

Spring 2020

# Labor Market Overview

South Central Valley/  
Southern Mother Lode Subregion

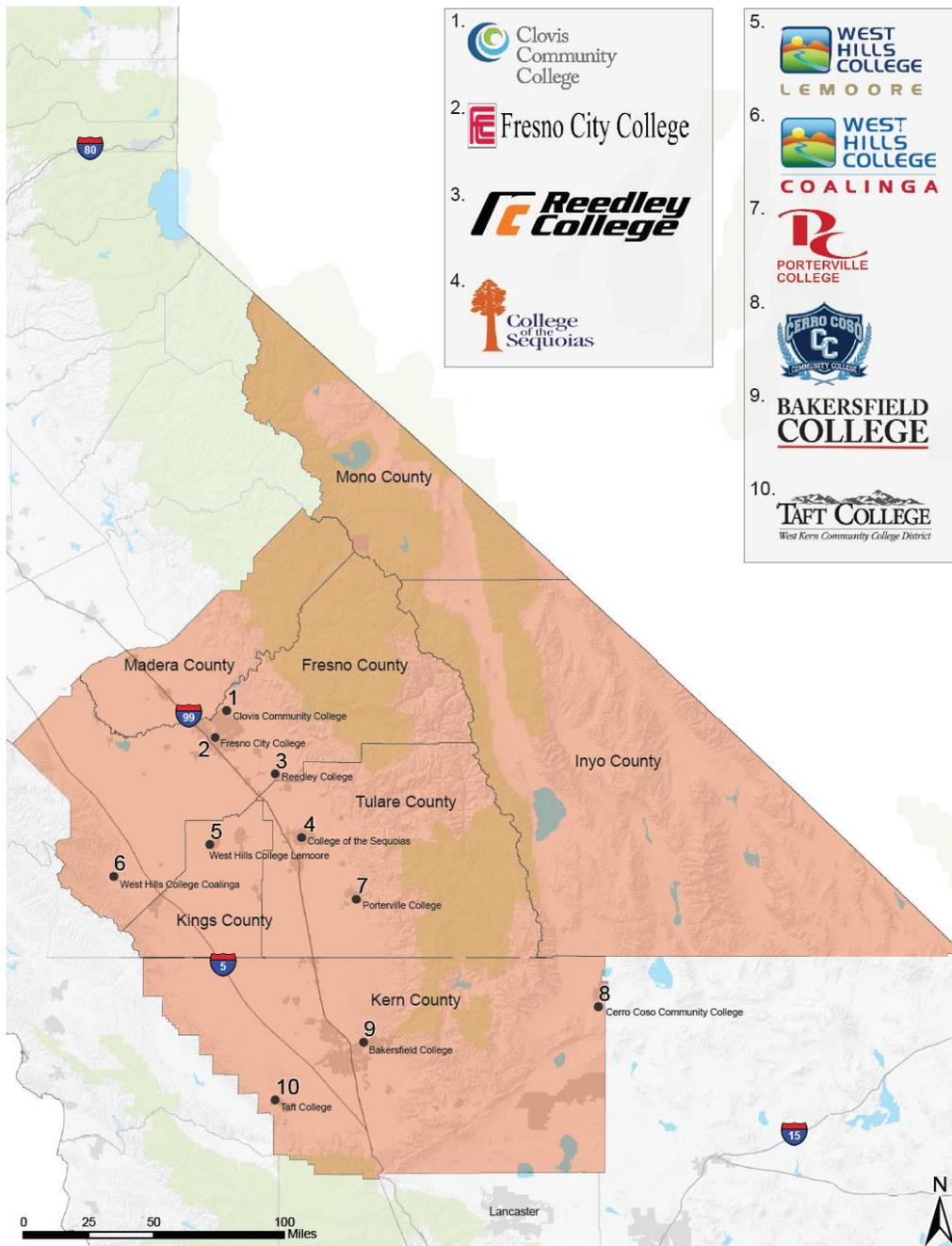


Prepared by the Central Valley/Mother Lode Center of Excellence

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**Exhibit 1: Map of community colleges in the South Central Valley/Southern Mother Lode subregion**

# Executive Summary

The Central Valley/Mother Lode Center of Excellence is in the process of updating its annual report on the 12 sectors and occupational groupings (sectors) critical to the region's economic vitality. As part of the study, the center also analyzes the subregions comprising the larger area. This report focuses on the South Central Valley/Southern Mother Lode (SCV/SML) subregion. It examines where future job growth is expected to occur and estimates workforce gaps, i.e., potential shortages of workers to fill middle-skill jobs in each sector.

In the subregion, population growth is expected to slow. The population currently totals more than 2.7 million, and by 2023, the subregion is projected to add 90,000 new residents, totaling 2.8 million residents.

Within the SCV/SML subregion, the 12 sectors are expected to offer more than 63,451 community college relevant (middle-skill) job openings annually.

A large proportion of new middle-skill jobs will be in the business sector, which will have nearly 13,000 annual openings in the SCV/SML subregion. Retail, hospitality, tourism, and entertainment (RHTE) is expected to offer 9,860 annual openings.

In the region and SCV/SML subregion, strategic planning is imperative for the business sector. A comparison of community college supply and projected workforce demand shows that the business sector will have the largest supply gap in the subregion, a shortage of 11,264 workers. The RHTE sector will have a supply gap of 8,805 workers. After business and RHTE, the third largest gap is in the energy, construction, and utilities sector, with a projected shortage of nearly 7,000 workers.

On average each year, community colleges in the region confer 14,434 awards (degrees and certificates) in areas related to the 12 sectors. The greatest number of awards are in health care, 5,662, followed by business, 1,658, and protective services, 1,617. Highlighting an area of need, only 63 awards are conferred on average each year in logistics although there are 5,126 annual openings projected. Other areas with much fewer awards than annual openings include global trade, 256 awards and 2,519 annual openings, and energy, construction, and utilities, 757 awards and 7,692 annual openings.

Future planning efforts by community colleges also should take into consideration occupations with the most annual openings in the SCV/SML subregion:

- Heavy and tractor-trailer truck drivers, 2,318 annual openings
- Office clerks (general), 2,449 annual openings
- Teacher assistants, 2,067 annual openings.
- Farmers, ranchers, and other agricultural managers, 1,687 annual openings

## 12 Sectors and occupational groupings:

- Agriculture, water and environmental technologies (AGWET)
- Advanced manufacturing
- Business and entrepreneurship (Business)
- Energy, construction and utilities (ECU)
- Education
- Global trade
- Health care
- ICT/digital media
- Logistics
- Mechanics and welding
- Protective services
- Retail, hospitality, tourism and entertainment (RHTE)

# Introduction

The Center of Excellence conducted a labor market analysis focusing on the Central Valley/Mother Lode subregions. This report focuses on the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The community colleges in the subregion are shown in Exhibit 1. In total, 12 sectors were analyzed for this report, and their workforce demand was compared with community college supply. A sector represents a cluster or grouping of occupations, comprising a segment of one or multiple industries. For each sector, the report details current employment numbers, projected occupational demand, entry-level and median wages, and three-year average supply of awards (degrees and certificates) from two-year higher education institutions. Each sector section contains a gap analysis, a comparison of workforce demand and educational supply. This report is organized by the 12 top sectors in the subregion:

- Agriculture, water, and environmental technologies
- Advanced manufacturing
- Business
- Energy, construction and utilities (ECU)
- Education
- Global trade
- Health care
- ICT/digital media
- Logistics
- Mechanics and welding
- Protective services
- Retail, hospitality, tourism and entertainment

## Methodology

Quantitative data collection and analysis were conducted for this report. Labor market data, particularly secondary data related to workforce demand and occupational employment, informed the report's findings. The North American Industry Classification System (NAICS) and the Standard Occupational Classification (SOC) System were used to source data. The average living wage for a single adult in the North Central Valley/Northern Mother Lode (NCV/NML) subregion is \$10.30/hour<sup>1</sup>; however, the state's minimum wage is \$12.00 - \$13.00/hour depending on business size. The criteria for occupations included in this report were determined by the Central Valley/Mother Lode Center of Excellence based on consortium discussions and recommendations. The occupational demand data include only community college relevant (middle-skill) jobs directly related to a sector having 10 or more annual openings. Occupational projections include annual openings. Replacements can be determined by subtracting annual openings from overall job change. If the change is negative, then all the annual openings are replacements. For more information on the data sources employed by this study, please refer to Appendix A. Each sector section of the report contains an analysis of educational supply section which counts awards by TOP4 codes from the Taxonomy of Programs and Classification of Instructional Program (CIP) codes. Appendix B contains typical education level, work experience, and on-the-job training required for each occupation discussed in the sector sections. Current Population Survey (CPS) data are also included, which is used to evaluate whether bachelor's-degree-education-level occupations are considered middle-skill. An occupation is considered middle-skill when one-third or more of current workers in B.A./B.S.-level occupations have completed some college up to an associate degree as their highest level of education.

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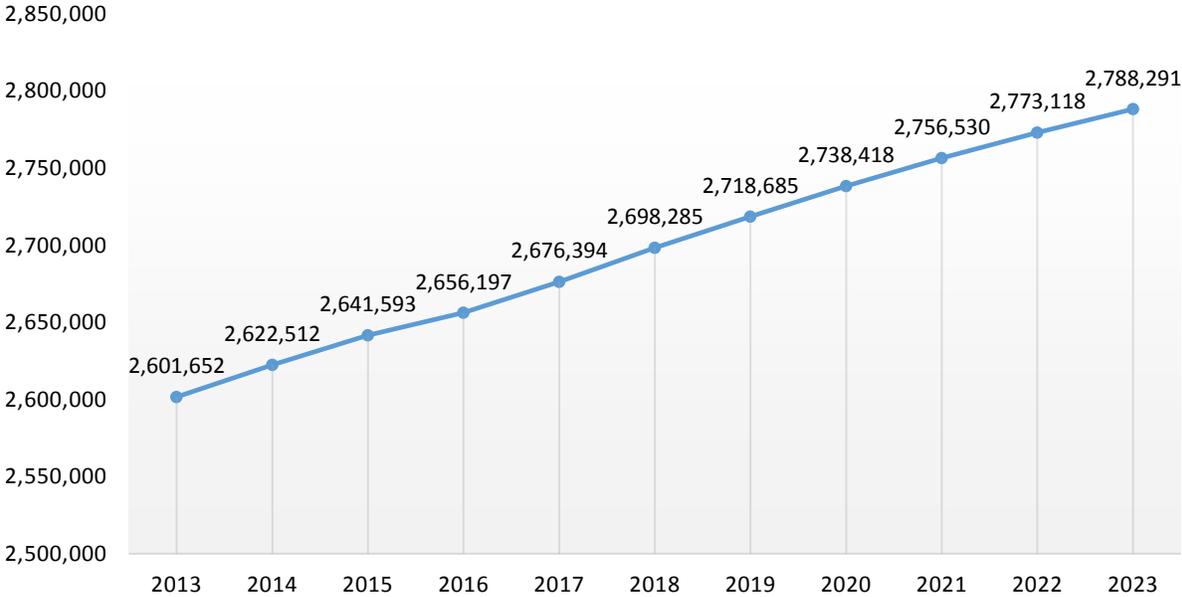
<sup>1</sup> The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

# Regional Overview

## Residential Population

According to the latest U.S. Census data, the SCV/SML subregion is home to approximately 2.7 residents (Exhibit 2). Between 2013 and 2018, the region added 96,633 residents. By 2023, the subregion is projected to add 90,000 new residents, totaling 2.8 million residents.

**Exhibit 2: Population estimates and projections in the SCV/SML subregion**



## Demographics

The SCV/SML subregion’s gender composition is equivalent to the state. The population is equally divided between men and women. Exhibit 3 shows projected changes in the SCV/SML subregion’s demographics by 2023. The number of individuals identifying as white, non-Hispanic is expected to decline by 78,067 in the subregion by 2023.

In the SCV/SML subregion, the most rapid growth is projected to occur among individuals identifying as two or more races, Hispanic, 29% growth; native Hawaiian or Pacific Islander, Hispanic, 24%; and black, Hispanic, 22%.

The most substantial population growth by number of residents is projected for:

- White, Hispanic residents, an increase of 195,705, representing 16% growth;
- Asian, non-Hispanic residents, an increase of 29,999, 20% growth; and
- Two or more races, Hispanic, an increase of 8,754, 29% growth.

**Exhibit 3: Projected changes in race/ethnicity in the SCV/SML subregion**

Race/Ethnicity	2013	2023	Change	% Change
White, Non-Hispanic	886,028	807,961	(78,067)	(9%)
Black, Non-Hispanic	110,584	115,618	5,034	5%
American Indian or Alaskan Native, Non-Hispanic	20,396	19,737	(659)	(3%)
Asian, Non-Hispanic	152,595	182,594	29,999	20%
Native Hawaiian or Pacific Islander, Non-Hispanic	3,145	3,701	556	18%
Two or More Races, Non-Hispanic	44,373	52,411	8,038	18%
White, Hispanic	1,250,274	1,445,979	195,705	16%
Black, Hispanic	26,079	31,699	5,620	22%
American Indian or Alaskan Native, Hispanic	57,184	65,312	8,128	14%
Asian, Hispanic	17,737	20,437	2,700	15%
Native Hawaiian or Pacific Islander, Hispanic	3,524	4,356	832	24%
Two or More Races, Hispanic	29,733	38,487	8,754	29%
<b>Total</b>	<b>2,601,652</b>	<b>2,788,291</b>	<b>186,639</b>	<b>7%</b>

For cohorts under age 20, the largest projected increase over the next five years will occur in children under age 5, a 14% increase representing the addition of more than 29,630 children (Exhibit 4). There is a projected 8% decrease in the 5-9 age cohort, a decline of 16,946 children in the subregion.

