Labor Market Analysis for Program Recommendation: 2133.10/Wildland Fire Technology (*Wildland Firefighter Technician – Certificate*)

CVML Center of Excellence, June 2025

Summary

Program LMI Endorsement	Endorsed: All LMI Criteria Met ☒	Endorsed: Some LMI Criteria Met ☐	Not LMI Endorsed ☐

Program LMI Endorsement Criteria		
	Yes ☑	No ☐
Supply Gap:	*Comments:* There are projected to be 242 **annual job openings** throughout the SCV/SML subregion for the three *fire technology-related occupations*, which **are more than the 202 awards conferred by educational institutions (community colleges).**	
	Yes ☑	No ☐
Living Wage: (Entry-Level, 25th)	*Comments:* Two *fire technology-related occupations* have an entry-level hourly wage above **the SCV/SML living wage of $16.08.** **NOTE:** There is insufficient hourly wage data for the third occupation: *Forest Fire Inspectors and Prevention Specialists*.	
	Yes ☑	No ☐
Education:	*Comments:* The Bureau of Labor Statistics (BLS) lists a postsecondary nondegree award as the typical entry-level education for *Firefighters* and *Fire Inspectors and Investigators*, and a high school diploma or equivalent as the typical entry-level education for *Forest Fire Inspectors and Prevention Specialists*. National-level educational attainment data indicates that **between 47% and 59% of workers in the field have completed some college or an associate degree as their highest level of education.**	

Emerging Occupation(s)	
Yes ☐	No ☑
Comments: N/A	

The Central Valley/Mother Lode Center of Excellence for Labor Market Research (CVML COE) prepared this report to determine whether there is a supply gap in the South Central Valley/Southern Mother Lode regional labor market related to the following middle skill occupations:

- Firefighters (SOC 33-2011)
- Fire Inspectors and Investigators (SOC 33-2021)
- Forest Fire Inspectors and Prevention Specialists (SOC 33-2022)

Middle-skill occupations typically require a community college education while above middle-skill occupations typically require at least a bachelor's degree.

Based on the available data, there appears to be a supply gap for the three *fire technology-related occupations* in the SCV/SML subregion. Although two *fire technology-related occupations* show entry-level wages above the SCV/SML subregion's living wage, wage data for the third occupation is not available. Even though the typical entry-level education for *Firefighters* and *Fire Inspectors and Investigators* is a postsecondary nondegree award and the typical entry-level education for *Forest Fire Inspectors and Prevention Specialists* is a high school diploma or equivalent, overall between 47% and 59% of incumbent workers have completed some college or an associate degree as their highest level of education. **Due to all the regional labor market criteria being met, the COE endorses this new program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for *fire technology-related occupations*.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25th percentile)	Typical Entry-Level Education	Community College Educational Attainment
Firefighters (33-2011)	NCV/NML: 134 SCV/SML: 236	NCV/NML: 113 SCV/SML: 202	NCV/NML: $25.63 SCV/SML: $27.73	Postsecondary nondegree award	59%
Fire Inspectors and Investigators (33-2021)	NCV/NML: 2 SCV/SML: 6		NCV/NML: $28.07 SCV/SML: $35.12	Postsecondary nondegree award	47%
Forest Fire Inspectors and Prevention Specialists (33-2022)	NCV/NML: 3 SCV/SML: 0		NCV/NML: $25.67 SCV/SML: Insufficient Data	High school diploma or equivalent	47%
Total	**381**	**315**	**-**	**-**	**-**

Demand:

- The number of jobs for the three *fire technology-related occupations* is projected to increase 10% through 2028. There will be 242 annual job openings in the SCV/SML subregion.
- Two *fire technology-related occupations* have an entry-level hourly wage above the living wage of $16.08 in the SCV/SML subregion. Wage data for the third occupation is not available.
- There were 96 online job postings for the three *fire technology-related occupations* over the past 12 months.
- The Bureau of Labor Statistics (BLS) lists a postsecondary nondegree award as the typical entry-level education for *Firefighters* and *Fire Inspectors and Investigators,* and a high school diploma or equivalent as the typical entry-level education for *Forest Fire Inspectors and Prevention Specialists*.
- National-level educational attainment data indicates that between 47% and 59% of workers in the field have completed some college or an associate degree as their highest level of education.

