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# REGIONAL LABOR MARKET ASSESSMENT

## GREATER SACRAMENTO REGION



**January 2019 Update**

Prepared by:  
The North/Far North Center of Excellence  
and Compass Policy Strategies



# TABLE OF CONTENTS

<b>Introduction</b> .....	3
<b>Data &amp; Methodology: How to Use the Report</b> .....	3
<b>Overview of Occupational Findings by Skill Level</b> .....	4
<b>Overview of Occupational Group Employment</b> .....	6
<b>What Is the Labor Market Demand for Occupations in Each Occupational Group?</b> .....	9
<b>Architecture &amp; Engineering</b> .....	9
<b>Arts, Design, Entertainment, Sports &amp; Media</b> .....	12
<b>Business &amp; Financial</b> .....	15
<b>Community &amp; Social Services</b> .....	18
<b>Computer &amp; Mathematical</b> .....	20
<b>Construction &amp; Extraction</b> .....	22
<b>Education &amp; Training</b> .....	26
<b>Food Preparation &amp; Serving</b> .....	28
<b>Healthcare Practitioner &amp; Technical</b> .....	30
<b>Healthcare Support</b> .....	34
<b>Installation, Maintenance &amp; Repair</b> .....	37
<b>Legal</b> .....	43
<b>Life, Physical &amp; Social Sciences</b> .....	45
<b>Management</b> .....	48
<b>Office &amp; Administrative Support</b> .....	50
<b>Personal Care &amp; Service</b> .....	55
<b>Production</b> .....	58
<b>Protective Service</b> .....	63
<b>Sales &amp; Related</b> .....	66
<b>Transportation &amp; Material Moving</b> .....	69
<b>Appendix A: Methodology &amp; Implications for Analysis</b> .....	72
<b>Data Sources</b> .....	74
<b>Key Terms and Concepts</b> .....	75

The COE acknowledges Janine Spadafore Kaiser, Compass Policy Strategies, who prepared the reports with COE; Lauren McSherry edited the report; Karin Odell, Venus Designs, designed the report.

# INTRODUCTION

This report prepared by the North/Far North Center of Excellence (COE) focuses on employment levels, occupational demand projections, and wages for middle-skill occupations, those occupations which are well suited to community college education because they require some education or training, but less than a bachelor's degree. The report also includes trends in community college awards and student headcounts related to the major occupational groups selected for this study's analysis.



The purpose of the report is to serve as a reference for regional governance efforts that involve sector- and cluster-based initiatives, through which regional stakeholders collaborate on developing strategies and programs. The following sections offer findings that can help identify and inform educational and training opportunities. Furthermore, this report can serve as a touchstone for program development strategies and planning for Strong Workforce Program (SWP) investments. State legislation calls for a regional planning process that identifies priorities for SWP investments based on labor market data.

## DATA & METHODOLOGY: HOW TO USE THE REPORT

To facilitate its use as a general reference, this report is organized according to the 23 major occupational groups in the Standard Occupational Classification (SOC) System. The major groups contain occupations that are not industry specific and that may occur in several different industries. Individual occupations are differentiated by skills, tasks, and education and training requirements. The report only includes the major occupational groups, of which there are 20, that met the occupational selection criteria.

The data represents an estimate of the size and performance of occupational employment. The COE uses a "middle-skill" definition and criteria to narrow the universe of occupations for analysis in the report. For each occupational category, award data is presented related to education and training programs offered by community colleges in the Greater Sacramento Region. This data was identified using Taxonomy of Programs (TOP) codes. The report does not include private training providers or other educational program data.

A comparison between occupational demand and educational program supply is not an absolute measure of a shortage or oversupply of workers in the region but can be used as an approximation to indicate unmet workforce demand to assist with program planning. This report's findings shed light on the following questions, which can be useful when determining the need for workforce investments:

- Which occupations and major occupational groups display significant employment, high growth, and substantial job openings?
- Are the programs currently offered by community colleges meeting demand?
- Does the data analysis indicate areas for further investigation related to program investment?

The first section of the report presents an overview of the findings, including the broader employment picture for the Greater Sacramento Region, including the breakdown of below-middle-skill, middle-skill, and above-middle-skill jobs. There is an overview of the major occupational groups by total current employment, projected job growth, annual openings, and wages over the next five years. The following sections of the report present detailed findings on individual occupations within the major groups and data on corresponding community college programs, including a three-year average of awards.

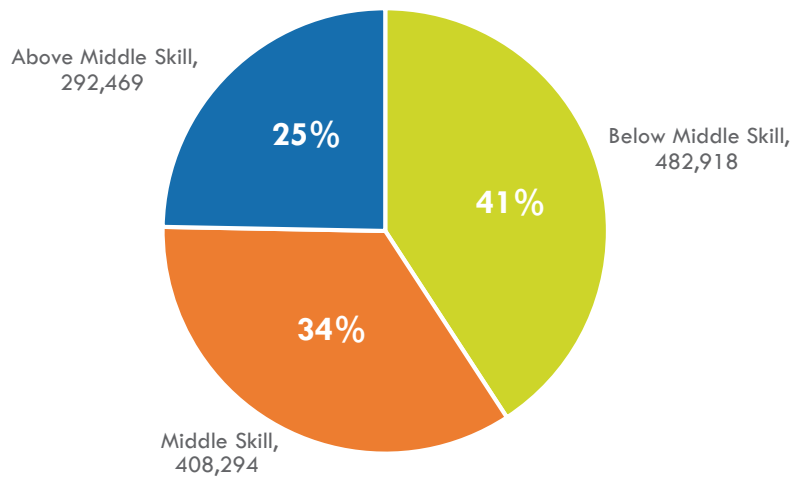
Seven counties comprise the Greater Sacramento Region: El Dorado, Nevada, Placer, Sacramento, Sutter, Yolo and Yuba. Eight colleges serve this geography and are included in this analysis: American River College, Cosumnes River College, Folsom Lake College, Lake Tahoe Community College, Sacramento City College, Sierra College, Woodland Community College and Yuba College.

For more specifics on how the study was conducted, please refer to Appendix A: Methodology & Implications for Analysis.

## OVERVIEW OF OCCUPATIONAL FINDINGS BY SKILL LEVEL

Middle-skill jobs accounted for 34 percent of total jobs in the region in 2017 (Exhibit 1). Between 2013 and 2017, total jobs in the Greater Sacramento Region increased 9.7 percent, to 1.18 million positions.

**Exhibit 1. Employment by skill level in the Greater Sacramento Region<sup>1</sup>**

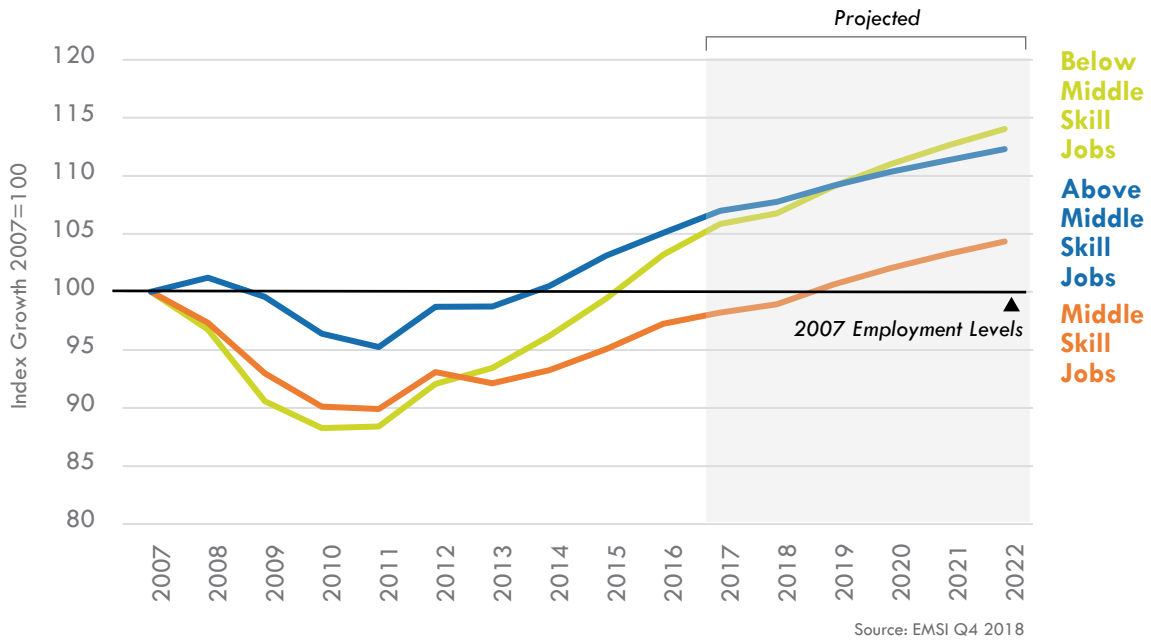


While they represent a significant share of employment in the region, middle-skill occupations expanded more slowly than above-middle-skill and below-middle-skill positions, +6.6 percent, versus 8.3 percent and 13.3 percent, respectively (Exhibit 2). In the 2017-2022 period, total jobs are expected to expand by 6.5 percent in the Greater Sacramento Region, with growth in middle-skill jobs roughly on par (+6.2 percent).



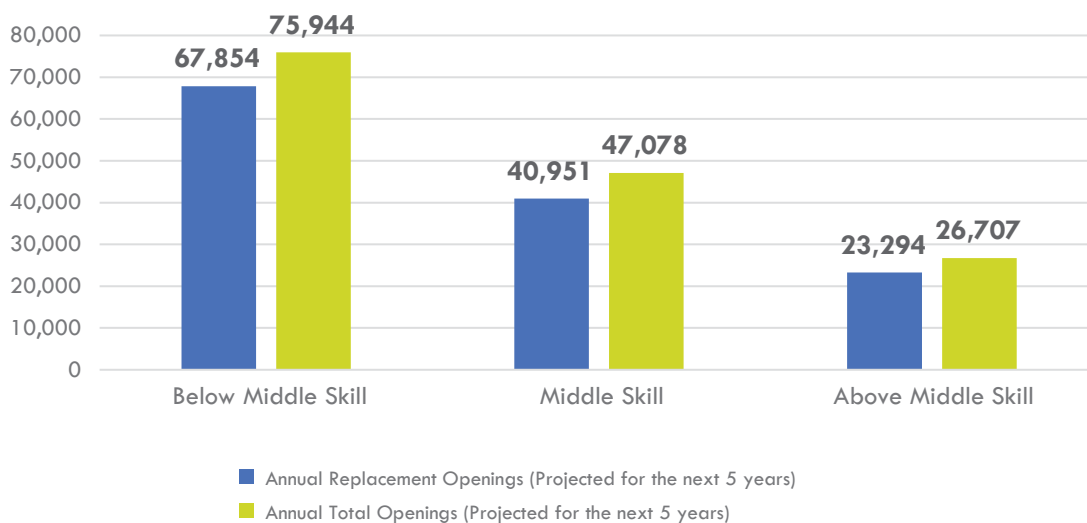
<sup>1</sup> Source: EMSI Q4 2018 Data Set, Accessed 12/18/2018. Skill-Level Crosswalk from Northern California Center of Excellence, 2018.

## Exhibit 2. Indexed historical and projected growth in employment by skill level, Greater Sacramento Region



Projected job openings in middle-skill occupations will average roughly 47,000 openings annually through 2022 (Exhibit 3). Openings will be driven by retirement among existing workers (replacement demand) in middle-skill occupations, as well as some new growth.

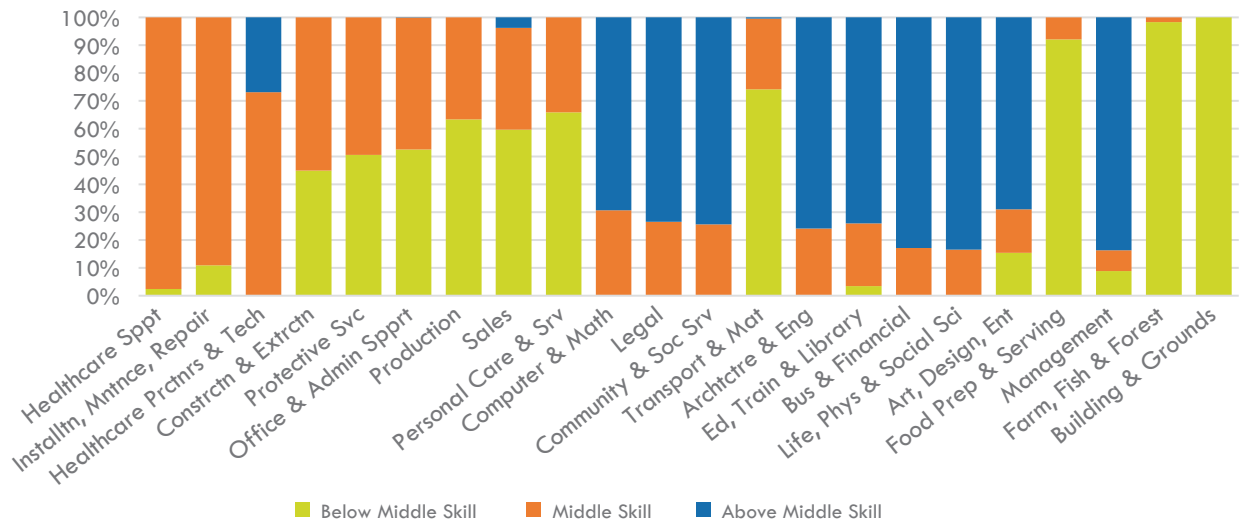
## Exhibit 3. Projected annual job openings by skill level, Greater Sacramento Region, 2017-2022



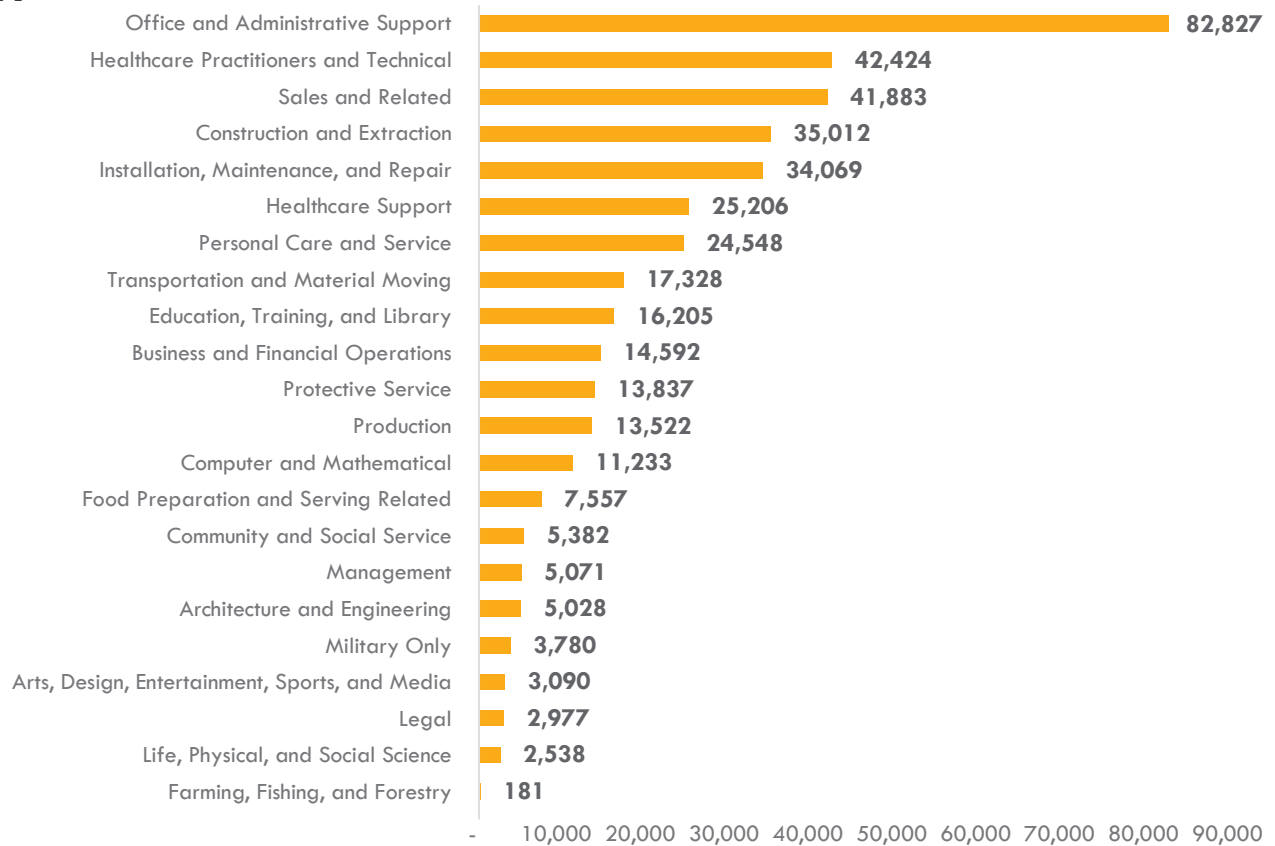
# OVERVIEW OF OCCUPATIONAL GROUP EMPLOYMENT

Occupational groups vary substantially with respect to the share of occupations comprised of middle-skill jobs (Exhibit 4). In the Greater Sacramento Region, in 2017, office and administrative support, and healthcare practitioners and technicians had the greatest number of middle-skill jobs (Exhibit 5).

**Exhibit 4. Percentage of middle-skill jobs in each occupational group, Greater Sacramento Region, 2017**



**Exhibit 5. Middle-skill jobs by occupational group, Greater Sacramento Region, 2017**



## Key Findings

### Major groups with the most middle-skill jobs:

1. Office & Administrative Support
2. Healthcare Practitioners & Technical
3. Sales & Related

### Major groups with the most annual openings:

1. Office & Administrative Support
2. Sales and Related
3. Construction & Extraction

### Major groups with the highest paying jobs:

1. Healthcare Practitioners & Technical
2. Protective Service
3. Management

Office and administrative support has a low projected growth rate, only 2 percent, but is the largest major occupational group by employment in the region, with nearly 83,000 jobs in 2017 (Exhibit 6). This major group is expected to offer nearly 9,700 annual openings through 2022.

Healthcare practitioners and technical, the second largest major occupational group, employed more than 42,400 workers in 2017 and is projected to undergo strong growth, 9 percent, with more than 3,300 annual openings. This occupational group also offers the highest median wages of all the groups studied.