**Exhibit 4: Projected change in age cohorts in the SCV/SML subregion, 2018-2023**

Age Cohort	2018 Population	2023 Population	Change	% Change	2018 % of Cohort
Under 5 years	208,957	238,591	29,634	14%	7.74%
5 to 9 years	221,808	204,862	(16,946)	(8%)	8.22%
10 to 14 years	219,986	222,545	2,559	1%	8.15%
15 to 19 years	198,431	211,134	12,703	6%	7.35%
20 to 24 years	194,868	194,547	(321)	0%	7.22%
25 to 29 years	215,405	197,892	(17,513)	(8%)	7.98%
30 to 34 years	194,723	211,301	16,578	9%	7.22%
35 to 39 years	183,047	190,055	7,008	4%	6.78%
40 to 44 years	160,504	176,880	16,376	10%	5.95%
45 to 49 years	153,466	153,704	238	0%	5.69%
50 to 54 years	148,013	145,539	(2,474)	(2%)	5.49%
55 to 59 years	149,299	139,395	(9,904)	(7%)	5.53%
60 to 64 years	131,994	138,815	6,821	5%	4.89%
65 to 69 years	106,969	121,027	14,058	13%	3.96%
70 to 74 years	81,259	94,527	13,268	16%	3.01%
75 to 79 years	55,815	67,556	11,741	21%	2.07%
80 to 84 years	36,113	42,065	5,952	16%	1.34%
85 years and over	37,626	37,856	230	1%	1.39%
<b>Total</b>	<b>2,698,285</b>	<b>2,788,291</b>	<b>90,006</b>	<b>3%</b>	<b>100.00%</b>

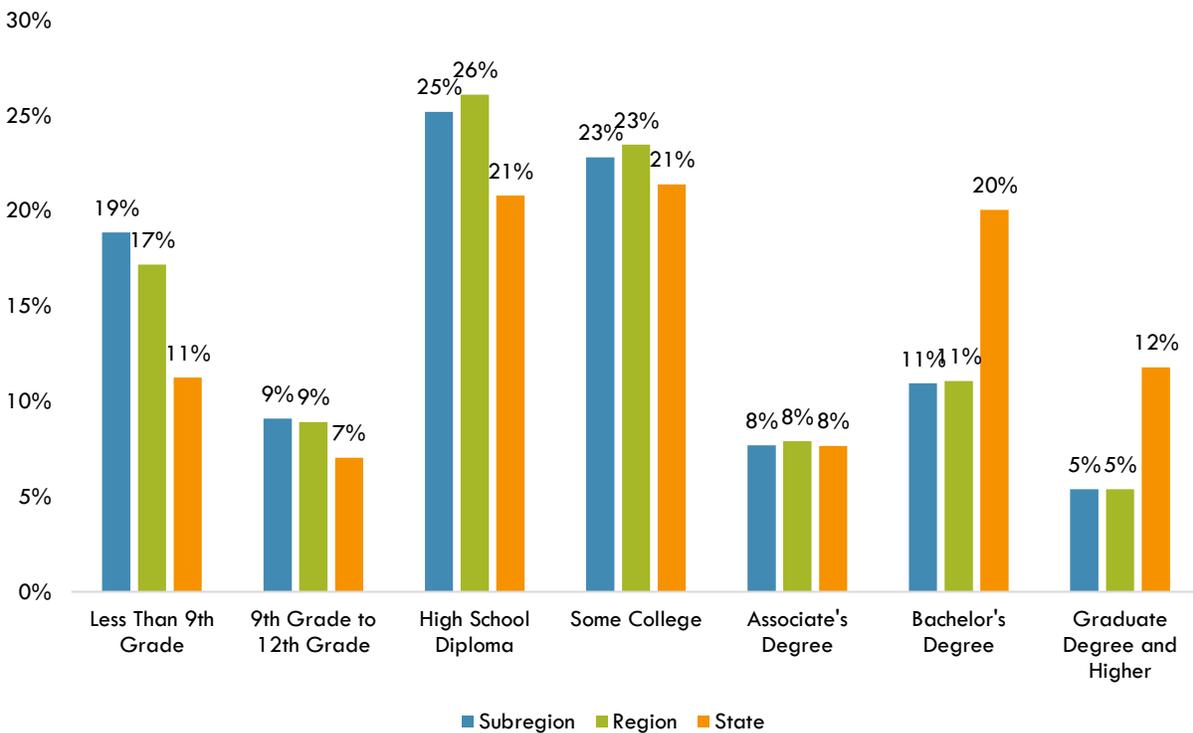
## Educational Attainment

The SCV/SML subregion trails the state in bachelor's degree attainment, with only 11% of the adult population holding a bachelor's degree, compared to 20% in the state (Exhibit 8).

Regarding associate degree attainment, the subregion and the state are the same, 8%. The subregion leads the state in the percent of population that has completed a high school diploma, 25% compared to 21%. A greater proportion of the subregion has completed some college compared to the state and nation. In the subregion, 23% of the population has completed some college, which is greater than the state, 21%.

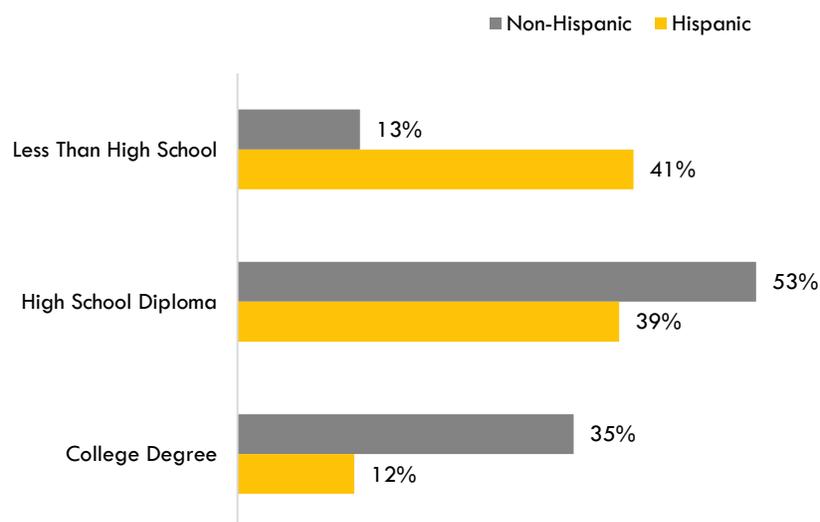
Compared to the state, a higher proportion of residents 25 years of age or older in the subregion have completed less than a 9<sup>th</sup> grade education and less than a 12<sup>th</sup> grade education, which indicates a greater need for adult education in the region. Nearly 20% percent of residents in the subregion have less than a 9<sup>th</sup> grade education and 9% have a 9<sup>th</sup>-12<sup>th</sup> grade education, compared to 11% and 7% in the state, respectively.

**Exhibit 8: Educational attainment comparison of the nation, state and SCV/SML subregion**



In the subregion, 35% of the non-Hispanic adult population has a college degree, compared to 12% of the Hispanic population (Exhibit 9). Also, a greater proportion of the Hispanic population has less than a high school education. More than 40% of the Hispanic population has less than a high school diploma, compared to 13% of the non-Hispanic population.

### Exhibit 9: Hispanic/non-Hispanic educational attainment in the subregion, 2018



### Labor Force & Employment

The size and characteristics of a region’s labor force are important considerations in workforce planning. Labor force, employment and unemployment data are based upon “place of residence” – where people live, regardless of where they work. Individuals who have more than one job are counted only once. These data elements differ from industry employment estimates that are “place-of-work” based – where the employer/workplace is located, regardless of where the employee resides. (For terms and definitions, see Appendix A.)

The labor force in the SCV/SML subregion has increased by nearly 6,000 workers over the last five years (Exhibit 10). Unemployment has declined from 13% to 8% during the same period. Employment has increased by nearly 62,800 workers, from 1,020,310 workers in 2013 to 1,083,090 workers in 2018.

### Exhibit 10: Labor force size, employment and unemployment in the SCV/SML subregion, 2013-2018

Metric	2013	2018	5-Year Change
Labor Force	1,170,660	1,176,650	5,990
Employment	1,020,310	1,083,090	62,780
Unemployment	150,250	93,370	(56,880)
Unemployment Rate	13%	8%	(5%)

Regional growth in labor appears to have been more limited than subregional growth. Since 2013, the labor force in the Central Valley/Mother Lode region has grown by nearly 23,000 workers. Total employment increased by 125,210 workers (Exhibit 11). In 2013, more than 243,000 individuals were unemployed. By 2018, this number had declined by 102,280. Because total employment increased more than the labor force, the unemployment rate decreased from 13% in 2013 (compared to 9% statewide) to 7% in 2018 (compared to 4% statewide).

**Exhibit 11: Labor force size, employment and unemployment in the CV/ML region, 2013-2018**

Metric	2013	2018	5-Year Change
Labor Force	1,904,580	1,927,560	22,980
Employment	1,661,150	1,786,360	125,210
Unemployment	243,310	141,030	(102,280)
Unemployment Rate	13%	7%	(5%)

At 4%, the state's unemployment rate is lower than the region's and subregion's unemployment rates (Exhibit 12). Over the last five years, the state's labor force has added more than 773,000 workers, growing to nearly 19.4 million. Unemployment has declined from 1.7 million workers in 2013 to 815,400 workers in 2018 statewide.

**Exhibit 12: Labor force size, employment and unemployment in California, 2013-2018**

Metric	2013	2018	5-Year Change
Labor Force	18,625,000	19,398,200	773,200
Employment	16,958,400	18,582,800	1,624,400
Unemployment	1,666,600	815,400	(851,200)
Unemployment Rate	9%	4%	(5%)

# Agriculture, Water & Environmental Technologies

## Summary

Agriculture, water, and environmental technologies occupations with the greatest employment in the SCV/SML subregion include farmers, ranchers, and other agricultural managers; agricultural equipment operators; and first-line supervisors of farming, fishing, and forestry workers. Occupations with strong projected growth include veterinary technologists and technicians; and veterinary assistants and laboratory animal caretakers. Food scientists and technologists, earn the highest median hourly wage, \$34.13, followed by compliance officers, \$32.90. On average each year, community colleges in the subregion confer 408 awards related to agriculture, water, and environmental technologies. The gap analysis reveals a shortage of 4,100 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 24: Agriculture, water and environmental technologies employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Farmers, Ranchers, and Other Agricultural Managers	16,270	15,864	(406)	(2%)	1,687
Agricultural Equipment Operators	4,116	4,411	295	7%	761
First-Line Supervisors of Farming, Fishing, and Forestry Workers	4,599	4,769	170	4%	738
Mobile Heavy Equipment Mechanics, Except Engines	1,570	1,626	56	4%	172
Compliance Officers	1,346	1,472	126	9%	149
Pest Control Workers	770	851	81	11%	128
Farm Equipment Mechanics and Service Technicians	826	879	53	6%	97
Water and Wastewater Treatment Plant and System Operators	1,018	1,023	5	0%	97
Agricultural Inspectors	565	589	24	4%	89
Pesticide Handlers, Sprayers, and Applicators, Vegetation	519	567	48	9%	79
Forest and Conservation Technicians	621	627	6	1%	78
Animal Trainers	491	510	19	4%	77
Forest and Conservation Workers	408	409	1	0%	77
Agricultural and Food Science Technicians	588	601	13	2%	77
Veterinary Assistants and Laboratory Animal Caretakers	270	325	55	20%	59
Veterinary Technologists and Technicians	300	364	64	21%	39
Life, Physical, and Social Science Technicians, All Other	263	285	22	8%	37
Animal Breeders	162	158	(4)	(2%)	27
Food Scientists and Technologists	194	191	(3)	(2%)	22
Logging Equipment Operators	84	94	10	12%	17

## Wages

**Exhibit 25: Agriculture, water and environmental technologies wages**

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Compliance Officers	\$24.81	\$32.90
Food Scientists and Technologists	\$23.88	\$34.13
Water and Wastewater Treatment Plant and System Operators	\$22.23	\$27.84
Mobile Heavy Equipment Mechanics, Except Engines	\$21.03	\$26.69
Agricultural Inspectors	\$18.91	\$22.04
Life, Physical, and Social Science Technicians, All Other	\$18.66	\$26.31
Farmers, Ranchers, and Other Agricultural Managers	\$17.94	\$28.57
Agricultural and Food Science Technicians	\$16.23	\$19.86
First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$15.35	\$18.23
Farm Equipment Mechanics and Service Technicians	\$14.68	\$18.56
Pest Control Workers	\$14.13	\$17.02
Animal Breeders	\$12.62	\$15.58
Forest and Conservation Technicians	\$12.42	\$15.29
Veterinary Assistants and Laboratory Animal Caretakers	\$11.93	\$14.38
Veterinary Technologists and Technicians	\$11.93	\$15.61
Agricultural Equipment Operators	\$11.83	\$13.45
Pesticide Handlers, Sprayers, and Applicators, Vegetation	\$11.79	\$14.25
Logging Equipment Operators	\$11.72	\$15.71
Animal Trainers	\$10.99	\$12.90
Forest and Conservation Workers	\$10.99	\$11.00
*Due to fluctuations in 10 <sup>th</sup> percentile wages, 25 <sup>th</sup> percentile wages have been used to describe entry-level wages.		

