

*North Central Valley/  
Northern Mother Lode*

# Subregional Labor Market Overview

2023

Prepared by the Central Valley/Mother Lode Center of Excellence

POWERED BY



California  
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Colleges



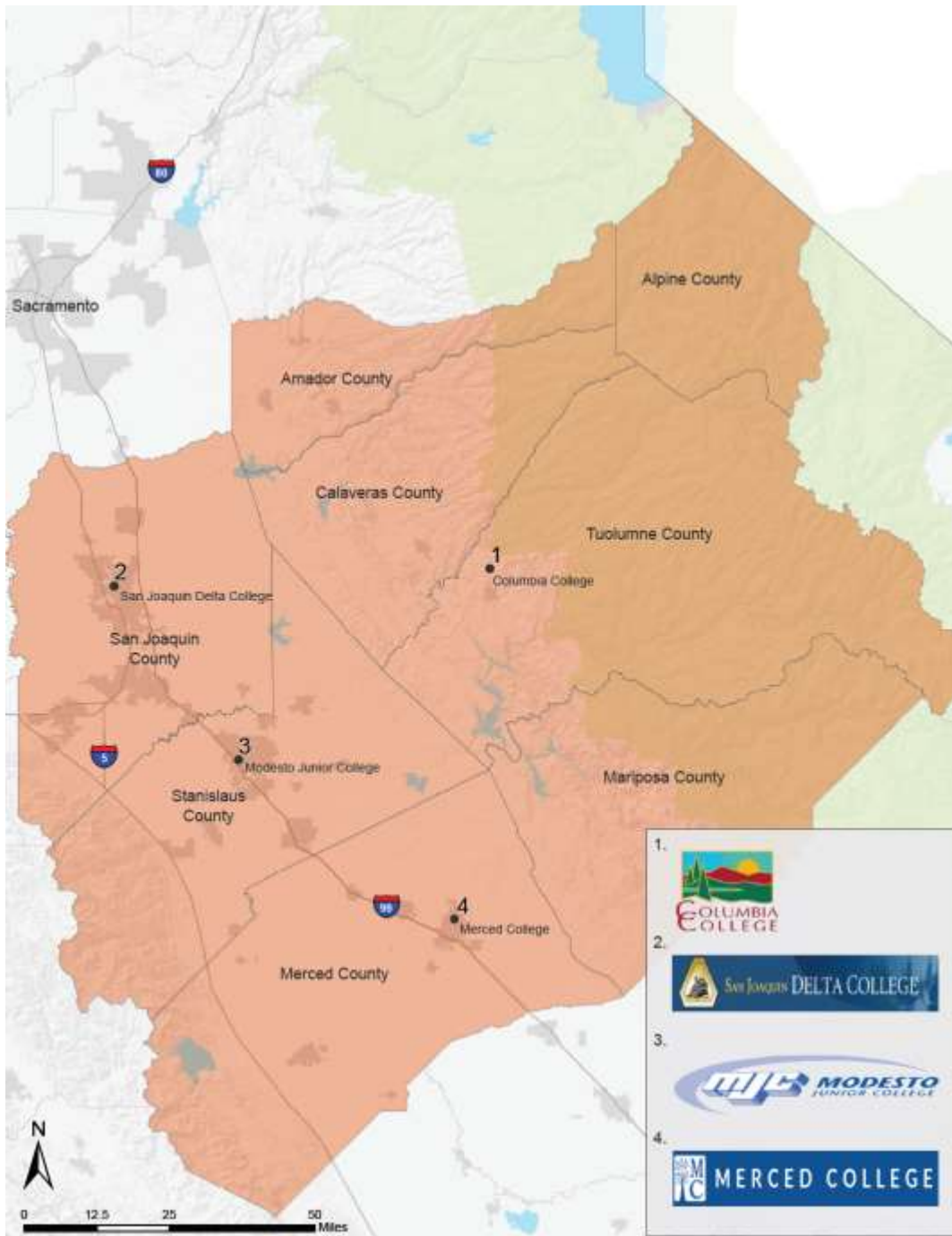
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**Map of community colleges in the North Central Valley/Northern Mother Lode subregion**

# EXECUTIVE SUMMARY

The Central Valley/Mother Lode Center of Excellence has updated its annual report on 10 sectors critical to the North Central Valley/Northern Mother Lode (NCV/NML) subregion's economic vitality. This report examines where future job growth is expected to occur and estimates workforce gaps, i.e., potential shortages of workers to fill middle-skill jobs (occupations requiring some education or training beyond a high school diploma, but less than a bachelor's degree) in each of the 10 sectors. The report examines subregional demographics and educational attainment, and for each sector identifies workforce demographic patterns, promising middle-skill occupations along with their projected demand and wages. For each sector, top job titles, certifications, and specialized skills are also highlighted.

In the subregion, the population is expected to add 88,473 new residents, totaling nearly 1.91 million residents by 2027.

Within the NCV/NML subregion, the 10 sectors are expected to offer nearly 44,387 job openings annually.

A large proportion of middle-skill job openings are expected in the health sector, which will have 9,687 annual openings, and business and entrepreneurship sector, which will have 7,559 annual openings in the subregion. The energy, construction, and utilities sector is expected to offer 5,044 annual openings.

Strategic planning is imperative for these sectors because they lead the subregion in terms of labor market demand. A comparison of community college supply and projected workforce demand shows that these sectors also have the largest supply gap in the subregion, a collective shortage of 18,986 workers. The advanced transportation and logistics sector is of particular concern due to a potential shortage of 4,701 workers. Related programs currently confer the second smallest number of awards (degrees and certificates) in the subregion, a total of 244, after advanced manufacturing, 189.

## Additional Key Findings

On average each year, community colleges in the region confer 6,081 awards in areas related to the 10 sectors. The greatest number of awards are in health care, 2,007, followed by business and entrepreneurship, 971, and retail, hospitality, and tourism, 623.

In addition to sectors with the largest shortage of workers, future planning efforts by the community colleges may take into consideration occupations with the most annual openings in the NCV/NML subregion:

- Heavy and tractor-trailer truck drivers, 2,352 annual openings (advanced transportation and logistics)
- Industrial truck and tractor operators, 1,264 annual openings (energy, construction, and utilities)
- Office clerks, general, 1,252 annual openings (ICT/digital media)
- Teaching assistants, except postsecondary, 1,072 annual openings (business and entrepreneurship)

# INTRODUCTION

The Central Valley/Mother Lode Center of Excellence (CVML COE) conducted a labor market analysis focusing on the two subregions comprising the larger Central Valley/Mother Lode region. This report focuses on the North Central Valley/Northern Mother Lode (NCV/NML) subregion. (A second report focuses on the South Central Valley/Southern Mother Lode subregion.) The community colleges in the subregion are shown at the beginning of this report.

The first half of the report addresses regional population characteristics and the labor force. Analysis of Strong Workforce Program metrics are provided for the subregion, region, and state in the Career Education Outcomes section.

A comparison of the number of postsecondary awards (degrees and certificates) with workforce demand (annual openings) by sector is presented in the Gap Analysis section. This section is intended to help community college leadership assess which workforce areas may be undersupplied in the subregion.

Last, a deep-dive analysis was conducted into the subregion's primary 10 sectors as defined by the California Community Colleges Chancellor's Office (CCCCO). For each sector, the CVML COE highlights:

- The top occupations, their current employment, projected demand, and median wages
- The composition of the sector's workforce in terms of gender and race/ethnicity
- Top job titles, specialized skills, and certifications in job postings

Please note, for the purpose of this report, a sector represents a cluster or grouping of occupations, comprising a segment of one or multiple industries.

For each individual sector analysis, the CVML COE identifies the top 15 or fewer occupations that are both in high demand and that pay a strong median wage. This approach was conducted because by offering training programs that are tailored to job opportunities in occupations that have a solid foundation in terms of employment outlook and earnings, community college can prepare students to access promising career pathways.

## CCCCO Sectors

- Advanced Manufacturing
- Advanced Transportation & Logistics
- Agriculture, Water & Environmental Technologies
- Business & Entrepreneurship
- Education
- Energy, Construction & Utilities
- Health
- ICT/Digital Media
- Public Safety
- Retail, Hospitality & Tourism



# METHODOLOGY

Quantitative data collection and analysis were conducted for this report. Labor market data, particularly secondary data related to workforce demand and occupational employment, informed the report's findings and is derived from the labor market analytics firm Lightcast.

The North American Industry Classification System (NAICS) and the Standard Occupational Classification (SOC) System were used to source data. Occupational projections include annual openings. Replacements can be determined by subtracting annual openings from overall job change. If the change is negative, then all the annual openings are replacements. Appendix A shows annual job openings and median hourly wages for below-middle-skill occupations.

Workforce demographics, such as gender and race/ethnicity composition by sector, are also sourced from Lightcast for each sector profile.<sup>1</sup> The data analysis of race/ethnicity demographics involved calculating percentages of the total for the top 15 occupations within a sector and comparing those percentages with the composition of workers across all sectors. For example, if 46% of workers are white in a sector, but across all sectors 30% of all workers are white, then there is overrepresentation of that demographic. Due to low percentages, the "All Other" category comprises Two or More Races, American Indian/Alaska Native, and Native Hawaiian/Other Pacific Islander.

The average living wage for a single adult in the North Central Valley/Northern Mother Lode (NCV/NML) subregion is \$12.65/hour.<sup>2</sup> Data on top job titles, specialized skills, and certifications is sourced from the job postings aggregator Lightcast for the most commonly occurring occupations among the 15 occupations selected for each sector.

The gap analysis section of this report relies on an evaluation of postsecondary educational supply which counts awards by TOP4 codes from the Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

For more information on data sources and the definition of terms used by this study, please refer to Appendix B.

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<sup>1</sup> Please note: This report uses race and ethnicity data from Lightcast collected by the U.S. Census Bureau through the American Community Survey. This report uses the term Asian American instead of Asian. The race/ethnicity terms in this document, including white, Hispanic, and Black, adhere to the terms and definitions the Census Bureau uses in collecting its data. For definitions, refer to: <https://www.census.gov/topics/population/race/about.html>. Please refer to Appendix A for additional information on definitions.

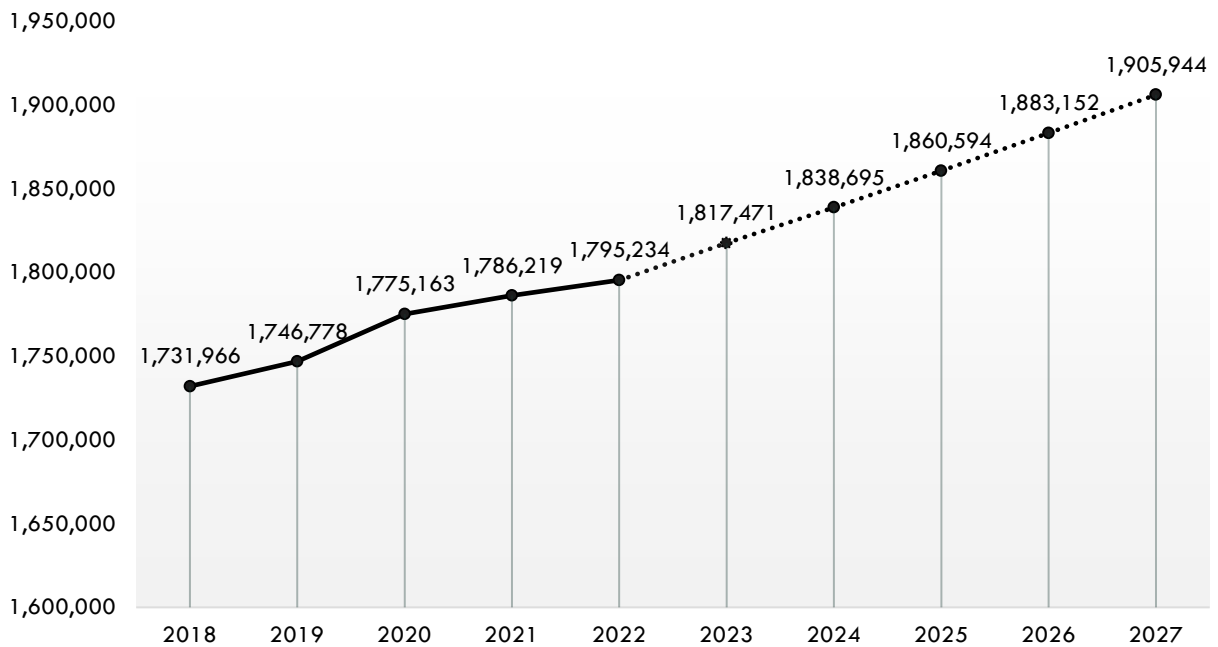
<sup>2</sup> The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

# REGIONAL OVERVIEW

## Residential Population

According to the latest U.S. Census data, the NCV/NML subregion is home to nearly 1.8 million residents (Exhibit 1). Between 2018 and 2022, the region added 63,268 residents. By 2027, the subregion is projected to add 88,473 new residents, totaling nearly 1.91 million residents.

**Exhibit 1. Population estimates and projections in the NCV/NML subregion, 2018-2027**



## Population Demographics

The NCV/NML subregion's gender composition is roughly equivalent to the state. The population is almost equally divided between men and women (Exhibit 2).

**Exhibit 2. Gender composition in the NCV/NML subregion**

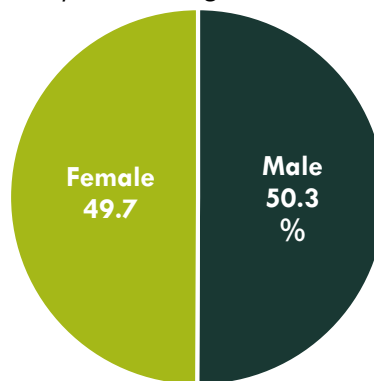


Exhibit 3 shows projected changes in the NCV/NML subregion's race/ethnicity demographics by 2027. The number of individuals identifying as white, non-Hispanic is expected to decline by 89,678 in the subregion by 2025. In the subregion, the most rapid growth is projected to occur among individuals identifying as Asian, Non-Hispanic, 38%; two or more races, Hispanic, 34%; and Native Hawaiian or Pacific Islander, Non-Hispanic, 22% growth. The most substantial population growth by number of residents is projected for:

- White, Hispanic residents, an increase of 153,672 residents, representing 23% growth
- Asian, non-Hispanic residents, an increase of 65,144 residents, 38% growth
- Two or More Races, Non-Hispanic, an increase of 10,886 residents, 21% growth

**Exhibit 3. Projected changes in race/ethnicity in the NCV/NML subregion, 2018-2027**

RACE/ETHNICITY	2018	2027	CHANGE	% CHANGE
White, Hispanic	663,471	817,143	153,672	23%
White, Non-Hispanic	656,941	567,263	(89,678)	(14%)
Asian, Non-Hispanic	169,952	235,096	65,144	38%
Black, Non-Hispanic	78,617	86,330	7,713	10%
Two or More Races, Non-Hispanic	50,705	61,591	10,886	21%
Two or More Races, Hispanic	27,706	37,103	9,397	34%
American Indian or Alaskan Native, Hispanic	27,667	33,151	5,484	20%
Asian, Hispanic	17,745	21,028	3,283	19%
Black, Hispanic	16,603	21,710	5,107	31%
American Indian or Alaskan Native, Non-Hispanic	9,880	9,961	81	1%
Native Hawaiian or Pacific Islander, Non-Hispanic	9,301	11,374	2,073	22%
Native Hawaiian or Pacific Islander, Hispanic	3,378	4,194	816	24%
<b>TOTAL</b>	<b>1,731,966</b>	<b>1,905,944</b>	<b>173,978</b>	<b>10%</b>

For cohorts under age 20, the largest projected increase over the next five years will occur in the 15-to-19 age group, the addition of nearly 9,410 teenagers, followed by the under-5 cohort, the addition of more than 7,600 children (Exhibit 4). There is a projected 5% increase in the 25-to-29 age cohort, an increase of 6,044 adults in the subregion. It is also important to note the impact of baby boomers in the subregion, with some of the highest growth rates occurring in the 70-to-74, 75-to-79, and 80-to-84 age cohorts.