Supply:

- Between 2021 and 2024, there was an average of 202 awards conferred by community colleges in the SCV/SML subregion.
- Between 2020 to 2023, there were no non-community college institutions in the SCV/SML subregion that conferred awards in relevant programs.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for the three *fire technology-related occupations* from 2018 through 2028. Employment in these occupations experienced a 4% increase in 2021 (SCV/SML), compared to the 2% increase across all occupations in California. Additionally, these occupations experienced a 6% increase in 2022 (SCV/SML), compared to the 5% increase across all occupations in California. Then in 2023, there was a 6% decrease in the SCV/SML subregion. Nevertheless, employment projections for the three *fire technology-related occupations* in the SCV/SML subregion are expected to continue increasing year over year through 2028.

Exhibit 2: Annual Percent Change in Jobs for Fire Technology-Related Occupations, 2018-2028

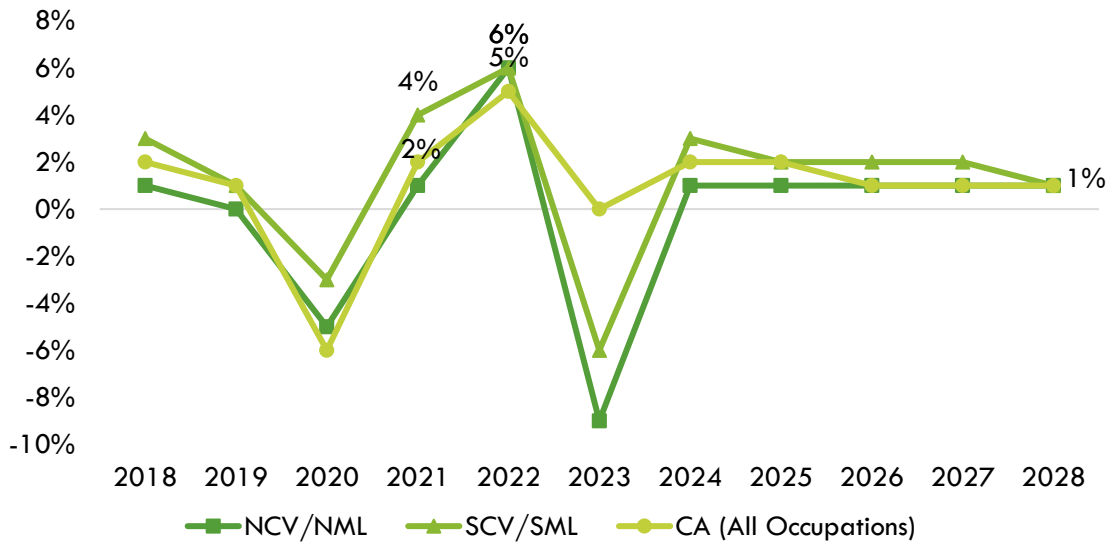


Exhibit 3 shows the five-year occupational demand projections for the three *fire technology-related occupations*. In the SCV/SML subregion, the number of jobs for *fire technology-related occupations* is projected to increase by 10% through 2028. There are projected to be 242 jobs available annually in the SCV/SML subregion.

Exhibit 3: Occupational Demand in NCV/NML, SCV/SML and CVML[1]

Geography	2023 Jobs	2028 Jobs	2023-2028 Change	2023-2028 % Change	Annual Openings
NCV/NML	1,574	1,656	82	5%	139
SCV/SML	2,449	2,705	256	10%	242
CVML	**4,023**	**4,361**	**338**	**8%**	**381**