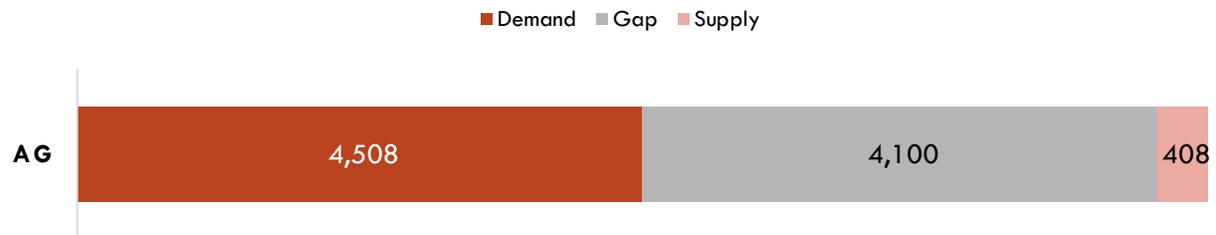
## Community College Supply

**Exhibit 26: Agriculture, water and environmental technologies community college supply**

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
010100 - Agriculture Technology and Sciences, General		15	11	21	16
010200 - Animal Science	56	122	106	59	114
010300 - Plant Science		32	37	76	48
010900 - Horticulture		9	18	11	13
011200 - Agriculture Business, Sales and Service		38	47	58	48
011300 - Food Processing and Related Technologies		0	0	10	3
011400 - Forestry		34	24	49	36
011500 - Natural Resources		3	5	16	8
011600 - Agricultural Power Equipment Technology		127	82	149	119
095800 - Water and Wastewater Technology		1	1	7	3
<b>Total</b>	<b>56</b>	<b>381</b>	<b>331</b>	<b>456</b>	<b>408</b>

## Gap Analysis

**Exhibit 27: Agriculture, water and environmental technologies annual demand and supply in the SCV/SML subregion**



# Advanced Manufacturing

## Summary

The largest occupation in the SCV/SML subregion's advanced manufacturing sector is packaging and filling machine operators and tenders, with 5,053 workers in 2018, 2% projected growth, and 630 annual openings. This occupation is followed by industrial machinery mechanics with 3,500 workers in 2018, 6% projected growth and 370 annual openings. The highest paid occupations are industrial production managers, \$46.23/hour median, and electrical and electronics engineering technicians, \$38.46/hour median. On average each year, community colleges in the subregion confer 433 awards related to advanced manufacturing. The gap analysis reveals a shortage of 2,794 advanced manufacturing workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 28: Advanced manufacturing employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Packaging and Filling Machine Operators and Tenders	5,053	5,167	114	2%	630
Industrial Machinery Mechanics	3,500	3,698	198	6%	370
First-Line Supervisors of Production and Operating Workers	3,203	3,371	168	5%	369
Inspectors, Testers, Sorters, Samplers, and Weighers	2,975	2,902	(73)	(2%)	367
Production Workers, All Other	1,955	2,036	81	4%	248
Production, Planning, and Expediting Clerks	1,728	1,884	156	9%	219
Mixing and Blending Machine Setters, Operators, and Tenders	930	978	48	5%	121
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	888	907	19	2%	108
Electrical and Electronics Engineering Technicians	864	876	12	1%	88
Engineering Technicians, Except Drafters, All Other	781	800	19	2%	81
Maintenance Workers, Machinery	753	798	45	6%	79
Industrial Production Managers	838	883	45	5%	72
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	315	360	45	14%	56
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	291	285	(6)	(2%)	35
Sawing Machine Setters, Operators, and Tenders, Wood	235	257	22	9%	34
Chemical Equipment Operators and Tenders	173	211	38	22%	30

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	204	234	30	15%	28
Stationary Engineers and Boiler Operators	217	229	12	6%	26
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	202	215	13	6%	25
Conveyor Operators and Tenders	172	184	12	7%	24

## Wages

### Exhibit 29: Advanced manufacturing wages

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Stationary Engineers and Boiler Operators	\$34.36	\$38.46
Industrial Production Managers	\$33.97	\$46.23
Electrical and Electronics Engineering Technicians	\$32.56	\$38.54
Engineering Technicians, Except Drafters, All Other	\$24.37	\$35.08
First-Line Supervisors of Production and Operating Workers	\$20.86	\$28.56
Industrial Machinery Mechanics	\$19.94	\$25.50
Production, Planning, and Expediting Clerks	\$17.20	\$22.08
Maintenance Workers, Machinery	\$15.46	\$20.40
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	\$14.87	\$20.98
Mixing and Blending Machine Setters, Operators, and Tenders	\$14.85	\$18.35
Chemical Equipment Operators and Tenders	\$14.54	\$17.14
Conveyor Operators and Tenders	\$14.34	\$20.37
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	\$13.00	\$16.50
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	\$12.70	\$16.10
Inspectors, Testers, Sorters, Samplers, and Weighers	\$12.24	\$15.44
Sawing Machine Setters, Operators, and Tenders, Wood	\$12.21	\$14.63
Packaging and Filling Machine Operators and Tenders	\$11.97	\$14.29
Production Workers, All Other	\$11.73	\$13.62
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	\$11.65	\$13.22
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	\$11.01	\$11.33

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
*Due to fluctuations in 10 <sup>th</sup> percentile wages, 25 <sup>th</sup> percentile wages have been used to describe entry-level wages.		

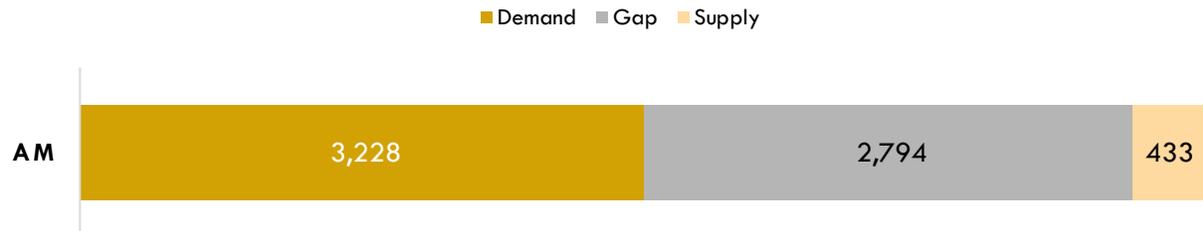
## Community College Supply

### Exhibit 30: Advanced manufacturing community college supply

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
083900 - Industrial Arts (Transfer)		1	0	1	1
090100 - Engineering, General		32	29	47	36
093500 - Electro-Mechanical Technology		0	0	7	2
093600 - Printing and Lithography		1	3	7	4
094500 - Industrial Systems Technology and Maintenance	102	193	149	90	178
095600 - Manufacturing and Industrial Technology		26	68	172	89
095630 - Machining and Machine Tools		62	24	20	35
15.0613 - Manufacturing Engineering Technology/Technician	0	3	3		2
095600 - Manufacturing and Industrial Technology	42	52	83		59
099900 - Other Engineering and Related Industrial Technologies		35	33	15	28
<b>Total</b>	<b>144</b>	<b>405</b>	<b>392</b>	<b>359</b>	<b>433</b>

## Gap Analysis

### Exhibit 31: Advanced manufacturing annual demand and supply in the SCV/SML subregion



# Business

## Summary

In the SCV/SML subregion, the largest business occupations include office clerks (general) with 19,032 workers in 2018, and secretaries and administration assistants (except legal, medical and executive) with more than 14,311 workers. These occupations will offer a substantial number of annual openings in coming years. Most business-related occupations are projected to undergo modest to moderate growth; however, tellers are projected to decline by 9%, a loss of 227 jobs over five years, as are executive secretaries and executive administrative assistants, a 4% drop representing a loss of 90 jobs. Business operations specialists earn the highest median wage in the subregion, \$32.42/hour, followed by executive secretaries and executive administrative assistants, \$27.57/hour. On average each year, community colleges in the subregion confer 1,658 awards related to business. The gap analysis reveals a shortage of 11,264 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 32: Business employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Office Clerks, General	19,032	19,665	633	3%	2,449
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	14,311	14,392	81	1%	1,643
Bookkeeping, Accounting, and Auditing Clerks	10,748	10,851	103	1%	1,291
First-Line Supervisors of Office and Administrative Support Workers	8,152	8,453	301	4%	933
Receptionists and Information Clerks	5,436	5,831	395	7%	830
Business Operations Specialists, All Other	6,556	6,965	409	6%	728
Billing and Posting Clerks	2,883	3,101	218	8%	368
Office and Administrative Support Workers, All Other	2,442	2,554	112	5%	312
Tellers	2,424	2,197	(227)	(9%)	282
Information and Record Clerks, All Other	2,153	2,239	86	4%	272
Eligibility Interviewers, Government Programs	2,339	2,477	138	6%	255
Executive Secretaries and Executive Administrative Assistants	2,203	2,113	(90)	(4%)	245
Insurance Claims and Policy Processing Clerks	2,202	2,215	13	1%	239
Real Estate Sales Agents	2,223	2,298	75	3%	230
First-Line Supervisors of Non-Retail Sales Workers	1,867	1,908	41	2%	193
Data Entry Keyers	1,635	1,502	(133)	(8%)	183
Dispatchers, Except Police, Fire, and Ambulance	1,655	1,735	80	5%	178

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Interviewers, Except Eligibility and Loan	1,296	1,331	35	3%	173
Payroll and Timekeeping Clerks	1,432	1,446	14	1%	163
Property, Real Estate, and Community Association Managers	1,663	1,746	83	5%	148

## Wages

### Exhibit 33: Business wages

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Business Operations Specialists, All Other	\$22.72	\$32.42
Executive Secretaries and Executive Administrative Assistants	\$22.35	\$27.57
First-Line Supervisors of Office and Administrative Support Workers	\$20.08	\$25.77
Eligibility Interviewers, Government Programs	\$19.07	\$23.44
Property, Real Estate, and Community Association Managers	\$18.82	\$29.18
Payroll and Timekeeping Clerks	\$17.53	\$22.04
Real Estate Sales Agents	\$16.69	\$27.08
Bookkeeping, Accounting, and Auditing Clerks	\$16.15	\$20.04
First-Line Supervisors of Non-Retail Sales Workers	\$15.72	\$25.99
Information and Record Clerks, All Other	\$15.71	\$18.80
Dispatchers, Except Police, Fire, and Ambulance	\$15.31	\$18.70
Interviewers, Except Eligibility and Loan	\$15.09	\$18.15
Insurance Claims and Policy Processing Clerks	\$15.00	\$17.81
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	\$14.50	\$18.36
Billing and Posting Clerks	\$13.93	\$16.70
Data Entry Keyers	\$12.77	\$14.88
Office Clerks, General	\$12.25	\$15.92
Tellers	\$12.22	\$13.90
Receptionists and Information Clerks	\$12.20	\$13.98
Office and Administrative Support Workers, All Other	\$11.66	\$13.86
*Due to fluctuations in 10 <sup>th</sup> percentile wages, 25 <sup>th</sup> percentile wages have been used to describe entry-level wages.		

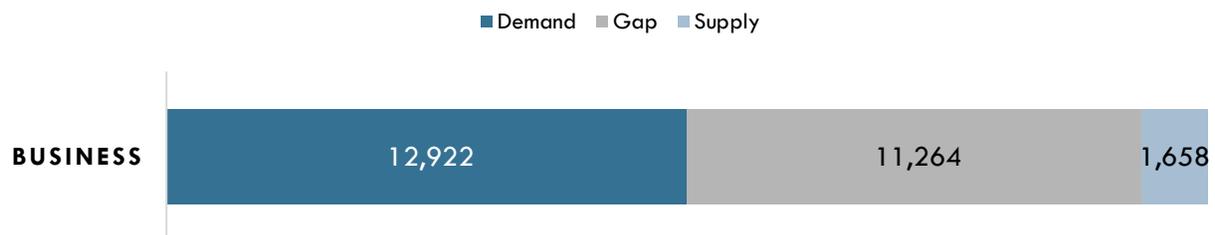
## Community College Supply

### Exhibit 34: Business community college supply

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
050200 - Accounting	47	157	166	157	176
050400 - Banking and Finance		7	3	4	5
050500 - Business Administration		593	675	872	713
051100 - Real Estate		2	0	0	1
051400 - Office Technology/Office Computer Applications		139	159	230	176
051410 - Legal Office Technology		7	3	3	4
051420 - Medical Office Technology		62	58	70	63
051430 - Court Reporting		1	2	4	2
51.0716 - Medical Administrative/Executive Assistant and Medical Secretary	59	42	69		57
52.0401 - Administrative Assistant and Secretarial Science, General	57	39	39		45
52.0408 - General Office Occupations and Clerical Services	284	382	325		330
059900 - Other Business and Management		0	1	0	0
140200 - Paralegal	20	83	76	76	85
<b>Total</b>	<b>467</b>	<b>1,514</b>	<b>1,576</b>	<b>1,416</b>	<b>1,658</b>

## Gap Analysis

### Exhibit 35: Business annual demand and supply in the SCV/SML subregion



# Energy, Construction & Utilities

## Summary

The largest energy, construction, and utilities occupation is maintenance and repair workers (general) with more than 9,084 workers in the SCV/SML subregion in 2018. This occupation is projected to undergo moderate growth, 7%, and will offer 1,044 annual openings. The second largest occupation is carpenters, with 5,903 workers in 2018 with 6% growth. This occupation will offer the second highest number of openings in the sector, 705 each year. Occupations earning the highest wages include telecommunications line installers and repairers, \$41.25/hour median, and construction and building inspectors, \$33.70/hour median. On average each year, community colleges in the subregion confer 757 awards related to energy, construction, and utilities. The gap analysis reveals a shortage of 6,935 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 36: Energy, construction and utilities employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Maintenance and Repair Workers, General	9,084	9,752	668	7%	1,044
Carpenters	5,903	6,259	356	6%	705
Electricians	4,055	4,296	241	6%	554
First-Line Supervisors of Construction Trades and Extraction Workers	4,194	4,435	241	6%	503
Plumbers, Pipefitters, and Steamfitters	2,692	2,994	302	11%	374
Telecommunications Equipment Installers and Repairers, Except Line Installers	2,831	2,695	(136)	(5%)	307
Operating Engineers and Other Construction Equipment Operators	2,317	2,468	151	7%	306
Painters, Construction and Maintenance	2,455	2,467	12	0%	260
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	1,953	2,157	204	10%	242
Service Unit Operators, Oil, Gas, and Mining	1,573	1,598	25	2%	232
Cement Masons and Concrete Finishers	1,884	2,000	116	6%	228
Construction Managers	2,467	2,582	115	5%	207
Drywall and Ceiling Tile Installers	1,746	1,760	14	1%	186
Installation, Maintenance, and Repair Workers, All Other	1,214	1,288	74	6%	149
Roofers	1,098	1,166	68	6%	135
Telecommunications Line Installers and Repairers	1,104	1,106	2	0%	133
Rotary Drill Operators, Oil and Gas	843	854	11	1%	123
Solar Photovoltaic Installers	700	831	131	19%	120
Sheet Metal Workers	875	953	78	9%	114
Construction and Building Inspectors	598	638	40	7%	84

## Wages

### Exhibit 37: Energy, construction and utilities wages

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Telecommunications Line Installers and Repairers	\$35.63	\$41.25
Construction and Building Inspectors	\$25.15	\$33.70
First-Line Supervisors of Construction Trades and Extraction Workers	\$24.14	\$32.40
Electricians	\$22.49	\$30.47
Telecommunications Equipment Installers and Repairers, Except Line Installers	\$22.41	\$27.20
Construction Managers	\$22.38	\$37.64
Service Unit Operators, Oil, Gas, and Mining	\$21.09	\$26.53
Operating Engineers and Other Construction Equipment Operators	\$20.92	\$24.72
Rotary Drill Operators, Oil and Gas	\$20.10	\$27.85
Drywall and Ceiling Tile Installers	\$18.01	\$24.36
Plumbers, Pipefitters, and Steamfitters	\$17.91	\$23.92
Roofers	\$17.62	\$22.82
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$17.37	\$23.62
Sheet Metal Workers	\$17.11	\$23.86
Cement Masons and Concrete Finishers	\$16.14	\$19.37
Carpenters	\$15.50	\$21.43
Solar Photovoltaic Installers	\$15.17	\$20.41
Maintenance and Repair Workers, General	\$13.99	\$18.76
Installation, Maintenance, and Repair Workers, All Other	\$13.79	\$17.53
Painters, Construction and Maintenance	\$13.50	\$17.84
*Due to fluctuations in 10 <sup>th</sup> percentile wages, 25 <sup>th</sup> percentile wages have been used to describe entry-level wages.		