**Exhibit 4. Projected change in age cohorts in the NCV/NML subregion, 2022-2027**

AGE COHORT	2022 POPULATION	2027 POPULATION	CHANGE	% CHANGE	2025 % OF COHORT
Under 5 years	114,755	122,356	7,601	7%	6%
5 to 9 years	128,201	124,347	(3,854)	(3%)	7%
10 to 14 years	135,983	139,372	3,389	2%	7%
15 to 19 years	133,878	143,282	9,404	7%	8%
20 to 24 years	122,934	131,245	8,311	7%	7%
25 to 29 years	119,543	125,587	6,044	5%	7%
30 to 34 years	127,749	124,674	(3,075)	(2%)	7%
35 to 39 years	122,478	140,648	18,170	15%	7%
40 to 44 years	117,901	132,693	14,792	13%	7%
45 to 49 years	103,575	121,807	18,232	18%	6%
50 to 54 years	104,483	105,969	1,486	1%	6%
55 to 59 years	101,079	104,706	3,627	4%	5%
60 to 64 years	99,727	98,138	(1,589)	(2%)	5%
65 to 69 years	86,105	92,654	6,549	8%	5%
70 to 74 years	68,761	75,706	6,945	10%	4%
75 to 79 years	49,637	56,190	6,553	13%	3%
80 to 84 years	29,977	36,435	6,458	22%	2%
85 years and over	28,468	30,133	1,665	6%	2%
<b>TOTAL</b>	<b>1,795,234</b>	<b>1,905,944</b>	<b>110,708</b>	<b>6%</b>	<b>100%</b>

## Educational Attainment

San Joaquin County has the largest number of cohort students, 12,148, in the subregion. San Joaquin county also has the largest number of high school graduates, 10,331. Calaveras County has the highest graduation rate, 92.4%, in the subregion. San Joaquin County has the largest number of graduates who meet UC or CSU requirements, a total of 3,390, and graduates who earned a seal of biliteracy, 937. Stanislaus County has the largest number of graduates who earned a golden state seal merit diploma, 1,843 (Exhibit 5). (Data for Alpine County was not available.)

**Exhibit 5. Cohort graduation rate by county in the NCV/NML subregion, academic year 2021-22**

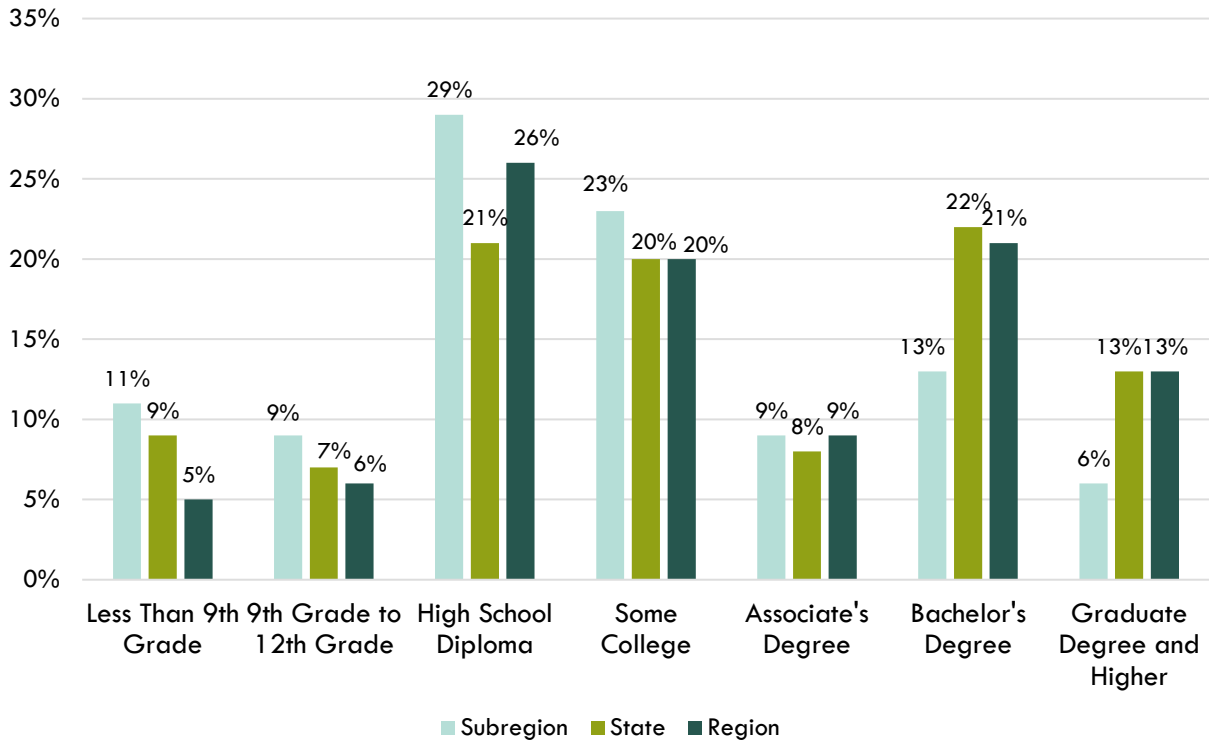
COUNTY	COHORT STUDENTS	REGULAR HIGH SCHOOL DIPLOMA GRADUATES	COHORT GRADUATION RATE	GRADUATES MEETING UC/CSU REQUIREMENTS	GRADUATES EARNING A SEAL OF BILITERACY	GRADUATES EARNING A GOLDEN STATE SEAL MERIT DIPLOMA
Alpine County	*	*	*	*	*	*
Amador County	343	308	89.8%	95	28	59
Calaveras County	450	416	92.4%	97	7	51
Mariposa County	142	121	85.2%	43	0	38
Merced County	4,662	4,288	92.0%	1,469	156	301
San Joaquin County	12,148	10,331	85.0%	3,390	937	1,691
Stanislaus County	8,721	7,599	87.1%	2,812	716	1,843
Tuolumne County	488	422	86.5%	75	1	12
<b>Subregional Total</b>	<b>26,954</b>	<b>23,485</b>	<b>85.4%</b>	<b>7,981</b>	<b>1,845</b>	<b>3,995</b>
<b>Statewide Total</b>	<b>500,404</b>	<b>433,028</b>	<b>86.5%</b>	<b>217,908</b>	<b>61,974</b>	<b>111,363</b>

An asterisk (\*) denotes data was not available.

The NCV/NML subregion trails the state in bachelor's degree attainment, with only 13% of the adult population (25 years of age or older) holding a bachelor's degree, compared to 22% in the state (Exhibit 6). A slightly greater proportion of the subregion has completed some college, 23%, compared to the state, 20%. Regarding associate degree attainment, the subregion and state are nearly the same, 9% and 8%, respectively. The subregion has a higher percentage of residents with only a high school diploma, 29%, compared to the state, 21%.

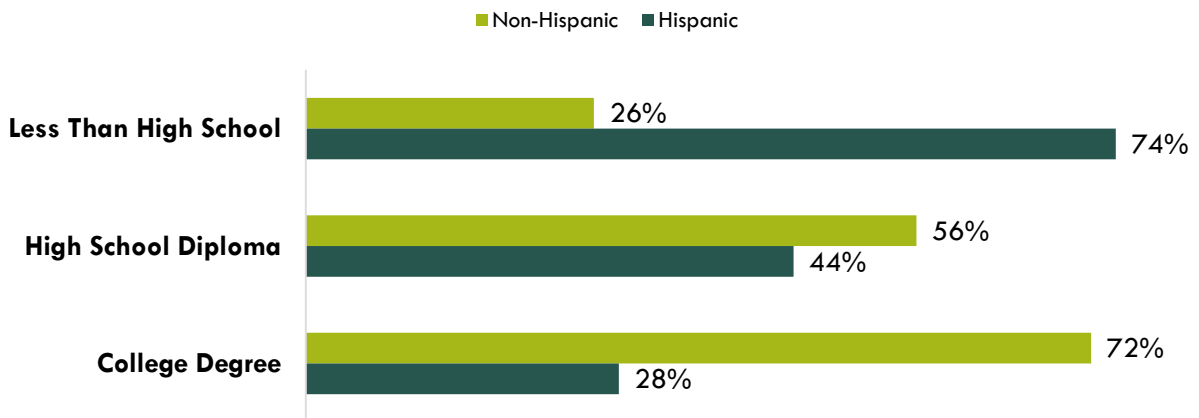
Compared to the state, a higher proportion of residents have completed less than a 9<sup>th</sup> grade education and less than a 12<sup>th</sup> grade education, which indicates a greater need for adult education in the subregion. In the subregion, 11% of residents have less than a 9<sup>th</sup> grade education and 9% have less than a 12<sup>th</sup> grade education, compared to 9% and 7% in the state, respectively.

**Exhibit 6. Educational attainment comparison for the NCV/NML subregion, region, and state, 2022**



In the subregion, 72% of the non-Hispanic adult population has a college degree, compared to 28% of the Hispanic population (Exhibit 7). Also, a greater proportion of the Hispanic population has less than a high school education, with 74% of the Hispanic population having completed less than a high school diploma, compared to 26% of the non-Hispanic population.

**Exhibit 7. Hispanic/non-Hispanic educational attainment in the subregion, 2022**



## 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. The labor force in the NCV/NML subregion has increased by more than 18,900 workers over the last five years (Exhibit 8). The unemployment rate has stayed constant at 6% during the same period. Unemployment has decreased by 5,300 individuals, from 48,090 workers in 2018 to 42,790 workers in 2022.

**Exhibit 8. Labor force size, employment, and unemployment in the NCV/NML subregion, 2018-2022**

METRIC	2018	2022	5-YEAR CHANGE	5-YEAR % CHANGE
Labor Force	747,630	766,590	18,960	2.5%
Employment	699,440	723,800	24,360	3.5%
Unemployment	48,090	42,790	(5,300)	(11.0%)
Unemployment Rate	6%	6%	(1%)	(13.2%)

Since 2018, the labor force in the Central Valley/Mother Lode region has grown by 37,260 workers, and total employment increased by 55,720 workers (Exhibit 9). In 2018, more than 142,500 individuals were unemployed. By 2022, this number had decreased by 18,350, to 124,220. Because total employment increased more than the labor force, the unemployment rate decreased from 7% in 2018 (compared to 4% statewide) to 6% in 2022 (compared to 4% statewide).

**Exhibit 9. Labor force size, employment, and unemployment in the CV/ML region, 2018-2022**

METRIC	2018	2022	5-YEAR CHANGE	5-YEAR % CHANGE
Labor Force	1,918,460	1,955,720	37,260	1.9%
Employment	1,775,880	1,831,600	55,720	3.1%
Unemployment	142,570	124,220	(18,350)	(12.9%)
Unemployment Rate	7%	6%	(1%)	(14.5%)

At 4%, the state's unemployment rate is lower than the region's and subregion's unemployment rates (Exhibit 10). Over the last five years, the state's labor force has lost 37,500 workers, declining to 19.3 million. The statewide number of unemployed individuals decreased from 819,600 in 2018 to 811,100 in 2022.

**Exhibit 10. Labor force size, employment, and unemployment in California, 2018-2022**

METRIC	2018	2022	5-YEAR CHANGE	5-YEAR % CHANGE
Labor Force	19,289,500	19,252,000	(37,500)	(0.2%)
Employment	18,469,900	18,440,900	(29,000)	(0.2%)
Unemployment	819,600	811,100	(8,500)	(1.0%)
Unemployment Rate	4%	4%	0%	0%

# CAREER EDUCATION OUTCOMES

Exhibit 11 summarizes Strong Workforce Program (SWP) outcomes from the California Community Colleges Chancellor Office’s Cal-PASS Plus LaunchBoard for all Career Education (CE) programs in the subregion, region, and state. At 21%, students who earned 9 or more CE units is similar to the region, 21% and state, 20%. However, a substantially smaller percentage of students in the subregion, 31%, have completed a noncredit CE course or workforce preparation class compared to the region, 60%, and state, 70%.

In the subregion, 2,997 students received a degree or certificate or attained apprenticeship journey status. Median annual earnings total \$34,270 in the subregion, which is slightly lower than the region, \$34,822.

The subregion and region are nearly on par with the state in terms of the percentage of students obtaining a job closely related to their field of study, 66% compared to 65%, respectively. In the subregion, 63% of students attained a living wage, which is lower than the region, 68%; however, this percentage is higher than the state, 57%.

**Exhibit 11. Comparison of SWP outcomes from LaunchBoard for the NCV/NML subregion, the Central Valley/Mother Lode region, and the state**

Metric	NCV/NML Subregion	CVML Region	State
Strong Workforce Program Students	32,751	91,769	838,713
Students Who Earned 9 or More Career Education Units in the District in a Single Year	21%	21%	20%
Students Who Completed a Noncredit CTE or Workforce Preparation Course	31%	60%	70%
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	2,997	8,794	80,082
Job Closely Related to Field of Study	66%	65%	69%
Median Annual Earnings	\$34,270	\$34,822	\$41,200
Median Change in Earnings	41%	30%	27%
Attained a Living Wage	63%	68%	57%

# GAP ANALYSIS

Annual openings for all middle-skill occupations in the 10 sectors total 44,387. With 6,081 awards (degrees and certificates) conferred on average each year, there is a potential supply gap of 38,306 workers in the NCV/NML subregion (Exhibit 12). The health sector has the most annual openings in the subregion, more than 9,600, followed by business and entrepreneurship, more than 7,500. Sectors with the fewest annual openings include advanced manufacturing, approximately 2,520, and public safety, 1,510. Postsecondary institutions in the subregion are conferring the most awards in health; business and entrepreneurship; and retail, hospitality, and tourism. The sectors with the largest supply gaps are:

- Health, an undersupply of 7,680 workers
- Business and entrepreneurship, an undersupply of 6,588 workers
- Energy, construction, and utilities, an undersupply of 4,718 workers

While gap analysis presented in this section reflects the greatest workforce demand by sector in the subregion, there may be localized differences in workforce demand. As a result, the colleges in the subregion are encouraged to evaluate demand by program to reveal local nuances in the labor market in terms of the occupations that fall within career paths within a college’s immediate vicinity.

