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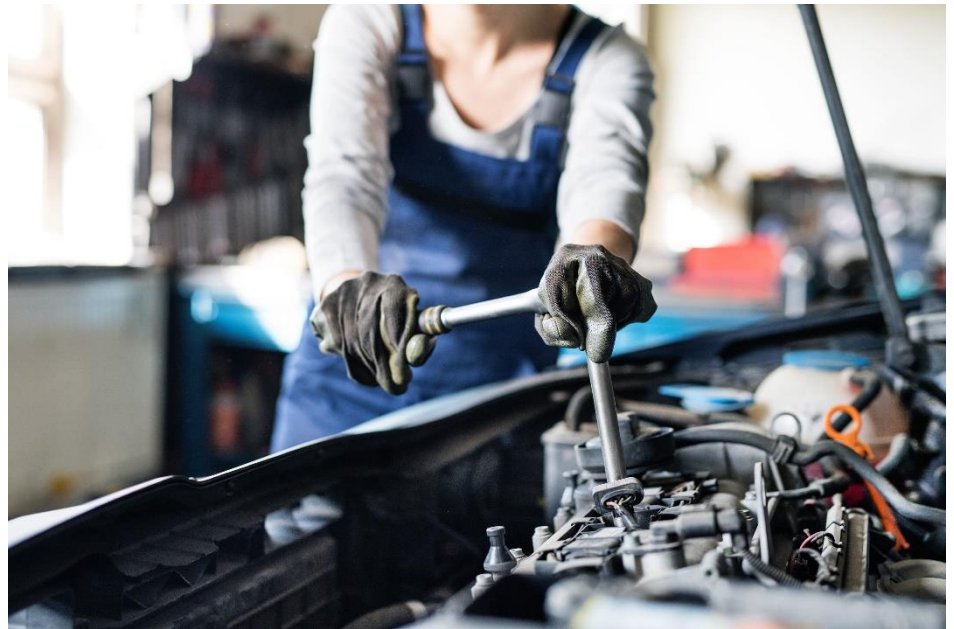
Labor Market Analysis

Automotive Hybrid, Electric, and Alternative Fuel Technology

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Colleges



Prepared by the Central Valley/Mother Lode Center of Excellence

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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.

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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 automotive hybrid, electric, and alternative fuel technology. Three occupations related to automotive hybrid, electric, and alternative fuel technology were identified for San Joaquin Delta College:

- 49-2093, Electrical and Electronics Installers and Repairers, Transportation Equipment
- 49-2096, Electronic Equipment Installers and Repairers, Motor Vehicles
- 49-3023, Automotive Service Technicians and Mechanics

Key findings:

- **Occupational demand** — Over 3,200 workers were employed in jobs related to automotive hybrid, electric, and alternative fuel technology in 2020 in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. The largest occupation is automotive service technicians and mechanics with 3,126 workers in 2020, a projected growth rate of 3% over the next five years, and 336 annual openings.
- **Wages** — Electrical and electronics installers and repairers, transportation equipment earn the highest entry-level wage, \$27.85/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Pep Boys, Chevrolet, and Yourmechanic.
- **Occupational titles** — The most common occupational title in job postings in the subregion is automotive specialty technicians. The most common job title is automotive technician.
- **Skills and certifications** — The top baseline skill is communication, the top specialized skill is repair, and the top software skill is Microsoft Excel. The most in-demand certification is a driver's license.
- **Education** — A high school diploma or equivalent is typically required for electronic equipment installers and repairers, motor vehicles. A postsecondary nondegree award is typically required for the remaining two occupations related to automotive hybrid, electric, and alternative fuel technology.
- **Supply** — Analysis of postsecondary completions shows that on average 472 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 152 trained workers in the subregion and 403 workers in the region. The Center of Excellence recommends that San Joaquin Delta College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of automotive hybrid, electric, and alternative fuel technology workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by San Joaquin Delta College to provide labor market information for automotive hybrid, electric, and alternative fuel technology. The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) 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 NCV/NML subregion is \$12.65/hour.¹ Analysis of the program and occupational data related to automotive hybrid, electric, and alternative fuel technology resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 49-2093, Electrical and Electronics Installers and Repairers, Transportation Equipment
- 49-2096, Electronic Equipment Installers and Repairers, Motor Vehicles
- 49-3023, Automotive Service Technicians and Mechanics

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.