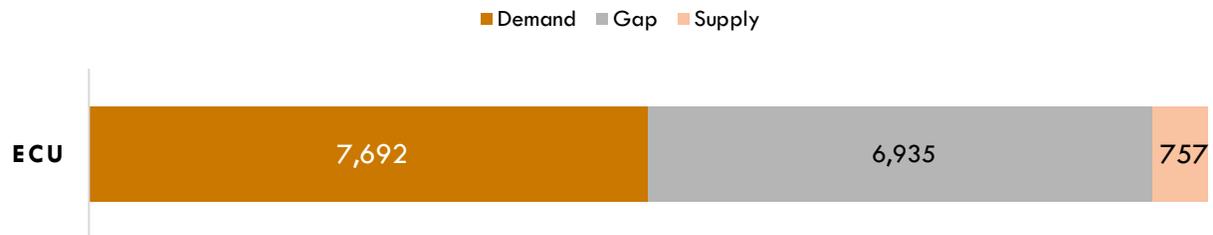
## Community College Supply

**Exhibit 38: Energy, construction and utilities community college supply**

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
093400 - Electronics and Electric Technology	52	183	171	175	194
094600 - Environmental Control Technology	325	332	291		316
094600 - Environmental Control Technology (HVAC)		48	35	104	62
095200 - Construction Crafts Technology	0	85	64	73	74
095300 - Drafting Technology	19	50	63	63	65
095640 - Sheet Metal and Structural Metal		0	5	0	2
095670 - Industrial and Occupational Safety and Health		24	16	10	17
095700 - Civil and Construction Management Technology	18	22	38	5	28
<b>Total</b>	<b>414</b>	<b>744</b>	<b>683</b>	<b>430</b>	<b>757</b>

## Gap Analysis

**Exhibit 39: Energy, construction and utilities annual demand and supply in the SCV/SML subregion**



# Education

## Summary

In the SCV/SML subregion, the largest education occupation is teacher assistants with 16,634 workers in 2018. This occupation has a projected growth rate of 8% with 2,067 annual openings. Childcare workers comprise the second largest occupation, with 9,770 workers in 2018, followed by preschool teachers (except special education), with 3,096 workers. There are projected to be 1,476 annual openings for childcare workers, even though this occupation is projected to decline by 3%. With 8% projected growth, preschool teachers is expected to offer 379 annual openings. The highest paid occupation is career/technical education teachers (secondary school), \$42.78/hour median. Kindergarten teachers (except special education) earn \$33.81/hour median. On average each year, community colleges in the subregion confer 1,416 awards related to education. The gap analysis reveals a shortage of 3,316 workers in the SCV/SML subregion.

## Employment & Occupational Demand

### Exhibit 40: Education employment and occupational projections

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Teacher Assistants	16,634	17,941	1,307	8%	2,067
Childcare Workers	9,770	9,429	(341)	(3%)	1,476
Preschool Teachers, Except Special Education	3,096	3,359	263	8%	379
Self-Enrichment Education Teachers	1,651	1,788	137	8%	223
Training and Development Specialists	1,128	1,246	118	10%	150
Library Technicians	845	847	2	0%	132
Kindergarten Teachers, Except Special Education	974	1,082	108	11%	123
Library Assistants, Clerical	480	490	10	2%	76
Career/Technical Education Teachers, Secondary School	532	595	63	12%	51
Education Administrators, Preschool and Childcare Center/Program	431	463	32	7%	42
Social Science Research Assistants	101	106	5	5%	13

## Wages

### Exhibit 41: Education wages

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Career/Technical Education Teachers, Secondary School	\$35.76	\$42.78
Kindergarten Teachers, Except Special Education	\$28.47	\$33.81
Training and Development Specialists	\$19.51	\$27.67
Library Technicians	\$16.46	\$18.61
Education Administrators, Preschool and Childcare Center/Program	\$15.14	\$20.60
Social Science Research Assistants	\$12.96	\$15.21
Teacher Assistants	\$12.67	\$15.02
Self-Enrichment Education Teachers	\$12.67	\$17.61
Library Assistants, Clerical	\$12.37	\$15.55
Preschool Teachers, Except Special Education	\$12.28	\$14.78
Childcare Workers	\$9.92	\$11.92

\*Due to fluctuations in 10<sup>th</sup> percentile wages, 25<sup>th</sup> percentile wages have been used to describe entry-level wages.

## Community College Supply

### Exhibit 42: Education community college supply

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
080200 - Educational Aide (Teacher Assistant)		10	12	4	9
130500 - Child Development/Early Care and Education		1,109	1,136	1,944	1396
160200 - Library Technician (Aide)		15	9	10	11
<b>Total</b>	<b>0</b>	<b>1,134</b>	<b>1,157</b>	<b>1,958</b>	<b>1,416</b>

## Gap Analysis

### Exhibit 43: Education annual demand and supply in the SCV/SML subregion

■ Demand ■ Gap ■ Supply



# Global Trade

## Summary

Several occupations make up the bulk of employment in the SCV/SML subregion's global trade sector. The largest occupations are general and operations managers, and sales representatives (wholesale and manufacturing, except technical and scientific products). General and operations managers is projected to undergo 8% growth and offer 1,101 annual openings. Sales representatives is expected to increase by 4% with 764 annual openings. Administrative services managers earn the highest median wages, \$44.55/hour, followed by general and operations managers, \$44.09/hour. On average each year, community colleges in the subregion confer 256 awards related to global trade. The gap analysis reveals a shortage of 2,263 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 44: Global trade employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
General and Operations Managers	10,361	11,202	841	8%	1,101
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	6,654	6,894	240	4%	764
Cost Estimators	1,645	1,745	100	6%	187
Buyers and Purchasing Agents	1,742	1,759	17	1%	178
Administrative Services Managers	1,546	1,663	117	8%	156
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	960	1,036	76	8%	122
Brokerage Clerks	101	100	(1)	(1%)	11

## Wages

**Exhibit 45: Global trade wages**

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Administrative Services Managers	\$34.02	\$44.55
General and Operations Managers	\$30.88	\$44.09
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	\$26.59	\$35.23
Cost Estimators	\$23.61	\$33.31
Brokerage Clerks	\$21.75	\$25.96
Buyers and Purchasing Agents	\$20.26	\$28.43
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	\$19.92	\$28.86

\*Due to fluctuations in 10<sup>th</sup> percentile wages, 25<sup>th</sup> percentile wages have been used to describe entry-level wages.

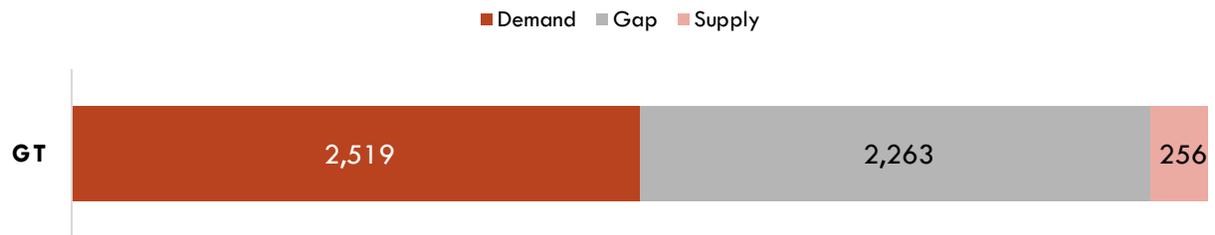
## Community College Supply

**Exhibit 46: Global trade community college supply**

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
050100 - Business and Commerce, General	1	65	73	74	71
050600 - Business Management	49	144	164	172	176
050900 - Marketing and Distribution		7	14	4	8
<b>Total</b>	<b>50</b>	<b>216</b>	<b>251</b>	<b>250</b>	<b>256</b>

## Gap Analysis

**Exhibit 47: Global trade annual demand and supply in the SCV/SML subregion**



# Health Care

## Summary

In the SCV/SML subregion, the top three largest health care occupations are registered nurses, 17,848 workers in 2018, nursing assistants, 6,240 workers, and medical assistants, 6,266 workers. These occupations are projected to undergo 11% growth and offer substantial annual openings. One occupation to note is home health aides which is expected to grow by 53%, with 425 annual openings. However, this occupation is one of the lowest wages bearing in the sector in the subregion with a median wage of \$12.42/hour. Dental hygienists earn the highest median wage in the subregion, \$43.92/hour, followed by registered nurses, \$41.49/hour. On average each year, community colleges in the subregion confer 5,662 awards related to health care. The gap analysis reveals a shortage of 2,196 health care workers in the SCV/SML subregion.

## Employment & Occupational Demand

### Exhibit 48: Health care employment and occupational projections

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Registered Nurses	17,848	19,828	1,980	11%	1,388
Nursing Assistants	6,240	6,914	674	11%	866
Medical Assistants	6,266	6,929	663	11%	852
Medical Secretaries	4,148	4,592	444	11%	574
Social and Human Service Assistants	3,609	4,187	578	16%	573
Home Health Aides	1,763	2,696	933	53%	425
Dental Assistants	3,055	3,380	325	11%	423
Licensed Practical and Licensed Vocational Nurses	3,828	4,198	370	10%	377
Pharmacy Technicians	2,730	2,886	156	6%	259
Health Technologists and Technicians, All Other	1,649	1,947	298	18%	180
Emergency Medical Technicians and Paramedics	1,582	1,782	200	13%	169
Healthcare Support Workers, All Other	1,149	1,226	77	7%	150
Psychiatric Technicians	1,383	1,527	144	10%	146
Clinical Laboratory Technologists and Technicians	1,346	1,503	157	12%	132
Massage Therapists	754	868	114	15%	116
Medical Records and Health Information Technicians	1,253	1,371	118	9%	107
Phlebotomists	651	772	121	19%	98
Dental Hygienists	972	1,112	140	14%	97
Radiologic Technologists	1,194	1,304	110	9%	90
Respiratory Therapists	960	1,071	111	12%	76

## Wages

### Exhibit 49: Health care wages

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Dental Hygienists	\$39.96	\$43.92
Registered Nurses	\$33.84	\$41.49
Psychiatric Technicians	\$29.17	\$33.03
Radiologic Technologists	\$28.92	\$35.31
Licensed Practical and Licensed Vocational Nurses	\$21.58	\$24.89
Respiratory Therapists	\$21.26	\$26.69
Clinical Laboratory Technologists and Technicians	\$19.18	\$25.23
Phlebotomists	\$16.50	\$18.39
Health Technologists and Technicians, All Other	\$15.39	\$18.77
Medical Records and Health Information Technicians	\$15.15	\$19.89
Healthcare Support Workers, All Other	\$15.09	\$17.50
Social and Human Service Assistants	\$14.93	\$17.99
Pharmacy Technicians	\$14.54	\$17.75
Medical Secretaries	\$14.49	\$17.05
Dental Assistants	\$14.16	\$17.04
Medical Assistants	\$13.16	\$15.05
Nursing Assistants	\$12.15	\$13.83
Massage Therapists	\$11.93	\$18.12
Emergency Medical Technicians and Paramedics	\$11.85	\$15.27
Home Health Aides	\$11.44	\$12.42
*Due to fluctuations in 10 <sup>th</sup> percentile wages, 25 <sup>th</sup> percentile wages have been used to describe entry-level wages.		

