

**April 2021**

# Labor Market Analysis

## Fire Technology

POWERED BY



California  
Community  
Colleges



Prepared by the Central Valley/Mother Lode Center of Excellence

---

# Table of Contents

Summary .....	2
Key findings .....	2
Introduction .....	3
Occupational Demand .....	4
Wages .....	4
Job Postings .....	5
Education .....	6
Baseline and Specialized Skills .....	6
Software Skills .....	7
Certifications .....	7
Education, Work Experience & Training .....	7
Supply .....	9
Student Outcomes .....	10
Conclusion .....	11
Recommendation .....	11
Appendix A: Methodology & Data Sources .....	12

**COVID-19 Statement:** This report includes employment projection data by Emsi. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

*If for any reason this document is not accessible or if you have specific needs for readability, please contact us and we will do our utmost to accommodate you with a modified version. To make a request, contact Nora Seronello by phone at (209) 575-6894 or by email [seronellon@mjc.edu](mailto:seronellon@mjc.edu).*

# Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for Fire Technology. Four occupations related to Fire Technology were identified for Fresno City College:

- 33-2011, Firefighters
- 33-1021, First-Line Supervisors of Firefighting and Prevention Workers
- 33-2021, Fire Inspectors and Investigators
- 33-2022, Forest Fire Inspectors and Prevention Specialists

## Key findings:

- **Occupational demand** — More than 2,500 workers were employed in jobs related to Fire Technology in 2019 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is Fire Technology with 2,143 workers in 2019, a projected growth rate of 6% over the next five years, and 165 annual openings.
- **Wages** — Fire inspectors and investigators earn the highest entry-level wage, \$41.67/hour in the subregion and \$38.94/hour in the region.
- **Employers** — Employers with the most job postings in the subregion are Commander, Kern County, and County Kern.
- **Occupational titles** — The most common occupational title in job postings in the subregion is municipal firefighters. The most common job title is firefighter.
- **Skills and certifications** — The top baseline skill is building effective relationships, the top specialized skill is CPR, and the top software skill is public administration. The most in-demand certification is a driver's license.
- **Education** — A postsecondary nondegree award is the typical entry-level education required for three of the four occupations. A high school diploma is typically required for forest fire inspectors and prevention specialists.
- **Supply** — Analysis of postsecondary completions in the region shows that on average 172 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 29 trained workers in the subregion and 261 workers in the region. The Center of Excellence recommends that Fresno City College work with the college's advisory board, and local industry in the expansion of programs to address the shortage of Fire Technology workers in the region.

# Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Fresno City College to provide labor market information for Fire Technology. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the SCV/SML subregion is \$10.30/hour.<sup>1</sup> Analysis of the program and occupational data related to Fire Technology resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 33-2011, Firefighters
- 33-1021, First-Line Supervisors of Firefighting and Prevention Workers
- 33-2021, Fire Inspectors and Investigators
- 33-2022, Forest Fire Inspectors and Prevention Specialists

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O\*NET OnLine are shown below.

## **Firefighters**

**Job Description:** Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster assistance.

**Knowledge:** Public Safety and Security, Building and Construction, Customer and Personal Service, Education and Training, Mechanical

**Skills:** Active Listening, Monitoring, Coordination, Operation Monitoring, Critical Thinking

## **First-Line Supervisors of Firefighting and Prevention Workers**

**Job Description:** Directly supervise and coordinate activities of workers engaged in firefighting and fire prevention and control.

**Knowledge:** Public Safety and Security, Customer and Personal Service, Administration and Management, English Language, Education and Training

**Skills:** Critical Thinking, Monitoring, Speaking, Active Listening, Complex Problem Solving

## **Fire Inspectors and Investigators**

**Job Description:** Inspect buildings to detect fire hazards and enforce local ordinances and state laws, or investigate and gather facts to determine cause of fires and explosions.

**Knowledge:** Public Safety and Security, Building and Construction, Customer and Personal Service, Law and Government, Education and Training

**Skills:** Active Listening, Critical Thinking, Speaking, Judgement and Decision Making, Complex Problem Solving

## **Forest Fire Inspectors and Prevention Specialists**

**Job Description:** Enforce fire regulations, inspect forest for fire hazards, and recommend forest fire prevention or control measures. May report forest fires and weather conditions.

**Knowledge:** Administration and Management, Customer and Personal Service, Education and Training, Personnel and Human Resources, Public Safety and Security

**Skills:** Critical Thinking, Coordination, Speaking, Active Listening, Judgement and Decision Making

---

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

# Occupational Demand

The South Central Valley/Southern Mother Lode subregion employed 2,544 workers in firefighter occupations in 2019 (Exhibit 1). The largest occupation is firefighters with 2,143 workers in 2019. This occupation is projected to grow by 6% over the next five years and has the greatest number of projected annual openings, 165.

