

2025 Overview:

Central Valley/Mother Lode Region



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Table of Contents

Central Valley/Mother Lode College Area	3
Executive Summary.....	4
Introduction.....	5
Methodology	5
Regional Overview.....	6
Residential Population	6
Demographics.....	6
Educational Attainment.....	9
Labor Force & Employment	10
K-12 Enrollment and Demographics.....	11
Regional K-12 Enrollment	11
High School Graduation Demographics	12
CE Enrollment and Demographics	13
Sector Composition	16
Middle-Skill Jobs Composition	17
Gap Analysis Summary	18
Advanced Manufacturing.....	20
Advanced Transportation and Logistics.....	25
Agriculture, Water & Environmental Technologies.....	30
Business & Entrepreneurship.....	35
Education	39
Energy, Construction & Utilities	43
Health.....	48
ICT/Digital Media	52
Public Safety.....	56
Retail, Hospitality & Tourism.....	60
Conclusion	65
Program Development Recommendations.....	66
Appendix A: Methodology & Data Sources.....	68
Data Sources.....	68
Key Terms and Concepts	68
Appendix B: Postsecondary Supply for Each Sector	70
Appendix C: Occupational Requirements and Educational Attainment for the Top Occupations in Each Sector	96

Central Valley/Mother Lode College Area

Exhibit 1. Map of community colleges in the Central Valley/Mother Lode region



Executive Summary

The Central Valley/Mother Lode Center of Excellence for Labor Market Research (CVML COE) analyzed labor market information and postsecondary education data to compile an overview of the CVML region's middle-skill workforce and training programs. This report examines where job growth is projected to occur and estimates the potential shortages of workers to fill middle-skill jobs. Estimates of workforce gaps are provided utilizing the Chancellor's Office priority sectors.¹ This framework may be used by the regional community colleges to facilitate program development to address the identified gaps. The middle-skill workforce is analyzed using occupational demand estimates, earnings, demographics, and the relevant supply from postsecondary institutions. Demographic information of the region, K-12 institutions, and community colleges is also provided in this report, allowing a unique view into how the demographics of the region align with education programs and the middle-skill workforce.

The middle-skill occupations within the 10 sectors detailed in this report are projected to have nearly 96,800 job openings available annually over the next five years within the region. Regional postsecondary institutions in the region have conferred an average of 24,520 awards annually over the last three academic years. The difference between the projected workforce demand and the average number of awards issued by regional postsecondary institutions indicates an undersupply of 72,255 workers in the region. This supply gap has decreased by approximately 10% since the 2023 CVML Overview, in which the supply gap was assessed at 80,297 workers. The three sectors with the greatest number of annual job openings also have the largest gaps in workforce supply in the region:

- Health: 22,870 workers
- Business and Entrepreneurship: 11,238 workers
- Advanced Transportation and Logistics: 7,682 workers

Sectors with the smallest gaps in workforce supply include public safety (a shortage of 2,924 workers) and advanced manufacturing (a shortage of 3,124 workers). However, it should be noted that these sectors also comprise the smallest share of demand. The sectors issuing the most awards each year, on average, include the health sector (7,422 awards), the education sector (2,790 awards), and the business and entrepreneurship sector (2,761 awards). The information and communication technologies (ICT)/digital media sector has issued the fewest awards (1,254 awards), followed by advanced manufacturing (1,295 awards).

Other findings:

- The health sector is projected to have the most demand for middle-skill workers over the next five years, accounting for nearly 31% of the projected middle-skill workforce demand in the region.
- ICT/digital media, business and entrepreneurship, advanced transportation and logistics, and agriculture, water, and environmental technologies have the largest supply gaps in proportion to their respective demand. These sectors play a critical role in powering the regional economy and intersect with other fields of work of regional importance, such as business and agriculture.
- Education, public safety, and retail, hospitality, and tourism have the smallest supply gaps in proportion to their projected demand.

¹ Referred to henceforth as sectors in this report, the 10 sectors analyzed by the COE adhere to the sector title designations from the California Community Colleges Chancellor's Office: <https://www.cccco.edu/About-Us/Chancellors-Office/Divisions/Workforce-and-Economic-Development/Strong-WorkforceProgram/SWP-Archive/Events/K12-SWP-Industry-Sector-Crosswalk>.

Introduction

The Center of Excellence has conducted an extensive labor market analysis of the 15-county Central Valley/Mother Lode region. The community colleges in the region are shown in Exhibit 1. This report analyzes ten of the California Community College Chancellor's Office (CCCCO) priority and emerging sectors, comparing the workforce demand to the postsecondary supply. A sector represents a cluster or grouping of primary occupations, comprising a segment of one or multiple industries. For each sector, the report details current employment numbers, projected occupational demand, wages, common skills from job postings, the demographic composition of the workforce, and a three-year average supply of awards (degrees and certificates) from two-year higher education institutions. A comparison of the workforce demand, captured by annual job openings, to the educational supply, assessed by the three-year average awards issued by regional community colleges, was conducted at the sector and regional levels. This type of analysis has the potential to yield insights into the alignment of educational programs to the workforce demand.

Methodology

As the Centers of Excellence for Labor Market Research primarily serve the needs of California Community Colleges, this analysis focuses on middle-skill occupations. Middle-skill occupations are those that typically require more than a high school education and less than a bachelor's degree. Some occupations outside of this narrow definition are considered middle-skill due to the number of incumbent workers with a community college education and the existence of relevant training programs offered by community colleges. Demand for middle-skill occupations is assessed by the number of annual job openings expected over the next five years, which is calculated based on occupational projections derived from historical growth estimates. Occupational earnings are compared to the living wage estimate of a single adult in the Central Valley/Mother Lode region, \$16.48², to provide insight into occupational pathways that provide workers with careers that facilitate economic mobility. Race/ethnicity data is provided at a regional level and for the middle-skill workforce within each sector to facilitate conversations regarding equity.

Each sector of the report contains an analysis of postsecondary supply, which counts awards by TOP6 codes for programs listed in the Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP). Appendix B contains the count of awards issued by postsecondary education institutions in the region, organized by sector. Appendix C details the educational attainment typically required for the top occupations in each sector.

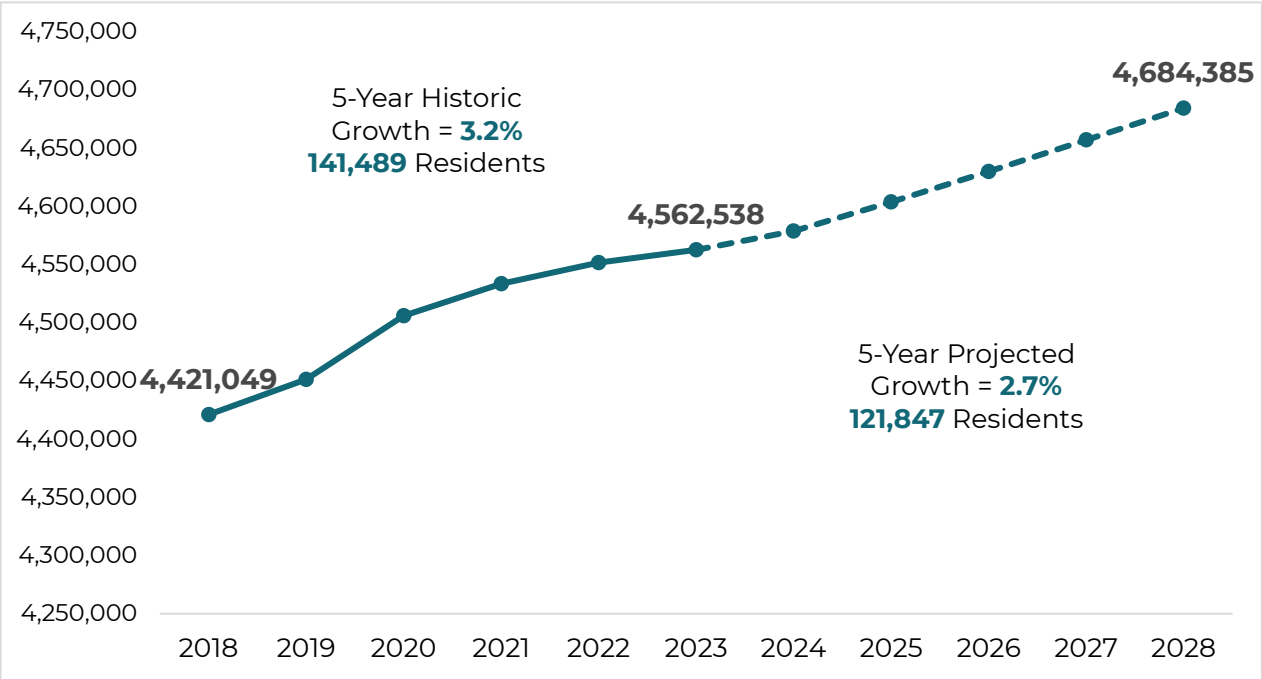
² The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightcccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>

Regional Overview

Residential Population

According to the latest U.S. Census data, the CVML region was home to approximately 4.56 million residents in 2023 (Exhibit 2). Between 2018 and 2023, the region added nearly 141,500 residents. Between 2023 and 2028, the region is projected to grow by 2.7%, adding more than 121,800 new residents, totaling nearly 4.68 million residents in 2028.

Exhibit 2: Population estimates and projections in the CVML region, 2018-2028



Demographics

The CVML region’s gender composition is equivalent to the state. The population is equally divided between men and women. Exhibit 3 shows projected changes in the CVML region’s race/ethnicity demographics by 2028. The largest group in the region by race/ethnicity is White, Hispanic, totaling more than 2.17 million residents in 2023. The number of individuals identifying as White, Non-Hispanic, the second largest demographic group in the region, is expected to decline by more than 129,700 residents over the next five years. Rapid growth rates are projected for residents identifying as Asian, Non-Hispanic (16% growth), two or more races, Hispanic, 13% growth; Asian, Hispanic (10% growth) and Native Hawaiian or Pacific Islander, Non-Hispanic (10% growth).

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

- White, Hispanic 152,647, representing 7% growth
- Asian, Non-Hispanic residents, an increase of 62,339, 16% growth
- Two or More Races, Non-Hispanic, 9,519, 9% growth

Exhibit 3. Projected change in race/ethnicity in the CVML region, 2023-2028

Race/Ethnicity	2023	2028	5-Year Change	5-Year % Change
White, Hispanic	2,165,453	2,318,100	152,647	7%
White, Non-Hispanic	1,382,604	1,252,877	(129,727)	(9%)
Asian, Non-Hispanic	395,668	458,007	62,339	16%
Black, Non-Hispanic	197,609	200,133	2,524	1%
Two or More Races, Non-Hispanic	109,587	119,106	9,519	9%
American Indian or Alaskan Native, Hispanic	97,823	103,538	5,715	6%
Two or More Races, Hispanic	69,884	78,873	8,989	13%
Black, Hispanic	50,551	54,829	4,278	8%
Asian, Hispanic	41,825	45,883	4,058	10%
American Indian or Alaskan Native, Non-Hispanic	29,099	28,497	(602)	(2%)
Native Hawaiian or Pacific Islander, Non-Hispanic	14,382	15,817	1,435	10%
Native Hawaiian or Pacific Islander, Hispanic	8,053	8,726	673	8%
Total	4,562,538	4,684,385	121,847	3%

Applying an equity lens to the data by examining cohort percentage reveals that residents identifying as Hispanic represented 53% of the total population in 2023. The Black population's overall percentage representation of 4% has remained stable and is projected to do so through 2028. The White residential cohort is projected to decline by more than 129,700 residents, or approximately 9% (Exhibit 4).

Exhibit 4. Projected change in Hispanic vs. Non-Hispanic races/ethnicities in CVML Region, 2023-2028

Race/Ethnicity	2023	2028	Change	% Change	% of Cohort
Hispanic	2,433,589	2,609,948	176,359	7%	53%
White	1,382,604	1,252,877	(129,727)	(9%)	30%
Asian	395,668	458,007	62,339	16%	9%
Black	197,609	200,133	2,524	1%	4%
Two or More Races	109,587	119,106	9,519	9%	2%
American Indian or Alaskan Native	29,099	28,497	(602)	(2%)	1%
Native Hawaiian or Pacific Islander	14,382	15,817	1,435	10%	0%
Total	4,562,538	4,684,385	121,847	3%	100%

Changes in residential population by age cohorts may indicate future demand for educational services and yield workforce implications. The 15-to-19 age group is projected to remain relatively flat over the next five years, which is of immediate relevance for community college planning in the region, while younger cohorts are projected to decrease in size (Exhibit 5). The 20-to-24 age cohort is expected to grow by 10%, representing an increase of nearly 29,600 residents.

Exhibit 5. Projected change in age cohorts in the CVML region, 2023–2028

Age Cohort	2023	2028	Change	% Change	2028 % of Cohort
Under 5 years	304,907	313,459	8,552	3%	7%
5 to 9 years	340,499	314,406	(26,093)	(8%)	7%
10 to 14 years	362,354	353,673	(8,681)	(2%)	8%
15 to 19 years	357,537	357,542	5	0%	8%
20 to 24 years	310,246	339,824	29,578	10%	7%
25 to 29 years	313,631	312,665	(966)	(0%)	7%
30 to 34 years	337,191	317,483	(19,708)	(6%)	7%
35 to 39 years	318,301	346,098	27,797	9%	7%
40 to 44 years	303,473	324,013	20,540	7%	7%
45 to 49 years	262,279	298,900	36,621	14%	6%
50 to 54 years	251,115	253,746	2,631	1%	5%
55 to 59 years	240,842	242,943	2,101	1%	5%
60 to 64 years	238,195	227,127	(11,068)	(5%)	5%
65 to 69 years	207,461	215,237	7,776	4%	5%
70 to 74 years	163,799	181,330	17,531	11%	4%
75 to 79 years	118,250	134,837	16,317	14%	3%
80 to 84 years	71,708	88,133	16,425	23%	2%
85 years and over	60,480	62,968	2,488	4%	1%
TOTAL	4,562,538	4,684,385	121,847	3%	100%

When the age of residents and the projected change in two separate age groups – the 20-to-54 age cohort and the 55+ age cohort – are considered, the analysis shows that both cohorts will add residents over the next five years. The cohorts are projected to increase at equivalent rates, but the 20 to 54 age cohort will add nearly twice as many residents (Exhibit 6).

Exhibit 6. Projected change in two age cohorts in the CVML region, 2023–2028

Age Cohort	2023	2028	Change	% Change
20 to 54 years	2,096,236	2,192,730	96,494	5%
55+ years	1,101,005	1,152,576	51,571	5%

In evaluating the age-cohort data to gauge the future education and hiring needs of the region’s labor market, the analysis incorporated the traditional lens of workers retiring out of the labor force at age 55. This renders a projection picture of nearly one-quarter of the population leaving the workforce by 2028. However, many workers are opting to work up to 65 years of age (Exhibit 7).

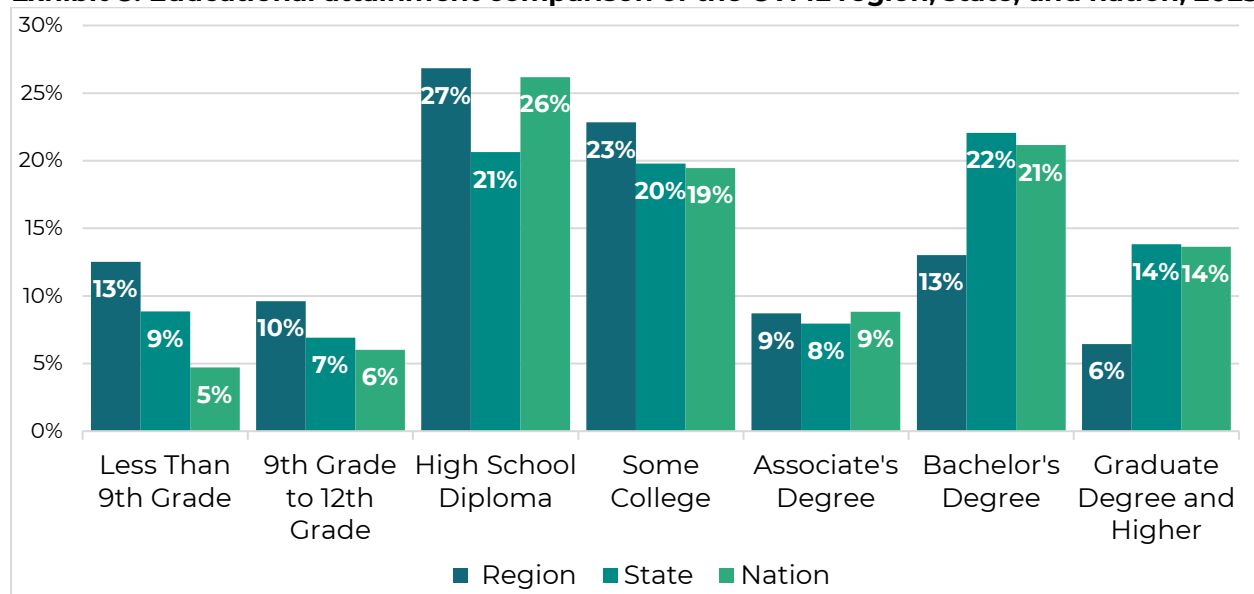
Exhibit 7. Projected change in age cohorts, grouped by young children, school age, working age, or retiring in the CVML region, 2023–2028

Category	Age Cohort	2023 Population	2028 Population	Change	% Change	2023 % of Cohort	2028 % of Cohort
Young Children	Under 5 years	304,907	313,459	8,552	3%	7%	7%
School Age	5 to 24 years	1,370,636	1,365,445	(5,191)	(0%)	30%	29%
Working Age	25 to 54 years	1,785,990	1,852,906	66,916	4%	39%	40%
Retiring	55 Plus	1,101,005	1,152,576	51,571	5%	24%	25%
	Total	4,562,538	4,684,385	121,847	3%	100%	100%
Still Working	55 to 64	479,037	470,070	(8,967)	(2%)	10%	10%
Retiring	65 Plus	621,968	682,505	60,537	10%	14%	15%

Educational Attainment

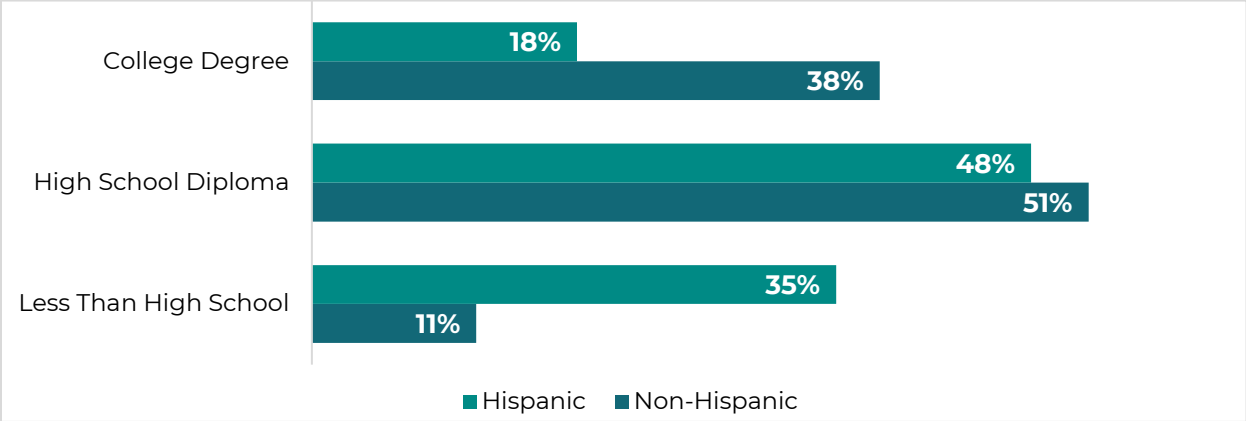
Exhibit 8 summarizes educational attainment data for the population's residents who are 25 years of age and older. The CVML region continues to trail the state in bachelor's degree attainment, with 13% of the adult population holding a bachelor's degree, compared to 22% in the state as a whole. Regarding associate degree attainment, the region and California are similar, 9% and 8%, respectively. The region has a higher percentage of residents with a high school education, 27% compared to 21% in the state. A slightly greater proportion of the region has completed some college, 23%, compared to 20% in California as a whole. Compared to the state, the region has larger shares of residents with less than a 9th grade education and less than a 12th grade education, which indicates a greater regional need for adult education. In the region, 13% of residents have less than a 9th grade education, compared to 9% in the state.

Exhibit 8. Educational attainment comparison of the CVML region, state, and nation, 2023



In the region, 38% of the Non-Hispanic adult population has a college degree, compared to 18% of the Hispanic population (Exhibit 9). A comparison of this data to the 2023 CVML Overview revealed a 2-percentage point increase for both groups. As observed in the 2023 CVML Overview, a greater proportion of Hispanic residents have completed less than a high school education, 35%, compared to Non-Hispanic residents, 11%.

Exhibit 9. Hispanic/Non-Hispanic educational attainment in the region, 2023



Labor Force & Employment

The size and characteristics of a region’s labor force are important considerations in workforce planning. Labor force, employment, and unemployment data are based upon “place of residence” – where people live, regardless of where they work. Individuals who have more than one job are counted only once. These data elements differ from industry employment estimates that are “place-of-work” based, where the employer/workplace is located, regardless of where the employee resides. (For terms and definitions, see Appendix A.) The labor force in the CVML region increased by 54,730 workers over the last five years (Exhibit 10). Employment grew by 10,780 workers, from 1.79 million workers in 2019 to 1.83 million workers in 2023. Unemployment rose from 7.2% in 2019 to 7.6% in 2023.

Exhibit 10. Labor force size, employment, and unemployment in the CVML region, 2019-2023

Metric	2019	2023	5-Year Change
Labor Force	1,928,210	1,982,940	54,730
Employment	1,788,920	1,833,190	44,270
Unemployment	139,170	149,950	10,780
Unemployment Rate	7.2%	7.6%	0.3%

In contrast to the region, over the last five years, the state’s labor force has lost 77,000 workers, declining from 19.38 million in 2019 to 19.30 million in 2023 (Exhibit 11). Approximately 201,300 workers in California were lost from the employment pool between 2019 and 2023. Employment declined from 18.60 million workers in 2019 to 18.39 million workers in 2023 statewide. The unemployment rate increased from 4.1% in 2019 to 4.8% in 2023.

Exhibit 11. Labor force size, employment, and unemployment in California, 2019-2023

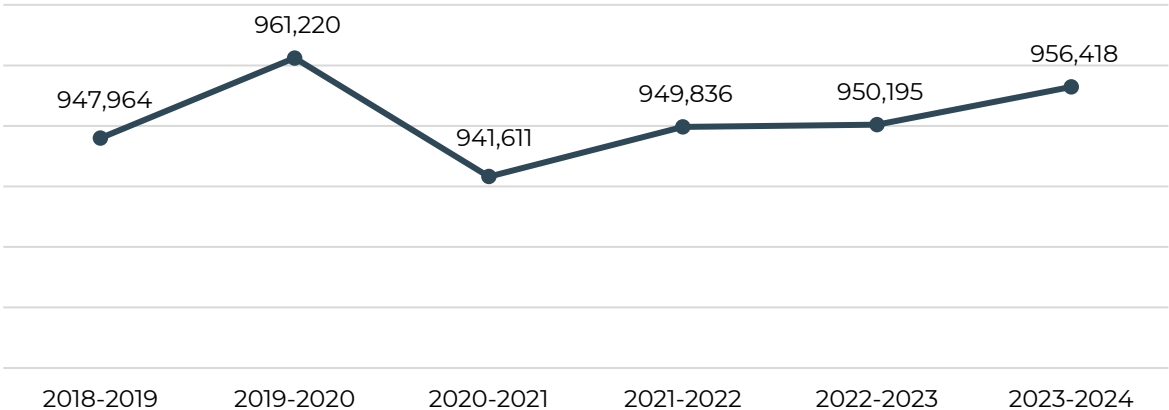
Metric	2019	2023	5-Year Change
Labor Force	19,385,300	19,308,300	(77,000)
Employment	18,589,600	18,388,300	(201,300)
Unemployment	795,700	920,000	124,300
Unemployment Rate	4.1%	4.8%	0.7%

K-12 Enrollment and Demographics

Regional K-12 Enrollment

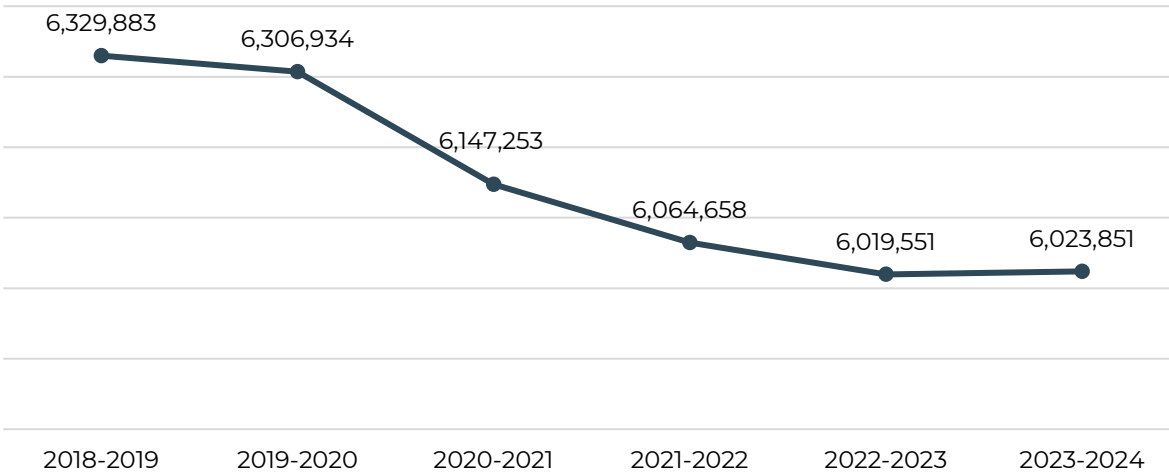
Exhibit 12 displays total K-12 enrollment in the region from the 2018-2019 academic year to the 2023-2024 academic year. Until the 2019–20 academic year, K-12 enrollment had been steadily increasing. During the COVID-19 pandemic, enrollment dropped by the greatest amount between the 2019–20 and 2020–21 academic years, a decrease of 19,609 students. Since the 2020-21 academic year, enrollments have increased by 1.6%, adding more than 14,800 students to the region. Enrollments appear to be recovering and nearing the pre-pandemic high.

Exhibit 12. Total enrollment for grades K-12 in the region, academic years 2018-2019 to 2023-2024



By comparison, K-12 enrollment has been steadily declining in the state since 2018-2019. Consistent with enrollment trends in the region, a substantial drop in enrollment occurred during the COVID-19 pandemic in the 2020–21 academic year. Since the 2020-2021 academic year, statewide K-12 enrollments have declined by more than 123,400 students, or 2.0%.

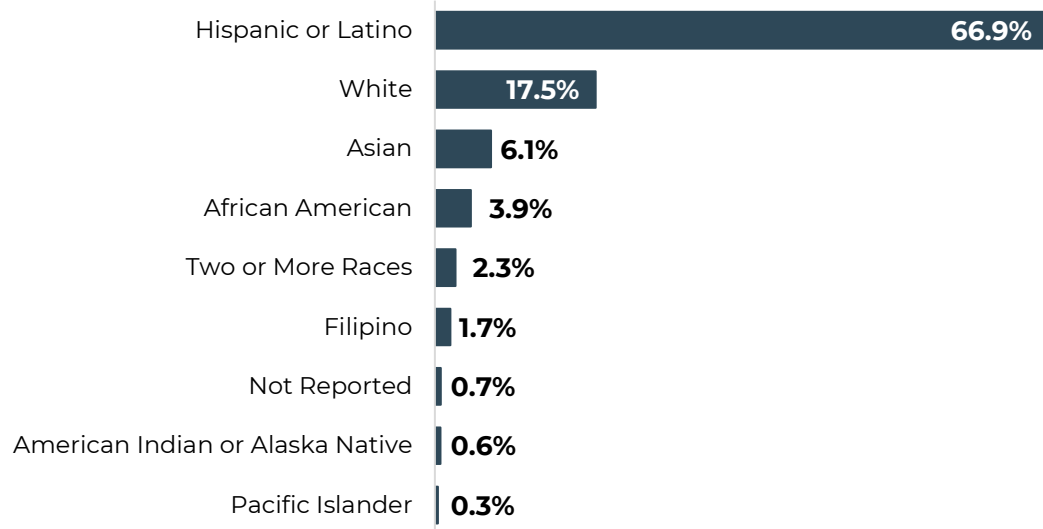
Exhibit 13. Total enrollment for grades K-12 in California, academic years 2018-2019 to 2023-2024



High School Graduation Demographics

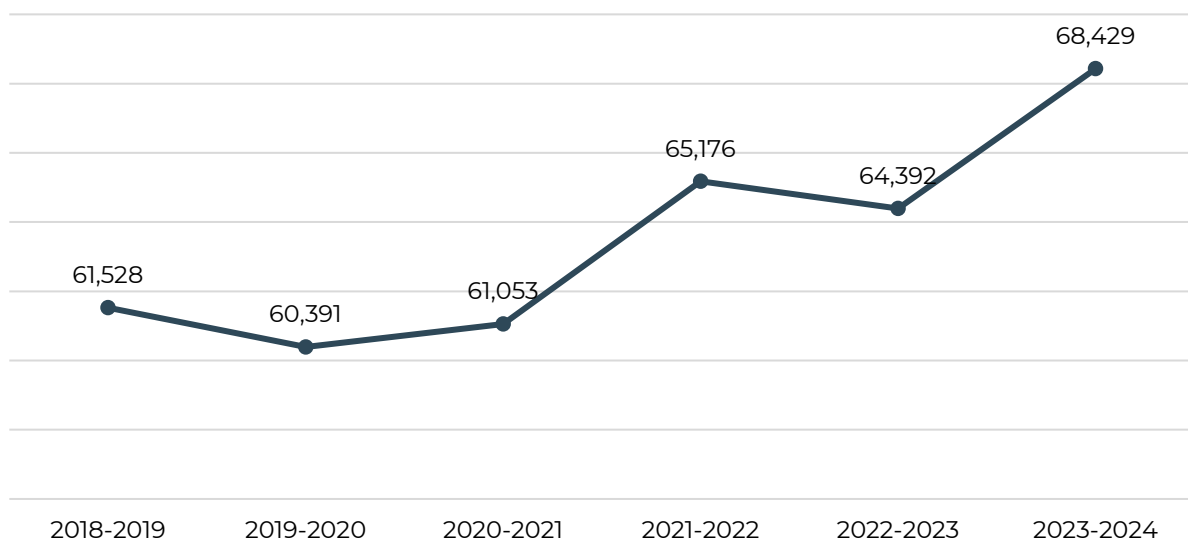
Students who identify as Hispanic or Latino comprise the largest share of students graduating from high school in the region, totaling nearly 45,800 students in the 2023-2024 academic year. The second largest group is White students, a total of approximately 12,000, followed by Asian American students, nearly 4,200. Students who identify as American Indian or Alaska Native, and those who identify as Pacific Islander, comprise the smallest groups in terms of race/ethnicity data reporting.

