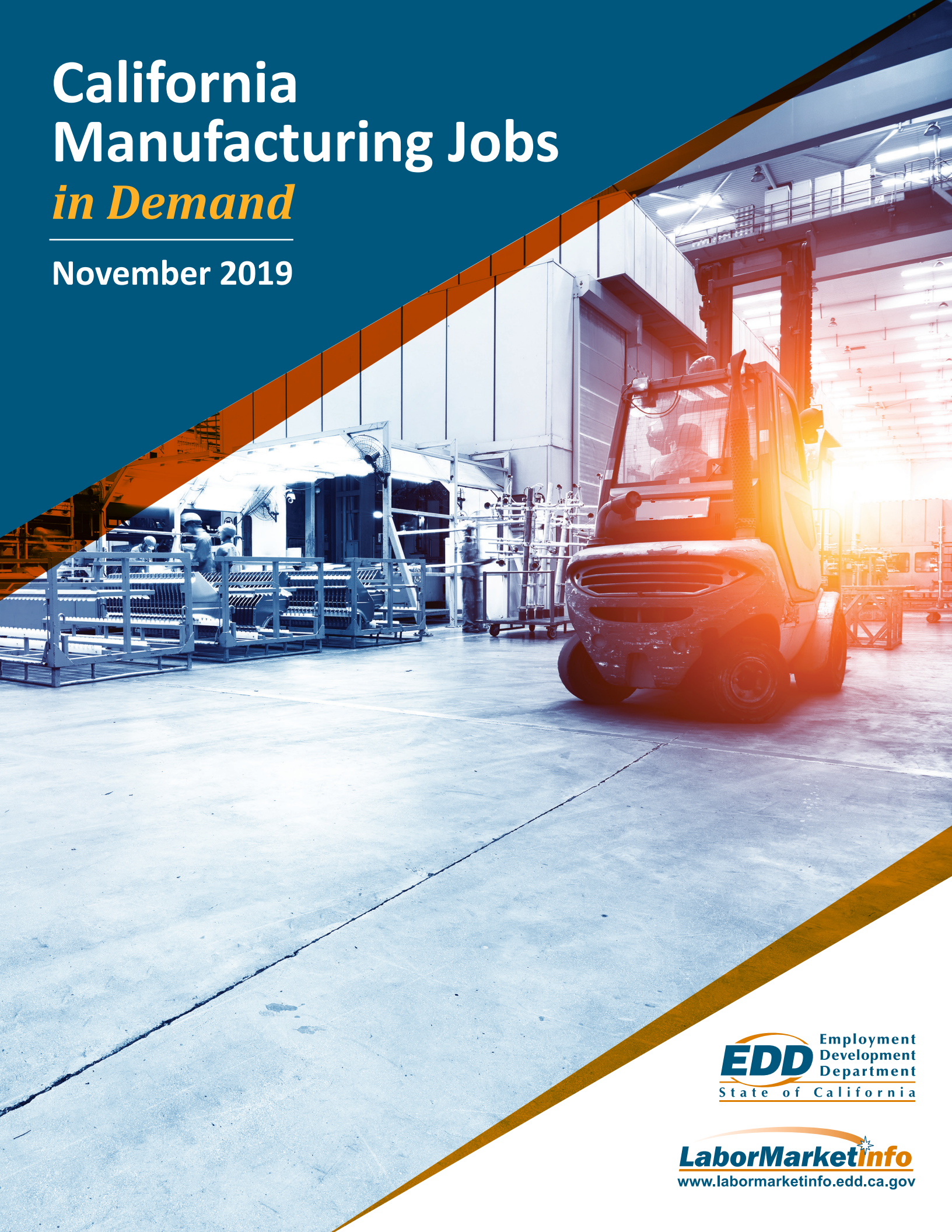


California Manufacturing Jobs *in Demand*

November 2019



EDD Employment
Development
Department
State of California

LaborMarketInfo
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Key Findings

The purpose of this study is to examine the current demand for jobs and skills in California's manufacturing industry, using real-time access to job listings posted online. Because of this sector's fluidity, using real-time data to give stakeholders an accurate, point-in-time snapshot of its job demand characteristics has many potential benefits. Real-time job demand data allow employers to identify the emerging skills coveted by industry leaders, job seekers to discern the location of current manufacturing hiring "hot spots," workforce developers to analyze various up-to-the-minute job trends, and training providers to tailor their programs and curriculum to better satisfy the existing job demand. The real-time job listings data are from the Conference Board's Help Wanted OnLine™ (HWOL) analytic software. The following are key findings based on an analysis of three months of job listings posted online between June 18, 2019 and September 18, 2019 as compared to the same period from the previous year:

- Approximately 30 percent of the 1.63 million job listings posted in California during the review period were looking for workers to fill positions common to manufacturing.
- The growth in the number of job listings for logistics occupations, an increase of 43.3 percent compared to the prior year's job listings for the same period, spurred a year-over growth of 3.2 percent in online job listings for the manufacturing industry. Total job listings in the four major manufacturing occupational groups reached over 480,000 during the review period.
- Of the over 480,000 job listings identified as manufacturing-related, approximately three out of every four were specific to either engineering occupations or "other" occupations common across all industries, such as customer service representatives and market research analysts.
- Engineering occupations make up only 3.8 percent of California's employment, yet they represent 10.6 percent of the 1.63 million job listings statewide.
- Job listings for production occupations are heavily concentrated in Southern California, but the region has closed the gap with the Bay Area and the rest of Northern California in terms of engineering job listings.
- The highest employer demand for skills and tools in manufacturing-related job listings were quality assurance, Structured Query Language (SQL), setup, product management, UNIX, and application development.
- Occupations faring the best for full-time job openings were applications software developers, industrial production managers, and wholesale and manufacturing sales representatives of technical and scientific products, while logistics occupations, such as stock clerks and truck drivers, showed the highest percentage of part-time listings.

Introduction

This report analyzes three months of California job listings posted online between June 18, 2019 and September 18, 2019 as compared to the same period from the previous year using the HWOL analytics tool.

Defining Manufacturing Occupational Groups

Job listings were classified into four broad occupational groups within manufacturing: engineering, production, logistics, and a miscellaneous group of “other” occupations common to manufacturing. Occupations were selected based on 2018 statewide employment and staffing patterns within the manufacturing industry (Occupational Employment Statistics Wage Survey, 1st Q, 2019). Below is a short description of the four manufacturing occupational groups. Figure 1 shows the groups and sample occupations within each group.

- Engineering occupations are involved in the design, development, testing, and evaluation of products and components, such as software for computer-driven production machines. This occupational group also includes engineering support occupations, such as technicians and drafters.
- Production occupations are jobs generally unique to the manufacturing industry. Their work involves creating new products from raw and component materials.
- Logistics occupations are jobs involved in the transportation, storage, and distribution of raw materials and manufactured products.
- “Other” manufacturing occupations are jobs involved in the support, finance, and sales aspects of the manufacturing industry. These occupations are in most industries and are difficult to isolate.

Figure 1: Manufacturing Occupational Groups

Occupational Group	Sample Occupations
Engineering Occupations	<ul style="list-style-type: none">• Electrical Engineers• Computer Hardware Engineers• Systems Software Developers
Production Occupations	<ul style="list-style-type: none">• Electrical and Electronic Equipment Assemblers• Welders, Cutters, Solderers, and Brazers• Assemblers and Fabricators
Logistics Occupations	<ul style="list-style-type: none">• Shipping, Receiving, and Traffic Clerks• Industrial Truck and Tractor Operators
“Other” Manufacturing Occupations	<ul style="list-style-type: none">• Bookkeeping, Accounting, and Auditing Clerks• Accountants and Auditors• Sales Representatives

Job Listings in Perspective – Labor Market Information

In 2018, California had a total employment of 18.83 million. During the review period of June 18, 2019 to September 18, 2019, 1.63 million job listings were posted online for all occupations throughout California. Figure 2 shows overall job listings posted within the four manufacturing occupational groups during the review period. It then compares the total overall job listings to California's total employment per group. These data show that engineering occupations represent 10.6 percent of all job listings over the review period, yet they make up only 3.8 percent of California's total employment. See Appendices A-D for a comparison of total jobs listings with labor market information available for all selected manufacturing occupations.

Figure 2: Comparison of Job Listings with California Estimated Employment

Occupational Group	Total Job Listings¹	Percent of all Job Listings	2018 California Employment²	Percent of 2018 California Employment
Engineering Occupations	173,561	10.6	719,400	3.8
Production Occupations	22,618	1.4	658,700	3.5
Logistics Occupations	95,401	5.9	1,228,600	6.5
"Other" Occupations Common to Mfg.	189,041	11.7	2,536,500	13.4
California	1,631,569	100.0	18,834,500	100.0

¹The Conference Board Help Wanted OnLine™ Data Series; three-month period ending September 18, 2019; ²California Employment Development Department, Projections of Employment 2018-2020.