Other localized trends and economic impacts may affect projected workforce demand. Reviewing program recommendation (PR) reports (also known as labor market assessments) prepared by the CVML COE can shed light on this, especially in terms of differences in student outcomes for the same programs that are offered by different colleges. Changes in labor market demand can be due to localized adoption of technological advancements that are changing the types of workers needed and the skill sets sought by employers. (For example, improved efficiencies are impacting the demand for farmers, ranchers, and agricultural managers in the region.) However, even when an occupation is projected to shed jobs, there may still be a need for workers due to replacements and retirements. As a result, the colleges are encouraged to examine numbers at the program-level in addition to sector-level since there may be substantial variation among programs within a single sector.

**Exhibit 12. 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**

SECTOR	DEMAND (ANNUAL OPENINGS)	SUPPLY (AVERAGE ANNUAL AWARDS)	GAP
Health	9,687	2,007	7,680
Business & Entrepreneurship	7,559	971	6,588
Energy, Construction & Utilities	5,044	326	4,718
Advanced Transportation & Logistics	4,945	244	4,701
Retail, Hospitality & Tourism	4,592	623	3,969
Education	2,991	523	2,468
Agriculture, Water & Environmental Technologies	2,885	401	2,484
ICT/Digital Media	2,657	303	2,354
Advanced Manufacturing	2,515	189	2,326
Public Safety	1,510	494	1,016
<b>TOTAL</b>	<b>44,387</b>	<b>6,081</b>	<b>38,306</b>



# ADVANCED MANUFACTURING

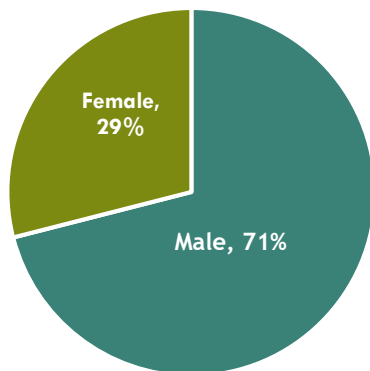
## Summary

- **Gender and race/ethnicity:** Comprising 29% of the workforce, women are underrepresented in this sector. Analysis shows underrepresentation of white, Black, and Asian American workers, and overrepresentation of Hispanic or Latino workers (Exhibits 13 and 14).
- **Employment and projected demand:** The largest middle-skill occupation is first-line supervisors of production and operating workers which will have the most annual openings, 283 (Exhibit 15).
- **Wages:** The highest paid occupation is industrial production managers, \$51.13/hour median (Exhibit 15).
- **In-demand qualifications:** The top skill is good manufacturing practices, and the top certification is a forklift certification (Exhibits 16 and 17).

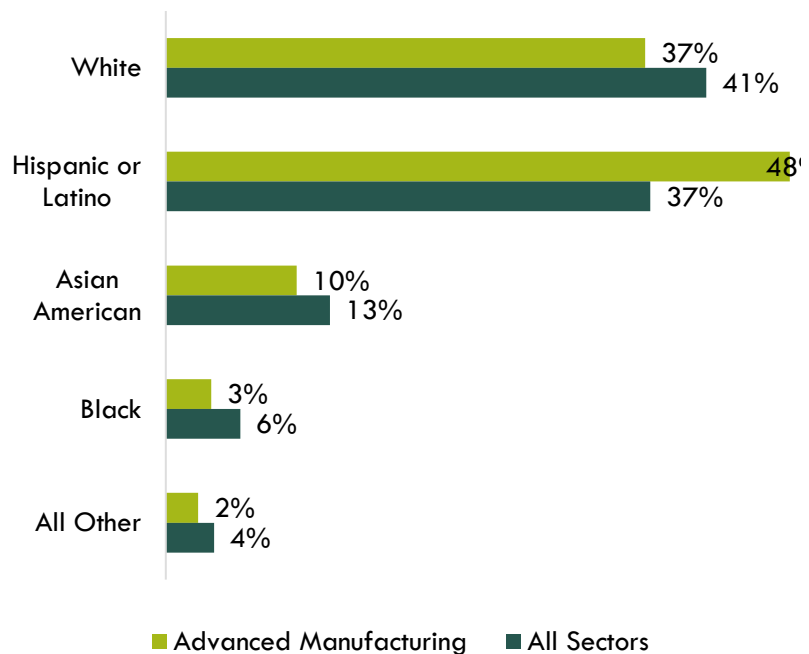
### Top Job Titles

- Production Supervisors
- Maintenance Mechanics
- Packaging Line Operators

**Exhibit 13. Gender composition of the top occupations in the advanced manufacturing workforce**



**Exhibit 14. Race/ethnicity composition of the top occupations in the advanced manufacturing workforce<sup>3</sup>**



<sup>3</sup> Due to low percentages, the "All Other" category comprises Two or More Races, American Indian/Alaska Native, and Native Hawaiian/Other Pacific Islander.

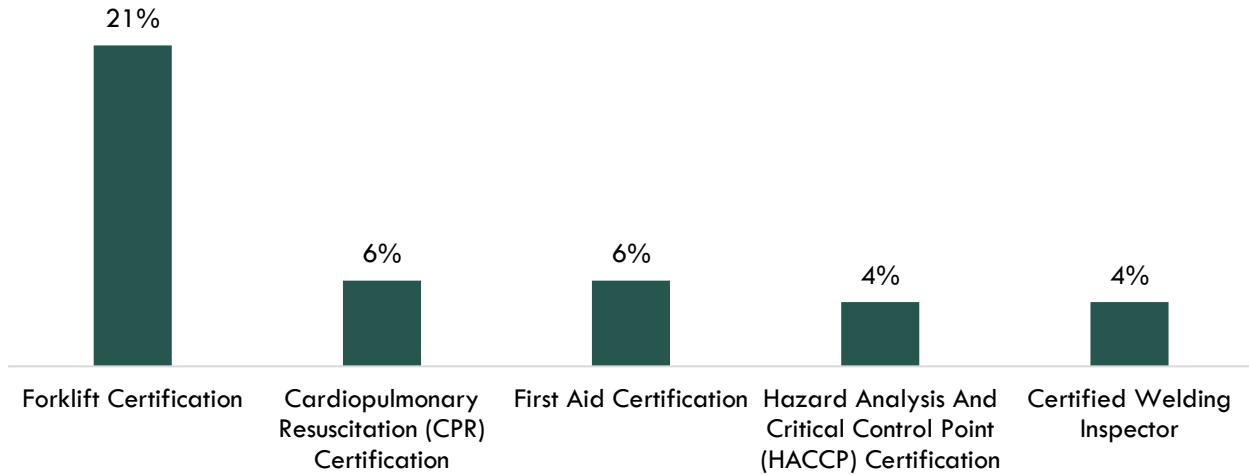
**Exhibit 15. Advanced manufacturing employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
First-Line Supervisors of Production and Operating Workers	2,486	2,704	219	9%	283	\$32.01
Industrial Machinery Mechanics	2,122	2,370	248	12%	222	\$31.10
Welders, Cutters, Solderers, and Brazers	1,771	1,886	116	7%	203	\$23.07
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	1,012	1,059	48	5%	107	\$27.15
Machinists	719	813	94	13%	94	\$22.91
Mixing and Blending Machine Setters, Operators, and Tenders	637	665	29	4%	73	\$21.71
Industrial Production Managers	807	879	71	9%	71	\$51.13
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	601	660	58	10%	68	\$21.46
Cutting and Slicing Machine Setters, Operators, and Tenders	421	421	1	0%	47	\$23.90
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	393	411	18	5%	44	\$22.56
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	370	398	27	7%	43	\$21.49
Printing Press Operators	376	369	(7)	(2%)	42	\$23.01
Computer Numerically Controlled Tool Operators	339	378	39	12%	40	\$23.61
Stationary Engineers and Boiler Operators	288	302	14	5%	34	\$34.76
Maintenance Workers, Machinery	233	269	36	15%	30	\$25.41

**Exhibit 16. Top specialized skills in job postings for advanced manufacturing occupations, n=2,910**



**Exhibit 17. Top certifications in job postings for advanced manufacturing occupations, n=145**



# ADVANCED TRANSPORTATION & LOGISTICS

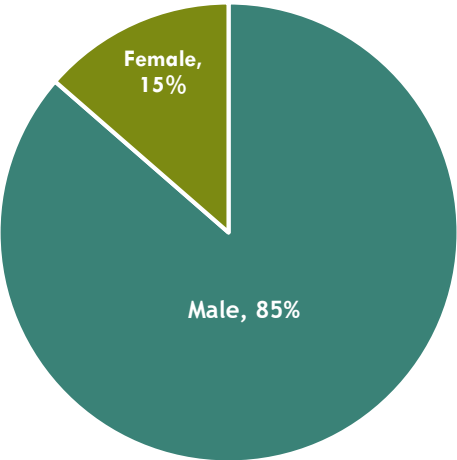
**Summary**

- **Gender and race/ethnicity:** Comprising 15% of the workforce, women are underrepresented in this sector. Analysis shows underrepresentation of white workers and overrepresentation of Hispanic or Latino workers (Exhibits 18 and 19).
- **Employment and projected demand:** The largest middle-skill occupation is heavy and tractor-trailer truck drivers, which will have 2,352 annual openings (Exhibit 20).
- **Wages:** The highest paid occupation is transportation, storage, and distribution managers, \$40.93/hour median (Exhibit 20).
- **In-demand qualifications:** The top skill is warehousing, and the top certification is CDL Class A License (Exhibits 21 and 22).

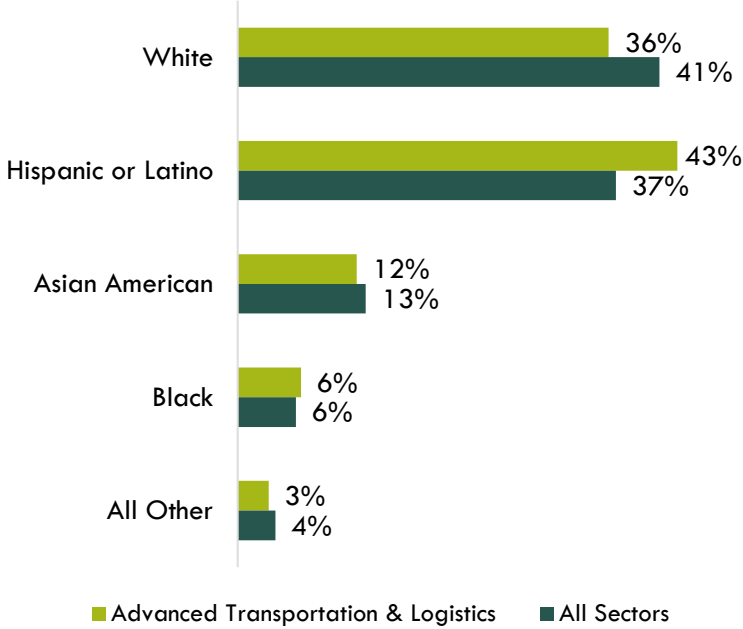
**Top Job Titles**

- **CDL-A Truck Drivers**
- **Regional CDL-A Truck Drivers**
- **Maintenance Supervisors**

**Exhibit 18. Gender composition of the top occupations in the advanced transportation and logistics workforce**



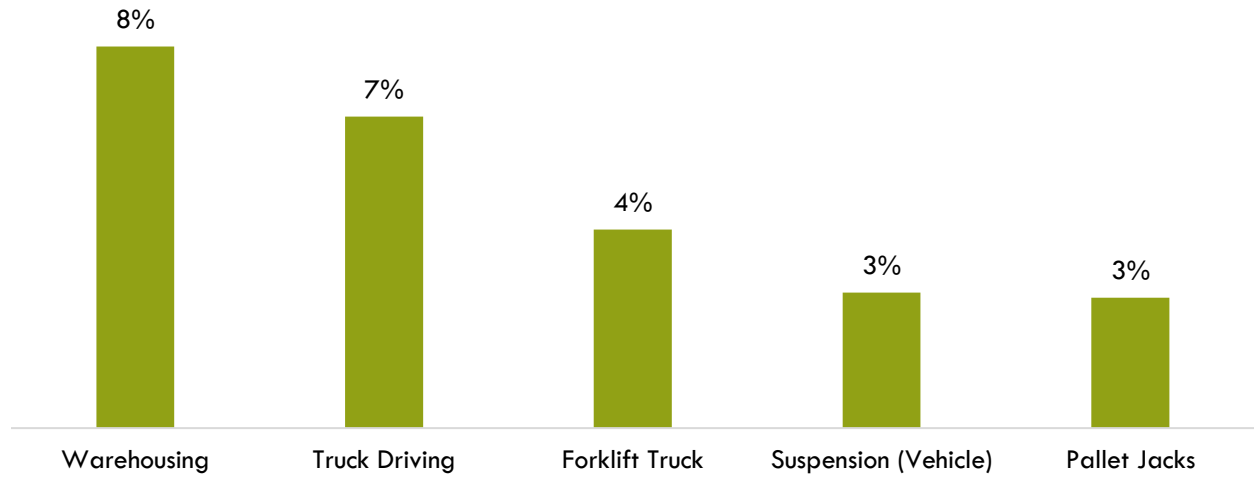
**Exhibit 19. Race/ethnicity composition of the top occupations in the advanced transportation and logistics workforce**



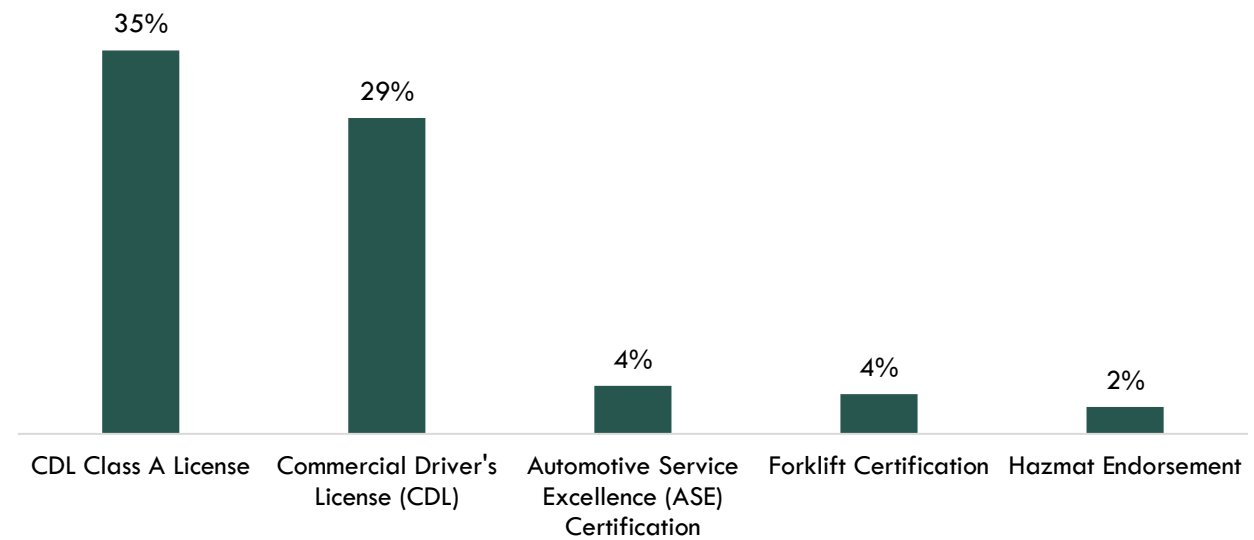
**Exhibit 20. Advanced transportation and logistics employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
Heavy and Tractor-Trailer Truck Drivers	17,271	19,482	2,211	13%	2,352	\$24.06
Shipping, Receiving, and Inventory Clerks	4,785	5,077	292	6%	564	\$18.33
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	3,254	3,801	546	17%	459	\$30.00
Automotive Service Technicians and Mechanics	3,439	3,804	365	11%	377	\$23.47
First-Line Supervisors of Mechanics, Installers, and Repairers	2,223	2,445	222	10%	236	\$38.49
Transportation, Storage, and Distribution Managers	1,672	1,915	243	15%	188	\$40.93
Bus and Truck Mechanics and Diesel Engine Specialists	1,606	1,773	168	10%	172	\$27.90
Bus Drivers, Transit and Intercity	918	1,022	104	11%	144	\$23.99
Logisticians	629	747	118	19%	78	\$39.59
Automotive Body and Related Repairers	619	686	68	11%	69	\$27.77
Aircraft Mechanics and Service Technicians	267	320	53	20%	32	\$33.49
Cargo and Freight Agents	145	201	56	39%	29	\$22.55