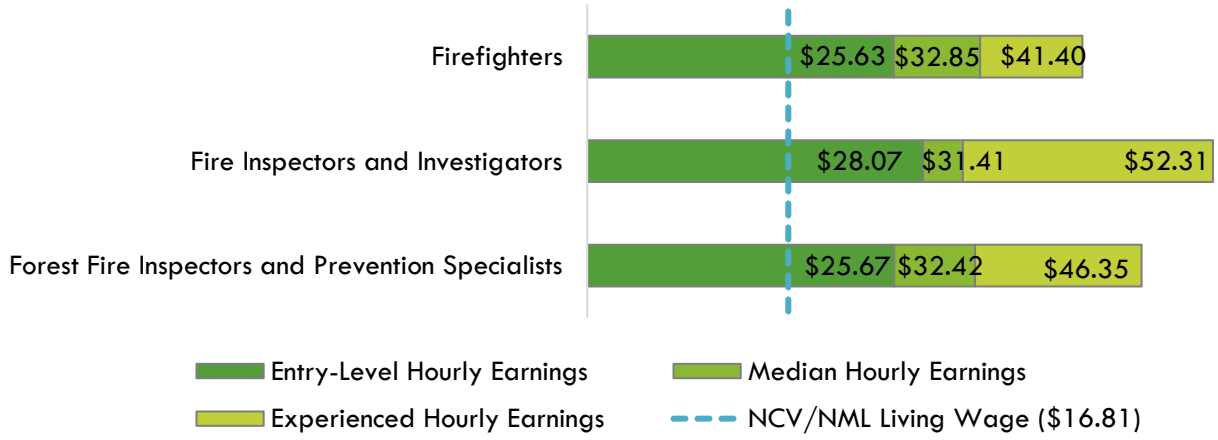
[1] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Wages:

The labor market endorsement in this report considers the entry-level hourly wages for the three *fire technology-related occupations* as they relate to the subregions and region's living wage. NCV/NML, SCV/SML and CVML wages are included below to provide a complete analysis of the subregions and region.

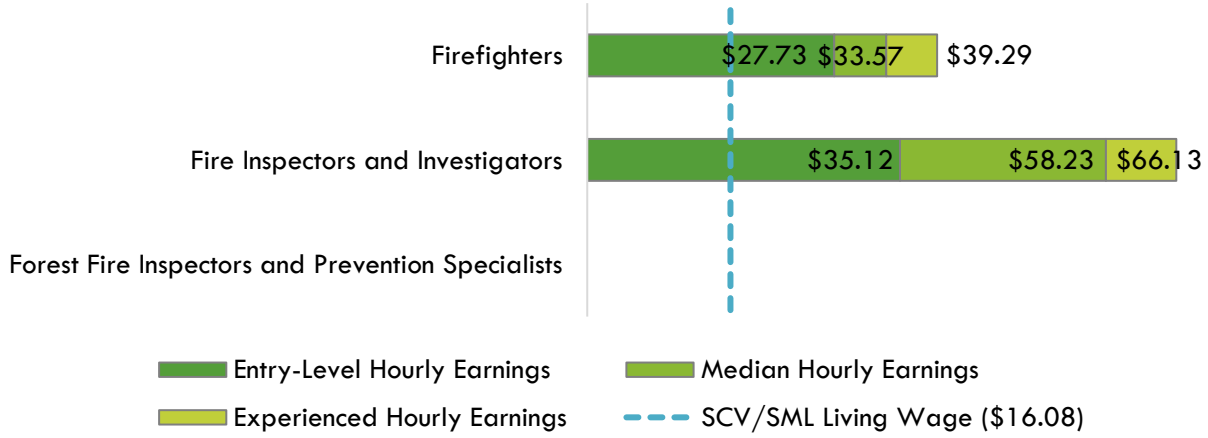
All three *fire technology-related occupations* have an entry-level hourly wage above the living wage for one adult in the NCV/NML subregion ($16.81). The NCV/NML average wage for these occupations is $36.30, which is below the average statewide wage of $42.39. Exhibit 4a shows the wage range for the three *fire technology-related occupations* and how they compare to the NCV/NML subregion's living wage.