Exhibit 14. High school graduates by race/ethnicity in the region, 2023-2024 academic year



The graduation trend in the region has increased steadily since the 2018-2019 academic year. However, between the academic years 2021-2022 and 2022-2023, there was a mild decline in graduations, with a 1.2% decrease, or nearly 800 graduates. Since 2018-2019 the number of students graduating from high school has increased by 11%, or more than 6,900 students.

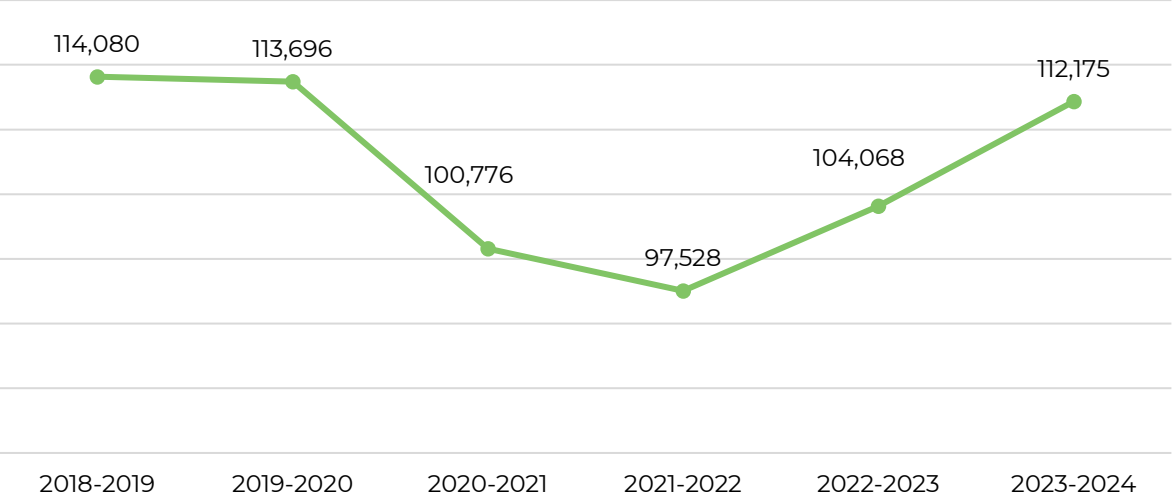
Exhibit 15. High school graduation trend in the region, academic years 2018-2019 to 2023-2024



CE Enrollment and Demographics

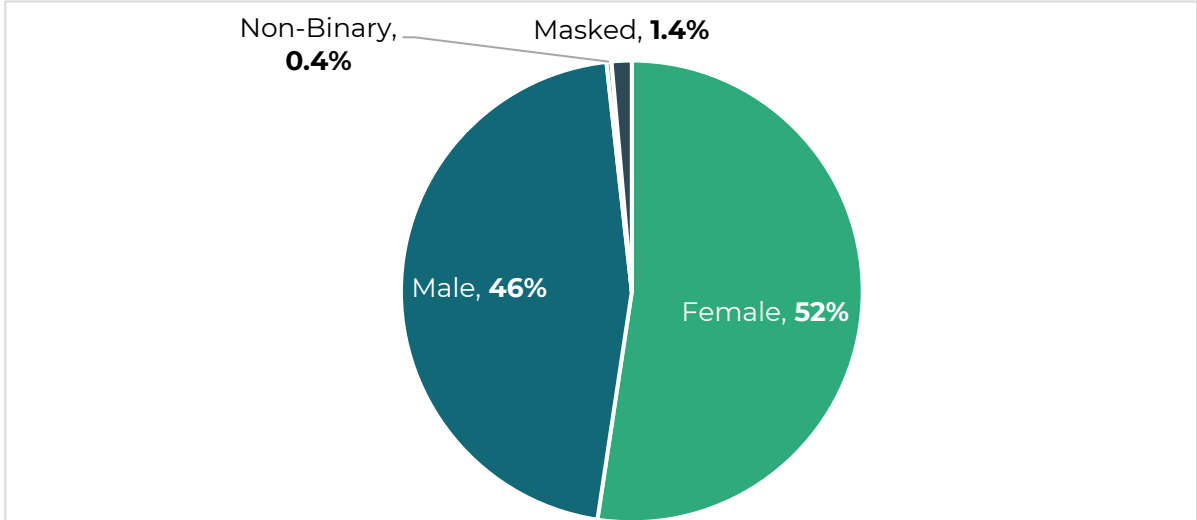
Exhibit 16 displays the number of community college career education (CE) enrollments from the 2018-2019 academic year to the 2023-2024 academic year. Between 2018-2019 and 2021-2022, enrollments steadily declined. Over this period, enrollments declined by nearly 16,600 students or by nearly 15%. Since the 2021-2022 academic year, enrollments have increased considerably. Despite enrollments growing 15% since 2021-2022, enrollments have yet to recover to pre-COVID-19 levels.

Exhibit 16. Community college CE enrollments, 2018-2019 – 2023-2024, CVML region



Female students comprise a larger percentage of students enrolled in career education (CE) programs than male students in the region (Exhibit 17). Female students account for 52% of CE students, while men account for 46%. Students identifying as non-binary accounted for 0.4% of all CE students, while approximately 1.4% of students' data was masked.

Exhibit 17. CE student gender comparison, CVML region



More than half, 62% of CE students, identify as Hispanic (Exhibit 18). About 21% identify as White, 5% identify as Asian American, and 4% identify as Black. Approximately 3% of students identify as two or more races.

Exhibit 18. Race/ethnicity of CE students, CVML region

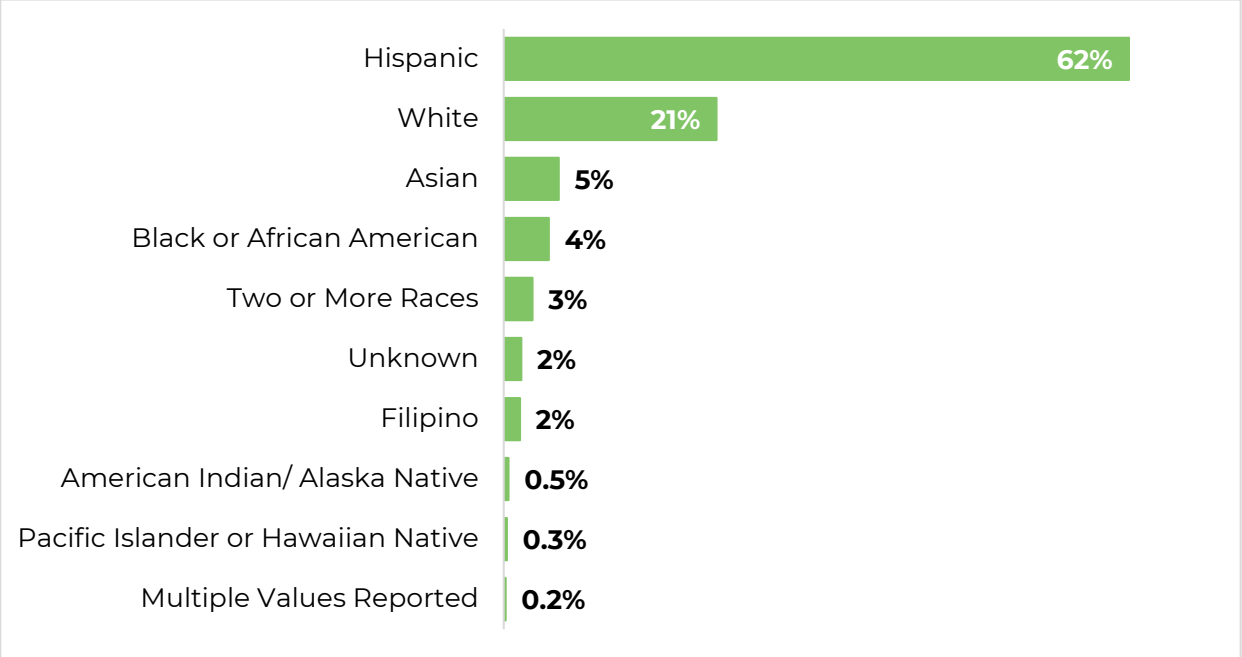
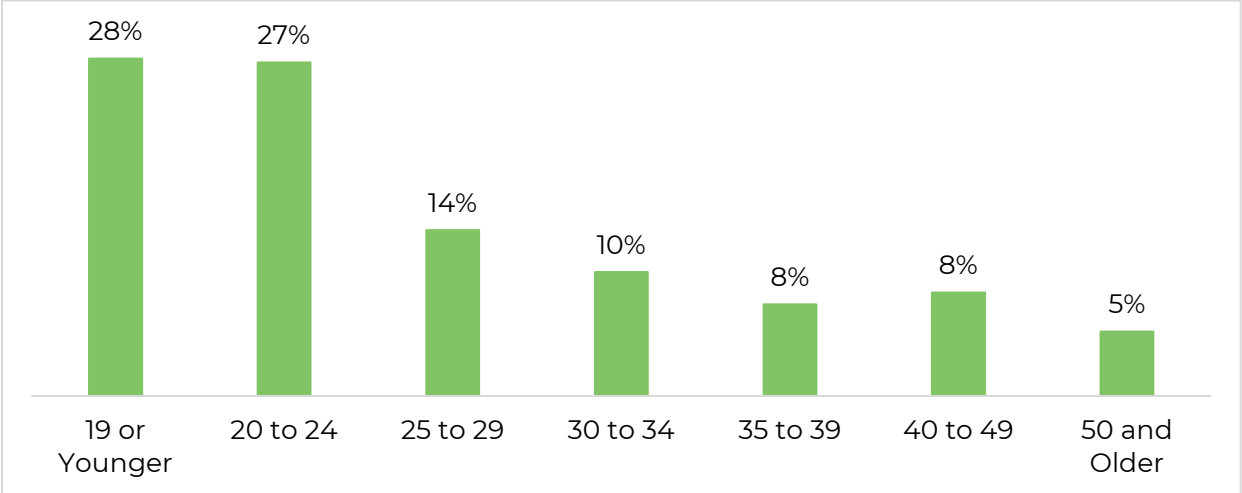


Exhibit 19 displays the share of CVML community college career education students by age group. More than half of the students are 24 or younger, accounting for approximately 55% of enrollments.

Exhibit 19. Students in the region by age group, CVML region



In the 2023-24 academic year, career education programs with the largest enrollment counts in the CVML region were health, business and entrepreneurship, ICT/digital media, and education (Exhibit 20).

Exhibit 20. Share of CE enrollments by sector in the CVML region, 2023-24 academic year

Sector	Percent
Health	19%
Business & Entrepreneurship	16%
ICT/Digital Media	14%
Education	13%
Public Safety	13%
Advanced Manufacturing	7%
Agriculture, Water & Environmental Technologies	6%
Unassigned	3%
Retail, Hospitality & Tourism	3%
Energy, Construction & Utilities	3%
Advanced Transportation & Logistics	2%
Biotechnology	0%
TOTAL	100%



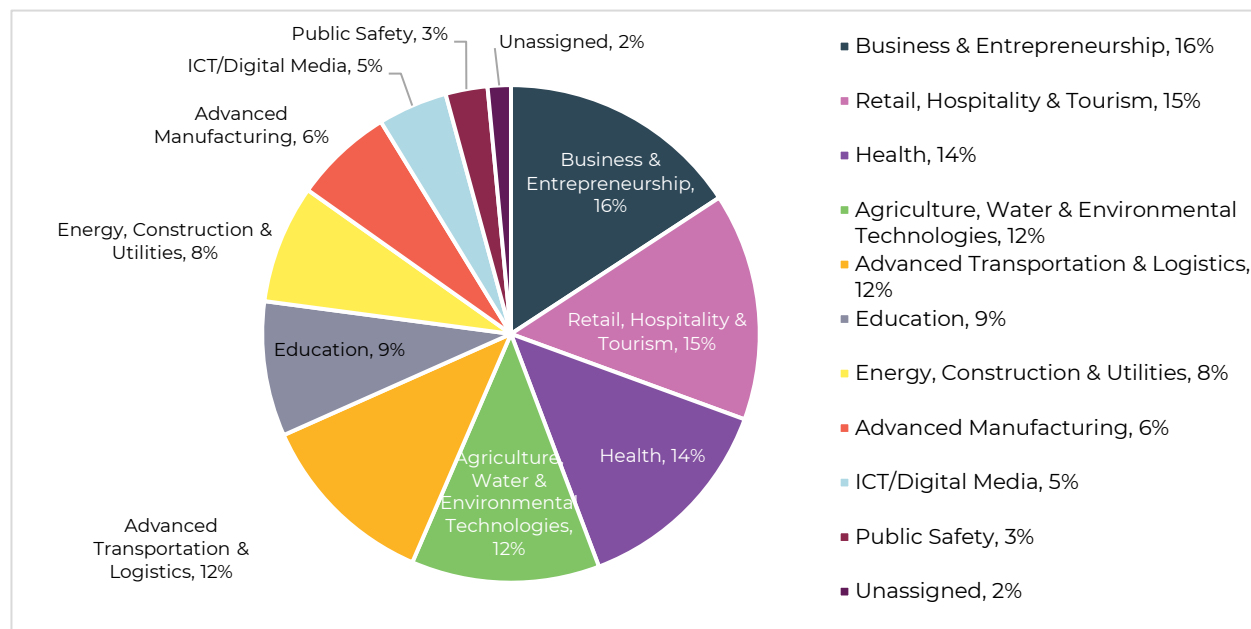
Sector Composition

Across all occupational sectors, there were more than 1.86 million jobs in the region in 2023. When below middle-skill, middle-skill, and above middle-skill jobs are all accounted for, the business and entrepreneurship sector contained the greatest number of jobs in 2023, with nearly 293,600 jobs in the CVML region. This was followed by the retail, hospitality, and tourism and health sectors, which had approximately 275,500 and 254,300 jobs, respectively (Exhibit 21). Regional employment is concentrated in the top five occupational sectors, accounting for approximately 69% of regional jobs (Exhibit 22).

Exhibit 21. Number of jobs by sector in the region, 2021

Sector	2023 Jobs
Business & Entrepreneurship	293,585
Retail, Hospitality & Tourism	275,527
Health	254,332
Agriculture, Water & Environmental Technologies	227,809
Advanced Transportation & Logistics	220,455
Education	163,241
Energy, Construction & Utilities	143,347
Advanced Manufacturing	119,776
ICT/Digital Media	84,140
Public Safety	50,764
Unassigned	28,041
TOTAL	1,861,018

Exhibit 22. Sector percentages by number of jobs in the CVML region, 2023

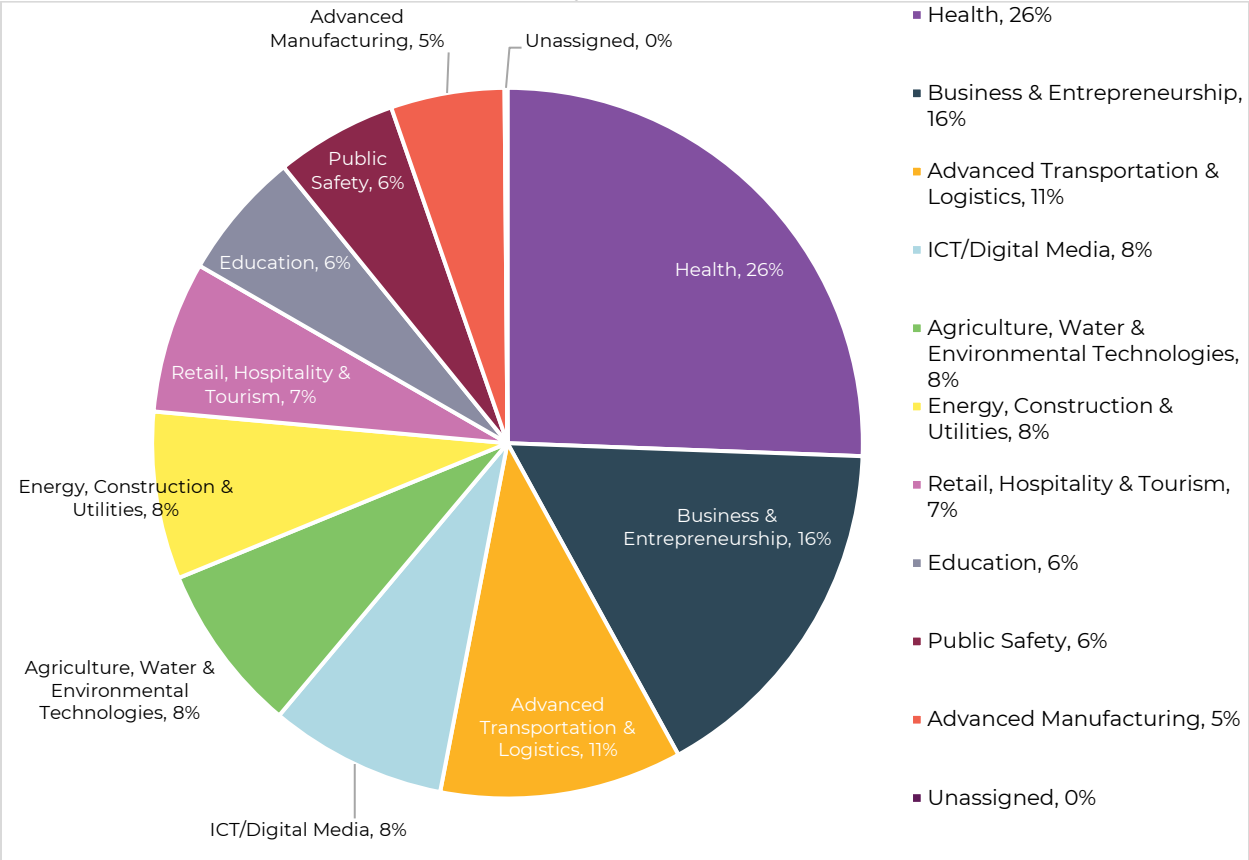


Middle-Skill Jobs Composition

Of the more than 1.86 million jobs in the region, nearly 762,200 jobs are middle-skill, requiring more education or training than a high school diploma but less than a bachelor’s degree. The largest sectors by number of middle-skill jobs are health (194,994 jobs), business and entrepreneurship (125,233 jobs), and advanced transportation and logistics (84,024 jobs). These sectors lead all others with the most annual job openings. Sectors with the smallest employment in terms of total jobs are advanced manufacturing (39,435 jobs), public safety (42,154 jobs), and education (44,522 jobs). Exhibit 23 shows the percentages that the sectors comprise in terms of overall middle-skill employment in the region.

Regarding projected occupational demand by sector, advanced manufacturing, education, and public safety are the smallest sectors in terms of total middle-skill employment and are expected to offer a much smaller share of annual openings compared to health, business and entrepreneurship, and advanced transportation and logistics.

Exhibit 23. 2023 CVML middle-skill employment



Gap Analysis Summary

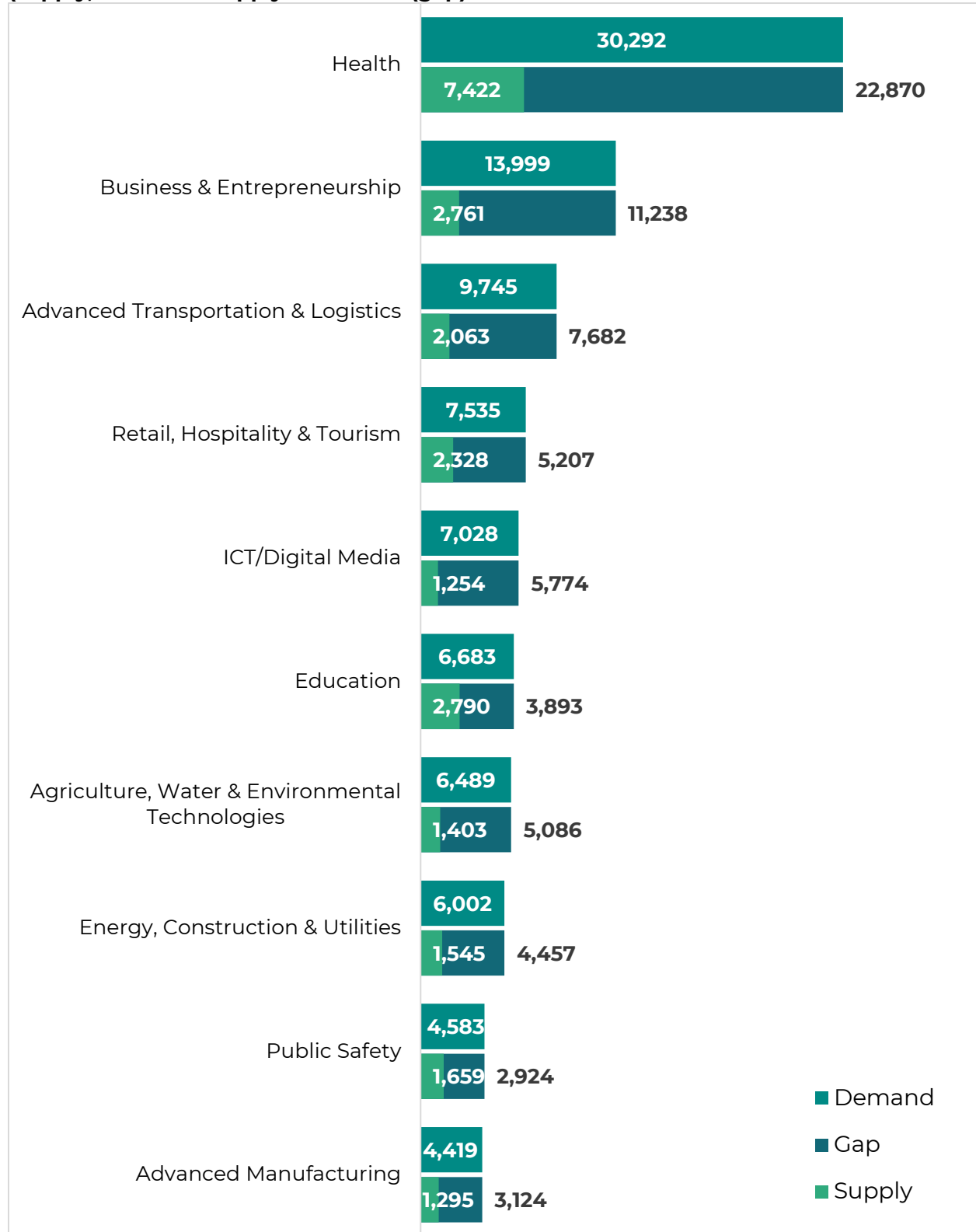
Nearly 96,800 annual openings are projected for the 10 occupational sectors displayed below. Overall, there is a supply gap of nearly 72,300 workers in the CVML region. The sectors with the largest supply gaps are health (a shortage of 22,870 workers), business and entrepreneurship (11,238 workers), and advanced transportation and logistics (7,682 workers) (Exhibit 24). Sectors with the smallest gaps are energy, construction, and utilities, public safety, and advanced manufacturing. Exhibit 25 visually depicts the supply gaps by sector for the projected job openings with the supply gap shown in blue.

Exhibit 24. Projected middle-skill annual job openings, average annual awards, and undersupply of workers (gap), CVML region

Occupational Sector	Demand (Annual Job Openings)	Gap	Supply (Average Annual Awards)
Health	30,292	22,870	7,422
Business & Entrepreneurship	13,999	11,238	2,761
Advanced Transportation & Logistics	9,745	7,682	2,063
Retail, Hospitality & Tourism	7,535	5,207	2,328
ICT/Digital Media	7,028	5,774	1,254
Education	6,683	3,893	2,790
Agriculture, Water & Environmental Technologies	6,489	5,086	1,403
Energy, Construction & Utilities	6,002	4,457	1,545
Public Safety	4,583	2,924	1,659
Advanced Manufacturing	4,419	3,124	1,295
Total	96,775	72,255	24,520



Exhibit 25. Projected middle-skill annual job openings (demand), average annual awards (supply, and undersupply of workers (gap)



Advanced Manufacturing

Summary

- There were more than 39,400 middle-skill advanced manufacturing jobs in the CVML region in 2023. This occupational group is projected to add nearly 2,200 jobs through 2028, growing by 6%. There are more than 4,400 annual job openings projected for advanced manufacturing workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$21.07 per hour, which is above the \$16.48 living wage in the CVML region.
- More than 3,800 job ads were posted in the CVML region for the top advanced manufacturing occupations profiled in this report. The top job titles were production supervisors, quality control technicians/quality assurance technicians, and engineering technicians.
- Specialized skills: The top skill is food safety and sanitation, and the top certification is Forklift Certification.

Advanced Manufacturing Demographics

Comprising 19% of the middle-skill advanced manufacturing workforce, women are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 53%. The advanced manufacturing workforce contains more Hispanic or Latino and White workers than the overall middle-skill workforce. Advanced manufacturing workers have a similar age distribution to the rest of the middle-skill workforce, although skewing slightly younger.

Exhibit 26. Gender composition of the advanced manufacturing workforce

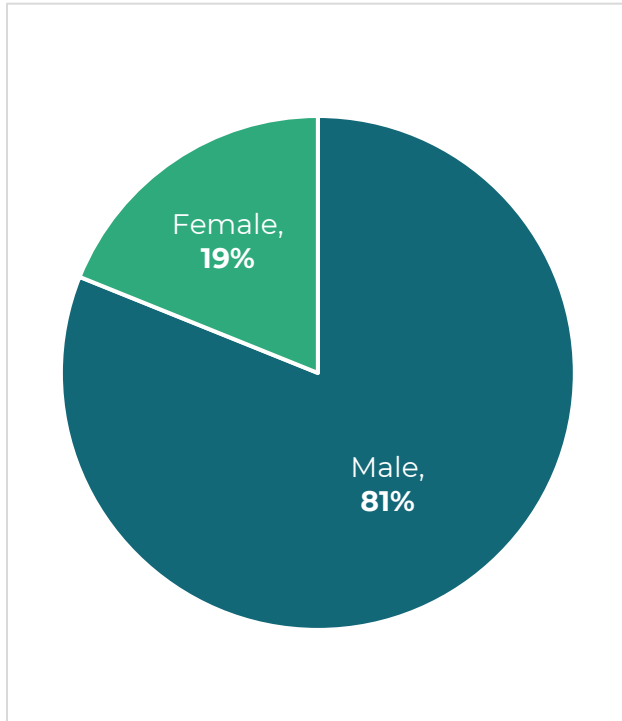


Exhibit 27. Race/ethnicity composition of the advanced manufacturing workforce

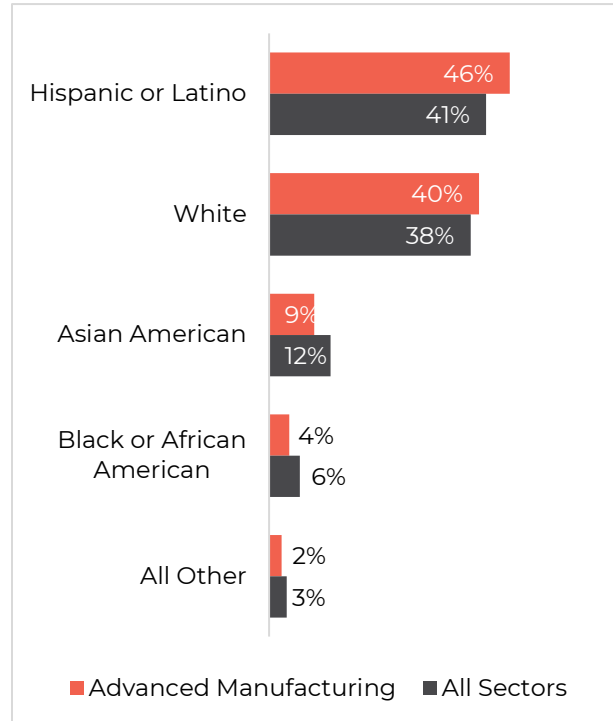
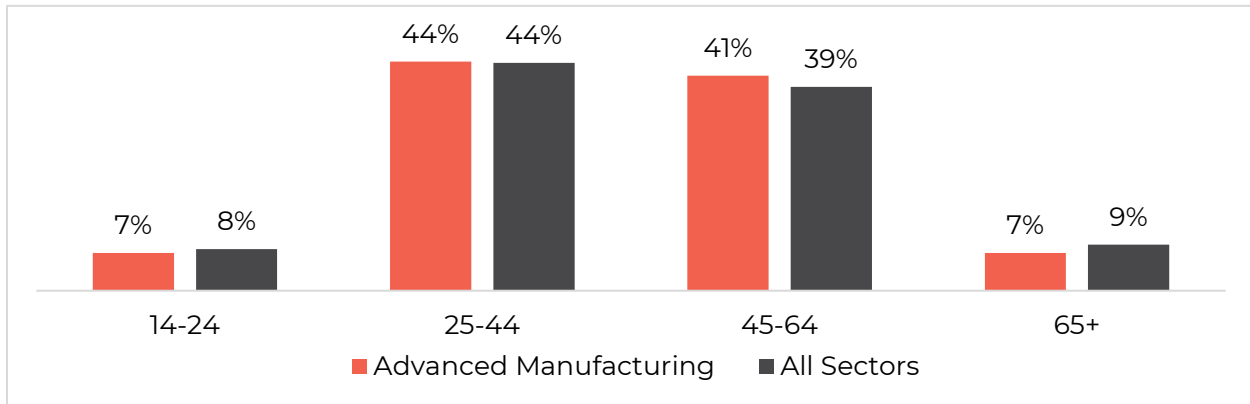


Exhibit 28. Advanced manufacturing workforce composition by age cohorts



Advanced Manufacturing Demand

There were more than 39,400 middle-skill advanced manufacturing jobs in the CVML region in 2023. This occupational group is projected to add nearly 2,200 jobs through 2028, growing by 6%. More than 4,400 annual job openings are projected for advanced manufacturing workers over this timeframe. First-line supervisors of production and operating workers are projected to have the most annual job openings through 2028. Exhibit 29 displays advanced manufacturing employment and occupational projections.