Top Manufacturing Job Listings by Occupational Group

Engineering Job Listings

Engineers design and transform ideas into products or components, which creates the need for a host of jobs in manufacturing as well as its supply chain. The demand for engineers continues, although the data show a decrease compared to the same three-month period from the previous year. This analysis revealed a demand for workers knowledgeable in applications software design and development within this category. More than one-third of all engineering job listings during the review period were for applications software developers (65,505). Job listings for industrial engineers (14,964), computer systems support, and analysis-related occupations posted significant numbers during this period (see Figure 3).

Due to the higher educational requirements associated with this occupational group, there is a clear delineation between the number of contract job advertisements and the number of corresponding part-time jobs. Conversely, nearly a quarter of the job listings for computer user support specialists (3,159), which do not require higher education, were looking for part-time workers.

Figure 3 shows the top five engineering occupations in demand during the review period. Appendix E provides a more detailed listing of engineering occupations in demand.

Figure 3: Distribution of Engineering Job Listings

Engineering Job Listings				
CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Year-over Change (Percent)*	Part- Time Jobs (Percent)	Contract Jobs (Percent)
Software Developers, Applications (15-1132)	65,505	-4.3	2.7	12.4
Industrial Engineers (17-2112)	14,964	-4.1	3.9	4.3
Network and Computer Systems Administrators (15-1142)	14,048	-4.6	4.1	9.8
Computer Systems Analysts (15-1121)	13,913	-2.1	3.5	15.0
Computer User Support Specialists (15-1151)	13,647	-2.9	23.1	4.3

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

Production Job Listings

Production jobs are essential to manufacturing since the process involves taking raw and component materials and creating new products. The occupation of inspectors, testers, sorters, samplers, and weighers experienced a significant increase (60.6 percent) in job listings during the same three-month period compared to the previous year (Figure 4). However, the year-over increase was minimal for production jobs overall (1.7 percent increase). The demand for first-line supervisors/managers of production and operating workers was more than double any other occupation within the top five production occupations in this group (7,067). Yet, the year-over change for production supervisors showed a decrease of 4.0 percent. Production online job listings (22,618) accounted for the fewest job listings among the manufacturing occupational groups.

All occupations in this group require entry-level education, most often a high school diploma at least, with the exception of industrial production managers, an occupation which typically requires a bachelor's degree. As seen in the engineering group, education level has a direct correlation to the number of part-time jobs. Approximately a quarter of the job listings for first-line supervisors/managers of production and operating workers, helpers of production workers, packaging and filling machine operators and tenders, and bakers were for part-time work.

Figure 4 displays the top five production occupations in demand during the review period. These numbers are tempered with the knowledge that openings for this group of occupations are typically filled either through union hiring halls or not advertised online. Appendix F provides a detailed listing of the twenty-five top production occupations in rank order of job listings.

Figure 4: Distribution of Production Job Listings

Production Job Listings CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Year-over Change (Percent)*	Part- Time Jobs (Percent)	Contract Jobs (Percent)
First-Line Supervisors/Managers of Production and Operating Workers (51-1011)	7,067	-4.0	23.2	1.8
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	3,057	60.6	15.0	1.8
Industrial Production Managers (11-3051)	3,048	10.4	3.1	2.5
Production Workers, All Other (51-9199)	2,351	-15.4	14.0	1.2
Machinists (51-4041)	1,596	-18.2	7.1	3.6

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

Logistics Job Listings

Logistics occupations are indispensable components of the manufacturing industry. By organizing the supply chain, transporting raw materials and finished products, and unloading cargo, these workers provide critical support for the production and engineering sectors of the manufacturing industry.

Overall, logistics job listings rose 43.3 percent (an increase of 28,830) compared to the same three-month period from the previous year, the highest increase among the four manufacturing occupational groups in this report. This increase was largely due to job listings for heavy and tractor-trailer truck drivers.

Heavy and tractor-trailer truck drivers was one of the occupations with the greatest number of job listings (42,690), which was an increase of over 100 percent from the same three-month period from the previous year (Figure 5). In addition, as shown in Appendix G, logisticians (22.1 percent increase), stock clerks and order fillers (16.0 percent), and light truck or delivery services drivers (10.0 percent increase) also supported the overall increase of job listings. Figure 5 shows the top five logistics occupations in demand during the review period and Appendix G provides a detailed listing of the ten top logistics occupations in rank order of job listings.

The logistics group showed an even larger percent of part-time workers than the production group. Analysis showed multiple occupations with over 50 percent of the jobs listed as part-time, including stock clerks and order fillers (16,277 job listings out of 27,630), light truck or delivery services drivers (4,121 out of 7,260), and manual laborers and freight, stock, and material movers (2,185 out of 4,047).

Figure 5: Distribution of Logistics Job Listings

Logistics Job Listings				
CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Year-over Change (Percent)*	Part- Time Jobs (Percent)	Contract Jobs (Percent)
Heavy and Tractor-Trailer Truck Drivers (53-3032)	42,690	121.5	15.4	0.3
Stock Clerks and Order Fillers (43-5081)	27,630	16.0	58.9	1.0
Light Truck or Delivery Services Drivers (53-3033)	7,260	10.0	56.8	1.8
Driver/Sales Workers (53-3031)	4,964	5.5	41.6	8.3
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	4,047	8.0	54.0	1.3

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

“Other” Manufacturing Job Listings

The “other” category consists of occupations integral to the daily operation of firms in the manufacturing industry. Occupations such as wholesale sales representatives, accountants, and auditors contribute to the successful operation of any manufacturing firm. Due to the universal nature of these occupations, the “other” job listings represent new jobs and vacancies across all industries.

The “other” jobs accounted for considerably higher online job listings during the review period (189,041) than job listings in the three other manufacturing occupational groups. In contrast, this group also showed the highest decline overall for the same three-month period from the previous year (4.4 percent decrease). This is partly due to the “other” category consisting of occupations with varied education levels and a mixture of full-time and part-time workers.

As shown in Appendix H, nearly half of the job listings for janitors and cleaners were for part-time workers (3,642 out of 7,439, or 49.0 percent), followed closely behind by those for general office clerks (3,377 out of 7,922, or 42.6 percent). Data for accountants and auditors jobs, which typically require a bachelor’s degree for entry into the occupation, showed only 5.9 percent of the jobs listed as part-time.

Customer service representatives showed a positive year-over change (3.6 percent) and the highest number of job listings (28,852) for this group. On the other hand, there was a significant decrease in job listings for technical and scientific products sales representatives (27.6 percent decrease compared to the previous year’s period). Figure 6 shows the top five “other” occupations in demand during the

review period, while Appendix H provides a detailed listing of the fifteen top “other” occupations in rank order of job listings.

Figure 6: Distribution of “Other” Manufacturing Job Listings

“Other” Job Listings CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Year-over Change (Percent)*	Part- Time Jobs (Percent)	Contract Jobs (Percent)
Customer Service Representatives (43-4051)	28,852	3.6	37.5	2.8
First-Line Supervisors/Managers of Office and Administrative Support Workers (43-1011)	23,130	-4.3	22.8	1.3
Market Research Analysts and Marketing Specialists (13-1161)	18,957	-13.8	19.2	2.3
Accountants and Auditors (13-2011)	18,259	6.2	5.9	3.2
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)	15,500	-27.6	2.3	1.4