Exhibit 4a: Wages by Occupation in NCV/NML



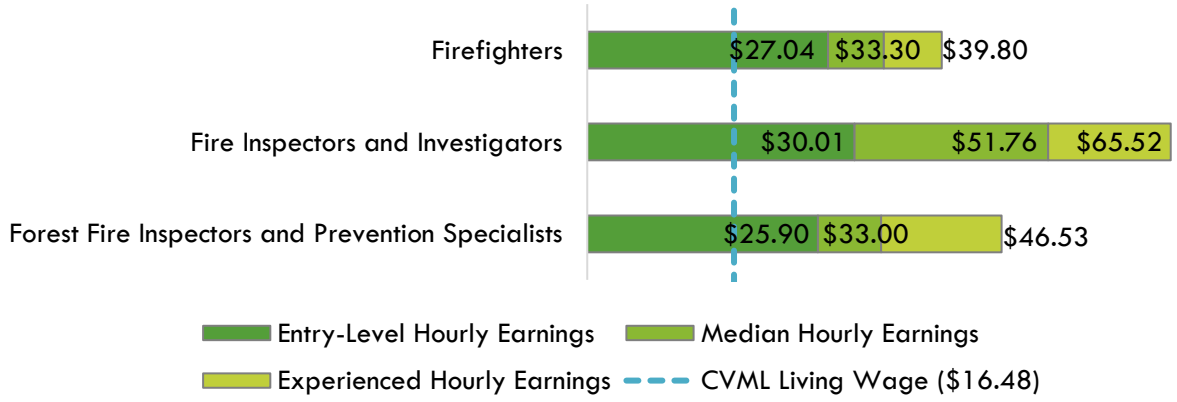
Two of the three *fire technology-related occupations* have an entry-level hourly wage above the living wage for one adult in the SCV/SML subregion ($16.08). The SCV/SML average wage for these occupations is $35.37, which is below the average statewide wage of $42.39. Exhibit 4b shows the wage range for two of the three *fire technology-related occupations* and how they compare to the SCV/SML subregion's living wage. **NOTE:** There is insufficient hourly wage data for *Forest Fire Inspectors and Prevention Specialists*.

Exhibit 4b: Wages by Occupation in SCV/SML



All three *fire technology-related occupations* have an entry-level hourly wage above the living wage for one adult in the CVML region ($16.48). The CVML average wage for these occupations is $35.73, which is below the average statewide wage of $42.39. Exhibit 5 shows the wage range for all three *fire technology-related occupations* and how they compare to the CVML region's living wage.

Exhibit 5: Wages by Occupation in CVML



Job Postings:

Important Online Job Postings Data Note: *Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.*[2] *For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast's database.*

Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

There were 96 online job postings for the three *fire technology-related occupations* listed in the past 12 months, which are shown in Exhibit 6.

Exhibit 6: Number of Job Postings by Occupation (n=96)

Occupation	Job Postings	Percentage of Job Postings
Firefighters	55	57%
Forest Fire Inspectors and Prevention Specialists	23	24%
Fire Inspectors and Investigators	18	19%

[2] K. R. Chowdhary, Fundamentals of Artificial Intelligence (Basingstoke: Springer Nature, 2020), https://link.springer.com/book/10.1007/978-81-322-3972-7.

The top employers in *fire technology-related occupations* by number of job postings are shown in Exhibit 7.

Exhibit 7: Top Employers by Number of Job Postings (n=96)

Employer	Job Postings	Percentage of Job Postings
Wildfire Defense Systems	15	16%
National Park Service	11	11%
United States Department of the Interior	8	8%
United States Department of Defense	4	4%
County of Tulare	4	4%
City of Coalinga	3	3%
Tulare County	3	3%
County of Kern	2	2%
City of Sanger	2	2%
U.S. National Park Service	2	2%

The top specialized, common, and software skills for *fire technology-related occupations* listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 8.

Exhibit 8: Top Skills by Number of Job Postings (n=96)