Exhibit 29: Advanced manufacturing employment and occupational projections, CVML, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
First-Line Supervisors of Production and Operating Workers	6,169	6,570	401	7%	668
Inspectors, Testers, Sorters, Samplers, and Weighers	5,167	5,407	240	5%	651
Industrial Machinery Mechanics	5,797	6,388	591	10%	586
Welders, Cutters, Solderers, and Brazers	4,507	4,682	175	4%	487
Machinists	1,401	1,481	80	6%	159
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	955	1,159	204	21%	152
Printing Press Operators	972	913	(59)	(6%)	103
Electrical and Electronic Engineering Technologists and Technicians	945	974	28	3%	99
Molders, Shapers, and Casters, Except Metal and Plastic	641	689	48	8%	95
Engineering Technologists and Technicians, Except Drafters, All Other	984	990	6	1%	92
Maintenance Workers, Machinery	759	825	66	9%	87
Electrical and Electronics Repairers, Commercial and Industrial Equipment	870	914	44	5%	85

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Computer, Automated Teller, and Office Machine Repairers	784	764	(20)	(3%)	83
Chemical Technicians	627	664	37	6%	82
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	721	752	31	4%	80
Top Advanced Manufacturing Occupations	31,300	33,173	1,873	6%	3,508
<i>All Other Advanced Manufacturing Occupations</i>	<i>8,135</i>	<i>8,434</i>	<i>299</i>	<i>4%</i>	<i>911</i>
Total	39,435	41,607	2,172	6%	4,419

Advanced Manufacturing Hourly Earnings

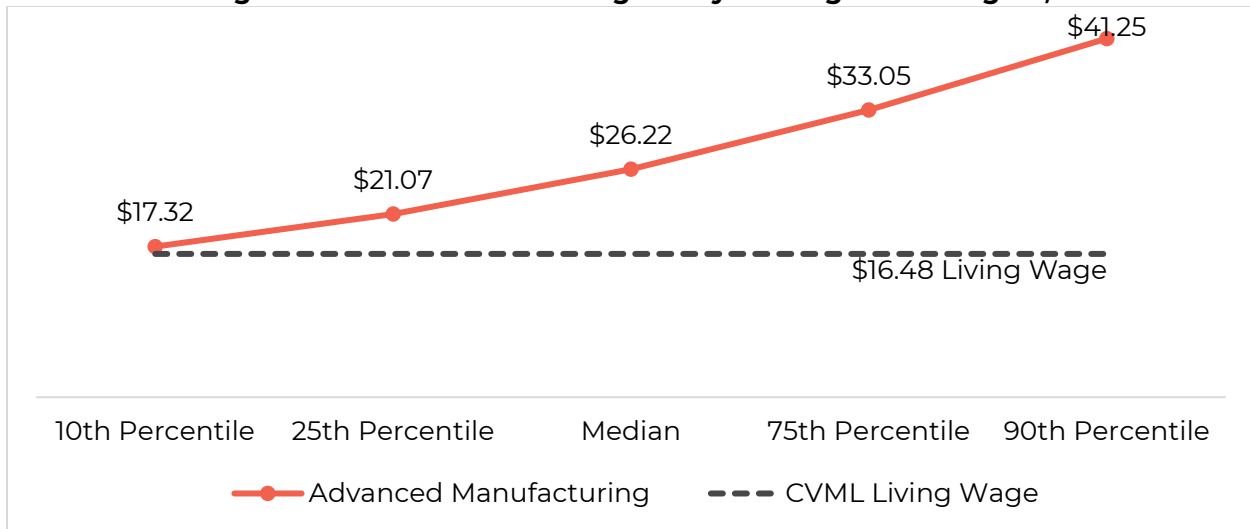
Exhibit 30 displays the hourly earnings for the top middle-skill advanced manufacturing occupations in the CVML region. Electrical and electronic engineering technologists and technicians have the highest entry-level hourly earnings in the advanced manufacturing occupational group at \$30.97 per hour. Exhibit 31 displays the average hourly earnings for the advanced manufacturing occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$21.07 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top manufacturing occupations was \$29.05 per hour over the last 12 months.

Exhibit 30. Advanced manufacturing hourly earnings in the region, 2023

Occupation	Hourly Earnings		
	25th Percentile	Median	75th Percentile
Electrical and Electronic Engineering Technologists and Technicians	\$30.97	\$41.03	\$50.00
Engineering Technologists and Technicians, Except Drafters, All Other	\$30.66	\$41.09	\$50.55
Electrical and Electronics Repairers, Commercial and Industrial Equipment	\$30.08	\$37.02	\$43.65
First-Line Supervisors of Production and Operating Workers	\$25.54	\$33.67	\$42.71
Industrial Machinery Mechanics	\$24.67	\$32.62	\$38.26
Maintenance Workers, Machinery	\$22.03	\$26.48	\$32.56
Welders, Cutters, Solderers, and Brazers	\$20.06	\$23.85	\$29.65
Chemical Technicians	\$19.93	\$23.77	\$28.86
Molders, Shapers, and Casters, Except Metal and Plastic	\$19.16	\$22.26	\$25.62
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	\$18.80	\$22.68	\$26.25
Machinists	\$18.71	\$23.21	\$29.32
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	\$18.44	\$21.57	\$23.24
Computer, Automated Teller, and Office Machine Repairers	\$17.78	\$21.75	\$28.12

Occupation	Hourly Earnings		
	25th Percentile	Median	75th Percentile
Printing Press Operators	\$17.23	\$22.24	\$27.36
Inspectors, Testers, Sorters, Samplers, and Weighers	\$16.87	\$20.23	\$26.25

Exhibit 31. Average advanced manufacturing hourly earnings in the region, 2023

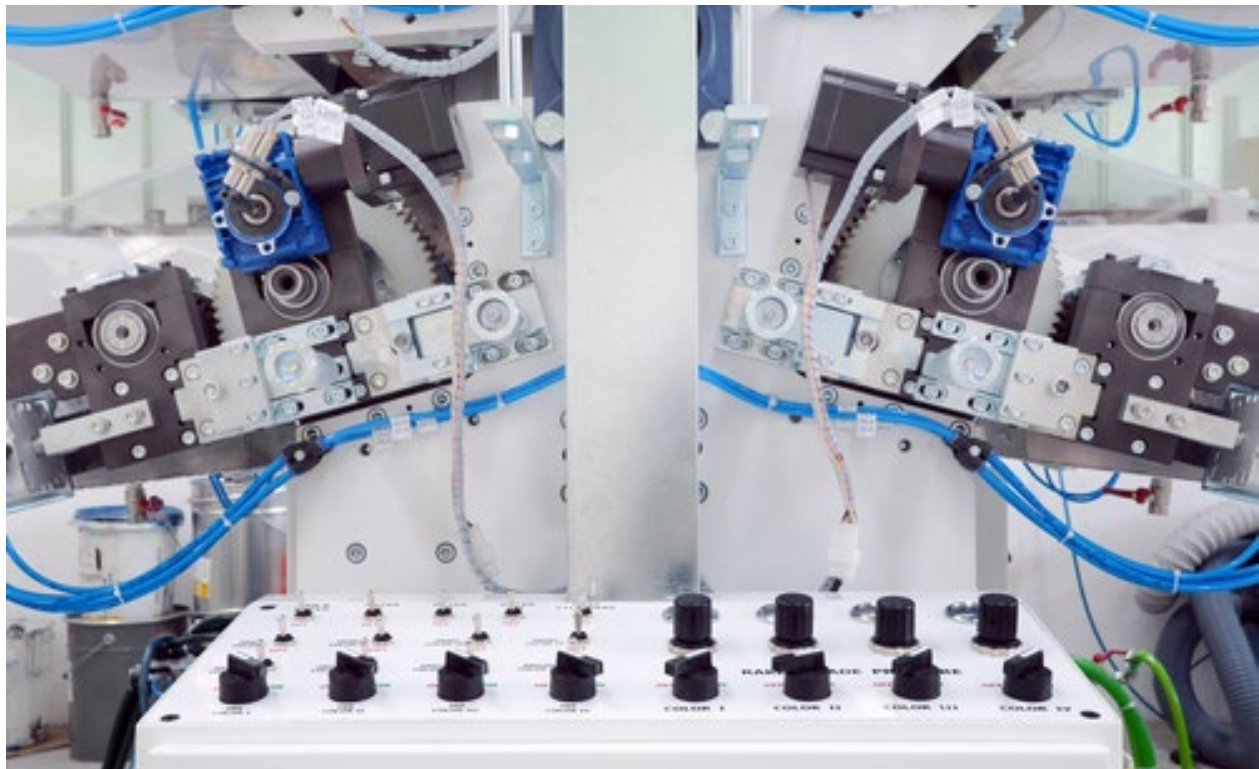
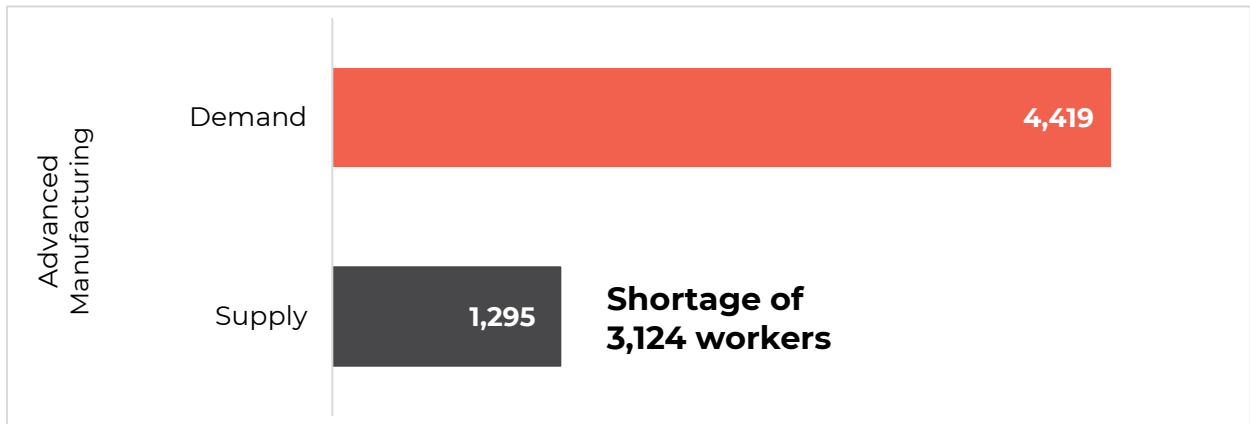


Over the last 12 months, from April 2024 to March 2025, more than 3,800 job advertisements were posted for the top advanced manufacturing occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for advanced manufacturing workers.

Exhibit 32. Top 10 certifications, specialized skills, and software skills in job postings for advanced manufacturing occupations

Certifications	Specialized Skills	Software Skills
Forklift Certification	Food Safety And Sanitation	Microsoft Office
Automotive Service Excellence (ASE) Certification	Good Manufacturing Practices	Microsoft Excel
CDL Class C License	Auditing	Microsoft Outlook
Engineer in Training	Machinery	SAP Applications
Cardiopulmonary Resuscitation (CPR) Certification	Continuous Improvement Process	Microsoft PowerPoint
First Aid Certification	Hand Tools	Microsoft Word
Hazard Analysis And Critical Control Point (HACCP) Certification	Forklift Truck	Spreadsheets
Commercial Driver's License (CDL)	Quality Management	Operational Databases
Airframe & Powerplant (A&P) Certificate	Housekeeping	Inventory Control Systems
CDL Class B License	Warehousing	AutoCAD

Exhibit 33. Advanced manufacturing workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Advanced Transportation and Logistics

Summary

- There were more than 84,000 middle-skill advanced transportation and logistics jobs in the CVML region in 2023. This occupational group is projected to add nearly 6,500 jobs through 2028, growing by 8%. There are more than 9,700 annual job openings projected for advanced transportation and logistics workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$28.12 per hour, which is above the \$16.48 living wage in the CVML region.
- There were nearly 14,200 job ads posted in the CVML region for the top advanced transportation and logistics occupations profiled in this report. The top job titles were CDL-A truck drivers, maintenance supervisors, truck drivers, and warehouse supervisors.
- Specialized skills: The top skill is truck driving, and the top certification is Valid Driver's License.

Advanced Transportation and Logistics Demographics

Comprising 10% of the middle-skill advanced transportation and logistics workforce, women are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 53%. The advanced transportation and logistics workforce contains more Hispanic or Latino workers than the overall middle-skill workforce. Advanced transportation and logistics workers have a similar age distribution to the rest of the middle-skill workforce, although skewing slightly younger.

Exhibit 34. Gender composition of the advanced transportation and logistics workforce

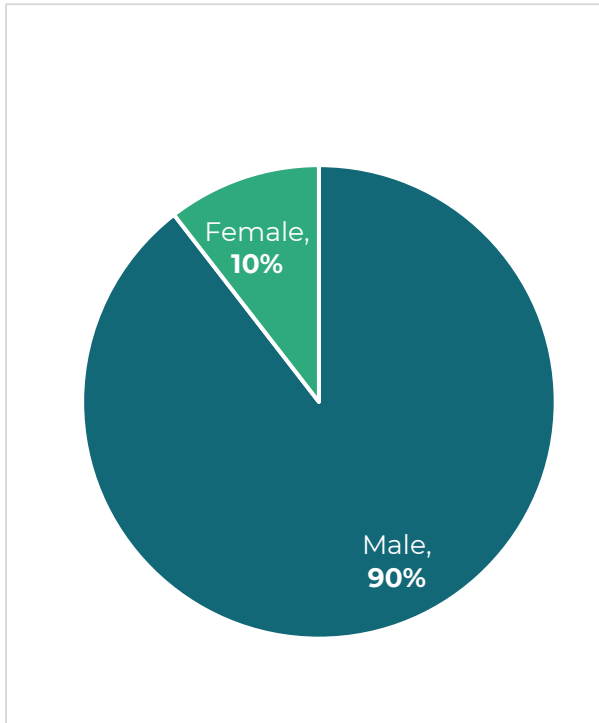


Exhibit 35. Race/ethnicity composition of the advanced transportation and logistics workforce

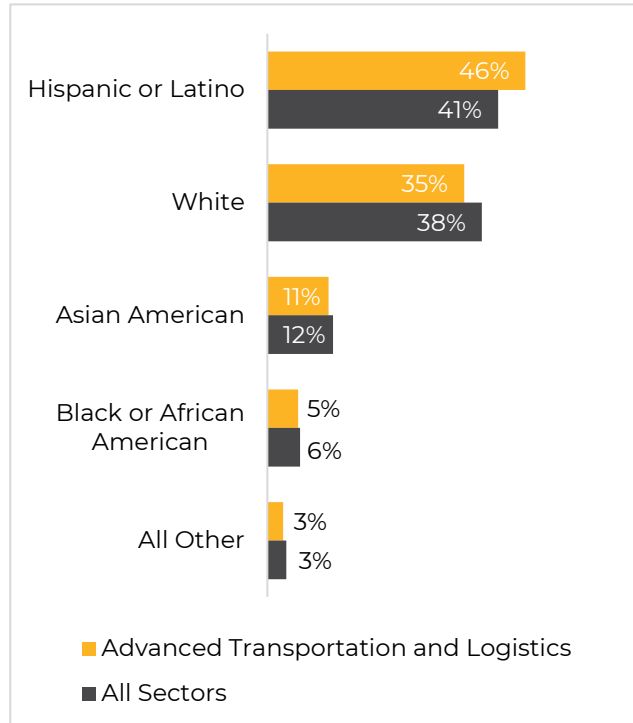
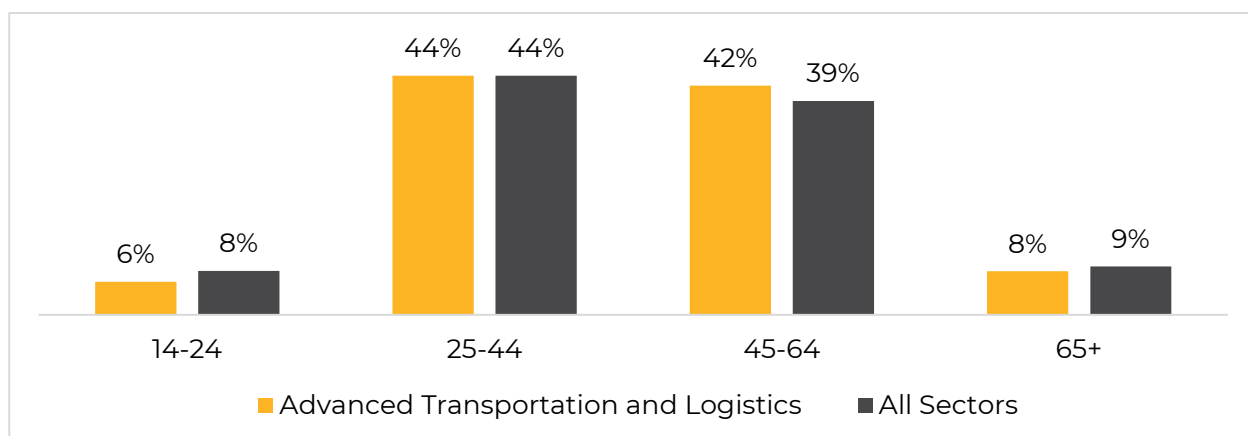


Exhibit 36. Advanced transportation and logistics workforce composition by age cohorts



Advanced Transportation and Logistics Demand

There were more than 84,000 middle-skill advanced transportation and logistics jobs in the CVML region in 2023. This occupational group is projected to add nearly 6,500 jobs through 2028, growing by 8%. There are more than 9,700 annual job openings projected for advanced transportation and logistics workers over this timeframe. Heavy and tractor-trailer truck drivers are projected to have the most annual job openings through 2028. Exhibit 37 displays advanced transportation and logistics employment and occupational projections.

Exhibit 37. Advanced transportation and logistics employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Heavy and Tractor-Trailer Truck Drivers	41,264	44,595	3,331	8%	5,135
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	7,194	7,879	685	10%	877
Automotive Service Technicians and Mechanics	8,319	8,623	305	4%	785
First-Line Supervisors of Mechanics, Installers, and Repairers	5,930	6,340	409	7%	582
Bus Drivers, Transit and Intercity	2,661	2,940	280	11%	412
Bus and Truck Mechanics and Diesel Engine Specialists	4,171	4,445	274	7%	409
Transportation, Storage, and Distribution Managers	3,111	3,426	314	10%	317
Logisticians	1,943	2,202	259	13%	214
Aircraft Mechanics and Service Technicians	2,072	2,200	127	6%	184
Automotive Body and Related Repairers	1,635	1,750	114	7%	171
Commercial Pilots	780	826	46	6%	100
Cargo and Freight Agents	674	752	78	12%	89
Recreational Vehicle Service Technicians	411	432	21	5%	53

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Outdoor Power Equipment and Other Small Engine Mechanics	439	459	20	5%	49
Railroad Conductors and Yardmasters	402	431	29	7%	39
Top Jobs Total	81,007	87,300	6,294	8%	9,415
<i>All other</i>	<i>3,017</i>	<i>3,220</i>	<i>202</i>	<i>7%</i>	<i>330</i>
Total	84,024	90,520	6,496	8%	9,745

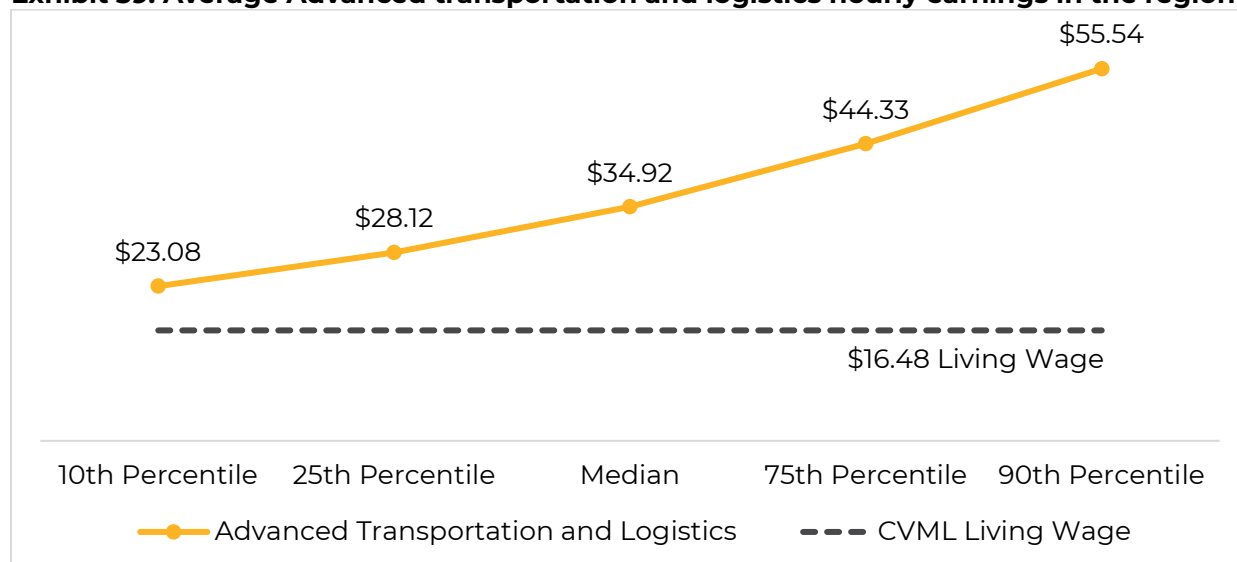
Advanced Transportation and Logistics Hourly Earnings

Exhibit 38 displays the hourly earnings for the top middle-skill advanced transportation and logistics occupations in the CVML region. Transportation, storage, and distribution managers have the highest entry-level hourly earnings in the advanced transportation and logistics occupational group at \$36.22 per hour. Exhibit 39 displays the average hourly earnings for the advanced transportation and logistics occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$28.12 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top advanced transportation and logistics occupations was \$32.18 per hour over the last 12 months.

Exhibit 38. Advanced transportation and logistics hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
Transportation, Storage, and Distribution Managers	\$36.22	\$45.88	\$57.50
Railroad Conductors and Yardmasters	\$30.86	\$34.00	\$40.55
First-Line Supervisors of Mechanics, Installers, and Repairers	\$30.84	\$39.54	\$49.60
Aircraft Mechanics and Service Technicians	\$30.36	\$39.14	\$44.04
Commercial Pilots	\$29.76	\$45.57	\$75.48
Logisticians	\$29.23	\$38.84	\$49.89
Bus Drivers, Transit and Intercity	\$23.41	\$28.60	\$35.77
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	\$23.37	\$30.69	\$36.96
Bus and Truck Mechanics and Diesel Engine Specialists	\$22.97	\$30.20	\$36.36
Cargo and Freight Agents	\$20.58	\$24.47	\$26.70
Recreational Vehicle Service Technicians	\$20.51	\$27.29	\$31.41
Heavy and Tractor-Trailer Truck Drivers	\$19.67	\$25.47	\$30.32
Automotive Body and Related Repairers	\$18.93	\$27.11	\$30.54
Outdoor Power Equipment and Other Small Engine Mechanics	\$18.22	\$22.38	\$28.77
Automotive Service Technicians and Mechanics	\$17.72	\$24.77	\$30.57

Exhibit 39. Average Advanced transportation and logistics hourly earnings in the region



Over the last 12 months, from April 2024 to March 2025, there were nearly 14,200 job advertisements posted for the top advanced transportation and logistics occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for advanced transportation and logistics workers.

Exhibit 40. Top 10 certifications, specialized skills, and software skills in job postings for advanced transportation and logistics occupations

Certifications	Specialized Skills	Software Skills
Valid Driver's License	Truck Driving	Microsoft Excel
CDL Class A License	Warehousing	Microsoft Office
Commercial Driver's License (CDL)	Forklift Truck	Microsoft Outlook
Automotive Service Excellence (ASE) Certification	Inventory Management	SAP Applications
CDL Class B License	Supply Chain	Microsoft PowerPoint
Security Clearance	Flatbed Truck Operation	Warehouse Management Systems
Hazmat Endorsement	Machinery	Microsoft Word
Secret Clearance	Suspension (Vehicle)	Inventory Control Systems
Tanker Endorsement	Vehicle Maintenance	Inventory Management System
Forklift Certification	Vehicle Inspection	Spreadsheets

Exhibit 41. Advanced transportation and logistics workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Agriculture, Water & Environmental Technologies

Summary

- There were more than 58,700 middle-skill agriculture, water, and environmental technologies jobs in the CVML region in 2023. This occupational group is projected to decrease employment by more than 200 jobs through 2028, declining by 0.4%. However, there are nearly 6,500 annual job openings projected for agriculture, water, and environmental technologies workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$20.84 per hour, which is above the \$16.48 living wage in the CVML region.
- There were more than 1,400 job ads posted in the CVML region for the top agriculture, water, and environmental technologies occupations profiled in this report. The top job titles were veterinary assistants, heavy equipment mechanics, veterinary technicians, and ranch managers.
- Specialized skills: The top skill is heavy equipment, and the top certification is Valid Driver's License.

Agriculture, Water & Environmental Technologies Demographics

Comprising 29% of the middle-skill agriculture, water, and environmental technologies workforce, women are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 53%. The agriculture, water, and environmental technologies workforce contains more White workers than the overall middle-skill workforce. Agriculture, water, and environmental technologies workers are slightly older than the rest of the middle-skill workforce, with approximately 58% of the workforce 45 years or older.

Exhibit 42. Gender composition of the agriculture, water, and environmental technologies workforce

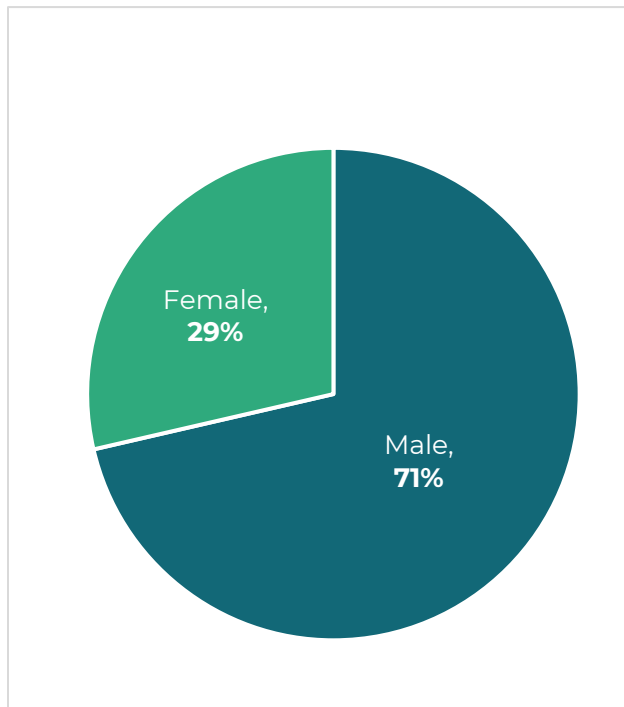


Exhibit 43. Race/ethnicity composition of the agriculture, water, and environmental technologies workforce

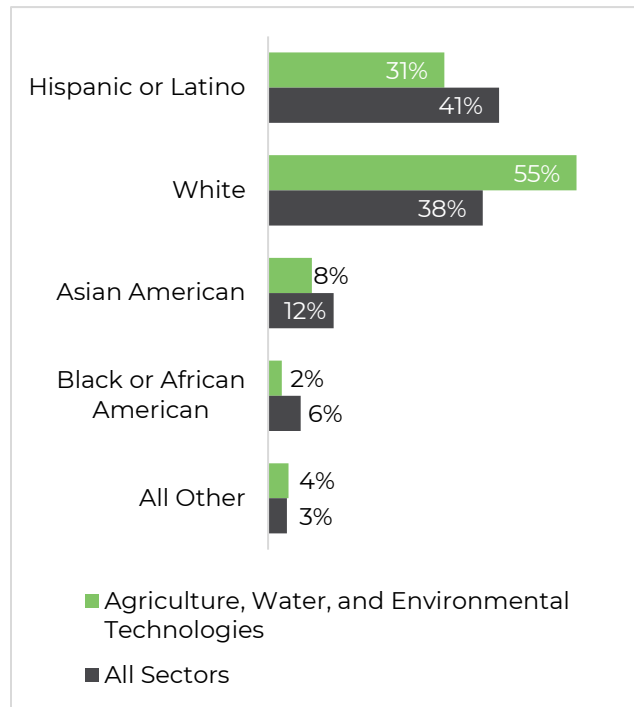
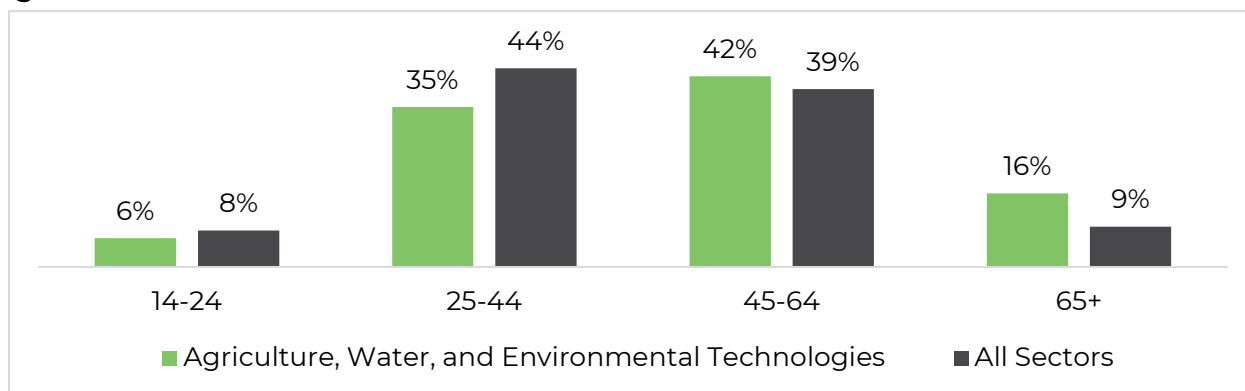


Exhibit 44. Agriculture, water, and environmental technologies workforce composition by age cohorts



Agriculture, Water & Environmental Technologies Demand

There were more than 58,700 middle-skill agriculture, water, and environmental technologies jobs in the CVML region in 2023. This occupational group is projected to decrease employment by more than 200 jobs through 2028, declining by 0.4%. There are nearly 6,500 annual job openings projected for agriculture, water, and environmental technologies workers over this timeframe. Farmers, ranchers, and other agricultural managers are projected to have the most annual job openings through 2028. Exhibit 45 displays agriculture, water, and environmental technologies employment and occupational projections.