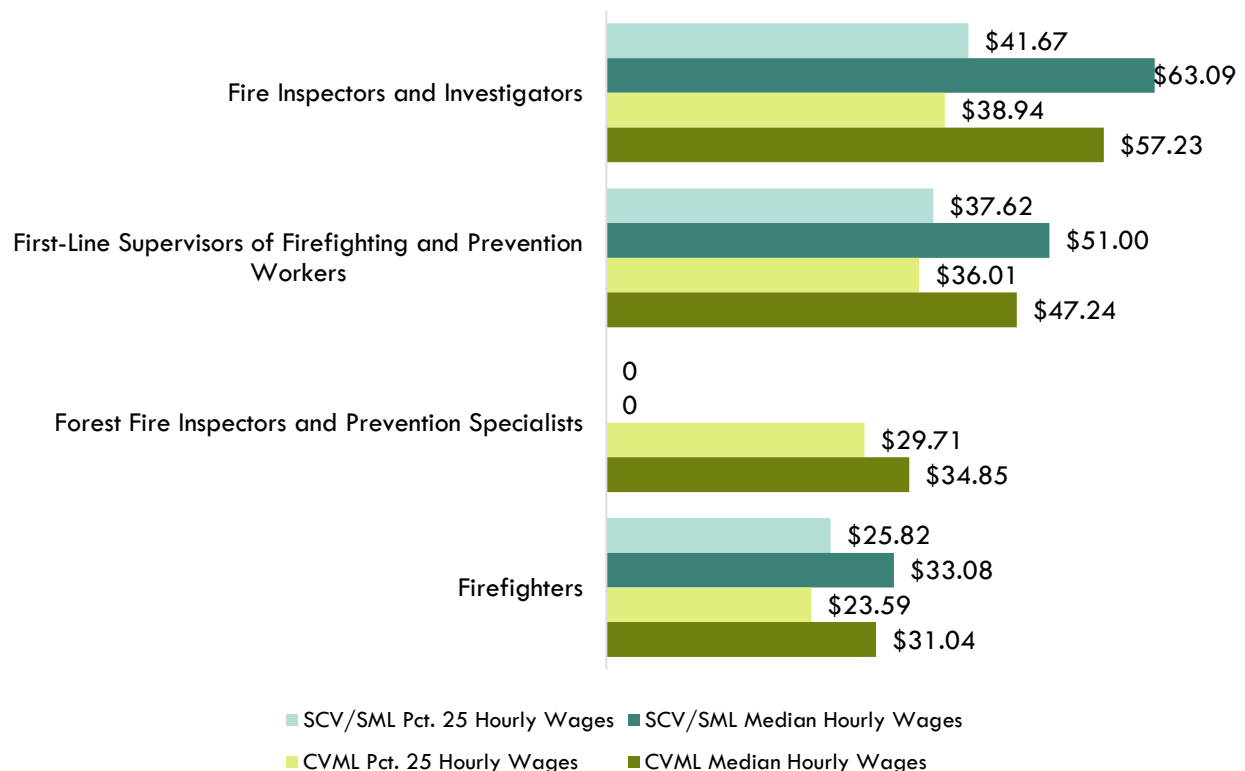
**Exhibit 1. Fire Technology employment and occupational projections in the SCV/SML subregion**

Occupation	2019 Jobs	2024 Jobs	5-Year Change	5-Year % Change	Annual Openings
Firefighters	2,143	2,263	119	6%	165
First-Line Supervisors of Firefighting and Prevention Workers	255	273	18	7%	19
Fire Inspectors and Investigators	146	153	8	5%	16
Forest Fire Inspectors and Prevention Specialists	<10	<10	Insf. Data	Insf. Data	1
<b>TOTAL</b>	<b>2,544</b>	<b>2,689</b>	<b>146</b>	<b>6%</b>	<b>201</b>

## Wages

Exhibit 2 compares the entry-level and experienced wages of the Fire Technology occupations. Fire inspectors and investigators earn the highest entry-level wage, \$41.67/hour in the subregion and \$38.94/hour in the region. Subregional wages were not available for forest fire inspectors and prevention specialists.

**Exhibit 2. Entry-level and experienced wage comparison in the SCV/SML subregion and region**



Median salary data from Emsi shows that fire inspectors and investigators earn the highest median salary, more than \$131,000 annually, followed by first-line supervisors of firefighting and prevention workers, more than \$106,000 annually (Exhibit 3).