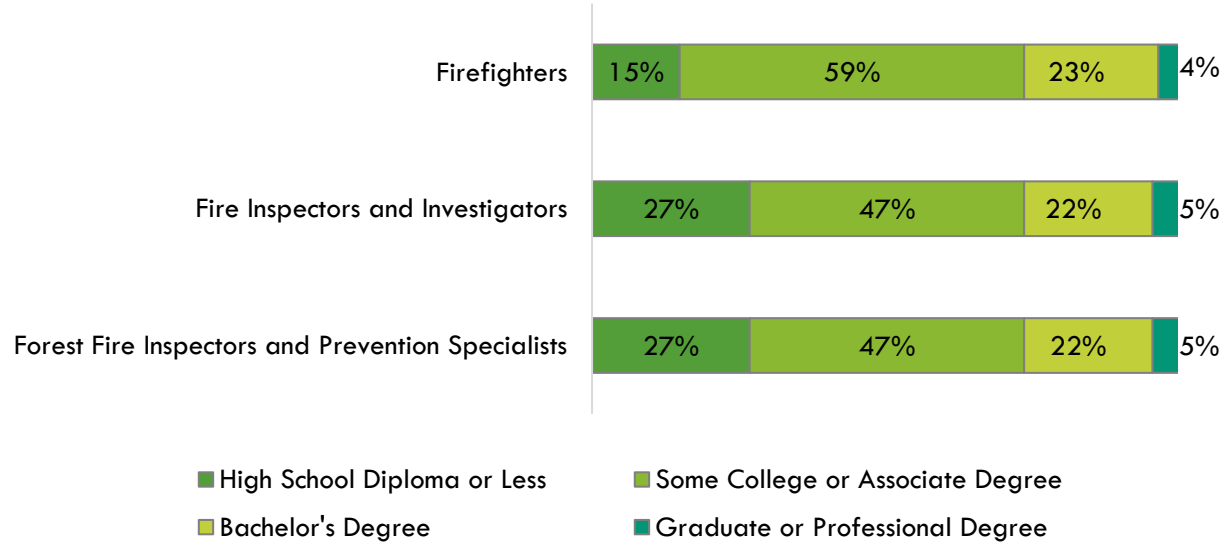
Top Specialized Skills	Top Common Skills	Top Software Skills
Firefighting (61)	Operations (39)	Expo (Application Development Framework) (1)
Fire Suppression Systems (35)	Management (30)	JavaScript (Programming Language) (1)
Fire Prevention (33)	Good Driving Record (25)	Business Software (1)
Wildfire Suppression (27)	Communication (25)	-
Fire Science (19)	First Aid (12)	-
Fire Behavior (19)	Coordinating (12)	-
Incident Command Systems (19)	Investigation (12)	-
Incident Management (18)	Physical Fitness (11)	-
Fire Protection (17)	Leadership (11)	-
Machinery (17)	Record Keeping (10)	-

Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a postsecondary nondegree award as the typical entry-level education for *Firefighters* and *Fire Inspectors and Investigators* and lists a high school diploma or equivalent as the typical entry-level education for *Forest Fire Inspectors and Prevention Specialists*. National-level educational attainment data indicates that between 47% and 59% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 9 shows the educational attainment for the three *fire technology-related occupations*.

Of the 96 online job postings, 45% (equivalent to 43 postings) of cumulative job postings for *fire technology-related occupations* listed a minimum education requirement in the SCV/SML subregion. Of the 43 postings, 58% (25) requested a high school diploma or GED.

Exhibit 9: National-level Educational Attainment for Fire Technology-Related Occupations



Educational Supply

Community College Supply:

Exhibits 10a and 10b show the annual and three-year average number of awards conferred by community colleges in the programs that have historically trained for the occupations included in this report. The colleges with the most completions are Fresno City (South) and Modesto (North).

Exhibit 10a: NCV/NML Community College Awards (Certificates and Degrees) 2021-22 through 2023-24

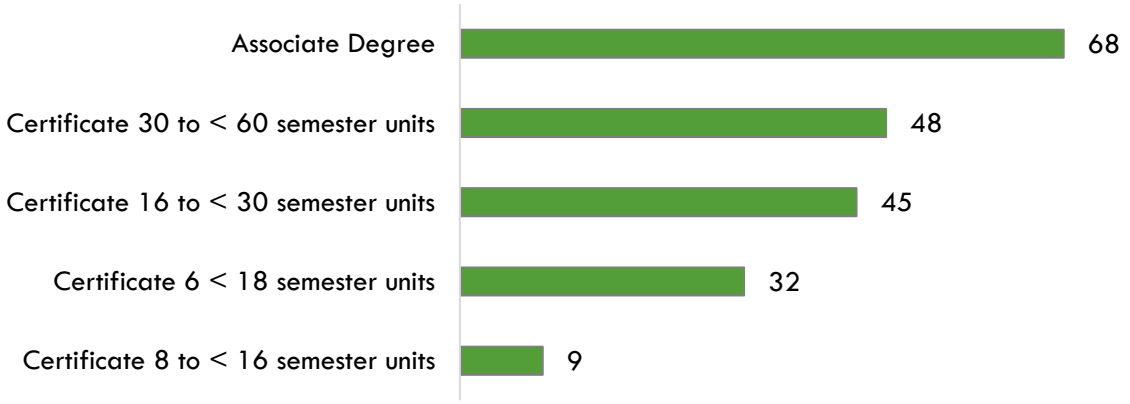
TOP Code	Program	College	2021-2022 Awards	2022-2023 Awards	2023-2024 Awards	3-Year Award Average
2133.00	Fire Technology	Columbia	42	88	21	50
		Merced	9	2	6	6
		Modesto	39	21	29	30
		Subtotal/Average	**90**	**111**	**56**	**86**
2133.50	Fire Academy	Modesto	18	18	45	27
		Subtotal/Average	**18**	**18**	**45**	**27**
NCV/NML Supply Grand Total			**108**	**129**	**101**	**113**