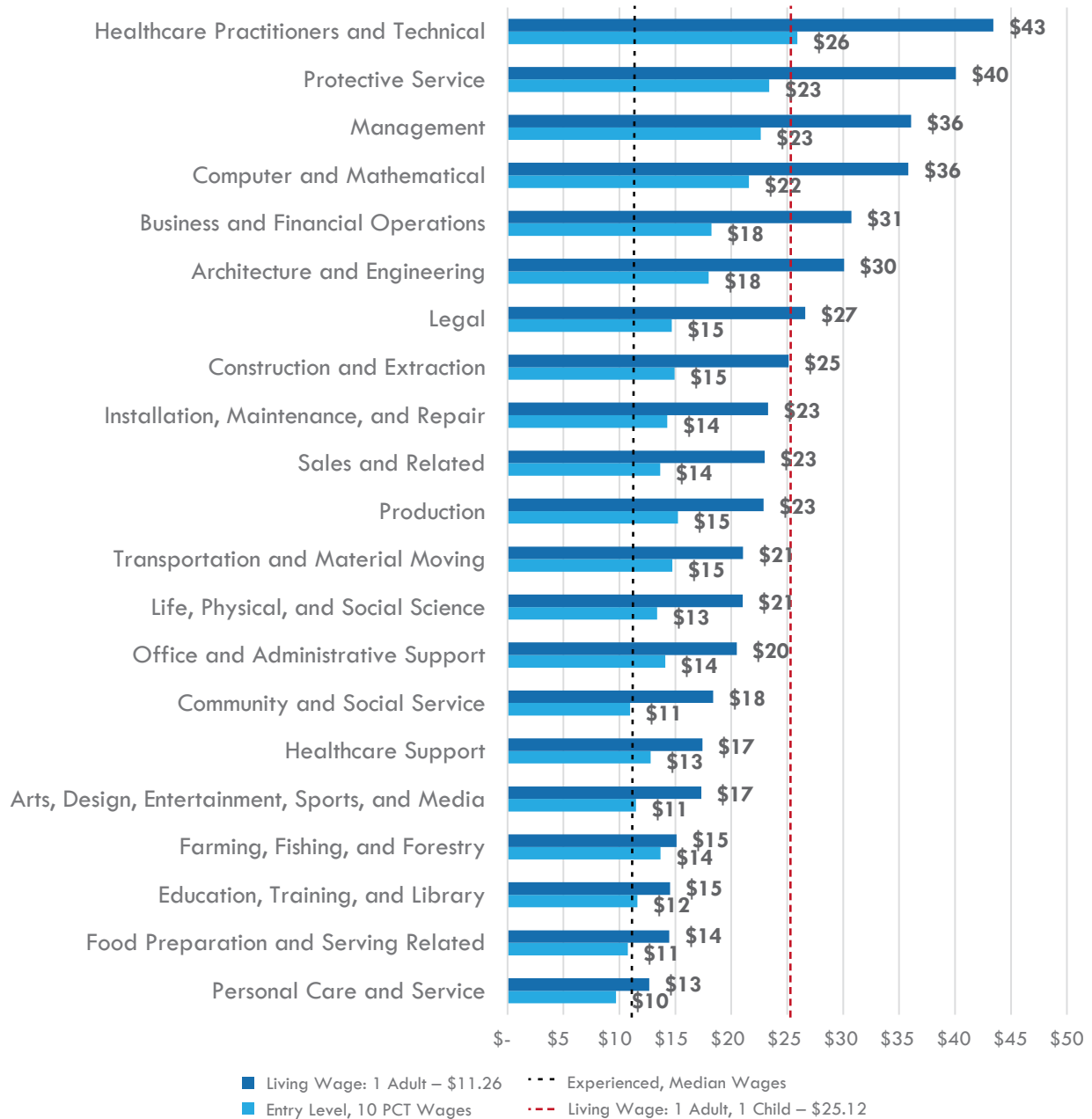
## Exhibit 6. Five-year occupational projections for middle-skill jobs by major group, Greater Sacramento Region, 2017-2022

Occupational Group*	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings	Weighted Median Wage
Office and Administrative Support (22)	82,827	1,635	2%	45,197	9,683	\$20.49
Healthcare Practitioners and Technical (25)	42,424	3,979	9%	12,587	3,329	\$43.43
Sales and Related (10)	41,883	2,566	6%	22,055	4,999	\$22.98
Construction and Extraction (20)	35,012	3,456	10%	17,876	4,358	\$25.11
Installation, Maintenance, and Repair (39)	34,069	2,837	8%	16,403	3,904	\$23.28
Healthcare Support (15)	25,206	3,916	16%	14,763	3,755	\$17.42
Personal Care and Service (11)	24,548	783	3%	17,093	3,743	\$12.66
Transportation and Material Moving (16)	17,328	1,529	9%	9,553	2,229	\$21.06
Education, Training, and Library (2)	16,205	970	6%	8,275	1,859	\$14.53
Business and Financial Operations (9)	14,592	(27)	0%	5,933	1,298	\$30.74
Protective Service (13)	13,837	331	2%	4,716	1,043	\$40.08
Production (29)	13,522	867	6%	7,233	1,664	\$22.88
Computer and Mathematical (6)	11,233	642	6%	3,895	911	\$35.83
Food Preparation and Serving Related (2)	7,557	692	9%	5,344	1,209	\$14.47
Community and Social Service (2)	5,382	509	9%	3,248	757	\$18.38
Management (5)	5,071	151	3%	1,957	434	\$36.08
Architecture and Engineering (13)	5,028	267	5%	2,212	502	\$30.08
Arts, Design, Entertainment, Sports, and Media (10)	3,090	72	2%	1,373	315	\$17.31
Legal (4)	2,977	141	5%	1,425	319	\$26.61
Life, Physical, and Social Science (9)	2,538	77	3%	1,410	301	\$21.01
Farming, Fishing, and Forestry (1)	181	1	1%	119	25	\$15.11
Building and Grounds Cleaning and Maintenance (0)	0	0	n/a	0	-	n/a
<b>TOTAL</b>	<b>408,294</b>	<b>25,509</b>	<b>6%</b>	<b>204,755</b>	<b>47,078</b>	<b>\$24.58</b>

\*Number of occupations in each group are shown in parentheses.

According to Massachusetts Institute of Technology’s (MIT’s) Living Wage Calculator, the living wage for one adult (with no dependents) in the Greater Sacramento Region was \$11.87/hour (assuming full-time work) in 2017. For one adult supporting one child, the living wage rate was estimated to be \$25.99/hour in 2017. Healthcare practitioners and technical, protective service, and management have the highest median earnings among the occupational groups in the region (Exhibit 7).

**Exhibit 7. Comparison of entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017<sup>2</sup>**



<sup>2</sup> Living Wages are sourced from MIT’s Living Wage Calculator. Living wage is a geographically-based estimate of the wage required to cover the cost of basic needs for families. It is higher than the federal poverty threshold.



# WHAT IS THE LABOR MARKET DEMAND FOR OCCUPATIONS IN EACH OCCUPATIONAL GROUP?



## ➤ Key Findings

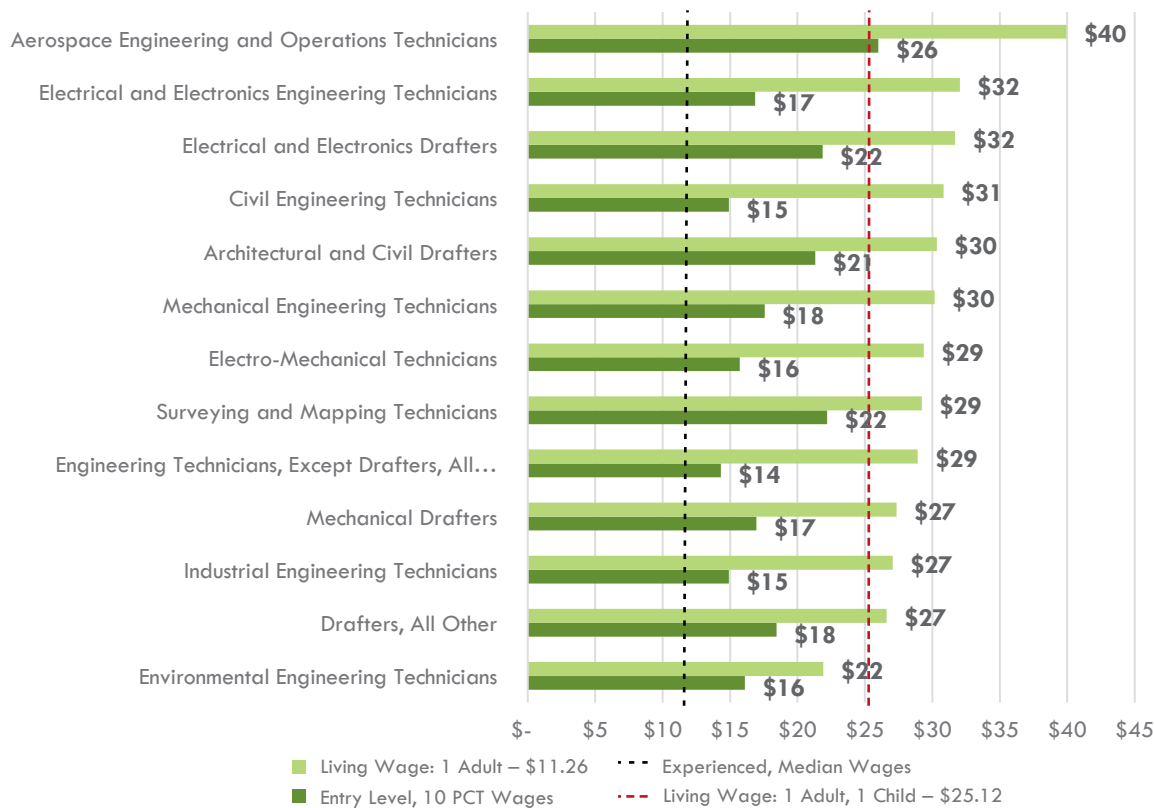
- There were roughly 5,000 middle-skill jobs in the architecture and engineering occupational group in the Greater Sacramento Region in 2017.
- Occupations with the most annual openings over the next five years include: electrical and electronics engineering technicians, architectural and civil drafters, and civil engineering technicians.
- Jobs in this occupational group generally pay well, with nearly all experienced wages in this group exceeding the living wage threshold for a one-adult, one-child household.
- Collectively, headcounts in related programs totaled roughly 5,000 students annually. On average, over the past three years, nearly 450 average awards were conferred annually.
- Community college program headcounts were highest in electronics and electric technology, GIS, and aeronautical and aviation technology.

**Exhibit 8. Employment and projected occupational demand for architecture and engineering occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
17-3023	Electrical and Electronics Engineering Technicians	1,254	49	4%	540	119
17-3011	Architectural and Civil Drafters	1,079	70	7%	464	108
17-3022	Civil Engineering Technicians	616	11	2%	264	57
17-3031	Surveying and Mapping Technicians	412	28	7%	220	51
17-3029	Engineering Technicians, Except Drafters, All Other	478	21	4%	207	46
17-3013	Mechanical Drafters	231	26	11%	101	25
17-3012	Electrical and Electronics Drafters	192	16	8%	83	20
17-3025	Environmental Engineering Technicians	209	6	3%	90	19
17-3026	Industrial Engineering Technicians	170	13	7%	74	17
17-3027	Mechanical Engineering Technicians	154	13	9%	68	16
17-3024	Electro-Mechanical Technicians	115	3	3%	49	11
17-3019	Drafters, All Other	63	9	15%	28	7
17-3021	Aerospace Engineering and Operations Technicians	56	1	2%	24	5
<b>TOTAL</b>		<b>5,028</b>	<b>267</b>	<b>5%</b>	<b>2,212</b>	<b>502</b>



**Exhibit 9. Comparison of architecture and engineering entry-level and experienced wages with the regional living wage, Greater Sacramento Region, 2017**



**Exhibit 10. Education and training requirements for architecture and engineering occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
17-3011	Architectural and Civil Drafters	Associate degree	None	61%
17-3012	Electrical and Electronics Drafters	Associate degree	None	61%
17-3013	Mechanical Drafters	Associate degree	None	61%
17-3019	Drafters, All Other	Associate degree	None	61%
17-3021	Aerospace Engineering and Operations Technicians	Associate degree	None	53%
17-3022	Civil Engineering Technicians	Associate degree	None	53%
17-3023	Electrical and Electronics Engineering Technicians	Associate degree	None	53%
17-3024	Electro-Mechanical Technicians	Associate degree	None	53%
17-3025	Environmental Engineering Technicians	Associate degree	None	53%
17-3026	Industrial Engineering Technicians	Associate degree	None	53%
17-3027	Mechanical Engineering Technicians	Associate degree	None	53%
17-3029	Engineering Technicians, Except Drafters, All Other	Associate degree	None	53%
17-3031	Surveying and Mapping Technicians	High school diploma or equivalent	Moderate-term	57%

**Exhibit 11. Community college program headcounts and average annual awards, architecture and engineering occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
20100	Architecture and Architectural Technology	329	5	6
30300	Environmental Technology	22	19	4
92400	Engineering Technology, General	122	3	2
93400	Electronics and Electric Technology	1,482	103	31
93410	Computer Electronics	148		
93420	Industrial Electronics	252	49	26
95000	Aeronautical and Aviation Technology	552	16	9
95200	Construction Crafts Technology	121	26	2
95300	Drafting Technology	751	25	5
95310	Architectural Drafting	162	15	11
95340	Mechanical Drafting	210	15	8
95600	Manufacturing and Industrial Technology	18	7	13
95800	Water and Wastewater Technology	259	7	
99900	Other Engineering and Related Industrial Technologies	4		
220610	Geographic Information Systems	637	16	11
<b>TOTAL</b>		<b>5,070</b>	<b>306</b>	<b>128</b>



## Key Findings

- While this major occupational group has more than 3,000 middle-skill jobs, when all skill levels are considered, close to 70 percent of jobs in this group require a bachelor’s degree or higher for entry-level positions.
- Among middle-skill jobs, 315 job openings are projected annually, led by photographers, and audio and video equipment technicians.
- This group of occupations is growing more slowly than middle-skill jobs overall in the region (+2 percent versus +6.7 percent, respectively).
- There are approximately 6,400 related student enrollments annually, with 260 average completions.
- The community college programs with the largest headcount in the Greater Sacramento Region within this group are applied photography, commercial music and journalism.

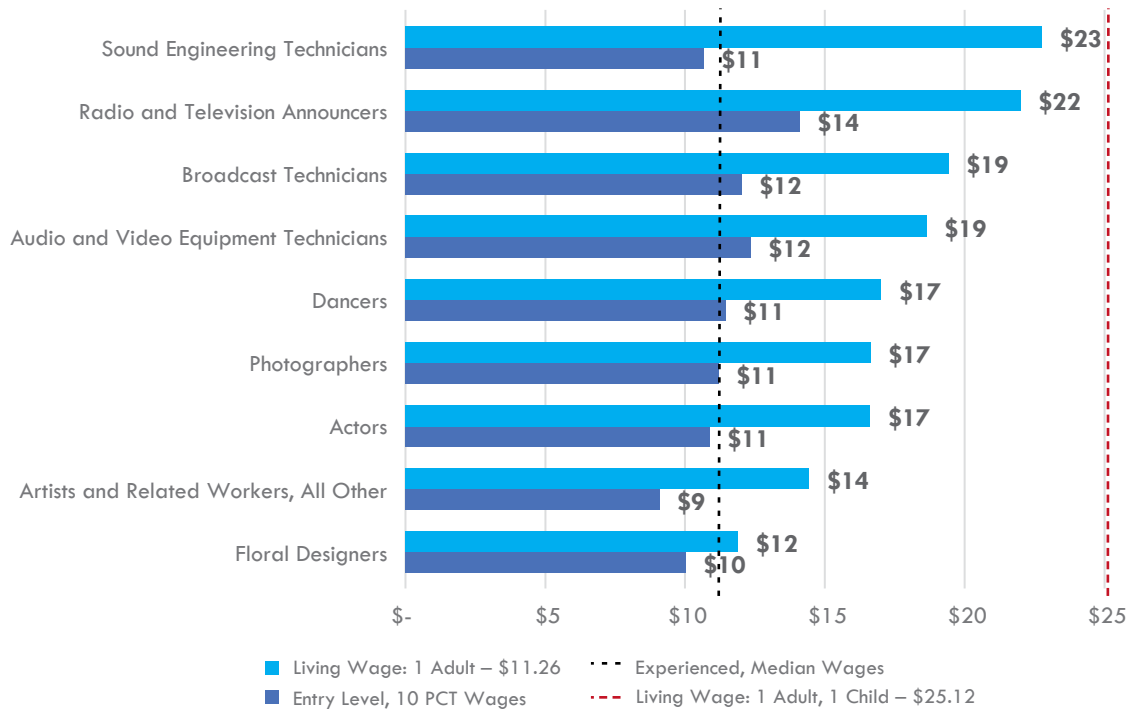
**Exhibit 12. Employment and projected occupational demand for arts, design, entertainment, sports and media occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
27-4021	Photographers	1,196	36	3%	475	115
27-4011	Audio and Video Equipment Technicians	480	32	7%	223	51
27-1023	Floral Designers	361	(12)	(3%)	163	34
27-2011	Actors	294	20	7%	149	34
27-3011	Radio and Television Announcers	264	(3)	(1%)	124	29
27-4012	Broadcast Technicians	228	(3)	(1%)	102	22
27-4014	Sound Engineering Technicians	98	2	2%	45	10
27-2031	Dancers	59	2	4%	40	9
27-1019	Artists and Related Workers, All Other	73	(3)	(5%)	27	6
<b>TOTAL</b>		<b>3,090</b>	<b>72</b>	<b>2%</b>	<b>1,373</b>	<b>315</b>





**Exhibit 13. Comparison of arts, design, entertainment, sports and media entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



**Exhibit 14. Education and training requirements for arts, design, entertainment, sports and media occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
27-1019	Artists and Related Workers, All Other	No formal educational credential	Long-term	28%
27-1023	Floral Designers	High school diploma or equivalent	Moderate-term	29%
27-2011	Actors	Some college, no degree	Long-term	33%
27-2031	Dancers	No formal educational credential	Long-term	26%
27-3011	Radio and Television Announcers	Bachelor's degree	None	36%
27-4011	Audio and Video Equipment Technicians	Postsecondary nondegree award	Short-term	44%
27-4012	Broadcast Technicians	Associate degree	Short-term	44%
27-4014	Sound Engineering Technicians	Postsecondary nondegree award	Short-term	44%
27-4021	Photographers	High school diploma or equivalent	Long-term	34%
27-4021	Photographers	High school diploma or equivalent	Long-term	34%

**Exhibit 15. Community college program headcounts and average annual awards, arts, design, entertainment, sports and media occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
10920	Floriculture /Floristry	108		
50910	Advertising	149		1
60200	Journalism	854	0	24
60400	Radio and Television	299	4	5
60410	Radio	44		1
60420	Television (including combined TV/film/video)	259	3	4
60430	Broadcast Journalism	5		1
61220	Film Production	364	4	5
61400	Digital Media	344	19	33
61440	Animation	354	9	
100500	Commercial Music	960	31	25
100600	Technical Theater	434	8	4
101200	Applied Photography	2,255	57	18
109900	Other Fine and Applied Arts	5		
<b>TOTAL</b>		<b>6,434</b>	<b>135</b>	<b>122</b>



## ➤ Key Findings

- There were roughly 14,600 middle-skill jobs in the business and financial occupational group in 2017, the 10th largest occupational group in the region.
- This group of occupations is projected to decline slightly over the next five years, although high replacement rates are driving nearly 1,300 job openings annually.
- The three expected to have the most openings are claims adjusters, examiners, and investigators; and tax examiners and collectors, and revenue agents; and loan officers.
- The overall student headcount in the region totals nearly 29,000. There are an average of 1,600 awards. Community college programs related to this sector with high headcounts are accounting, business administration and business management.
- Business administration has the highest rate of completion of associate degrees by far and most degrees are AS-T.