Electrical and Electronics Installers and Repairers, Transportation Equipment

Job Description: Install, adjust, or maintain mobile electronics communication equipment, including sound, sonar, security, navigation, and surveillance systems on trains, watercraft, or other mobile equipment.

Knowledge: Engineering and Technology, Computers and Electronics, Mathematics, Public Safety and Security, and Mechanical

Skills: Critical Thinking, Active Listening, Operations Monitoring, Quality Control Analysis, Complex Problem Solving

Electronic Equipment Installers and Repairers, Motor Vehicles

Job Description: Install, diagnose, or repair communications, sound, security, or navigation equipment in motor vehicles.

Knowledge: Mechanical, Computers and Electronics, Customer and Personal Service, Mathematics, English Language

Skills: Repairing, Troubleshooting, Critical Thinking, Operations Monitoring, Active Listening

Automotive Service Technicians and Mechanics

Job Description: Diagnose, adjust, repair, or overhaul automotive vehicles.

Knowledge: Mechanical, Computers and Electronics, Customer and Personal Service, English Language, Engineering and Technology

Skills: Repairing, Troubleshooting, Operations Monitoring, Equipment Maintenance, Operation and Control

Occupational Demand

The NCV/NML subregion employed 3,221 workers in automotive hybrid, electric, and alternative fuel technology occupations in 2020 (Exhibit 1). The largest occupation is automotive service technicians and mechanics with 3,126 workers in 2020. This occupation is projected to grow by 3% over the next five years and has the greatest number of projected annual openings, 336.

¹ 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://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

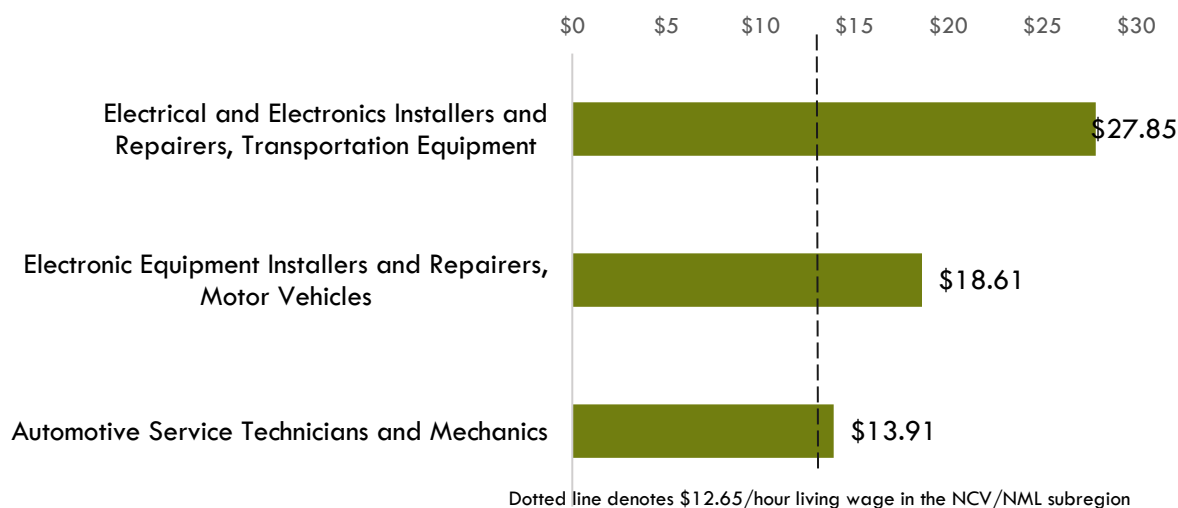
Exhibit 1. Automotive hybrid, electric, and alternative fuel technology employment and occupational projections in the NCV/NML subregion

Occupation	2020 Jobs	2025 Jobs	5-Year Change	5-Year % Change	Annual Openings
Automotive Service Technicians and Mechanics	3,126	3,229	103	3%	336
Electronic Equipment Installers and Repairers, Motor Vehicles	68	66	(3)	(4%)	6
Electrical and Electronics Installers and Repairers, Transportation Equipment	27	29	2	8%	3
TOTAL	3,221	3,324	102	3%	344

Wages

Exhibit 2 shows the entry-level hourly wages of the automotive hybrid, electric, and alternative fuel technology occupations. Electrical and Electronics installers and repairers, transportation equipment earn the highest entry-level wage, \$27.85/hour in the subregion. Entry-level wages are derived from the 25th percentile.