Exhibit 10b: SCV/SML Community College Awards (Certificates and Degrees) 2021-22 through 2023-24

TOP Code	Program	College	2021-2022 Awards	2022-2023 Awards	2023-2024 Awards	3-Year Award Average
2133.00	Fire Technology	Bakersfield	49	73	41	54
		Fresno City	37	36	36	36
		Porterville	-	5	10	5
		Reedley	13	15	-	9
		Sequoias	13	21	17	17
		Subtotal/Average	**112**	**150**	**104**	**122**
2133.10	Wildland Fire Technology	Bakersfield	-	3	1	1
		Reedley	1	2	2	2
		Subtotal/Average	**1**	**5**	**3**	**3**
2133.50	Fire Academy	Bakersfield	-	-	1	0
		Fresno City	42	54	38	45
		Sequoias	-	46	50	32
		Subtotal/Average	**42**	**100**	**89**	**77**
SCV/SML Supply Grand Total			**155**	**255**	**196**	**202**

Exhibit 11 shows the annual average community college awards by type from 2021-22 through 2023-24. Of the 202 awards conferred in the SCV/SML subregion, 34% (68) of the awards were for an associate degree.

Exhibit 11: SCV/SML Subregion Annual Average Community College Awards by Type, 2021-2024



Community College Student Outcomes:

Exhibit 12 shows the Strong Workforce Program (SWP) metrics for the Wildland Fire Technology program in the Kern Community College District (KCCD), the SCV/SML subregion, the CVML region, and California. Of the 1,486 wildland fire technology students statewide in the 2023-24 academic year, 33% (485) attended a CVML institution.

CVML students that exited wildland fire technology programs in the 2022-23 academic year had median annual earnings ($49,362), which is below the statewide median annual earnings ($68,460). Notably, 63% of SCV/SML wildland fire technology students attained a living wage, which is lower than the percentage of students who attained a living wage statewide (67%).

Exhibit 12: Wildland Fire Technology (2133.10) Strong Workforce Metrics

SWP Metric	KCCD	SCV/SML Region	CVML Region	California
SWP Students	424	446	485	1,486
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	29%	28%	32%	36%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	52%	52%	50%	54%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	5%	5%	5%	4%

SWP Metric	KCCD	SCV/SML Region	CVML Region	California
SWP Students Who Transferred to a Four-Year Postsecondary Institution	N/A	N/A	N/A	1%
SWP Students with a Job Closely Related to Their Field of Study	N/A	N/A	N/A	94%
Median Annual Earnings for SWP Exiting Students	$43,366 ($20.85)	$46,274 ($22.25)	$49,362 ($23.73)	$68,460 ($32.91)
Median Change in Earnings for SWP Exiting Students	45%	46%	67%	32%
SWP Exiting Students Who Attained the Living Wage	62%	63%	66%	67%

2023-24 2022-23 2021-22 N/A

Non-Community College Supply:

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for the occupations studied in this report. This includes examining the annual and three-year average number of awards conferred by non-community college institutions in programs that have historically trained for the occupations of interest.

Between 2020 and 2023, there were no non-community colleges in the CVML region that conferred awards annually in related training programs.

Appendix A: Methodology

The CVML COE prepared this report by analyzing data from occupations and education programs.

Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the CVML COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education but also require short-to long-term on-the-job training where multiple community colleges have existing programs.

The CVML COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a "supply table" with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the CVML COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/
Living Wage	The living wage is derived from the Insight Center's California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, childcare, health care, transportation, and taxes. For more information, see: https://selfsufficiencystandard.org/California/ Wage figures are used by the CCCCO to calculate the percentage of students that attained the regional living wage.
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/
Educational Supply	The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions
Student Metrics and Demographics	DataVista, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://datavista.cccco.edu/

Data Type	Source
Population and Occupation Demographics	The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml

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