Exhibit 45. Agriculture, water & environmental technologies employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Farmers, Ranchers, and Other Agricultural Managers	22,772	21,323	(1,450)	(6%)	2,299
First-Line Supervisors of Farming, Fishing, and Forestry Workers	5,738	5,914	176	3%	801
Mobile Heavy Equipment Mechanics, Except Engines	2,721	2,853	132	5%	257
Veterinary Assistants and Laboratory Animal Caretakers	1,166	1,262	96	8%	255
Food Science Technicians	1,349	1,364	16	1%	188
Farm Equipment Mechanics and Service Technicians	1,885	1,975	90	5%	180
Forest and Conservation Technicians	1,082	1,082	0	0%	135
Forest and Conservation Workers	700	681	(19)	(3%)	124
Animal Trainers	772	740	(32)	(4%)	109
Pesticide Handlers, Sprayers, and Applicators, Vegetation	645	701	55	9%	97
Agricultural Inspectors	551	571	19	4%	93
Veterinary Technologists and Technicians	692	771	79	11%	82
Agricultural Technicians	539	536	(3)	(1%)	73

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Environmental Science and Protection Technicians, Including Health	546	578	31	6%	64
Hazardous Materials Removal Workers	490	523	33	7%	62
Top Jobs Total	41,650	40,873	(777)	(2%)	4,819
<i>All other</i>	<i>17,062</i>	<i>17,602</i>	<i>540</i>	<i>3%</i>	<i>1,670</i>
Total	58,712	58,475	(237)	(0%)	6,489

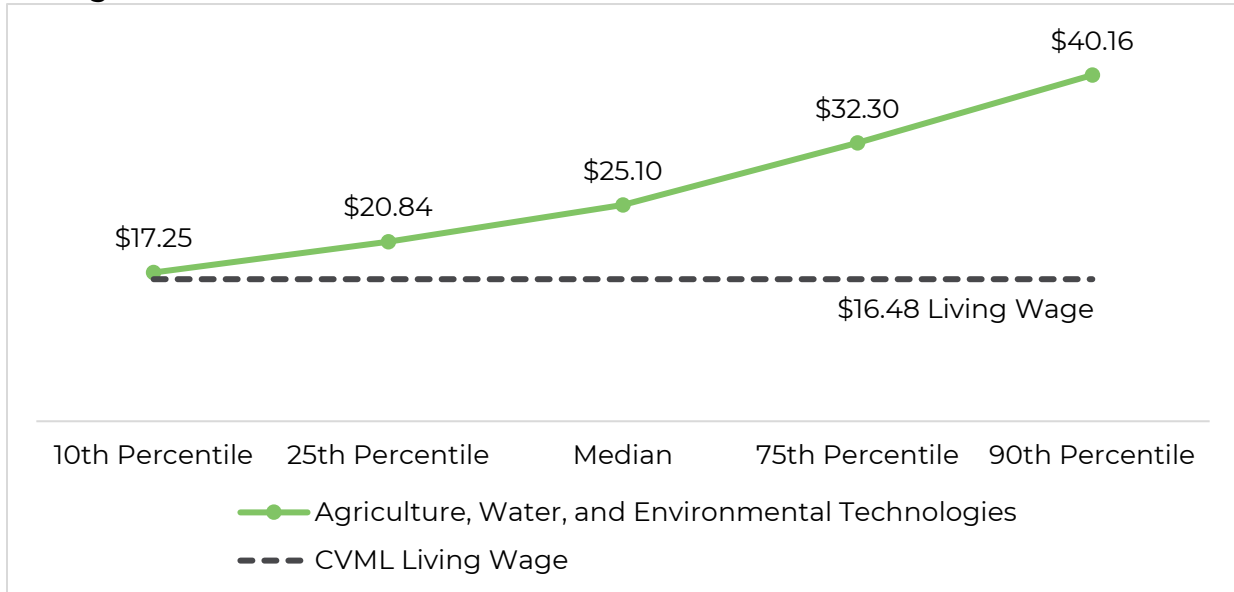
Agriculture, Water & Environmental Technologies Hourly Earnings

Exhibit 46 displays the hourly earnings for the top middle-skill agriculture, water, and environmental technologies occupations in the CVML region. Mobile heavy equipment mechanics, except engines have the highest entry-level hourly earnings in the agriculture, water, and environmental technologies occupational group at \$27.67 per hour. Exhibit 47 displays the average hourly earnings for the agriculture, water, and environmental technologies occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$20.84 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top agriculture, water, and environmental technologies occupations was \$26.03 per hour over the last 12 months.

Exhibit 46. Agriculture, water & environmental technologies hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
Mobile Heavy Equipment Mechanics, Except Engines	\$27.67	\$31.78	\$36.67
Environmental Science and Protection Technicians, Including Health	\$22.74	\$28.17	\$36.35
Forest and Conservation Technicians	\$20.70	\$25.64	\$32.54
Hazardous Materials Removal Workers	\$20.31	\$24.38	\$35.99
Farm Equipment Mechanics and Service Technicians	\$20.22	\$23.68	\$30.48
Veterinary Technologists and Technicians	\$19.90	\$22.89	\$26.92
Food Science Technicians	\$19.88	\$23.60	\$29.45
Agricultural Inspectors	\$19.78	\$25.17	\$31.35
Agricultural Technicians	\$17.61	\$19.56	\$23.20
Pesticide Handlers, Sprayers, and Applicators, Vegetation	\$17.42	\$19.20	\$22.73
First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$17.15	\$22.51	\$29.95
Veterinary Assistants and Laboratory Animal Caretakers	\$17.12	\$17.86	\$21.11
Forest and Conservation Workers	\$16.50	\$16.66	\$20.69
Farmers, Ranchers, and Other Agricultural Managers	\$16.50	\$18.45	\$32.78
Animal Trainers	\$16.50	\$17.58	\$24.23

Exhibit 47. Average agriculture, water & environmental technologies hourly earnings in the region

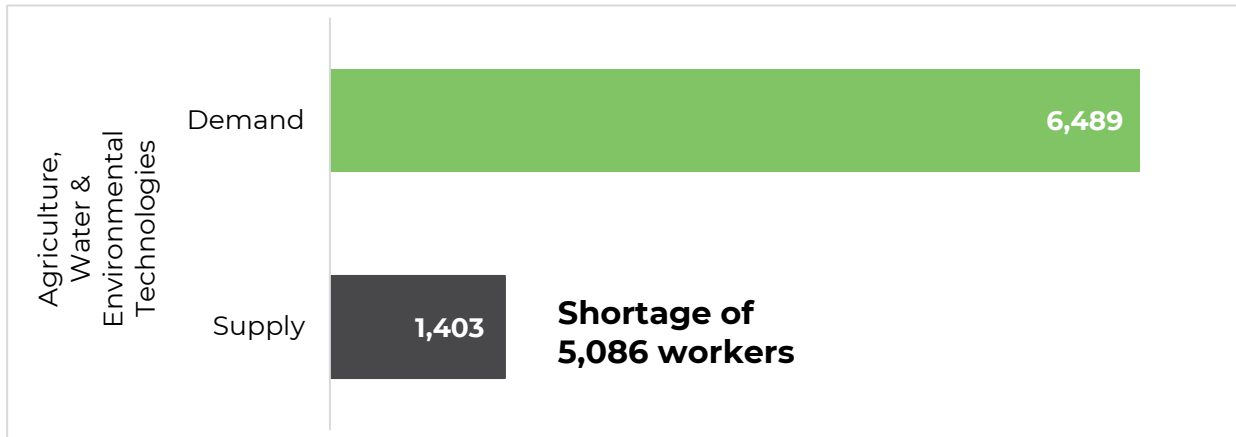


Over the last 12 months, from April 2024 to March 2025, there were more than 1,400 job advertisements posted for the top agriculture, water, and environmental technologies occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for agriculture, water, and environmental technologies workers.

Exhibit 48. Top 10 certifications, specialized skills, and software skills in job postings for agriculture, water & environmental technologies occupations

Certifications	Specialized Skills	Software Skills
Certified Veterinary Technician	Heavy Equipment	Microsoft Office
Valid Driver's License	Surgery	Microsoft Excel
Registered Veterinary Technologist (RVT)	Agriculture	Microsoft Outlook
CDL Class C License	Hydraulics	Microsoft PowerPoint
Commercial Driver's License (CDL)	Hand Tools	Microsoft Word
Automotive Service Excellence (ASE) Certification	Machinery	Inventory Control Systems
CDL Class A License	Bilingual (Spanish/English)	Mono
Forklift Certification	Medication Administration	Geographic Information Systems
CDL Class B License	Safe Restraining Techniques (Veterinary)	Spreadsheets
Security Clearance	Animal Care	ArcGIS (GIS Software)

Exhibit 49. Agriculture, water & environmental technologies workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Business & Entrepreneurship

Summary

- There were more than 125,200 middle-skill business and entrepreneurship jobs in the CVML region in 2023. This occupational group is projected to add nearly 3,700 jobs through 2028, growing by 3%. There are nearly 14,000 annual job openings projected for business and entrepreneurship workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$21.92 per hour, which is above the \$16.48 living wage in the CVML region.
- There were nearly 14,500 job ads posted in the CVML region for the top business and entrepreneurship occupations profiled in this report. The top job titles were customer service representatives, receptionists, and accounting clerks.
- Specialized skills: The top skill is accounting, and the top certification is a real estate salesperson license.

Business & Entrepreneurship Demographics

Comprising 35% of the middle-skill business and entrepreneurship workforce, men are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 47%. The business and entrepreneurship workforce contains more White workers than the overall middle-skill workforce. Business and entrepreneurship workers have a similar age distribution to the rest of the middle-skill workforce, although skewing slightly older.

Exhibit 50. Gender composition of the business and entrepreneurship workforce

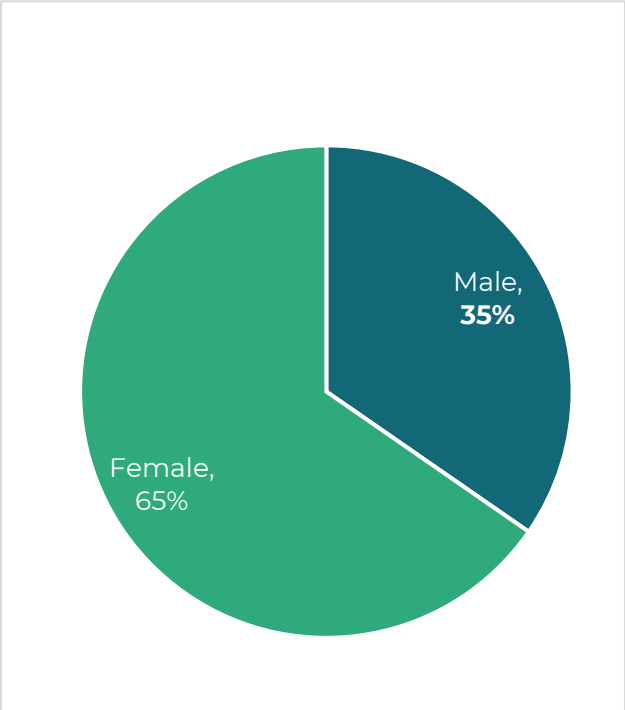


Exhibit 51. Race/ethnicity composition of the business and entrepreneurship workforce

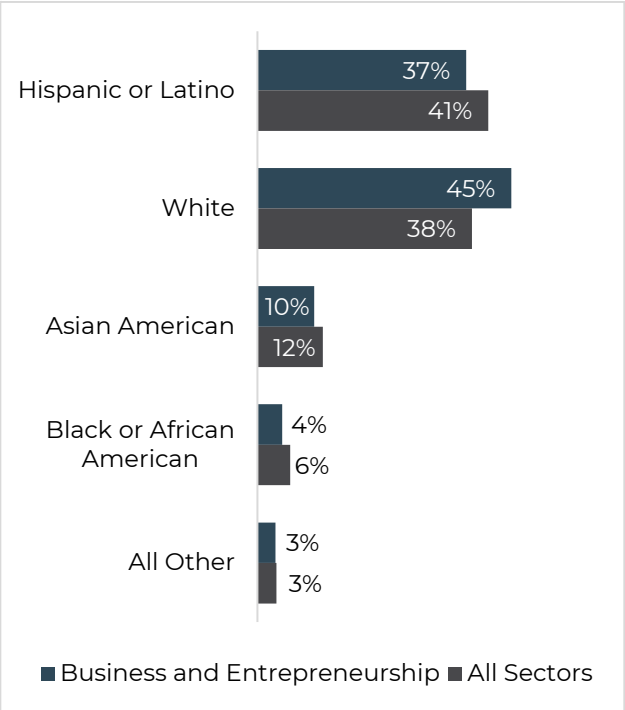
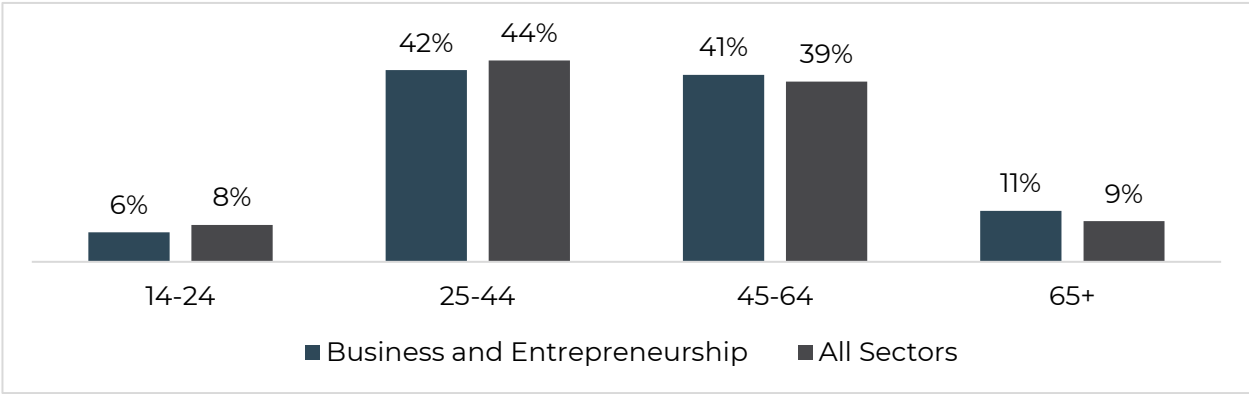


Exhibit 52. Business and entrepreneurship workforce composition by age cohorts



Business & Entrepreneurship Demand

There were more than 125,200 middle-skill business and entrepreneurship jobs in the CVML region in 2023. This occupational group is projected to add nearly 3,700 jobs through 2028, growing by 3%. There are nearly 14,000 annual job openings projected for business and entrepreneurship workers over this timeframe. General and operations managers are projected to have the most annual job openings through 2028. Exhibit 53 displays business and entrepreneurship employment and occupational projections.

Exhibit 53. Business and entrepreneurship employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
General and Operations Managers	21,302	23,259	1,957	9%	2,140
Customer Service Representatives	15,109	15,476	367	2%	2,135
Bookkeeping, Accounting, and Auditing Clerks	15,976	16,100	124	1%	1,905
First-Line Supervisors of Office and Administrative Support Workers	13,922	14,180	257	2%	1,390
Receptionists and Information Clerks	7,213	7,799	586	8%	1,110
Insurance Sales Agents	5,346	5,499	153	3%	492
Real Estate Sales Agents	3,935	4,040	105	3%	354
Sales and Related Workers, All Other	2,398	2,408	11	0%	322
Property, Real Estate, and Community Association Managers	3,487	3,527	41	1%	296
Payroll and Timekeeping Clerks	2,486	2,404	(82)	(3%)	246
Court, Municipal, and License Clerks	1,912	2,086	173	9%	232
Paralegals and Legal Assistants	2,023	2,062	39	2%	219
First-Line Supervisors of Non-Retail Sales Workers	2,416	2,434	18	1%	212
Tellers	2,129	1,786	(343)	(16%)	203
Administrative Services Managers	2,226	2,373	146	7%	203
Top Jobs Total	101,879	105,433	3,554	3%	11,460
<i>All other</i>	23,354	23,472	119	1%	2,538
Total	125,233	128,905	3,673	3%	13,999

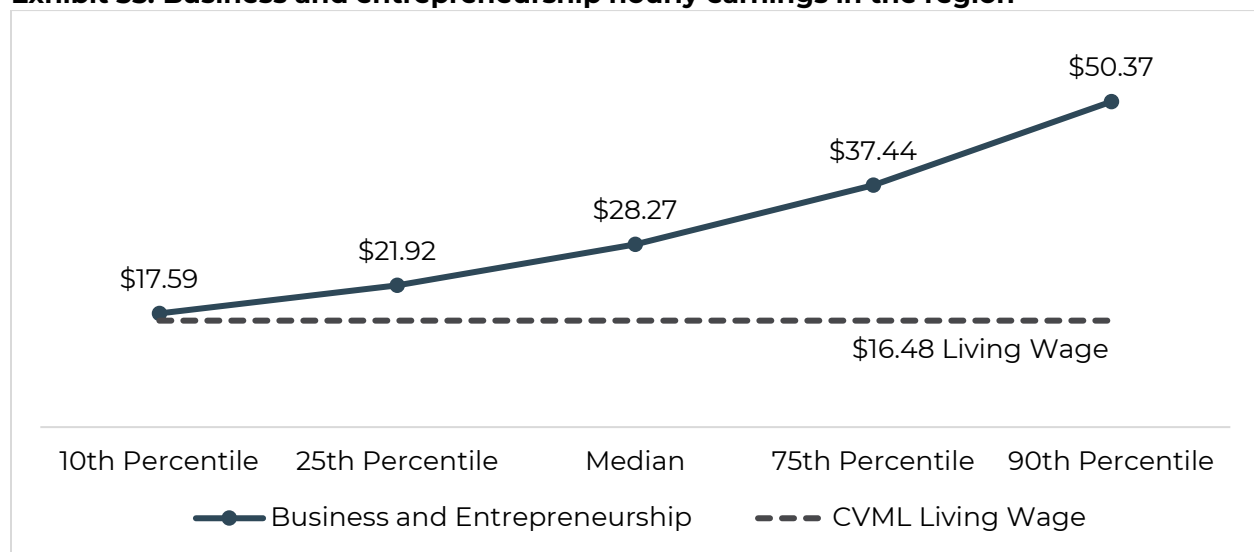
Business & Entrepreneurship Hourly Earnings

Exhibit 54 displays the hourly earnings for the top middle-skill business and entrepreneurship occupations in the CVML region. General and operations managers have the highest entry-level hourly earnings in the business and entrepreneurship occupational group at \$36.24 per hour. Exhibit 55 displays the average hourly earnings for the business and entrepreneurship occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$21.92 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top business and entrepreneurship occupations was \$22.95 per hour over the last 12 months.

Exhibit 54. Business and entrepreneurship hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
General and Operations Managers	\$36.24	\$48.26	\$71.77
Administrative Services Managers	\$34.10	\$46.60	\$62.25
First-Line Supervisors of Office and Administrative Support Workers	\$25.55	\$31.24	\$37.80
Paralegals and Legal Assistants	\$23.57	\$28.61	\$35.12
Court, Municipal, and License Clerks	\$23.38	\$26.71	\$29.67
Property, Real Estate, and Community Association Managers	\$21.06	\$28.90	\$43.52
Bookkeeping, Accounting, and Auditing Clerks	\$20.09	\$23.75	\$28.85
First-Line Supervisors of Non-Retail Sales Workers	\$19.97	\$31.38	\$44.56
Payroll and Timekeeping Clerks	\$19.86	\$25.24	\$30.80
Insurance Sales Agents	\$19.80	\$26.75	\$38.47
Real Estate Sales Agents	\$18.02	\$31.08	\$57.38
Tellers	\$18.01	\$19.09	\$21.53
Customer Service Representatives	\$17.60	\$20.28	\$25.26
Sales and Related Workers, All Other	\$17.23	\$21.75	\$32.28
Receptionists and Information Clerks	\$16.50	\$17.92	\$20.36

Exhibit 55. Business and entrepreneurship hourly earnings in the region



Over the last 12 months, from April 2024 to March 2025, there were nearly 14,500 job advertisements posted for the top business and entrepreneurship occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for business and entrepreneurship workers.

Exhibit 56. Top 10 certifications, specialized skills, and software skills in job postings for business and entrepreneurship occupations

Certifications	Specialized Skills	Software Skills
Real Estate Salesperson License	Accounting	Microsoft Office
Valid Driver's License	Invoicing	Microsoft Excel
Property And Casualty Insurance License	Data Entry	Microsoft Outlook
Certified Accounting Technician	Accounts Payable	Microsoft Word
Cardiopulmonary Resuscitation (CPR) Certification	Auditing	QuickBooks (Accounting Software)
First Aid Certification	Accounts Receivable	Microsoft PowerPoint
CDL Class C License	Marketing	Accounting Software
Security Clearance	Bookkeeping	Spreadsheets
Typing Certification	Financial Statements	Yardi (Property Management Software)
Insurance License	Billing	Payroll Systems

Exhibit 57. Business and entrepreneurship workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Education

Summary

- There were more than 44,500 middle-skill education jobs in the CVML region in 2023. This occupational group is projected to add nearly 2,200 jobs through 2028, growing by 7%. There are nearly 6,700 annual job openings projected for education workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$20.25 per hour, which is above the \$16.48 living wage in the CVML region.
- There were nearly 4,000 job ads posted in the CVML region for the top education occupations profiled in this report. The top job titles were paraeducators, instructional aides, and preschool teachers.
- Specialized skills: The top skill is special education, and the top certification is Cardiopulmonary Resuscitation (CPR) Certification.

Education Demographics

Comprising 10% of the middle-skill education workforce, men are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 47%. The education workforce contains more Hispanic or Latino workers than the overall middle-skill workforce. Education workers have a similar age distribution to the rest of the middle-skill workforce, with a notable share of workers in the 14-24 age cohort at 13%.

Exhibit 58. Gender composition of the education workforce

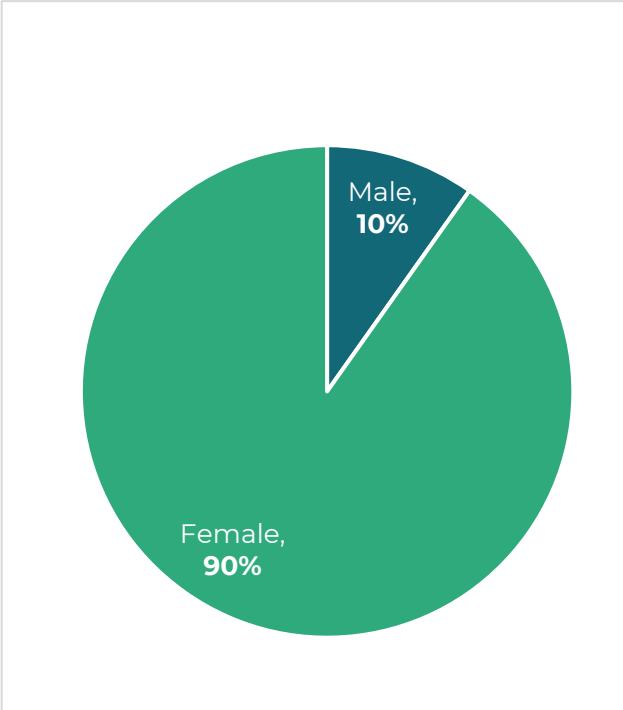


Exhibit 59. Race/ethnicity composition of the education workforce

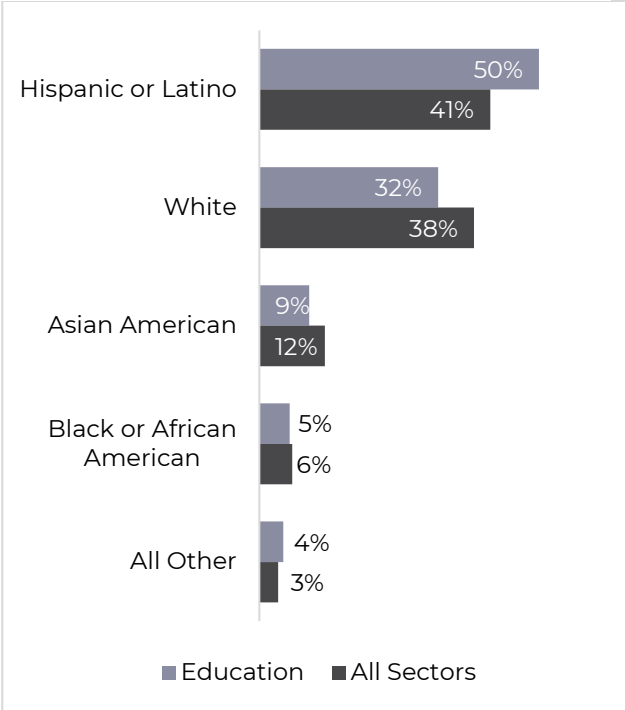
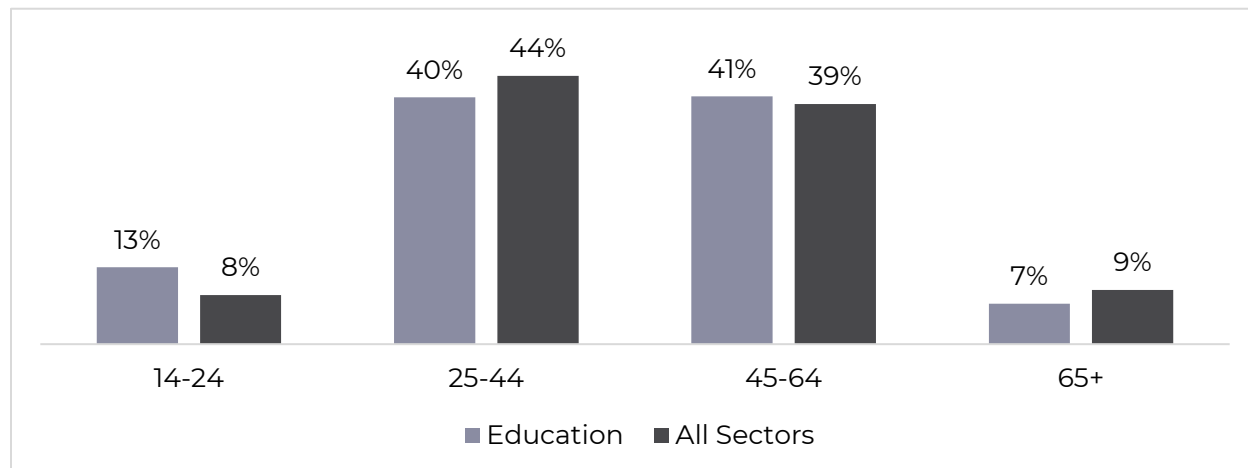


Exhibit 60. Education workforce composition by age cohorts



Education Demand

There were more than 44,500 middle-skill education jobs in the CVML region in 2023. This occupational group is projected to add nearly 2,200 jobs through 2028, growing by 7%. There are nearly 6,700 annual job openings projected for education workers over this timeframe. Teaching assistants, except postsecondary are projected to have the most annual job openings through 2028. Exhibit 61 displays education employment and occupational projections.

Exhibit 61. Education employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Teaching Assistants, Except Postsecondary	22,596	25,176	2,580	11%	3,276
Childcare Workers	12,119	11,527	(591)	(5%)	2,062
Preschool Teachers, Except Special Education	5,239	5,736	497	9%	682
Teaching Assistants, Postsecondary	1,626	1,760	134	8%	225
Kindergarten Teachers, Except Special Education	1,347	1,548	200	15%	191
Library Technicians	960	1,008	48	5%	173
Interpreters and Translators	636	675	39	6%	74
Top Jobs Total	44,522	47,430	2,908	7%	6,683
<i>All other</i>	-	-	-	-	-
Total	44,522	47,430	2,908	7%	6,683

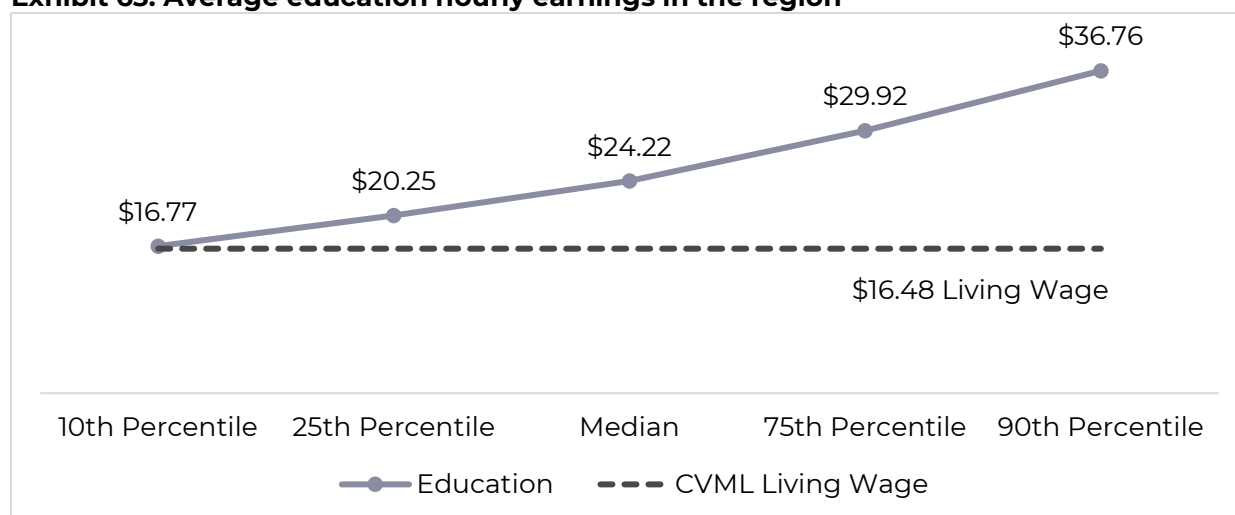
Education Hourly Earnings

Exhibit 62 displays the hourly earnings for the top middle-skill education occupations in the CVML region. Kindergarten teachers, except special education, have the highest entry-level hourly earnings in the education occupational group at \$33.98 per hour. Exhibit 63 displays the average hourly earnings for the education occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$20.25 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top education occupations was \$20.49 per hour over the last 12 months.