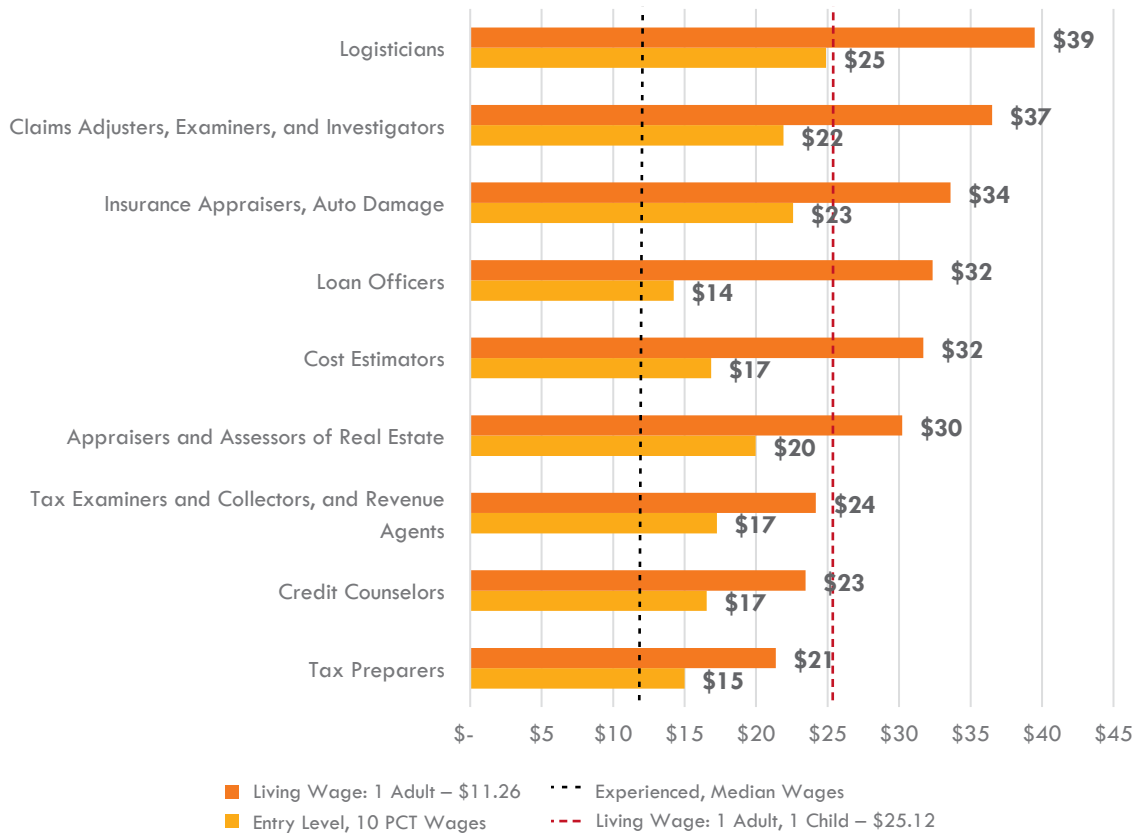
**Exhibit 16. Employment and projected occupational demand for business and financial occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
13-1031	Claims Adjusters, Examiners, and Investigators	3,516	(111)	(3%)	1,406	295
13-2081	Tax Examiners and Collectors, and Revenue Agents	3,536	(115)	(3%)	1,207	251
13-2072	Loan Officers	2,834	(91)	(3%)	1,124	233
13-1051	Cost Estimators	1,786	226	13%	904	226
13-2082	Tax Preparers	927	42	5%	490	110
13-1081	Logisticians	655	53	8%	321	75
13-2021	Appraisers and Assessors of Real Estate	670	16	2%	217	50
13-1032	Insurance Appraisers, Auto Damage	468	(56)	(12%)	183	39
13-2071	Credit Counselors	200	10	5%	82	18
<b>TOTAL</b>		<b>14,592</b>	<b>(27)</b>	<b>0%</b>	<b>5,933</b>	<b>1,298</b>





**Exhibit 17. Comparison of business and financial entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



**Exhibit 18. Education and training requirements for business and financial occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
13-1031	Claims Adjusters, Examiners, and Investigators	High school diploma or equivalent	Long-term	36%
13-1032	Insurance Appraisers, Auto Damage	Postsecondary nondegree award	Moderate-term	36%
13-1051	Cost Estimators	Bachelor's degree	Moderate-term	39%
13-1081	Logisticians	Bachelor's degree	None	40%
13-2021	Appraisers and Assessors of Real Estate	Bachelor's degree	Long-term	36%
13-2071	Credit Counselors	Bachelor's degree	Moderate-term	35%
13-2072	Loan Officers	Bachelor's degree	Moderate-term	35%
13-2081	Tax Examiners and Collectors, and Revenue Agents	Bachelor's degree	Moderate-term	31%
13-2082	Tax Preparers	High school diploma or equivalent	Moderate-term	30%



**Exhibit 19. Community college program headcounts and average annual awards, business and financial occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
50100	Business and Commerce, General	7,546	16	77
50200	Accounting	11,068	113	189
50210	Tax Studies	411	6	3
50400	Banking and Finance	0		3
50500	Business Administration	3,180		1,071
50600	Business Management	3,156	37	54
50650	Retail Store Operations and Management	0	2	2
50800	International Business and Trade	126		
50900	Marketing and Distribution	1,343	4	22
50920	Purchasing	61	3	
51100	Real Estate	1,989	18	11
<b>TOTAL</b>		<b>28,881</b>	<b>199</b>	<b>1,433</b>





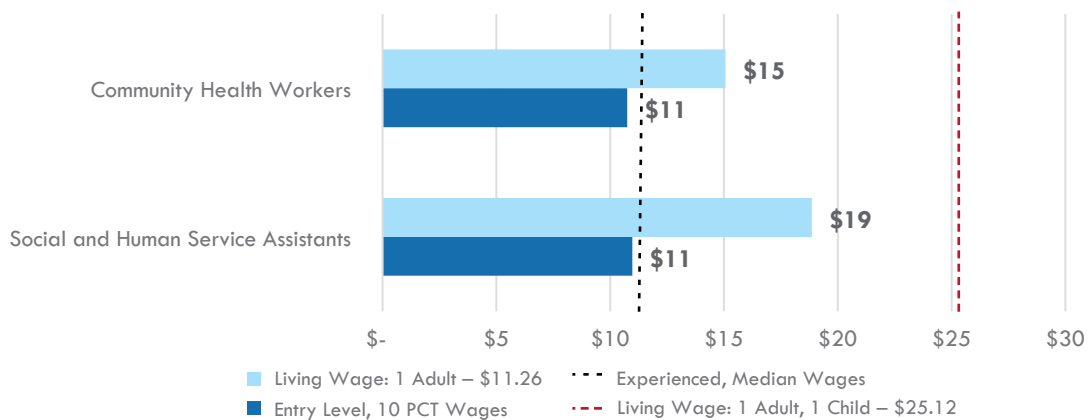
## Key Findings

- Jobs in this cluster are expected to grow by 9 percent between 2017 and 2022, faster than middle-skill jobs overall in the region.
- While these occupations are projected to have a considerable number of job openings in the next five years, wages are low.
- Headcounts in related programs are 4,200 annually, with 140 awards conferred.
- The largest programs are human services and family studies.

**Exhibit 20. Employment and projected occupational demand for community and social services occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
21-1093	Social and Human Service Assistants	4,706	439	9%	2,829	658
21-1094	Community Health Workers	677	71	10%	419	98
<b>TOTAL</b>		<b>5,382</b>	<b>509</b>	<b>9%</b>	<b>3,248</b>	<b>757</b>

**Exhibit 21. Comparison of community and social services entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



## Exhibit 22. Education and training requirements for community and social services occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
21-1093	Social and Human Service Assistants	High school diploma or equivalent	Short-term	36%
21-1094	Community Health Workers	High school diploma or equivalent	Short-term	29%

## Exhibit 23. Community college program headcounts and average annual awards, community and social services occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
130100	Family and Consumer Sciences, General	27		
130560	Parenting and Family Education	574		
130800	Family Studies	967		
130900	Gerontology	683	2	12
210400	Human Services	1,496	22	53
210440	Alcohol and Controlled Substances	484	25	26
<b>TOTAL</b>		<b>4,233</b>	<b>49</b>	<b>91</b>





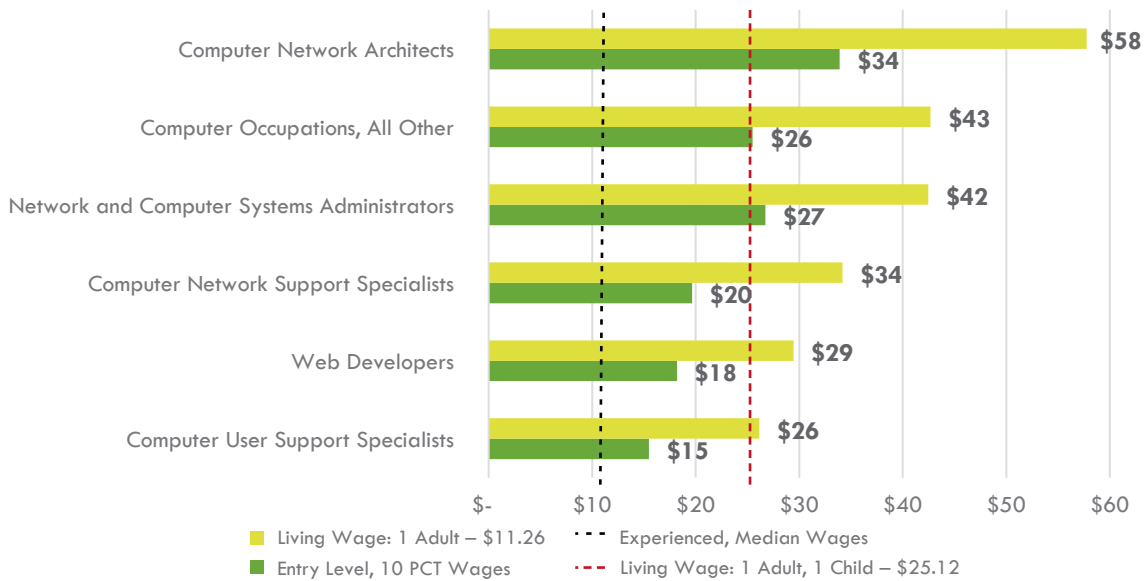
## Key Findings

- Within the computer and mathematical occupational cluster, 31 percent of jobs are middle skill, accounting for 11,200 jobs in the region.
- More than 900 job openings are projected annually over the next five years, led by computer user support specialists.
- Headcounts in related programs in the Greater Sacramento Region total more than 23,000 annually.
- Nearly 225 certificates and 200 associate degrees are conferred annually.

### Exhibit 24. Employment and projected occupational demand for computer and mathematical occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
15-1151	Computer User Support Specialists	3,889	296	8%	1,442	349
15-1199	Computer Occupations, All Other	2,335	107	5%	784	179
15-1142	Network and Computer Systems Administrators	2,052	89	4%	636	146
15-1134	Web Developers	1,162	58	5%	409	94
15-1152	Computer Network Support Specialists	1,013	69	7%	375	89
15-1143	Computer Network Architects	781	24	3%	249	55
<b>TOTAL</b>		<b>11,233</b>	<b>642</b>	<b>6%</b>	<b>3,895</b>	<b>911</b>

### Exhibit 25. Comparison of computer and mathematical entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017





## Exhibit 26. Education and training requirements for computer and mathematical occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
15-1134	Web Developers	Associate degree	None	25%
15-1142	Network and Computer Systems Administrators	Bachelor's degree	None	38%
15-1143	Computer Network Architects	Bachelor's degree	None	35%
15-1151	Computer User Support Specialists	Some college, no degree	None	41%
15-1152	Computer Network Support Specialists	Associate degree	None	41%
15-1199	Computer Occupations, All Other	Bachelor's degree	None	35%

## Exhibit 27. Community college program headcounts and average annual awards, computer and mathematical occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
61420	Electronic Game Design	106		
61430	Website Design and Development	710	4	3
70100	Information Technology, General	4,126		1
70200	Computer Information Systems	461	3	18
70210	Software Applications	6,153	11	7
70700	Computer Software Development	24	1	8
70710	Computer Programming	6,737	33	50
70730	Computer Systems Analysis	155		
70800	Computer Infrastructure and Support	439	55	28
70810	Computer Networking	2,777	37	58
70820	Computer Support	411	9	7
70900	World Wide Web Administration	409	8	
79900	Other Information Technology	0	2	
93430	Telecommunications Technology	144	45	6
220610	Geographic Information Systems	637	16	11
<b>TOTAL</b>		<b>23,288</b>	<b>224</b>	<b>197</b>

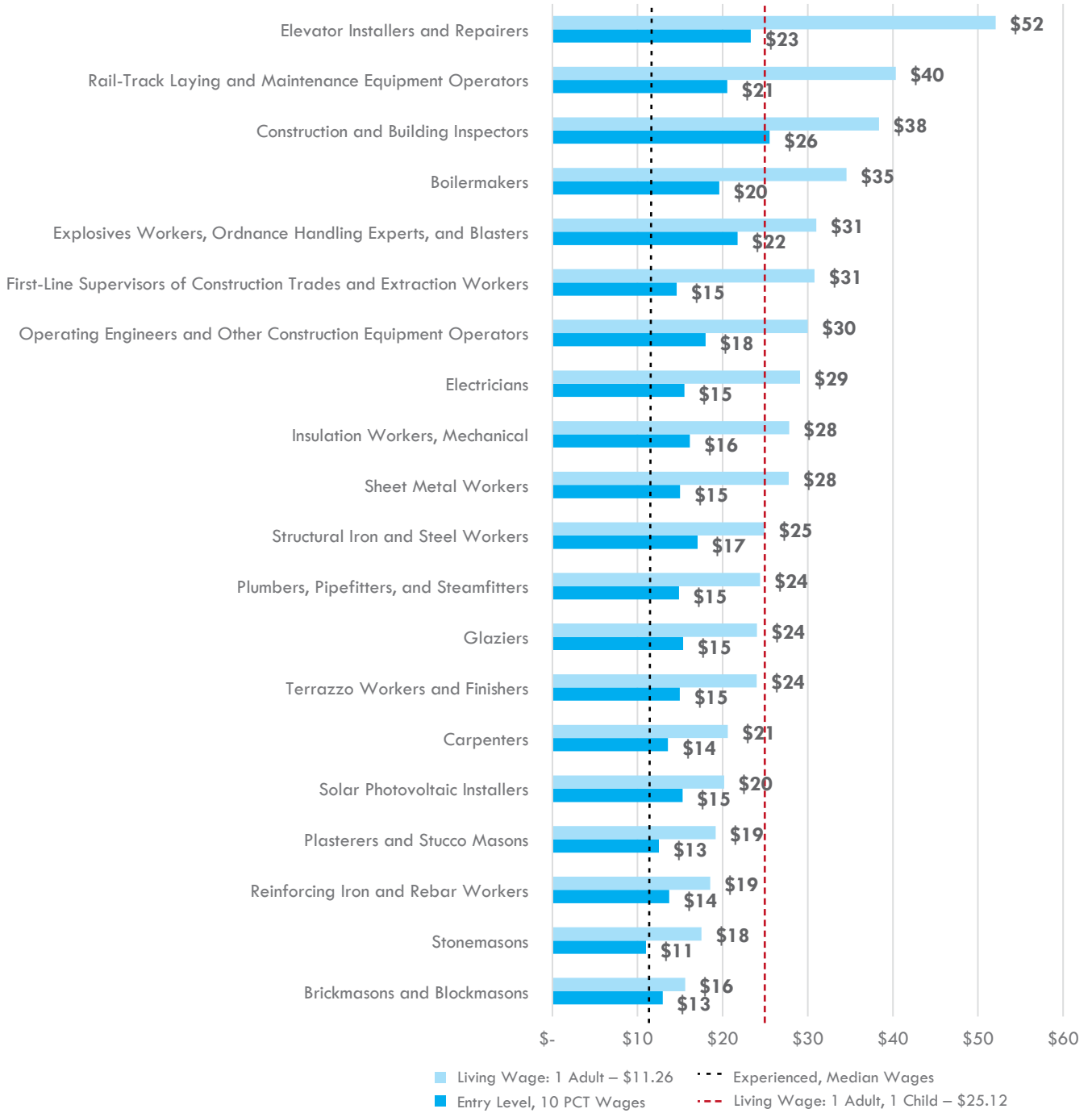
## Key Findings

- Construction and extraction is the 4th largest source of middle-skill jobs in the region, with more than 35,000 jobs in 2017.
- This occupational group is projected to have the 2nd highest number of annual openings over the next five years.
- Carpenters, electricians, and plumbers, pipefitters and steamfitters are projected to have the highest number of annual openings.
- Student headcounts total 16,500 annually in related community college programs. The largest programs in the region are: Carpentry, drywall and insulation, and sheet metal and structural metal.
- While headcounts are high, program awards are low in this category, fewer than 200 per year.

### Exhibit 28. Employment and projected occupational demand for construction and extraction occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
47-2031	Carpenters	1,3274	1,004	8%	6,174	1,471
47-2111	Electricians	4,781	522	11%	2,712	657
47-2152	Plumbers, Pipefitters, and Steamfitters	4,400	434	10%	2,349	562
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	4,623	381	8%	2,273	557
47-2073	Operating Engineers and Other Construction Equipment Operators	2,651	204	8%	1,481	340
47-2211	Sheet Metal Workers	1,178	131	11%	634	153
47-2121	Glaziers	730	201	27%	459	132
47-2221	Structural Iron and Steel Workers	591	186	32%	348	107
47-4011	Construction and Building Inspectors	802	38	5%	433	96
47-2231	Solar Photovoltaic Installers	339	172	51%	213	77
47-2161	Plasterers and Stucco Masons	727	29	4%	342	77
47-2021	Brickmasons and Blockmasons	330	68	21%	151	48
47-2171	Reinforcing Iron and Rebar Workers	180	47	26%	102	30
47-2022	Stonemasons	125	17	14%	56	15
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	90	4	5%	54	12
47-4021	Elevator Installers and Repairers	59	2	3%	34	8
47-4061	Rail-Track Laying and Maintenance Equipment Operators	52	1	1%	25	5
47-2132	Insulation Workers, Mechanical	40	5	12%	22	5
47-2011	Boilermakers	28	8	29%	15	5
47-2053	Terrazzo Workers and Finishers	13	2	16%	-	-
<b>TOTAL</b>		<b>35,012</b>	<b>3,456</b>	<b>10%</b>	<b>17,876</b>	<b>4,358</b>

**Exhibit 29. Comparison of construction and extraction entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



### Exhibit 30. Education and training requirements for construction and extraction occupations

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	None	32%
47-2011	Boilermakers	High school diploma or equivalent	Apprenticeship	34%
47-2021	Brickmasons and Blockmasons	High school diploma or equivalent	Apprenticeship	16%
47-2022	Stonemasons	High school diploma or equivalent	Apprenticeship	16%
47-2031	Carpenters	High school diploma or equivalent	Apprenticeship	25%
47-2053	Terrazzo Workers and Finishers	High school diploma or equivalent	Apprenticeship	18%
47-2073	Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	Moderate-term	26%
47-2111	Electricians	High school diploma or equivalent	Apprenticeship	46%
47-2121	Glaziers	High school diploma or equivalent	Apprenticeship	26%
47-2132	Insulation Workers, Mechanical	High school diploma or equivalent	Apprenticeship	24%
47-2152	Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	Apprenticeship	32%
47-2161	Plasterers and Stucco Masons	No formal educational credential	Long-term	12%
47-2171	Reinforcing Iron and Rebar Workers	High school diploma or equivalent	Apprenticeship	16%
47-2211	Sheet Metal Workers	High school diploma or equivalent	Apprenticeship	32%
47-2221	Structural Iron and Steel Workers	High school diploma or equivalent	Apprenticeship	36%
47-2231	Solar Photovoltaic Installers	High school diploma or equivalent	Moderate-term	30%
47-4011	Construction and Building Inspectors	High school diploma or equivalent	Moderate-term	45%
47-4021	Elevator Installers and Repairers	High school diploma or equivalent	Apprenticeship	41%
47-4061	Rail-Track Laying and Maintenance Equipment Operators	High school diploma or equivalent	Moderate-term	35%
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	High school diploma or equivalent	Long-term	26%



**Exhibit 31. Community college program headcounts and average annual awards, construction and extraction occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
94600	Environmental Control Technology	980	27	8
94610	Energy Systems Technology	62	19	2
94740	Railroad and Light Rail Operations	36	7	2
95200	Construction Crafts Technology	121	26	2
95210	Carpentry	9,476	35	
95220	Electrical	550	17	1
95230	Plumbing, Pipefitting and Steamfitting	149		
95250	Mill and Cabinet Work	46		
95270	Painting, Decorating, and Flooring	2		
95280	Drywall and Insulation	3,030	19	0
95640	Sheet Metal and Structural Metal	1,348	12	0
95700	Civil and Construction Management Technology	598	5	5
95720	Construction Inspection	68	3	1
<b>TOTAL</b>		<b>16,465</b>	<b>170</b>	<b>21</b>





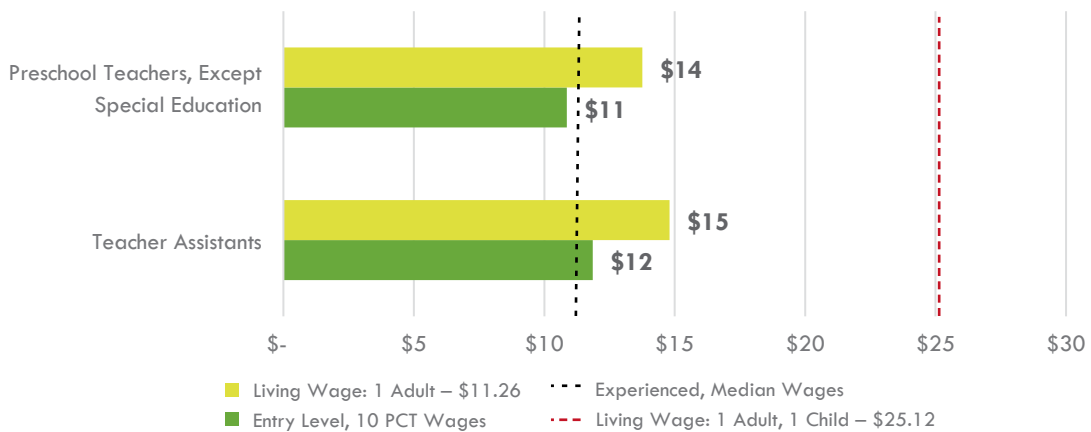
## Key Findings

- The education and training occupational group is projected to have roughly 1,900 middle-skill job openings annually through 2022.
- Teachers assistants will have the greatest number of openings, 1,421 annually.
- Related college programs have both robust headcounts and awards, roughly 11,800 students and 550 awards annually.

