Teach people the value of self-motivation, diligence, and dedication. Computer and math skills are also important.

Employee Skill Needs

Industry	Employees	If you have employees with skill needs that require new or updated training, please describe the type of training that is needed:
312 Beverage and Tobacco Product Manufacturing	4	They do in-house scientific training for brewers.
322 Paper Manufacturing	250	None
322 Paper Manufacturing	125	They teach what's going on within the industry. They are reverting to smaller meetings to go over procedural training. Their suppliers conduct quality training on their products. ESL would be very helpful in assisting some of their entry-level employees to be able to advance within the company.
322 Paper Manufacturing	120	Computer skills, ESL, safety, customer service, sales, and harassment.
322 Paper Manufacturing	40	They train in-house in order to move their workforce into higher levels of work. It rewards loyalty. They train for forklift driving, receiving and shipping, safety, first aid, CPR and training-the-trainers.
322 Paper Manufacturing	35	Computer skills (i.e. Excel). If engineering skills need updating, we usually go through manufacture workshops (i.e. AutoCAD).
323 Printing And Related Support Activities	85	On-the-job training.
323 Printing And Related Support Activities	85	Graphics printing, estimating through manufacturing. Max Graphics training, Pre-press training. Journeymen help their new people develop skills on the printers, which works well in their business.
323 Printing And Related Support Activities	75	On the job mentoring
323 Printing And Related Support Activities	40	In-house. They train them to run printing presses. They recruit from the ground up. Safety training specific to the printing industry (handling of waste products i.e. solvents, oil, ink, etc.)
323 Printing And Related Support Activities	35	Bring in training specialists, send employees to workshops or seminars
325 Chemical Manufacturing	1450	Compliance training, safety, equipment operations, etc.
325 Chemical Manufacturing	254	Novel techniques in Life Science research.
325 Chemical Manufacturing	200	HR/interview training, harassment training, and safety training. Computer skills training is done on an individual basis, not by the company.
325 Chemical Manufacturing	83	They train for specific chemistry departments. Purification, synthesis, following standard operational procedures.
325 Chemical Manufacturing	65	They offer significant in-house training. Skills needed are basic math and the ability to redefine a problem and to find a solution to it. Fluid dynamics and basic mechanical courses would be helpful.
325 Chemical Manufacturing	40	Safety and biochemical training done in house. Training on new equipment and processes.
325 Chemical Manufacturing	35	People further along in their career need management and communication skills training so they can advance.
326 Plastics and Rubber Products Manufacturing	350	Employees go to vendor training within injection molding industry.
326 Plastics and Rubber Products Manufacturing	150	Management, sales, clerical, design and operational staff all need Powerpoint & Excel training primarily, but all could benefit from updated computer training.
326 Plastics and Rubber Products Manufacturing	80	On the job staff instruction is typically focused on safety for each type of machinery that they use.
327 Non-Metallic Mineral Product Manufacturing	121	CNC operations, CNC programming
331 Primary Metal Manufacturing	200	All the state required training, such as harassment. Export Compliance training insuring their parts are sound, safety training, quality training, cross training.
331 Primary Metal Manufacturing	60	Most technical positions need to update their tech skills, i.e. drafting and CAD skills. Welders and painters need annual certification. Safety training is on-going for their tradesmen.
331 Primary Metal Manufacturing	57	Mechanical technicians need to keep up and be trained on new technology.
331 Primary Metal Manufacturing	46	None