Exhibit 62. Education hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
Kindergarten Teachers, Except Special Education	\$33.98	\$43.25	\$49.53
Interpreters and Translators	\$21.51	\$28.62	\$40.39
Library Technicians	\$18.82	\$21.63	\$26.91
Teaching Assistants, Except Postsecondary	\$17.41	\$18.86	\$22.36
Preschool Teachers, Except Special Education	\$17.35	\$20.19	\$24.23
Teaching Assistants, Postsecondary	\$17.35	\$20.73	\$27.28
Childcare Workers	\$16.50	\$16.50	\$18.78

Exhibit 63. Average education hourly earnings in the region



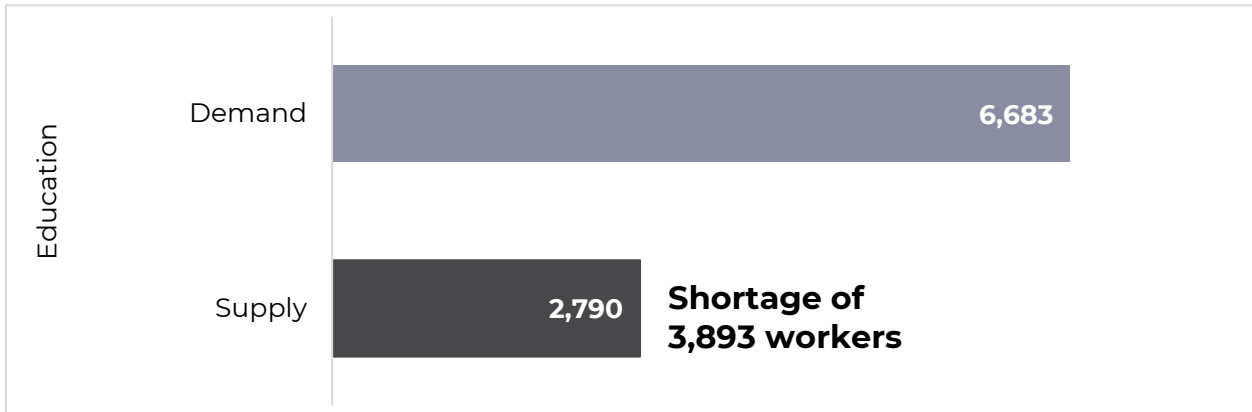
Over the last 12 months, from April 2024 to March 2025, there were nearly 4,000 job advertisements posted for the top education occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for education workers.

Exhibit 64. Top 10 certifications, specialized skills, and software skills in job postings for education occupations

Certifications	Specialized Skills	Software Skills
Cardiopulmonary Resuscitation (CPR) Certification	Special Education	Microsoft Excel
First Aid Certification	Child Development	Microsoft Office
No Child Left Behind Act (NCLB) Standards	Preschool Education	Student Information Systems
Valid Driver's License	Lesson Planning	Microsoft PowerPoint
Typing Certification	Working With Children	Zoom (Video Conferencing Tool)
Teaching Certificate	Early Childhood Education	Microsoft Outlook
English Learner Authorization	Office Equipment	Spreadsheets
American Red Cross (ARC) Certification	Individualized Education Programs (IEP)	Business Software

Certifications	Specialized Skills	Software Skills
Registered Behavior Technician (RBT)	Disabilities	Microsoft Word
Automated External Defibrillator (AED) Certification	Classroom Management	Google Workspace

Exhibit 65. Education workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Energy, Construction & Utilities

Summary

- There were more than 58,00 middle-skill energy, construction, and utilities jobs in the CVML region in 2023. This occupational group is projected to add nearly 3,600 jobs through 2028, growing by 6%. There are more than 6,000 annual job openings projected for energy, construction, and utilities workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$27.52 per hour, which is above the \$16.48 living wage in the CVML region.
- There were more than 3,600 job ads posted in the CVML region for the top energy, construction, and utilities occupations profiled in this report. The top job titles were electricians, solar technicians, and heavy equipment operators.
- Specialized skills: The top skill is construction, and the top certification is EPA 608 Technician Certification.

Energy, Construction & Utilities Demographics

Comprising 5% of the middle-skill energy, construction, and utilities workforce, women are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 53%. The energy, construction, and utilities workforce contain more Hispanic or Latino and White workers than the overall middle-skill workforce. Energy, construction, and utilities workers have a similar age distribution to the rest of the middle-skill workforce, although skewing slightly younger.

Exhibit 66. Gender composition of the energy, construction, and utilities workforce

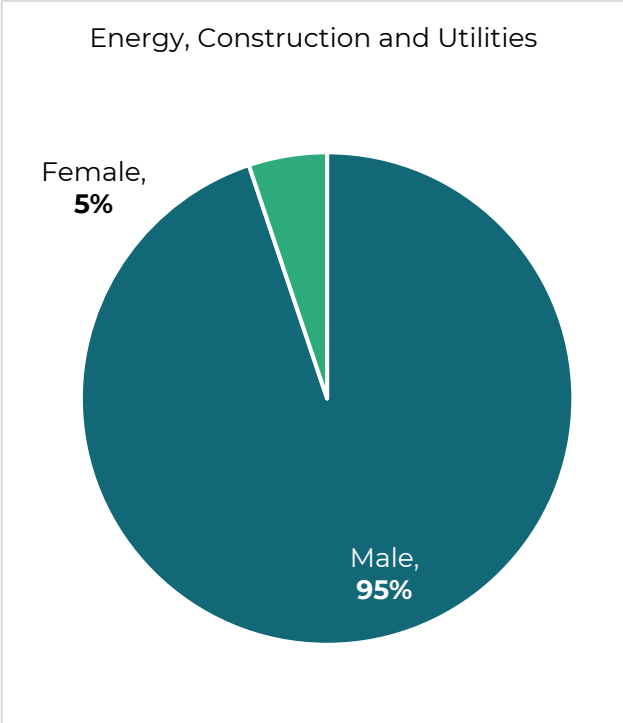


Exhibit 67. Race/ethnicity composition of the energy, construction, and utilities workforce

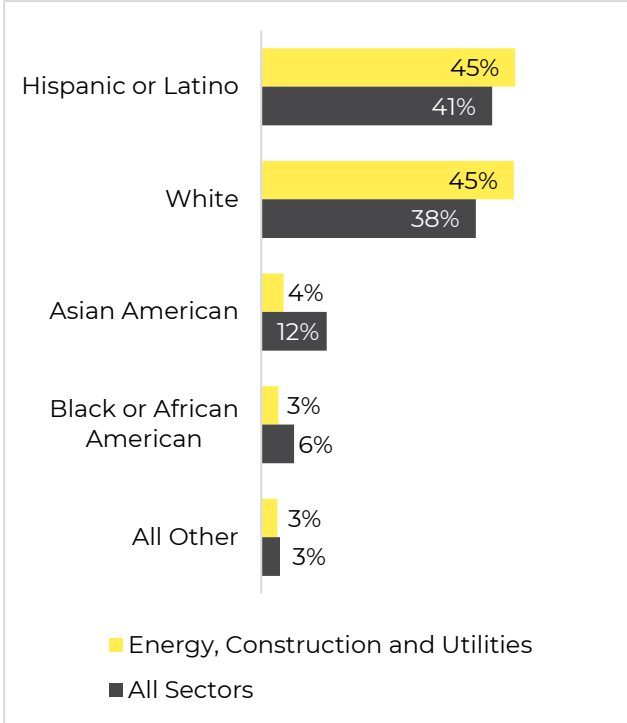
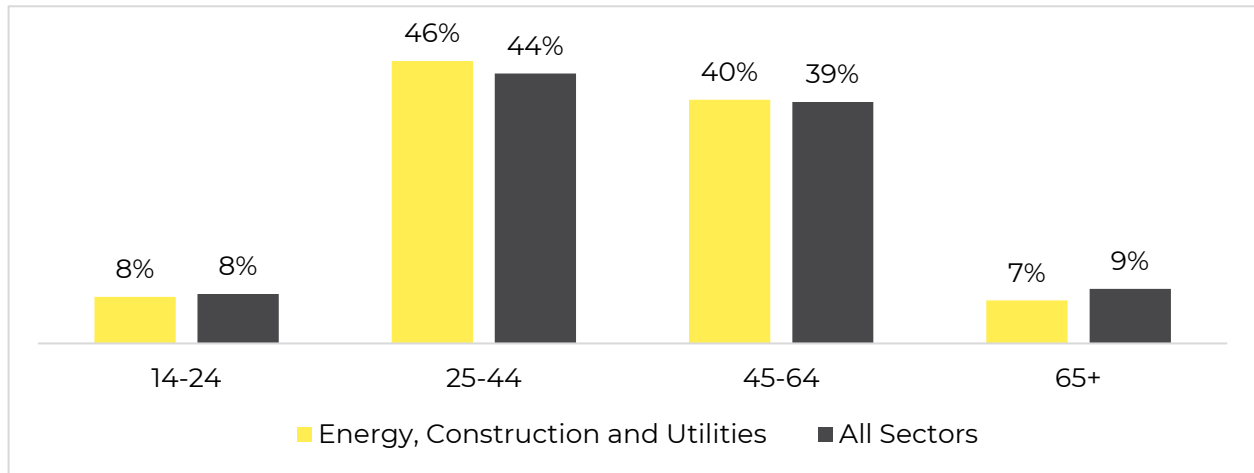


Exhibit 68. Energy, construction, and utilities workforce composition by age cohorts



Energy, Construction & Utilities Demand

There were more than 58,000 middle-skill energy, construction, and utilities jobs in the CVML region in 2023. This occupational group is projected to add nearly 3,600 jobs through 2028, growing by 6%. There are more than 6,000 annual job openings projected for energy, construction, and utilities workers over this timeframe. Carpenters are projected to have the most annual job openings through 2028. Exhibit 69 displays energy, construction, and utilities employment and occupational projections.

Exhibit 69. Energy, construction, and utilities employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Carpenters	10,992	11,220	228	2%	994
Electricians	7,299	8,125	825	11%	843
First-Line Supervisors of Construction Trades and Extraction Workers	7,582	8,010	428	6%	720
Operating Engineers and Other Construction Equipment Operators	4,436	4,785	349	8%	460
Plumbers, Pipefitters, and Steamfitters	4,415	4,724	309	7%	452
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	4,294	4,656	362	8%	443
Installation, Maintenance, and Repair Workers, All Other	2,848	2,915	67	2%	289
Water and Wastewater Treatment Plant and System Operators	1,805	1,966	161	9%	210
Construction and Building Inspectors	1,241	1,305	64	5%	157
Solar Photovoltaic Installers	1,129	1,297	168	15%	139
Telecommunications Equipment Installers and Repairers, Except Line Installers	1,217	1,244	27	2%	138

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Stationary Engineers and Boiler Operators	1,007	1,046	40	4%	115
Sheet Metal Workers	989	1,056	67	7%	107
Security and Fire Alarm Systems Installers	748	788	40	5%	91
Cabinetmakers and Bench Carpenters	873	858	(15)	(2%)	87
Top Jobs Total	50,875	53,996	3,121	6%	5,244
<i>All other</i>	<i>7,175</i>	<i>7,619</i>	<i>444</i>	<i>6%</i>	<i>758</i>
Total	58,050	61,614	3,565	6%	6,002

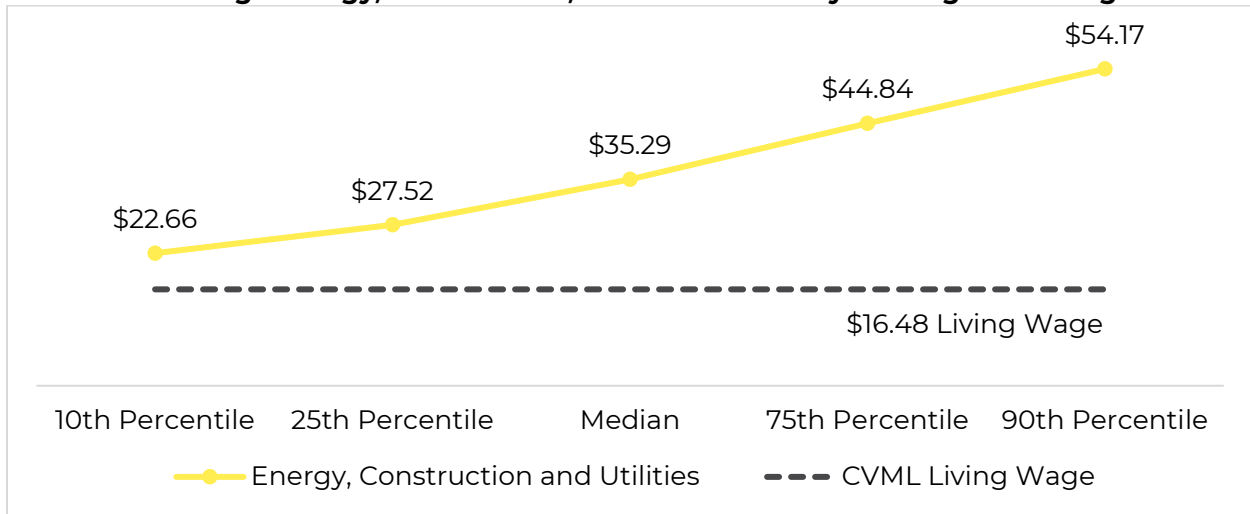
Energy, Construction & Utilities Hourly Earnings

Exhibit 70 displays the hourly earnings for the top middle-skill energy, construction, and utilities occupations in the CVML region. First-line supervisors of construction trades and extraction workers have the highest entry-level hourly earnings in the energy, construction, and utilities occupational group at \$30.30 per hour. Exhibit 71 displays the average hourly earnings for the energy, construction, and utilities occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$27.52 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top energy, construction, and utilities occupations was \$32.62 per hour over the last 12 months.

Exhibit 70. Energy, construction, and utilities hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
First-Line Supervisors of Construction Trades and Extraction Workers	\$30.30	\$38.32	\$49.51
Construction and Building Inspectors	\$28.45	\$38.79	\$48.82
Telecommunications Equipment Installers and Repairers, Except Line Installers	\$28.12	\$32.21	\$36.55
Operating Engineers and Other Construction Equipment Operators	\$27.58	\$33.65	\$49.91
Water and Wastewater Treatment Plant and System Operators	\$26.46	\$34.11	\$41.71
Electricians	\$23.92	\$33.33	\$43.25
Sheet Metal Workers	\$23.00	\$32.93	\$50.87
Security and Fire Alarm Systems Installers	\$22.75	\$26.92	\$33.97
Plumbers, Pipefitters, and Steamfitters	\$22.03	\$28.31	\$37.59
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$21.77	\$27.36	\$34.77
Carpenters	\$21.39	\$28.36	\$37.22
Solar Photovoltaic Installers	\$20.40	\$23.27	\$28.33
Stationary Engineers and Boiler Operators	\$19.86	\$28.68	\$43.09
Installation, Maintenance, and Repair Workers, All Other	\$17.63	\$21.57	\$28.45
Cabinetmakers and Bench Carpenters	\$17.49	\$21.03	\$24.69

Exhibit 71. Average energy, construction, and utilities hourly earnings in the region



Over the last 12 months, from April 2024 to March 2025, there were more than 3,600 job advertisements posted for the top energy, construction, and utilities occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for energy, construction, and utilities workers.

Exhibit 72. Top 10 certifications, specialized skills, and software skills in job postings for energy, construction, and utilities occupations

Certifications	Specialized Skills	Software Skills
EPA 608 Technician Certification	Construction	Microsoft Excel
Security Clearance	HVAC	Microsoft Office
Cardiopulmonary Resuscitation (CPR) Certification	Hand Tools	Microsoft Outlook
10-Hour OSHA General Industry Card	Electrical Wiring	Microsoft Word
First Aid Certification	Blueprinting	Microsoft PowerPoint
CDL Class A License	Plumbing	SAP Applications
Journeyman Electrician	Power Tool Operation	Spreadsheets
30-Hour OSHA General Industry Card	Electrical Systems	Software Systems
EPA Universal Certification	Preventive Maintenance	Geographic Information Systems
NABCEP Certified Energy Practitioner	Machinery	Business Software

Exhibit 73. Energy, construction, and utilities workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Health

Summary

- There were nearly 195,000 middle-skill health jobs in the CVML region in 2023. This occupational group is projected to add more than 31,000 jobs through 2028, growing by 16%. There are nearly 30,300 annual job openings projected for health workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$26.43 per hour, which is above the \$16.48 living wage in the CVML region.
- There were more than 29,600 job ads posted in the CVML region for the top health occupations profiled in this report. The top job titles were registered nurses, licensed vocational nurses, and medical assistants.
- Specialized skills: The top skill is nursing, and the top certification is registered nurse (RN).

Health Demographics

Comprising 20% of the middle-skill health workforce, men are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 47%. The health workforce contains more Hispanic or Latino, Asian American, and Black or African American workers than the overall middle-skill workforce. Health workers are younger on average than the rest of the middle-skill workforce.

Exhibit 74. Gender composition of the health workforce

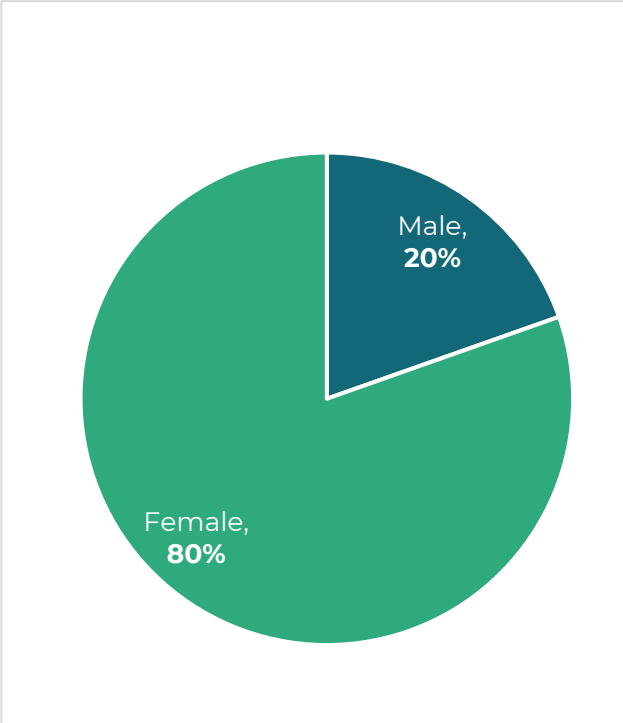


Exhibit 75. Race/ethnicity composition of the health workforce

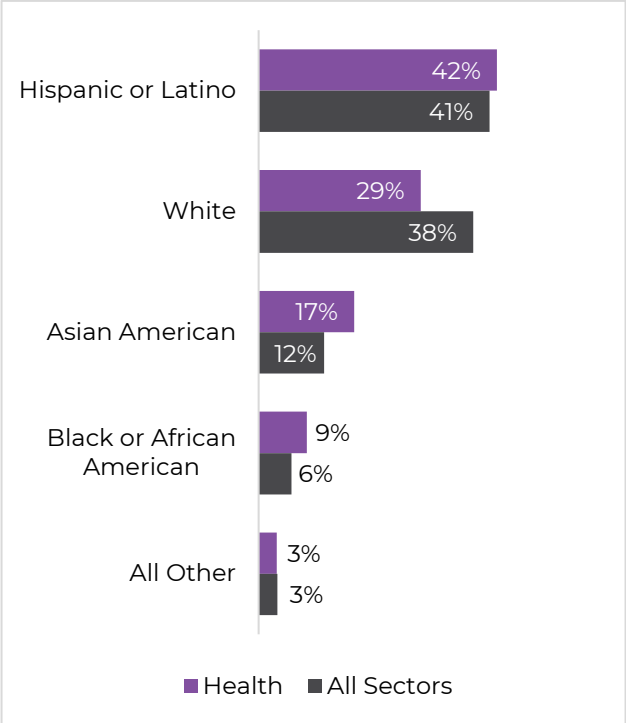
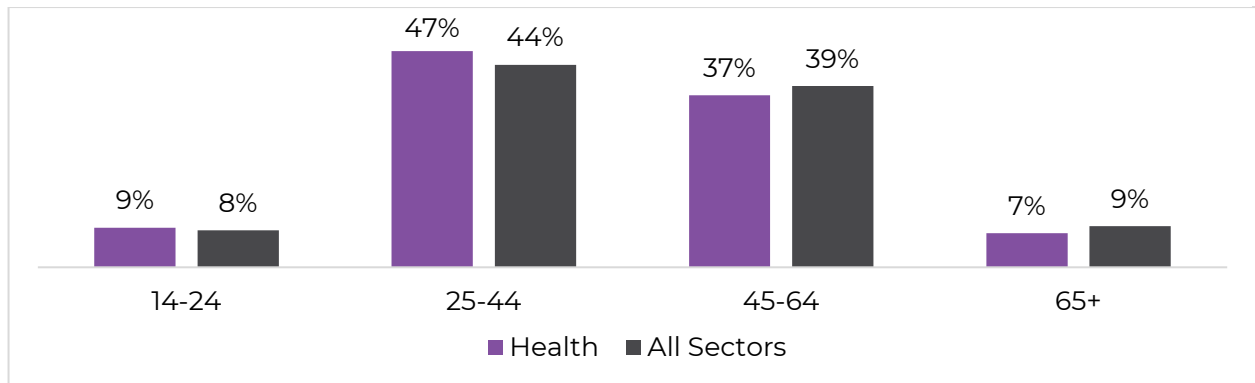


Exhibit 76. Health workforce composition by age cohorts



Health Demand

There were nearly 195,000 middle-skill health jobs in the CVML region in 2023. This occupational group is projected to add more than 31,000 jobs through 2028, growing by 16%. There are nearly 30,300 annual job openings projected for health workers over this timeframe. Home and health and personal aide workers are projected to have the most annual job openings through 2028. Exhibit 77 displays health employment and occupational projections.

Exhibit 77. Health employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Home Health and Personal Care Aides	78,691	99,260	20,569	26%	17,109
Registered Nurses	30,084	32,447	2,364	8%	2,180
Nursing Assistants	11,243	12,468	1,225	11%	1,934
Medical Assistants	11,681	12,955	1,275	11%	1,810
Medical Secretaries and Administrative Assistants	9,233	9,883	649	7%	1,124
Dental Assistants	4,969	5,317	348	7%	773
Social and Human Service Assistants	5,285	6,104	819	15%	736
Licensed Practical and Licensed Vocational Nurses	7,598	8,238	640	8%	733
Pharmacy Technicians	4,212	4,434	222	5%	429
Massage Therapists	1,755	2,083	328	19%	319
Healthcare Support Workers, All Other	1,707	1,814	106	6%	255
Health Technologists and Technicians, All Other	2,189	2,509	320	15%	218
Psychiatric Technicians	1,916	2,057	142	7%	194
Emergency Medical Technicians	1,976	2,210	233	12%	191
Phlebotomists	1,281	1,348	68	5%	186
Top Jobs Total	173,820	203,126	29,306	17%	28,189
<i>All other</i>	<i>21,174</i>	<i>22,885</i>	<i>1,711</i>	<i>8%</i>	<i>2,103</i>
Total	194,994	226,011	31,017	16%	30,292

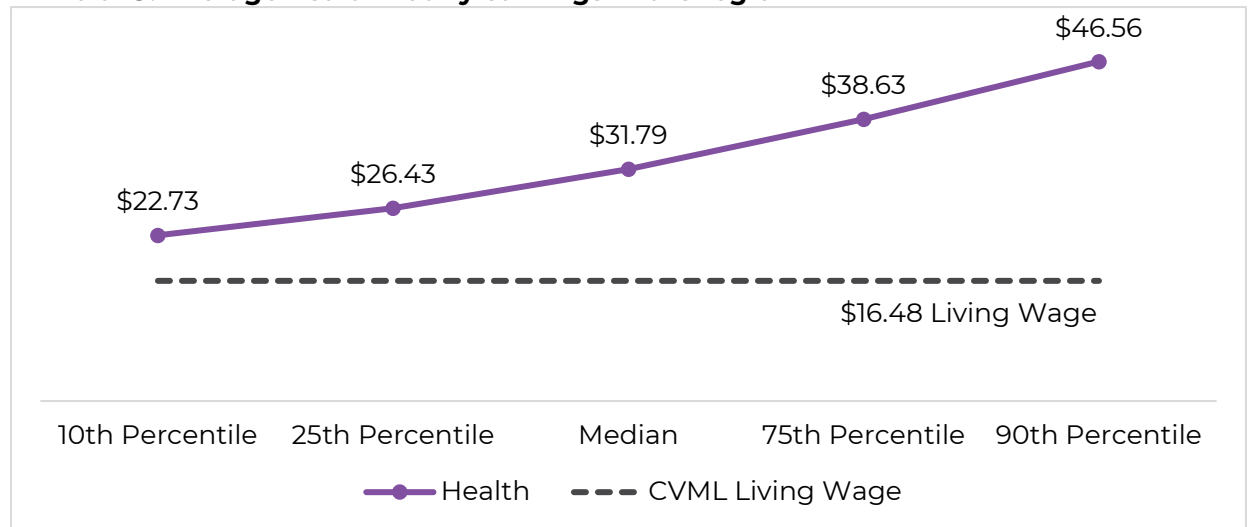
Health Hourly Earnings

Exhibit 78 displays the hourly earnings for the top middle-skill health occupations in the CVML region. Registered nurses have the highest entry-level hourly earnings in the health occupational group at \$49.33 per hour. Exhibit 79 displays the average hourly earnings for the health occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$26.43 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top health occupations was \$32.43 per hour over the last 12 months.

Exhibit 78. Health hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
Registered Nurses	\$49.33	\$60.79	\$73.15
Licensed Practical and Licensed Vocational Nurses	\$30.06	\$33.83	\$36.51
Psychiatric Technicians	\$28.94	\$35.36	\$38.18
Health Technologists and Technicians, All Other	\$21.45	\$23.64	\$29.12
Dental Assistants	\$20.52	\$23.02	\$28.49
Phlebotomists	\$19.73	\$22.82	\$25.60
Healthcare Support Workers, All Other	\$18.87	\$21.75	\$26.95
Pharmacy Technicians	\$18.74	\$22.70	\$27.65
Social and Human Service Assistants	\$18.30	\$21.11	\$25.01
Nursing Assistants	\$18.15	\$20.08	\$21.98
Emergency Medical Technicians	\$18.11	\$20.01	\$24.26
Medical Assistants	\$18.10	\$20.50	\$23.97
Medical Secretaries and Administrative Assistants	\$17.97	\$21.16	\$24.90
Home Health and Personal Care Aides	\$16.50	\$16.50	\$16.50
Massage Therapists	\$16.50	\$20.80	\$36.27

Exhibit 79. Average health hourly earnings in the region

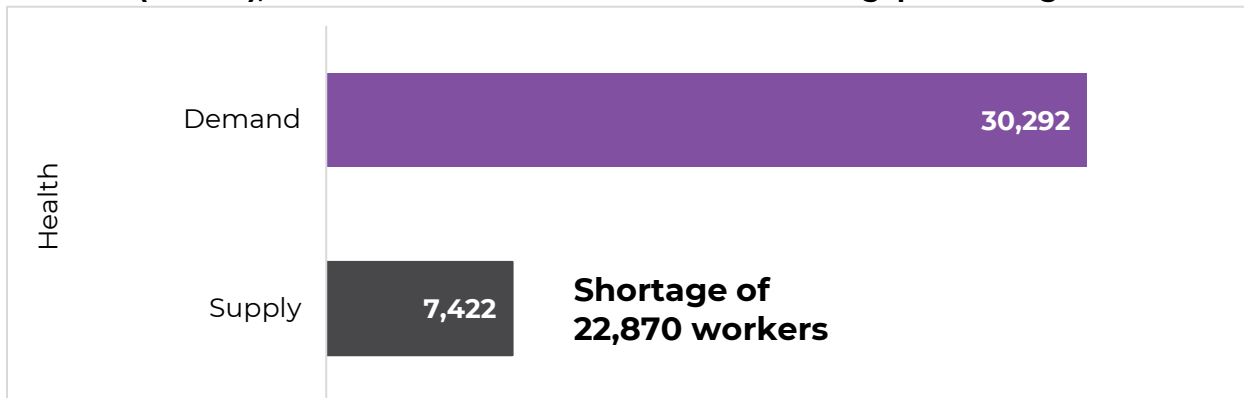


Over the last 12 months, from April 2024 to March 2025, there were more than 29,600 job advertisements posted for the top health occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for health workers.

Exhibit 80. Top 10 certifications, specialized skills, and software skills in job postings for health occupations

Certifications	Specialized Skills	Software Skills
Registered Nurse (RN)	Nursing	Microsoft Office
Basic Life Support (BLS) Certification	Nursing Care	Microsoft Outlook
Cardiopulmonary Resuscitation (CPR) Certification	Medication Administration	Microsoft Excel
Advanced Cardiovascular Life Support (ACLS) Certification	Cardiopulmonary Resuscitation (CPR)	HealthStream
Licensed Vocational Nurse (LVN)	Medical Records	Microsoft Word
Valid Driver's License	Vital Signs	Microsoft PowerPoint
Certified Nursing Assistant (CNA)	Home Health Care	Epic EMR
Pediatric Advanced Life Support (PALS)	Caregiving	Dentrix
Licensed Practical Nurse (LPN)	Infection Control	Patient Management Software
First Aid Certification	Medical Assistance	Spreadsheets

Exhibit 81. Health workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



ICT/Digital Media

Summary

- There were 61,500 middle-skill ICT/digital media jobs in the CVML region in 2023. This occupational group is projected to add nearly 1,100 jobs through 2028, growing by 2%. There are more than 7,000 annual job openings projected for ICT/digital media workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$22.50 per hour, which is above the \$16.48 living wage in the CVML region.
- There were more than 6,200 job ads posted in the CVML region for the top ICT/digital media occupations profiled in this report. The top job titles were administrative assistants, systems administrators, and IT specialists.
- Specialized skills: The top skill is administrative support, and the top certification is typing certification.

ICT/Digital Media Demographics

Comprising 21% of the middle-skill ICT/digital media workforce, men are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 47%. The ICT/digital media workforce contains more White workers than the overall middle-skill workforce. ICT/digital media workers have a similar age distribution to the rest of the middle-skill workforce, although skewing slightly older.