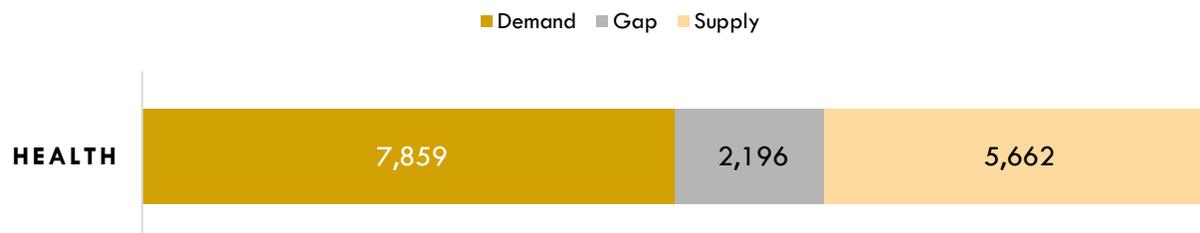
## Community College Supply

### Exhibit 50: Health care community college supply

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
083700 - Health Education		1	1	1	1
095500 - Laboratory Science Technology		0	0	2	1
120100 - Health Occupations, General	0	166	193	44	134
120500 - Medical Laboratory Technology		20	22	18	20
120600 - Physicians Assistant	22	24	0		15
120800 - Medical Assisting	2,503	2,568	2,543	100	2,571
121000 - Respiratory Care/Therapy	199	225	192	15	210
121700 - Surgical Technician	30	51	36		39
122100 - Pharmacy Technology	459	432	317	16	408
122200 - Physical Therapist Assistant		25	21	19	22
122300 - Health Information Technology	188	277	313	18	265
122400 - School Health Clerk	74	118	134		109
122500 - Radiologic Technology		66	66	63	65
122700 - Diagnostic Medical Sonography	8	13	14		12
123000 - Nursing	269	1,032	1,046	587	978
123900 - Psychiatric Technician		109	97	117	108
124000 - Dental Occupations	523	592	599	82	599
126200 - Massage Therapy	134	88	95		106
<b>Total</b>	<b>4,409</b>	<b>5,807</b>	<b>5,689</b>	<b>1,082</b>	<b>5,662</b>

## Gap Analysis

### Exhibit 51: Health care annual demand and supply in the SCV/SML subregion



# ICT & Digital Media

## Summary

ICT/digital media is the smallest sector analyzed in this report. The largest occupation in the SCV/SML subregion is computer user support specialists. This occupation employed 2,077 workers in 2018 and is projected to increase by 10% over the next five years, offering 218 annual openings. Computer occupations (all other), the second largest ICT/digital media occupation in the subregion, is projected to experience growth of 5% and will offer 148 annual openings. Computer network architects earn the highest median wage, \$45.23/hour. The lowest median wage is earned by computer, automated teller and office machine repairers, \$18.64/hour. On average each year, community colleges in the subregion confer 308 awards related to ICT and digital media. The gap analysis reveals a shortage of 476 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 52: ICT/digital media employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Computer User Support Specialists	2,077	2,276	199	10%	218
Computer Occupations, All Other	1,746	1,831	85	5%	148
Graphic Designers	814	851	37	5%	93
Network and Computer Systems Administrators	984	1,039	55	6%	83
Computer Network Support Specialists	561	601	40	7%	55
Computer, Automated Teller, and Office Machine Repairers	467	472	5	1%	55
Web Developers	392	432	40	10%	40
Surveying and Mapping Technicians	221	230	9	4%	29
Medical Equipment Repairers	190	216	26	14%	26
Computer Network Architects	241	253	12	5%	20
Media and Communication Equipment Workers, All Other	152	156	4	3%	18

## Wages

**Exhibit 53: ICT/digital media wages**

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Media and Communication Equipment Workers, All Other	\$34.73	\$44.49
Computer Network Architects	\$34.03	\$45.23
Network and Computer Systems Administrators	\$29.13	\$38.66
Computer Network Support Specialists	\$26.05	\$31.13
Computer Occupations, All Other	\$25.58	\$38.84
Surveying and Mapping Technicians	\$24.60	\$29.12
Computer User Support Specialists	\$18.77	\$23.72
Medical Equipment Repairers	\$16.06	\$19.72

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Computer, Automated Teller, and Office Machine Repairers	\$14.19	\$18.64
Web Developers	\$13.95	\$22.86
Graphic Designers	\$13.92	\$19.63

\*Due to fluctuations in 10<sup>th</sup> percentile wages, 25<sup>th</sup> percentile wages have been used to describe entry-level wages.

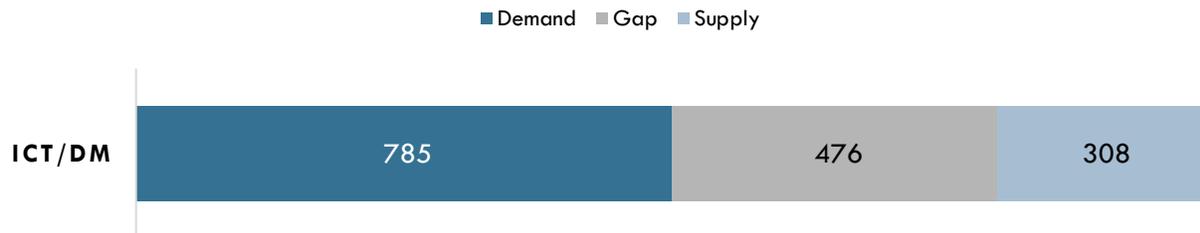
## Community College Supply

**Exhibit 54: ICT/digital media community college supply**

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
061400 - Digital Media	4	10	4	19	12
070100 - Information Technology, General	12	24	16	2	18
070200 - Computer Information Systems	0	162	172	172	169
070700 - Computer Software Development		0	16	6	7
070800 - Computer Infrastructure and Support	63	72	55	107	99
070900 - World Wide Web Administration		1	5	3	3
<b>Total</b>	<b>79</b>	<b>269</b>	<b>268</b>	<b>309</b>	<b>308</b>

## Gap Analysis

**Exhibit 55: ICT/digital media annual demand and supply in the SCV/SML subregion**



# Logistics

## Summary

In the SCV/SML subregion, heavy and tractor-trailer truck drivers comprise the largest logistics occupation. In 2018, 16,526 workers were employed in this occupation which is projected to grow by 10%, offering 2,318 annual openings. The second largest occupation, industrial truck and tractor operators, is projected to expand by 15% over the next five years, offering 732 annual openings. Shipping, receiving, and traffic clerks will also offer substantial annual openings, 471. The highest median wage is earned by airline pilots, copilots, and flight engineers, \$93.77/hour. The lowest is earned by industrial truck and tractor operators, \$15.08/hour. On average each year, community colleges in the subregion confer 63 certificates related to logistics. The gap analysis reveals a shortage of 5,062 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 56: Logistics employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Heavy and Tractor-Trailer Truck Drivers	16,526	18,230	1,704	10%	2,318
Industrial Truck and Tractor Operators	4,831	5,572	741	15%	732
Shipping, Receiving, and Traffic Clerks	3,970	4,277	307	8%	471
First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	2,915	3,252	337	12%	397
Bus Drivers, School or Special Client	2,172	2,448	276	13%	342
Aircraft Mechanics and Service Technicians	1,178	1,339	161	14%	140
Logisticians	1,268	1,312	44	3%	135
Bus Drivers, Transit and Intercity	680	764	84	12%	108
Transportation, Storage, and Distribution Managers	947	1,030	83	9%	97
Transportation Attendants, Except Flight Attendants	582	618	36	6%	87
Commercial Pilots	363	410	47	13%	49
Painters, Transportation Equipment	361	384	23	6%	45
Cargo and Freight Agents	221	279	58	26%	34
Airline Pilots, Copilots, and Flight Engineers	293	295	2	1%	33
Sailors and Marine Oilers	176	183	7	4%	24
Transportation Inspectors	192	192	0	0%	21
Captains, Mates, and Pilots of Water Vessels	154	158	4	3%	16
Railroad Conductors and Yardmasters	170	159	(11)	(6%)	16
Rail Car Repairers	127	128	1	1%	14
Flight Attendants	88	97	9	10%	12

## Wages

### Exhibit 57: Logistics wages

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Airline Pilots, Copilots, and Flight Engineers	\$54.36	\$93.77
Transportation Inspectors	\$30.29	\$33.31
Transportation, Storage, and Distribution Managers	\$29.92	\$38.82
Logisticians	\$29.90	\$39.46
Railroad Conductors and Yardmasters	\$29.07	\$34.49
Commercial Pilots	\$28.11	\$40.41
Aircraft Mechanics and Service Technicians	\$27.20	\$31.63
First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	\$20.17	\$26.80
Rail Car Repairers	\$20.04	\$25.47
Flight Attendants	\$16.41	\$20.83
Bus Drivers, Transit and Intercity	\$16.13	\$20.45
Cargo and Freight Agents	\$15.70	\$17.73
Heavy and Tractor-Trailer Truck Drivers	\$15.25	\$19.88
Sailors and Marine Oilers	\$14.81	\$19.87
Bus Drivers, School or Special Client	\$14.43	\$17.42
Painters, Transportation Equipment	\$13.75	\$17.91
Transportation Attendants, Except Flight Attendants	\$13.16	\$20.61
Industrial Truck and Tractor Operators	\$12.99	\$15.08
Shipping, Receiving, and Traffic Clerks	\$12.85	\$15.13
Captains, Mates, and Pilots of Water Vessels	\$12.81	\$19.53
*Due to fluctuations in 10 <sup>th</sup> percentile wages, 25 <sup>th</sup> percentile wages have been used to describe entry-level wages.		

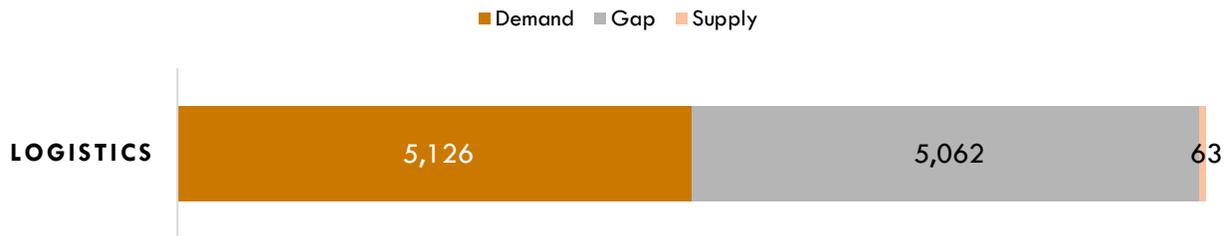
**Community College Supply**

**Exhibit 58: Logistics community college supply**

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
051000 - Logistics and Materials Transportation		25	20	21	22
095000 - Aeronautical and Aviation Technology	34	37	37	16	41
<b>Total</b>	<b>34</b>	<b>62</b>	<b>57</b>	<b>37</b>	<b>63</b>

**Gap Analysis**

**Exhibit 59: Logistics annual demand and supply in the SCV/SML subregion**



# Mechanics & Welding

## Summary

By far, the largest mechanics and welding occupation in the SCV/SML subregion is automotive service technicians and mechanics with 5,567 workers in 2018. This occupation is projected to expand by 1%, with 567 annual openings. With 2,834 workers in 2018, welders, cutters, solderers, and brazers is the second largest occupation and is projected to undergo 6% growth, offering 352 annual openings. Recreational vehicle service technicians is projected to contract by 6% through 2023, shedding 22 workers. First-line supervisors of mechanics, installers, and repairers earn the highest median wage, \$34.85/hour, followed by electronic equipment installers and repairers, motor vehicles, \$22.35/hour. On average each year, community colleges in the subregion confer 799 awards related to mechanics and welding. The gap analysis reveals a shortage of 997 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 60: Mechanics and welding employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Automotive Service Technicians and Mechanics	5,567	5,626	59	1%	567
Welders, Cutters, Solderers, and Brazers	2,834	2,992	158	6%	352
First-Line Supervisors of Mechanics, Installers, and Repairers	2,703	2,884	181	7%	293
Bus and Truck Mechanics and Diesel Engine Specialists	1,849	1,990	141	8%	207
Machinists	1,321	1,366	45	3%	149
Automotive Body and Related Repairers	774	783	9	1%	79
Recreational Vehicle Service Technicians	341	319	(22)	(6%)	37
Structural Metal Fabricators and Fitters	334	330	(4)	(1%)	35
Automotive Glass Installers and Repairers	199	207	8	4%	22
Mechanical Door Repairers	152	168	16	11%	17
Outdoor Power Equipment and Other Small Engine Mechanics	132	139	7	5%	16
Electronic Equipment Installers and Repairers, Motor Vehicles	107	99	(8)	(7%)	12
Motorboat Mechanics and Service Technicians	101	101	0	0%	11

## Wages

**Exhibit 61: Mechanics and welding wages**

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
First-Line Supervisors of Mechanics, Installers, and Repairers	\$25.84	\$34.85
Electronic Equipment Installers and Repairers, Motor Vehicles	\$17.09	\$22.35

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Recreational Vehicle Service Technicians	\$16.52	\$19.39
Bus and Truck Mechanics and Diesel Engine Specialists	\$15.93	\$21.45
Welders, Cutters, Solderers, and Brazers	\$15.58	\$19.50
Structural Metal Fabricators and Fitters	\$14.92	\$18.30
Machinists	\$14.86	\$19.62
Automotive Body and Related Repairers	\$14.52	\$19.48
Outdoor Power Equipment and Other Small Engine Mechanics	\$14.23	\$19.44
Automotive Service Technicians and Mechanics	\$13.64	\$19.24
Automotive Glass Installers and Repairers	\$12.76	\$14.18
Motorboat Mechanics and Service Technicians	\$11.44	\$16.68
Mechanical Door Repairers	\$11.05	\$13.25

\*Due to fluctuations in 10<sup>th</sup> percentile wages, 25<sup>th</sup> percentile wages have been used to describe entry-level wages.

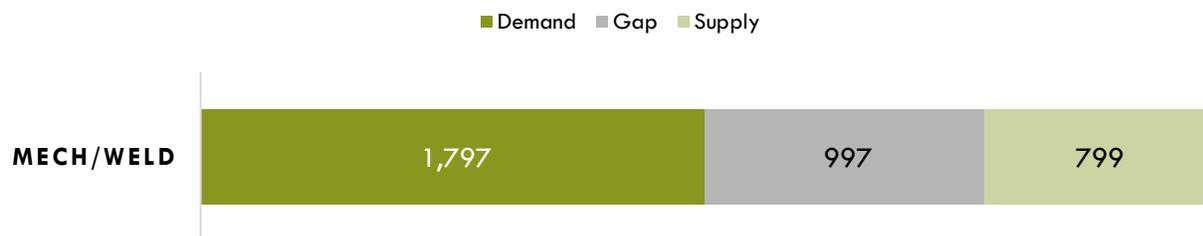
## Community College Supply

### Exhibit 62: Mechanics and welding community college supply

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
094700 - Diesel Technology	366	337	362	0	355
094800 - Automotive Technology	0	167	181	222	190
094900 - Automotive Collision Repair		14	21	17	17
095650 - Welding Technology		143	187	210	180
48.0508 - Welding Technology/Welder	42	49	80		57
<b>Total</b>	<b>408</b>	<b>710</b>	<b>831</b>	<b>449</b>	<b>799</b>

## Gap Analysis

### Exhibit 63: Mechanics and welding annual demand and supply in the SCV/SML subregion



# Protective Services

## Summary

Correctional officers and jailers comprise the largest protective services occupation in the SCV/SML subregion, with 9,177 workers in 2018. With 3% growth projected, this occupation will offer 868 annual openings. The second largest occupation is police and sheriff’s patrol officers, which is expected to undergo 6% growth, translating to 386 annual openings. The highest paid occupation is first-line supervisors of police and detectives, earning a median wage of \$68.07/hour, followed by first-line supervisors of correctional officers, \$58.50/hour. On average each year, community colleges in the subregion confer 1,617 awards related to protective services. The gap analysis reveals a shortage of 808 workers in the SCV/SML subregion.