Exhibit 2. automotive hybrid, electric, and alternative fuel technology entry-level wages in the NCV/NML subregion



Job Postings

There were 689 job postings for the three occupations in the NCV/NML subregion from July 2021 to December 2021.² The employers with the most job postings are listed in Exhibit 3.

² 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.

Exhibit 3. Top employers of automotive hybrid, electric, and alternative fuel technology by number of job postings

Employer	Job Postings	% Job Postings
Pep Boys	20	2%
Chevrolet	18	2%
Yourmechanic	15	2%
Les Schwab	14	1%
TravelCenters of America	13	1%
Belcorp Ag	12	1%
Tire Choice Auto Service Centers	12	1%
Bridgestone / Firestone	11	1%
Best Buy	10	1%
Jiffy Lube	10	1%

Exhibit 4 shows how job postings for the targeted occupations in the NCV/NML subregion are distributed across three O*NET OnLine occupations. The occupational title automotive specialty technicians is listed in 648 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Automotive Technician in 42 job postings, Lube Technician in 29 job postings, and Service Technicians in 26 job postings.

Exhibit 4. Top occupational titles in job postings for automotive hybrid, electric, and alternative fuel technology

Occupational Title	Job Postings	% of Job Postings
Automotive Specialty Technicians	648	94%
Automotive Master Mechanics	29	4%
Electronic Equipment Installers and Repairers, Motor Vehicles	12	2%

Salaries

Exhibit 5 shows the “Market Salaries” for automotive hybrid, electric, and alternative fuel technology occupations that are calculated by Burning Glass which uses a machine learning model built off of millions of job postings every year, and accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 5. Salaries for automotive hybrid, electric, and alternative fuel technology occupations

Market Salary Percentile	Salary Amount
10th Percentile	\$27,362
25th Percentile	\$32,185
50th Percentile	\$39,655
75th Percentile	\$47,539
90th Percentile	\$54,135

Education

Of the 689 job postings, 338 listed an education level preferred for the positions being filled. Among those, 89% requested high school or vocational training, and 7% requested an associate 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%.

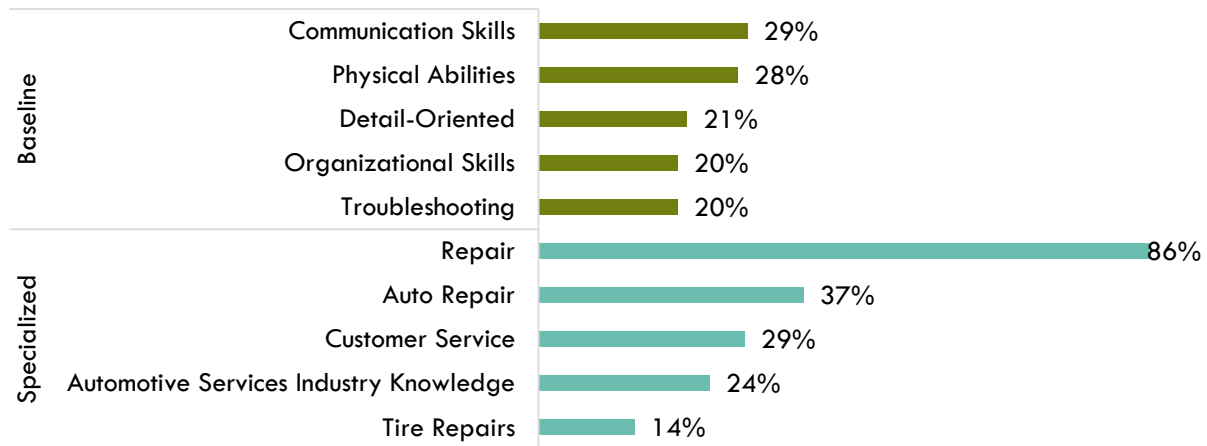
Exhibit 6. Education levels requested in job postings for automotive hybrid, electric, and alternative fuel technology

Education Level	Job Postings	% of Job Postings
High school or vocational training	301	89%
Associate's degree	24	7%

Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication, 29% of job postings, physical abilities, 28%, and detail-oriented, 21%. The top three specialized skills are repair, 86% of job postings, auto repair, 37%, and customer service, 29%.