Exhibit 82. Gender composition of the ICT/digital media workforce

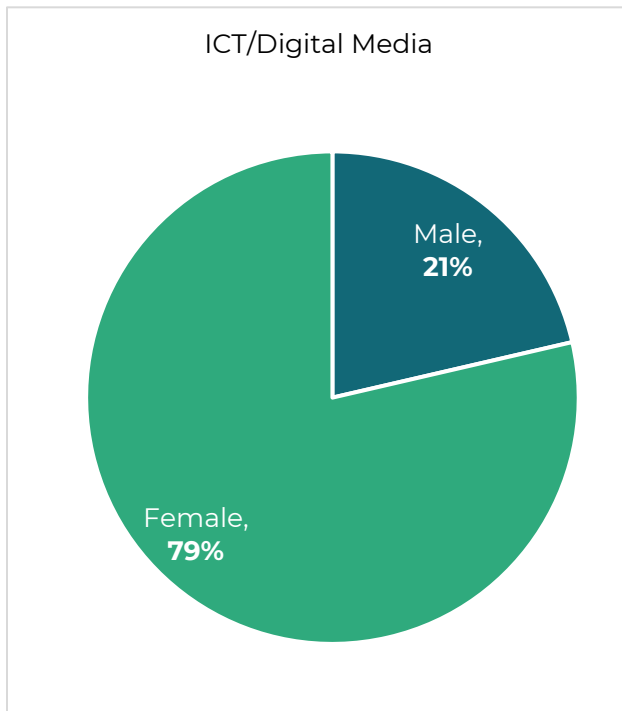


Exhibit 83. Race/ethnicity composition of the ICT/digital media workforce

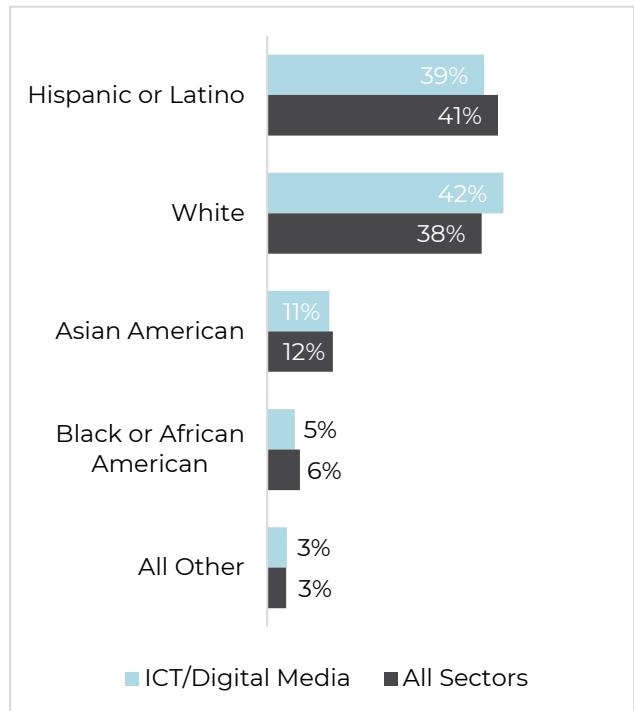
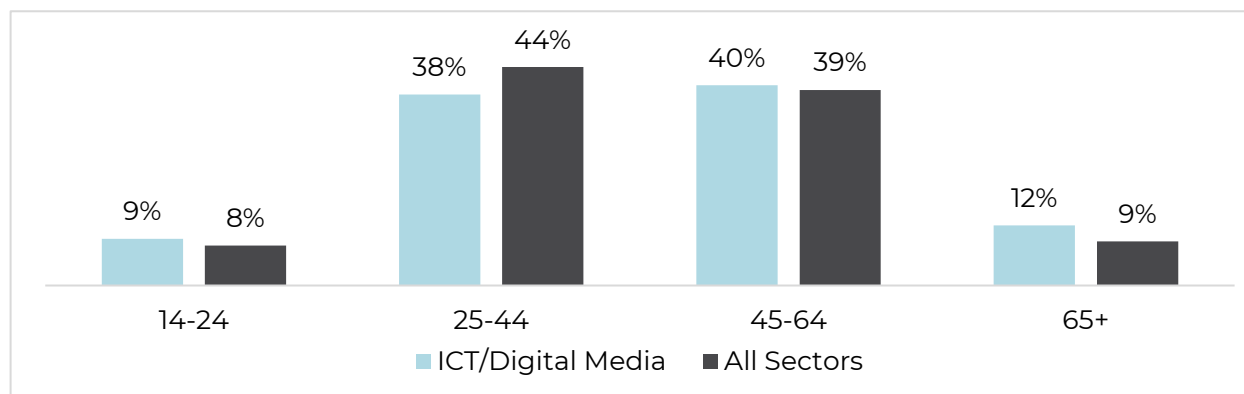


Exhibit 84. ICT/digital media workforce composition by age cohorts



ICT/Digital Media Demand

There were 61,500 middle-skill ICT/digital media jobs in the CVML region in 2023. This occupational group is projected to add nearly 1,100 jobs through 2028, growing by 2%. There are more than 7,000 annual job openings projected for ICT/digital media workers over this timeframe. Office clerks, general, are projected to have the most annual job openings through 2028. Exhibit 85 displays ICT/digital media employment and occupational projections.

Exhibit 85. ICT/digital media employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Office Clerks, General	28,504	29,130	626	2%	3,557
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	16,689	16,911	222	1%	1,931
Executive Secretaries and Executive Administrative Assistants	3,491	3,335	(156)	(4%)	353
Computer User Support Specialists	3,194	3,432	238	7%	265
Data Entry Keyers	988	914	(74)	(7%)	112
Telecommunications Line Installers and Repairers	1,086	1,085	(1)	0%	107
Network and Computer Systems Administrators	1,486	1,580	94	6%	104
Photographers	990	994	4	0%	93
Word Processors and Typists	586	514	(72)	(12%)	74
Computer Network Support Specialists	812	876	64	8%	69
Procurement Clerks	694	692	(2)	(0%)	67
Audio and Video Technicians	582	623	41	7%	62
Surveying and Mapping Technicians	432	446	14	3%	55
Web and Digital Interface Designers	506	545	40	8%	46
Audiovisual Equipment Installers and Repairers	355	347	(8)	(2%)	38
Top Jobs Total	60,395	61,424	1,029	2%	6,933
<i>All other</i>	<i>1,106</i>	<i>1,173</i>	<i>67</i>	<i>6%</i>	<i>95</i>
Total	61,500	62,597	1,096	2%	7,028

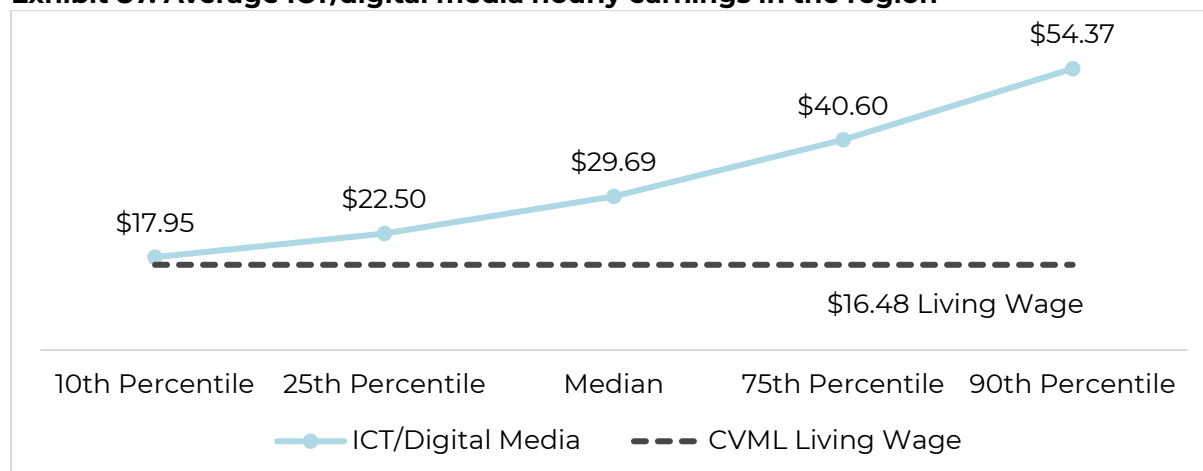
ICT/Digital Media Hourly Earnings

Exhibit 86 displays the hourly earnings for the top middle-skill ICT/digital media occupations in the CVML region. Network and computer systems administrators have the highest entry-level hourly earnings in the ICT/digital media occupational group at \$36.62 per hour. Exhibit 87 displays the average hourly earnings for the ICT/digital media occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$22.50 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top ICT/digital media occupations was \$24.06 per hour over the last 12 months.

Exhibit 86. ICT/digital media hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
Network and Computer Systems Administrators	\$36.62	\$46.13	\$55.10
Telecommunications Line Installers and Repairers	\$28.87	\$39.61	\$45.60
Executive Secretaries and Executive Administrative Assistants	\$28.06	\$33.53	\$40.06
Computer Network Support Specialists	\$27.81	\$33.29	\$40.75
Web and Digital Interface Designers	\$26.31	\$39.51	\$62.68
Computer User Support Specialists	\$23.75	\$30.20	\$37.95
Audiovisual Equipment Installers and Repairers	\$22.55	\$27.19	\$34.68
Surveying and Mapping Technicians	\$22.13	\$30.07	\$44.93
Procurement Clerks	\$20.50	\$23.61	\$27.94
Audio and Video Technicians	\$19.13	\$25.17	\$33.62
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	\$18.89	\$22.84	\$27.27
Word Processors and Typists	\$18.77	\$21.61	\$22.83
Office Clerks, General	\$16.99	\$19.74	\$23.56
Data Entry Keyers	\$16.86	\$19.22	\$22.75
Photographers	\$16.50	\$23.78	\$44.70

Exhibit 87. Average ICT/digital media hourly earnings in the region



Over the last 12 months, from April 2024 to March 2025, there were more than 6,200 job advertisements posted for the top ICT/digital media occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for ICT/digital media workers.

Exhibit 88. Top 10 certifications, specialized skills, and software skills in job postings for ICT/digital media occupations

Certifications	Specialized Skills	Software Skills
Typing Certification	Administrative Support	Microsoft Office
CompTIA A+	Data Entry	Microsoft Excel
Security Clearance	Office Equipment	Microsoft Outlook
CompTIA Network+	Invoicing	Spreadsheets
CompTIA Security+	Office Supply Management	Microsoft PowerPoint
Cardiopulmonary Resuscitation (CPR) Certification	Accounting	Microsoft Word
Cisco Certified Network Associate	Punctuation and Capitalization	Operating Systems
Microsoft Certified Professional	Technical Support	Active Directory
First Aid Certification	Operating Systems	QuickBooks (Accounting Software)
CompTIA Security+ CE	Proofreading	Microsoft Access

Exhibit 89. ICT/digital media workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Public Safety

Summary

- There were nearly 42,200 middle-skill public safety jobs in the CVML region in 2023. This occupational group is projected to add nearly 2,000 jobs through 2028, growing by 5%. There are nearly 4,600 annual job openings projected for public safety workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$31.29 per hour, which is above the \$16.48 living wage in the CVML region.
- There were nearly 4,500 job ads posted in the CVML region for the top public safety occupations profiled in this report. The top job titles were security officers, police officers, and patrol security guards.
- Specialized skills: The top skill is law enforcement, and the top certification is Cardiopulmonary Resuscitation (CPR) Certification.

Public Safety Demographics

Comprising 27% of the middle-skill public safety workforce, women are underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 53%. The public safety workforce contains more Black or African American workers than the overall middle-skill workforce. Public safety workers are considerably younger than the middle-skill workforce overall, with 61% of workers aged 44 or younger.

Exhibit 90. Gender composition of the public safety workforce

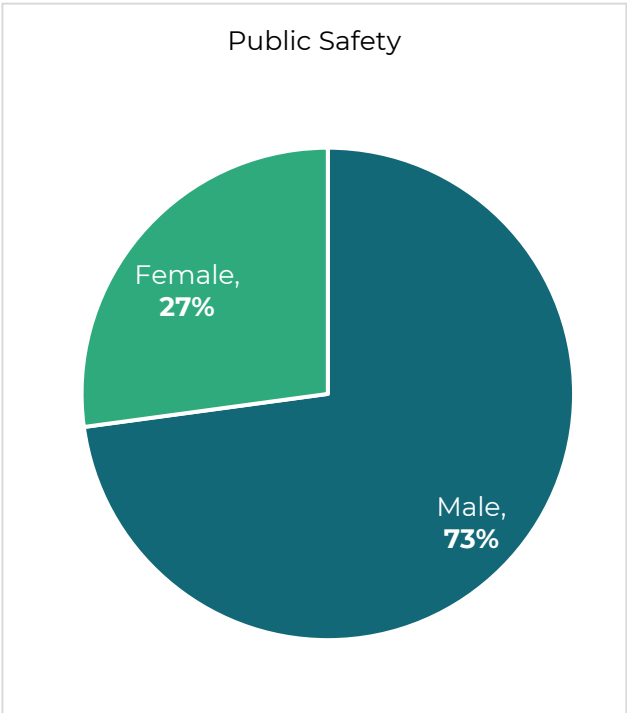


Exhibit 91. Race/ethnicity composition of the public safety workforce

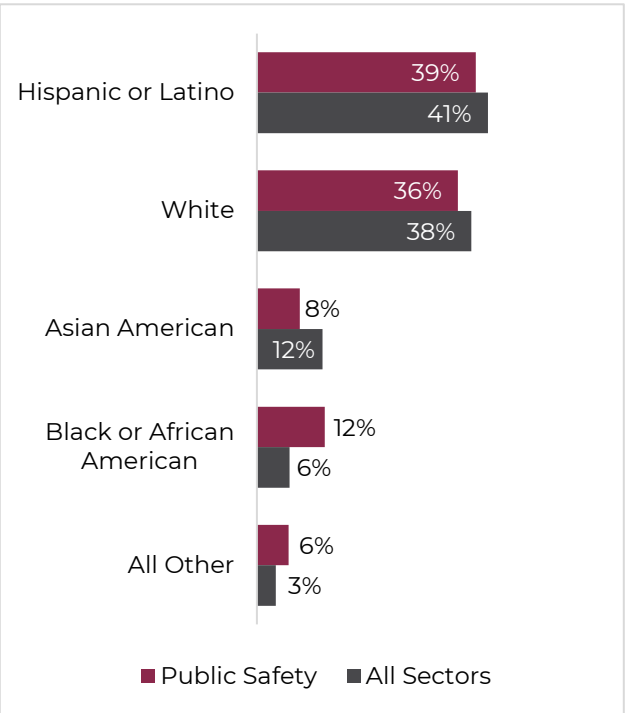
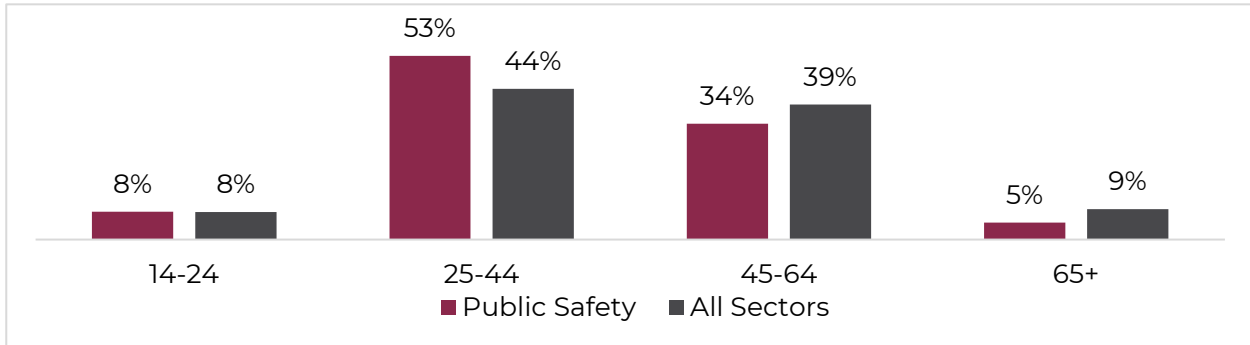


Exhibit 92. Public safety workforce composition by age cohorts



Public Safety Demand

There were nearly 42,200 middle-skill public safety jobs in the CVML region in 2023. This occupational group is projected to add nearly 2,000 jobs through 2028, growing by 5%. There are nearly 4,600 annual job openings projected for public safety workers over this timeframe. Security guards are projected to have the most annual job openings through 2028. Exhibit 93 displays public safety employment and occupational projections.

Exhibit 93. Public safety employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Security Guards	11,331	11,645	314	3%	1,613
Correctional Officers and Jailers	10,477	10,451	(27)	(0%)	938
Police and Sheriff's Patrol Officers	7,638	8,395	756	10%	759
Firefighters	3,928	4,297	368	9%	380
Public Safety Telecommunicators	1,069	1,179	109	10%	133
First-Line Supervisors of Correctional Officers	1,383	1,423	40	3%	121
Detectives and Criminal Investigators	1,258	1,344	85	7%	112
First-Line Supervisors of Police and Detectives	1,030	1,159	129	13%	97
First-Line Supervisors of Firefighting and Prevention Workers	960	1,058	98	10%	81
First-Line Supervisors of Security Workers	683	676	(6)	(1%)	65
Transportation Security Screeners	524	534	9	2%	52
Private Detectives and Investigators	486	499	13	3%	48
Gambling Surveillance Officers and Gambling Investigators	286	301	15	5%	42
Forensic Science Technicians	225	251	26	11%	34
First-Line Supervisors of Protective Service Workers, All Other	199	211	12	6%	21
Top Jobs Total	41,479	43,422	1,943	5%	4,496
<i>All other</i>	676	708	32	5%	88
Total	42,154	44,130	1,975	5%	4,583

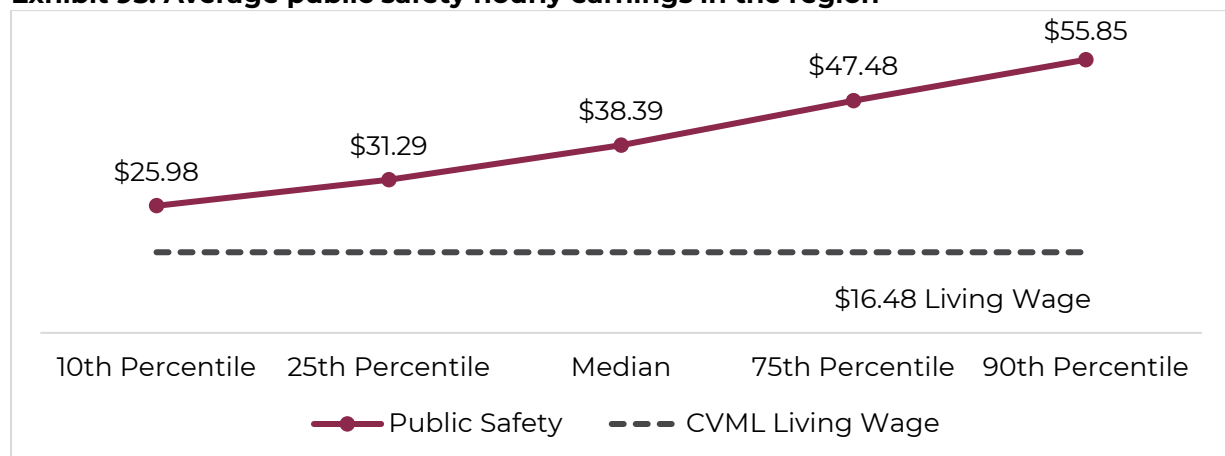
Public Safety Hourly Earnings

Exhibit 94 displays the hourly earnings for the top middle-skill public safety occupations in the CVML region. First-line supervisors of correctional officers have the highest entry-level hourly earnings in the public safety occupational group at \$53.58 per hour. Exhibit 95 displays the average hourly earnings for the public safety occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$31.29 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top public safety occupations was \$21.97 per hour over the last 12 months.

Exhibit 94. Public safety hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
First-Line Supervisors of Correctional Officers	\$53.58	\$62.67	\$68.64
First-Line Supervisors of Police and Detectives	\$51.27	\$61.71	\$78.75
First-Line Supervisors of Firefighting and Prevention Workers	\$40.62	\$44.52	\$55.67
Detectives and Criminal Investigators	\$39.05	\$47.28	\$57.24
Police and Sheriff's Patrol Officers	\$37.57	\$42.72	\$52.64
Correctional Officers and Jailers	\$35.59	\$47.11	\$49.86
Forensic Science Technicians	\$31.81	\$35.40	\$41.81
First-Line Supervisors of Protective Service Workers, All Other	\$27.10	\$32.11	\$39.14
Firefighters	\$27.04	\$33.30	\$39.80
Public Safety Telecommunicators	\$26.24	\$30.06	\$34.85
Transportation Security Screeners	\$22.82	\$25.50	\$35.64
First-Line Supervisors of Security Workers	\$21.29	\$30.87	\$38.86
Gambling Surveillance Officers and Gambling Investigators	\$20.23	\$30.53	\$36.82
Private Detectives and Investigators	\$19.39	\$25.57	\$38.29
Security Guards	\$16.64	\$17.57	\$20.63

Exhibit 95. Average public safety hourly earnings in the region

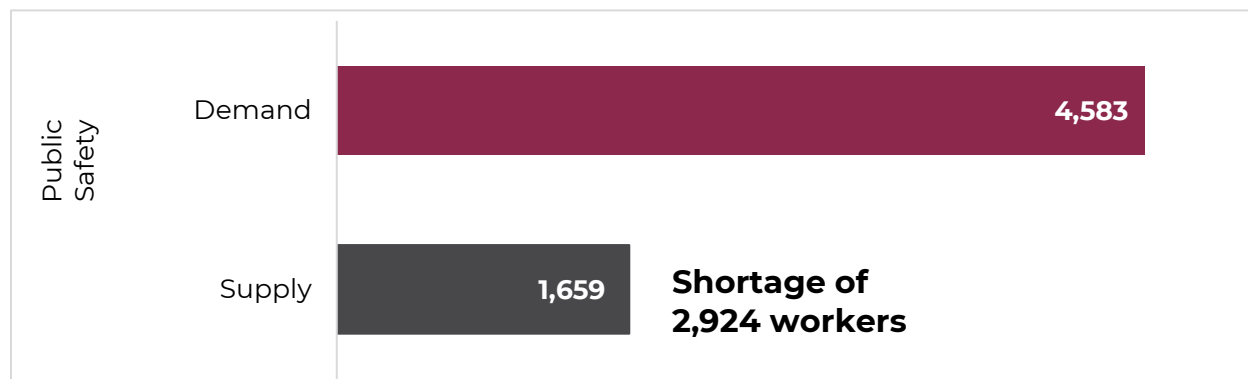


Over the last 12 months, from April 2024 to March 2025, there were nearly 4,500 job advertisements posted for the top public safety occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for public safety workers.

Exhibit 96. Top 10 certifications, specialized skills, and software skills in job postings for public safety occupations

Certifications	Specialized Skills	Software Skills
Cardiopulmonary Resuscitation (CPR) Certification	Law Enforcement	Microsoft Word
First Aid Certification	Emergency Response	Microsoft Excel
CDL Class C License	Site Security	Microsoft Office
Basic Life Support (BLS) Certification	Patrolling	Microsoft Outlook
Peace Officer Standards and Training (POST) Certificate	Access Controls	Spreadsheets
Automated External Defibrillator (AED) Certification	Alarm Devices	Microsoft PowerPoint
Security Clearance	Criminal Corrections	Mobile Security
Security Guard License	Rehabilitation	Microsoft Security Essentials
Emergency Medical Technician (EMT)	Crime Prevention	Database Application
Certified First Responder (CFR)	Office Equipment	IBM MQ

Exhibit 97. Public safety workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Retail, Hospitality & Tourism

Summary

- There were nearly 52,600 middle-skill retail, hospitality, and tourism jobs in the CVML region in 2023. This occupational group is projected to add nearly 3,800 jobs through 2028, growing by 7%. There are more than 7,500 annual job openings projected for retail, hospitality, and tourism workers over this timeframe.
- The average entry-level hourly earnings for the middle-skill occupational group is \$19.12 per hour, which is above the \$16.48 living wage in the CVML region.
- There were more than 10,800 job ads posted in the CVML region for the top retail, hospitality, and tourism occupations profiled in this report. The top job titles were shift supervisors, assistant store managers, and store managers.
- Specialized skills: The top skill is merchandising, and the top certification is ServSafe® Certification.

Retail, Hospitality & Tourism Demographics

Comprising 44% of the middle-skill retail, hospitality, and tourism workforce, women are slightly underrepresented in this sector when compared to the middle-skill workforce across all sectors, at 53%. The retail, hospitality, and tourism workforce contain more Asian American workers than the overall middle-skill workforce. Retail, hospitality, and tourism workers are considerably younger than the middle-skill workforce overall, with 56% of workers aged 44 or younger.

Exhibit 98. Gender composition of the retail, hospitality, and tourism workforce

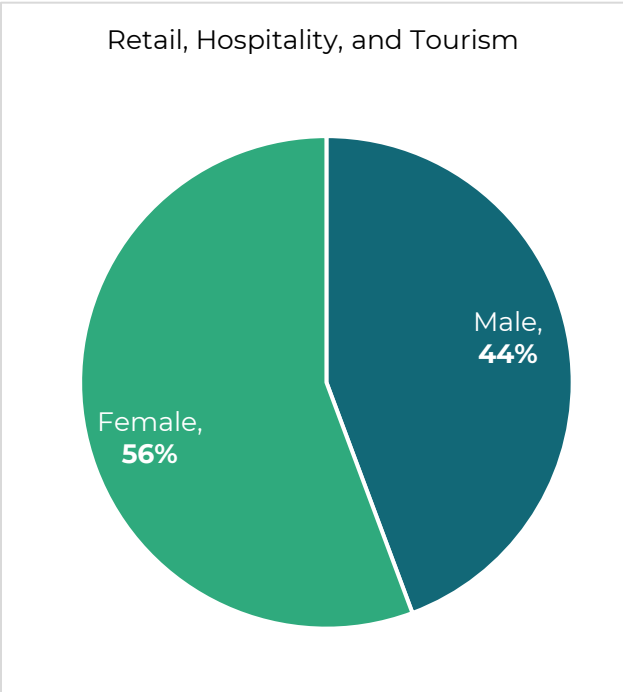


Exhibit 99. Race/ethnicity composition of the retail, hospitality, and tourism workforce

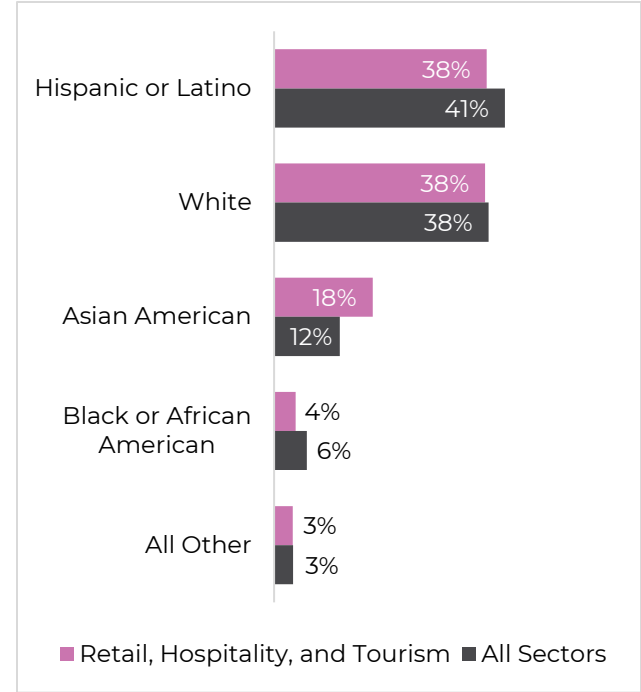
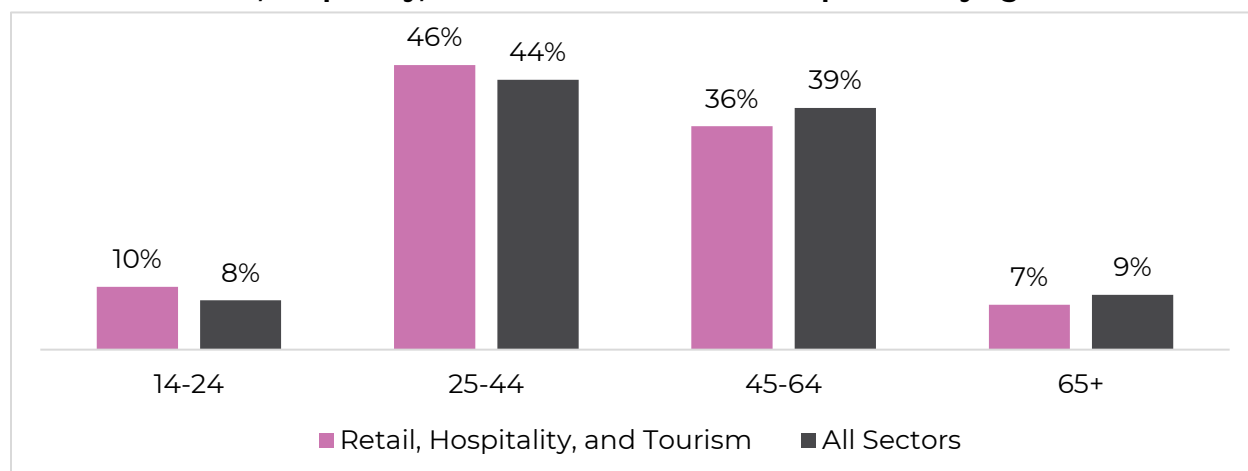


Exhibit 100. Retail, hospitality, and tourism workforce composition by age cohorts



Retail, Hospitality & Tourism Demand

There were nearly 52,600 middle-skill retail, hospitality, and tourism jobs in the CVML region in 2023. This occupational group is projected to add nearly 3,800 jobs through 2028, growing by 7%. There are more than 7,500 annual job openings projected for retail, hospitality, and tourism workers over this timeframe. First-line supervisors of food preparation and serving workers are projected to have the most annual job openings through 2028. Exhibit 101 displays retail, hospitality, and tourism employment and occupational projections.

Exhibit 101. Retail, hospitality, and tourism employment and occupational projections, CVML region, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
First-Line Supervisors of Food Preparation and Serving Workers	11,443	12,575	1,132	10%	1,957
First-Line Supervisors of Retail Sales Workers	13,498	13,471	(27)	(0%)	1,382
Hairdressers, Hairstylists, and Cosmetologists	6,069	6,461	392	6%	922
Exercise Trainers and Group Fitness Instructors	2,952	3,353	401	14%	664
Food Service Managers	4,983	5,383	400	8%	647
Manicurists and Pedicurists	3,542	4,068	526	15%	543
First-Line Supervisors of Housekeeping and Janitorial Workers	2,207	2,353	146	7%	291
Chefs and Head Cooks	1,966	2,177	211	11%	286
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	1,970	2,093	123	6%	239
First-Line Supervisors of Entertainment and Recreation Workers, Except Gambling Services	1,049	1,164	115	11%	141
First-Line Supervisors of Personal Service Workers	965	1,078	113	12%	137

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Job Openings
Tour and Travel Guides	542	609	67	12%	134
Lodging Managers	587	630	44	7%	69
Reservation and Transportation Ticket Agents and Travel Clerks	304	335	32	10%	43
Travel Agents	241	275	34	14%	40
Top Jobs Total	52,317	56,025	3,707	7%	7,496
<i>All other</i>	245	290	45	18%	40
Total	52,563	56,315	3,752	7%	7,535

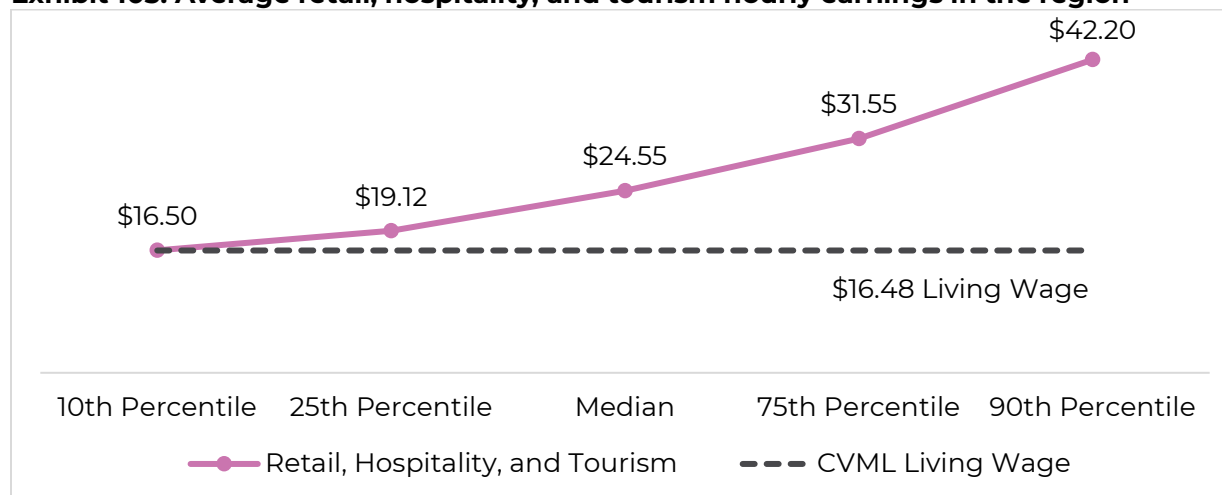
Retail, Hospitality & Tourism Hourly Earnings

Exhibit 102 displays the hourly earnings for the top middle-skill retail, hospitality, and tourism occupations in the CVML region. Lodging managers have the highest entry-level hourly earnings in the retail, hospitality, and tourism occupational group at \$21.00 per hour. Exhibit 103 displays the average hourly earnings for the retail, hospitality, and tourism occupational group, categorized by percentile, compared to the regional living wage. The average entry-level hourly earnings for the middle-skill occupational group is \$19.12 per hour, which is above the \$16.48 living wage in the CVML region. The median advertised salary for the top retail, hospitality, and tourism occupations was \$24.12 per hour over the last 12 months.