## Employment & Occupational Demand

**Exhibit 64: Protective services employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Correctional Officers and Jailers	9,177	9,418	241	3%	868
Police and Sheriff's Patrol Officers	4,629	4,887	258	6%	386
Protective Service Workers, All Other	1,289	1,383	94	7%	339
Firefighters	2,374	2,492	118	5%	191
Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	717	768	51	7%	189
Private Detectives and Investigators	871	882	11	1%	84
First-Line Supervisors of Correctional Officers	865	885	20	2%	67
Police, Fire, and Ambulance Dispatchers	474	523	49	10%	57
Transportation Security Screeners	508	524	16	3%	52
Detectives and Criminal Investigators	531	572	41	8%	44
First-Line Supervisors of Protective Service Workers, All Other	337	341	4	1%	36
First-Line Supervisors of Police and Detectives	402	441	39	10%	34
First-Line Supervisors of Fire Fighting and Prevention Workers	299	320	21	7%	24
Forensic Science Technicians	110	125	15	14%	17
Animal Control Workers	160	167	7	4%	17
Ambulance Drivers and Attendants, Except Emergency Medical Technicians	44	62	18	41%	12
Bailiffs	105	111	6	6%	10

## Wages

**Exhibit 65: Protective services wages**

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
First-Line Supervisors of Correctional Officers	\$47.73	\$58.50
First-Line Supervisors of Police and Detectives	\$46.23	\$68.07
Detectives and Criminal Investigators	\$38.32	\$44.81
First-Line Supervisors of Fire Fighting and Prevention Workers	\$36.22	\$44.35
Correctional Officers and Jailers	\$32.09	\$42.85
Police and Sheriff's Patrol Officers	\$29.49	\$38.40
Bailiffs	\$23.95	\$27.53
Firefighters	\$22.80	\$29.88
Private Detectives and Investigators	\$22.13	\$30.94
First-Line Supervisors of Protective Service Workers, All Other	\$19.66	\$28.09
Forensic Science Technicians	\$18.59	\$26.16
Transportation Security Screeners	\$15.49	\$19.87
Protective Service Workers, All Other	\$14.15	\$17.34
Ambulance Drivers and Attendants, Except Emergency Medical Technicians	\$11.98	\$13.31
Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	\$11.61	\$15.31
Police, Fire, and Ambulance Dispatchers	\$11.36	\$13.76
Animal Control Workers	\$11.28	\$12.51

\*Due to fluctuations in 10<sup>th</sup> percentile wages, 25<sup>th</sup> percentile wages have been used to describe entry-level wages.

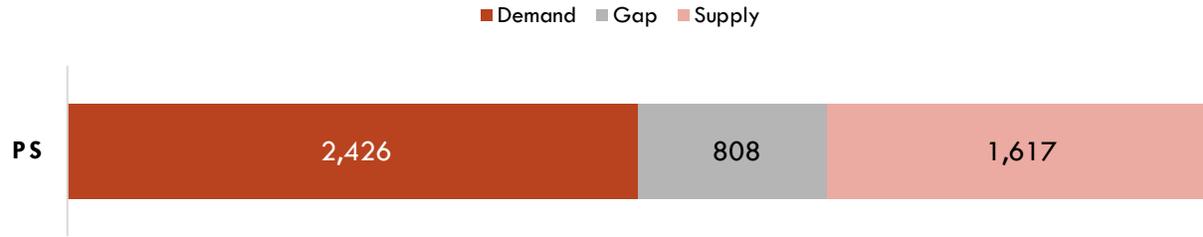
## Community College Supply

**Exhibit 66: Protective services community college supply**

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
125000 - Emergency Medical Services		151	303	297	250
210500 - Administration of Justice	326	1,115	1,000	880	1,107
213300 - Fire Technology		161	126	150	146
219900 - Other Public and Protective Services	83	149	110	1	114
<b>Total</b>	<b>409</b>	<b>1,576</b>	<b>1,539</b>	<b>1,328</b>	<b>1,617</b>

## Gap Analysis

**Exhibit 67: Protective services annual demand and supply in the SCV/SML subregion**



# Retail, Hospitality, Tourism & Entertainment

## Summary

The analysis of the retail, hospitality, tourism, and entertainment sector broke the sector into two subsectors: retail as the first sector, and hospitality, tourism, and entertainment as the second sector. The largest retail occupation in the SCV/SML subregion is customer service representatives with 8,866 workers in 2018. This occupation is projected to increase by 8%, offering 1,368 annual openings. The largest occupation in the hospitality, tourism, and entertainment sector is cooks (restaurant) with 6,191 workers in 2018. With a strong growth projection of 14%, this occupation will offer 1,105 annual openings. The highest paid retail occupation is precision instrument and equipment repairers (all other) with a median wage of \$24.57/hour. The highest paid hospitality, tourism, and entertainment occupation is radio and television announcers with a median wage of \$36.80/hour. On average each year, community colleges in the subregion confer 1,738 awards related to retail, hospitality, tourism, and entertainment. The combined gap in supply totals 8,805 workers.

## Employment & Occupational Demand

### Exhibit 68: Retail employment and occupational projections

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Customer Service Representatives	8,866	9,582	716	8%	1,368
First-Line Supervisors of Retail Sales Workers	9,380	9,447	67	1%	1,081
Sales Representatives, Services, All Other	5,064	5,446	382	8%	739
Hairdressers, Hairstylists, and Cosmetologists	3,982	4,309	327	8%	582
Insurance Sales Agents	4,157	4,349	192	5%	465
First-Line Supervisors of Personal Service Workers	1,675	1,961	286	17%	232
Manicurists and Pedicurists	1,043	1,199	156	15%	158
Demonstrators and Product Promoters	620	633	13	2%	113
Barbers	637	734	97	15%	95
Advertising Sales Agents	604	584	(20)	(3%)	84
Skincare Specialists	513	578	65	13%	75
Merchandise Displayers and Window Trimmers	431	452	21	5%	49
Security and Fire Alarm Systems Installers	320	329	9	3%	42
Floral Designers	311	290	(21)	(7%)	31
Designers, All Other	242	250	8	3%	27
Funeral Attendants	151	155	4	3%	26
Home Appliance Repairers	202	216	14	7%	26
Interior Designers	161	173	12	7%	19
Set and Exhibit Designers	161	168	7	4%	18

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Precision Instrument and Equipment Repairers, All Other	137	142	5	4%	16

**Exhibit 69: Hospitality, tourism and entertainment employment and occupational projections**

Occupation	2018	2023	5-Year Change	5-Year % Change	Annual Openings
Cooks, Restaurant	6,191	7,088	897	14%	1,105
First-Line Supervisors of Food Preparation and Serving Workers	4,978	5,642	664	13%	937
Cooks, Institution and Cafeteria	2,416	2,621	205	8%	394
Food Service Managers	2,448	2,587	139	6%	322
Fitness Trainers and Aerobics Instructors	1,593	1,732	139	9%	305
Gaming Dealers	1,477	1,423	(54)	(4%)	231
Bakers	1,173	1,221	48	4%	175
Butchers and Meat Cutters	1,059	1,100	41	4%	142
First-Line Supervisors of Housekeeping and Janitorial Workers	963	1,090	127	13%	141
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	924	976	52	6%	114
Chefs and Head Cooks	682	743	61	9%	105
Interpreters and Translators	782	839	57	7%	93
Audio and Video Equipment Technicians	559	605	46	8%	72
Tour and Travel Guides	323	360	37	11%	58
Photographers	532	521	(11)	(2%)	56
Meeting, Convention, and Event Planners	379	420	41	11%	53
Lodging Managers	299	304	5	2%	35
Radio and Television Announcers	280	265	(15)	(5%)	34
Multimedia Artists and Animators	237	232	(5)	(2%)	26
Gaming Service Workers, All Other	183	158	(25)	(14%)	26

**Wages**

**Exhibit 70: Retail wages**

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Security and Fire Alarm Systems Installers	\$18.70	\$23.35
Sales Representatives, Services, All Other	\$15.17	\$22.85
Precision Instrument and Equipment Repairers, All Other	\$14.81	\$24.57
Insurance Sales Agents	\$13.80	\$21.64
First-Line Supervisors of Retail Sales Workers	\$13.73	\$18.16
Advertising Sales Agents	\$13.64	\$23.90

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
First-Line Supervisors of Personal Service Workers	\$13.19	\$16.87
Home Appliance Repairers	\$12.87	\$17.46
Funeral Attendants	\$12.49	\$16.21
Customer Service Representatives	\$12.21	\$14.92
Designers, All Other	\$11.76	\$23.69
Demonstrators and Product Promoters	\$11.29	\$14.74
Floral Designers	\$11.23	\$13.95
Merchandise Displayers and Window Trimmers	\$11.18	\$12.95
Interior Designers	\$11.14	\$17.17
Skincare Specialists	\$11.04	\$13.04
Hairdressers, Hairstylists, and Cosmetologists	\$11.00	\$13.88
Manicurists and Pedicurists	\$11.00	\$11.91
Set and Exhibit Designers	\$11.00	\$15.65
Barbers	\$8.67	\$11.37
*Due to fluctuations in 10 <sup>th</sup> percentile wages, 25 <sup>th</sup> percentile wages have been used to describe entry-level wages.		

**Exhibit 71: Hospitality, tourism and entertainment wages**

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Interpreters and Translators	\$22.27	\$28.95
Radio and Television Announcers	\$19.98	\$36.80
Fitness Trainers and Aerobics Instructors	\$15.43	\$24.88
Food Service Managers	\$14.89	\$19.32
Multimedia Artists and Animators	\$14.66	\$28.31
Meeting, Convention, and Event Planners	\$14.64	\$19.97
Lodging Managers	\$14.03	\$24.03
First-Line Supervisors of Housekeeping and Janitorial Workers	\$13.88	\$19.51
Chefs and Head Cooks	\$13.52	\$17.74
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	\$13.27	\$20.28
Audio and Video Equipment Technicians	\$13.19	\$20.48
Cooks, Institution and Cafeteria	\$13.17	\$15.72
First-Line Supervisors of Food Preparation and Serving Workers	\$12.32	\$14.81
Bakers	\$11.96	\$13.73
Cooks, Restaurant	\$11.86	\$13.45
Butchers and Meat Cutters	\$11.74	\$14.21
Photographers	\$11.69	\$19.06
Tour and Travel Guides	\$11.40	\$15.27

Occupation	25th Percentile Hourly Wages*	Median Hourly Wages
Gaming Dealers	\$11.15	\$11.79
Gaming Service Workers, All Other	\$1.49	\$12.02

\*Due to fluctuations in 10<sup>th</sup> percentile wages, 25<sup>th</sup> percentile wages have been used to describe entry-level wages.

## Community College Supply

### Exhibit 72: Retail community college supply

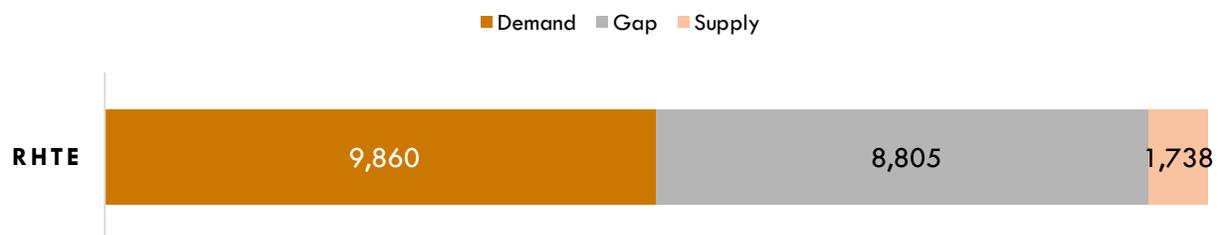
TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
300700 - Cosmetology and Barbering	715	624	709		683

### Exhibit 73: Hospitality, tourism and entertainment community college supply

TOP4 or CIP Code and Program Title	2014-15	2015-16	2016-17	2017-18	Latest 3-Year Average
100500 - Commercial Music		5	5	16	9
100600 - Technical Theater		1	3	0	1
101200 - Applied Photography		28	22	29	26
101300 - Commercial Art		0	2	6	3
103000 - Graphic Art and Design	1	39	49	44	44
130300 - Fashion		13	9	28	17
130600 - Nutrition, Foods, and Culinary Arts	227	204	154	38	208
130700 - Hospitality		92	49	54	65
300700 - Cosmetology and Barbering	715	624	709		683
<b>Total</b>	<b>943</b>	<b>1,006</b>	<b>1,002</b>	<b>215</b>	<b>1,055</b>