Industry	Employees	If you have employees with skill needs that require new or updated training, please describe the type of training that is needed:
331 Primary Metal Manufacturing	45	Job shadow and/or junior college classes for manufacturing.
331 Primary Metal Manufacturing	43	None
332 Fabricated Metal Product Manufacturing	6800	We currently offer resume and interview skills for internal positions and preparation to understand behavioral interviewing.
332 Fabricated Metal Product Manufacturing	600	They have required training in all different industry applications. Machinists need software training, inspectors need blue print certification/licensing annually.
332 Fabricated Metal Product Manufacturing	200	New technology training - usually done internally.
332 Fabricated Metal Product Manufacturing	200	Certificate training for forklift driving, safety training.
332 Fabricated Metal Product Manufacturing	140	ESL for the assembly machine operators.
332 Fabricated Metal Product Manufacturing	115	Communication skills targeted for work/business is needed and could be taught through Adult Education.
332 Fabricated Metal Product Manufacturing	100	Safety training and all the OSHA required training.
332 Fabricated Metal Product Manufacturing	52	None
333 Machinery Manufacturing	110	Recommend employees go to schools like DeVry's or a place that teaches car mechanics.
333 Machinery Manufacturing	110	Qualified forklift operators, hand-signals for cranes, operating lifts on job sites, ability to direct traffic while loading materials on job sites. OSHA required programs.
333 Machinery Manufacturing	100	Basic safety training practices.
333 Machinery Manufacturing	100	Blueprint reading and basic refreshers in math and geometry.
333 Machinery Manufacturing	85	OSHA in regards to hazardous waste.
333 Machinery Manufacturing	66	MS Office Suite. Their IT dept is spearheading training on this. They have in-house training on the fundamentals of Hydronics. Classes on how to get along and organizational 'time management' training would be helpful.
333 Machinery Manufacturing	30	They do a minimal amount of training to familiarize workers with their processes. New hires start as helpers and have the opportunity to advance within the company.
334 Computer And Electronic Product Manufacturing	250	Their EHS manager (Environmental, Health and Safety) does all of their safety and other required training.
334 Computer And Electronic Product Manufacturing	200	Management soft skills training, MS Office computer skills.
334 Computer And Electronic Product Manufacturing	170	They have on-going in-house training that is specific to the high-end computer world.
334 Computer And Electronic Product Manufacturing	115	Diversity training and professionalism (service skills on the telephone). New managers also get time and project management training.
334 Computer And Electronic Product Manufacturing	103	None
334 Computer And Electronic Product Manufacturing	70	They have orientation training, which includes safety training. They do some soft-skills training via webinars, IT training and the 'culture of leadership' training.
334 Computer And Electronic Product Manufacturing	65	Send to workshops or online training, especially for basic computer/excel skills.
334 Computer And Electronic Product Manufacturing	63	They train in-house for product upgrades unique to their industry, machinery repair, and custom training for machine specific needs. Also OSHA compliance training for sexual harassment, safety compliance, etc.
334 Computer And Electronic Product Manufacturing	48	They provide in-house ISO certification. Computer skills classes.. FileMaker, Excel. Free classes would be very helpful.
334 Computer And Electronic Product Manufacturing	38	None

Industry	Employees	If you have employees with skill needs that require new or updated training, please describe the type of training that is needed:
334 Computer And Electronic Product Manufacturing	35	In-house training classes to handle internal aspects of the company.
335 Electrical Equipment, Appliance, And Component Manufacturing	90	None
335 Electrical Equipment, Appliance, and Component Manufacturing	80	They have ongoing safety training for all of their manufacturing personnel.
335 Electrical Equipment, Appliance, And Component Manufacturing	25	Training is provided on-the-job as needed through their mentor program.
336 Transportation Equipment Manufacturing	40	In-house apprentice method
336 Transportation Equipment Manufacturing	14	None
336 Transportation Equipment Manufacturing	10	Sales and designers - training to keep them up to date with trends in social media, and how to use analytics to best target demographics. They also read online research and speak to their peers in other industries to get the information they need.
336 Transportation Equipment Manufacturing	5	None
337 Furniture And Related Product Manufacturing	200	In-plant training
337 Furniture And Related Product Manufacturing	120	None
337 Furniture And Related Product Manufacturing	80	Computer training. They do it in-house with their IT guy.
339 Miscellaneous Manufacturing	350	We train in-house for what we need.
339 Miscellaneous Manufacturing	285	Soldering skills and techniques.
339 Miscellaneous Manufacturing	250	In-house technical skills training for all levels. They also do 'next-level' training to help people who wish to advance within the company (i.e. to become certified dental technicians).
339 Miscellaneous Manufacturing	250	They have a robust global training company for their leadership and developmental soft skills. Perhaps more technical writing skills training is needed.
339 Miscellaneous Manufacturing	250	Customer service skills, accounts receivable, data entry, computer skills. Medical billing training would be helpful.
339 Miscellaneous Manufacturing	220	None
339 Miscellaneous Manufacturing	100	None
339 Miscellaneous Manufacturing	100	In-house management training programs, soldering certifications.
339 Miscellaneous Manufacturing	40	Corporate office in San Diego handles the training.
339 Miscellaneous Manufacturing	25	None
561 Administrative and Support Services	75	Computer skills, ESL, cross training people so that they have administrative skills (basic clerical) so that they can fill other duties when needed.

Workforce Needs Assessment Survey Instrument

Advanced Manufacturing Industry Workforce Needs Assessment (Alameda)

1. Page One

Thank you for agreeing to participate in our industry workforce needs assessment for Alameda County.