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

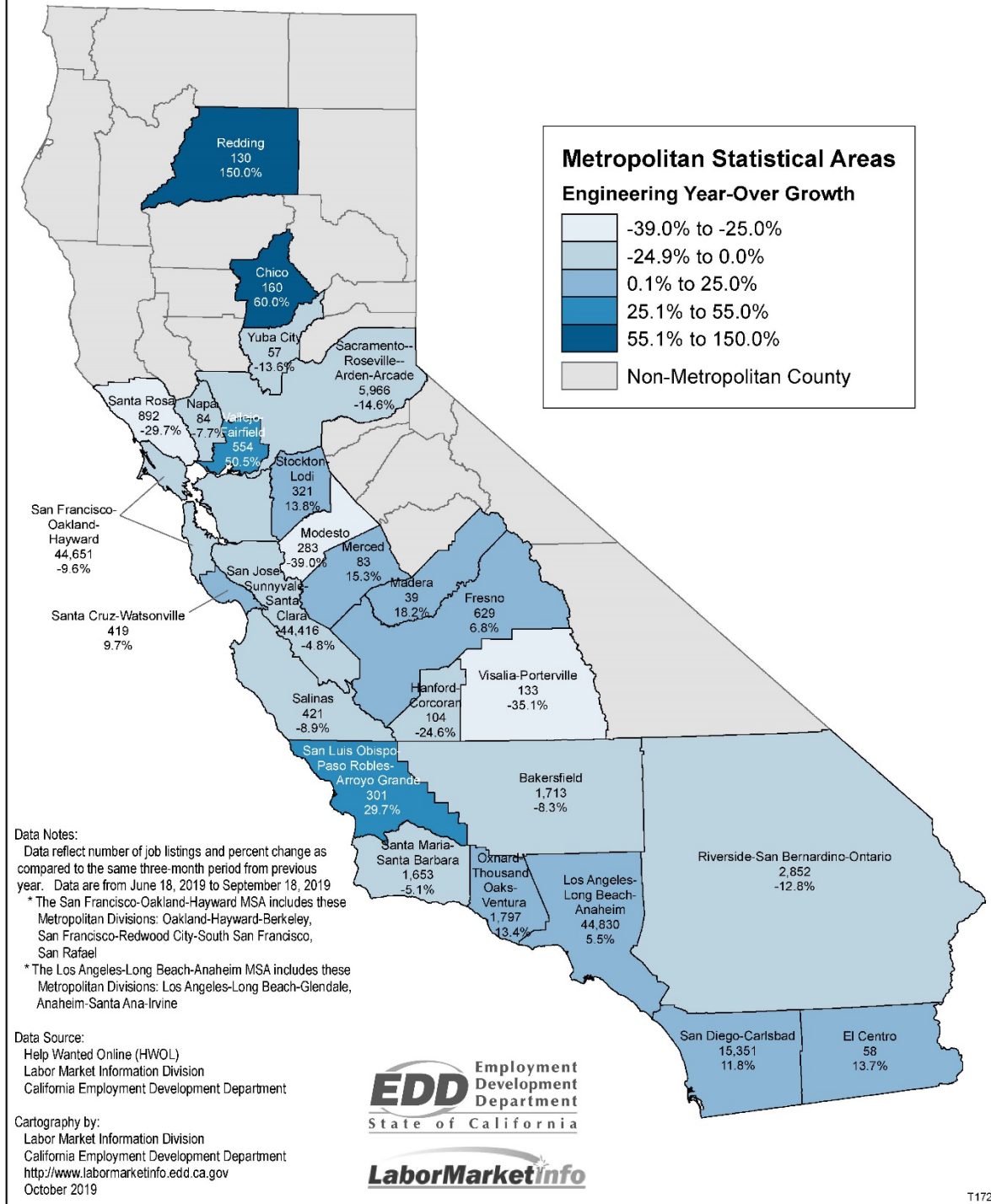
Geographic Location of Job Listings

By mapping total job listings and year-over change in California's 26 metropolitan statistical areas (MSAs), patterns emerge that indicate positive regional activity and job demand. Job listings for production occupations are still heavily concentrated in Southern California, but the region has closed the gap with the Bay Area and the rest of Northern California in terms of engineering job listings as well. In the logistics occupational group, there was strong year-over growth in job listings across the state (43.3 percent increase), compared to the same timeframe in 2018, with the top three MSAs (Los Angeles-Long Beach-Anaheim, 22,143; San Francisco-Oakland-Hayward, 14,092; and Riverside-San Bernardino-Ontario, 10,389) totaling 46,624 job listings, resulting in a year-over increase of 32.1 percent.

Engineering Job Listings in California

Unlike the distribution of production job listings, employers still directed their search for engineering workers in what have traditionally been the most fertile grounds for computer, industrial, and technological research and development: the Silicon Valley and the remainder of the San Francisco Bay Area. The MSAs of San Francisco-Oakland-Hayward (44,651 job listings) and San Jose-Sunnyvale-Santa Clara (44,416) comprised over half of all engineering job listings during the review period (52.9 percent combined). In year-over comparisons, the amount of statewide engineering job listings decreased by 3.2 percent. However, there were pockets of growth in many regions of the state, with the Redding MSA (150.0 percent increase) in the north, the Vallejo-Fairfield MSA (50.5 percent) in the Bay Area, the Stockton-Lodi MSA (13.8 percent) in the San Joaquin Valley, and the Oxnard-Thousand Oaks-Ventura MSA (13.4 percent) on the southern coast posting double-digit year-over percentage growth.

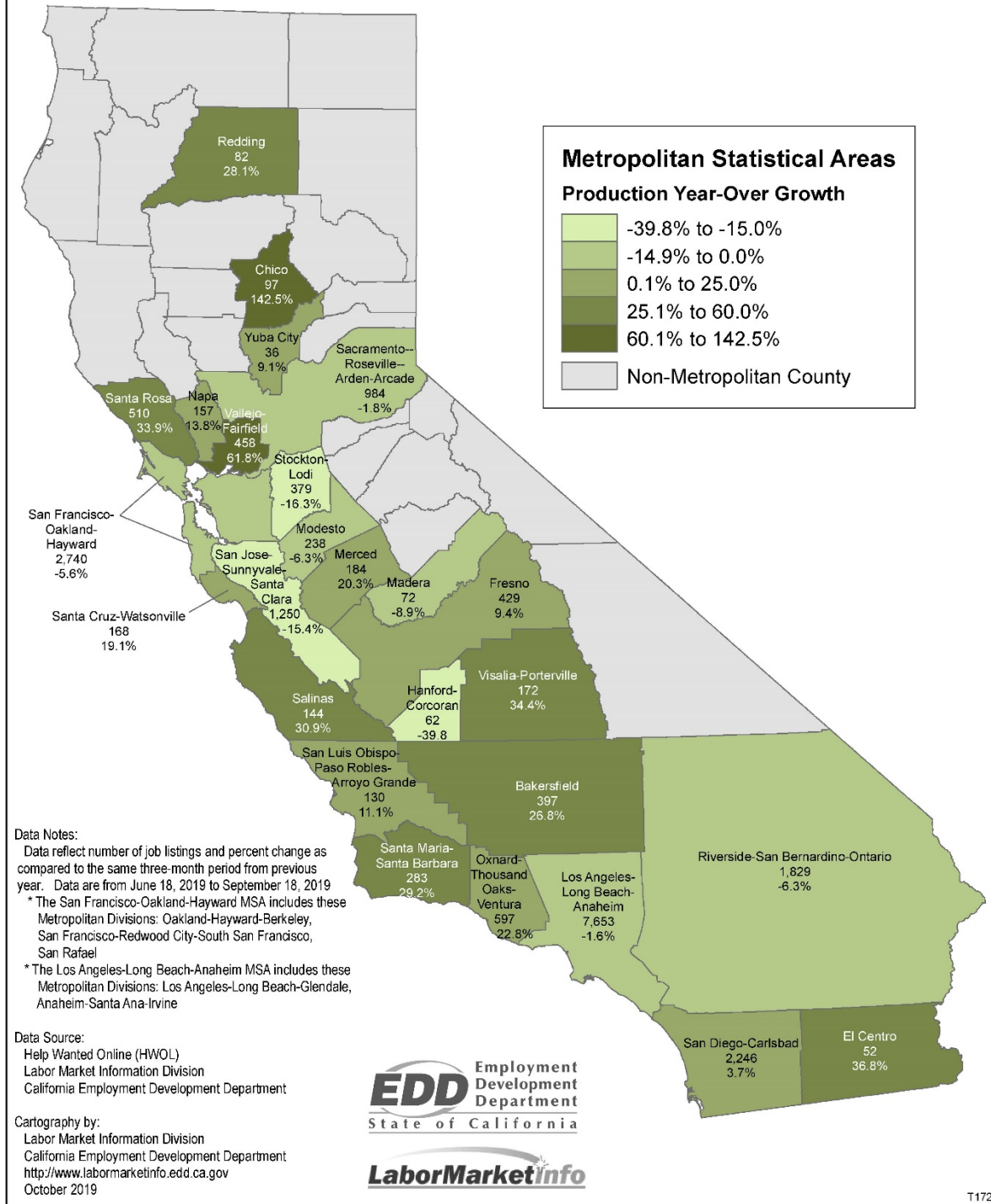
Number of Engineering Job Listings and Year-Over Growth



Production Job Listings in California

In terms of the number of production job listings, the Los Angeles-Long Beach-Anaheim MSA led the state during the researched timeframe with 7,653 job listings, nearly matching the number of job listings from the next four MSAs combined: San Francisco-Oakland-Hayward (2,740), San Diego-Carlsbad (2,246), Riverside-San Bernardino-Ontario (1,829), and San Jose-Sunnyvale-Santa Clara (1,250). Job listings in the production occupational group increased by 383 statewide in year-over comparison (1.7 percent), spurred by strong growth in the Vallejo-Fairfield (61.8 percent increase), Santa Rosa (33.9 percent), and Oxnard-Thousand Oaks-Ventura (22.8 percent) MSAs.