Exhibit 102. Retail, hospitality, and tourism hourly earnings in the region, 2023

Occupation	Hourly Wages		
	25 th Percentile	Median	75 th Percentile
Lodging Managers	\$21.00	\$30.02	\$39.77
Food Service Managers	\$20.38	\$27.10	\$35.18
Chefs and Head Cooks	\$19.08	\$26.13	\$34.47
First-Line Supervisors of Housekeeping and Janitorial Workers	\$18.87	\$24.07	\$31.67
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	\$18.13	\$25.44	\$36.16
First-Line Supervisors of Entertainment and Recreation Workers, Except Gambling Services	\$17.71	\$21.07	\$26.70
First-Line Supervisors of Retail Sales Workers	\$17.57	\$21.39	\$27.92
First-Line Supervisors of Food Preparation and Serving Workers	\$17.20	\$17.97	\$23.47
First-Line Supervisors of Personal Service Workers	\$17.10	\$22.19	\$28.46
Tour and Travel Guides	\$16.56	\$18.00	\$22.67
Exercise Trainers and Group Fitness Instructors	\$16.50	\$22.90	\$32.67
Reservation and Transportation Ticket Agents and Travel Clerks	\$16.50	\$17.66	\$21.63
Manicurists and Pedicurists	\$16.50	\$16.50	\$17.23
Travel Agents	\$16.50	\$21.15	\$27.96
Hairdressers, Hairstylists, and Cosmetologists	\$16.50	\$17.27	\$26.38

Exhibit 103. Average retail, hospitality, and tourism hourly earnings in the region

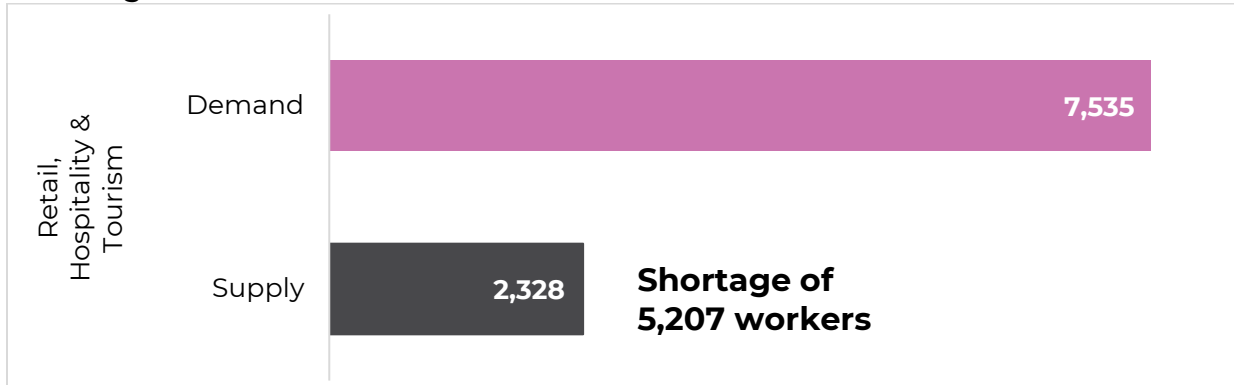


Over the last 12 months, from April 2024 to March 2025, there were more than 10,800 job advertisements posted for the top retail, hospitality, and tourism occupations detailed in this report. The table below displays the certifications, specialized skills, and software skills included in employer job ads for retail, hospitality, and tourism workers.

Exhibit 104. Top 10 certifications, specialized skills, and software skills in job postings for retail, hospitality, and tourism occupations

Certifications	Specialized Skills	Software Skills
ServSafe® Certification	Merchandising	Microsoft Office
Barber License	Restaurant Operation	Microsoft Excel
Food Handler's Card	Retail Operations	Microsoft Outlook
Cosmetology License	Cash Handling	Microsoft Word
Cardiopulmonary Resuscitation (CPR) Certification	Marketing	Microsoft PowerPoint
Security Clearance	Selling Techniques	Inventory Management System
First Aid Certification	Food Safety and Sanitation	Spreadsheets
Personal Trainer Certification	Inventory Management	Web Browsers
Automated External Defibrillator (AED) Certification	Loss Prevention	Safari (Web Browser)
Food Safety Certification	Product Knowledge	Property Management Systems

Exhibit 105. Retail, hospitality, and tourism workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill the gap in the region



Conclusion

The middle-skill occupations within the 10 sectors detailed in this report are projected to have nearly 96,800 job openings available annually over the next five years within the region. Regional postsecondary institutions in the region have conferred an average of 24,520 awards annually over the last three academic years. The difference between the projected workforce demand and the average number of awards issued by regional postsecondary institutions indicates an undersupply of 72,255 workers in the region. This supply gap has decreased by approximately 10% since the 2023 CVML Overview, in which the supply gap was assessed at 80,297 workers. Exhibit 106 displays the comparison of middle-skill demand to postsecondary supply and the resulting workforce gaps by CCCCCO sector.

Exhibit 106. Comparison between workforce demand (annual job openings) and postsecondary supply of students (awards) for each sector, showing gaps in the number of workers to fill openings

Occupational Sector	Demand (Annual Job Openings)	Supply (Average Annual Awards)	Gap
Health	30,292	7,422	22,870
Business & Entrepreneurship	13,999	2,761	11,238
Advanced Transportation & Logistics	9,745	2,063	7,682
Retail, Hospitality & Tourism	7,535	2,328	5,207
ICT/Digital Media	7,028	1,254	5,774
Education	6,683	2,790	3,893
Agriculture, Water & Environmental Technologies	6,489	1,403	5,086
Energy, Construction & Utilities	6,002	1,545	4,457
Public Safety	4,583	1,659	2,924
Advanced Manufacturing	4,419	1,295	3,124
Total	96,775	24,520	72,255

The three sectors with the greatest number of annual job openings also have the largest gaps in workforce supply in the region:

- Health: 22,870 workers
- Business and Entrepreneurship: 11,238 workers
- Advanced Transportation and Logistics: 7,682 workers

Sectors with the smallest gaps in workforce supply include public safety (a shortage of 2,924 workers) and advanced manufacturing (a shortage of 3,124 workers). However, it should be noted that these sectors also comprise the smallest share of demand. The sectors issuing the most awards each year, on average, include the health sector (7,422 awards), the education sector (2,790 awards), and the business and entrepreneurship sector (2,761 awards). The information and communication technologies (ICT)/digital media sector has issued the fewest awards (1,254 awards), followed by advanced manufacturing (1,295 awards).

The health sector is projected to have the most demand for middle-skill workers over the next five years, accounting for nearly 31% of the projected middle-skill workforce demand in the region. ICT/digital media, business and entrepreneurship, advanced transportation and logistics, and agriculture, water, and environmental technologies have the largest supply gaps

in proportion to their respective demand. These sectors play a critical role in powering the regional economy and intersect with other fields of work of regional importance, such as business and agriculture. Education, public safety, and retail, hospitality, and tourism have the smallest supply gaps in proportion to their projected demand.

Program Development Recommendations

These recommendations are based on programs with no awards issued over the last three academic years and, therefore, do not encompass all opportunities for program development in the region. These recommendations, displayed by sector, highlight a program code that has not issued awards in the last three academic years and an occupation that would benefit from program development.

- **Advanced Manufacturing:**
 - *Chemical Technology (0954.00)*
 - This program prepares students for employment as Chemical Technicians (19-4031), which pays students \$19.93 per hour at the entry level and \$23.77 per hour at the median, with 82 job openings projected annually over the next five years.
- **Advanced Transportation and Logistics:**
 - *Railroad and Light Rail Operations (0947.40)*
 - This program prepares students for employment like Railroad Conductors and Yardmasters (53-4031), which is projected to have 39 annual job openings over the next five years and pay students \$30.86 per hour at the entry level.
 - *Recreational Vehicle Service (0948.50)*
 - This program prepares students for employment as Recreational Vehicle Service Technicians (49-3092), which pays students \$20.51 per hour at the entry level and \$27.59 per hour at the median, with 39 job openings projected annually over the next five years.
- **Business and Entrepreneurship Sector:**
 - *Insurance (0512.00)*
 - This program prepares students for employment as an Insurance Sales Agent (41-3021), which is projected to have 492 annual job openings over the next five years and pays an entry-level wage of \$19.80 per hour, with workers earning \$26.75 per hour at the median level.
 - Additionally, insurance programs can prepare students for employment as Claims Adjusters, Examiners, and Investigators (13-1031), which is not displayed in detail in this report, as it has lower annual job openings than other occupations in the sector. This occupation is projected to have 130 annual job openings over the next five years and pay students \$27.94 per hour at the entry level.
- **Energy, Construction, and Utilities Sector:**
 - *Carpentry (0952.10)*
 - This program prepares students for employment as a Carpenter (47-2031), which is projected to have 994 annual job openings over the next five years and pays an entry-level wage of \$21.39 per hour, with workers earning \$28.36 at the median level.
 - *Energy Systems Technology (0946.10)*
 - This program prepares students for employment as a Solar Photovoltaic Installer (47-2231), which is projected to have 139 annual job openings over the next five years and pays an entry-level wage of \$20.40 per hour, with workers earning \$23.27 at the median level.

- **Health Sector:**
 - *Phlebotomy (1205.10)*
 - This program prepares students for employment as a Phlebotomist (31-9097), which is projected to have 186 annual job openings over the next five years and pays an entry-level wage of \$19.73 per hour, with workers earning \$22.82 at the median level.
 - *Massage Therapy (1262.00)*
 - This program prepares students for employment as a Massage Therapist (31-9011), which is projected to have 319 annual job openings over the next five years and pays an entry-level wage of \$16.50 per hour, with workers earning \$20.80 at the median level.
 - *Home Health Aide (1230.80)*
 - This program prepares students for employment as Home Health and Personal Care Aides (31-1128). Despite this occupation typically paying workers the minimum wage, there is considerable demand for home health and personal care aides in the region, with 17,109 annual job openings projected over the next five years. This occupation can provide students with an entry into the health care field, allowing access to valuable work experience and skills needed to progress into other health-related pathways.
- **Information and Communication Technologies/Digital Media Sector:**
 - *Surveying (0957.30)*
 - This program prepares students for employment as Surveying and Mapping Technicians (17-3031), which is projected to have 55 annual job openings over the next five years. It pays workers entry-level hourly earnings of \$22.13 and \$30.07 per hour at the median.
- **Public Safety Sector:**
 - *Industrial and Transportation Security (2105.30)*
 - This program prepares students for employment as Transportation and Security Screeners (33-9093), which is projected to have 52 annual job openings over the next five years and pays workers and entry-level hourly earnings of \$22.82 and \$25.50 per hour at the median.
- **Retail, Hospitality, and Tourism Sector:**
 - *Travel Services and Tourism (3009.00)*
 - This program prepares students for employment as Tour and Travel Guides (39-7018), which is projected to have 134 annual job openings over the next five years and pays workers and entry-level hourly earnings of \$16.56 and \$18.00 per hour at the median.
 - Additionally, this program prepares students for employment as Travel Agents (41-3041), which is projected to have 40 annual job openings over the next five years and pays workers and entry-level hourly earnings of \$16.50 and \$21.15 per hour at the median.

Appendix A: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report are derived from a variety of sources. Data were drawn from external sources, including Lightcast, 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 Lightcast	Lightcast. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast 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 Lightcast earnings by industry: https://lightcast.io .
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/education-and-training-by-occupation.htm .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division, labormarketinfo.edd.ca.gov
Job Posting and Skills Data	Lightcast, https://lightcast.io .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledges, work activities and interests associated with specific occupations: onetonline.org https://www.onetonline.org/ .
K-12 Enrollment and Demographics	The California Department of Education (CDE) collections enrollment and demographic data on students enrolled in the K-12 system in California. https://www.cde.ca.gov/ds/
Community College Enrollment and Demographics	DataVista is a collaboration between the California Community Colleges Chancellor's Office and WestEd. DataVista provides users with detailed student-level program information at California Community Colleges. https://datavista.cccco.edu/

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 aged 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Lightcast formula that includes historical employment and economic indicators along with national, state and local trends.

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

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

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

Race and Ethnicity: The federal government tracks several racial categories (White, Black or African American, Asian, etc.) but only two ethnic categories, Hispanic and Non-Hispanic. There may be some overlap between race and ethnicity unless the two characteristics are clearly separated, e.g., “White Non-Hispanic,” “White Hispanic,” and “Non-White Hispanic.”

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

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

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

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

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

Appendix B: Postsecondary Supply for Each Sector

Exhibit B1. Postsecondary supply for the advanced manufacturing workforce

TOP6 or CIP with Title	College	3-Year Average Awards
092400 - Engineering Technology, General (requires Trigonometry)	Bakersfield	3
	Merced	2
093400 - Electronics and Electric Technology	Bakersfield	29
	Fresno City	124
	Lemoore	5
	Merced	4
	San Joaquin Delta	1
093410 - Computer Electronics	Merced	7
	Modesto	4
093420 - Industrial Electronics	Fresno City	7
	Modesto	19
093500 - Electro-Mechanical Technology	Bakersfield	81
	Fresno City	2
	Modesto	0
	San Joaquin Delta	4
093600 - Printing and Lithography	Fresno City	3
094300 - Instrumentation Technology	Lemoore	1
	Modesto	7
094500 - Industrial Systems Technology and Maintenance	Bakersfield	5
	Clovis	5
	Fresno City	29
	Lemoore	9
	Madera	2
	Merced	2
	Modesto	0
	San Joaquin Delta	1
Sequoias	76	
095340 - Mechanical Drafting	Merced	4
	San Joaquin Delta	8
	Sequoias	4
095600 - Manufacturing and Industrial Technology	Bakersfield	4
	Fresno City	50
	Madera	6
	Modesto	12

TOP6 or CIP with Title	College	3-Year Average Awards
	Porterville	1
	Reedley	44
095630 - Machining and Machine Tools	Madera	2
	Modesto	14
	Reedley	10
	San Joaquin Delta	2
095650 - Welding Technology	Bakersfield	15
	Cerro Coso	31
	Coalinga	14
	Columbia	7
	Fresno City	49
	Madera	8
	Merced	125
	Modesto	38
	Reedley	30
	San Joaquin Delta	35
	Sequoias	26
	Taft	6
	095670 - Industrial and Occupational Safety and Health	Bakersfield
Taft		6
099900 - Other Engineering and Related Industrial Technologies	Taft	0
130330 - Fashion Production	San Joaquin Delta	1
15.0406 - Automation Engineer Technology/Technician	Institute of Technology	13
47.0303 - Industrial Mechanics and Maintenance Technology/Technician	San Joaquin Valley College-Bakersfield	7
	San Joaquin Valley College-Fresno	0
	San Joaquin Valley College-Modesto	51
	San Joaquin Valley College-Trades Education Center	6
	San Joaquin Valley College-Visalia	23
48.0508 - Welding Technology/Welder	Advanced Career Institute	170
	Institute of Technology	26
Grand Total		1,295

Exhibit B2. Postsecondary supply for the advanced transportation and logistics workforce

TOP6 or CIP with Title	College	3-Year Average Awards
051000 - Logistics and Materials Transportation	Bakersfield	9
	Modesto	6
	San Joaquin Delta	5
094700 - Diesel Technology	Fresno City	1
	San Joaquin Delta	10
094720 - Heavy Equipment Maintenance	San Joaquin Delta	64
094730 - Heavy Equipment Operation	Coalinga	11
094750 - Truck and Bus Driving	Coalinga	2
094800 - Automotive Technology	Bakersfield	87
	Columbia	12
	Fresno City	11
	Merced	76
	Modesto	18
	Reedley	34
	San Joaquin Delta	67
	Sequoias	145
094900 - Automotive Collision Repair	Fresno City	23
	Modesto	29
	San Joaquin Delta	6
095000 - Aeronautical and Aviation Technology	Reedley	39
095010 - Aviation Airframe Mechanics	Reedley	14
095020 - Aviation Powerplant Mechanics	Reedley	10
302020 - Piloting	Reedley	1
47.0604 - Automobile/Automotive Mechanics Technology/Technician	UEI College-Bakersfield	111
47.0607 - Airframe Mechanics and Aircraft Maintenance Technology/Technician	California Aeronautical University	5
	San Joaquin Valley College-Trades Education Center	41
49.0102 - Airline/Commercial/Professional Pilot and Flight Crew	California Aeronautical University	1
49.0205 - Truck and Bus Driver/Commercial Vehicle Operator and Instructor	Advanced Career Institute	1,227
Grand Total		2,063

Exhibit B3. Postsecondary supply for the agriculture, water, and environmental technologies workforce

TOP6 or CIP with Title	College	3-Year Average Awards
010100 - Agriculture Technology and Sciences, General	Coalinga	39
	Merced	11
	Modesto	14
	Porterville	5
	Reedley	2
010200 - Animal Science	Bakersfield	30
	Merced	17
	Modesto	20
	Reedley	21
	San Joaquin Delta	1
	Sequoias	34
010210 - Veterinary Technician (Licensed)	Modesto	57
010220 - Artificial Inseminator (Licensed)	Modesto	7
010230 - Dairy Science	Modesto	5
	Sequoias	2
010240 - Equine Science	Merced	1
	Modesto	5
	Reedley	5
	Sequoias	4
010300 - Plant Science	Bakersfield	13
	Coalinga	43
	Madera	4
	Merced	13
	Modesto	10
	Reedley	102
	San Joaquin Delta	2
Sequoias	14	
010310 - Agricultural Pest Control Adviser and Operator (Licensed)	Coalinga	1
010400 - Viticulture, Enology, and Wine Business	Reedley	0
010900 - Horticulture	Bakersfield	3
	Madera	0
	Merced	5
	Modesto	2
	San Joaquin Delta	3
	Sequoias	3
010910 - Landscape Design and Maintenance	San Joaquin Delta	2

TOP6 or CIP with Title	College	3-Year Average Awards
	Sequoias	3
010920 - Floriculture /Floristry	Modesto	1
	Sequoias	0
010930 - Nursery Technology	Modesto	0
	San Joaquin Delta	1
011200 - Agriculture Business, Sales and Service	Bakersfield	96
	Lemoore	1
	Madera	3
	Merced	34
	Modesto	25
	Porterville	7
	Reedley	76
	San Joaquin Delta	3
011300 - Food Processing and Related Technologies	Sequoias	16
	Bakersfield	5
	Coalinga	1
011400 - Forestry	Sequoias	1
	Bakersfield	12
	Columbia	13
011500 - Natural Resources	Reedley	85
	Columbia	15
	Fresno City	7
011510 - Parks and Outdoor Recreation	Reedley	30
	Reedley	7
011600 - Agricultural Power Equipment Technology	Bakersfield	18
	Merced	57
	Modesto	21
	Reedley	207
	San Joaquin Delta	2
019900 - Other Agriculture and Natural Resources	Sequoias	5
	Modesto	5
01.8301 - Veterinary/Animal Health Technology/Technician and Veterinary Assistant	Carrington College-Stockton	23
	San Joaquin Valley College-Bakersfield	52
	San Joaquin Valley College-Fresno	55
	Stellar Career College	14
Grand Total		1,403

Exhibit B4. Postsecondary supply for the business and entrepreneurship workforce

TOP6 or CIP with Title	College	3-Year Average Awards
050100 - Business and Commerce, General	Columbia	2
	Madera	30
	Merced	23
	Porterville	1
	Reedley	73
	San Joaquin Delta	176
	Sequoias	11
	Taft	14
050200 - Accounting	Bakersfield	45
	Clovis	8
	Coalinga	4
	Columbia	2
	Fresno City	38
	Lemoore	8
	Madera	4
	Merced	21
	Modesto	25
	Porterville	2
	Reedley	22
	San Joaquin Delta	90
	Sequoias	21
050210 - Tax Studies	San Joaquin Delta	9
050500 - Business Administration	Bakersfield	234
	Cerro Coso	52
	Coalinga	19
	Clovis	144
	Columbia	14
	Fresno City	204
	Lemoore	55
	Madera	58
	Merced	102
	Modesto	184
	Porterville	41
	Reedley	88
	San Joaquin Delta	123
	Sequoias	114

TOP6 or CIP with Title	College	3-Year Average Awards
	Taft	33
050600 - Business Management	Cerro Coso	4
	Clovis	1
	Coalinga	9
	Columbia	8
	Fresno City	32
	Lemoore	18
	Modesto	18
	Porterville	5
	Reedley	54
050630 - Management Development and Supervision	Merced	37
	Modesto	4
	San Joaquin Delta	4
	Taft	3
050640 - Small Business and Entrepreneurship	Bakersfield	32
	Cerro Coso	1
	Clovis	2
	Columbia	3
	Merced	8
	Modesto	8
	Porterville	2
	Reedley	1
San Joaquin Delta	5	
050800 - International Business and Trade	Modesto	1
050900 - Marketing and Distribution	Bakersfield	0
	Fresno City	14
	Merced	6
	Modesto	3
	San Joaquin Delta	1
050940 - Sales and Salesmanship	Bakersfield	4
051100 - Real Estate	Merced	12
	Modesto	57
	San Joaquin Delta	34
051410 - Legal Office Technology	Fresno City	6
051430 - Court Reporting	Taft	1
051440 - Office Management	Bakersfield	8
	San Joaquin Delta	10

TOP6 or CIP with Title	College	3-Year Average Awards
051800 - Customer Service	Bakersfield	16
059900 - Other Business and Management	Fresno City	0
	San Joaquin Delta	1
140200 - Paralegal	Cerro Coso	24
	Fresno City	54
	Merced	0
	San Joaquin Delta	5
	Sequoias	14
22.0001 - Pre-Law Studies	Humphreys University-Stockton and Modesto Campuses	5
22.0302 - Legal Assistant/Paralegal	Humphreys University-Stockton and Modesto Campuses	4
22.0303 - Court Reporting and Captioning/Court Reporter	Humphreys University-Stockton and Modesto Campuses	1
51.3501 - Massage Therapy/Therapeutic Massage	Carrington College-Stockton	9
	Milan Institute-Bakersfield	15
	Milan Institute-Clovis	3
	Milan Institute-Visalia	17
52.0201 - Business Administration and Management, General	Agape College of Business and Science	2
	Humphreys University-Stockton and Modesto Campuses	3
52.0301 - Accounting	Humphreys University-Stockton and Modesto Campuses	1
52.0302 - Accounting Technology/Technician and Bookkeeping	Stellar Career College	6
52.1001 - Human Resources Management/Personnel Administration, General	San Joaquin Valley College-Visalia	67
Grand Total		2,761

Exhibit B5. Postsecondary supply for the education and human development workforce

TOP6 or CIP with Title	College	3-Year Average Awards
080200 - Educational Aide (Teacher Assistant)	Bakersfield	13
	Fresno City	37
	Modesto	1
	San Joaquin Delta	1
080900 - Special Education	Fresno City	2
	Sequoias	1
	Taft	2
083520 - Fitness Trainer	Fresno City	2
	San Joaquin Delta	2
085010 - Sign Language Interpreting	Bakersfield	5
	Fresno City	2
086000 - Educational Technology	Bakersfield	64
089900 - Other Education	Bakersfield	1
130500 - Child Development/Early Care and Education	Bakersfield	183
	Cerro Coso	80
	Clovis	91
	Coalinga	132
	Columbia	21
	Fresno City	247
	Lemoore	247
	Madera	45
	Merced	89
	Modesto	224
	Porterville	105
	Reedley	98
	San Joaquin Delta	67
	Sequoias	382
Taft	64	
130510 - Child and Adolescent Development	Bakersfield	29
	Clovis	20
	Coalinga	8
	Sequoias	50
130520 - Children with Special Needs	Clovis	0
	Fresno City	7
	Madera	0
	Modesto	9
	Reedley	1
	Sequoias	0
Taft	2	
130540 - Preschool Age Children	San Joaquin Delta	39

TOP6 or CIP with Title	College	3-Year Average Awards
130550 - The School Age Child	Clovis	1
	Reedley	0
130560 - Parenting and Family Education	Merced	0
130570 - Foster and Kinship Care	Fresno City	0
130580 - Child Development Administration and Management	Cerro Coso	5
	Merced	1
	Modesto	7
	San Joaquin Delta	3
130590 - Infants and Toddlers	Fresno City	9
	Merced	2
160200 - Library Technician (Aide)	Fresno City	24
13.0101 - Education, General	Teachers College of San Joaquin	359
13.1210 - Early Childhood Education and Teaching	Humphreys University-Stockton and Modesto Campuses	6
13.1299 - Teacher Education and Professional Development, Specific Levels and Methods, Other	Humphreys University-Stockton and Modesto Campuses	0
Grand Total		2,790

Exhibit B6. Postsecondary supply for the energy, construction, and utilities workforce

TOP6 or CIP with Title	College	3-Year Average Awards
020100 - Architecture and Architectural Technology	Bakersfield	11
	Fresno City	12
	San Joaquin Delta	3
	Sequoias	39
093440 - Electrical Systems and Power Transmission	Sequoias	9
093470 - Electron Microscopy	San Joaquin Delta	13
094600 - Environmental Control Technology (HVAC)	Bakersfield	14
	Coalinga	17
	Fresno City	41
	Merced	19
	San Joaquin Delta	12
	Sequoias	25
095200 - Construction Crafts Technology	Bakersfield	1
	Fresno City	48

TOP6 or CIP with Title	College	3-Year Average Awards
	Sequoias	18
095220 - Electrical	Bakersfield	15
	Merced	23
	Modesto	7
	San Joaquin Delta	50
	Sequoias	65
095230 - Plumbing, Pipefitting and Steamfitting	Bakersfield	9
095250 - Mill and Cabinet Work	Bakersfield	1
095300 - Drafting Technology	Bakersfield	7
	Fresno City	20
	San Joaquin Delta	14
095500 - Laboratory Science Technology	Fresno City	1
095640 - Sheet Metal and Structural Metal	Bakersfield	12
	Modesto	6
095700 - Civil and Construction Management Technology	Bakersfield	7
095720 - Construction Inspection	Sequoias	3
095800 - Water and Wastewater Technology	Clovis	4
	Columbia	7
	Sequoias	4
46.0000 - Construction Trades, General	San Joaquin Valley College-Visalia	0
46.0302 - Electrician	San Joaquin Valley College-Bakersfield	56
	San Joaquin Valley College-Modesto	117
	San Joaquin Valley College-Trades Education Center	66
	UEI College-Bakersfield	116
	UEI College-Stockton	32
47.0201 - Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	DeHart Technical School	54
	Institute of Technology	135
	San Joaquin Valley College-Bakersfield	27
	San Joaquin Valley College-Fresno	3
	San Joaquin Valley College-Trades Education Center	11
	San Joaquin Valley College-Visalia	62
	UEI College-Bakersfield	90

TOP6 or CIP with Title	College	3-Year Average Awards
	UEI College-Fresno	134
	UEI College-Stockton	75
52.2001 - Construction Management, General	San Joaquin Valley College-Visalia	27
Grand Total		1,545

Exhibit B7. Postsecondary supply for the health workforce

TOP6 or CIP with Title	College	3-Year Average Awards
051420 - Medical Office Technology	Fresno City	21
	Madera	10
	Merced	45
	Reedley	21
	San Joaquin Delta	21
120100 - Health Occupations, General	Bakersfield	18
	Columbia	37
	Fresno City	28
	Modesto	58
	San Joaquin Delta	122
	Taft	65
120200 - Hospital and Health Care Administration	Clovis	2
120800 - Medical Assisting	Cerro Coso	11
	Merced	27
	Modesto	92
120810 - Clinical Medical Assisting	Cerro Coso	24
	Fresno City	118
120820 - Administrative Medical Assisting	Cerro Coso	24
	Columbia	3
121000 - Respiratory Care/Therapy	Fresno City	20
	Modesto	31
121800 - Occupational Therapy Technology	Clovis	14
122000 - Speech-Language Pathology and Audiology	Madera	19
	Reedley	2
	San Joaquin Delta	33
122100 - Pharmacy Technology	Sequoias	15
122200 - Physical Therapist Assistant	Bakersfield	4
	Sequoias	24
122300 - Health Information Technology	Bakersfield	11

TOP6 or CIP with Title	College	3-Year Average Awards
	Fresno City	4
122310 - Health Information Coding	Fresno City	10
122500 - Radiologic Technology	Bakersfield	19
	Fresno City	32
	Merced	25
	San Joaquin Delta	2
122700 - Diagnostic Medical Sonography	Merced	5
122800 - Athletic Training and Sports Medicine	Modesto	7
	Sequoias	5
123010 - Registered Nursing	Bakersfield	156
	Fresno City	226
	Lemoore	36
	Madera	11
	Merced	52
	Modesto	92
	Porterville	19
	San Joaquin Delta	121
Sequoias	91	
123020 - Licensed Vocational Nursing	Bakersfield	18
	Cerro Coso	27
	Madera	36
	Merced	40
	Reedley	1
123030 - Certified Nurse Assistant	Merced	89
	Modesto	26
	Reedley	5
	Sequoias	65
123900 - Psychiatric Technician	Coalinga	25
	Porterville	19
	San Joaquin Delta	63
124010 - Dental Assistant	Fresno City	9
	Reedley	37
124020 - Dental Hygienist	Fresno City	23
	Taft	16
125000 - Emergency Medical Services	Bakersfield	7
	Columbia	2
	Lemoore	2
	Merced	42
	Modesto	15