**Exhibit 32. Employment and projected occupational demand for education and training occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
25-9041	Teacher Assistants	12,118	817	7%	6,284	1,421
25-2011	Preschool Teachers, Except Special Education	4,087	153	4%	1,991	438
<b>TOTAL</b>		<b>16,205</b>	<b>970</b>	<b>6%</b>	<b>8,275</b>	<b>1,859</b>

**Exhibit 33. Comparison of education and training entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



**Exhibit 34. Education and training requirements for education and training occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
25-2011	Preschool Teachers, Except Special Education	Associate degree	None	40%
25-9041	Teacher Assistants	Some college, no degree	None	41%

**Exhibit 35. Community college program headcounts and average annual awards, education and training occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
80200	Educational Aide (Teacher Assistant)	4		0
130500	Child Development/Early Care and Education	10,900	355	193
130540	Preschool Age Child	922		
<b>TOTAL</b>		<b>11,827</b>	<b>355</b>	<b>193</b>



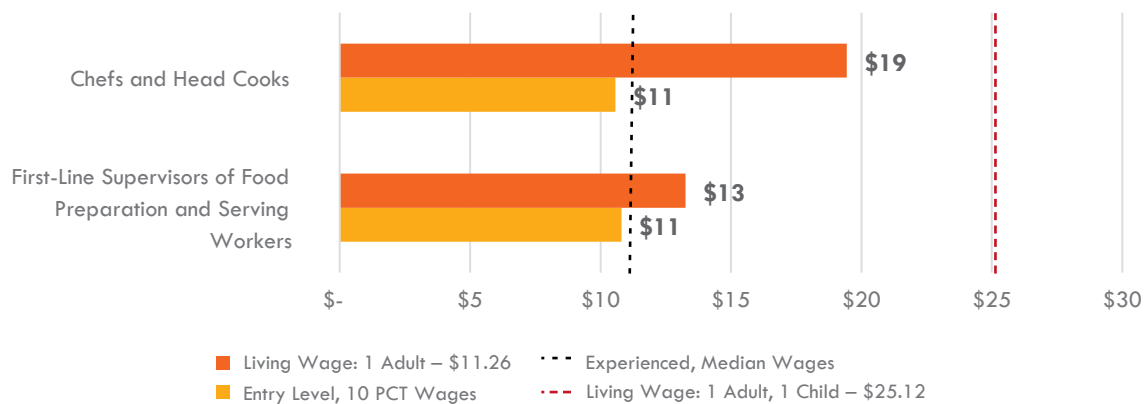
## ➤ Key Findings

- Jobs in the food preparation and serving occupational group are projected to grow 9 percent over the next five years, more quickly than middle-skill jobs overall.
- First-line supervisors of food preparation and serving workers are projected to have the most annual openings, roughly 1,000 annually.
- Nutrition, foods, and culinary arts is the largest related community college program, followed by culinary arts, and restaurant and food services management.
- Roughly 130 awards are conferred annually in the region.

**Exhibit 36. Employment and projected occupational demand for food preparation and serving occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	6,076	591	10%	4,410	1,002
35-1011	Chefs and Head Cooks	1,481	101	7%	934	208
<b>TOTAL</b>		<b>7,557</b>	<b>692</b>	<b>9%</b>	<b>5,344</b>	<b>1,209</b>

**Exhibit 37. Comparison of food preparation and serving entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



### Exhibit 38. Education and training requirements for food preparation and serving occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
35-1011	Chefs and Head Cooks	High school diploma or equivalent	None	41%
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	High school diploma or equivalent	None	39%

### Exhibit 39. Community college program headcounts and average annual awards, food preparation and serving occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
130600	Nutrition, Foods, and Culinary Arts	10,134	3	2
130620	Dietetic Services and Management	82	8	
130630	Culinary Arts	1,751	49	8
130710	Restaurant and Food Services and Management	972	31	27
<b>TOTAL</b>		<b>12,939</b>	<b>92</b>	<b>37</b>





## Key Findings

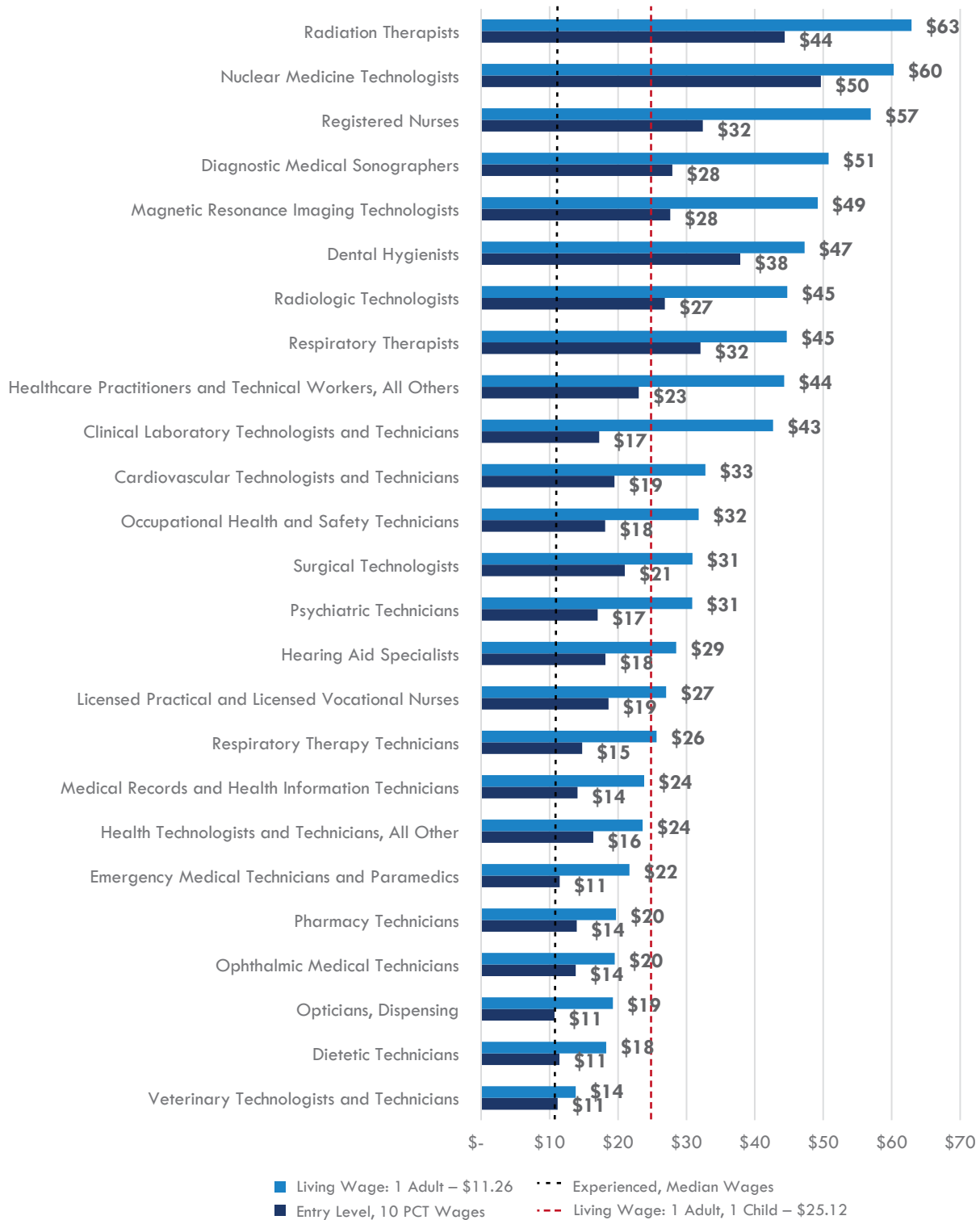
- The healthcare practitioners and technical occupational group is the second largest group in the Greater Sacramento Region, with more than 42,000 jobs in 2017.
- Roughly 3,300 openings are projected annually in the next five years, led by openings for registered nurses.
- Jobs in this occupational group generally pay well, and many require an associate degree or postsecondary certificate.
- Headcounts in related community college programs totaled more than 17,800 annually, led by nutrition, foods, and culinary arts, followed by registered nursing and veterinary technician (licensed).
- Awards are high in related programs, averaging more than 500 per year.

**Exhibit 40. Employment and projected occupational demand for healthcare practitioner and technical occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
29-1141	Registered Nurses	20,317	1,717	8%	5,245	1,396
29-2061	Licensed Practical and Licensed Vocational Nurses	3,878	418	11%	1,408	366
29-2052	Pharmacy Technicians	2,326	134	6%	915	211
29-2021	Dental Hygienists	2,017	236	12%	620	171
29-2071	Medical Records and Health Information Technicians	1,981	148	7%	600	150
29-2018	Clinical Laboratory Technologists and Technicians	1,833	124	7%	573	140
29-2099	Health Technologists and Technicians, All Other	1,304	262	20%	426	138
29-2056	Veterinary Technologists and Technicians	1,278	147	12%	515	133
29-2041	Emergency Medical Technicians and Paramedics	1,232	190	15%	382	118
29-2034	Radiologic Technologists	1,350	114	8%	355	94
29-2055	Surgical Technologists	871	93	11%	349	89
29-1126	Respiratory Therapists	1,015	90	9%	242	67
29-2081	Opticians, Dispensing	458	63	14%	168	46
29-2032	Diagnostic Medical Sonographers	612	64	10%	162	45
29-2057	Ophthalmic Medical Technicians	323	36	11%	129	33
29-2053	Psychiatric Technicians	198	48	24%	85	27
29-2051	Dietetic Technicians	247	17	7%	97	23
29-2031	Cardiovascular Technologists and Technicians	341	14	4%	88	21
29-9099	Healthcare Practitioners and Technical Workers, All Other	251	17	7%	64	16
29-2035	Magnetic Resonance Imaging Technologists	207	16	8%	54	14
29-2033	Nuclear Medicine Technologists	112	7	7%	29	7
29-9012	Occupational Health and Safety Technicians	91	11	12%	24	7
29-2092	Hearing Aid Specialists	70	9	13%	22	6
29-1124	Radiation Therapists	77	8	11%	18	5
29-2054	Respiratory Therapy Technicians	37	(6)	(16%)	13	3
<b>TOTAL</b>		<b>42,424</b>	<b>3,979</b>	<b>9%</b>	<b>12,587</b>	<b>3,329</b>



**Exhibit 41. Comparison of healthcare practitioner and technical entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**





**Exhibit 42. Education and training requirements for healthcare practitioner and technical occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
29-1124	Radiation Therapists	Associate degree	None	43%
29-1126	Respiratory Therapists	Associate degree	None	68%
29-1141	Registered Nurses	Bachelor's degree	None	38%
29-2018	Clinical Laboratory Technologists and Technicians	Data Not available	n/a	n/a
29-2021	Dental Hygienists	Associate degree	None	59%
29-2031	Cardiovascular Technologists and Technicians	Associate degree	None	59%
29-2032	Diagnostic Medical Sonographers	Associate degree	None	59%
29-2033	Nuclear Medicine Technologists	Associate degree	None	59%
29-2034	Radiologic Technologists	Associate degree	None	59%
29-2035	Magnetic Resonance Imaging Technologists	Associate degree	None	59%
29-2041	Emergency Medical Technicians and Paramedics	Postsecondary nondegree award	None	65%
29-2051	Dietetic Technicians	Associate degree	None	56%
29-2052	Pharmacy Technicians	High school diploma or equivalent	Moderate-term	56%
29-2053	Psychiatric Technicians	Postsecondary nondegree award	Short-term	56%
29-2054	Respiratory Therapy Technicians	Associate degree	None	56%
29-2055	Surgical Technologists	Postsecondary nondegree award	None	56%
29-2056	Veterinary Technologists and Technicians	Associate degree	None	56%
29-2057	Ophthalmic Medical Technicians	Postsecondary nondegree award	None	56%
29-2061	Licensed Practical and Licensed Vocational Nurses	Postsecondary nondegree award	None	70%
29-2071	Medical Records and Health Information Technicians	Postsecondary nondegree award	None	56%
29-2081	Opticians, Dispensing	High school diploma or equivalent	Long-term	47%
29-2092	Hearing Aid Specialists	High school diploma or equivalent	Moderate-term	49%
29-2099	Health Technologists and Technicians, All Other	Postsecondary nondegree award	None	49%
29-9012	Occupational Health and Safety Technicians	High school diploma or equivalent	Moderate-term	23%
29-9099	Healthcare Practitioners and Technical Workers, All Other	Postsecondary nondegree award	None	23%





### Exhibit 43. Community college program headcounts and average annual awards, healthcare practitioner and technical, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
10210	Veterinary Technician (Licensed)	890	18	27
43000	Biotechnology and Biomedical Technology	235	4	13
51420	Medical Office Technology	18		7
95500	Laboratory Science Technology	0	2	3
120500	Medical Laboratory Technology	54		15
121000	Respiratory Care/Therapy	215		16
122100	Pharmacy Technology	203		9
122300	Health Information Technology	412		15
122310	Health Information Coding	175	4	
122500	Radiologic Technology	213		12
122700	Diagnostic Medical Sonography	80	1	4
123000	Nursing	417		
123010	Registered Nursing	2,071		233
123020	Licensed Vocational Nursing	139	26	23
123900	Psychiatric Technician	101	4	
124020	Dental Hygienist	656		22
125000	Emergency Medical Services	1,556	17	
125100	Paramedic	160	9	6
130600	Nutrition, Foods, and Culinary Arts	10,134	3	2
130620	Dietetic Services and Management	82	8	
<b>TOTAL</b>		<b>17,809</b>	<b>97</b>	<b>407</b>





## Key Findings

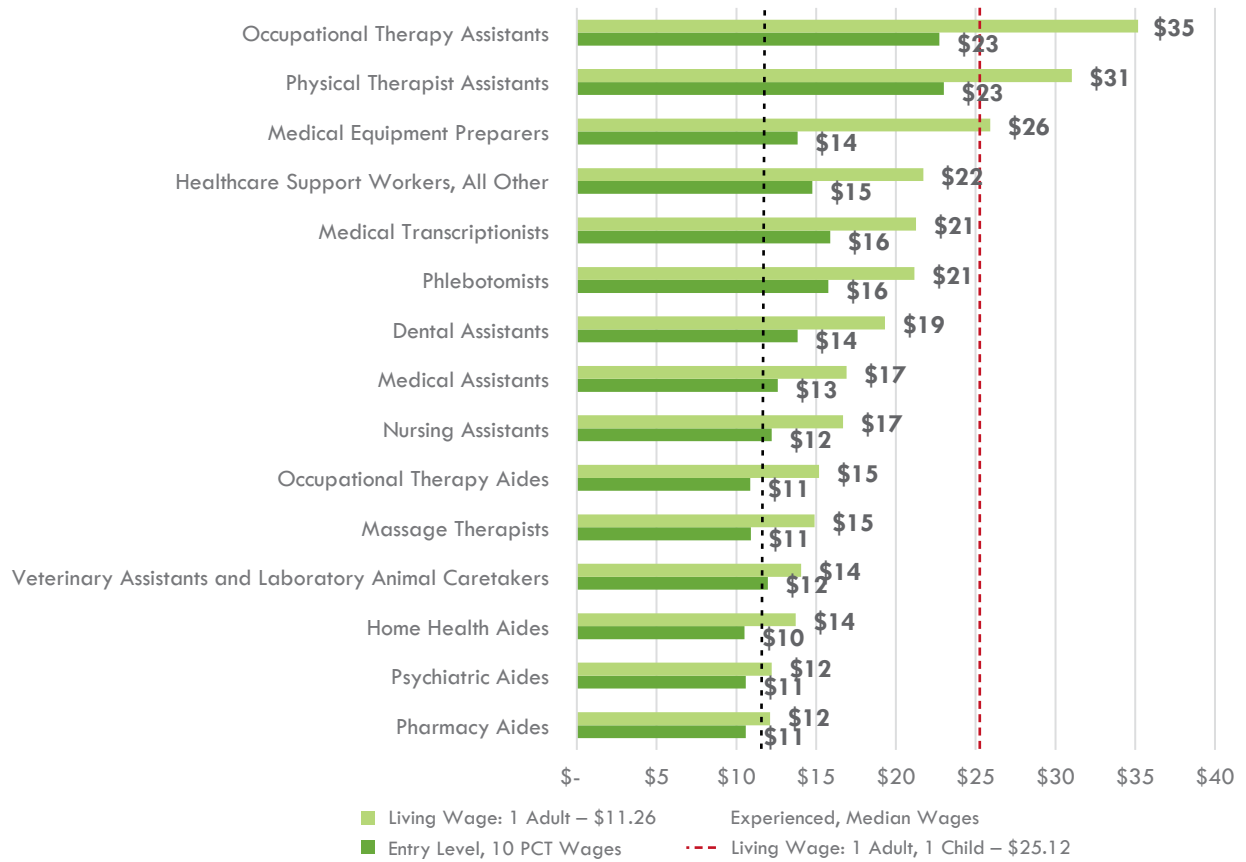
- Healthcare support is projected to be the fastest growing occupational group in the region, expanding 16 percent over the next five years.
- Medical assistants, nursing assistants and dental assistants are projected to have the most annual openings.
- Jobs in this cluster experience a wide range of compensation. Wages are generally below the living wage threshold for a one-adult, one-child household.
- Student headcounts total 3,400 annually in related community college programs, led by gerontology, occupational therapy and physical therapist assistant programs. There are approximately 200 awards on average annually.
- The highest number of awards occurred in medical assisting and occupational therapy

**Exhibit 44. Employment and projected occupational demand for healthcare support occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
31-9092	Medical Assistants	6,583	987	15%	3,648	934
31-1014	Nursing Assistants	6,451	729	11%	3,724	893
31-9091	Dental Assistants	3,479	400	11%	1,956	471
31-1011	Home Health Aides	1,905	1,175	62%	1,284	495
31-9011	Massage Therapists	1,839	213	12%	972	237
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	980	115	12%	775	178
31-9097	Phlebotomists	802	82	10%	421	101
31-9095	Pharmacy Aides	590	(15)	(2%)	390	78
31-9099	Healthcare Support Workers, All Other	806	43	5%	502	109
31-9094	Medical Transcriptionists	443	17	4%	262	57
31-2021	Physical Therapist Assistants	446	53	12%	274	66
31-9093	Medical Equipment Preparers	519	42	8%	326	74
31-2011	Occupational Therapy Assistants	110	21	19%	72	19
31-1013	Psychiatric Aides	173	47	27%	108	31
31-2012	Occupational Therapy Aides	79	7	9%	49	11
<b>TOTAL</b>		<b>25,206</b>	<b>3,916</b>	<b>16%</b>	<b>14,763</b>	<b>3,755</b>



**Exhibit 45. Comparison of healthcare support entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**





**Exhibit 46. Education and training requirements for healthcare support occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
31-1011	Home Health Aides	High school diploma or equivalent	Short-term	42%
31-1013	Psychiatric Aides	High school diploma or equivalent	Short-term	42%
31-1014	Nursing Assistants	Postsecondary nondegree award	None	42%
31-2011	Occupational Therapy Assistants	Associate degree	None	79%
31-2012	Occupational Therapy Aides	High school diploma or equivalent	Short-term	79%
31-2021	Physical Therapist Assistants	Associate degree	None	64%
31-9011	Massage Therapists	Postsecondary nondegree award	None	53%
31-9091	Dental Assistants	Postsecondary nondegree award	None	62%
31-9092	Medical Assistants	Postsecondary nondegree award	None	66%
31-9093	Medical Equipment Preparers	High school diploma or equivalent	Moderate-term	38%
31-9094	Medical Transcriptionists	Postsecondary nondegree award	None	56%
31-9095	Pharmacy Aides	High school diploma or equivalent	Short-term	45%
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	High school diploma or equivalent	Short-term	44%
31-9097	Phlebotomists	Postsecondary nondegree award	None	64%
31-9099	Healthcare Support Workers, All Other	High school diploma or equivalent	None	38%