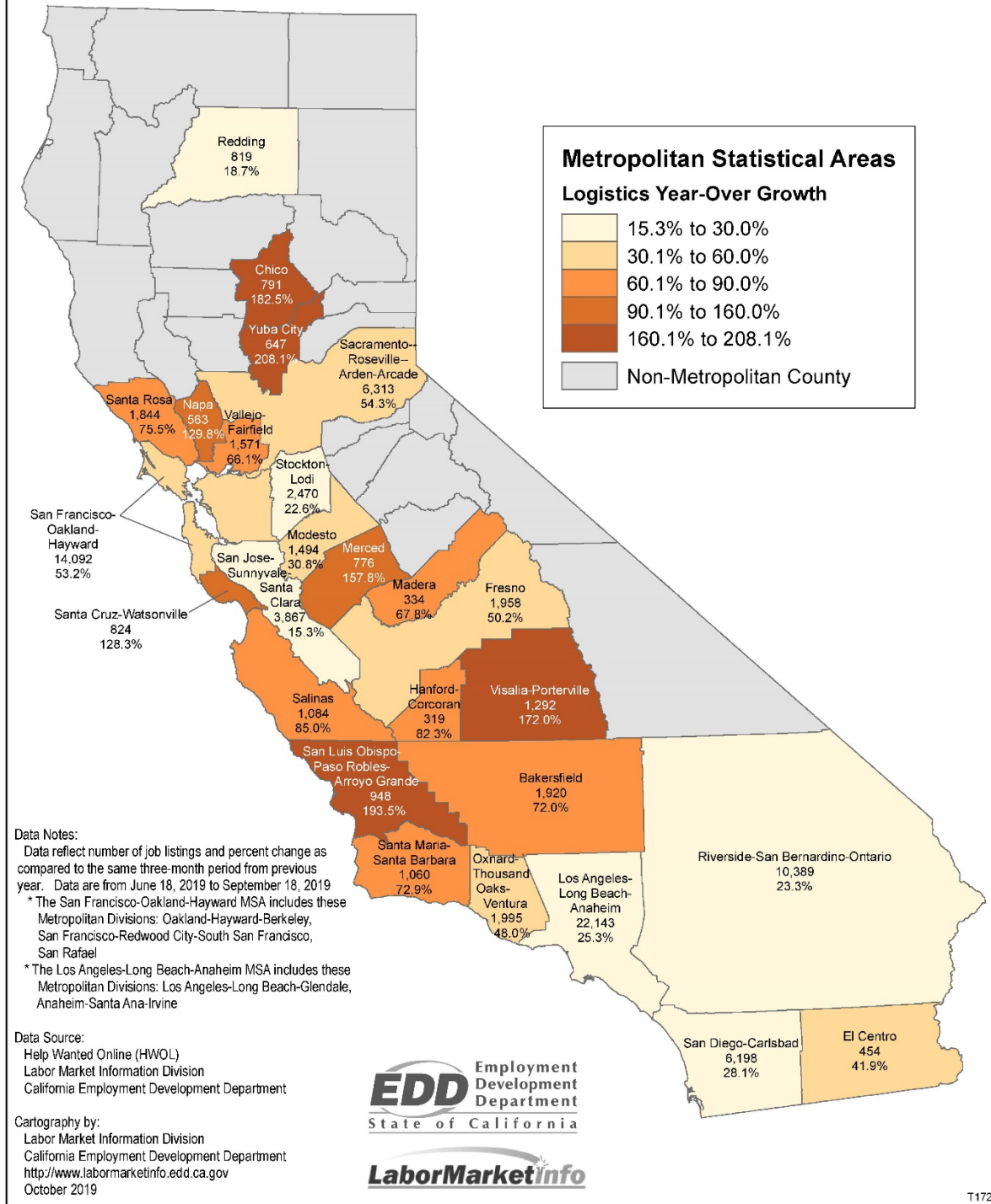
Number of Production Job Listings and Year-Over Growth



Logistics Job Listings in California

The geographic pattern of job listings in the logistics occupational group resembled that of the production occupational group, as the symbiotic relationship between the two would strongly suggest relatively robust activity in the southern part of the state with pockets in the Bay Area and the Central Valley. Furthermore, with the predominance of job listings for heavy and tractor-trailer truck drivers within this occupational group, the regions straddling the Interstate 5, 10, and 80 corridors (Los Angeles-Long Beach-Anaheim, Riverside-San Bernardino-Ontario, and San Francisco-Oakland-Fremont MSAs) showed the highest number of logistic job listings. Strong year-over growth of job listings in the Visalia-Porterville (172.0 percent), Merced (157.8 percent), and Napa (129.8 percent) MSAs also serve to underscore the logistical importance of California's main transportation arteries and demonstrate the stable growth of its manufacturing industry.

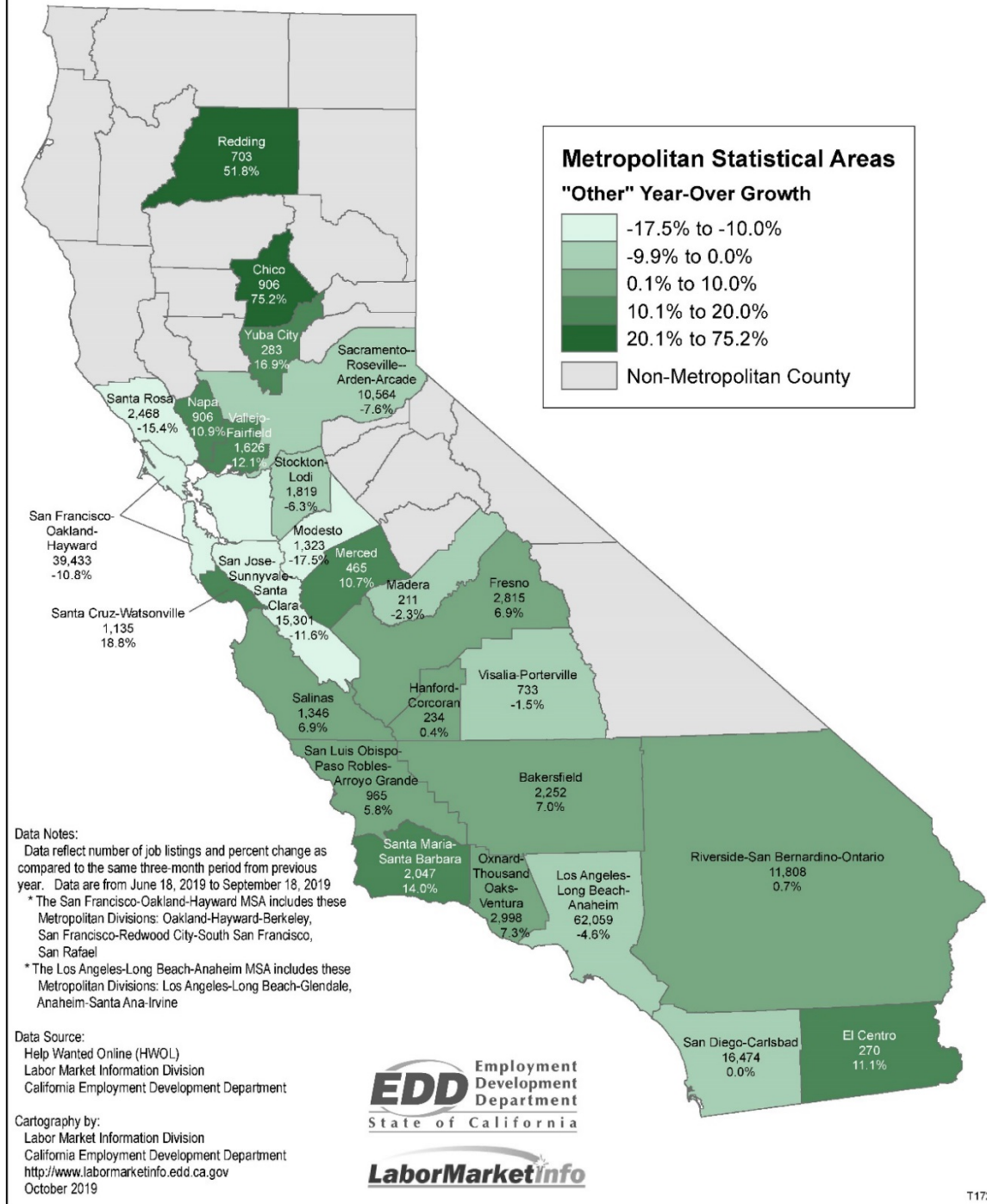
Number of Logistics Job Listings and Year-Over Growth



“Other” Manufacturing Job Listings in California

Since the “other” manufacturing job listings are also present in many other industries, there was no discerning geographic pattern in job listings for these occupations. To no surprise, the highly populated Los Angeles-Long Beach-Anaheim MSA was home to the majority of job listings (62,059) in this occupational group, more than San Francisco-Oakland-Hayward MSA (39,433), San Diego-Carlsbad MSA (16,474), and San Jose-Sunnyvale-Santa Clara MSA (15,301) combined. In terms of year-over comparison, the Redding (51.8 percent), Santa Cruz-Watsonville (18.8 percent), and Yuba City (16.9 percent) MSAs posted significant growth in the occurrences of job listings in the “other” occupational group.