**Exhibit 21. Top specialized skills in job postings for advanced transportation and logistics occupations, n=4,692**



**Exhibit 22. Top certifications in job postings for advanced transportation and logistics occupations, n=1,342**





# AGRICULTURE, WATER & ENVIRONMENTAL TECHNOLOGIES

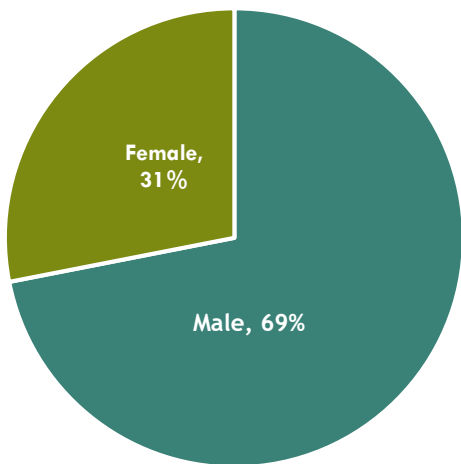
## Summary

- **Gender and race/ethnicity:** Comprising 31% of the workforce, women are underrepresented in this sector. Analysis shows underrepresentation of Asian American, Black, and Hispanic or Latino workers, and overrepresentation of white workers (Exhibits 23 and 24).
- **Employment and projected demand:** The largest middle-skill occupation is farmers, ranchers, and other agricultural managers, which will have 819 annual openings (Exhibit 25).
- **Wages:** The highest paid occupation is cost estimators, \$36.96/hour median (Exhibit 25).
- **In-demand qualifications:** The top skill is selling techniques, and the top certification is an Automotive Service Excellence (ASE) Certification (Exhibits 26 and 27).

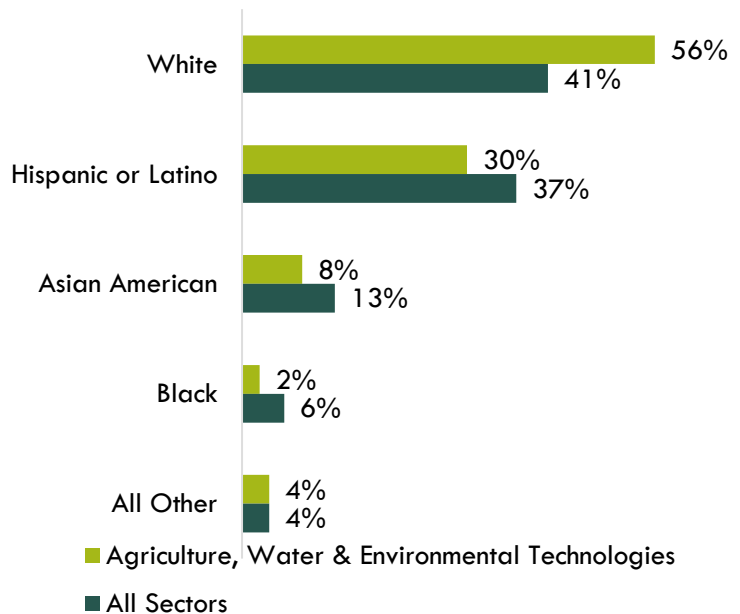
### Top Job Titles

- Outside Sales Representatives
- Pest Control Technicians
- Quality Assurance Technicians

**Exhibit 23. Gender composition of the top occupations in the agriculture, water, and environmental technologies workforce**



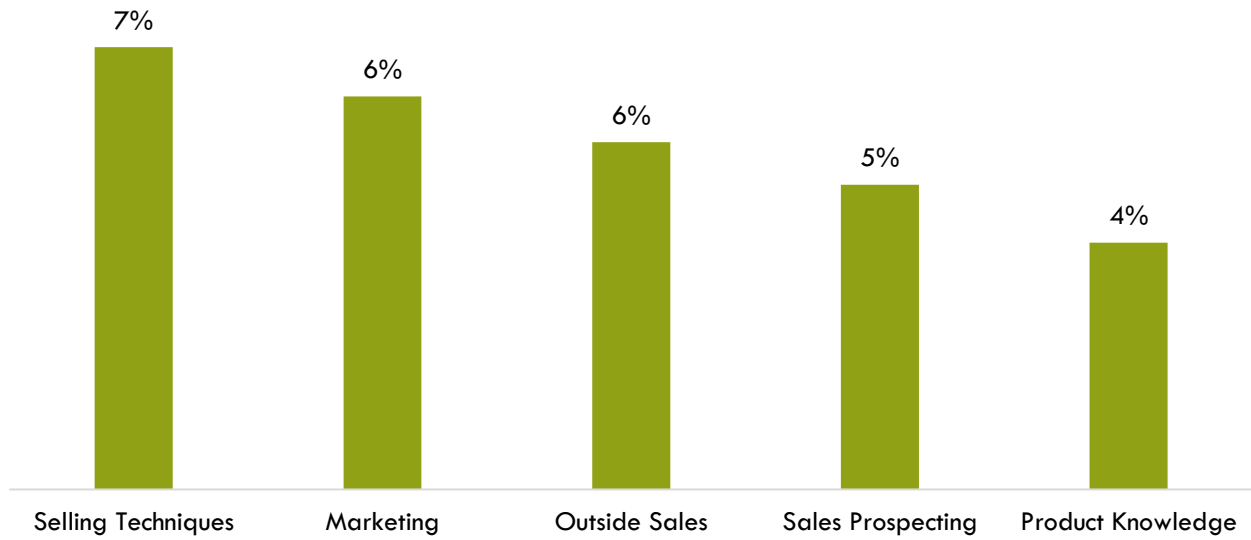
**Exhibit 24. Race/ethnicity composition of the top occupations in the agriculture, water, and environmental technologies workforce**



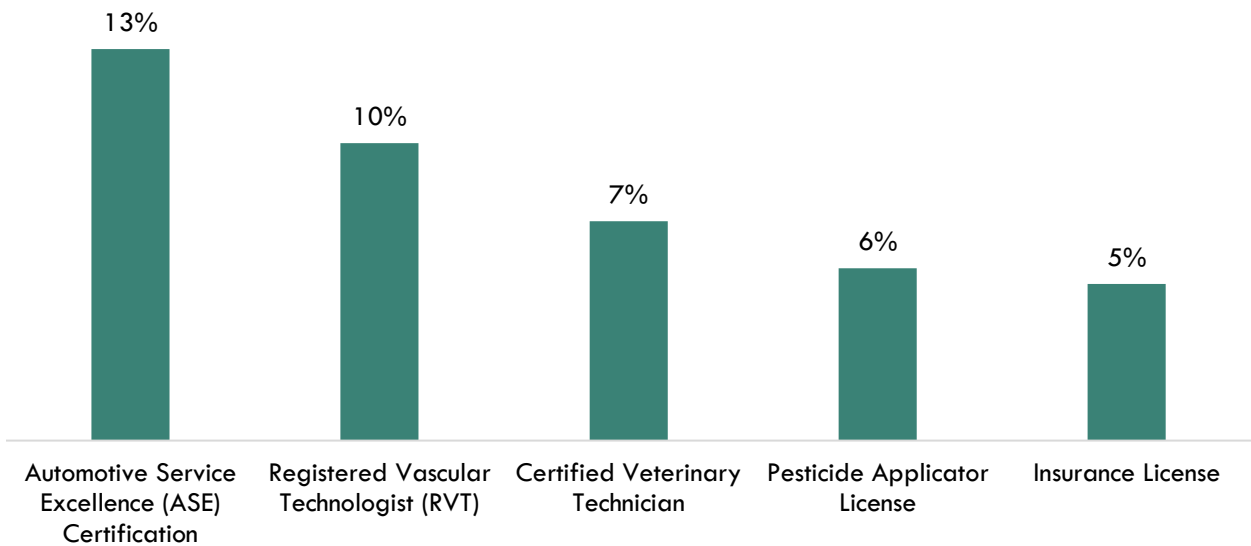
**Exhibit 25. Agriculture, water, and environmental technologies employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
Farmers, Ranchers, and Other Agricultural Managers	7,637	7,649	12	0%	819	\$17.15
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	4,168	4,480	312	7%	445	\$31.47
First-Line Supervisors of Farming, Fishing, and Forestry Workers	1,492	1,534	42	3%	209	\$22.25
Buyers and Purchasing Agents	1,537	1,590	52	3%	154	\$30.49
Cost Estimators	1,093	1,185	91	8%	112	\$36.96
Veterinary Assistants and Laboratory Animal Caretakers	428	482	54	13%	98	\$17.26
Compliance Officers	1,022	1,088	66	7%	93	\$33.41
Mobile Heavy Equipment Mechanics, Except Engines	854	938	84	10%	90	\$30.68
Pest Control Workers	579	596	17	3%	83	\$21.69
Food Science Technicians	465	479	14	3%	66	\$22.92
Forest and Conservation Technicians	505	491	(14)	(3%)	61	\$19.53
Veterinary Technologists and Technicians	373	426	53	14%	46	\$22.01
Farm Equipment Mechanics and Service Technicians	459	489	30	6%	46	\$28.50
Forest and Conservation Workers	240	246	6	2%	45	\$19.97
Agricultural Technicians	233	237	5	2%	33	\$19.07

**Exhibit 26. Top specialized skills in job postings for agriculture, water, and environmental technologies occupations, n=3,484**



**Exhibit 27. Top certifications in job postings for agriculture, water, and environmental technologies occupations, n=196**



# BUSINESS & ENTREPRENEURSHIP

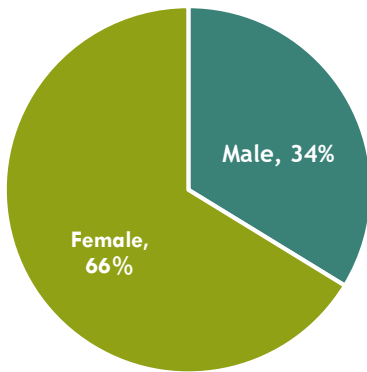
## Summary

- **Gender and race/ethnicity:** Comprising 34% of the workforce, men are underrepresented in this sector. Analysis shows underrepresentation of Hispanic or Latino workers, and overrepresentation of White workers (Exhibits 28 and 29).
- **Employment and projected demand:** The largest middle-skill occupation is general and operations managers, which will have 897 annual openings (Exhibit 30).
- **Wages:** The highest paid occupation is general and operations managers, \$47.59/hour median (Exhibit 30).
- **In-demand qualifications:** The top skill is accounting, and the top certification is a Professional in Human Resources (Exhibits 31 and 32).

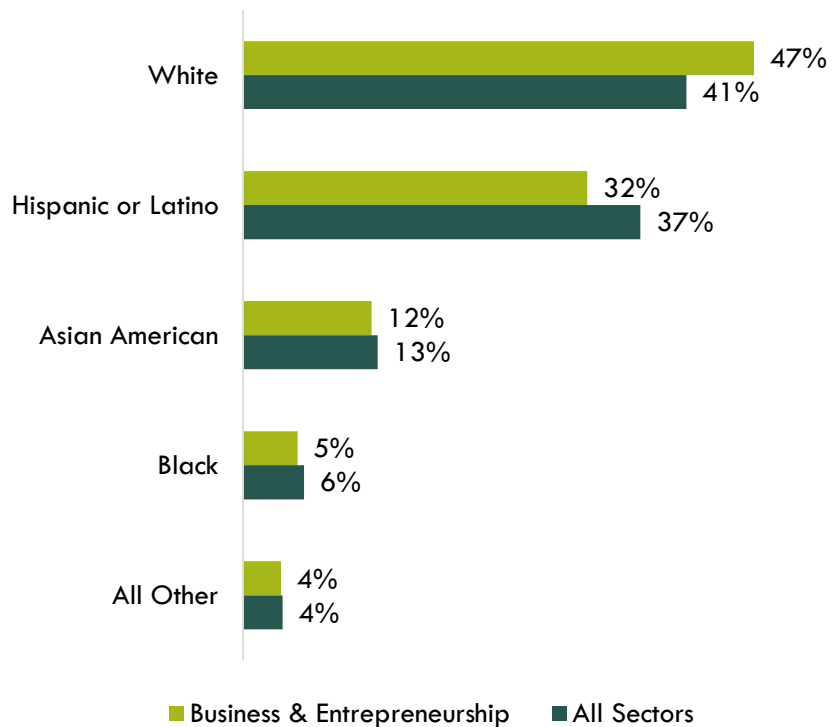
### Top Job Titles

- **Customer Service Representatives**
- **Receptionists**
- **Operations Managers**

**Exhibit 28. Gender composition of the top occupations in the business and entrepreneurship workforce**



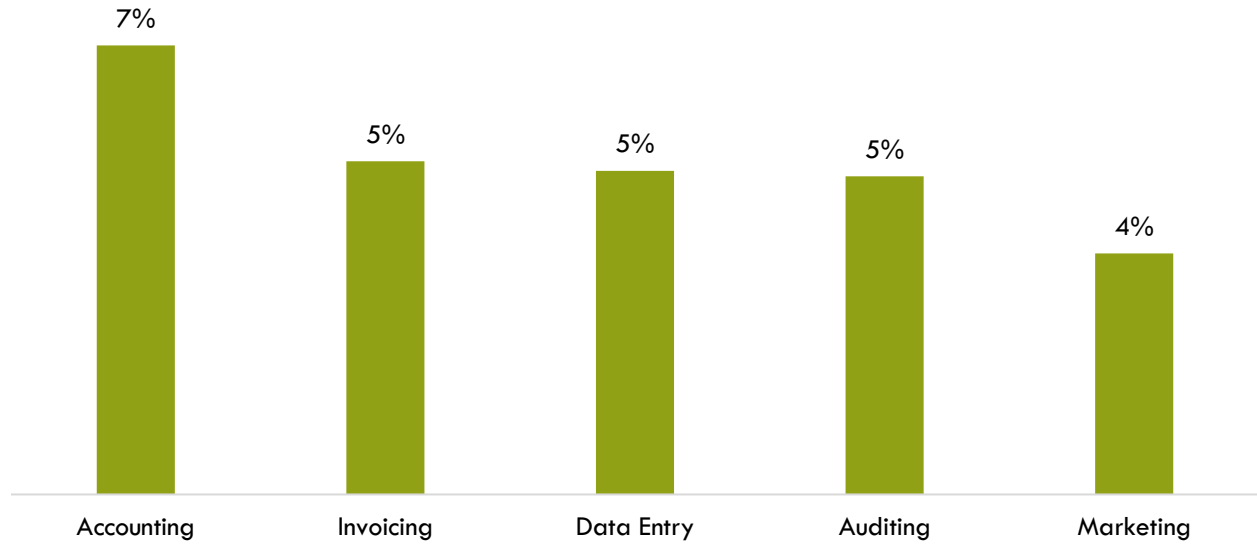
**Exhibit 29. Race/ethnicity composition of the top occupations in the business and entrepreneurship workforce**