**Exhibit 47. Community college program headcounts and average annual awards, healthcare support occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
51420	Medical Office Technology	18		7
120510	Phlebotomy	24		
120800	Medical Assisting	118	19	17
120810	Clinical Medical Assisting	26		
120820	Administrative Medical Assisting	64	16	4
121800	Occupational Therapy Technology	595		28
122000	Speech/Language Pathology and Audiology	186		19
122200	Physical Therapist Assistant	553		23
122310	Health Information Coding	175	4	
123000	Nursing	417		
123030	Certified Nurse Assistant	63	18	
123080	Home Health Aide	15	9	
123900	Psychiatric Technician	101	4	
124010	Dental Assistant	354	7	7
130900	Gerontology	683	2	12
<b>TOTAL</b>		<b>3,391</b>	<b>80</b>	<b>116</b>

## Key Findings

- The installation, maintenance and repair occupational group is the 5th largest source of middle-skill jobs in the region and is projected to grow by 8 percent over the next five years, with nearly 4,000 annual openings.
- While the group in aggregate is growing rapidly, there is considerable variation in growth rates among specific occupations. For instance, jobs in electrical power-line installers and repairers are projected to double (from a low base) in the next five years, while telecommunications equipment installers and repairers, except line installers is expected to decline.
- Maintenance and repair workers (general), automotive service technicians and mechanics, and first-line supervisors of mechanics, installers and repairers are projected to have the most job openings annually over the next five years.
- Related community college program headcounts are approximately 8,300 annually. There are approximately 800 awards annually in the category. The largest programs include automotive

### Exhibit 48. Employment and projected occupational demand for installation, maintenance and repair occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
49-9071	Maintenance and Repair Workers, General	8,419	807	10%	4,207	1,004
49-3023	Automotive Service Technicians and Mechanics	6,133	501	8%	2,915	684
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	2,833	274	10%	1,238	302
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	2,754	(86)	(3%)	1,415	296
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,430	255	10%	1,200	295
49-3021	Automotive Body and Related Repairers	1,402	203	14%	697	180
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	1,413	144	10%	650	159
49-9041	Industrial Machinery Mechanics	1,365	145	11%	607	151
49-2011	Computer, Automated Teller, and Office Machine Repairers	1,042	10	1%	501	111
49-9052	Telecommunications Line Installers and Repairers	807	61	8%	407	95
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	841	56	7%	407	93
49-3011	Aircraft Mechanics and Service Technicians	788	55	7%	304	73
49-9051	Electrical Power-Line Installers and Repairers	312	158	51%	149	62

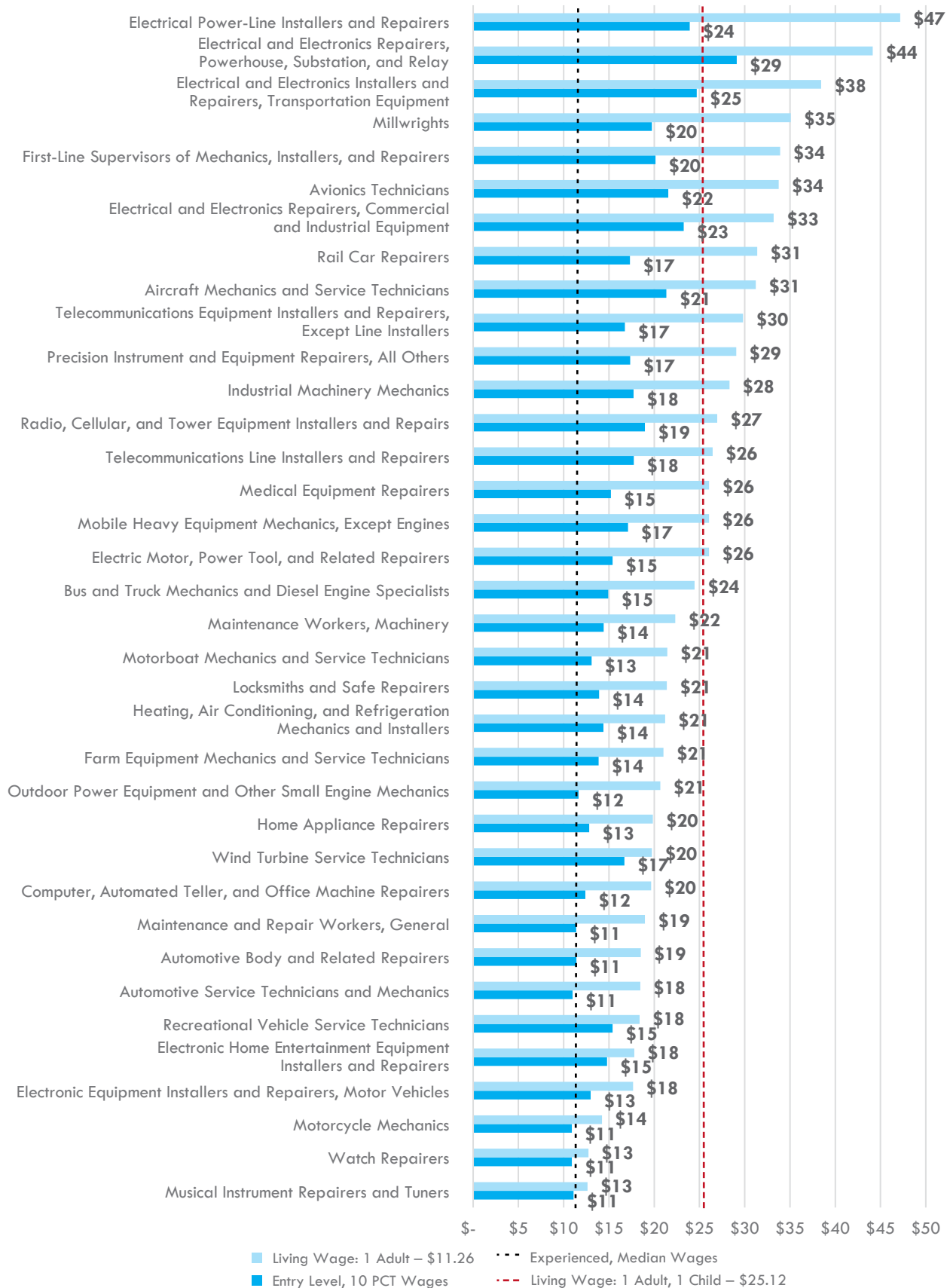
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**Exhibit 48. Employment and projected occupational demand for installation, maintenance and repair occupations, 2017-2022** *(continued)*

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	441	28	6%	194	45
49-9043	Maintenance Workers, Machinery	299	32	11%	157	38
49-3092	Recreational Vehicle Service Technicians	259	15	6%	164	36
49-9031	Home Appliance Repairers	328	14	4%	155	34
49-9062	Medical Equipment Repairers	218	32	15%	98	26
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	201	16	8%	105	24
49-3051	Motorboat Mechanics and Service Technicians	164	11	7%	87	20
49-3041	Farm Equipment Mechanics and Service Technicians	130	19	14%	64	17
49-9094	Locksmiths and Safe Repairers	176	(6)	(4%)	79	16
49-9044	Millwrights	137	17	12%	64	16
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	131	2	2%	68	16
49-9069	Precision Instrument and Equipment Repairers, All Other	151	7	5%	66	15
49-3043	Rail Car Repairers	117	7	6%	57	13
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	105	7	7%	56	13
49-2091	Avionics Technicians	136	9	7%	54	13
49-3052	Motorcycle Mechanics	83	8	9%	45	11
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	65	18	27%	32	10
49-2092	Electric Motor, Power Tool, and Related Repairers	86	7	8%	40	10
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	95	4	4%	42	9
49-9063	Musical Instrument Repairers and Tuners	76	3	3%	33	7
49-9081	Wind Turbine Service Technicians	30	9	31%	16	5
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	43	(2)	(6%)	20	4
49-9064	Watch Repairers	29	(4)	(14%)	12	2
	All Other Installation, Maintenance, and Repair Occupations	30	(3)	(9%)	12	2
<b>TOTAL</b>		<b>34,069</b>	<b>2,837</b>	<b>8%</b>	<b>16,403</b>	<b>3,904</b>



**Exhibit 49. Comparison of installation, maintenance and repair entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**





**Exhibit 50. Education and training requirements for installation, maintenance and repair occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	None	43%
49-2011	Computer, Automated Teller, and Office Machine Repairers	Some college, no degree	Short-term	55%
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairs	Associate degree	Moderate-term	52%
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	Postsecondary nondegree award	Moderate-term	52%
49-2091	Avionics Technicians	Associate degree	None	62%
49-2092	Electric Motor, Power Tool, and Related Repairers	High school diploma or equivalent	Moderate-term	47%
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	Postsecondary nondegree award	Long-term	50%
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	Postsecondary nondegree award	Long-term	50%
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	Postsecondary nondegree award	Moderate-term	50%
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	High school diploma or equivalent	Moderate-term	41%
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	Postsecondary nondegree award	Short-term	42%
49-3011	Aircraft Mechanics and Service Technicians	Postsecondary nondegree award	None	63%
49-3021	Automotive Body and Related Repairers	High school diploma or equivalent	Long-term	26%
49-3023	Automotive Service Technicians and Mechanics	Postsecondary nondegree award	Short-term	35%
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	High school diploma or equivalent	Long-term	35%
49-3041	Farm Equipment Mechanics and Service Technicians	High school diploma or equivalent	Long-term	38%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	High school diploma or equivalent	Long-term	38%
49-3043	Rail Car Repairers	High school diploma or equivalent	Long-term	38%
49-3051	Motorboat Mechanics and Service Technicians	High school diploma or equivalent	Long-term	34%
49-3052	Motorcycle Mechanics	Postsecondary nondegree award	Short-term	34%
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	High school diploma or equivalent	Moderate-term	34%
49-3092	Recreational Vehicle Service Technicians	High school diploma or equivalent	Long-term	25%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Postsecondary nondegree award	Long-term	41%

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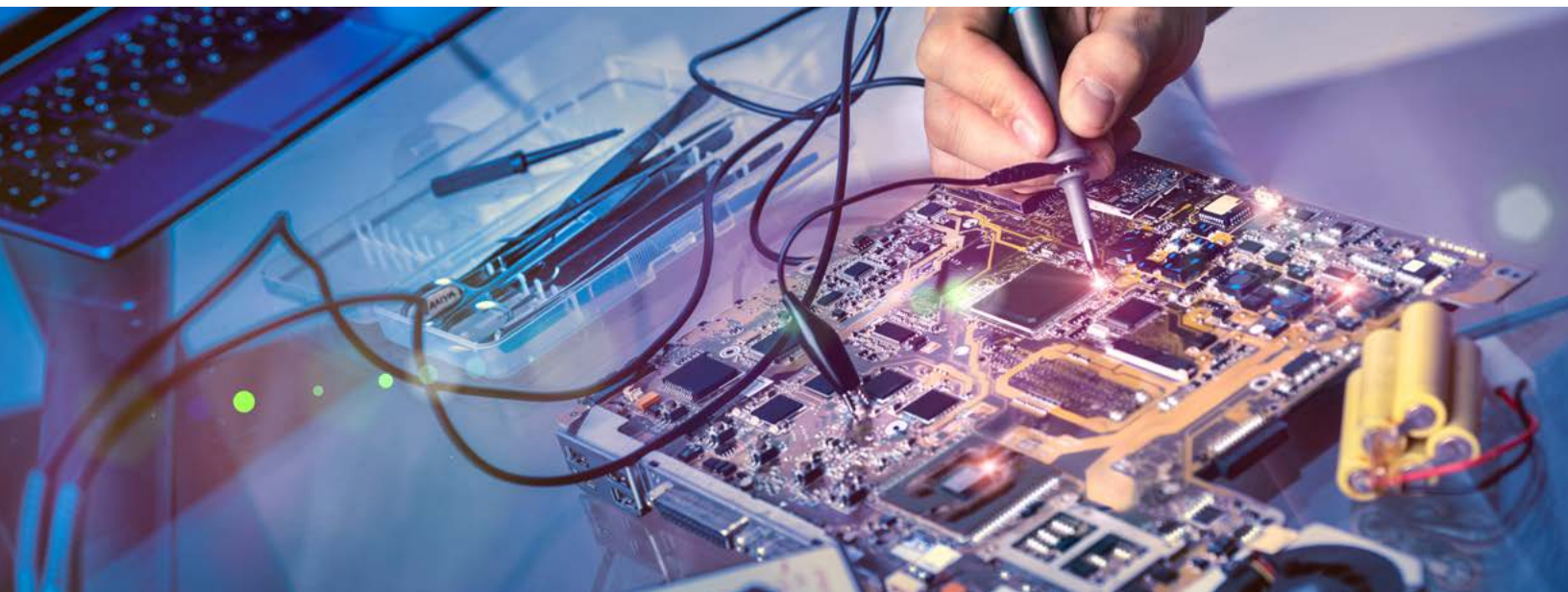
### Exhibit 50. Education and training requirements for installation, maintenance and repair occupations (continued)

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
49-9031	Home Appliance Repairers	High school diploma or equivalent	Moderate-term	43%
49-9041	Industrial Machinery Mechanics	High school diploma or equivalent	Long-term	42%
49-9043	Maintenance Workers, Machinery	High school diploma or equivalent	Long-term	42%
49-9044	Millwrights	High school diploma or equivalent	Apprenticeship	47%
49-9051	Electrical Power-Line Installers and Repairers	High school diploma or equivalent	Long-term	49%
49-9052	Telecommunications Line Installers and Repairers	High school diploma or equivalent	Long-term	46%
49-9062	Medical Equipment Repairers	Associate degree	Moderate-term	48%
49-9063	Musical Instrument Repairers and Tuners	High school diploma or equivalent	Apprenticeship	48%
49-9064	Watch Repairers	High school diploma or equivalent	Long-term	48%
49-9069	Precision Instrument and Equipment Repairers, All Other	High school diploma or equivalent	Long-term	48%
49-9071	Maintenance and Repair Workers, General	High school diploma or equivalent	Moderate-term	38%
49-9081	Wind Turbine Service Technicians	Postsecondary nondegree award	Long-term	37%
49-9094	Locksmiths and Safe Repairers	High school diploma or equivalent	Long-term	38%



**Exhibit 51. Community college program headcounts and average annual awards, installation, maintenance and repair occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
93400	Electronics and Electric Technology	1,482	103	31
93410	Computer Electronics	148		
93420	Industrial Electronics	252	49	26
93430	Telecommunications Technology	144	45	6
93460	Biomedical Instrumentation	97	16	
94500	Industrial Systems Technology and Maintenance	0	30	
94600	Environmental Control Technology	980	27	8
94610	Energy Systems Technology	62	19	2
94700	Diesel Technology	628	42	6
94740	Railroad and Light Rail Operations	36	7	2
94800	Automotive Technology	3,080	217	36
94840	Alternative Fuels and Advanced Transportation Technology	5		
94900	Automotive Collision Repair	256	21	2
95000	Aeronautical and Aviation Technology	552	16	9
95010	Aviation Airframe Mechanics	0	7	3
95020	Aviation Powerplant Mechanics	0	6	2
95220	Electrical	550	17	1
95600	Manufacturing and Industrial Technology	18	7	13
<b>TOTAL</b>		<b>8,290</b>	<b>629</b>	<b>145</b>



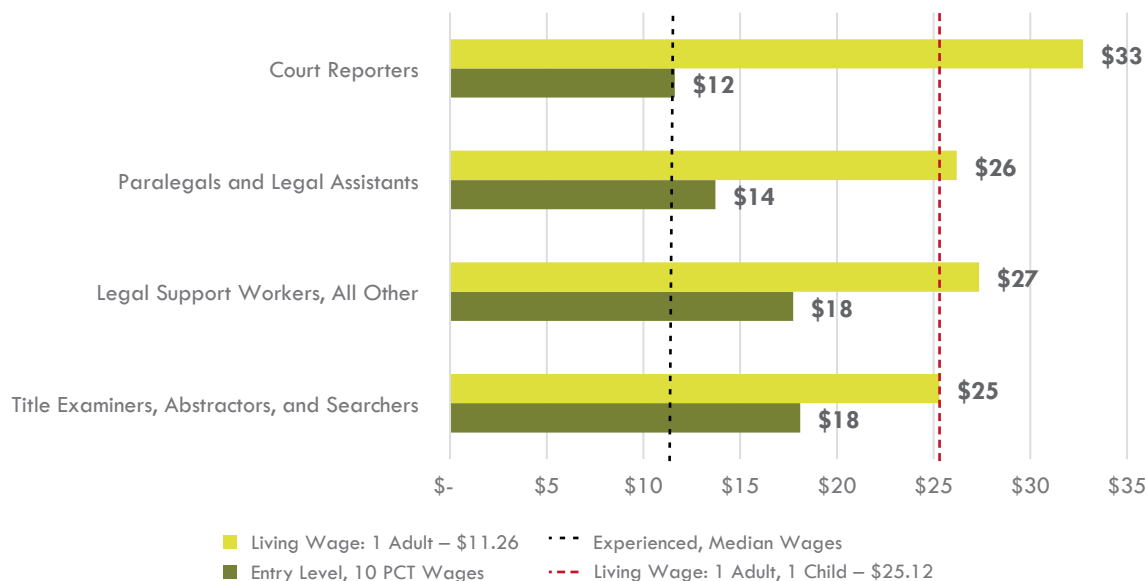
## ➤ Key Findings

- Legal was one of the smallest occupational groups for middle-skill jobs in the region in 2017, employing nearly 3,000 people.
- Around 320 annual openings are projected through 2022.
- The community college program related to this occupational cluster is paralegal, which had an annual headcount of roughly 900 students and conferred, on average, 50 awards per year.

**Exhibit 52. Employment and projected occupational demand for legal occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
23-2011	Paralegals and Legal Assistants	1,993	139	7%	1,025	233
23-2093	Title Examiners, Abstractors, and Searchers	498	(7)	(1%)	201	43
23-2099	Legal Support Workers, All Other	278	4	2%	113	24
23-2091	Court Reporters	209	5	2%	85	18
<b>TOTAL</b>		<b>2,977</b>	<b>141</b>	<b>5%</b>	<b>1,425</b>	<b>319</b>

**Exhibit 53. Comparison of legal entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



### Exhibit 54. Education and training requirements for legal occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
23-2011	Paralegals and Legal Assistants	Associate degree	None	44%
23-2091	Court Reporters	Postsecondary nondegree award	Short-term	41%
23-2093	Title Examiners, Abstractors, and Searchers	High school diploma or equivalent	Moderate-term	41%
23-2099	Legal Support Workers, All Other	Associate degree	None	41%

### Exhibit 55. Community college program headcounts and average annual awards, legal occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
140200	Paralegal	905	20	30
<b>TOTAL</b>		<b>905</b>	<b>20</b>	<b>30</b>



## ➤ Key Findings

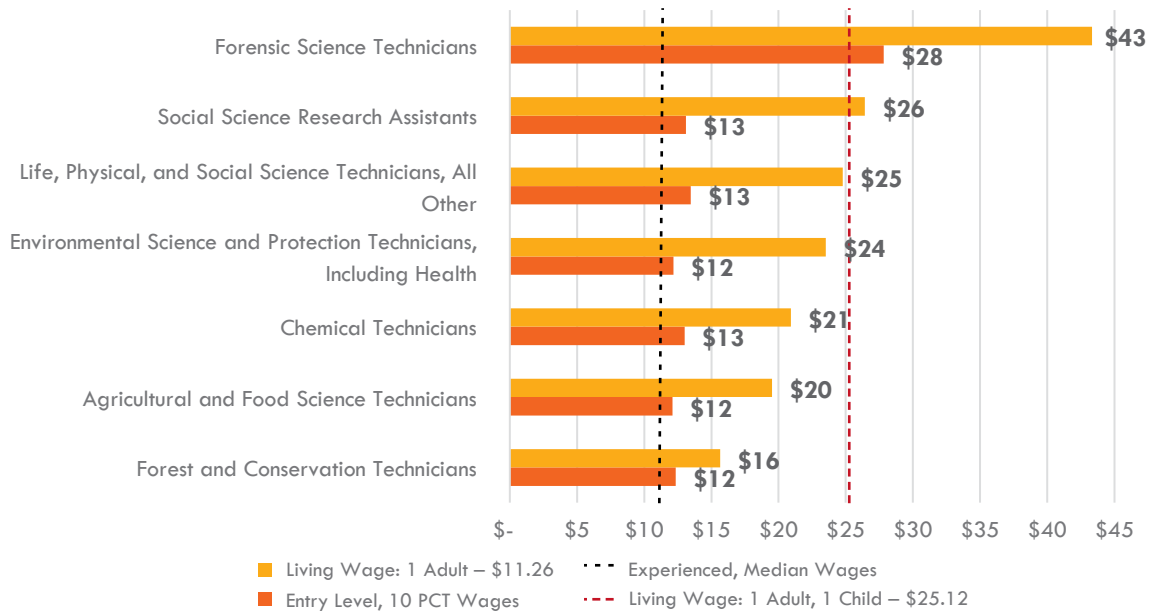
- Life, physical and social sciences is a small occupational group for middle-skill jobs in the Greater Sacramento Region; only 17 percent of total jobs in this occupational group are considered middle skill.
- More than 300 job openings are projected annually in this group over the next five years.
- Nearly 2,400 students enroll in related programs annually, led by agriculture technology and sciences, general. Overall, 63 awards are conferred on average each year.