Number of "Other" Job Listings and Year-Over Growth



Skills, Tools, Software, and Certifications in Demand

This section identifies the essential skills, tools, software, and certifications needed in manufacturing firms today. Using 37 keywords recommended by members of the California Manufacturers & Technology Association (CMTA), the HWOL tool was used to search across all job listings during the review period. Figures 11 shows the top five skills and knowledge while figure 12 shows the top five tools and software in demand, respectively. Figure 13 displays data for the three certifications for which CMTA offered keywords. For results on all 37 keywords provided by CMTA, see Appendices I-K. Note: a few keywords supplied by CMTA brought indefinite results due to the multiple meanings of the word depending on field of work. For example, “setup” is a skill required by occupations in production as well as in office and accounting occupations.

Figure 11: Skills and Knowledge in Demand

Skills and Knowledge			
Skill/ Knowledge	Total Job Listings	Sample Occupations	Top Employers
QA ¹ (Quality Assurance)	49,157	<ul style="list-style-type: none"> Software Developers, Applications Industrial Engineers Computer Systems Analysts Industrial Production Managers 	<ul style="list-style-type: none"> Oracle Apple Northrop Grumman Splunk Lockheed Martin
Setup	37,501	<ul style="list-style-type: none"> Computer User Support Specialists Software Developers, Applications Network and Computer Systems Administrators 	<ul style="list-style-type: none"> Internal Revenue Service (IRS) US Army Oracle Sears Holdings
Product management	32,478	<ul style="list-style-type: none"> Marketing Managers Computer Software Engineers, Applications General and Operations Managers Engineering Managers 	<ul style="list-style-type: none"> Oracle Splunk Amazon Cisco
Application development	15,669	<ul style="list-style-type: none"> Software Developers, Applications Computer Occupations, All Other Computer Systems Analysts Web Developers 	<ul style="list-style-type: none"> Oracle International Business Machines (IBM) Apple Infosys Limited University of California
Business analysis	12,584	<ul style="list-style-type: none"> Management Analysts Computer Systems Analysts Computer Occupations, All Other Marketing Managers 	<ul style="list-style-type: none"> Anthem Deloitte Coldwell Banker Richard Ellis (CBRE) Kaiser Permanente Accenture

Source: The Conference Board Help Wanted OnLine™ Data Series for three-month period ending September 18, 2019; Keywords submitted by California Manufacturers & Technology Association; Job listings are across all industries. ¹ The quality assurance acronym “QA” was applied to the keyword search, as the acronym produced higher results.

Figure 12: Tools and Software in Demand

Tools and Software			
Tool/ Software	Total Job Listings	Sample Occupations	Top Employers
SQL	45,891	<ul style="list-style-type: none"> • Software Developers, Applications • Market Research Analysts and Marketing Specialists • Computer Systems Analysts 	<ul style="list-style-type: none"> • Oracle • Anthem • Apple • Walmart
UNIX	17,366	<ul style="list-style-type: none"> • Software Developers, Applications • Network and Computer Systems Administrators • Software Developers, Systems Software • Computer Systems Analysts 	<ul style="list-style-type: none"> • Oracle • Apple • Northrop Grumman • Centene
Computer-aided design (CAD)	9,659	<ul style="list-style-type: none"> • Mechanical Engineers • Industrial Engineers • Electrical Engineers • Electronics Engineers, Except Computer 	<ul style="list-style-type: none"> • Northrop Grumman • Apple • Lockheed Martin • Raytheon
InDesign	5,036	<ul style="list-style-type: none"> • Market Research Analysts and Marketing Specialists • Industrial Engineers • Software Developers, Applications 	<ul style="list-style-type: none"> • University of California • CBRE • Stanford University • Gensler
SolidWorks	4,156	<ul style="list-style-type: none"> • Mechanical Engineers • Industrial Engineers • Electronics Engineers, Except Computer • Electrical Engineers 	<ul style="list-style-type: none"> • Northrop Grumman • Danaher • Tesla Motors • Intuitive Surgical

Source: The Conference Board Help Wanted OnLine™ Data Series for three-month period ending September 18, 2019; Keywords submitted by California Manufacturers & Technology Association; Job listings are across all industries.

Figure 13: Certifications in Demand

Certifications			
Certification	Total Job Listings	Sample Occupations	Top Employers
CISSP (Certified Information Systems Security Professional)	6,230	<ul style="list-style-type: none"> Information Security Analysts Network and Computer Systems Administrators Computer and Information Systems Managers Accountants and Auditors Software Developers, Applications 	<ul style="list-style-type: none"> Northrop Grumman Oracle Ernst & Young Deloitte Booz Allen Hamilton
ISO9000	523	<ul style="list-style-type: none"> Industrial Engineers Industrial Production Managers Network and Computer Systems Administrators First-Line Supervisors/Managers of Production and Operating Workers 	<ul style="list-style-type: none"> Wipro Limited Bastion Technologies General Atomics Medtronic Masimo
AS9100	18	<ul style="list-style-type: none"> Industrial Engineers Industrial Production Managers First-Line Supervisors/Managers of Production and Operating Workers Mechanical Drafters 	<ul style="list-style-type: none"> Skill Set Group Northrop Grumman Lin Engineering Solvay

Source: The Conference Board Help Wanted OnLine™ Data Series for three-month period ending September 18, 2019; Keywords submitted by California Manufacturers & Technology Association; Job listings are across all industries.

Age of Job Listings – What Jobs Are Hard To Fill?

One of the capabilities of HWOL is to identify and stratify job listings by the length of time the listings are available online. Long-running job listings can be an indicator of hard-to-fill jobs, even tempered by the knowledge that some listings are posted on a regular basis regardless of actual openings, and that other ads languish online long after the position is filled.

Figure 14 shows during the three-month period ending September 18, 2019, 47.2 percent of the 1,631,569 job listings were advertised over 90 days. All four manufacturing occupational groups show similar shares, with 51.0 percent of logistics job listings and 48.7 percent of engineering job listings still available past the 90-day mark, while the long-running job listings for both the production and “other” manufacturing occupational groups occurred at roughly the same 44 percent rate.

Figure 14 shows the breakdown of job listings over 90 days old by occupational group.

Figure 14: Longest-Running Job Listings by Occupational Group

Occupational Group	Job Listings 90 Days or More	Total Job Listings	Percent of Total
Engineering	84,522	173,561	48.7
Production	10,048	22,618	44.4
Logistics	48,696	95,401	51.0
"Other" Manufacturing	84,431	189,041	44.7
California	770,101	1,631,569	47.2

Source: The Conference Board Help Wanted OnLine™ Data Series for three-month period ending September 18, 2019.

Summary and Caveats About Real-Time Data

Production job listings were low, given the overall employment in this category. The authors believe skilled labor job listings on HWOL do not reflect true demand, since these jobs generally are not advertised but are filled through union halls, word-of-mouth, or other methods.

Real-time labor market information using tools such as HWOL provide point-in-time snapshots of job demand, as well as valuable year-over comparisons. However, comparing job listings as a time series over a number of years would be even more valuable and would smooth out irregularities, giving a more accurate picture of job demand by industry, by geographic location, and by occupational classification.

Caveats of HWOL and Real-Time Data

- Real-time data systems, such as HWOL, cannot classify a majority of job listings to their correct industry. This is due in part to lack of employer information within the listings and temporary agencies or recruiting firms generating job listings. Therefore, while this study focuses on occupations common to manufacturing based on staffing patterns, some of the occupational job listing totals are inflated due to the cross-industry nature of some occupations. This is particularly true in the “other” occupational group, where occupations (e.g., accountants and auditors) appear in all industries.
- The “job description” field in each job listing is rich with emerging and in-demand skills, software, certifications, and other information. However, the non-standard nature of this information makes it very time consuming to develop an anecdotal-level analysis and impossible to quantify on a reliable basis.
- The HWOL system does not have a year-over comparison function for keyword searches, which inhibits tracking the demand for new technologies and skills.
- Even with the use of the HWOL filter settings designed to exclude duplicate job listings, the authors still came across instances where multiple job listings were found for one position in a single location.
- Users of real-time data need to be aware that job listings are not the same as job openings. One listing often represents multiple open positions.
- Numbers of job listings may not be exact due to rounding.