The purpose of the assessment is to learn more about the workforce needs and other priorities of our valued employers and to share the summarized results with:
1. Industry Employers
2. Education & Training Providers

This workforce needs assessment is conducted by Jim Cassio & Associates on behalf of the Alameda County Workforce Investment Board and the Design It - Build It - Ship It (DBS) Regional Workforce Initiative.

All information provided as part of this needs assessment will remain confidential. Only summarized or aggregated information will be published.

1. Please briefly describe the primary business activities your company is engaged in at your Alameda County location:

2. What are your business plans in the next 2-5 years?

3. What is your most significant barrier to achieving your goals?

4. How many employees do you currently have working at locations within Alameda County?

5. Of those current employees, about what PERCENT are:

Full Time Regular (%)	
Part Time Regular (%)	
On Call (%)	
Temporary, Not Seasonal (%)	
Seasonal (%)	
Independent Contractors (%)	

6. About how many employees do you expect to have working:

6 months from now	
1 year from now	
3 years from now (your best guess estimate if you're unsure)	

7. If you expect to grow, what jobs will make up the most new positions over the next 3 years, and how many new jobs do you expect to add?

a) Type of job?	
Number of these jobs you expect to add?	
b) Type of job?	
Number of these jobs you expect to add?	
c) Type of job?	
Number of these jobs you expect to add?	
d) Type of job?	
Number of these jobs you expect to add?	
e) Type of job?	
Number of these jobs you expect to add?	

8. For what jobs do you expect to hire the most replacements when current employees retire or leave your company over the next 3 years, and how many replacements do you expect to hire?

a) Type of job?	
# Replacements you expect to hire?	
b) Type of job?	
# Replacements you expect to hire?	
c) Type of job?	
# Replacements you expect to hire?	
d) Type of job?	
# Replacements you expect to hire?	
e) Type of job?	
# Replacements you expect to hire?	

9. For what jobs do you have significant difficulty finding qualified applicants, and why?

a) Type of job?

Why is it difficult?

b) Type of job?

Why is it difficult?

c) Type of job?

Why is it difficult?

d) Type of job?

Why is it difficult?

e) Type of job?

Why is it difficult?

10. For employees you have recently hired, what specific knowledge, skills, abilities or personal characteristics are lacking?

a) For what jobs?

What qualities are lacking?

b) For what jobs?

What qualities are lacking?

c) For what jobs?

What qualities are lacking?

d) For what jobs?

What qualities are lacking?

e) For what jobs?

What qualities are lacking?

11. How many current job openings do you have, and for what types of jobs?

12. What are your most common recruitment methods for finding prospective job applicants?

Advanced Manufacturing Industry Workforce Needs Assessment (Alameda)

13. Do you need to hire foreign workers to fill the need for skilled workers? If so, for what types of jobs?

14. Do you see a need for new or more effective pre-employment (or soft skills) training - designed to better prepare new hires for the workforce?

- ◯ Yes
- ◯ No

15. If yes, please describe the type of pre-employment training you believe is needed:

16. If you have employees with skill needs that require new or updated training, please describe the type of training that is needed:

17. What is the most effective way to inform your company about programs and resources available through city, state, and federal government programs and agencies?

18. Your contact information - in case we need to contact you for clarification or to notify you when the needs assessment results are available:

Your name & title:	
Organization:	
Address1:	
Address2:	
City:	
State:	
Zip:	
Phone:	
Email:	

19. Name of research analyst conducting this interview, if any:

Manufacturing Sector Description (NAICS Codes)

The Manufacturing Sector in the United States is undergoing a dramatic transformation that has profound implications for the incumbent workforce and for the new workers that employers demand. Modern manufacturing facilities bare little resemblance to the traditional factory of decades past. Today, manufacturing workers require advanced academic, workplace, and technical skills to enable their employers to stay competitive. Even as overall employment in the manufacturing sector has declined, many employers report difficulty finding and hiring the highly skilled employees they need.

Advanced Manufacturing is the integration of technology based systems and processes in the production of products. Products and processes are often innovative, made from advanced materials and components, and produced using technology driven equipment and processes.