**Exhibit 3. Median salaries for Fire Technology occupations**

Occupation	Median Salary
Fire Inspectors and Investigators	\$131,230.82
First-Line Supervisors of Firefighting and Prevention Workers	\$106,079.51
Firefighters	\$68,808.76
Forest Fire Inspectors and Prevention Specialists	Insf. Data

## Job Postings

There were 56 job postings for the four occupations in the SCV/SML subregion from September 2020 to February 2021.<sup>2</sup> The employers with the most job postings are listed in Exhibit 4.

**Exhibit 4. Top employers of Fire Technology by number of job postings**

Employer	Job Postings	% Job Postings
Commander	6	12%
Kern County	4	8%
County Kern	3	6%
County Tulare	3	6%
Forest Service	3	6%
City Hanford	2	4%
City Tulare	2	4%
City Visalia	2	4%
Davey Tree Expert Company	2	4%
Johnson Controls Incorporated	2	4%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across six O\*NET OnLine occupations. The occupational title municipal firefighters is listed in 22 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include firefighter in seven job postings, fire lieutenant in five job postings, and fire alarm inspector in two job postings.

**Exhibit 5. Top occupational titles in job postings for Fire Technology**

Occupational Title	Job Postings	% of Job Postings
Municipal Firefighters	22	39%
Municipal Fire Fighting and Prevention Supervisors	15	27%
Fire Inspectors	8	14%
Forest Fire Fighting and Prevention Supervisors	7	13%
Forest Fire Inspectors and Prevention Specialists	3	5%
Forest Firefighters	1	2%

<sup>2</sup> Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

## Education

Of the 56 job postings, 31 listed an education level preferred for the positions being filled. Of those, 52% requested high school or vocational training, 39% requested an associate degree, and 26% requested a bachelor's degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

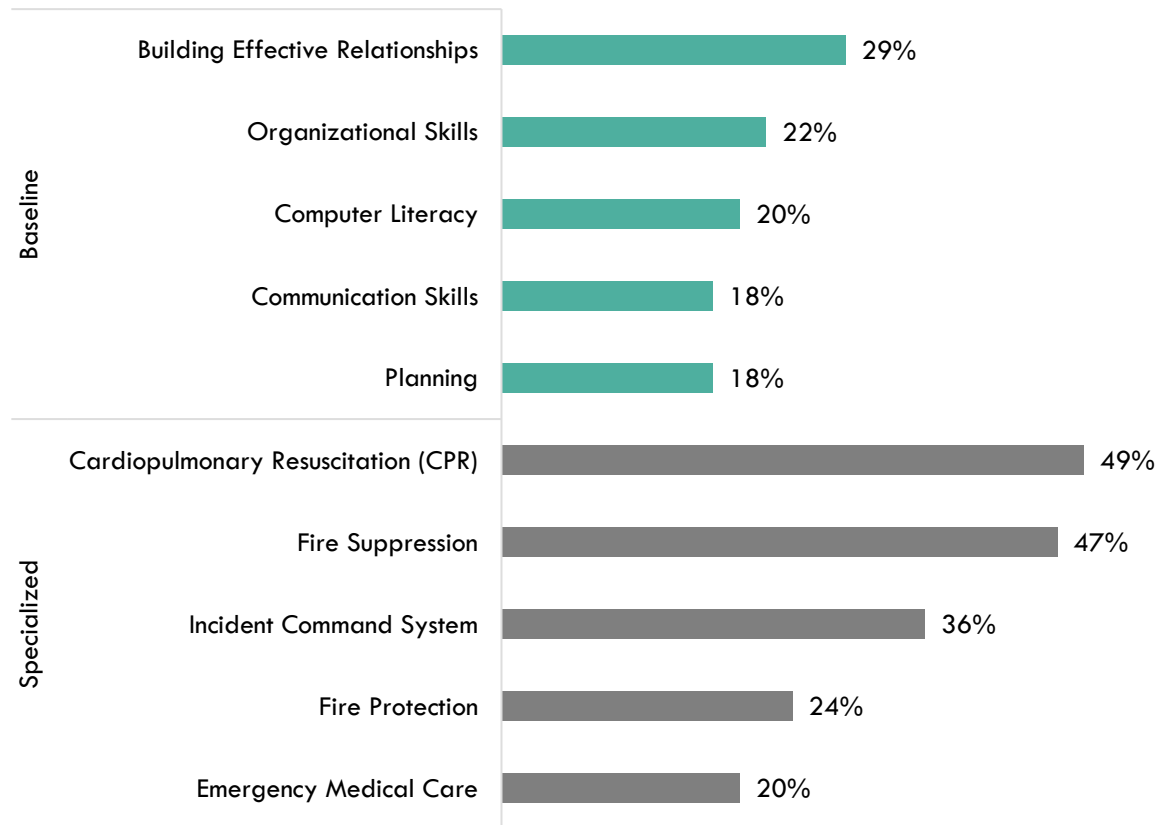
**Exhibit 6. Education levels requested in job postings for Fire Technology**