Labor Market Information for Engineering Occupations – Appendix A

Engineering Occupations in Demand (in rank order by 2018 Employment)				
Occupational Title (Standard Occupational Classification Code)	2018 Employment Estimate	2020 Projected Employment	Job Growth (Percent)	Median Hourly Wage
Software Developers, Applications (15-1132)	145,800	159,600	9.5	\$60.47
Software Developers, Systems Software (15-1133)	97,500	102,800	5.4	\$62.45
Computer Systems Analysts (15-1121)	83,700	87,100	4.1	\$48.71
Computer User Support Specialists (15-1151)	74,200	77,900	5.0	\$30.11
Computer and Information Systems Managers (11-3021)	56,300	59,300	5.3	\$81.92
Network and Computer Systems Administrators (15-1142)	45,300	46,900	3.5	\$45.89
Architectural and Engineering Managers (11-9041)	29,500	30,700	4.1	\$80.52
Electronics Engineers, Except Computer (17-2072)	28,900	30,000	3.8	\$59.70
Computer Hardware Engineers (17-2061)	26,900	28,500	5.9	\$63.14
Electrical Engineers (17-2071)	26,400	27,800	5.3	\$53.89
Mechanical Engineers (17-2141)	25,800	26,700	3.5	\$49.61
Electrical and Electronics Engineering Technicians (17-3023)	25,300	26,400	4.3	\$31.88
Industrial Engineers (17-2112)	24,900	26,100	4.8	\$49.85
Engineers, All Other (17-2199)	17,900	18,500	3.4	\$52.49
Aerospace Engineers (17-2011)	11,000	11,400	3.6	\$60.15

Source: California Employment Development Department, Projections of Employment 2018-2020; Occupational Employment Statistics Wage Survey, 1st Q, 2019.

Labor Market Information for Production Occupations – Appendix B

Production Occupations in Demand (in rank order by 2018 Employment)				
Occupational Title (Standard Occupational Classification Code)	2018 Employment Estimate	2020 Projected Employment	Job Growth (Percent)	Median Hourly Wage
Team Assemblers (51-2092)	90,900	94,000	3.4	\$15.13
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	56,000	55,400	-1.1	\$19.78
First-Line Supervisors of Production and Operating Workers (51-1011)	55,200	55,800	1.1	\$30.80
Packaging and Filling Machine Operators and Tenders (51-9111)	52,000	52,900	1.7	\$14.22
Helpers--Production Workers (51-9198)	45,600	46,100	1.1	\$13.64
Machinists (51-4041)	35,600	36,100	1.4	\$22.16
Electrical and Electronic Equipment Assemblers (51-2022)	34,600	34,600	0.0	\$17.04
Bakers (51-3011)	33,300	34,100	2.4	\$13.97
Welders, Cutters, Solderers, and Brazers (51-4121)	30,700	31,700	3.3	\$21.03
Production Workers, All Other (51-9199)	27,400	27,700	1.1	\$14.12
Sewing Machine Operators (51- 6031)	26,300	23,300	-11.4	\$12.17
Assemblers and Fabricators, All Other (51-2099)	20,400	20,000	-2.0	\$15.13
Industrial Production Managers (11-3051)	19,700	20,000	1.5	\$54.39
Food Batchmakers (51-3092)	17,700	17,700	0.0	\$14.16
Mixing and Blending Machine Setters, Operators, and Tenders (51-9023)	15,000	15,200	1.3	\$18.81
Printing Press Operators (51-5112)	15,000	14,000	-6.7	\$18.12

Production Occupations in Demand (in rank order by 2018 Employment)				
Occupational Title (Standard Occupational Classification Code)	2018 Employment Estimate	2020 Projected Employment	Job Growth (Percent)	Median Hourly Wage
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (51-4031)	14,300	14,200	-0.7	\$17.31
Cabinetmakers and Bench Carpenters (51-7011)	12,000	12,100	0.8	\$16.94
Computer-Controlled Machine Tool Operators, Metal and Plastic (51-4011)	11,500	11,700	1.7	\$19.85
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders (51-9012)	9,600	10,000	4.2	\$22.00
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (51-4033)	8,700	8,600	-1.1	\$15.55
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (51-4072)	8,300	8,100	-2.4	\$15.95
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (51-9121)	6,800	6,900	1.5	\$17.15

Source: California Employment Development Department, Projections of Employment 2018-2020; Occupational Employment Statistics Wage Survey, 1st Q, 2019.

Labor Market Information for Logistics Occupations – Appendix C

Logistics Occupations in Demand (in rank order by 2018 Employment)				
Occupational Title (Standard Occupational Classification Code)	2018 Employment Estimate	2020 Projected Employment	Job Growth (Percent)	Median Hourly Wage
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	336,800	352,700	4.7	\$14.50
Stock Clerks and Order Fillers (43-5081)	239,900	245,800	2.5	\$13.62
Heavy and Tractor-Trailer Truck Drivers (53-3032)	151,200	154,700	2.3	\$22.82
Light Truck or Delivery Services Drivers (53-3033)	117,000	122,600	4.8	\$17.85
Packers and Packagers, Hand (53-7064)	104,700	106,500	1.7	\$12.56
Shipping, Receiving, and Traffic Clerks (43-5071)	101,300	103,900	2.6	\$16.63
Industrial Truck and Tractor Operators (53-7051)	63,900	67,500	5.6	\$17.68
Production, Planning, and Expediting Clerks (43-5061)	50,800	52,200	2.8	\$24.41
Driver/Sales Workers (53-3031)	45,800	46,700	2.0	\$16.43
Logisticians (13-1081)	17,200	17,800	3.5	\$39.68

Source: California Employment Development Department, Projections of Employment 2018-2020; Occupational Employment Statistics Wage Survey, 1st Q, 2019.

Labor Market Information for “Other” Occupations – Appendix D

“Other” Manufacturing Occupations in Demand (in rank order by 2018 Employment)				
Occupational Title (Standard Occupational Classification Code)	2018 Employment Estimate	2020 Projected Employment	Job Growth (Percent)	Median Hourly Wage
Office Clerks, General (43-9061)	345,800	349,100	1.0	\$17.39
General and Operations Managers (11-1021)	276,800	285,900	3.3	\$55.92
Janitors and Cleaners, Except Maids and Housekeeping Cleaners (37-2011)	251,900	262,300	4.1	\$14.94
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive (43-6014)	245,400	246,500	0.4	\$20.80
Customer Service Representatives (43-4051)	219,800	223,500	1.7	\$18.76
Bookkeeping, Accounting, and Auditing Clerks (43-3031)	209,700	211,900	1.0	\$22.82
First-Line Supervisors of Office and Administrative Support Workers (43-1011)	181,200	184,600	1.9	\$29.18
Accountants and Auditors (13-2011)	166,700	172,800	3.7	\$37.10
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products (41-4012)	149,300	151,500	1.5	\$29.93
Business Operations Specialists, All Other (13-1199)	148,400	153,400	3.4	\$36.79
Maintenance and Repair Workers, General (49-9071)	130,900	134,900	3.1	\$20.71
Market Research Analysts and Marketing Specialists (13-1161)	100,100	106,900	6.8	\$33.70

“Other” Manufacturing Occupations in Demand (in rank order by 2018 Employment)				
Occupational Title (Standard Occupational Classification Code)	2018 Employment Estimate	2020 Projected Employment	Job Growth (Percent)	Median Hourly Wage
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)	49,700	51,200	3.0	\$40.25
Purchasing Agents, Except Wholesale, Retail, and Farm Products (13-1023)	35,700	36,100	1.1	\$32.63
Industrial Machinery Mechanics (49-9041)	25,100	25,600	2.0	\$27.75

Source: Employment Development Department Projections of Employment 2018-2020; Occupational Employment Statistics Wage Survey, 1st Q, 2019.

Top Engineering Occupations – Appendix E

Engineering Job Listings				
CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Percent Change*	Part-Time Jobs (Percent)	Contract Jobs (Percent)
Software Developers, Applications (15-1132)	65,505	-4.3	2.7	12.4
Industrial Engineers (17-2112)	14,964	-4.1	3.9	4.3
Network and Computer Systems Administrators (15-1142)	14,048	-4.6	4.1	9.8
Computer Systems Analysts (15-1121)	13,913	-2.1	3.5	15.0
Computer User Support Specialists (15-1151)	13,647	-2.9	23.1	4.3
Software Developers, Systems Software (15-1133)	10,058	3.4	3.7	4.1
Computer and Information Systems Managers (11-3021)	9,087	-15.3	3.7	2.2
Mechanical Engineers (17-2141)	6,233	1.2	5.6	3.0
Electronics Engineers, Except Computer (17-2072)	5,501	4.5	3.9	2.8
Architectural and Engineering Managers (11-9041)	5,320	7.3	3.9	2.4
Electrical Engineers (17-2071)	4,919	4.0	5.7	3.2
Aerospace Engineers (17-2011)	3,571	-7.8	11.6	1.7
Computer Hardware Engineers (17-2061)	3,256	0.2	2.7	2.5
Electrical and Electronics Engineering Technicians (17-3023)	2,802	-2.9	9.9	2.2
Engineers, All Other (17-2199)	737	5.6	3.7	4.7