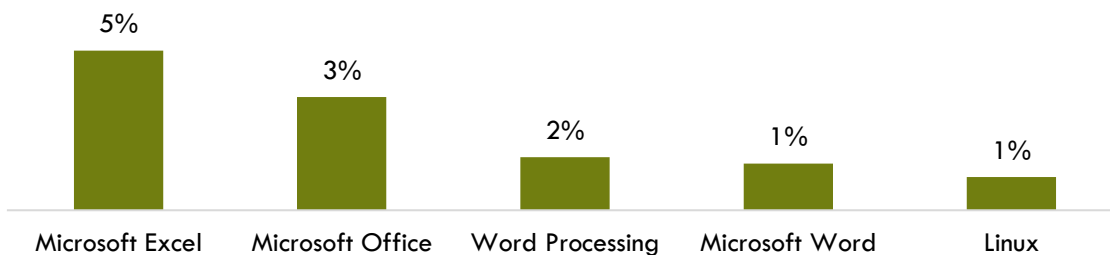
Exhibit 7. In-demand automotive hybrid, electric, and alternative fuel technology baseline and specialized skills



Software Skills

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

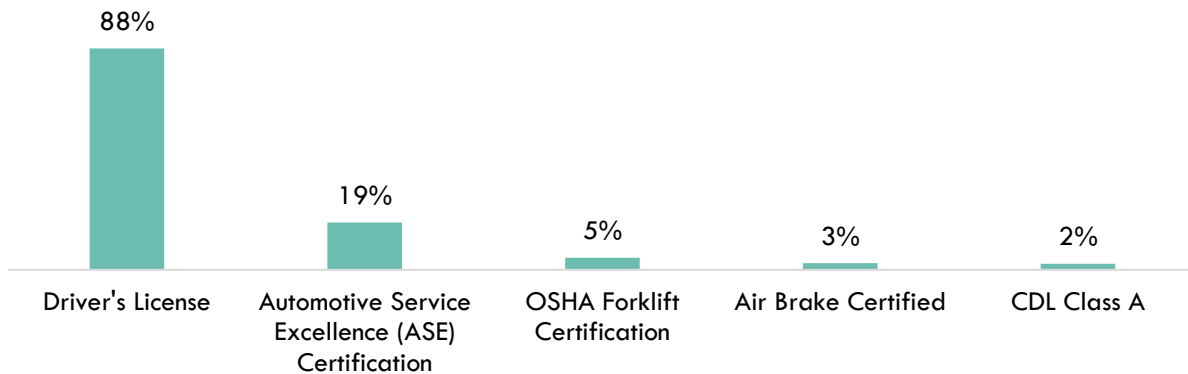
Exhibit 8. In-demand automotive hybrid, electric, and alternative fuel technology software skills



Certifications

Of the 689 job postings, 453 contained certification data. Among those, 88% indicated a need for a driver's license. The next top certifications are an automotive service excellence and OSHA forklift (Exhibit 9).

Exhibit 9. Top automotive hybrid, electric, and alternative fuel technology certifications requested in job postings



Education, Work Experience & Training

A postsecondary nondegree award is typically required for the two occupations (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for automotive hybrid, electric, and alternative fuel technology occupations³

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Automotive Service Technicians and Mechanics	Postsecondary nondegree award	None	Short-term	35.7%
Electronic Equipment Installers and Repairers, Motor Vehicles	High school diploma or equivalent	None	Moderate-term	44.4%
Electrical and Electronics Installers and Repairers, Transportation Equipment	Postsecondary nondegree award	None	Long-term	44.4%