Education Level	Job Postings	% of Job Postings
High school or vocational training	16	52%
Associate degree	12	39%
Bachelor's degree	8	26%
Doctoral degree	2	6%
Master's degree	1	3%

## Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are building effective relationships, 29% of job postings, organizational skills, 22%, and computer literacy, 20%. The top three specialized skills are CPR, 49% of job postings, fire suppression, 47%, and incidental command system, 36%.

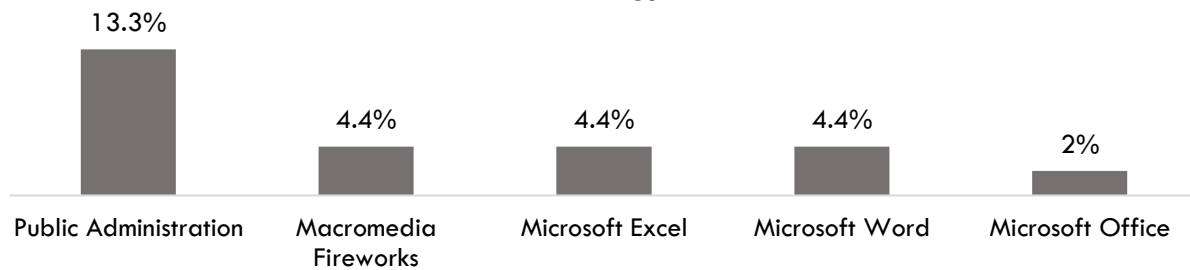
**Exhibit 7. In-demand baseline and specialized skills for Fire Technology**



### Software Skills

Analysis also included the software skills most in demand by employers. Microsoft Office and Excel were the top two software skills identified in job postings (Exhibit 8).

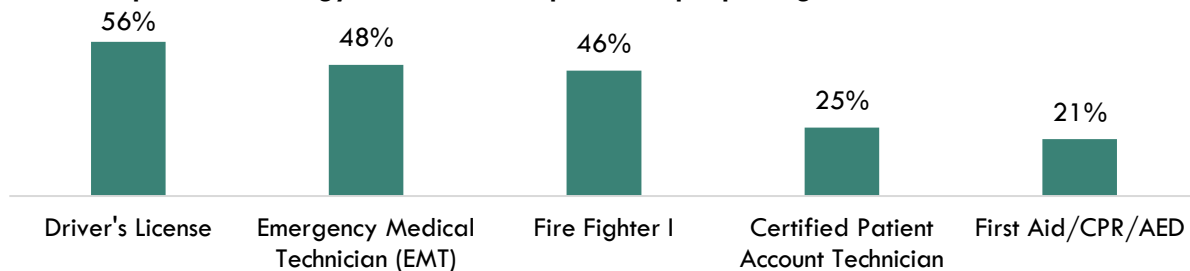
**Exhibit 8. In-demand software skills for Fire Technology**



### Certifications

Of the 56 job postings, 48 contained certification data. Among those, 56% indicated a need for a driver's license. The next top certifications are EMT and Fire Fighter I (Exhibit 9).

**Exhibit 9. Top Fire Technology certifications requested in job postings**



## Education, Work Experience & Training

A postsecondary nondegree award is the typical entry-level education required for three of the four occupations (Exhibit 10). A high school diploma is typically required for forest fire inspectors and prevention specialists.

**Exhibit 10. Education, work experience, training, and Current Population Survey results for Fire Technology<sup>3</sup>**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Firefighters	Postsecondary nondegree award	None	Long-term	60.7%
First-Line Supervisors of Firefighting and Prevention Workers	Postsecondary nondegree award	Less than 5 years	Moderate-term	56.8%
Fire Inspectors and Investigators	Postsecondary nondegree award	5 years or more	Moderate-term	58.4%
Forest Fire Inspectors and Prevention Specialists	High school diploma or equivalent	Less than 5 years	Moderate-term	58.4%

<sup>3</sup> "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.