The Manufacturing Sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembly of component parts into new products is also considered part of the manufacturing sector. The Manufacturing Sector can be defined using the North American Industry Classification System (NAICS) codes listed below. Sub-sectors include Food & Beverage Processing (311-312); Textiles/Apparel Manufacturing (313-316); Wood & Paper Products (321-322); Printing (323); Petroleum & Coal (324); Chemicals (325); Plastics & Rubber Products (326); Building Materials (327); Primary Metal Products (331); Fabricated Metal Products (332); Machinery (333); Computer & Electronic Products (334); Electrical Equipment & Appliances (335); Transportation Equipment (336); Furniture (337); and Miscellaneous Manufacturing (339). For purposes of this study we have classified the manufacturing sector based on the following categories:

NAICS Code	Industry Segment
Food & Beverage Processing	
3111	Animal Food Mfg
3112	Grain & Oil Seed Milling
3113	Sugar & Confectionery Products
3114	Fruit & Vegetable Preserving and Specialty Food Mfg

NAICS Code	Industry Segment
Apparel, Textiles, & Leather	
3131	Fiber, Yarn, & Thread Mills
3132	Fabric Mills
3133	Textile & Fabric Finishing & Coating
3141	Textile Furnishing Mills

3115	Dairy Products
3116	Meat & Poultry Processing
3117	Seafood Preparation & Packaging
3118	Bakeries & Tortilla Mfg
3119	Other Food Mfg
3121	Beverage Mfg
3122	Tobacco Mfg

3149	Other Textile Product Mills
3151	Apparel Knitting Mills
3152	Cut & Sew Apparel Mfg
3159	Apparel Accessories
3161	Leather & Hide Finishing
3162	Footwear Mfg
3169	Other Leather & Allied Products

NAICS Code	Industry Segment
Wood & Paper Products	
3211	Sawmills & Wood Preservation
3212	Veneer, Plywood, & Engineered Wood Products
3219	Millwork & Other Wood Products
3221	Pulp, Paper, & Paperboard Mills
3222	Converted Paper Product Mfg

Printing	
3231	Printing & Related Support Activities

Petroleum Refining & Products	
3241	Petroleum & Coal Products

Industrial, Agriculture, & Household Chemicals	
3251	Basic Chemical Mfg
3253	Pesticide, Fertilizer, & Other Agricultural Chemicals
3256	Soap, Cleaning Compound, & Toilet Preparation
3259	Other Chemical Products

Polymers & Coatings	
3252	Resin, Synthetic, Rubber, & Artificial Fibers & Filaments

NAICS Code	Industry Segment
Primary Metals	
3311	Iron & Steel Mills
3312	Steel Products
3313	Aluminum Production
3314	Nonferrous Metal
3315	Foundries

Fabricated Metals	
3321	Forging & Stamping
3322	Cutlery & Handtools
3323	Architectural & Structural Metals
3324	Boiler, Tank, & Shipping Containers
3325	Hardware
3326	Spring & Wire Mfg
3327	Machine Shops
3328	Coating, Engraving, & Heat Treating
3329	Other Fabricated Metal Products

Machinery	
3331	Agriculture, Construction, & Mining Machinery
3332	Industrial Machinery

3255	Paint, Coating, and Adhesive Mfg

Plastic & Rubber Products	
3261	Plastic Products
3262	Rubber Products
334516	Analytical Laboratory Instrument Manufacturing
334517	Irradiation Apparatus Manufacturing
3391	Medical Equipment & Supplies

Building Materials	
3271	Clay Products
3272	Glass Products
3273	Cement & Concrete
3274	Lime & Gypsum
3279	Other Nonmetallic Mineral Products

3333	Commercial & Service Industry Machinery
3335	Metalworking Machinery
3339	Other General Purpose Machinery

Environmental Control Systems	
3334	HVAC, Commercial Refrigeration Equipment

Power Generation Equipment	
3336	Engine, Turbine, & Power Transmission Equipment

Digital & Electronic Devices & Components	
3341	Computer & Peripheral Equipment
3342	Communications Equipment
3343	Audio/Video Equipment
3344	Semiconductor & Other Electronic Components
3345*	Navigational, Measuring, Electro-medical, & Control Instruments
3346	Magnetic & Optical Media

* excluding 334510, 334516, & 334517

Electrical Equipment & Appliances	
3351	Electric Lighting Equipment
3352	Household Appliances
3353	Electrical Equipment
3359**	Other Electrical Equipment & Components

Battery Storage	
33591	Battery Manufacturing

Transportation Equipment	
3361	Motor Vehicles
3362	Motor Vehicles Body & Trailer Mfg
3363	Motor Vehicle Parts
3365	Railroad Rolling Stock
3366	Ship & Boat Building
3369	Other Transportation Equipment

Aerospace Equipment	
3364	Aerospace Product and Parts Mfg

Furniture	
3371	Household & Institutional Furniture
3372	Office Furniture
3379	Other Furniture

Misc. Manufacturing	
33991	Jewelry & Silverware Mfg
33992	Sporting & Athletic Goods Mfg
33993	Doll, Toy, & Game Mfg
33994	Office Supplies (except Paper) Mfg
33995	Sign Mfg
33999	All Other Miscellaneous Mfg

** excluding 33591