TOP6 or CIP with Title	College	3-Year Average Awards
	Sequoias	64
125100 - Paramedic	Bakersfield	33
	Fresno City	12
	Lemoore	19
	Merced	1
126000 - Health Professions, Transfer Core Curriculum	Coalinga	34
	Fresno City	380
	Lemoore	116
	Merced	78
126100 - Community Health Care Worker	Bakersfield	9
130620 - Dietetic Services and Management	Bakersfield	6
	Fresno City	0
	Merced	6
130900 - Gerontology	Fresno City	5
	Modesto	5
210400 - Human Services	Bakersfield	33
	Cerro Coso	15
	Columbia	4
	Fresno City	54
	Madera	2
	Merced	5
	Modesto	28
	San Joaquin Delta	5
Sequoias	14	
210440 - Alcohol and Controlled Substances	Cerro Coso	1
	Fresno City	43
	Merced	0
	Modesto	9
	San Joaquin Delta	10
51.0000 - Health Services/Allied Health/Health Sciences, General	San Joaquin Valley College-Visalia	2
51.0601 - Dental Assisting/Assistant	Carrington College-Stockton	54
	Milan Institute-Merced	20
	Milan Institute-Visalia	26
	San Joaquin Valley College-Bakersfield	32
	San Joaquin Valley College-Fresno	38
	San Joaquin Valley College-Visalia	53

TOP6 or CIP with Title	College	3-Year Average Awards
	Stellar Career College	2
	UEI College-Bakersfield	90
	UEI College-Fresno	114
	UEI College-Stockton	82
51.0602 - Dental Hygiene/Hygienist	San Joaquin Valley College-Visalia	28
51.0705 - Medical Office Management/Administration	Agape College of Business and Science	1
51.0706 - Health Information/Medical Records Administration/Administrator	Institute of Technology	68
51.0710 - Medical Office Assistant/Specialist	Clovis Adult Education	14
	San Joaquin Valley College-Bakersfield	16
	San Joaquin Valley College-Delano	12
	San Joaquin Valley College-Fresno	11
	San Joaquin Valley College-Hanford Classroom	11
	San Joaquin Valley College-Madera	10
	San Joaquin Valley College-Modesto	11
	San Joaquin Valley College-Porterville	14
	San Joaquin Valley College-Visalia	16
	UEI College-Stockton	44
51.0713 - Medical Insurance Coding Specialist/Coder	Glendale Career College-North-West College-Bakersfield	1
	San Joaquin Valley College-Visalia	215
	UEI College-Bakersfield	66
	UEI College-Fresno	0
51.0714 - Medical Insurance Specialist/Medical Biller	Carrington College-Stockton	12
51.0716 - Medical Administrative/Executive Assistant and Medical Secretary	Carrington College-Stockton	4
	Milan Institute-Merced	12
	Milan Institute-Visalia	23
	Stellar Career College	5
51.0801 - Medical/Clinical Assistant	Agape College of Business and Science	11
	California Institute of Medical Science	7

TOP6 or CIP with Title	College	3-Year Average Awards
	Carrington College-Stockton	93
	Clovis Adult Education	5
	Glendale Career College- North-West College- Bakersfield	6
	Institute of Technology	132
	Milan Institute-Bakersfield	2
	Milan Institute-Clovis	8
	Milan Institute-Merced	51
	Milan Institute-Visalia	62
	San Joaquin Valley College- Bakersfield	75
	San Joaquin Valley College- Delano	48
	San Joaquin Valley College- Fresno	92
	San Joaquin Valley College- Hanford Classroom	50
	San Joaquin Valley College- Madera	44
	San Joaquin Valley College- Modesto	102
	San Joaquin Valley College- Porterville	48
	San Joaquin Valley College- Visalia	183
	Stellar Career College	8
	UEI College-Bakersfield	271
	UEI College-Fresno	286
	UEI College-Stockton	220
51.0802 - Clinical/Medical Laboratory Assistant	California Institute of Medical Science	24
51.0805 - Pharmacy Technician/Assistant	Carrington College-Stockton	22
	Glendale Career College- North-West College- Bakersfield	1
	Institute of Technology	15
	San Joaquin Valley College- Bakersfield	25
	San Joaquin Valley College- Fresno	15
	San Joaquin Valley College- Modesto	31
	San Joaquin Valley College- Visalia	32

TOP6 or CIP with Title	College	3-Year Average Awards
	UEI College-Bakersfield	48
	UEI College-Fresno	66
51.0806 - Physical Therapy Assistant	Institute of Technology	55
51.0908 - Respiratory Care Therapy/Therapist	San Joaquin Valley College-Bakersfield	55
	San Joaquin Valley College-Visalia	60
51.0909 - Surgical Technology/Technologist	Glendale Career College-North-West College-Bakersfield	1
	San Joaquin Valley College-Bakersfield	17
	San Joaquin Valley College-Fresno	24
51.0910 - Diagnostic Medical Sonography/Sonographer and Ultrasound Technician	San Joaquin Valley College-Bakersfield	30
51.1009 - Phlebotomy Technician/Phlebotomist	Agape College of Business and Science	4
	California Institute of Medical Science	0
51.1012 - Sterile Processing Technology/Technician	Stellar Career College	1
51.2602 - Home Health Aide/Home Attendant	Clovis Adult Education	6
51.3801 - Registered Nursing/Registered Nurse	Glendale Career College-North-West College-Bakersfield	0
	San Joaquin Valley College-Visalia	59
	Xavier College School of Nursing	19
51.3901 - Licensed Practical/Vocational Nurse Training	Clovis Adult Education	58
	San Joaquin Valley College-Bakersfield	32
	San Joaquin Valley College-Visalia	35
	Xavier College School of Nursing	53
51.3902 - Nursing Assistant/Aide and Patient Care Assistant/Aide	Agape College of Business and Science	1
	Clovis Adult Education	54
	Institute of Technology	31
51.3999 - Practical Nursing, Vocational Nursing and Nursing Assistants, Other	Institute of Technology	244
Grand Total		7,422

Exhibit B8. Postsecondary supply for the information and communications technologies/digital media workforce

TOP6 or CIP with Title	College	3-Year Average Awards
051400 - Office Technology/Office Computer Applications	Bakersfield	13
	Cerro Coso	12
	Coalinga	3
	Fresno City	13
	Lemoore	1
	Madera	11
	Merced	90
	Modesto	43
	Reedley	46
	San Joaquin Delta	19
	Taft	4
060200 - Journalism	Bakersfield	11
	Fresno City	9
	San Joaquin Delta	3
	Sequoias	5
060400 - Radio and Television	San Joaquin Delta	2
061000 - Mass Communications	San Joaquin Delta	2
061220 - Film Production	Porterville	4
061400 - Digital Media	Cerro Coso	21
	Columbia	2
	Fresno City	1
	Merced	5
	San Joaquin Delta	10
061410 - Multimedia	Bakersfield	13
	San Joaquin Delta	3
061430 - Website Design and Development	Bakersfield	2
	Cerro Coso	6
	Clovis	4
061460 - Computer Graphics and Digital Imagery	Modesto	33
070100 - Information Technology, General	Bakersfield	1
	Cerro Coso	1
	Lemoore	0
	Merced	5
	Modesto	8
	Porterville	9

TOP6 or CIP with Title	College	3-Year Average Awards
	Reedley	5
	San Joaquin Delta	1
070200 - Computer Information Systems	Cerro Coso	65
	Clovis	1
	Columbia	0
	Fresno City	35
	Merced	20
	Porterville	5
	Reedley	6
	San Joaquin Delta	19
	Sequoias	9
070210 - Software Applications	Coalinga	5
	Lemoore	19
	Modesto	1
	San Joaquin Delta	0
070700 - Computer Software Development	Clovis	3
	Lemoore	1
070710 - Computer Programming	Clovis	3
	Columbia	4
	Lemoore	3
	Merced	1
	Modesto	4
	Reedley	25
	San Joaquin Delta	1
070730 - Computer Systems Analysis	Merced	1
070800 - Computer Infrastructure and Support	Bakersfield	6
	Lemoore	2
	Modesto	6
070810 - Computer Networking	Cerro Coso	32
	Clovis	10
	Fresno City	21
	Lemoore	3
	Merced	3
	Modesto	6
	Reedley	5
	San Joaquin Delta	27
Sequoias	18	

TOP6 or CIP with Title	College	3-Year Average Awards
070820 - Computer Support	Clovis	2
	Madera	1
	Reedley	6
070900 - World Wide Web Administration	Fresno City	9
093430 - Telecommunications Technology	Fresno City	8
100500 - Commercial Music	Bakersfield	16
	Clovis	2
	Fresno City	18
	Modesto	9
	Sequoias	5
101200 - Applied Photography	Bakersfield	7
	Fresno City	46
	Merced	1
	Modesto	3
	San Joaquin Delta	1
101300 - Commercial Art	Porterville	3
103000 - Graphic Art and Design	Bakersfield	16
	Fresno City	21
	San Joaquin Delta	15
	Sequoias	6
220610 - Geographic Information Systems	Columbia	14
11.0101 - Computer and Information Sciences, General	Milan Institute-Visalia	3
11.0103 - Information Technology	San Joaquin Valley College-Visalia	60
52.0401 - Administrative Assistant and Secretarial Science, General	Clovis Adult Education	9
	Milan Institute-Visalia	4
	Stellar Career College	0
52.0408 - General Office Occupations and Clerical Services	Agape College of Business and Science	1
	San Joaquin Valley College-Bakersfield	13
	San Joaquin Valley College-Delano	4
	San Joaquin Valley College-Fresno	9
	San Joaquin Valley College-Hanford Classroom	4
	San Joaquin Valley College-Madera	3

TOP6 or CIP with Title	College	3-Year Average Awards
	San Joaquin Valley College-Modesto	5
	San Joaquin Valley College-Porterville	6
	San Joaquin Valley College-Visalia	44
	UEI College-Bakersfield	36
	UEI College-Fresno	20
	UEI College-Stockton	31
Grand Total		1,254

Exhibit B9. Postsecondary supply for the public safety workforce

TOP6 or CIP with Title	College	3-Year Average Awards
210500 - Administration of Justice	Bakersfield	182
	Cerro Coso	28
	Clovis	50
	Coalinga	21
	Fresno City	144
	Lemoore	55
	Madera	31
	Merced	73
	Modesto	97
	Porterville	36
	Reedley	58
	San Joaquin Delta	95
	Sequoias	103
Taft	33	
210510 - Corrections	Bakersfield	2
	Clovis	1
	Coalinga	5
	Fresno City	10
	Lemoore	11
	Madera	2
	Reedley	10
	San Joaquin Delta	8
	Sequoias	7
Taft	0	
210540 - Forensics, Evidence, and Investigation	Fresno City	2

TOP6 or CIP with Title	College	3-Year Average Awards
210550 - Police Academy	Fresno City	20
	Porterville	11
	San Joaquin Delta	39
	Sequoias	57
213300 - Fire Technology	Bakersfield	54
	Columbia	50
	Fresno City	36
	Merced	6
	Modesto	30
	Porterville	5
	Reedley	9
	Sequoias	17
213310 - Wildland Fire Technology	Bakersfield	1
	Reedley	2
213350 - Fire Academy	Bakersfield	0
	Fresno City	45
	Modesto	27
	Sequoias	32
219900 - Other Public and Protective Services	Porterville	8
43.0102 - Corrections	Carrington College-Stockton	1
	San Joaquin Valley College-Bakersfield	8
	San Joaquin Valley College-Fresno	7
	San Joaquin Valley College-Modesto	9
	San Joaquin Valley College-Visalia	17
43.0103 - Criminal Justice/Law Enforcement Administration	Humphreys University-Stockton and Modesto Campuses	6
43.0107 - Criminal Justice/Police Science	Institute of Technology	22
43.0109 - Security and Loss Prevention Services	UEI College-Bakersfield	30
	UEI College-Fresno	43
	UEI College-Stockton	0
Grand Total		1,659

Exhibit B10. Postsecondary supply for the retail, hospitality, and tourism workforce

TOP6 or CIP with Title	College	3-Year Average Awards
050650 - Retail Store Operations and Management	Bakersfield	0
	Coalinga	8
	Fresno City	45
	Lemoore	10
	Modesto	2
	San Joaquin Delta	4
100600 - Technical Theater	Fresno City	3
	Modesto	1
	San Joaquin Delta	2
130200 - Interior Design and Merchandising	San Joaquin Delta	7
130300 - Fashion	Sequoias	12
130310 - Fashion Design	San Joaquin Delta	2
	Sequoias	9
130320 - Fashion Merchandising	Fresno City	4
	San Joaquin Delta	3
	Sequoias	10
130600 - Nutrition, Foods, and Culinary Arts	Bakersfield	7
	Clovis	0
	Columbia	1
	Fresno City	6
	Merced	4
	Sequoias	2
130630 - Culinary Arts	Bakersfield	23
	Columbia	24
	Fresno City	2
	Lemoore	4
	Merced	5
	San Joaquin Delta	22
	Sequoias	22
130700 - Hospitality	Lemoore	4
130710 - Restaurant and Food Services and Management	Columbia	5
	Fresno City	5
	Lemoore	16
130720 - Lodging Management	Lemoore	1
130730 - Resort and Club Management	Lemoore	4
300700 - Cosmetology and Barbering	Sequoias	0

TOP6 or CIP with Title	College	3-Year Average Awards
12.0401 - Cosmetology/Cosmetologist, General	Adrian's Beauty College of Turlock	25
	California Beauty School	9
	California College of Barbering and Cosmetology	37
	Estes Institute of Cosmetology Arts and Science	22
	Institute of Technology	16
	Lawrence & Company College of Cosmetology	36
	Lyle's College of Beauty	9
	Lyle's College of Beauty	18
	Milan Institute-Bakersfield	75
	Milan Institute-Clovis	42
	Milan Institute-Merced	28
	Milan Institute-Visalia	68
	North Adrian's College of Beauty Inc	53
	Paul Mitchell the School-Fresno	94
	Paul Mitchell the School-Modesto	73
12.0402 - Barbering/Barber	Princess Institute of Beauty	20
	Sierra College of Beauty	22
	California College of Barbering and Cosmetology	32
	Central Valley Barber College	25
	Institute of Technology	19
	Lawrence & Company College of Cosmetology	5
	Milan Institute-Bakersfield	10
	Milan Institute-Clovis	39
	Milan Institute-Merced	8
	North Adrian's College of Beauty Inc	10
	Paul Mitchell the School-Fresno	21
Paul Mitchell the School-Modesto	19	
Sierra College of Beauty	16	
12.0409 - Aesthetician/Esthetician and Skin Care Specialist	Adrian's Beauty College of Turlock	20

TOP6 or CIP with Title	College	3-Year Average Awards
	California Beauty School	32
	California College of Barbering and Cosmetology	99
	Lawrence & Company College of Cosmetology	17
	Lyle's College of Beauty	20
	Lyle's College of Beauty	25
	Milan Institute-Bakersfield	106
	Milan Institute-Clovis	254
	Milan Institute-Merced	39
	Milan Institute-Visalia	27
	North Adrian's College of Beauty Inc	31
	Paul Mitchell the School-Modesto	143
	Princess Institute of Beauty	8
	Sierra College of Beauty	39
12.0410 - Nail Technician/Specialist and Manicurist	Adrian's Beauty College of Turlock	18
	California Beauty School	15
	California College of Barbering and Cosmetology	40
	Estes Institute of Cosmetology Arts and Science	20
	Lawrence & Company College of Cosmetology	27
	Lyle's College of Beauty	41
	Lyle's College of Beauty	34
	Milan Institute-Bakersfield	11
	Milan Institute-Clovis	7
	Milan Institute-Merced	2
	Milan Institute-Visalia	9
	North Adrian's College of Beauty Inc	17
	Paul Mitchell the School-Modesto	34
Princess Institute of Beauty	11	
Sierra College of Beauty	19	
12.0413 - Cosmetology, Barber/Styling, and Nail Instructor	Adrian's Beauty College of Turlock	0
	California College of Barbering and Cosmetology	1

TOP6 or CIP with Title	College	3-Year Average Awards
	Lyle's College of Beauty	0
	North Adrian's College of Beauty Inc	0
12.0501 - Baking and Pastry Arts/Baker/Pastry Chef	Institute of Technology	33
Grand Total		2,328

Appendix C: Occupational Requirements and Educational Attainment for the Top Occupations in Each Sector

Exhibit C1. Advanced manufacturing educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Chemical Technicians	Associate's degree	None	Moderate-term on-the-job training	36.3%
Computer, Automated Teller, and Office Machine Repairers	Some college, no degree	None	Short-term on-the-job training	48.2%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	High school diploma or equivalent	None	Moderate-term on-the-job training	24.5%
Electrical and Electronic Engineering Technologists and Technicians	Associate's degree	None	None	56.9%
Electrical and Electronics Repairers, Commercial and Industrial Equipment	Postsecondary nondegree award	None	Long-term on-the-job training	51.9%
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	High school diploma or equivalent	None	Moderate-term on-the-job training	31.3%
Engineering Technologists and Technicians, Except Drafters, All Other	Associate's degree	None	None	48.5%
First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	Less than 5 years	None	35.1%
Industrial Machinery Mechanics	High school diploma or equivalent	None	Long-term on-the-job training	43.2%
Inspectors, Testers, Sorters, Samplers, and Weighers	High school diploma or equivalent	None	Moderate-term on-the-job training	37.6%
Machinists	High school diploma or equivalent	None	Long-term on-the-job training	40.3%
Maintenance Workers, Machinery	High school diploma or equivalent	None	Long-term on-the-job training	37.7%
Molders, Shapers, and Casters, Except Metal and Plastic	High school diploma or equivalent	None	Long-term on-the-job training	25.9%
Printing Press Operators	High school diploma or equivalent	None	Moderate-term on-the-job training	33.2%

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	None	Moderate-term on-the-job training	30.8%

Exhibit C2. Advanced transportation and logistics educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Aircraft Mechanics and Service Technicians	Postsecondary nondegree award	None	None	57.3%
Automotive Body and Related Repairers	High school diploma or equivalent	None	Long-term on-the-job training	23.8%
Automotive Service Technicians and Mechanics	Postsecondary nondegree award	None	Short-term on-the-job training	35.7%
Bus and Truck Mechanics and Diesel Engine Specialists	High school diploma or equivalent	None	Long-term on-the-job training	37.5%
Bus Drivers, Transit and Intercity	High school diploma or equivalent	None	Moderate-term on-the-job training	39.2%
Cargo and Freight Agents	High school diploma or equivalent	None	Short-term on-the-job training	40.0%
Commercial Pilots	High school diploma or equivalent	None	Moderate-term on-the-job training	18.6%
First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	Less than 5 years	None	43.3%
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	High school diploma or equivalent	Less than 5 years	None	37.7%
Heavy and Tractor-Trailer Truck Drivers	Postsecondary nondegree award	None	Short-term on-the-job training	29.8%
Logisticians	Bachelor's degree	None	None	32.7%
Outdoor Power Equipment and Other Small Engine Mechanics	High school diploma or equivalent	None	Moderate-term on-the-job training	33.2%
Railroad Conductors and Yardmasters	High school diploma or equivalent	None	Moderate-term on-the-job training	43.1%

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Recreational Vehicle Service Technicians	High school diploma or equivalent	None	Long-term on-the-job training	27.8%
Transportation, Storage, and Distribution Managers	High school diploma or equivalent	5 years or more	None	34.5%

Exhibit C3. Agriculture, water, and environmental technologies educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Agricultural Inspectors	Bachelor's degree	None	Moderate-term on-the-job training	25.2%
Agricultural Technicians	Associate's degree	None	Moderate-term on-the-job training	41.1%
Animal Trainers	High school diploma or equivalent	None	Moderate-term on-the-job training	33.7%
Environmental Science and Protection Technicians, Including Health	Associate's degree	None	None	34.7%
Farm Equipment Mechanics and Service Technicians	High school diploma or equivalent	None	Long-term on-the-job training	39.3%
Farm Equipment Mechanics and Service Technicians	High school diploma or equivalent	None	Long-term on-the-job training	39.3%
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	5 years or more	None	29.5%
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High school diploma or equivalent	Less than 5 years	None	23.8%
Food Science Technicians	Associate's degree	None	Moderate-term on-the-job training	41.1%
Forest and Conservation Technicians	Associate's degree	None	None	32.5%
Forest and Conservation Workers	High school diploma or equivalent	None	Moderate-term on-the-job training	19.7%
Hazardous Materials Removal Workers	High school diploma or equivalent	None	Moderate-term on-the-job training	34.0%

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Mobile Heavy Equipment Mechanics, Except Engines	High school diploma or equivalent	None	Long-term on-the-job training	39.3%
Pesticide Handlers, Sprayers, and Applicators, Vegetation	High school diploma or equivalent	None	Moderate-term on-the-job training	25.5%
Veterinary Assistants and Laboratory Animal Caretakers	High school diploma or equivalent	None	Short-term on-the-job training	45.9%
Veterinary Technologists and Technicians	Associate's degree	None	None	58.3%

Exhibit C4. Business and entrepreneurship educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Administrative Services Managers	Bachelor's degree	Less than 5 years	None	33.0%
Bookkeeping, Accounting, and Auditing Clerks	Some college, no degree	None	Moderate-term on-the-job training	49.4%
Court, Municipal, and License Clerks	High school diploma or equivalent	None	Long-term on-the-job training	45.6%
Customer Service Representatives	High school diploma or equivalent	None	Short-term on-the-job training	41.6%
First-Line Supervisors of Non-Retail Sales Workers	High school diploma or equivalent	Less than 5 years	None	30.9%
First-Line Supervisors of Office and Administrative Support Workers	High school diploma or equivalent	Less than 5 years	None	40.0%
General and Operations Managers	Bachelor's degree	5 years or more	None	33.4%
Insurance Sales Agents	High school diploma or equivalent	None	Moderate-term on-the-job training	35.4%
Paralegals and Legal Assistants	Associate's degree	None	None	40.3%
Payroll and Timekeeping Clerks	High school diploma or equivalent	None	Moderate-term on-the-job training	47.1%
Property, Real Estate, and Community Association Managers	High school diploma or equivalent	Less than 5 years	None	33.4%

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Real Estate Sales Agents	High school diploma or equivalent	None	Moderate-term on-the-job training	33.7%
Receptionists and Information Clerks	High school diploma or equivalent	None	Short-term on-the-job training	45.6%
Sales and Related Workers, All Other	High school diploma or equivalent	None	None	31.1%
Tellers	High school diploma or equivalent	None	Short-term on-the-job training	42.9%

Exhibit C5. Energy, construction, and utilities educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Cabinetmakers and Bench Carpenters	High school diploma or equivalent	None	Moderate-term on-the-job training	25.2%
Carpenters	High school diploma or equivalent	None	Apprenticeship	24.1%
Construction and Building Inspectors	High school diploma or equivalent	5 years or more	Moderate-term on-the-job training	41.6%
Electricians	High school diploma or equivalent	None	Apprenticeship	45.6%
First-Line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	5 years or more	None	29.0%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Postsecondary nondegree award	None	Long-term on-the-job training	43.9%
Installation, Maintenance, and Repair Workers, All Other	High school diploma or equivalent	None	Moderate-term on-the-job training	35.7%
Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	None	Moderate-term on-the-job training	24.1%
Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	None	Apprenticeship	33.9%
Security and Fire Alarm Systems Installers	High school diploma or equivalent	None	Moderate-term on-the-job training	42.2%

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Sheet Metal Workers	High school diploma or equivalent	None	Apprenticeship	31.9%
Solar Photovoltaic Installers	High school diploma or equivalent	None	Moderate-term on-the-job training	37.5%
Stationary Engineers and Boiler Operators	High school diploma or equivalent	None	Long-term on-the-job training	37.4%
Telecommunications Equipment Installers and Repairers, Except Line Installers	Postsecondary nondegree award	None	Moderate-term on-the-job training	49.8%
Water and Wastewater Treatment Plant and System Operators	High school diploma or equivalent	None	Long-term on-the-job training	43.1%

Exhibit C6. Education educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Childcare Workers	High school diploma or equivalent	None	Short-term on-the-job training	35.5%
Interpreters and Translators	Bachelor's degree	None	None	31.1%
Kindergarten Teachers, Except Special Education	Bachelor's degree	None	None	29.7%
Library Technicians	Postsecondary nondegree award	None	None	26.6%
Preschool Teachers, Except Special Education	Associate's degree	None	None	29.7%
Teaching Assistants, Except Postsecondary	Some college, no degree	None	None	35.6%
Teaching Assistants, Postsecondary	Bachelor's degree	None	None	35.6%

Exhibit C7. Health educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Dental Assistants	Postsecondary nondegree award	None	None	56.7%
Emergency Medical Technicians	Postsecondary nondegree award	None	None	58.2%
Health Technologists and Technicians, All Other	Postsecondary nondegree award	None	None	45.6%
Healthcare Support Workers, All Other	High school diploma or equivalent	None	None	42.4%
Home Health and Personal Care Aides	High school diploma or equivalent	None	Short-term on-the-job training	33.6%
Licensed Practical and Licensed Vocational Nurses	Postsecondary nondegree award	None	None	73.0%
Massage Therapists	Postsecondary nondegree award	None	None	51.0%
Medical Assistants	Postsecondary nondegree award	None	None	62.5%
Medical Secretaries and Administrative Assistants	High school diploma or equivalent	None	Moderate-term on-the-job training	50.9%
Nursing Assistants	Postsecondary nondegree award	None	None	43.1%
Pharmacy Technicians	High school diploma or equivalent	None	Moderate-term on-the-job training	52.2%
Phlebotomists	Postsecondary nondegree award	None	None	59.6%
Psychiatric Technicians	Postsecondary nondegree award	Less than 5 years	Short-term on-the-job training	40.2%
Registered Nurses	Bachelor's degree	None	None	30.5%
Social and Human Service Assistants	High school diploma or equivalent	None	Short-term on-the-job training	32.1%

Exhibit C8. ICT/digital media educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Audio and Video Technicians	Postsecondary nondegree award	None	Short-term on-the-job training	41.0%
Audiovisual Equipment Installers and Repairers	Postsecondary nondegree award	None	Short-term on-the-job training	48.4%
Computer Network Support Specialists	Associate's degree	None	None	38.9%
Computer User Support Specialists	Some college, no degree	None	None	38.9%
Data Entry Keyers	High school diploma or equivalent	None	Short-term on-the-job training	45.0%
Executive Secretaries and Executive Administrative Assistants	High school diploma or equivalent	Less than 5 years	None	42.1%
Network and Computer Systems Administrators	Bachelor's degree	None	None	37.6%
Office Clerks, General	High school diploma or equivalent	None	Short-term on-the-job training	43.0%
Photographers	High school diploma or equivalent	None	Moderate-term on-the-job training	33.4%
Procurement Clerks	High school diploma or equivalent	None	Moderate-term on-the-job training	38.2%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	High school diploma or equivalent	None	Short-term on-the-job training	44.3%
Surveying and Mapping Technicians	High school diploma or equivalent	None	Moderate-term on-the-job training	55.2%
Telecommunications Line Installers and Repairers	High school diploma or equivalent	None	Long-term on-the-job training	47.4%
Web and Digital Interface Designers	Bachelor's degree	None	None	20.9%
Word Processors and Typists	High school diploma or equivalent	None	Short-term on-the-job training	48.5%

Exhibit C9. Public safety educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Correctional Officers and Jailers	High school diploma or equivalent	None	Moderate-term on-the-job training	47.9%
Detectives and Criminal Investigators	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training	28.2%
Firefighters	Postsecondary nondegree award	None	Long-term on-the-job training	58.9%
First-Line Supervisors of Correctional Officers	High school diploma or equivalent	Less than 5 years	None	47.1%
First-Line Supervisors of Firefighting and Prevention Workers	Postsecondary nondegree award	Less than 5 years	Moderate-term on-the-job training	57.1%
First-Line Supervisors of Firefighting and Prevention Workers	Postsecondary nondegree award	Less than 5 years	Moderate-term on-the-job training	57.1%
First-Line Supervisors of Police and Detectives	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training	37.4%
First-Line Supervisors of Security Workers	High school diploma or equivalent	Less than 5 years	None	42.9%
Forensic Science Technicians	Bachelor's degree	None	Moderate-term on-the-job training	32.5%
Gambling Surveillance Officers and Gambling Investigators	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training	40.8%
Police and Sheriff's Patrol Officers	High school diploma or equivalent	None	Moderate-term on-the-job training	45.5%
Private Detectives and Investigators	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training	29.1%
Public Safety Telecommunicators	High school diploma or equivalent	None	Moderate-term on-the-job training	54.0%
Security Guards	High school diploma or equivalent	None	Short-term on-the-job training	40.8%
Transportation Security Screeners	High school diploma or equivalent	None	Short-term on-the-job training	44.0%

Exhibit C10. Retail, hospitality, and tourism educational attainment

Occupation	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training	Current Population Survey (CPS) Community College Educational Attainment
Chefs and Head Cooks	High school diploma or equivalent	5 years or more	None	37.8%
Exercise Trainers and Group Fitness Instructors	High school diploma or equivalent	None	Short-term on-the-job training	27.7%
First-Line Supervisors of Entertainment and Recreation Workers, Except Gambling Services	High school diploma or equivalent	Less than 5 years	None	40.9%
First-Line Supervisors of Food Preparation and Serving Workers	High school diploma or equivalent	Less than 5 years	None	38.4%
First-Line Supervisors of Housekeeping and Janitorial Workers	High school diploma or equivalent	Less than 5 years	None	32.7%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	High school diploma or equivalent	Less than 5 years	None	28.5%
First-Line Supervisors of Personal Service Workers	High school diploma or equivalent	Less than 5 years	None	40.9%
First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	Less than 5 years	None	37.2%
Food Service Managers	High school diploma or equivalent	Less than 5 years	None	36.0%
Hairdressers, Hairstylists, and Cosmetologists	Postsecondary nondegree award	None	None	43.5%
Lodging Managers	High school diploma or equivalent	Less than 5 years	None	33.8%
Manicurists and Pedicurists	Postsecondary nondegree award	None	None	24.2%
Reservation and Transportation Ticket Agents and Travel Clerks	High school diploma or equivalent	None	Short-term on-the-job training	43.2%
Tour and Travel Guides	High school diploma or equivalent	None	Moderate-term on-the-job training	26.9%
Travel Agents	High school diploma or equivalent	None	Moderate-term on-the-job training	38.2%



Important Disclaimers

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. This study examines the most recent data available at the time of the analysis; 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 the report 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.

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