**Exhibit 30. Business and entrepreneurship employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
General and Operations Managers	8,058	9,150	1,092	14%	897	\$47.59
First-Line Supervisors of Office and Administrative Support Workers	5,235	5,498	263	5%	564	\$30.02
Business Operations Specialists, All Other	3,589	3,873	284	8%	373	\$32.27
Human Resources Specialists	2,212	2,440	228	10%	236	\$32.84
Insurance Sales Agents	1,957	2,244	286	15%	223	\$29.22
Real Estate Sales Agents	1,792	1,872	80	4%	168	\$28.39
Training and Development Specialists	1,320	1,464	144	11%	144	\$29.21
First-Line Supervisors of Non-Retail Sales Workers	937	959	22	2%	84	\$32.15
Administrative Services Managers	898	958	60	7%	82	\$45.42
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	573	614	40	7%	61	\$44.45
Loan Officers	837	825	(12)	(1%)	58	\$30.71
Facilities Managers	573	624	51	9%	55	\$46.12
Real Estate Brokers	591	616	24	4%	55	\$40.20
Claims Adjusters, Examiners, and Investigators	427	432	5	1%	31	\$39.07
Property Appraisers and Assessors	307	312	5	2%	28	\$36.79

**Exhibit 31. Top specialized skills in job postings for business and entrepreneurship occupations, n=8,049**



**Exhibit 32. Top certifications in job postings for business and entrepreneurship occupations, n=562**





# EDUCATION

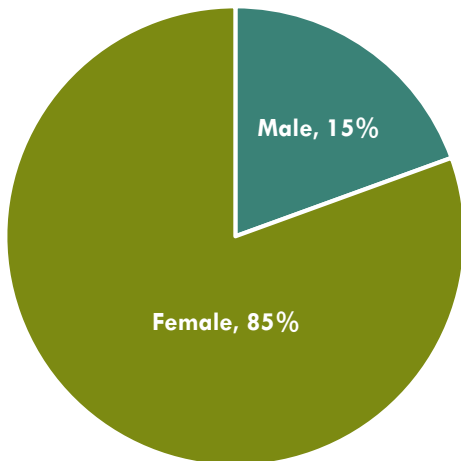
## Summary

- **Gender and race/ethnicity:** Comprising 15% of the workforce, men are underrepresented in this sector. Analysis shows underrepresentation of white and Asian American workers, and overrepresentation of Hispanic or Latino workers (Exhibits 33 and 34).
- **Employment and projected demand:** The largest middle-skill occupation is teaching assistants, except postsecondary, which will have 1,072 annual openings (Exhibit 35).
- **Wages:** The highest paid occupation is interpreters and translators, \$25.70/hour median (Exhibit 35).
- **In-demand qualifications:** The top skill is child development, and the top certification is a Cardiopulmonary Resuscitation (CPR) Certification (Exhibits 36 and 37).

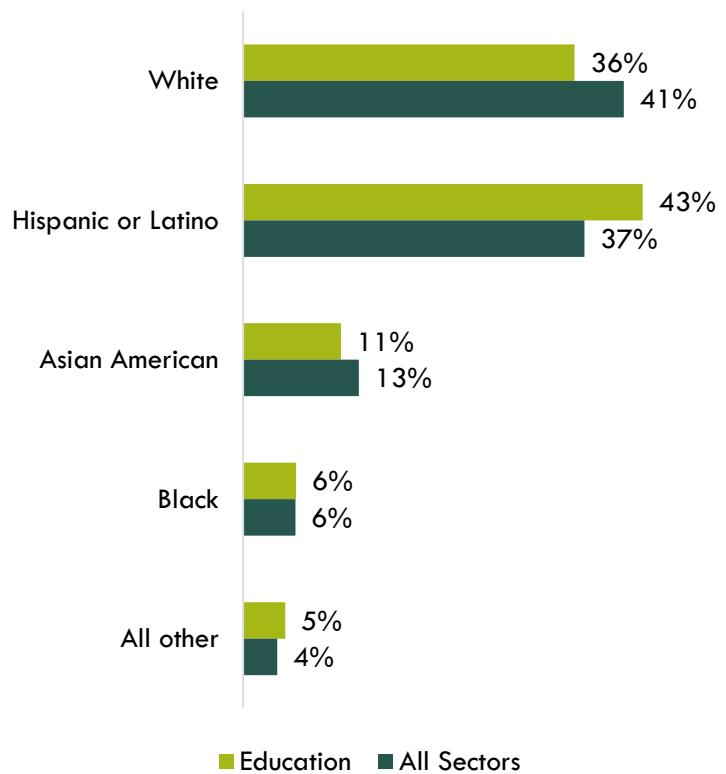
### Top Job Titles

- Pre-School Teachers
- Activities Assistants
- Paraeducators

**Exhibit 33. Gender composition of the top occupations in the education workforce**

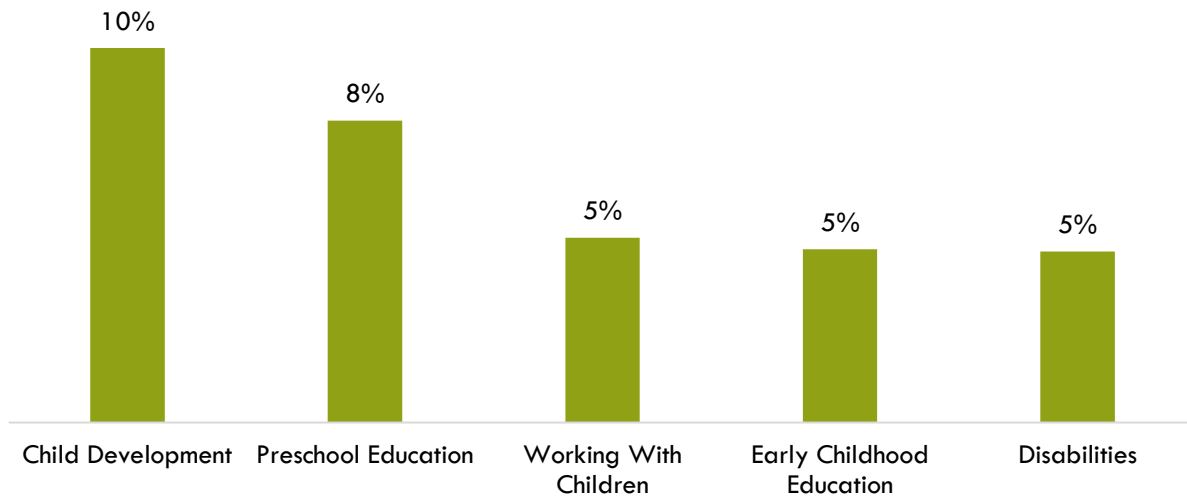


**Exhibit 34. Race/ethnicity composition of the top occupations in the education workforce**

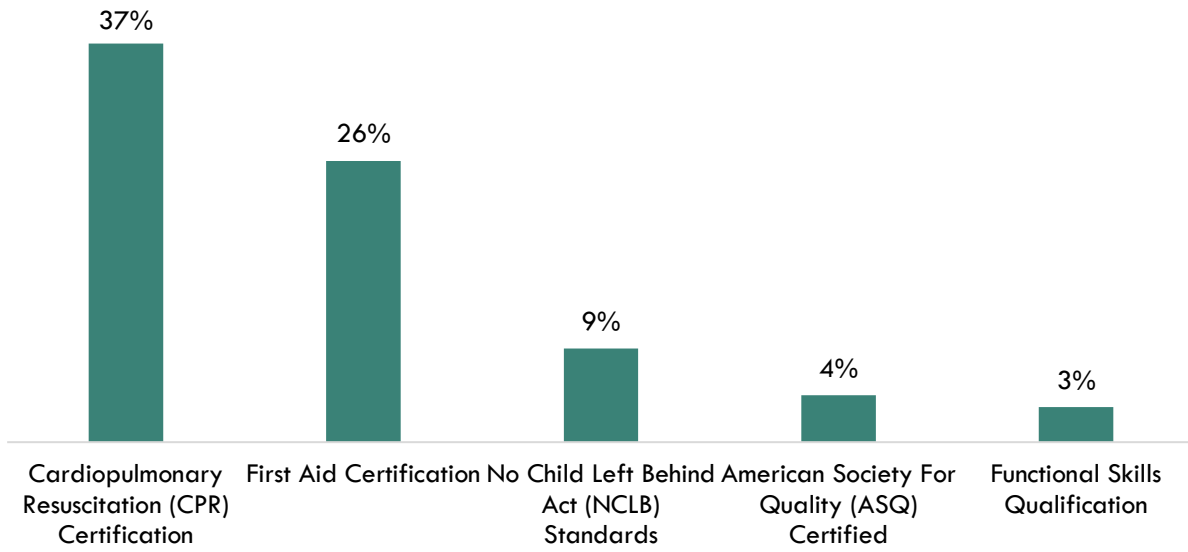


**Exhibit 35. Education employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
Teaching Assistants, Except Postsecondary	7,548	8,322	773	10%	1,072	\$18.45
Childcare Workers	3,839	3,409	(430)	(11%)	610	\$15.92
Substitute Teachers, Short-Term	3,835	4,236	401	10%	558	\$23.65
Recreation Workers	1,320	1,442	122	9%	306	\$15.83
Preschool Teachers, Except Special Education	1,936	1,968	33	2%	224	\$19.26
Library Technicians	348	367	18	5%	63	\$22.63
Teaching Assistants, Postsecondary	338	402	64	19%	55	\$20.25
Library Assistants, Clerical	192	208	16	8%	38	\$19.57
Interpreters and Translators	278	312	34	12%	36	\$25.70

**Exhibit 36. Top specialized skills in job postings for education occupations, n=1,530**

**Exhibit 37. Top certifications in job postings for education occupations, n=275**



# ENERGY, CONSTRUCTION & UTILITIES

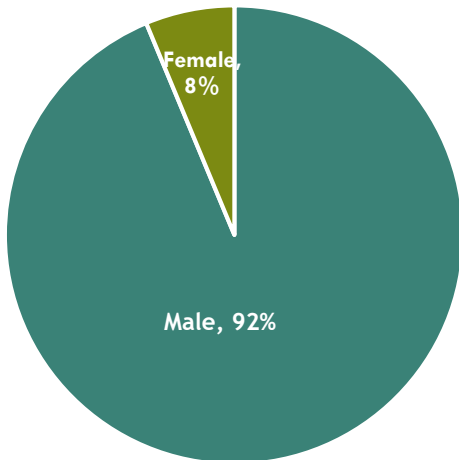
## Summary

- **Gender and race/ethnicity:** Comprising only 8% of the workforce, women are substantially underrepresented in this sector. Analysis shows underrepresentation of Asian American workers, and overrepresentation of Hispanic or Latino workers (Exhibits 38 and 39).
- **Employment and projected demand:** The largest middle-skill occupation is industrial truck and tractor operators, which will have 1,264 annual openings (Exhibit 40).
- **Wages:** The highest paid occupation is electrical power-line installers and repairers, \$60.64/hour median (Exhibit 40).
- **In-demand qualifications:** The top skill is forklift truck, and the top certification is a Forklift Certification (Exhibits 41 and 42).

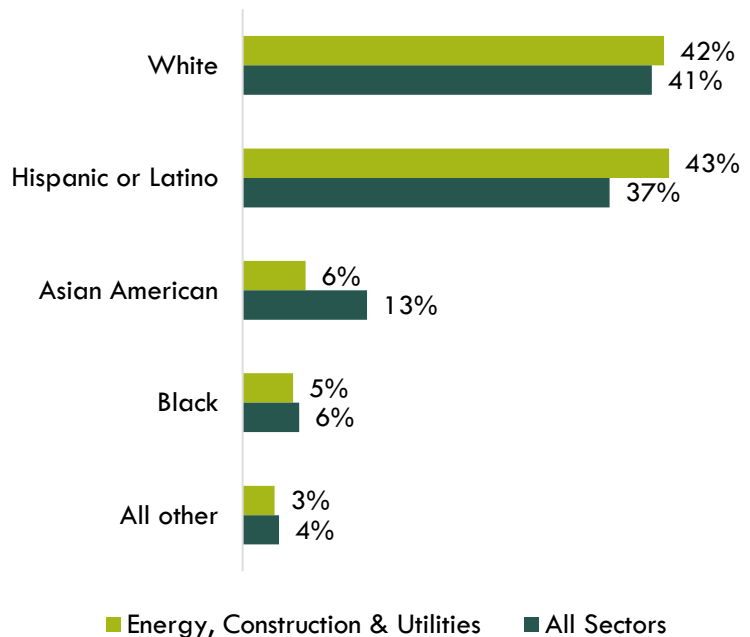
## Top Job Titles

- **Forklift Operators**
- **Maintenance Technicians**
- **Forklift Drivers**

**Exhibit 38. Gender composition of the top occupations in the energy, construction, and utilities workforce**



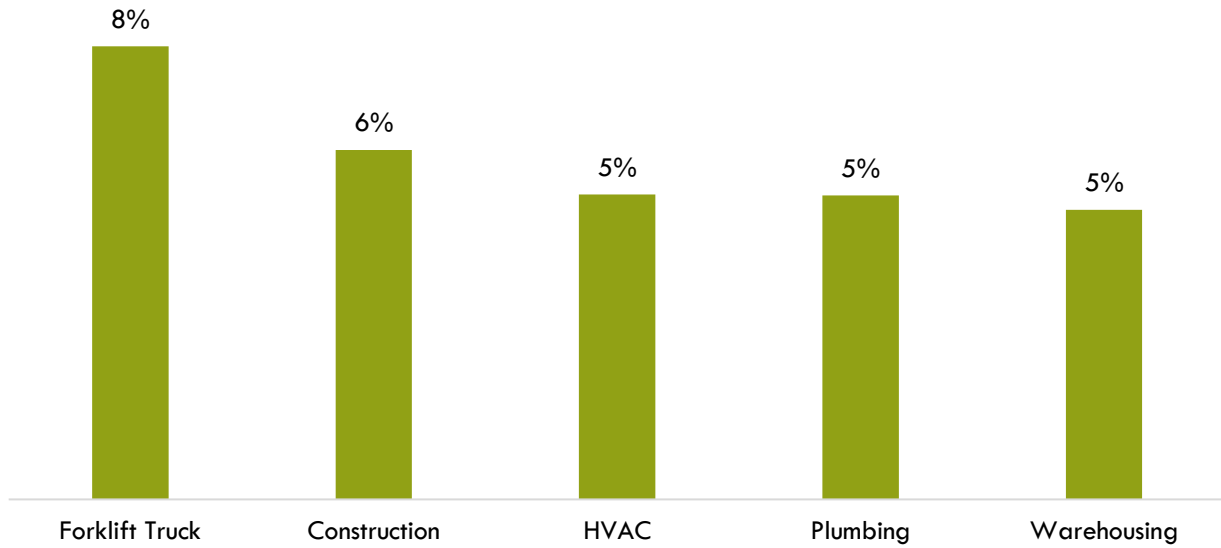
**Exhibit 39. Race/ethnicity composition of the top occupations in the energy, construction, and utilities workforce**