**Exhibit 56. Employment and projected occupational demand for life, physical and social sciences occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
19-4093	Forest and Conservation Technicians	907	6	1%	523	108
19-4091	Environmental Science and Protection Technicians, Including Health	491	8	2%	284	59
19-4099	Life, Physical, and Social Science Technicians, All Other	304	21	7%	180	40
19-4011	Agricultural and Food Science Technicians	339	10	3%	170	36
19-4031	Chemical Technicians	252	16	6%	119	27
19-4092	Forensic Science Technicians	102	7	7%	60	14
19-4061	Social Science Research Assistants	65	5	8%	39	9
	All Other Life, Physical, and Social Science Occupations	79	4	6%	34	8
<b>TOTAL</b>		<b>2,538</b>	<b>77</b>	<b>3%</b>	<b>1,410</b>	<b>301</b>



**Exhibit 57. Comparison of life, physical and social sciences entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



**Exhibit 58. Education and training requirements for life, physical and social sciences occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
19-4011	Agricultural and Food Science Technicians	Associate degree	Moderate-term	39%
19-4031	Chemical Technicians	Associate degree	Moderate-term	42%
19-4061	Social Science Research Assistants	Bachelor's degree	None	36%
19-4091	Environmental Science and Protection Technicians, Including Health	Associate degree	None	36%
19-4092	Forensic Science Technicians	Bachelor's degree	Moderate-term	36%
19-4093	Forest and Conservation Technicians	Associate degree	None	36%
19-4099	Life, Physical, and Social Science Technicians, All Other	Associate degree	None	36%

**Exhibit 59. Community college program headcounts and average annual awards, life, physical and social sciences occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
10100	Agriculture Technology and Sciences, General	852	8	16
10200	Animal Science	408	0	
10300	Plant Science	344		
10900	Horticulture	339	12	2
10930	Nursery Technology	63	3	1
43000	Biotechnology and Biomedical Technology	235	4	13
95500	Laboratory Science Technology	0	2	3
210540	Forensics, Evidence, and Investigation	172		
<b>TOTAL</b>		<b>2,413</b>	<b>29</b>	<b>34</b>





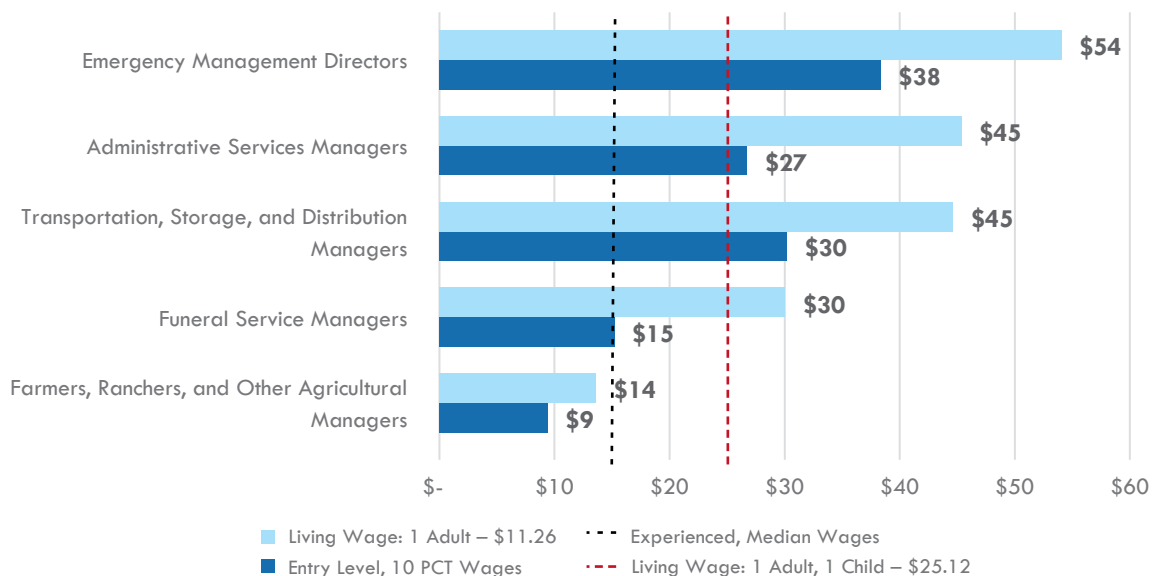
## Key Findings

- Alignment between program categories and occupational categories presents special challenges for the management occupational group. Nonetheless, the section offers a general snapshot of occupational demand and related program offerings.
- The management occupational group is projected to grow by 3 percent over the next five years, more slowly than middle-skill jobs overall.
- Approximately 430 job openings are expected annually, led by administrative services managers.
- There are considerable headcounts in related community programs (22,400 students total), largely in general office and business programs, such as program software and business administration, which span various occupational groups. The category has 1,400 annual awards.

### Exhibit 60. Employment and projected occupational demand for management occupations, 2017-2022

SOC	Occupation	2015 Jobs	5-Yr Change	5-Yr % Change	5-Yr Replacements	Annual Openings
11-3011	Administrative Services Managers	2,385	110	5%	960	214
11-9013	Farmers, Ranchers, and Other Agricultural Managers	1,497	(18)	(1%)	543	116
11-3071	Transportation, Storage, and Distribution Managers	938	53	6%	361	83
11-9161	Emergency Management Directors	202	4	2%	76	16
11-9061	Funeral Service Managers	48	2	5%	17	4
<b>TOTAL</b>		<b>5,071</b>	<b>151</b>	<b>3%</b>	<b>1,957</b>	<b>434</b>

### Exhibit 61. Comparison of management entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017



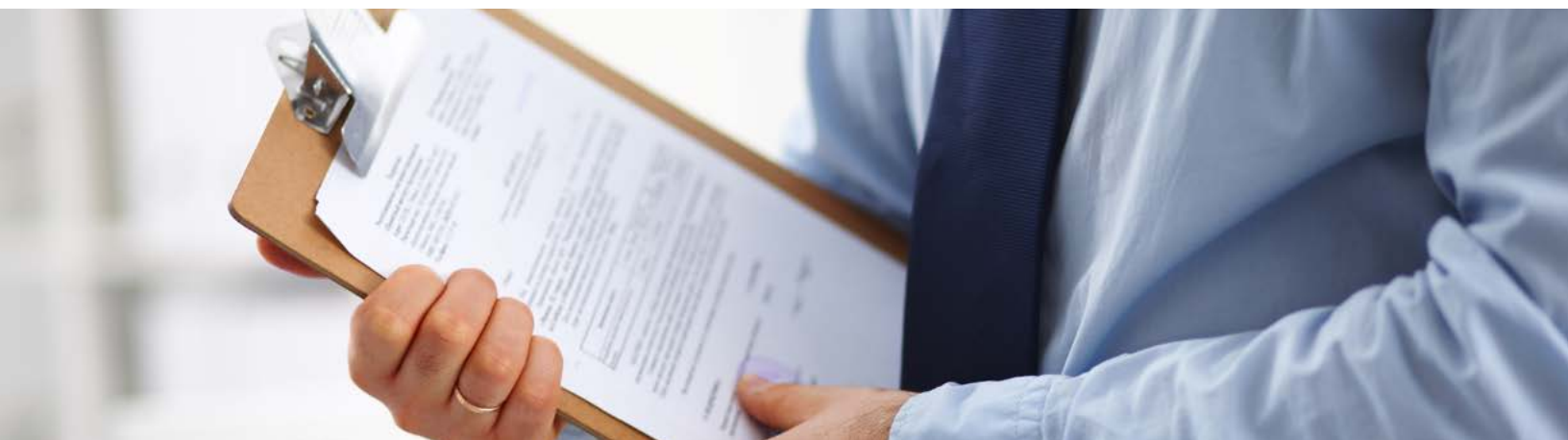


## Exhibit 62. Education and training requirements for management occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
11-3011	Administrative Services Managers	Bachelor's degree	None	38%
11-3071	Transportation, Storage, and Distribution Managers	High school diploma or equivalent	None	37%
11-9013	Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	None	30%
11-9061	Funeral Service Managers	Associate degree	None	26%
11-9161	Emergency Management Directors	Bachelor's degree	None	29%

## Exhibit 63. Community college program headcounts and average annual awards, management occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
11200	Agriculture Business, Sales and Service	309	3	3
50100	Business and Commerce, General	7,546	16	77
50500	Business Administration	3,180		1,071
50600	Business Management	3,156	37	54
50630	Management Development and Supervision	206	1	
50640	Small Business and Entrepreneurship	951	19	46
51440	Office Management	32	2	
70210	Software Applications	6,153	11	7
125500	Mortuary Science	433		24
302000	Aviation and Airport Management and Services	414		
<b>TOTAL</b>		<b>22,379</b>	<b>87</b>	<b>1,281</b>





### ➤ Key Findings

- Office and administrative support is the largest source of middle-skill jobs in the Greater Sacramento Region and employed 82,800 workers in 2017.
- Secretaries and administrative assistants (except legal, medical and executive) is projected to offer nearly 2,000 annual openings. Customer service representatives is also expected to have nearly 2,000 annual openings. Bookkeeping, accounting and auditing clerks will offer just under 1,500 annual openings.
- Compensation for occupations in this group vary, though median wages are generally below the living wage threshold for a one-adult, one-child household.
- Related community college program headcounts were also sizable, 23,000 annually, with 540 awards conferred annually.
- The largest programs in terms of headcounts are accounting, software applications and office technology/office computer applications.



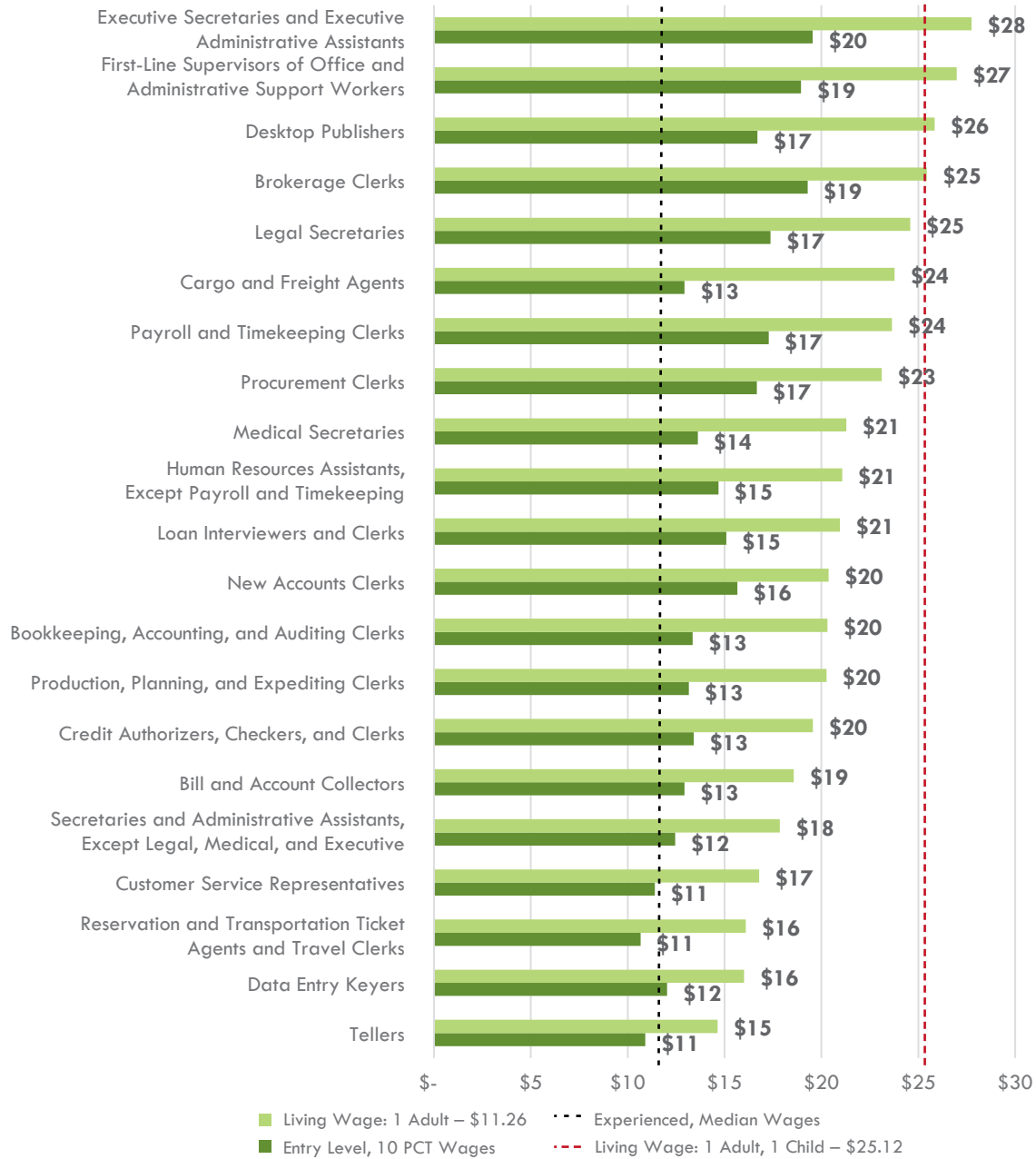


### Exhibit 64. Employment and projected occupational demand for office and administrative support occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Projected Total Annual Job Openings
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	18,082	54	0%	9,581	1,987
43-4051	Customer Service Representatives	13,684	992	7%	8,849	1,970
43-3031	Bookkeeping, Accounting, and Auditing Clerks	12,348	278	2%	6,842	1,438
43-1011	First-Line Supervisors of Office and Administrative Support Workers	10,754	293	3%	5,267	1,115
43-6013	Medical Secretaries	5,955	667	11%	3,287	793
43-6011	Executive Secretaries and Executive Administrative Assistants	4,872	(427)	(9%)	2,485	500
43-5061	Production, Planning, and Expediting Clerks	2,392	171	7%	1,232	281
43-3071	Tellers	2,415	(255)	(11%)	1,332	268
43-3011	Bill and Account Collectors	2,034	62	3%	1,053	229
43-3051	Payroll and Timekeeping Clerks	2,226	21	1%	1,093	227
43-9021	Data Entry Keyers	1,726	(116)	(7%)	969	195
43-6012	Legal Secretaries	1,779	(150)	(8%)	910	186
43-4131	Loan Interviewers and Clerks	1,658	(20)	(1%)	779	164
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,093	8	1%	597	124
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	508	25	5%	268	59
43-5011	Cargo and Freight Agents	312	46	15%	133	36
43-3061	Procurement Clerks	303	14	5%	165	36
43-4141	New Accounts Clerks	246	(38)	(16%)	119	24
43-4011	Brokerage Clerks	147	12	8%	76	18
43-9031	Desktop Publishers	135	(9)	(7%)	70	14
43-4041	Credit Authorizers, Checkers, and Clerks	96	4	4%	48	11
<b>TOTAL</b>		<b>82,827</b>	<b>1,635</b>	<b>2%</b>	<b>45,197</b>	<b>9,683</b>



**Exhibit 65. Comparison of office and administrative support entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**





## Exhibit 66. Education and training requirements for office and administrative support occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
43-1011	First-Line Supervisors of Office and Administrative Support Workers	High school diploma or equivalent	None	39%
43-3011	Bill and Account Collectors	High school diploma or equivalent	Moderate-term	47%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	Some college, no degree	Moderate-term	49%
43-3051	Payroll and Timekeeping Clerks	High school diploma or equivalent	Moderate-term	47%
43-3061	Procurement Clerks	High school diploma or equivalent	Moderate-term	34%
43-3071	Tellers	High school diploma or equivalent	Short-term	44%
43-4011	Brokerage Clerks	High school diploma or equivalent	Moderate-term	30%
43-4041	Credit Authorizers, Checkers, and Clerks	High school diploma or equivalent	Moderate-term	43%
43-4051	Customer Service Representatives	High school diploma or equivalent	Short-term	43%
43-4131	Loan Interviewers and Clerks	High school diploma or equivalent	Short-term	50%
43-4141	New Accounts Clerks	High school diploma or equivalent	Moderate-term	48%
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	Associate degree	None	40%
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	High school diploma or equivalent	Short-term	44%
43-5011	Cargo and Freight Agents	High school diploma or equivalent	Short-term	56%
43-5061	Production, Planning, and Expediting Clerks	High school diploma or equivalent	Moderate-term	40%
43-6011	Executive Secretaries and Executive Administrative Assistants	High school diploma or equivalent	None	47%
43-6012	Legal Secretaries	High school diploma or equivalent	Moderate-term	47%
43-6013	Medical Secretaries	High school diploma or equivalent	Moderate-term	47%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	High school diploma or equivalent	Short-term	47%
43-9021	Data Entry Keyers	High school diploma or equivalent	Short-term	46%
43-9031	Desktop Publishers	Associate degree	Short-term	42%



**Exhibit 67. Community college program headcounts and average annual awards, office and administrative support occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
50200	Accounting	11,068	113	189
50400	Banking and Finance	0		3
50630	Management Development and Supervision	206	1	
50920	Purchasing	61	3	
50940	Sales and Salesmanship	122		
50970	E-Commerce (business emphasis)	124	1	
51400	Office Technology/Office Computer Applications	3,823	29	30
51410	Legal Office Technology	7	1	1
51420	Medical Office Technology	18		7
51440	Office Management	32	2	
61400	Digital Media	344	19	33
61410	Multimedia	164	5	14
61450	Desktop Publishing	6	0	
70210	Software Applications	6,153	11	7
120820	Administrative Medical Assisting	64	16	4
140200	Paralegal	905	20	30
<b>TOTAL</b>		<b>23,096</b>	<b>221</b>	<b>318</b>



## ➤ Key Findings

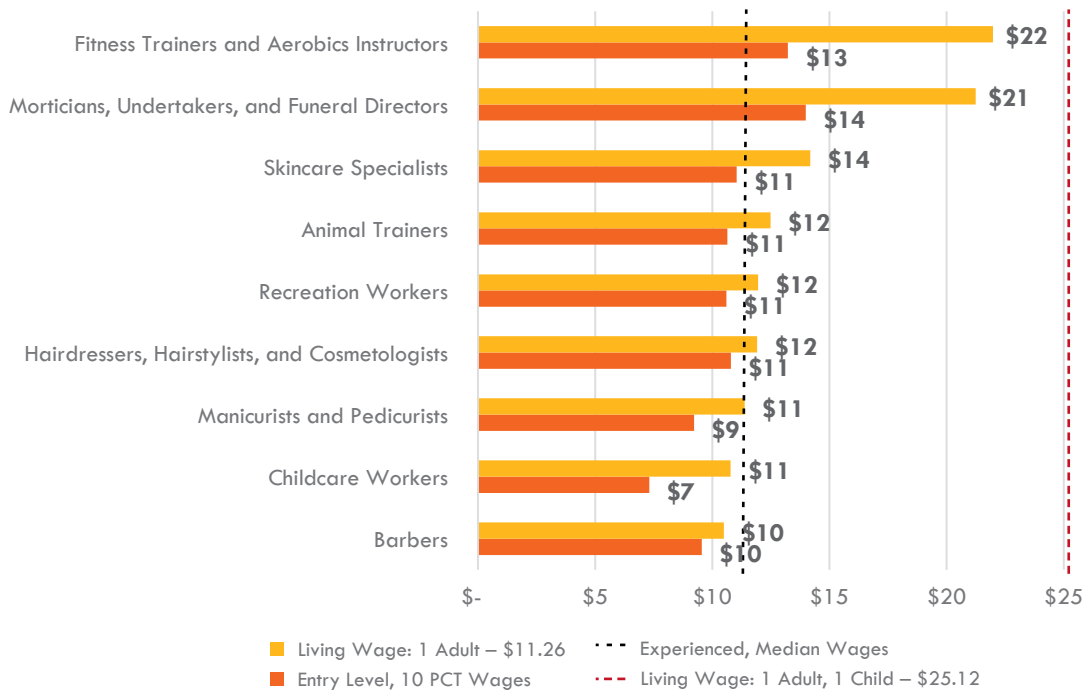
- In the personal care and service occupational group, 3,700 job openings are projected annually, led by childcare workers; hairdressers, hairstylists and cosmetologists; and recreation workers.
- While numerous, jobs in this occupational group are generally not well compensated, particularly childcare workers and barbers.
- On average, student headcounts total 14,700 annually in related programs, and more than 700 awards are conferred annually.
- The largest program for headcounts and awards is child development/early care and education, followed by cosmetology and barbering.