## Gap Analysis

### Exhibit 74: Retail annual supply and demand in the SCV/SML subregion



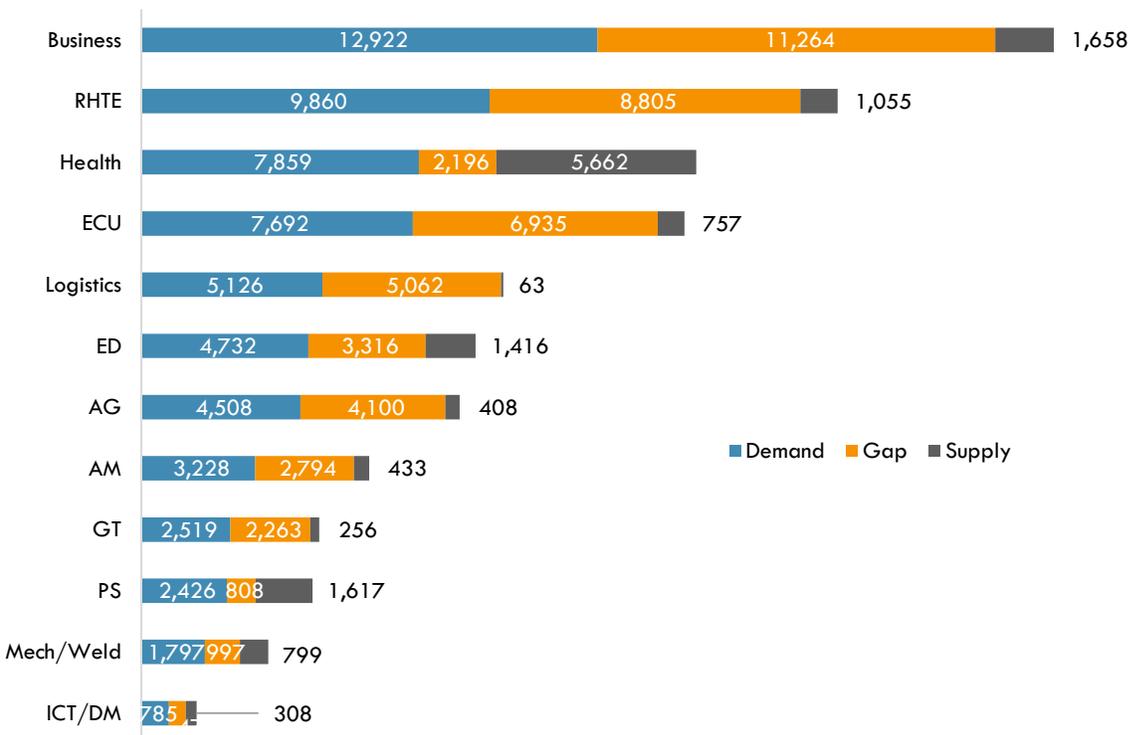
# Gap Analysis Summary

Nearly 63,500 annual openings are projected for the 12 sectors. Overall, there is a supply gap of 49,017 workers in the SCV/SML region. The sectors with the largest supply gaps are business; retail, hospitality, trade, and entertainment; and energy, construction, and utilities (Exhibits 75 and 76).

**Exhibit 75: Gap analysis for all 12 sectors**

Sector	Demand	Gap	Supply
Business	12,922	11,264	1,658
Retail, Hospitality, Tourism & Entertainment	9,860	8,805	1,055
Energy, Construction & Utilities	7,692	6,935	757
Logistics	5,126	5,062	63
Agriculture, Water & Environmental Technologies	4,508	4,100	408
Education	4,732	3,316	1,416
Advanced Manufacturing	3,228	2,794	433
Global Trade	2,519	2,263	256
Health Care	7,859	2,196	5,662
Mechanics & Welding	1,797	997	799
Protective Service	2,426	808	1,617
ICT/Digital Media	785	476	308
<b>Total</b>	<b>63,451</b>	<b>49,017</b>	<b>14,434</b>

**Exhibit 76: Chart representing gap analysis for all 12 sectors**



# Conclusion & Recommendations

In the SCV/SML subregion, the 12 sectors detailed in this study are projected to offer 63,451 job openings each year for middle-skill occupations. By comparison, community colleges in the subregion are conferring 14,434 awards on average each year. An undersupply of approximately 49,000 workers exists in the region.

The business sector has the largest number of middle-skill annual openings in the SCV/SML subregion, nearly 13,000. Regionally, the business sector accounts for 20% of the current gap in supply. When global trade, a subset of the business sector, is added to the total business percentage, the gap jumps to 24% in the region. Business occupations in high demand are office clerks (general); secretaries and administrative assistants (except legal, medical, and executive); bookkeeping, accounting, and auditing clerks; and first-line supervisors of office and administrative support workers. Community colleges are strongly encouraged to increase the completion rates of business students and agriculture business students.

Another area of need is the retail, hospitality, trade, and entertainment sector. In the SCV/SML subregion, the retail, hospitality, trade, and entertainment sector has the second largest supply gap in the subregion, an undersupply of 8,805 workers. This sector is projected to have 9,860 annual openings. By comparison, community colleges confer 1,055 awards on average each year. Occupations with strong demand for workers include customer service representatives, first-line supervisors of retail sales workers, cooks (restaurant), and first-line supervisors of food preparation and serving workers. Each of these occupations has 1,000 or more projected annual openings.

Two other sectors that also warrant attention due to substantial supply gaps are: logistics; and energy, construction, and utilities. Annual openings for the energy, construction, and utilities sector total 7,700, and 5,100 for logistics. The undersupply of workers for energy, construction, and utilities totals nearly 7,000 workers; for logistics that number is 5,000. By comparison, community colleges in the subregion, confer only 63 awards on average each year related to logistics and 757 awards related to energy, construction, and utilities. Given the large supply gaps in these sectors, the community colleges are encouraged to expand existing programs or develop new programs to meet employer demand.

Within the energy, construction, and utilities sector, occupations worth noting are:

- Maintenance and repair workers (general), 7% growth, 1,044 annual openings
- Carpenters, 6% growth, 705 annual openings
- Electricians, 6% growth, 554 annual openings

Within the logistics sector, there are three occupations with a high number of annual openings, which community colleges may want to target for programs:

- Heavy and tractor-trailer truck drivers, 10% growth, 2,318 annual openings
- Industrial truck and tractor operators, 15% growth, 732 annual openings
- Shipping, receiving, and traffic clerks, 8% growth, 471 annual openings

Future planning efforts by community colleges also should take into consideration occupations with the most annual openings in the SCV/SML subregion:

- Heavy and tractor-trailer truck drivers, 2,318 annual openings
- Office clerks (general), 2,449 annual openings
- Teacher assistants, 2,067 annual openings.
- Farmers, ranchers, and other agricultural managers, 1,687 annual openings

# Appendix A: Methodology & Data Sources

## Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor’s Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry: <a href="http://economicmodeling.com">economicmodeling.com</a> .
Living Wage	A living wage calculator that estimates the cost of living in a specific community or subregion: <a href="http://livingwage.mit.edu">livingwage.mit.edu</a> .
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: <a href="http://www.bls.gov/emp/ep_education_tech.htm">www.bls.gov/emp/ep_education_tech.htm</a> .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division, <a href="http://labormarketinfo.edd.ca.gov">labormarketinfo.edd.ca.gov</a>
Job Posting and Skills Data	Burning Glass, <a href="http://www.burning-glass.com/">http://www.burning-glass.com/</a>
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledges, work activities and interests associated with specific occupations: <a href="http://www.onetonline.org">www.onetonline.org</a>

## Key Terms and Concepts

**Annual Job Openings:** Annual openings are calculated by dividing the number of years in the projection period by total job openings.

**Education Attainment Level:** The highest education attainment level of workers age 25 years or older.

**Employment Estimate:** The total number of workers currently employed.

**Employment Projections:** Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

**Living Wage:** The cost of living in a specific community or subregion for one adult and no children. The cost increases with the addition of children.

**Occupation:** An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

**Percent Change:** Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

**Replacements:** Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

**Total Job Openings (New + Replacements):** Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs or retain the current employment level, number of openings will equal replacements.

**Typical Education Requirement:** represents the typical education level most workers need to enter an occupation.

**Typical On-The-Job Training:** indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.

**Wages Family Compositions:** The living wage calculator estimates the living wage needed to support families. For single adult families, the adult is assumed to be employed full time. For two adult families where both adults are in the labor force, both adults are assumed to be employed full time. For two adult families where one adult is not in the labor force, one of the adults is assumed to be employed full time while the other non-wage-earning adult provides full-time child care for the family's children. Full-time work is assumed to be year-round, 40 hours per week for 52 weeks, per adult. Families with one child are assumed to have a 'young child' (4 years old). Families with two children are assumed to have a 'young child' and a 'child' (9 years old). Families with three children are assumed to have a 'young child,' a 'child,' and a 'teenager' (15 years old).

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# Appendix B: Typical Education, Training & Experience for Occupations in All Industries

**Exhibit 1B: Agriculture, water and environmental technologies educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	5 years or more	None	28.9%
Agricultural Equipment Operators	No formal educational credential	None	Moderate-term	12.7%
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High school diploma or equivalent	Less than 5 years	None	22.8%
Mobile Heavy Equipment Mechanics, Except Engines	High school diploma or equivalent	None	Long-term	37.0%
Compliance Officers	Bachelor's degree	None	Moderate-term	28.3%
Pest Control Workers	High school diploma or equivalent	None	Moderate-term	39.0%
Farm Equipment Mechanics and Service Technicians	High school diploma or equivalent	None	Long-term	37.0%
Water and Wastewater Treatment Plant and System Operators	High school diploma or equivalent	None	Long-term	45.4%
Agricultural Inspectors	Bachelor's degree	None	Moderate-term	28.7%
Pesticide Handlers, Sprayers, and Applicators, Vegetation	High school diploma or equivalent	None	Moderate-term	19.7%
Forest and Conservation Technicians	Associate's degree	None	None	33.9%
Animal Trainers	High school diploma or equivalent	None	Moderate-term	35.4%
Forest and Conservation Workers	High school diploma or equivalent	None	Moderate-term	31.3%
Agricultural and Food Science Technicians	Associate's degree	None	Moderate-term	36.3%
Veterinary Assistants and Laboratory Animal Caretakers	High school diploma or equivalent	None	Short-term	47.1%
Veterinary Technologists and Technicians	Associate's degree	None	None	56.4%
Life, Physical, and Social Science Technicians, All Other	Associate's degree	None	None	33.9%
Animal Breeders	High school diploma or equivalent	None	Short-term	12.7%
Food Scientists and Technologists	Bachelor's degree	None	None	18.9%
Logging Equipment Operators	High school diploma or equivalent	None	Moderate-term	14.9%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	5 years or more	None	28.9%

**Exhibit 2B: Advanced manufacturing educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Packaging and Filling Machine Operators and Tenders	High school diploma or equivalent	None	Moderate-term	18.6%
Industrial Machinery Mechanics	High school diploma or equivalent	None	Long-term	41.7%
First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	Less than 5 years	None	35.3%
Inspectors, Testers, Sorters, Samplers, and Weighers	High school diploma or equivalent	None	Moderate-term	37.7%
Production Workers, All Other	High school diploma or equivalent	None	Moderate-term	26.7%
Production, Planning, and Expediting Clerks	High school diploma or equivalent	None	Moderate-term	40.1%
Mixing and Blending Machine Setters, Operators, and Tenders	High school diploma or equivalent	None	Moderate-term	27.1%
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	High school diploma or equivalent	None	Moderate-term	40.7%
Electrical and Electronics Engineering Technicians	Associate's degree	None	None	55.1%
Engineering Technicians, Except Drafters, All Other	Associate's degree	None	None	55.1%
Maintenance Workers, Machinery	High school diploma or equivalent	None	Long-term	34.5%
Industrial Production Managers	Bachelor's degree	5 years or more	None	32.7%
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	High school diploma or equivalent	None	Moderate-term	16.6%
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	High school diploma or equivalent	None	Moderate-term	26.8%
Sawing Machine Setters, Operators, and Tenders, Wood	High school diploma or equivalent	None	Moderate-term	18.7%
Chemical Equipment Operators and Tenders	High school diploma or equivalent	None	Moderate-term	40.7%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	High school diploma or equivalent	None	Moderate-term	25.8%
Stationary Engineers and Boiler Operators	High school diploma or equivalent	None	Long-term	42.1%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	High school diploma or equivalent	None	Moderate-term	27.9%
Conveyor Operators and Tenders	No formal educational credential	None	Short-term	27.3%

### Exhibit 3B: Business educational attainment

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Office Clerks, General	High school diploma or equivalent	None	Short-term	45.6%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	High school diploma or equivalent	None	Short-term	47.5%
Bookkeeping, Accounting, and Auditing Clerks	Some college, no degree	None	Moderate-term	48.8%
First-Line Supervisors of Office and Administrative Support Workers	High school diploma or equivalent	Less than 5 years	None	40.8%
Receptionists and Information Clerks	High school diploma or equivalent	None	Short-term	46.1%
Business Operations Specialists, All Other	Bachelor's degree	None	None	27.9%
Billing and Posting Clerks	High school diploma or equivalent	None	Moderate-term	49.6%
Office and Administrative Support Workers, All Other	High school diploma or equivalent	None	Short-term	42.7%
Tellers	High school diploma or equivalent	None	Short-term	44.5%
Information and Record Clerks, All Other	High school diploma or equivalent	None	Short-term	51.5%
Eligibility Interviewers, Government Programs	High school diploma or equivalent	None	Moderate-term	38.4%
Executive Secretaries and Executive Administrative Assistants	High school diploma or equivalent	Less than 5 years	None	47.5%
Insurance Claims and Policy Processing Clerks	High school diploma or equivalent	None	Moderate-term	46.5%
Real Estate Sales Agents	High school diploma or equivalent	None	Moderate-term	37.9%
First-Line Supervisors of Non-Retail Sales Workers	High school diploma or equivalent	Less than 5 years	None	32.2%
Data Entry Keyers	High school diploma or equivalent	None	Short-term	46.3%
Dispatchers, Except Police, Fire, and Ambulance	High school diploma or equivalent	None	Moderate-term	47.6%
Interviewers, Except Eligibility and Loan	High school diploma or equivalent	None	Short-term	49.5%
Payroll and Timekeeping Clerks	High school diploma or equivalent	None	Moderate-term	51.3%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Property, Real Estate, and Community Association Managers	High school diploma or equivalent	Less than 5 years	None	36.7%