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

Supply

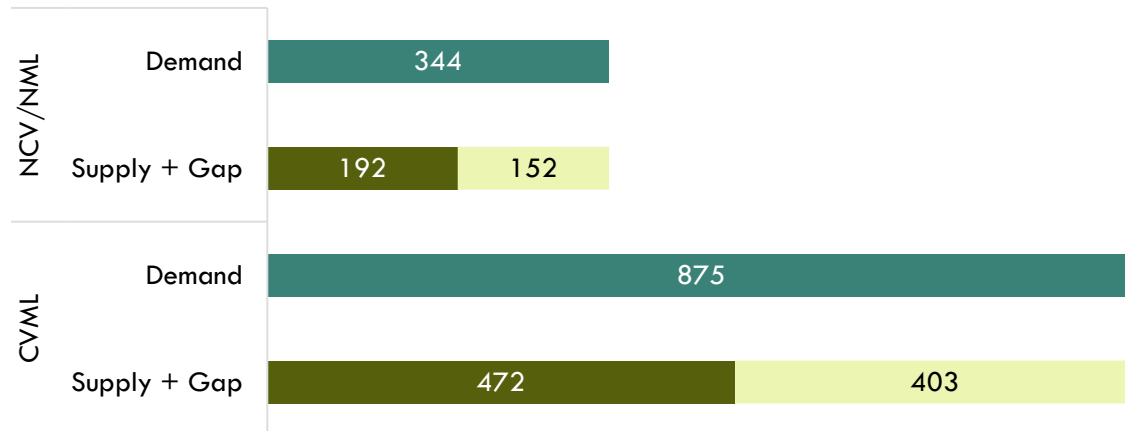
Analysis of program data from the California Community Colleges Chancellor’s Office Data Mart included the TOP and CIP codes and titles: 095650 - Welding Technology and 48.0508 - Welding Technology/Welder. Analysis of the last three years of data shows that, on average, 472 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

Exhibit 11. Postsecondary supply for automotive hybrid, electric, and alternative fuel technology occupations in the region

TOP/CIP Codes- Title	College	Associate Degree	Award 1 < 2 Academic Years	Certificate 12 < 18 Semester Units	Certificate 16 < 30 Semester Units	Certificate 18 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 6 < 18 Semester Units	Certificate 60+ Semester Units	Certificate 8 < 16 Semester Units	Noncredit Award 960+ Hours	Subtotal
094800 - Automotive Technology	Bakersfield	10			19	61	20	0				111
	Columbia	2		6		3	3	7		1		22
	Fresno City	12								1		19
	Merced	8			9	29	32					78
	Modesto	7		5	2	4	8			2		27
	Reedley College	9					43					51
	San Joaquin Delta	10			7	18	30					65
	Sequoias	6						1	37			43
47.0604 - Automobile/Automotive Mechanics Technology/Technician	UEI College-Bakersfield		55									55
TOTAL		64	55	10	37	115	136	44	1	3	6	472

There is an undersupply of 152 automotive hybrid, electric, and alternative fuel technology workers in the NCV/NML subregion and 403 workers in the region (Exhibit 12).

Exhibit 12. Automotive hybrid, electric, and alternative fuel technology workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the NCV/NML 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 code related to automotive hybrid, electric, and alternative fuel technology. Of note, 188 automotive technology students received a degree or certificate or attained apprenticeship journey status; 10 students transferred; 69% of students obtained a job closely related to their field of study; 42% had a median change in earnings; and 57% of students attained a living wage.

Exhibit 13. Regional metrics for the TOP code related to automotive hybrid, electric, and alternative fuel technology

Metric	Automotive Technology 094800
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	188
Number of Students Who Transferred	10
Job Closely Related to Field of Study	69%
Median Change in Earnings	42%
Attained a Living Wage	57%
* denotes data not available.	

Conclusion

The entry-level wages of the three occupations exceed the NCV/NML subregion's average living wage. There were 689 job postings in the past six months for occupations related to automotive hybrid, electric, and alternative fuel technology in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication, and the top specialized skill is repair.
- The top software skill is Microsoft Excel.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 152 in the NCV/NML subregion and 403 in the region.

Recommendation

Based on these findings, it is recommended that San Joaquin Delta College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of automotive hybrid, electric, and alternative fuel technology workers 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: economicmodeling.com .
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: https://www.bls.gov/emp/tables/educational-attainment.htm .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
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: onetonline.org .

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.