### Exhibit 68. Employment and projected occupational demand for personal care and service occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
39-9011	Childcare Workers	8,495	(688)	(8%)	5,899	1,198
39-5012	Hairdressers, Hairstylists, and Cosmetologists	6,354	774	12%	3,905	936
39-9032	Recreation Workers	3,804	216	6%	3,202	685
39-9031	Fitness Trainers and Aerobics Instructors	2,723	124	5%	2,291	491
39-5092	Manicurists and Pedicurists	1,991	234	12%	1,156	278
39-5094	Skincare Specialists	386	58	15%	227	57
39-5011	Barbers	459	56	12%	218	55
39-2011	Animal Trainers	232	2	1%	129	27
39-4031	Morticians, Undertakers, and Funeral Directors	64	3	5%	40	9
<b>TOTAL</b>		<b>24,548</b>	<b>783</b>	<b>3%</b>	<b>17,093</b>	<b>3,743</b>



**Exhibit 69. Comparison of personal care and service entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



**Exhibit 70. Education and training requirements for personal care and service occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
39-2011	Animal Trainers	High school diploma or equivalent	Moderate-term	39%
39-4031	Morticians, Undertakers, and Funeral Directors	Associate degree	Long-term	49%
39-5011	Barbers	Postsecondary nondegree award	None	35%
39-5012	Hairdressers, Hairstylists, and Cosmetologists	Postsecondary nondegree award	None	43%
39-5092	Manicurists and Pedicurists	Postsecondary nondegree award	None	28%
39-5094	Skincare Specialists	Postsecondary nondegree award	None	28%
39-9011	Childcare Workers	High school diploma or equivalent	Short-term	37%
39-9031	Fitness Trainers and Aerobics Instructors	High school diploma or equivalent	Short-term	34%
39-9032	Recreation Workers	High school diploma or equivalent	Short-term	34%



### Exhibit 71. Community college program headcounts and average annual awards, personal care and service occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
10240	Equine Science	73		3
83520	Fitness Trainer	243	22	
83610	Recreation Assistant	356	2	
122800	Athletic Training and Sports Medicine	6		
125500	Mortuary Science	433		24
130500	Child Development/Early Care and Education	10,900	355	193
130540	Preschool Age Child	922		
130550	The School Age Child	119	11	0
130590	Infants and Toddlers	682	17	
300700	Cosmetology and Barbering	940	85	7
<b>TOTAL</b>		<b>14,676</b>	<b>493</b>	<b>228</b>



## Key Findings

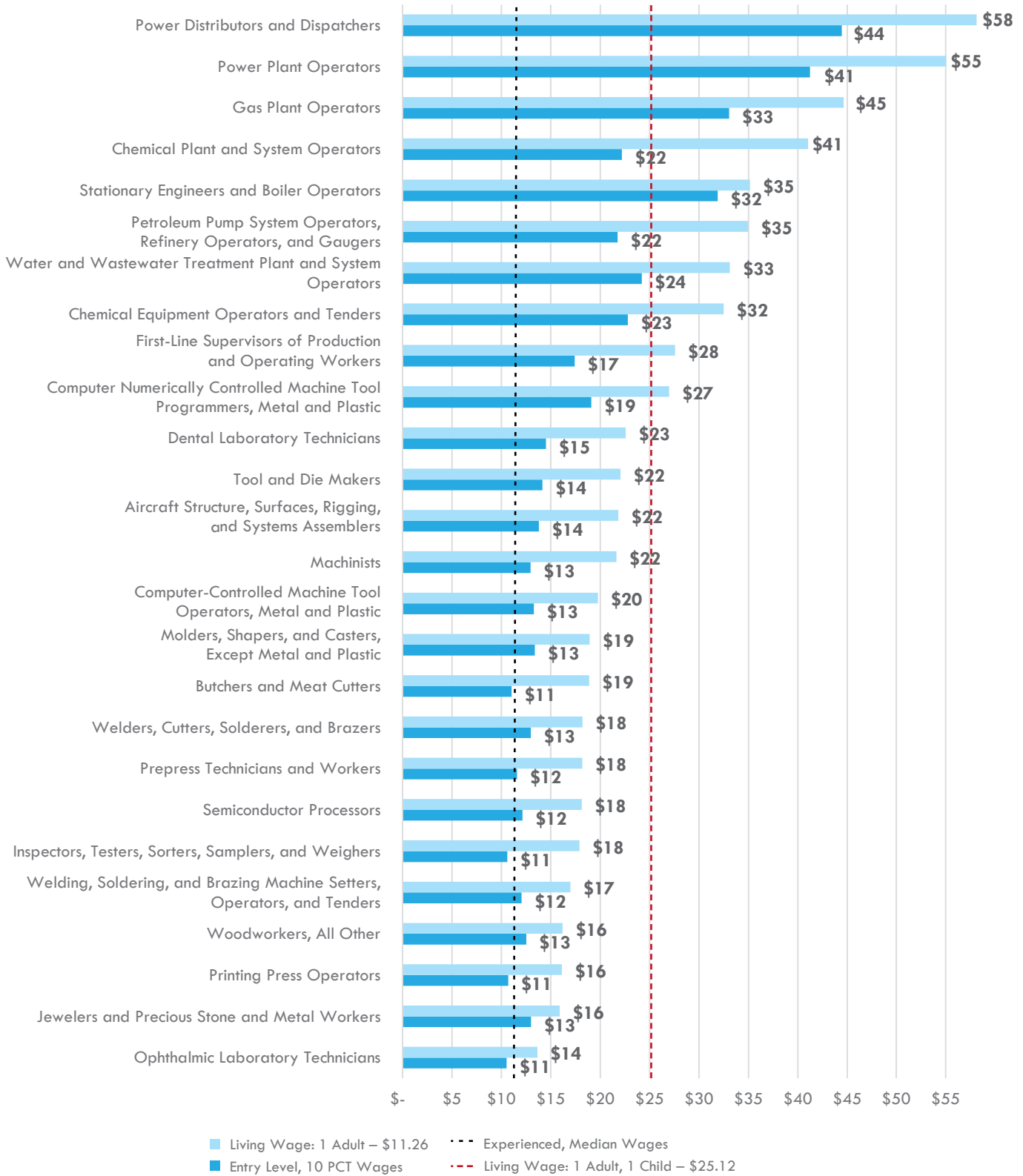
- More than 1,600 job openings are projected annually over the next five years in the production occupational group.
- The largest sources of openings (as well as 2017 employment) are: first-line supervisors of production and operating workers; inspectors, testers, sorters, samplers and weighers; and welders, cutters, solderers and brazers .
- Student headcounts in related programs total 5,500 annually, led by the welding technology, electronics and electric technology, and aeronautical and aviation technology programs.
- Electronics and electric technology, welding technology and industrial electronics have the most annual average awards. The category has an annual average of 450 awards.



## Exhibit 72. Employment and projected occupational demand for production occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Projected Total Annual Job Openings
51-1011	First-Line Supervisors of Production and Operating Workers	2,316	181	8%	1,148	266
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	1,957	62	3%	1,169	248
51-4121	Welders, Cutters, Solderers, and Brazers	1,595	238	15%	889	226
51-3021	Butchers and Meat Cutters	1,326	68	5%	820	178
51-5112	Printing Press Operators	1,145	51	4%	606	139
51-4041	Machinists	1,107	67	6%	567	130
51-8031	Water and Wastewater Treatment Plant and System Operators	904	(22)	(2%)	364	76
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	324	24	7%	163	38
51-9081	Dental Laboratory Technicians	284	6	2%	152	37
51-9011	Chemical Equipment Operators and Tenders	268	31	11%	148	36
51-8021	Stationary Engineers and Boiler Operators	327	4	1%	169	35
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	265	22	8%	138	33
51-8013	Power Plant Operators	219	24	11%	96	30
51-9071	Jewelers and Precious Stone and Metal Workers	250	8	3%	132	29
51-5111	Prepress Technicians and Workers	196	(4)	(2%)	114	25
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	170	12	7%	91	21
51-9083	Ophthalmic Laboratory Technicians	133	17	12%	76	19
51-7099	Woodworkers, All Other	116	9	7%	65	15
51-9141	Semiconductor Processors	109	(1)	(1%)	62	14
51-8091	Chemical Plant and System Operators	109	11	10%	55	13
51-8092	Gas Plant Operators	71	26	37%	39	13
51-4111	Tool and Die Makers	81	10	12%	39	10
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	77	8	10%	39	10
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	86	(7)	(9%)	43	9
51-8012	Power Distributors and Dispatchers	52	17	34%	26	9
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	37	7	19%	19	5
<b>TOTAL</b>		<b>13,522</b>	<b>867</b>	<b>6%</b>	<b>7,233</b>	<b>1,664</b>

**Exhibit 73. Comparison of production entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



**Exhibit 74. Education and training requirements for production occupations**

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	None	35%
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	High school diploma or equivalent	Moderate-term	33%
51-3021	Butchers and Meat Cutters	No formal educational credential	Long-term	23%
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	High school diploma or equivalent	Moderate-term	43%
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	Postsecondary nondegree award	Moderate-term	43%
51-4041	Machinists	High school diploma or equivalent	Long-term	40%
51-4111	Tool and Die Makers	Postsecondary nondegree award	Long-term	48%
51-4121	Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	Moderate-term	31%
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	High school diploma or equivalent	Moderate-term	31%
51-5111	Prepress Technicians and Workers	Postsecondary nondegree award	None	39%
51-5112	Printing Press Operators	High school diploma or equivalent	Moderate-term	32%
51-7099	Woodworkers, All Other	High school diploma or equivalent	Moderate-term	26%
51-8012	Power Distributors and Dispatchers	High school diploma or equivalent	Long-term	49%
51-8013	Power Plant Operators	High school diploma or equivalent	Long-term	49%
51-8021	Stationary Engineers and Boiler Operators	High school diploma or equivalent	Long-term	39%
51-8031	Water and Wastewater Treatment Plant and System Operators	High school diploma or equivalent	Long-term	41%
51-8091	Chemical Plant and System Operators	High school diploma or equivalent	Moderate-term	42%
51-8092	Gas Plant Operators	High school diploma or equivalent	Long-term	42%
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	High school diploma or equivalent	Moderate-term	42%
51-9011	Chemical Equipment Operators and Tenders	High school diploma or equivalent	Moderate-term	36%
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	High school diploma or equivalent	Moderate-term	38%
51-9071	Jewelers and Precious Stone and Metal Workers	High school diploma or equivalent	Long-term	35%
51-9081	Dental Laboratory Technicians	High school diploma or equivalent	Moderate-term	52%

*Continued on the next page*

**Exhibit 74. Education and training requirements for production occupations**
*(continued)*

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
51-9083	Ophthalmic Laboratory Technicians	High school diploma or equivalent	Moderate-term	52%
51-9141	Semiconductor Processors	High school diploma or equivalent	Moderate-term	27%
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	High school diploma or equivalent	Long-term	27%

**Exhibit 75. Community college program headcounts and average annual awards, production occupations, 2015-18**

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
43000	Biotechnology and Biomedical Technology	235	4	13
93400	Electronics and Electric Technology	1,482	103	31
93420	Industrial Electronics	252	49	26
93410	Computer Electronics	148		
94500	Industrial Systems Technology and Maintenance	0	30	
95000	Aeronautical and Aviation Technology	552	16	9
95010	Aviation Airframe Mechanics	0	7	3
95020	Aviation Powerplant Mechanics	0	6	2
95250	Mill and Cabinet Work	46		
95500	Laboratory Science Technology	0	2	3
95600	Manufacturing and Industrial Technology	18	7	13
95630	Machining and Machine Tools	69		
95650	Welding Technology	2,458	103	16
95800	Water and Wastewater Technology	259	7	
<b>TOTAL</b>		<b>5,520</b>	<b>334</b>	<b>116</b>



## ➤ Key Findings

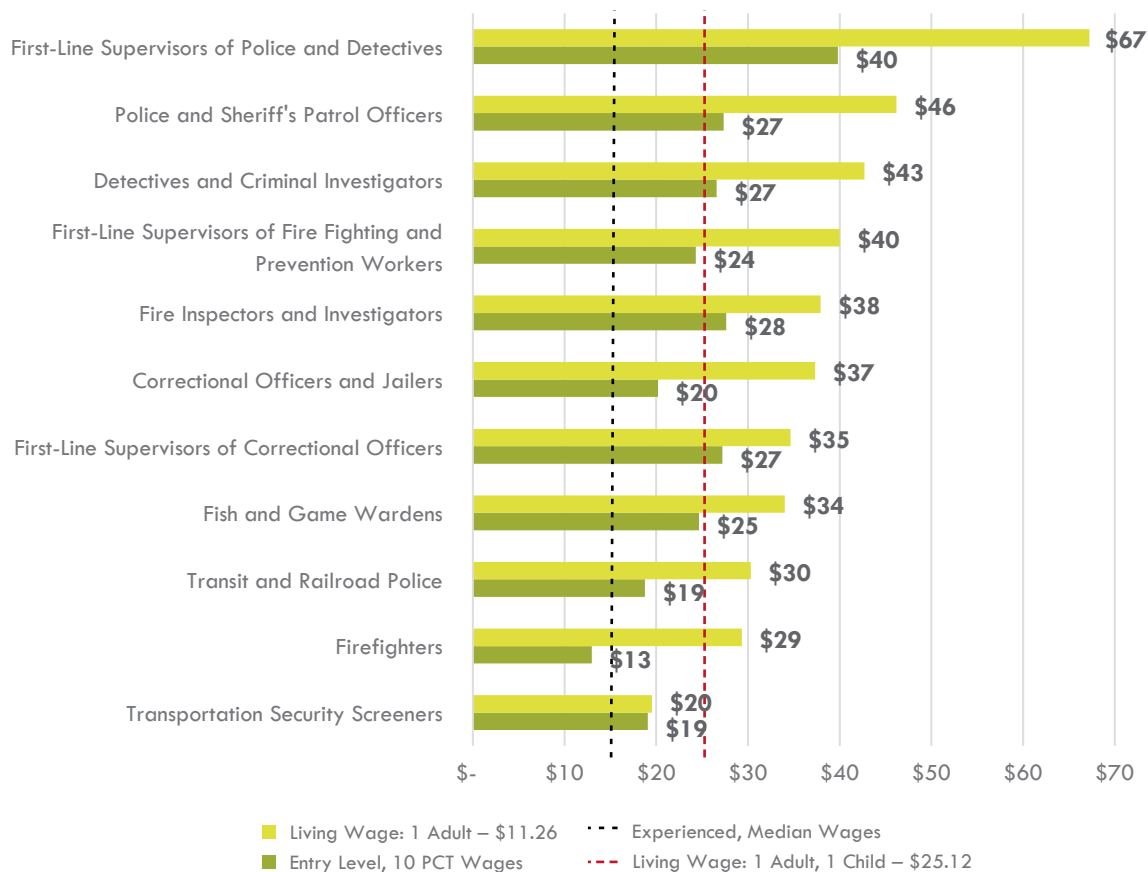
- The protective service occupational group accounted for nearly 14,000 jobs in 2017.
- Projections suggest there will be over 1,000 openings annually in this occupational group, led by openings for police and sheriff's patrol officers, correctional officers and jailers, and firefighters.
- Jobs in this occupational cluster are well compensated.
- Administration of justice programs in the region report a student headcount of 11,000 annually; this is largest source of headcounts in this occupational group.
- Fire technology, police academy and fire academy are the next largest programs in terms of headcount.
- Protective service programs confer nearly 2,300 awards annually, on average.

### Exhibit 76. Employment and projected occupational demand for protective service occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
33-3051	Police and Sheriff's Patrol Officers	5,238	162	3%	1,671	369
33-3012	Correctional Officers and Jailers	2,489	56	2%	1,002	219
33-2011	Firefighters	2,619	108	4%	865	195
33-3021	Detectives and Criminal Investigators	1,122	(2)	0%	348	75
33-1011	First-Line Supervisors of Correctional Officers	980	(65)	(7%)	310	66
33-1012	First-Line Supervisors of Police and Detectives	529	28	5%	159	38
33-9093	Transportation Security Screeners	331	16	5%	148	34
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	235	15	6%	78	19
33-2021	Fire Inspectors and Investigators	89	3	3%	45	10
33-3031	Fish and Game Wardens	97	0	0%	43	9
33-3052	Transit and Railroad Police	37	2	4%	12	3
	All Other Protective Service Occupations	71	8	12%	34	8
<b>TOTAL</b>		<b>13,837</b>	<b>331</b>	<b>2%</b>	<b>4,716</b>	<b>1,043</b>



### Exhibit 77. Comparison of protective service entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017







## Exhibit 78. Education and training requirements for protective service occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
33-1011	First-Line Supervisors of Correctional Officers	High school diploma or equivalent	None	48%
33-1012	First-Line Supervisors of Police and Detectives	High school diploma or equivalent	Moderate-term	47%
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	Postsecondary nondegree award	Moderate-term	59%
33-2011	Firefighters	Postsecondary nondegree award	Long-term	61%
33-2021	Fire Inspectors and Investigators	Postsecondary nondegree award	Moderate-term	56%
33-3012	Correctional Officers and Jailers	High school diploma or equivalent	Moderate-term	50%
33-3021	Detectives and Criminal Investigators	High school diploma or equivalent	Moderate-term	38%
33-3031	Fish and Game Wardens	Bachelor's degree	Moderate-term	44%
33-3051	Police and Sheriff's Patrol Officers	High school diploma or equivalent	Moderate-term	48%
33-3052	Transit and Railroad Police	High school diploma or equivalent	Moderate-term	48%
33-9093	Transportation Security Screeners	High school diploma or equivalent	Short-term	44%

## Exhibit 79. Community college program headcounts and average annual awards, protective service occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
11520	Wildlife and Fisheries	21		
210500	Administration of Justice	11,016	1,643	437
210510	Corrections	291	2	12
210520	Probation and Parole	23		
210550	Police Academy	1,113	95	1
213300	Fire Technology	2,397	22	54
213310	Wildland Fire Technology	29		
213350	Fire Academy	887	17	4
<b>TOTAL</b>		<b>15,776</b>	<b>1,779</b>	<b>508</b>

## ➤ Key Findings

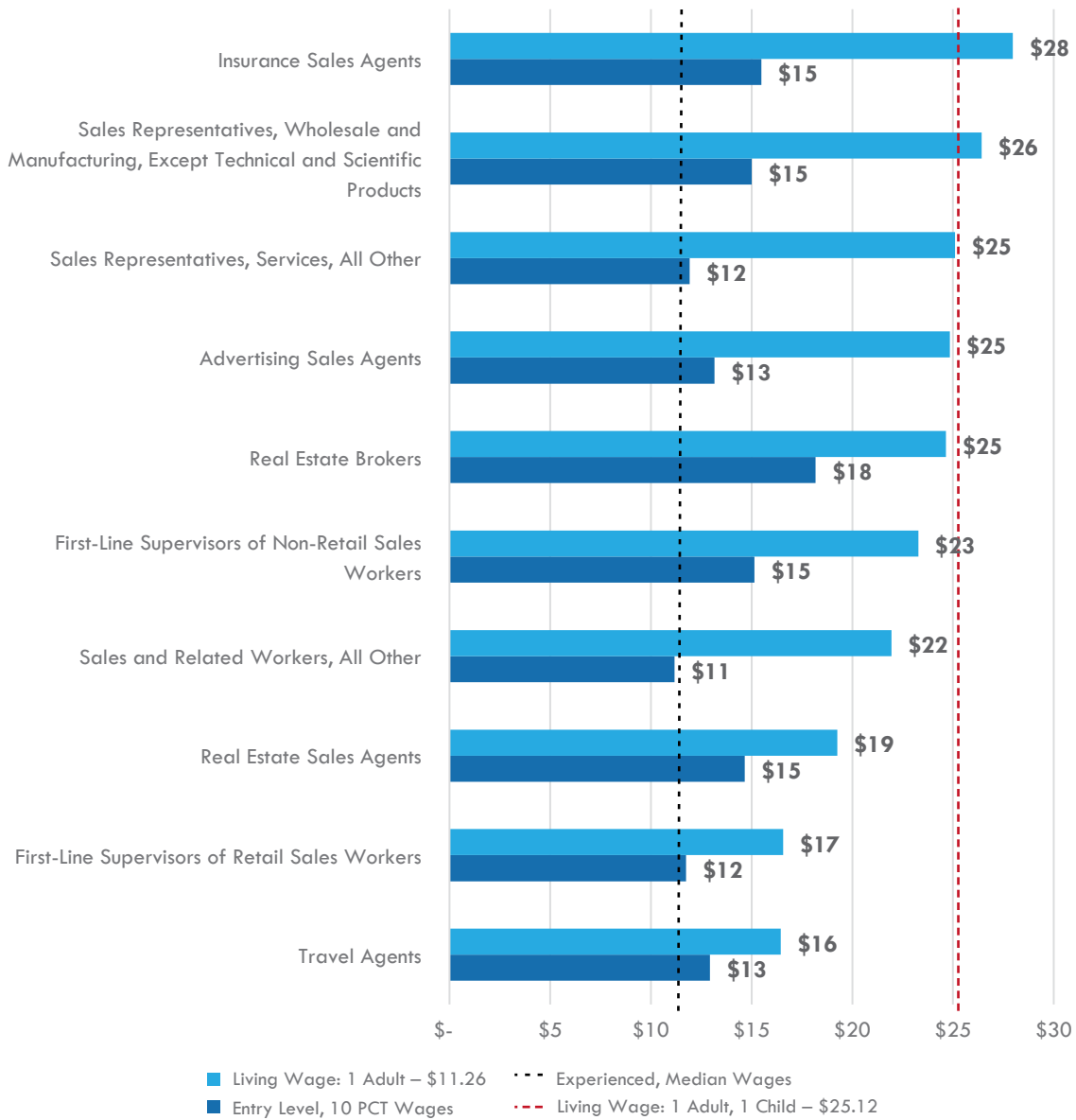
- The sales and related occupational group is the 2nd largest source of projected job openings in the region over the next five years, with 5,000 annual openings.
- The most job openings are projected for first-line supervisors of retail sales workers; sales representatives, services, all other; and insurance sales agents.
- Student headcounts total 3,900 annually in related programs offered by the region’s community colleges, led by real estate, and marketing and distribution programs. The category confers about 60 awards on average annually.