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

Top Production Occupations – Appendix F

Production Job Listings				
CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Percent Change*	Part- Time Jobs (Percent)	Contract Jobs (Percent)
First-Line Supervisors/Managers of Production and Operating Workers (51-1011)	7,067	-4.0	23.2	1.8
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	3,057	60.6	15.0	1.8
Industrial Production Managers (11-3051)	3,048	10.4	3.1	2.5
Production Workers, All Other (51-9199)	2,351	-15.4	14.0	1.2
Machinists (51-4041)	1,596	-18.2	7.1	3.6
Assemblers and Fabricators, All Other (51-2099)	1,198	-8.2	15.1	1.5
Helpers--Production Workers (51-9198)	871	-3.9	25.6	0.9
Welders, Cutters, Solderers, and Brazers (51-4121)	548	-2.7	6.4	2.4
Electrical and Electronic Equipment Assemblers (51-2022)	535	-9.2	11.2	3.6
Computer-Controlled Machine Tool Operators, Metal and Plastic (51-4011)	368	8.2	14.7	3.8
Packaging and Filling Machine Operators and Tenders (51-9111)	335	0.0	23.9	3.0
Printing Press Operators (51-5112)	278	-1.4	11.2	1.4
Bakers (51-3011)	268	17.0	25.7	1.9
Team Assemblers (51-2092)	155	32.5	9.0	1.9
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders (51-9012)	141	22.6	15.6	0.7
Food Batchmakers (51-3092)	134	30.1	19.4	3.7
Electromechanical Equipment Assemblers (51-2023)	107	-0.9	4.7	3.7
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (51-4031)	102	18.6	16.7	4.9
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (51-4072)	88	49.2	12.5	4.5

Production Job Listings				
CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Percent Change*	Part-Time Jobs (Percent)	Contract Jobs (Percent)
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (51-4033)	82	28.1	12.2	1.2
Sewing Machine Operators (51-6031)	82	-25.5	22.0	3.7
Mixing and Blending Machine Setters, Operators, and Tenders (51-9023)	71	-2.7	32.4	1.4
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (51-9121)	60	33.3	25.0	1.7
Cabinetmakers and Bench Carpenters (51-7011)	42	2.4	14.3	9.5
Paper Goods Machine Setters, Operators, and Tenders (51-9196)	34	209.1	5.9	5.9

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

Top Logistics Occupations – Appendix G

Logistics Job Listings CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Percent Change*	Part-Time Jobs (Percent)	Contract Jobs (Percent)
Heavy and Tractor-Trailer Truck Drivers (53-3032)	42,690	121.5	15.4	0.3
Stock Clerks and Order Fillers (43-5081)	27,630	16.0	58.9	1.0
Light Truck or Delivery Services Drivers (53-3033)	7,260	10.0	56.8	1.8
Driver/Sales Workers (53-3031)	4,964	5.5	41.6	8.3
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	4,047	8.0	54.0	1.3
Logisticians (13-1081)	3,174	22.1	12.2	1.9
Production, Planning, and Expediting Clerks (43-5061)	1,889	-8.9	11.4	2.8
Shipping, Receiving, and Traffic Clerks (43-5071)	1,753	-13.3	29.7	2.1
Industrial Truck and Tractor Operators (53-7051)	1,642	17.8	30.1	1.9
Packers and Packagers, Hand (53-7064)	352	5.7	41.8	1.1

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

Top “Other” Manufacturing Occupations – Appendix H

“Other” Job Listings CA Listings posted online June 18, 2019 to Sept. 18, 2019				
Occupational Title (Standard Occupational Classification Code)	Total Job Listings	Percent Change*	Part-Time Jobs (Percent)	Contract Jobs (Percent)
Customer Service Representatives (43-4051)	28,852	3.6	37.5	2.8
First-Line Supervisors/Managers of Office and Administrative Support Workers (43-1011)	23,130	-4.3	22.8	1.3
Market Research Analysts and Marketing Specialists (13-1161)	18,957	-13.8	19.2	2.3
Accountants and Auditors (13-2011)	18,259	6.2	5.9	3.2
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)	15,500	-27.6	2.3	1.4
Maintenance and Repair Workers, General (49-9042)	13,778	-1.0	16.6	2.1
General and Operations Managers (11-1021)	12,650	-3.7	13.8	1.1
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive (43-6014)	11,761	3.6	29.0	2.0
Business Operations Specialists, All Other (13-1199)	10,609	-13.4	15.2	9.8
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products (41-4012)	9,465	0.0	14.6	1.9
Office Clerks, General (43-9061)	7,922	2.6	42.6	1.1
Janitors and Cleaners, Except Maids and Housekeeping Cleaners (37-2011)	7,439	19.1	49.0	3.3
Bookkeeping, Accounting, and Auditing Clerks (43-3031)	5,729	-1.0	13.8	2.9
Purchasing Agents, Except Wholesale, Retail, and Farm Products (13-1023)	3,381	-1.7	7.4	6.2
Industrial Machinery Mechanics (49-9041)	1,609	-14.7	6.5	2.7

Source: The Conference Board Help Wanted OnLine™ Data Series, *as compared to the same three-month period from the previous year.

Skills and Knowledge in Demand – Appendix I

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Application development	15,669	10,551	<ul style="list-style-type: none"> • Software Developers, Applications • Computer Occupations, All Other • Computer Systems Analysts • Web Developers 	<ul style="list-style-type: none"> • Oracle • IBM • Apple • Infosys Limited • University of California
Business analysis	12,583	4,772	<ul style="list-style-type: none"> • Management Analysts • Computer Systems Analysts • Computer Occupations, All Other • Marketing Managers 	<ul style="list-style-type: none"> • Anthem, • Deloitte • CBRE • Kaiser Permanente • Accenture
Complex solutions	3,451	947	<ul style="list-style-type: none"> • Sales Engineers • Software Developers, Applications • Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products • Sales Managers 	<ul style="list-style-type: none"> • Oracle • Microsoft • IBM • Kaiser Permanente • Verizon

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Compounding	2,089	378	<ul style="list-style-type: none"> • First-Line Supervisors/Managers of Production and Operating Workers • Software Developers, Applications • Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products • Industrial Engineers 	<ul style="list-style-type: none"> • B. Braun • Affirm • Grifols • McGuff Family of Companies • Johnson & Johnson
Database administration	2,456	1,324	<ul style="list-style-type: none"> • Software Developers, Applications • Network and Computer Systems Administrators • Computer Systems Analysts • Software Developers, Systems Software 	<ul style="list-style-type: none"> • Oracle • University of California • Northrop Grumman • PRA Health Sciences • Microsoft

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Extrusion	461	373	<ul style="list-style-type: none"> Industrial Engineers Mechanical Engineers First-Line Supervisors/Managers of Production and Operating Workers Production Workers, All Other Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic 	<ul style="list-style-type: none"> Medtronic Tesla Motors Edwards Lifesciences DaMar Plastics Red Collar Pet Foods
Fiber placement	26	15	<ul style="list-style-type: none"> Industrial Engineers Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic Aerospace Engineers Computer Hardware Engineers Mechanical Engineers 	<ul style="list-style-type: none"> Northrop Grumman Lockheed Martin United Technologies Collins Aerospace Systems Virgin Orbit

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Injection molding	1,331	1,199	<ul style="list-style-type: none"> Industrial Engineers Mechanical Engineers First-Line Supervisors/Managers of Production and Operating Workers Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic 	<ul style="list-style-type: none"> Apple Danaher Cepheid Tesla Motors Applied Medical
Marcom	878	160	<ul style="list-style-type: none"> Market Research Analysts and Marketing Specialists Software Developers, Applications Network and Computer Systems Administrators Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products 	<ul style="list-style-type: none"> Apple Google Thermo Fisher Scientific Plantronics Mattel

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Mold making	76	54	<ul style="list-style-type: none"> • Machinists • Industrial Engineers • First-Line Supervisors/Managers of Production and Operating Workers • Mechanical Engineers 	<ul style="list-style-type: none"> • Danaher • WET Design • Cepheid • Edmunds.com • Renymed
Plastic injection	350	334	<ul style="list-style-type: none"> • Mechanical Engineers • Industrial Engineers • First-Line Supervisors/Managers of Production and Operating Workers • Machinists 	<ul style="list-style-type: none"> • Danaher • JunoPacific • Luxottica • Cepheid • Oakley
Product management	32,478	11,857	<ul style="list-style-type: none"> • Marketing Managers • Computer Software Engineers, Applications • General and Operations Managers • Engineering Managers 	<ul style="list-style-type: none"> • Oracle • Splunk • Amazon • Cisco • Walmart
Quality assurance (QA)	49,157	20,062	<ul style="list-style-type: none"> • Software Developers, Applications • Industrial Engineers • Computer Systems Analysts • Industrial Production Managers 	<ul style="list-style-type: none"> • Oracle • Apple • Northrop Grumman • Splunk • Lockheed Martin