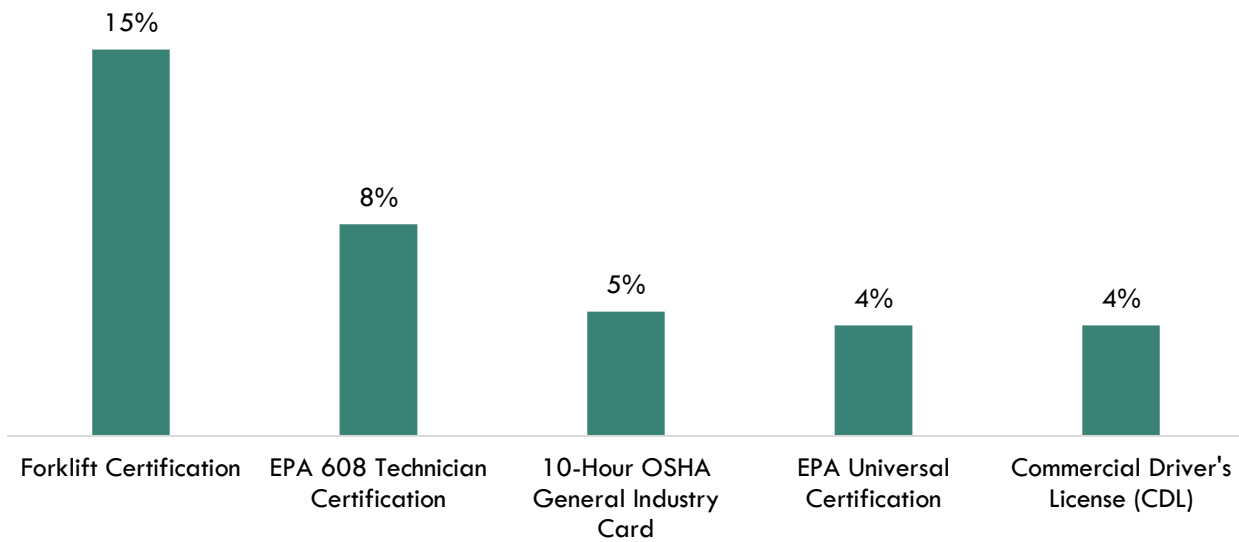
**Exhibit 40. Energy, construction, and utilities employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
Industrial Truck and Tractor Operators	10,039	11,216	1,176	12%	1,264	\$22.39
Maintenance and Repair Workers, General	6,299	6,924	625	10%	719	\$23.16
Carpenters	5,328	5,698	370	7%	535	\$27.81
Electricians	2,878	3,389	511	18%	375	\$30.57
First-Line Supervisors of Construction Trades and Extraction Workers	2,714	3,056	342	13%	302	\$36.71
Operating Engineers and Other Construction Equipment Operators	1,732	1,937	205	12%	195	\$34.70
Construction Managers	2,033	2,250	216	11%	194	\$42.04
Plumbers, Pipefitters, and Steamfitters	1,528	1,682	154	10%	168	\$27.91
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	1,390	1,548	158	11%	154	\$28.35
Water and Wastewater Treatment Plant and System Operators	701	729	28	4%	73	\$35.38
Construction and Building Inspectors	483	514	31	6%	62	\$37.87
Occupational Health and Safety Specialists	396	454	58	15%	56	\$39.50
Brickmasons and Blockmasons	368	471	103	28%	54	\$32.88
Telecommunications Line Installers and Repairers	344	365	21	6%	36	\$38.00
Electrical Power-Line Installers and Repairers	313	349	36	12%	32	\$60.64

**Exhibit 41. Top specialized skills in job postings for energy, construction, and utilities occupations, n=6,014**



**Exhibit 42. Top certifications in job postings for energy, construction, and utilities occupations, n=547**



# HEALTH

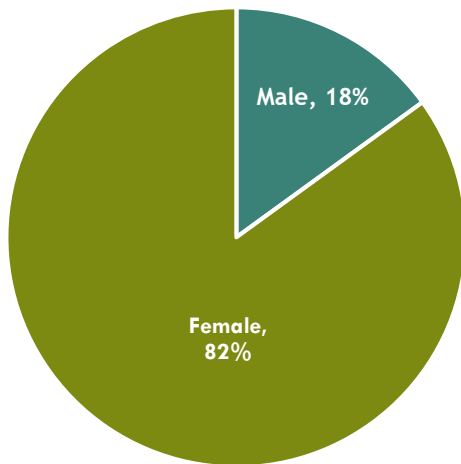
## Summary

- **Gender and race/ethnicity:** Comprising 18% of the workforce, men are underrepresented in this sector. Analysis shows underrepresentation of white and Hispanic or Latino workers, and overrepresentation of Asian American and Black workers (Exhibits 43 and 44).
- **Employment and projected demand:** The largest middle-skill occupation is registered nurses, which will have 748 annual openings (Exhibit 45).
- **Wages:** The highest paid occupation is registered nurses, \$62.35/hour median (Exhibit 45).
- **In-demand qualifications:** The top skill is nursing, and the top certification is registered nurse (RN) (Exhibits 46 and 47).

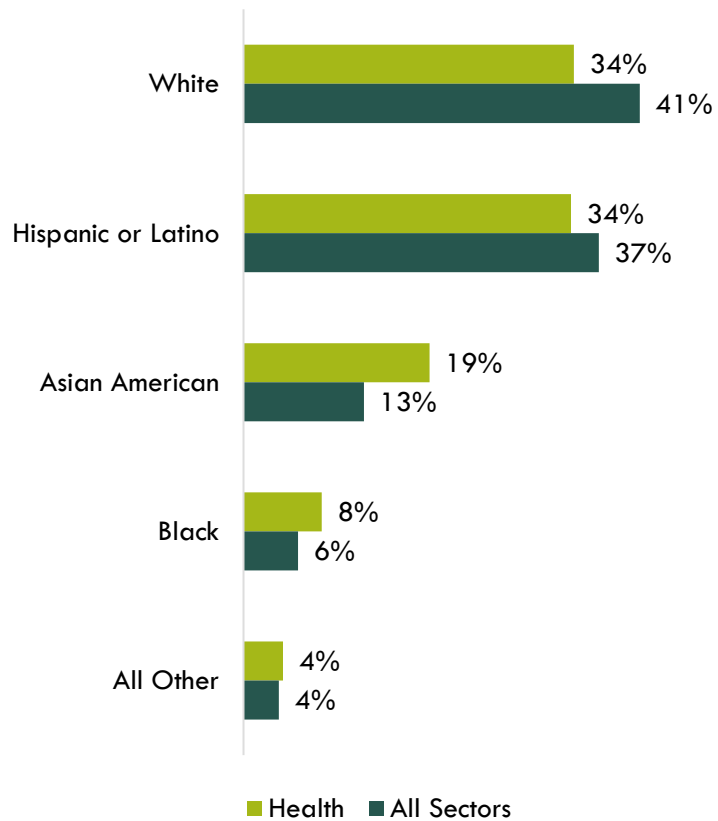
## Top Job Titles

- Registered Nurses
- Caregivers
- Medical Assistants

**Exhibit 43. Gender composition of the top occupations in the health workforce**



**Exhibit 44. Race/ethnicity composition of the top occupations in the health workforce**

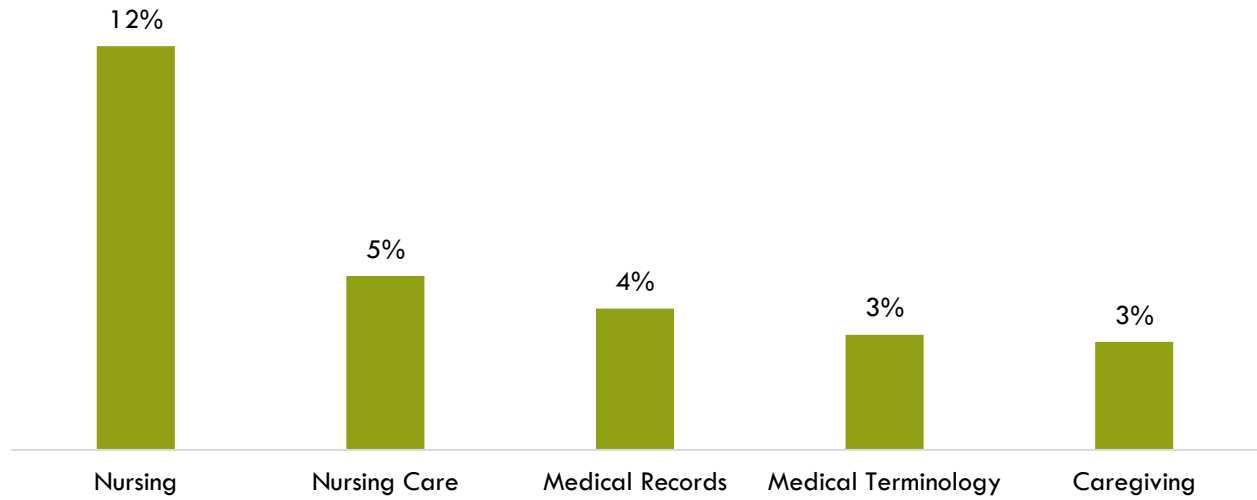


**Exhibit 45. Health employment, occupational projections, and median wages**

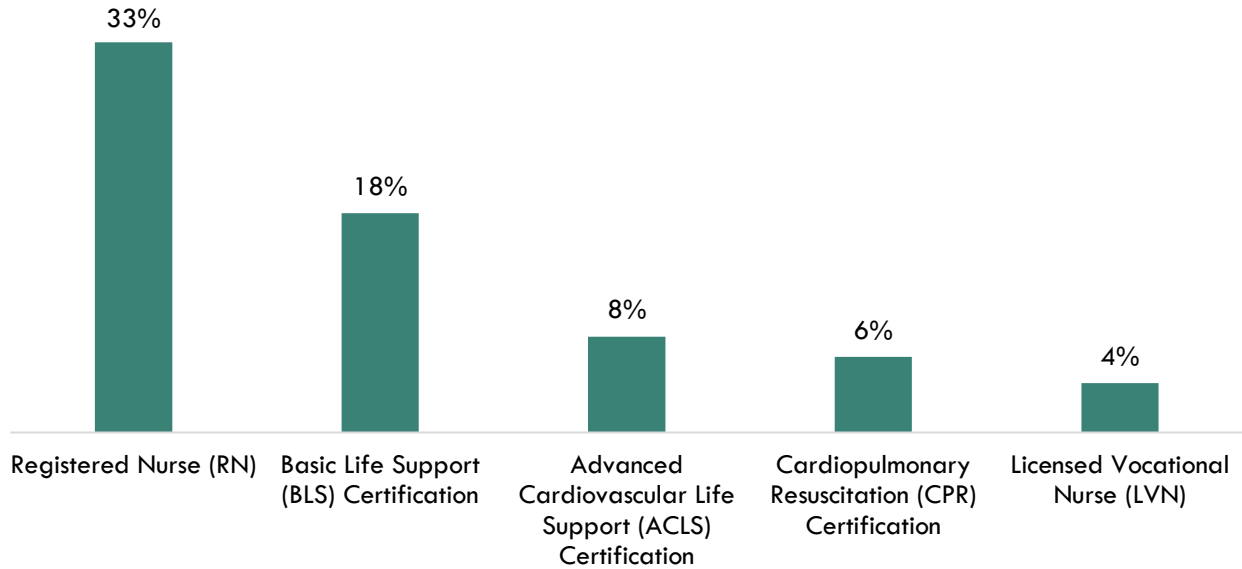
OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
Registered Nurses	11,237	11,839	602	5%	748	\$62.35
Dental Assistants	2,137	2,392	255	12%	361	\$22.60
Licensed Practical and Licensed Vocational Nurses	2,658	2,942	284	11%	269	\$30.71
Pharmacy Technicians	1,463	1,560	97	7%	154	\$22.43
Dental Hygienists	886	1,014	128	14%	87	\$50.53
Health Technologists and Technicians, All Other	677	788	111	16%	71	\$23.09
Psychiatric Technicians	693	731	38	5%	65	\$33.76
Physical Therapist Assistants	330	401	71	22%	63	\$36.18
Medical Records Specialists	818	850	32	4%	62	\$25.08
Phlebotomists	380	413	33	9%	57	\$24.60
Clinical Laboratory Technologists and Technicians	717	762	45	6%	56	\$35.62
Medical Equipment Preparers	309	318	9	3%	44	\$31.07
Radiologic Technologists and Technicians	599	642	43	7%	41	\$49.87
Opticians, Dispensing	351	373	23	6%	35	\$22.75
Respiratory Therapists	559	588	28	5%	35	\$47.46



**Exhibit 46. Top specialized skills in job postings for health occupations, n=20,741**



**Exhibit 47. Top certifications in job postings for health occupations, n=11,709**



# ICT/DIGITAL MEDIA

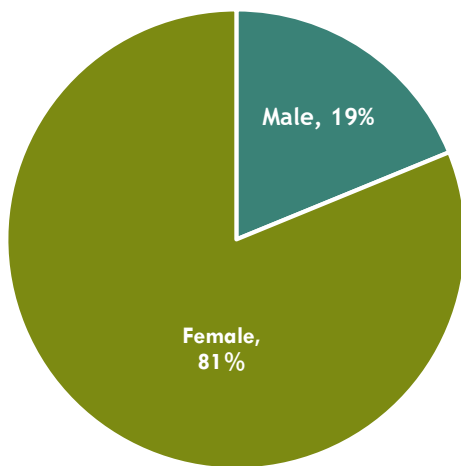
## Summary

- **Gender and race/ethnicity:** Comprising 19% of the workforce, men are underrepresented in this sector.<sup>4</sup> Analysis shows an underrepresentation of Hispanic or Latino workers and overrepresentation of white workers (Exhibits 48 and 49).
- **Employment and projected demand:** The largest middle-skill occupation is office clerks, general, which will have 1,252 annual openings (Exhibit 50).
- **Wages:** The highest paid occupation is network and computer systems administrators, \$43.65/hour median (Exhibit 50).
- **In-demand qualifications:** The top skill is administrative support, and the top certification is a CompTIA A+ (Exhibits 51 and 52).