**Exhibit 80. Employment and projected occupational demand for sales and related occupations, 2017-2022**

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
41-1011	First-Line Supervisors of Retail Sales Workers	10,186	324	3%	5,359	1,159
41-3099	Sales Representatives, Services, All Other	7,877	551	7%	4,780	1,066
41-3021	Insurance Sales Agents	6,969	960	14%	3,464	898
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	7,595	533	7%	3,910	893
41-9022	Real Estate Sales Agents	3,528	66	2%	1,600	348
41-1012	First-Line Supervisors of Non-Retail Sales Workers	2,602	88	3%	1,174	253
41-9099	Sales and Related Workers, All Other	809	53	7%	536	118
41-3011	Advertising Sales Agents	858	(37)	(4%)	522	108
41-9021	Real Estate Brokers	1,052	20	2%	477	103
41-3041	Travel Agents	406	8	2%	233	52
<b>TOTAL</b>		<b>41,883</b>	<b>2,566</b>	<b>6%</b>	<b>22,055</b>	<b>4,999</b>



**Exhibit 81. Comparison of sales and related entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**



## Exhibit 82. Education and training requirements for sales and related occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
41-1011	First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	None	39%
41-1012	First-Line Supervisors of Non-Retail Sales Workers	High school diploma or equivalent	None	31%
41-3011	Advertising Sales Agents	High school diploma or equivalent	Moderate-term	27%
41-3021	Insurance Sales Agents	High school diploma or equivalent	Moderate-term	35%
41-3041	Travel Agents	High school diploma or equivalent	Moderate-term	41%
41-3099	Sales Representatives, Services, All Other	High school diploma or equivalent	Moderate-term	31%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	High school diploma or equivalent	Moderate-term	31%
41-9021	Real Estate Brokers	High school diploma or equivalent	None	37%
41-9022	Real Estate Sales Agents	High school diploma or equivalent	Moderate-term	37%
41-9099	Sales and Related Workers, All Other	High school diploma or equivalent	None	30%
41-9099	Sales and Related Workers, All Other	High school diploma or equivalent	None	30%

## Exhibit 83. Community college program headcounts and average annual awards, sales and related occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
50650	Retail Store Operations and Management	0	2	2
50800	International Business and Trade	126		
50900	Marketing and Distribution	1,343	4	22
50910	Advertising	149		1
50940	Sales and Salesmanship	122		
50970	E-Commerce (business emphasis)	124	1	
51100	Real Estate	1,989	18	11
<b>TOTAL</b>		<b>3,854</b>	<b>24</b>	<b>36</b>



## Key Findings

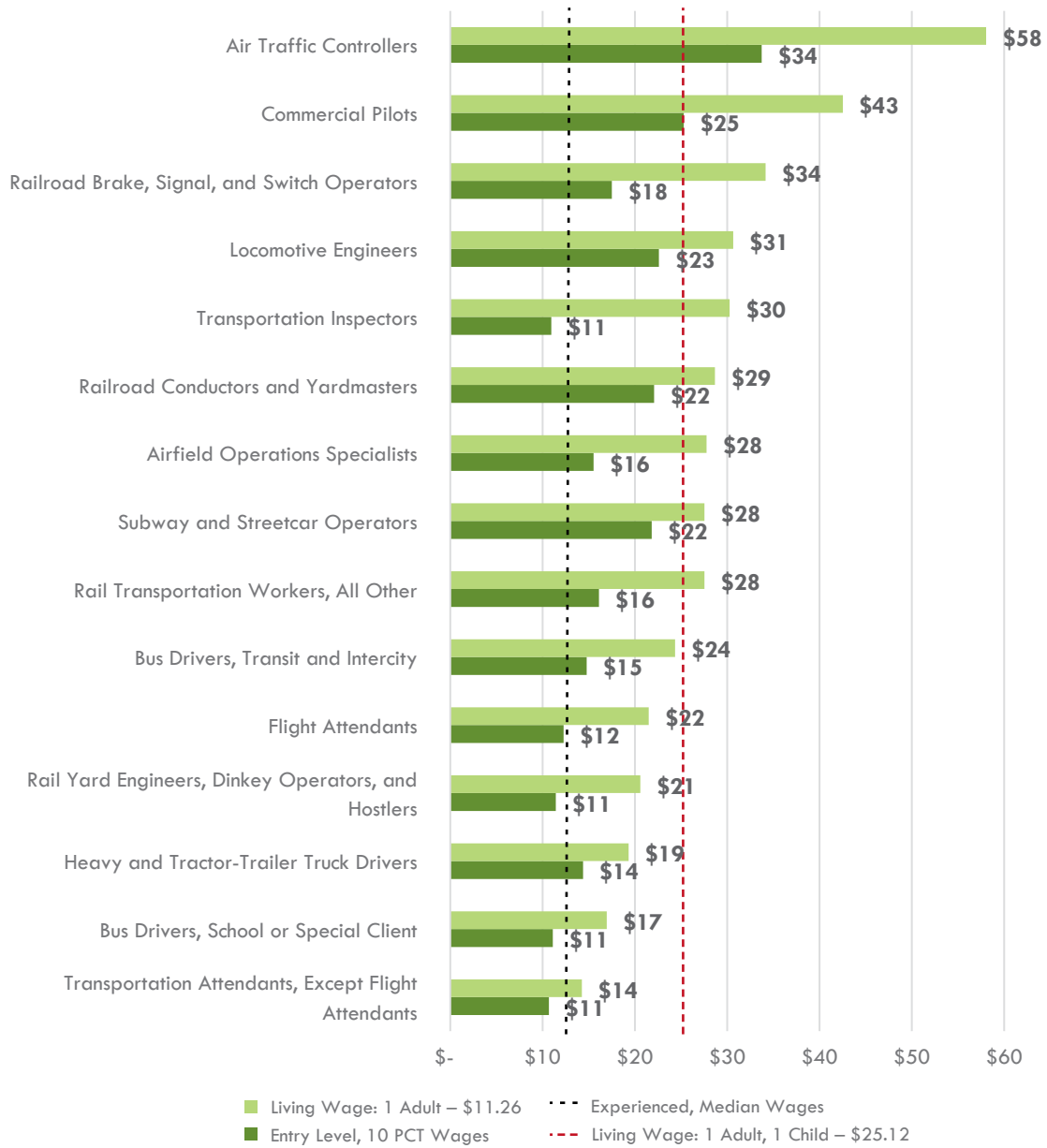
- The transportation and material moving occupational cluster accounted for approximately 17,300 middle-skill jobs in 2017.
- Heavy and tractor-trailer truck drivers is the largest occupation in this group, with 1,500 annual openings projected over the next five years.
- Aviation and airport management and services programs at community colleges have the highest student headcounts (410 annually), followed by railroad and light rail operations (40 annually).
- Related programs confer about 50 awards on average annually.

### Exhibit 84. Employment and projected occupational demand for transportation and material moving occupations, 2017-2022

SOC	Occupation	2017 Jobs	5-Yr Change	5-Yr Projected % Change	5-Yr Projected Replacements	Annual Openings
53-3032	Heavy and Tractor-Trailer Truck Drivers	11,994	1,245	10%	6,609	1,572
53-3022	Bus Drivers, School or Special Client	1,762	178	10%	1,085	253
53-3021	Bus Drivers, Transit and Intercity	1,309	66	5%	794	172
53-2012	Commercial Pilots	296	23	8%	140	33
53-6051	Transportation Inspectors	322	2	1%	153	32
53-4041	Subway and Streetcar Operators	307	(2)	(1%)	141	29
53-2031	Flight Attendants	220	16	7%	122	28
53-4031	Railroad Conductors and Yardmasters	262	(2)	(1%)	119	25
53-4099	Rail Transportation Workers, All Other	216	(6)	(3%)	97	20
53-4011	Locomotive Engineers	212	(3)	(2%)	84	18
53-2021	Air Traffic Controllers	164	9	6%	76	17
53-6061	Transportation Attendants, Except Flight Attendants	59	8	13%	41	10
53-2022	Airfield Operations Specialists	83	5	6%	39	9
53-4021	Railroad Brake, Signal, and Switch Operators	74	0	(1%)	34	7
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	49	(8)	(17%)	18	4
<b>TOTAL</b>		<b>17,328</b>	<b>1,529</b>	<b>9%</b>	<b>9,553</b>	<b>2,229</b>



**Exhibit 85. Comparison of transportation and material moving entry-level and experienced wages with regional living wage, Greater Sacramento Region, 2017**





### Exhibit 86. Education and training requirements for transportation and material moving occupations

SOC	Occupation	Typical Entry-Level Education (BLS)	Typical On-The-Job Training (BLS)	% of Current Workers with Associate Degree or Some College (CPS)
53-2012	Commercial Pilots	High school diploma or equivalent	Moderate-term	22%
53-2021	Air Traffic Controllers	Associate degree	Long-term	41%
53-2022	Airfield Operations Specialists	High school diploma or equivalent	Long-term	41%
53-2031	Flight Attendants	High school diploma or equivalent	Moderate-term	44%
53-3021	Bus Drivers, Transit and Intercity	High school diploma or equivalent	Moderate-term	37%
53-3022	Bus Drivers, School or Special Client	High school diploma or equivalent	Short-term	37%
53-3032	Heavy and Tractor-Trailer Truck Drivers	Postsecondary nondegree award	Short-term	30%
53-4011	Locomotive Engineers	High school diploma or equivalent	Moderate-term	49%
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	High school diploma or equivalent	Moderate-term	49%
53-4021	Railroad Brake, Signal, and Switch Operators	High school diploma or equivalent	Moderate-term	44%
53-4031	Railroad Conductors and Yardmasters	High school diploma or equivalent	Moderate-term	48%
53-4041	Subway and Streetcar Operators	High school diploma or equivalent	Moderate-term	44%
53-4099	Rail Transportation Workers, All Other	High school diploma or equivalent	Moderate-term	44%
53-6051	Transportation Inspectors	High school diploma or equivalent	Moderate-term	44%
53-6061	Transportation Attendants, Except Flight Attendants	High school diploma or equivalent	Short-term	36%

### Exhibit 87. Community college program headcounts and average annual awards, transportation and material moving occupations, 2015-18

TOP Code	TOP Title	Annual Average Headcount	Annual Average Certificates or Other Credit Awards	Annual Average Degrees
94740	Railroad and Light Rail Operations	36	7	2
302000	Aviation and Airport Management and Services	414		
302020	Piloting	0	10	15
302030	Air Traffic Control	0		15
<b>TOTAL</b>		<b>450</b>	<b>17</b>	<b>32</b>

# APPENDIX A: METHODOLOGY & IMPLICATIONS FOR ANALYSIS

## Methodology and Implications for Analysis

There are several data and methods considerations for planning. These are related to the middle-skill designation and employment counts; comparing occupations and programs; projections and planning; 2016 middle-skill reports; and emerging trends.

### Middle-Skill Designation and Employment Counts

The report emphasizes occupations that meet the COE's criteria and interpretation of middle-skill occupations, occupations that are most closely related to the community college level of education and training. The report only includes the occupations that met the individual selection criteria for middle skill. The analysis does not address "pipelines" or "pathway" occupations that lead into or result from community-college-level programs.

The calculations sum employment totals based on the middle-skill criteria. The first section of the report compares the amount of employment at the below-middle-skill, middle-skill, and above-middle-skill levels, indicating occupational areas that could present more training opportunities for the community colleges.

Occupations in the major groups 37-Building and Grounds Cleaning and Maintenance, and 45-Farming, Fishing, and Forestry are not included in this report because they did not meet the middle-skill criteria for inclusion. In addition, some occupations that qualify as middle skill had fewer than 10 total job openings and were truncated in the report.

Middle-skill occupations meet one or more of the following criteria based on typical entry-level education (TELE), typical on-the-job-training (OJT), and educational attainment (EA) of some college or an associate degree:

- TELE some college, a postsecondary non-degree award, or an associate degree
- TELE high school diploma or equivalent + more than short-term OJT (usually long-term)
- TELE high school diploma or equivalent with a significant amount of postsecondary educational attainment levels
- TELE bachelor's degree if a large share (a third or more) have EA at the community college level
- OJT Apprenticeship

A few occupations were included in this report that did not meet any of the previously detailed education, training or educational attainment requirements, but are established career education (CE) targets of existing community college programs in California.

### Comparing Occupations and Programs

To compare occupational employment to community college programs, the analysis assumes a relationship between students and programs, and jobs in the economy. The method recognizes that the two sides of the coin each come from different data sources that measure different things using different methods.

The research employed tools developed by COE to align occupations and programs, recognizing there are many considerations for correlation. A uniform training gap analysis is not possible using the comparison suggested in the report.

Programs and students are counted by the colleges and the California Community Colleges Chancellor's Office in the DataMart, by Taxonomy of Program (TOP) code. Jobs and employment are estimated as part of surveys conducted by the Employment Development Department (EDD), especially the Occupational Employment Survey (OES). Labor market



data comes from EMSI, an economics software vendor that models the OES and other data allowing for analysis of local geographic data. The report uses EMSI 2018.4 dataset for the occupational analysis, and awards and headcount data from the Chancellor's Office DataMart. Comparing the two is an accepted method for workforce researchers but involves assumptions that have some challenges.

Furthermore, there is not a one-to-one relationship between TOP codes and occupations. For example, some TOP codes relate to more than one SOC code, which, in turn, are related to other TOP codes. For the purposes of this report, some TOP codes awards data are presented in multiple occupational groups. These are methodological challenges well known in the field for which there are no standard solutions.

There are other considerations factored into "supply" that do not have ready data solutions, except in complex econometric modeling. Other sources for labor supply include unemployed workers with similar skills or work experience, migration of workers from outside the region.

### **Projections and Planning**

Projections are estimates of future employment and can be used to assess the need for job training programs and gain insight into future employment trends. The estimates are based on information available at the time of the forecast and assume that historical trends will continue into the future. Unforeseen events may occur during the projection period such as major business closures or openings and natural disasters, which can have a major impact on employment levels. Regional governance efforts, including cluster- or sector-based planning with employer stakeholders, is recommended alongside research findings for program planning.

### **2016 Middle-Skill Reports**

This report presents an update of the 2016 COE report, "Regional Labor Market Assessment: Greater Sacramento Region." But it does not allow direct comparison to the 2016 report and should not be used to evaluate program performance or changes in occupational employment. Many differences exist in how the data is classified and counted since the original report was released. These include changes in the Bureau of Labor Statistics (BLS) projections methodology, which results in far larger numbers for annual openings; modeling adjustments from EMSI across baseline years; adjustments to the COE's middle-skill occupational definition; and changes in TOP code designations for community college programs.

### **Emerging Trends**

Emerging trends in occupations may not be accurately reflected in the SOC titling and in the estimates of employment, current and future. One way to associate an "emerging job" with a traditional job title is to conduct a keyword search on O\*NET to locate the SOC with the highest relevance. It is likely that the BLS will be assigning employment for the "emerging job" under that title. Real-time LMI, or job posting data, is another good source of information about emerging trends and occupations but cannot provide reliable projected demand.

## Data Sources

Labor market and educational supply data compiled in this report cover the 15 counties and seven community colleges in the Far North Region. Below is a summary of the data sources found in this study.

Data Type	Source
Community College Average Headcount	Chancellor's Office MIS systems (COMIS) provided by Educational Results Partnership (ERP) by TOP06 and TOP04. Note: it would NOT be accurate to sum up TOP06 headcount to get TOP04 because of duplication issues.
Community College Awards	California Community Colleges Chancellor's Office Data Mart. The program awards module provides all credit degrees and certificates (from 6 to 60 semester units) that have been reported to the Chancellor's Office. <a href="http://datamart.cccco.edu">datamart.cccco.edu</a>
Educational Attainment Levels	Accessed through the Bureau of Labor Statistics, these data reflect patterns from the U.S. Census Bureau, Current Population Survey (CPS). The CPS is a monthly survey of about 50,000 households conducted by the Census Bureau for the Bureau of Labor Statistics. The survey has been conducted for more than 50 years.
Labor Market Information	Economic Modeling Specialists, Intl. (EMSI), Q4 2018 data release. 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	MIT Living Wage Calculator, a living wage calculator that estimates the cost of living in a specific community or region. The estimate is constructed from a weighted average of households. The rate combines the counties in the region. <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>



## 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.

**Community College Annual Average Awards:** Annual average awards for a community college program are based on three-year averages across the region for years 2015-16 through 2017-18.

**Community College Annual Average Headcount:** Three-year average unduplicated student count in community college programs across the region, covering 2015-16 through 2017-18, including Fall, Winter and Spring semesters.

**Education Attainment Level:** The highest educational attainment level of workers age 25 years or older for current workers in corresponding occupations.

**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.

**Entry-Level and Experienced Wage:** Hourly wages are reported in percentiles and averages. The 10th percentile is a useful proxy of entry-level wages—90% of people working in the occupation earn a higher wage—while the 50th percentile (median) wage may reflect a more experienced worker.

**Living Wage:** The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children. The Far North Living Wage estimate is constructed through weighting the county-level living wages by number of households in the county.

**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.

**Standard Occupational Classification (SOC) System:** The 2010 Standard Occupational Classification (SOC) System is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of 840 detailed occupations according to their occupational definition. Only occupations that met the community college relevant criteria were included in this study. For quick reference to the SOC definitions, please review the Occupation Definitions Reference Guide.

**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.

# MORE ABOUT THE CENTERS OF EXCELLENCE

The Centers of Excellence (COE) for Labor Market Research deliver regional workforce research and technical expertise to California Community Colleges for program decision making and resource development. This information has proven valuable to colleges in beginning, revising, or updating economic development and Career Education (CE) programs, strengthening grant applications, assisting in the accreditation process, and in supporting strategic planning efforts.

The Centers of Excellence Initiative is funded in part by the Chancellor's Office, California Community Colleges, Economic and Workforce Development Program. The Centers aspire to be the leading source of regional workforce information and insight for California Community Colleges. More information about the Centers of Excellence is available at [www.coecc.net](http://www.coecc.net).

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## **Important Disclaimer**

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

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