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Requirements documentation	987	440	<ul style="list-style-type: none"> • Computer Systems Analysts • Software Developers, Applications • Software Developers, Systems Software • Industrial Engineers 	<ul style="list-style-type: none"> • Stanford University • Raytheon • Google • General Atomics • Automatic Data Processing (ADP)
Scientific molding	39	39	<ul style="list-style-type: none"> • Industrial Engineers • First-Line Supervisors/Managers of Production and Operating Workers • Mechanical Engineers 	<ul style="list-style-type: none"> • Danaher • Ormco • Cepheid • Life Technologies
Setup	37,496	13,468	<ul style="list-style-type: none"> • Computer User Support Specialists • Software Developers, Applications • Network and Computer Systems Administrators • Business Operations Specialists, All Other 	<ul style="list-style-type: none"> • IRS • US Army • Oracle • Sears Holdings • US Navy
Ship repair	280	140	<ul style="list-style-type: none"> • Welders, Cutters, Solderers, and Brazers • First-Line Supervisors/Managers of Production and Operating Workers • Purchasing Agents, Except Wholesale, Retail, and Farm Products • Industrial Engineers 	<ul style="list-style-type: none"> • BAE Systems Group • Colonna's Shipyard • Venture Dynamics • Lockheed Martin • Integrated Marine Services

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Shipbuilding	583	332	<ul style="list-style-type: none"> • Purchasing Agents, Except Wholesale, Retail, and Farm Products • Software Developers, Applications • Logisticians • Industrial Engineers • Software Developers, Systems Software 	<ul style="list-style-type: none"> • Northrop Grumman • General Dynamics • Huntington Ingalls Industries • National Steel and Shipbuilding • General Atomics
SPM	384	113	<ul style="list-style-type: none"> • Mechanical Engineers • General and Operations Managers • Aerospace Engineers • Purchasing Agents, Except Wholesale, Retail, and Farm Products • Industrial Engineers 	<ul style="list-style-type: none"> • Northrop Grumman • Facebook • Xactly • University of California • Worley Companies
Thermoforming	152	104	<ul style="list-style-type: none"> • Industrial Engineers • Mechanical Engineers • Production Workers, All Other • First-Line Supervisors/Managers of Production and Operating Workers 	<ul style="list-style-type: none"> • Pactiv • Masimo • Danaher • Apple • Sonoco

Skills and Knowledge Keywords (Alpha Order)*				
Skill or Knowledge	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Welding	7,902	4,758	<ul style="list-style-type: none"> • Maintenance and Repair Workers, General • Welders, Cutters, Solderers, and Brazers • Industrial Engineers • Industrial Machinery Mechanics 	<ul style="list-style-type: none"> • CBRE • Pacific Gas and Electric • Tesla Motors • Airgas • Northrop Grumman

Source: The Conference Board Help Wanted OnLine™ Data Series for three-month period ending September 18, 2019; *Keywords submitted by California Manufacturers & Technology Association.

Tools and Software in Demand – Appendix J

Tools and Software Keywords (Alpha Order)*				
Tool or Software	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
CAD	9,659	6,431	<ul style="list-style-type: none"> • Mechanical Engineers • Industrial Engineers • Electrical Engineers • Electronics Engineers, Except Computer • Aerospace Engineers 	<ul style="list-style-type: none"> • Northrop Grumman • Apple • Lockheed Martin • Raytheon • Tesla Motors
CAE	185	141	<ul style="list-style-type: none"> • Industrial Engineers • Electrical Engineers • Electronics Engineers, Except Computer • Software Developers, Systems Software • Mechanical Engineers 	<ul style="list-style-type: none"> • Raytheon • JET Propulsion Laboratory • Bastion Technologies • Columbus Technologies • California Institute of Technology
CAM	868	680	<ul style="list-style-type: none"> • Electronics Engineers, Except Computer • Industrial Engineers • Software Developers, Applications • Software Developers, Systems Software • Mechanical Engineers 	<ul style="list-style-type: none"> • Northrop Grumman • Lockheed Martin • Raytheon • PROLIM • General Atomics

Tools and Software Keywords (Alpha Order)*				
Tool or Software	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
InDesign	5,036	855	<ul style="list-style-type: none"> • Market Research Analysts and Marketing Specialists • Secretaries and Administrative Assistants, Except Legal, Medical, and Executive • Industrial Engineers • Software Developers, Applications • Business Operations Specialists, All Other 	<ul style="list-style-type: none"> • University of California • CBRE • Stanford University • Gensler • Jones Land LaSalle (JLL)
IT Service Management (ITIL)	282	173	<ul style="list-style-type: none"> • Network and Computer Systems Administrators • Computer User Support Specialists • Computer and information Systems Managers • Accountants and Auditors • Software Developers, Applications 	<ul style="list-style-type: none"> • University of California • Centene • ORSA Technologies • Word & Brown • State of California

Tools and Software Keywords (Alpha Order)*				
Tool or Software	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
MasterCAM	356	303	<ul style="list-style-type: none"> • Machinists • Industrial Engineers • Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic • First-Line Supervisors/Managers of Production and Operating Workers 	<ul style="list-style-type: none"> • Skill Set Group • General Atomics • Northrop Grumman • Triumph Group • L3 Technologies
Remedy (BMC)	158	82	<ul style="list-style-type: none"> • Network and Computer Systems Administrators • Computer User Support Specialists • Software Developers, Applications • Computer Systems Analysts 	<ul style="list-style-type: none"> • General Dynamics • PCM Services • Visa • LogMeIn • AAA Motor Club
SolidWorks	4,156	3,530	<ul style="list-style-type: none"> • Mechanical Engineers • Industrial Engineers • Electronics Engineers, Except Computer • Electrical Engineers • Aerospace Engineers 	<ul style="list-style-type: none"> • Northrop Grumman • Danaher • Tesla Motors • Intuitive Surgical • Edwards Lifesciences

Tools and Software Keywords (Alpha Order)*				
Tool or Software	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
SQL	45,891	26,827	<ul style="list-style-type: none"> • Software Developers, Applications • Market Research Analysts and Marketing Specialists • Computer Systems Analysts • Network and Computer Systems Administrators 	<ul style="list-style-type: none"> • Oracle • Anthem • Apple • Walmart • Amazon
SurfCAM	28	28	<ul style="list-style-type: none"> • Machinists • Computer-Controlled Machine Tool Operators, Metal and Plastic • Industrial Engineers • Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic 	<ul style="list-style-type: none"> • Krisalis Precision Machining • L3 Technologies • MicroVention • Ricman Manufacturing • Millennium Engineering and Integration Company
Tool Path	22	22	<ul style="list-style-type: none"> • Machinists • Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic • First-Line Supervisors/Managers of Production and Operating Workers • Software Developers, Applications • Industrial Engineers 	<ul style="list-style-type: none"> • Corning Inc. • Tesla Motors • Peridot • TPS Family of Companies • El Dorado Molds

Tools and Software Keywords (Alpha Order)*				
Tool or Software	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
Unigraphics	267	258	<ul style="list-style-type: none"> • Mechanical Engineers • Industrial Engineers • Aerospace Engineers • Electronics Engineers, Except Computer • Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic 	<ul style="list-style-type: none"> • Apple • Northrop Grumman • SPACEX • JET Propulsion Laboratory • Raytheon
UNIX	17,366	12,487	<ul style="list-style-type: none"> • Software Developers, Applications • Network and Computer Systems Administrators • Software Developers, Systems Software • Computer Systems Analysts • Computer User Support Specialists 	<ul style="list-style-type: none"> • Oracle • Apple • Northrop Grumman • Centene • Anthem

Source: The Conference Board Help Wanted OnLine™ Data Series for three-month period ending September 18, 2019; *Keywords submitted by California Manufacturers & Technology Association; Certifications may also exist for many of these tools and software.

Certifications in Demand – Appendix K

Certifications Keywords*				
Certification	Total Job Listings		Top Occupations	Top Advertising Employers
	All Industries	Manufacturing Occupations		
CISSP (Certified Information Systems Security Professional)	6,230	2,144	<ul style="list-style-type: none"> • Information Security Analysts • Network and Computer Systems Administrators • Computer and Information Systems Managers • Accountants and Auditors • Software Developers, Applications 	<ul style="list-style-type: none"> • Northrop Grumman • Oracle • Ernst & Young • Deloitte • Booz Allen Hamilton
AS9100	18	17	<ul style="list-style-type: none"> • Industrial Engineers • Industrial Production Managers • First-Line Supervisors/Managers of Production and Operating Workers • Mechanical Drafters 	<ul style="list-style-type: none"> • Skill Set Group • Northrop Grumman • Lin Engineering Inc. • Solvay
ISO9000	523	393	<ul style="list-style-type: none"> • Industrial Engineers • Industrial Production Managers • Network and Computer Systems Administrators • First-Line Supervisors/Managers of Production and Operating Workers • Inspectors, Testers, Sorters, Samplers, and Weighers 	<ul style="list-style-type: none"> • Wipro Limited • Bastion Technologies • General Atomics • Medtronic • Masimo Corp.

Source: The Conference Board Help Wanted OnLine™ Data Series for three-month period ending September 18, 2019; *Keywords submitted by California Manufacturers & Technology Association.

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