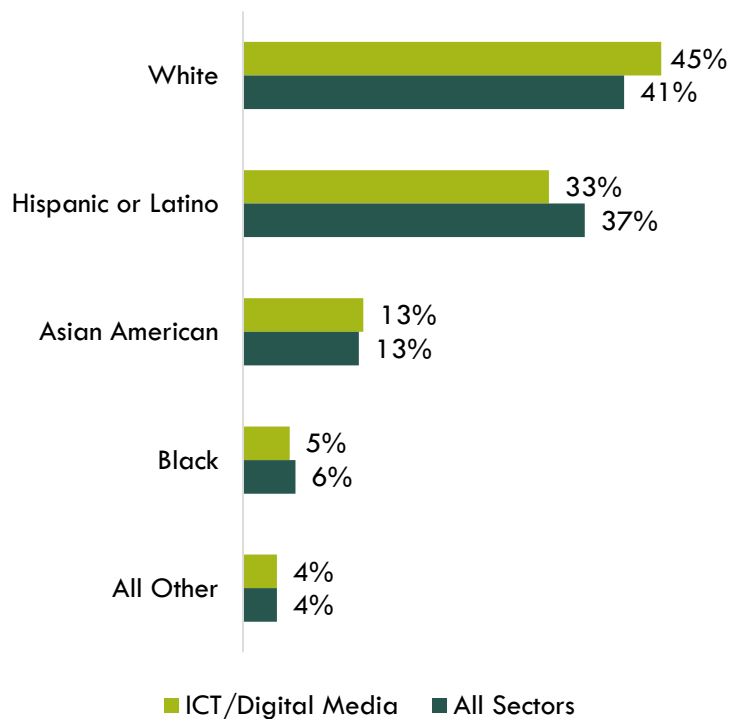
## Top Job Titles

- **Administrative Assistants**
- **Office Assistants**
- **Office Clerks**

**Exhibit 48. Gender composition of the top occupations in the ICT/digital media workforce**



**Exhibit 49. Race/ethnicity composition of the top occupations in the ICT/digital media workforce**

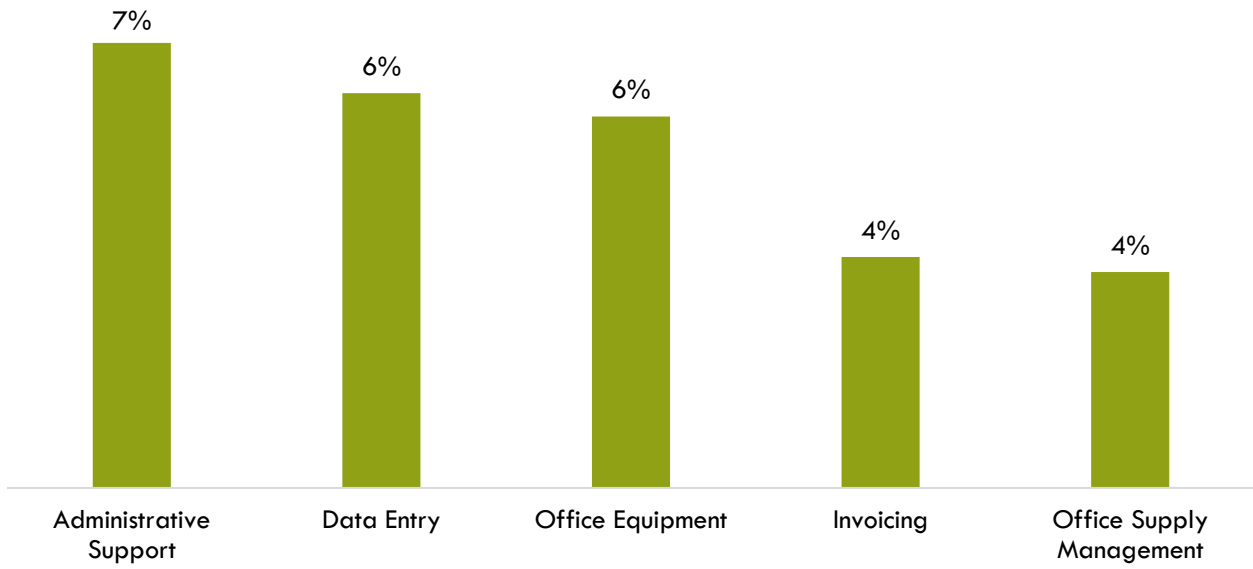


<sup>4</sup> Women are highly concentrated in the following occupations: Office Clerks, General and Secretaries and Administrative Assistants, Except Legal, Medical, and Executive.

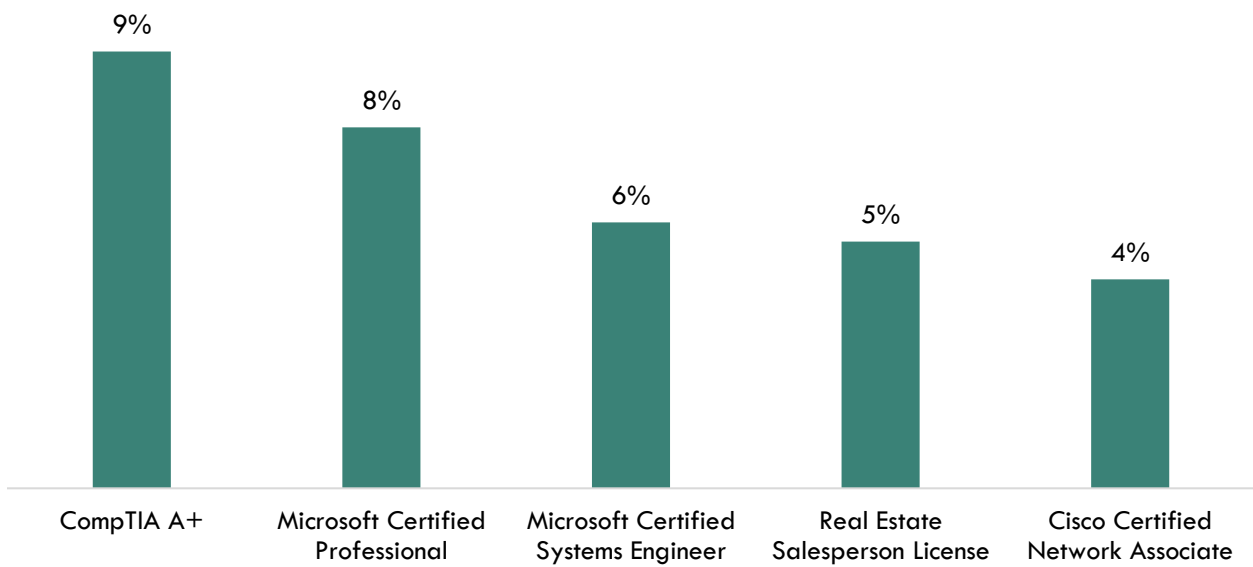
**Exhibit 50. ICT/digital media employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
Office Clerks, General	9,381	9,896	515	5%	1,252	\$18.87
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	6,468	6,684	215	3%	780	\$22.46
Executive Secretaries and Executive Administrative Assistants	1,169	1,134	(35)	(3%)	120	\$33.58
Computer User Support Specialists	1,133	1,239	106	9%	99	\$28.55
Computer Occupations, All Other	1,006	1,074	68	7%	78	\$39.62
Graphic Designers	622	656	34	5%	60	\$26.82
Network and Computer Systems Administrators	461	510	49	11%	36	\$43.65
Switchboard Operators, Including Answering Service	356	307	(49)	(14%)	33	\$20.25
Procurement Clerks	313	316	3	1%	30	\$24.45
Computer Network Support Specialists	302	330	29	10%	27	\$32.13

**Exhibit 51. Top specialized skills in job postings for ICT/digital media occupations, n=3,638**



**Exhibit 52. Top certifications in job postings for ICT/digital media occupations, n=253**



# PUBLIC SAFETY

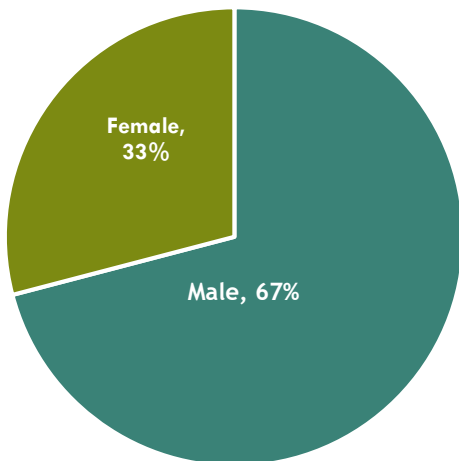
## Summary

- **Gender and race/ethnicity:** Comprising 33% of the workforce, women are underrepresented in this sector. Analysis shows underrepresentation of white and Asian American workers and overrepresentation of Black workers (Exhibits 53 and 54).
- **Employment and projected demand:** The largest middle-skill occupation is correctional officers and jailers, but the occupation with the most annual openings is protective service workers, all other, which will have 576 annual openings (Exhibit 55).
- **Wages:** The highest paid occupation is first-line supervisors of police and detectives, \$57.04/hour median (Exhibit 55).
- **In-demand qualifications:** The top skill is law enforcement, and the top certification is a Cardiopulmonary Resuscitation (CPR) Certification (Exhibits 56 and 57).

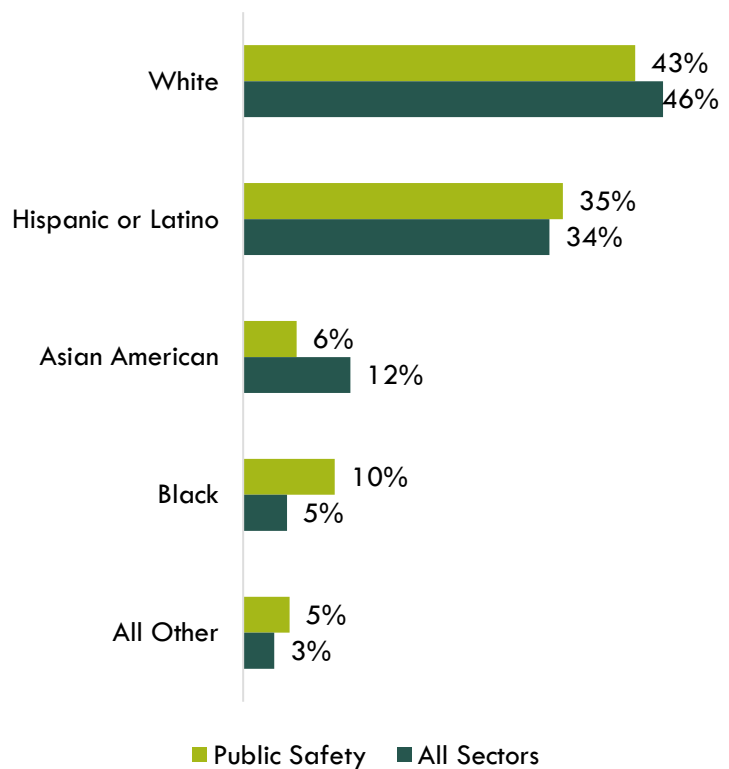
### Top Job Titles

- **Border Patrol Agents**
- **Store Protection Specialists**
- **Private Investigators**

**Exhibit 53. Gender composition of the top occupations in the public safety workforce**



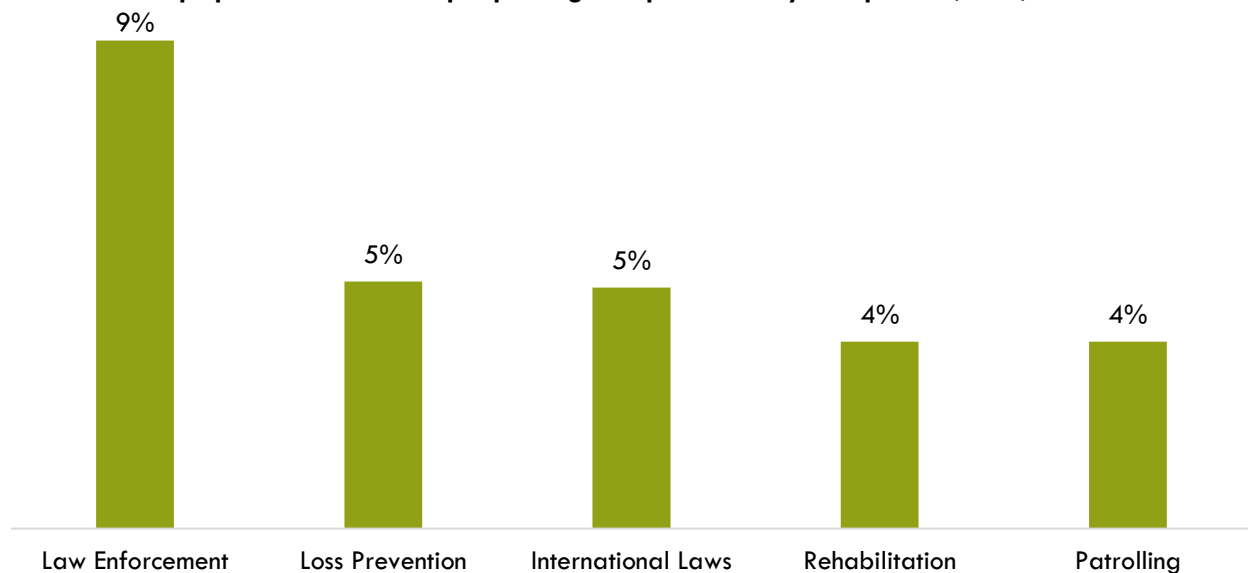
**Exhibit 54. Race/ethnicity composition of the top occupations in the public safety workforce**



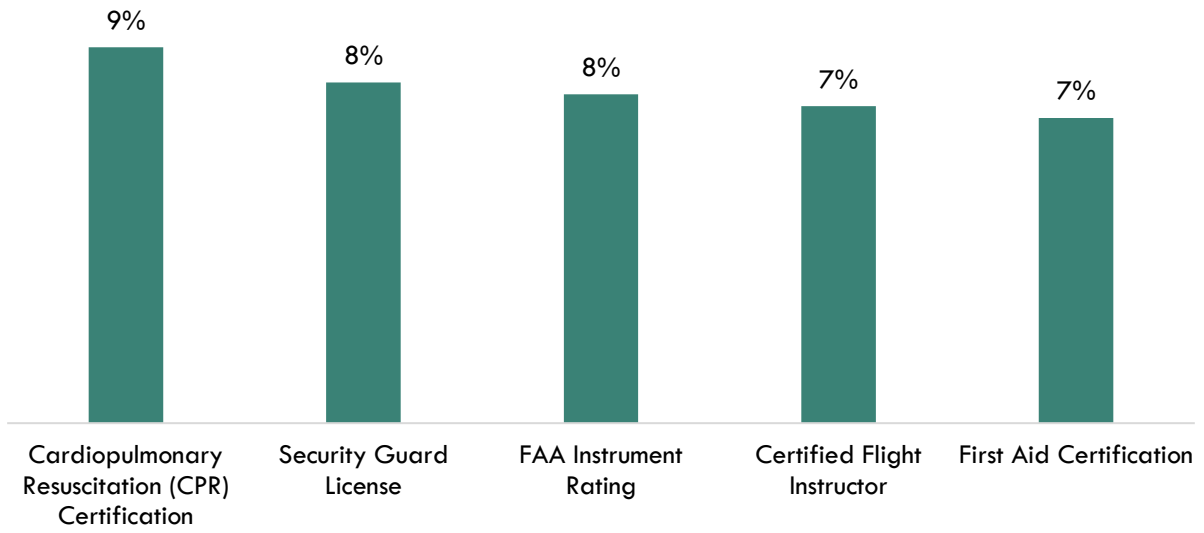
**Exhibit 55. Public safety employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
Protective Service Workers, All Other	1,799	1,944	145	8%	576	\$15.97
Correctional Officers and Jailers	2,954	2,995	41	1%	268	\$43.98
Police and Sheriff's Patrol Officers	2,534	2,773	239	9%	248	\$41.96
Firefighters	1,808	1,946	138	8%	168	\$31.02
Public Safety Telecommunicators	363	393	30	8%	43	\$29.47
First-Line Supervisors of Correctional Officers	348	365	17	5%	32	\$54.45
First-Line Supervisors of Police and Detectives	310	348	38	12%	29	\$57.04
First-Line Supervisors of Firefighting and Prevention Workers	344	376	32	9%	28	\$42.31
Private Detectives and Investigators	220	239	19	9%	25	\$28.52

**Exhibit 56. Top specialized skills in job postings for public safety occupations, n=1,622**



**Exhibit 57. Top certifications in job postings for public safety occupations, n=366**



# RETAIL, HOSPITALITY & TOURISM

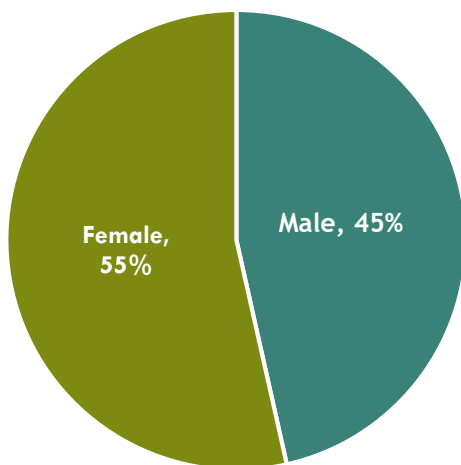
## Summary

- **Gender and race/ethnicity:** Comprising 45% of the workforce, men are slightly underrepresented in this sector. Analysis shows underrepresentation of Hispanic or Latino and Black workers, and overrepresentation of Asian American workers (Exhibits 58 and 59).
- **Employment and projected demand:** The largest middle-skill occupation is first-line supervisors of retail sales workers, but the occupation with the most annual openings is first-line supervisors of food preparation and serving workers, which will have the most annual openings, 987 (Exhibit 60).
- **Wages:** The highest paid occupation is musicians and singers, \$45.34/hour median (Exhibit 60).
- **In-demand qualifications:** The top skill is merchandising, and the top certification is a ServSafe Certification (Exhibits 61 and 62).