**Exhibit 4B: Energy, construction and utilities educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Maintenance and Repair Workers, General	High school diploma or equivalent	None	Moderate-term	38.2%
Carpenters	High school diploma or equivalent	None	Apprenticeship	25.9%
Electricians	High school diploma or equivalent	None	Apprenticeship	47.3%
First-Line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	5 years or more	None	32.8%
Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	None	Apprenticeship	31.4%
Telecommunications Equipment Installers and Repairers, Except Line Installers	Postsecondary nondegree award	None	Moderate-term	52.8%
Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	None	Moderate-term	24.3%
Painters, Construction and Maintenance	No formal educational credential	None	Moderate-term	20.5%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Postsecondary nondegree award	None	Long-term	43.9%
Service Unit Operators, Oil, Gas, and Mining	No formal educational credential	None	Moderate-term	28.8%
Cement Masons and Concrete Finishers	No formal educational credential	None	Moderate-term	15.2%
Construction Managers	Bachelor's degree	None	Moderate-term	32.8%
Drywall and Ceiling Tile Installers	No formal educational credential	None	Moderate-term	15.4%
Installation, Maintenance, and Repair Workers, All Other	High school diploma or equivalent	None	Moderate-term	35.0%
Roofers	No formal educational credential	None	Moderate-term	13.7%
Telecommunications Line Installers and Repairers	High school diploma or equivalent	None	Long-term	47.2%
Rotary Drill Operators, Oil and Gas	No formal educational credential	None	Moderate-term	28.8%
Solar Photovoltaic Installers	High school diploma or equivalent	None	Moderate-term	28.0%
Sheet Metal Workers	High school diploma or equivalent	None	Apprenticeship	34.4%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Construction and Building Inspectors	High school diploma or equivalent	5 years or more	Moderate-term	44.5%

**Exhibit 5B: Educational attainment in the education sector**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Teacher Assistants	Some college, no degree	None	None	43.7%
Childcare Workers	High school diploma or equivalent	None	Short-term	36.7%
Preschool Teachers, Except Special Education	Associate's degree	None	None	37.8%
Self-Enrichment Education Teachers	High school diploma or equivalent	Less than 5 years	None	26.7%
Training and Development Specialists	Bachelor's degree	Less than 5 years	None	33.7%
Library Technicians	Postsecondary nondegree award	None	None	26.1%
Kindergarten Teachers, Except Special Education	Bachelor's degree	None	None	37.8%
Library Assistants, Clerical	High school diploma or equivalent	None	Short-term	37.6%
Career/Technical Education Teachers, Secondary School	Bachelor's degree	Less than 5 years	None	4.8%
Education Administrators, Preschool and Childcare Center/Program	Bachelor's degree	Less than 5 years	None	13.0%
Social Science Research Assistants	Bachelor's degree	None	None	33.9%

**Exhibit 6B: Global trade educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
General and Operations Managers	Bachelor's degree	5 years or more	None	34.8%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	High school diploma or equivalent	None	Moderate-term	31.6%
Cost Estimators	Bachelor's degree	None	Moderate-term	40.8%
Buyers and Purchasing Agents	Bachelor's degree	None	Moderate-term	33.0%
Administrative Services Managers	Bachelor's degree	Less than 5 years	None	42.0%
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Bachelor's degree	None	Moderate-term	31.6%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Brokerage Clerks	High school diploma or equivalent	None	Moderate-term	36.8%

**Exhibit 7B: Health care educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Registered Nurses	Bachelor's degree	None	None	42.1%
Nursing Assistants	Postsecondary nondegree award	None	None	41.7%
Medical Assistants	Postsecondary nondegree award	None	None	65.0%
Medical Secretaries	High school diploma or equivalent	None	Moderate-term	47.5%
Social and Human Service Assistants	High school diploma or equivalent	None	Short-term	40.0%
Home Health Aides	High school diploma or equivalent	None	Short-term	41.7%
Dental Assistants	Postsecondary nondegree award	None	None	58.3%
Licensed Practical and Licensed Vocational Nurses	Postsecondary nondegree award	None	None	74.1%
Pharmacy Technicians	High school diploma or equivalent	None	Moderate-term	56.4%
Health Technologists and Technicians, All Other	Postsecondary nondegree award	None	None	45.4%
Emergency Medical Technicians and Paramedics	Postsecondary nondegree award	None	None	68.3%
Healthcare Support Workers, All Other	High school diploma or equivalent	None	None	38.1%
Psychiatric Technicians	Postsecondary nondegree award	Less than 5 years	Short-term	56.4%
Clinical Laboratory Technologists and Technicians	Bachelor's degree	None	None	39.3%
Massage Therapists	Postsecondary nondegree award	None	None	54.0%
Medical Records and Health Information Technicians	Postsecondary nondegree award	None	None	54.9%
Phlebotomists	Postsecondary nondegree award	None	None	61.1%
Dental Hygienists	Associate's degree	None	None	60.8%
Radiologic Technologists	Associate's degree	None	None	66.1%
Respiratory Therapists	Associate's degree	None	None	69.9%

**Exhibit 8B: Hospitality, tourism and entertainment educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Cooks, Restaurant	No formal educational credential	Less than 5 years	Moderate-term	23.4%
First-Line Supervisors of Food Preparation and Serving Workers	High school diploma or equivalent	Less than 5 years	None	37.9%
Cooks, Institution and Cafeteria	No formal educational credential	None	Short-term	23.4%
Food Service Managers	High school diploma or equivalent	Less than 5 years	None	37.7%
Gaming Dealers	High school diploma or equivalent	None	Short-term	39.7%
Bakers	No formal educational credential	None	Long-term	27.8%
Butchers and Meat Cutters	No formal educational credential	None	Long-term	20.5%
First-Line Supervisors of Housekeeping and Janitorial Workers	High school diploma or equivalent	Less than 5 years	None	35.2%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	High school diploma or equivalent	Less than 5 years	None	32.9%
Chefs and Head Cooks	High school diploma or equivalent	5 years or more	None	39.4%
Interpreters and Translators	Bachelor's degree	None	None	36.0%
Audio and Video Equipment Technicians	Postsecondary nondegree award	None	Short-term	44.6%
Tour and Travel Guides	High school diploma or equivalent	None	Moderate-term	36.9%
Photographers	High school diploma or equivalent	None	Moderate-term	33.0%
Meeting, Convention, and Event Planners	Bachelor's degree	None	None	24.9%
Lodging Managers	High school diploma or equivalent	Less than 5 years	None	33.4%
Radio and Television Announcers	Bachelor's degree	None	None	42.0%
Multimedia Artists and Animators	Bachelor's degree	None	None	27.4%
Gaming Service Workers, All Other	High school diploma or equivalent	None	Short-term	39.7%
Fitness Trainers and Aerobics Instructors	High school diploma or equivalent	None	Short-term	34.1%

**Exhibit 9B: ICT/digital media educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Computer User Support Specialists	Some college, no degree	None	None	45.2%
Computer Occupations, All Other	Bachelor's degree	None	None	36.9%
Graphic Designers	Bachelor's degree	None	None	30.3%
Network and Computer Systems Administrators	Bachelor's degree	None	None	39.5%
Computer Network Support Specialists	Associate's degree	None	None	45.2%
Computer, Automated Teller, and Office Machine Repairers	Some college, no degree	None	Short-term	53.1%
Web Developers	Associate's degree	None	None	27.2%
Surveying and Mapping Technicians	High school diploma or equivalent	None	Moderate-term	58.5%
Medical Equipment Repairers	Associate's degree	None	Moderate-term	54.4%
Computer Network Architects	Bachelor's degree	5 years or more	None	37.0%
Media and Communication Equipment Workers, All Other	High school diploma or equivalent	None	Short-term	44.6%

**Exhibit 10B: Logistics educational attainment**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Heavy and Tractor-Trailer Truck Drivers	Postsecondary nondegree award	None	Short-term	28.3%
Industrial Truck and Tractor Operators	No formal educational credential	None	Short-term	24.2%
Shipping, Receiving, and Traffic Clerks	High school diploma or equivalent	None	Short-term	32.9%
First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	High school diploma or equivalent	Less than 5 years	None	38.1%
Bus Drivers, School or Special Client	High school diploma or equivalent	None	Short-term	36.1%
Aircraft Mechanics and Service Technicians	Postsecondary nondegree award	None	None	60.0%
Logisticians	Bachelor's degree	None	None	38.8%
Bus Drivers, Transit and Intercity	High school diploma or equivalent	None	Moderate-term	36.1%
Transportation, Storage, and Distribution Managers	High school diploma or equivalent	5 years or more	None	34.5%
Transportation Attendants, Except Flight Attendants	High school diploma or equivalent	None	Short-term	35.6%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Commercial Pilots	High school diploma or equivalent	None	Moderate-term	20.5%
Painters, Transportation Equipment	High school diploma or equivalent	None	Moderate-term	27.1%
Cargo and Freight Agents	High school diploma or equivalent	None	Short-term	46.0%
Airline Pilots, Copilots, and Flight Engineers	Bachelor's degree	Less than 5 years	Moderate-term	20.5%
Sailors and Marine Oilers	No formal educational credential	None	Moderate-term	27.0%
Transportation Inspectors	High school diploma or equivalent	None	Moderate-term	46.7%
Captains, Mates, and Pilots of Water Vessels	Postsecondary nondegree award	Less than 5 years	None	35.7%
Railroad Conductors and Yardmasters	High school diploma or equivalent	None	Moderate-term	48.4%
Rail Car Repairers	High school diploma or equivalent	None	Long-term	37.0%
Flight Attendants	High school diploma or equivalent	Less than 5 years	Moderate-term	47.3%

#### Exhibit 11B: Mechanics and welding educational attainment

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	None	Moderate-term	28.2%
First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	Less than 5 years	None	42.9%
Bus and Truck Mechanics and Diesel Engine Specialists	High school diploma or equivalent	None	Long-term	34.8%
Machinists	High school diploma or equivalent	None	Long-term	38.8%
Recreational Vehicle Service Technicians	High school diploma or equivalent	None	Long-term	21.8%
Structural Metal Fabricators and Fitters	High school diploma or equivalent	None	Moderate-term	34.7%
Mechanical Door Repairers	High school diploma or equivalent	None	Moderate-term	49.1%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Outdoor Power Equipment and Other Small Engine Mechanics	High school diploma or equivalent	None	Moderate-term	34.5%
Motorboat Mechanics and Service Technicians	High school diploma or equivalent	None	Long-term	34.5%
Automotive Service Technicians and Mechanics	Postsecondary nondegree award	None	Short-term	33.4%
Automotive Body and Related Repairers	High school diploma or equivalent	None	Long-term	26.1%
Automotive Glass Installers and Repairers	High school diploma or equivalent	None	Moderate-term	23.1%
Electronic Equipment Installers and Repairers, Motor Vehicles	High school diploma or equivalent	None	Moderate-term	38.5%

#### Exhibit 12B: Protective services educational attainment

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Correctional Officers and Jailers	High school diploma or equivalent	None	Moderate-term	52.4%
Police and Sheriff's Patrol Officers	High school diploma or equivalent	None	Moderate-term	51.6%
Protective Service Workers, All Other	High school diploma or equivalent	None	Short-term	36.4%
Firefighters	Postsecondary nondegree award	None	Long-term	63.6%
Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	No formal educational credential	None	Short-term	36.4%
Private Detectives and Investigators	High school diploma or equivalent	Less than 5 years	Moderate-term	32.1%
First-Line Supervisors of Correctional Officers	High school diploma or equivalent	Less than 5 years	None	46.3%
Police, Fire, and Ambulance Dispatchers	High school diploma or equivalent	None	Moderate-term	47.6%
Transportation Security Screeners	High school diploma or equivalent	None	Short-term	49.5%
Detectives and Criminal Investigators	High school diploma or equivalent	Less than 5 years	Moderate-term	35.2%
First-Line Supervisors of Protective Service Workers, All Other	High school diploma or equivalent	Less than 5 years	None	43.1%
First-Line Supervisors of Police and Detectives	High school diploma or equivalent	Less than 5 years	Moderate-term	43.4%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
First-Line Supervisors of Fire Fighting and Prevention Workers	Postsecondary nondegree award	Less than 5 years	Moderate-term	59.2%
Forensic Science Technicians	Bachelor's degree	None	Moderate-term	33.9%
Animal Control Workers	High school diploma or equivalent	None	Moderate-term	40.5%
Ambulance Drivers and Attendants, Except Emergency Medical Technicians	High school diploma or equivalent	None	Moderate-term	38.2%
Bailiffs	High school diploma or equivalent	None	Moderate-term	52.4%

### Exhibit 13B: Retail educational attainment

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Customer Service Representatives	High school diploma or equivalent	None	Short-term	43.7%
First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	Less than 5 years	None	38.1%
Sales Representatives, Services, All Other	High school diploma or equivalent	None	Moderate-term	34.3%
Hairdressers, Hairstylists, and Cosmetologists	Postsecondary nondegree award	None	None	41.6%
Insurance Sales Agents	High school diploma or equivalent	None	Moderate-term	35.6%
First-Line Supervisors of Personal Service Workers	High school diploma or equivalent	Less than 5 years	None	37.6%
Manicurists and Pedicurists	Postsecondary nondegree award	None	None	30.2%
Demonstrators and Product Promoters	No formal educational credential	None	Short-term	36.4%
Barbers	Postsecondary nondegree award	None	None	34.0%
Advertising Sales Agents	High school diploma or equivalent	None	Moderate-term	30.1%
Skincare Specialists	Postsecondary nondegree award	None	None	30.2%

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Merchandise Displayers and Window Trimmers	High school diploma or equivalent	None	Short-term	30.3%
Security and Fire Alarm Systems Installers	High school diploma or equivalent	None	Moderate-term	47.2%
Floral Designers	High school diploma or equivalent	None	Moderate-term	30.3%
Designers, All Other	Bachelor's degree	None	None	30.3%
Funeral Attendants	High school diploma or equivalent	None	Short-term	51.9%
Home Appliance Repairers	High school diploma or equivalent	None	Moderate-term	37.6%
Interior Designers	Bachelor's degree	None	None	30.3%
Set and Exhibit Designers	Bachelor's degree	None	None	30.3%
Precision Instrument and Equipment Repairers, All Other	High school diploma or equivalent	None	Long-term	54.4%