# Supply

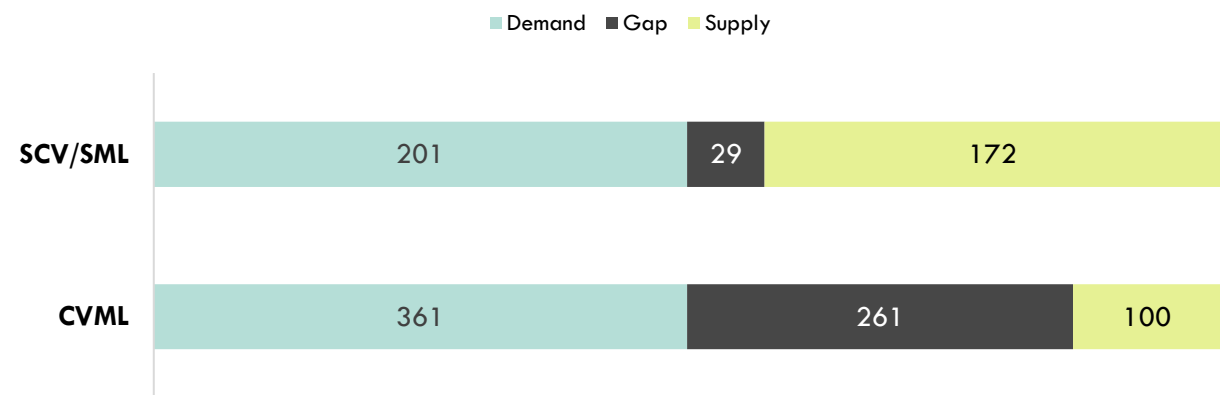
Analysis of program data from the California Community Colleges Chancellor's Office Data Mart included the TOP codes and titles: 011400 - Forestry/Technical Firefighting Emphasis, 213300 - Fire Technology, and 213310 - Wildland Fire Technology. Analysis of the last three years of data shows that, on average, 172 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

**Exhibit 11. Postsecondary supply for Fire Technology in the region**

TOP Code-Title	College	Associate Degree	Certificate 18 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 6 < 18 Semester Units	Subtotal
011400 - Forestry/Technical Firefighting Emphasis	Reedley College		11			11
	Bakersfield	23		14		37
213300 - Fire Technology	Columbia	12	26			38
	Fresno City	6				6
	Merced	7		2		9
	Modesto	18		6		24
	Porterville			4		4
	San Joaquin Delta	0				0
	Sequoias	9		1		9
213310 - Wildland Fire Technology	Bakersfield	3			0	3
	Porterville				30	30
<b>TOTAL</b>		<b>78</b>	<b>37</b>	<b>26</b>	<b>30</b>	<b>172</b>

There is an undersupply of 29 Fire Technology workers in the SCV/SML subregion and 261 workers in the region (Exhibit 12).

**Exhibit 12. Firefighter workforce annual demand and supply in the SCV/SML subregion and region**



## Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor’s Cal-PASS Plus LaunchBoard for the TOP codes related to Fire Technology. There were 211 fire technology students who received a degree or certificate or attained apprenticeship journey status and 46 who transferred; 82% of students obtained a job closely related to their field of study; 26% reported a median change in earnings; and 78% attained a living wage.

**Exhibit 13. Regional metrics for the TOP codes related to Fire Technology**

Metric	Fire Technology	Wildland Fire Technology
	213300	213310
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	211	*
Number of Students Who Transferred	46	*
Job Closely Related to Field of Study	82%	80%
Median Change in Earnings	26%	38%
Attained a Living Wage	78%	68%
* denotes data not available.		

## Conclusion

The entry-level wages of the four occupations exceed the SCV/SML subregion's average living wage. (Please note: Subregional wages were not available for forest fire inspectors and prevention specialists.) There were 56 job postings in the past six months for occupations related to Fire Technology in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is building effective relationships, and the top specialized skill is CPR.
- The top software skill is public administration.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 29 in the SCV/SML subregion and 261 in the region.

## Recommendation

Based on these findings, it is recommended that Fresno City College work with the college's advisory board, and local industry in the expansion of programs to address the shortage of Fire Technology in the region.

# Appendix A: Methodology & Data Sources

## Data Sources

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

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry: <a href="http://economicmodeling.com">economicmodeling.com</a> .
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="https://www.bls.gov/emp/tables/educational-attainment.htm">https://www.bls.gov/emp/tables/educational-attainment.htm</a> .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: <a href="http://labormarketinfo.edd.ca.gov">labormarketinfo.edd.ca.gov</a> .
Job Posting and Skills Data	Burning Glass: <a href="http://burning-glass.com/">burning-glass.com/</a> .
Additional Education Requirements/Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: <a href="http://onetonline.org">onetonline.org</a> .

## Key Terms and Concepts

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

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

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

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

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

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

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

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

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

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

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