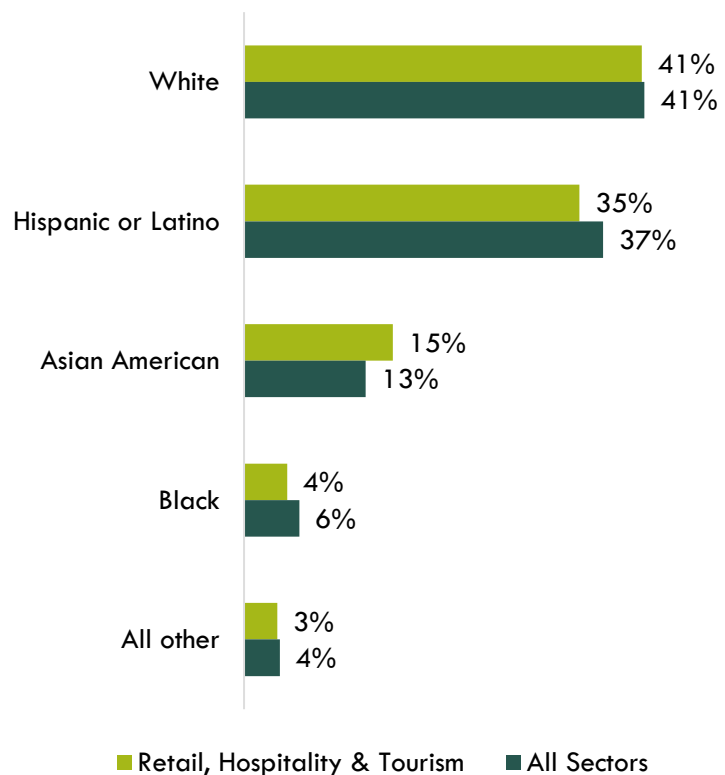
## Top Job Titles

- Assistant Managers
- Store Managers
- Cooks

**Exhibit 58. Gender composition of the top occupations in the retail, hospitality, and tourism workforce**



**Exhibit 59. Race/ethnicity composition of the top occupations in the retail, hospitality, and tourism workforce**

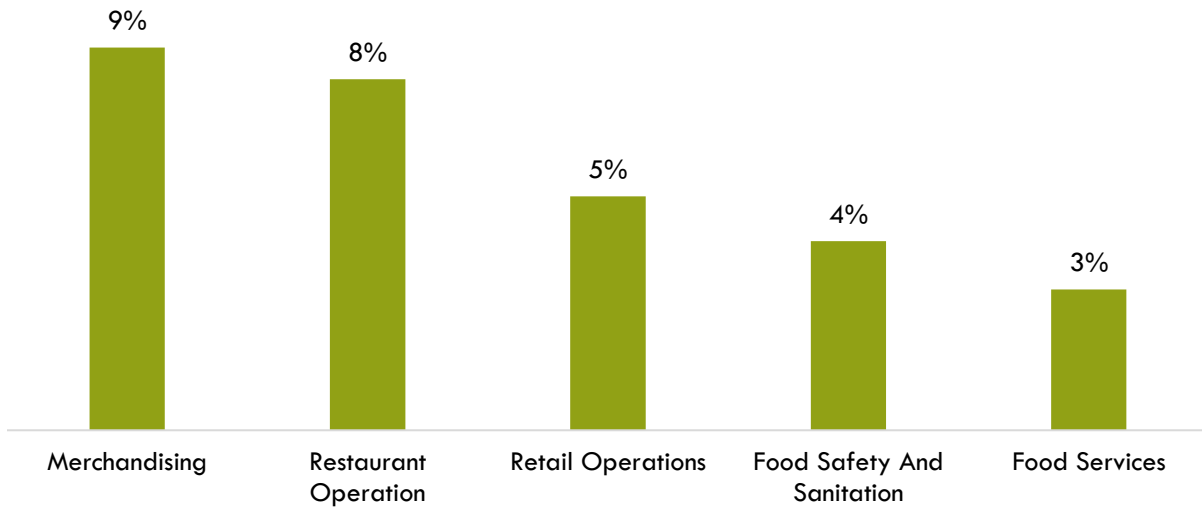




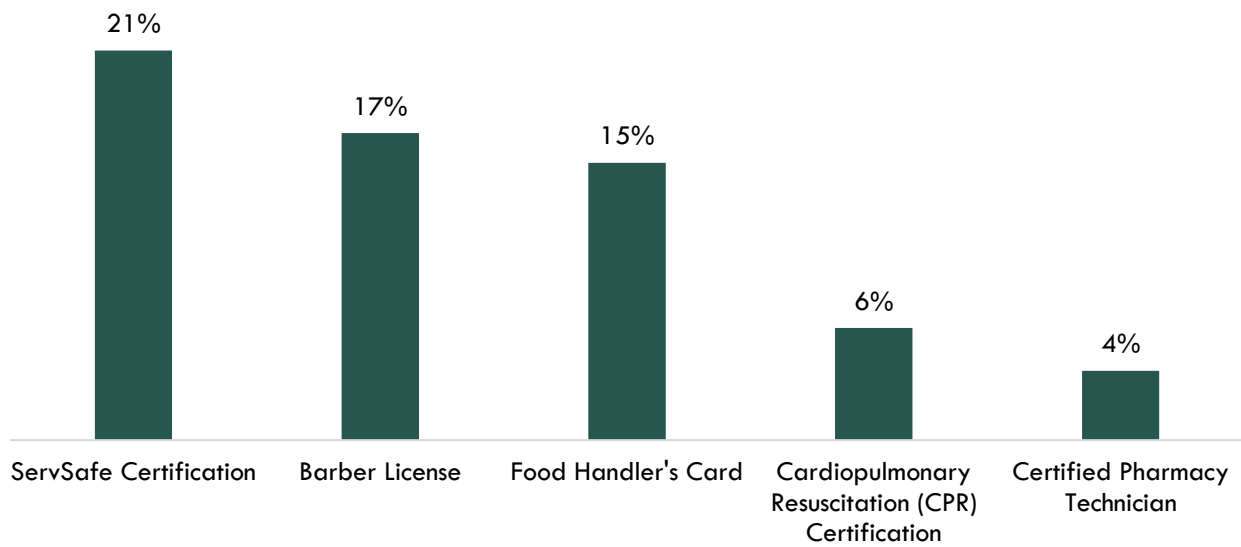
**Exhibit 60. Retail, hospitality, and tourism employment, occupational projections, and median wages**

OCCUPATION	2022 JOBS	2027 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS	MEDIAN WAGE
First-Line Supervisors of Food Preparation and Serving Workers	5,139	6,013	875	17%	987	\$17.72
Cooks, Restaurant	3,933	4,883	950	24%	846	\$17.23
First-Line Supervisors of Retail Sales Workers	5,561	5,869	308	6%	628	\$21.20
Hairdressers, Hairstylists, and Cosmetologists	2,812	3,088	276	10%	453	\$16.32
Food Service Managers	1,924	2,140	216	11%	267	\$23.96
Exercise Trainers and Group Fitness Instructors	1,093	1,147	54	5%	226	\$25.72
Self-Enrichment Teachers	1,515	1,675	160	11%	222	\$22.16
First-Line Supervisors of Housekeeping and Janitorial Workers	767	857	90	12%	111	\$21.65
Chefs and Head Cooks	659	755	96	15%	102	\$23.75
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	691	744	53	8%	83	\$25.12
Musicians and Singers	430	429	(1)	(0%)	58	\$45.34
Skincare Specialists	258	311	53	20%	49	\$16.52
First-Line Supervisors of Personal Service Workers	319	354	35	11%	45	\$21.87
Photographers	358	400	42	12%	42	\$25.85
Actors	344	347	3	1%	41	\$22.66

**Exhibit 61. Top specialized skills in job postings for retail, hospitality, and tourism occupations, n=6,521**



**Exhibit 62. Top certifications in job postings for retail, hospitality, and tourism occupations, n=549**



# CONCLUSION

## Gap analysis

In the NCV/NML subregion, the 10 sectors detailed in this study are projected to offer **44,387 annual openings** each year for middle-skill occupations, those requiring more education and training than a high school diploma, but less than a bachelor's degree. By comparison, postsecondary institutions in the region are conferring **6,081 awards** (degrees and certificates) on average each year. A comparison between workforce demand and the number of awards being earned shows **a potential undersupply of 38,306 workers** in the subregion.

On average each year, the greatest number of awards are being conferred by programs in the health sector (2,007 awards), business and entrepreneurship sector (971 awards), and retail, hospitality, and tourism sector (623 awards). The fewest awards are being conferred in the ICT/digital media sector (303 awards) and advanced manufacturing (189 awards).

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

- **Health**, a shortage of 7,680 workers
- **Business and entrepreneurship**, a shortage of 6,588 workers
- **Energy, construction, and utilities**, a shortage of 4,718 workers

## Occupational titles in job postings

While job postings should not be used as a direct measure of employment demand, they can indicate hiring needs and preferences among employers.<sup>5</sup> To provide additional insights into the occupations that

Please refer to the separate supplemental section of this report for a comprehensive list of occupations by sector along with current employment, projected demand, and wages. The supplemental section also lists typical education level, work experience, and on-the-job training required for each occupation discussed in the sector sections. Current Population Survey (CPS) data are included, which is used to evaluate whether bachelor's-degree-education-level occupations are considered middle skill. An occupation is considered middle skill when one-third or more of current workers in B.A./B.S.-level occupations have completed some college up to an associate degree as their highest level of education. Finally, a thorough inventory of awards by program has also been compiled for the subregion and is included for review.

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<sup>5</sup> Job postings should not be used as a direct measure of demand for specific occupations in the economy since an employer can post more than one job ad for the same position or may post job ads to test out a potential labor market without actually filling any positions.

are at the forefront of the current hiring wave, job postings were examined to identify frequently occurring occupational titles. The most commonly occurring occupational titles can indicate jobs with hiring challenges, such as a high churn rate or a severe worker shortage due to other factors.

**Advanced Manufacturing**—Job postings are highly concentrated for the sector’s largest occupation, first-line supervisors of production and operating workers.

**Advanced Transportation & Logistics**—Job postings for heavy and tractor-trailer truck drivers account for 2,352 out of 4,700 postings, or 50%.

**Agriculture, Water & Environmental Technologies**—Job postings for sales representatives, wholesale and manufacturing, except technical and scientific products account for 60% of postings. This reflects anecdotes communicated to CVML COE concerning heightened demand for this type of position due to the poaching of experienced agricultural sales representatives by ag companies. This is a highly valued occupation in the CVML region.

**Business & Entrepreneurship**—Job postings for customer service representatives occur with high frequency in this sector. About 22% of all postings are for this occupation in the subregion. At \$19.04/hour, this occupation’s median wage is well above the subregion’s living wage and given its high projected employment demand, 898 annual openings, it may be a promising career choice for students.

**Education**—Analysis shows the top occupational title in job postings are for preschool teachers, except special education.

**Energy, Construction & Utilities**—A third of job postings are for maintenance and repair workers, general in this sector. This occupation also may be a promising career choice for students since it is projected to offer 719 annual openings in the subregion and pays a median wage of \$23.16/hour.

**Health**—It has been widely reported that the Central Valley/Mother Lode region is facing a severe shortage of registered nurses. In the subregion, 50% of job postings are for registered nurses, which is also the top job title for the sector.

**ICT/Digital Media**—Ads for secretaries and administrative assistants, except legal, medical, and executive comprise 42% of all job postings. This is the second largest occupation in the sector in terms of employment in the subregion.

**Public Safety**—Job postings for retail loss prevention specialists account for 26% of all ads. Police and sheriff’s patrol officers, has the second highest number of job postings, 211.

**Retail, Hospitality & Tourism**—Forty percent of all job postings are for first-line supervisors of retail sales workers. Job postings are also concentrated for food service managers, 376 ads, and first-line supervisors of food preparation and serving workers, 349 ads.

## Workforce demographics

The starkest degree of underrepresentation of women in the subregion exists in the energy, construction, and utilities sector, in which women make up only 8% of the workforce. The advanced transportation and logistics sector also has a low percentage of women in its workforce, only 15%, and is followed by advanced manufacturing, 29%. (Women comprise about a third of the public safety workforce and the agriculture, water, and environmental technologies workforce.)

By contrast, men are most severely underrepresented in the education sector, in which only 15% of the workforce is male. Men comprise only 18% of the health sector workforce and 19 % of the ICT/digital media sector workforce.

In terms of race/ethnicity composition of the subregion's workforce, Asian American workers comprise 13% of the overall workforce but are underrepresented in several sectors: agriculture, water, and environmental technologies, 8%; energy, construction, and utilities, 6%; and public safety, 6%. Asian American workers are overrepresented in the health sector, accounting for 19% of the workforce.

Black workers are overrepresented in the public safety sector, comprising 11% of the sector's workforce and 6% of the overall workforce in the subregion. Black workers are underrepresented in advanced manufacturing, 3%, and agriculture, water, and environmental technologies, 2%.

Comprising 37% of the overall workforce, Hispanic or Latino workers are overrepresented by 6-11 percentage points in four sectors: advanced manufacturing, 48%; advanced transportation and logistics, 43%; education, 43%; and energy, construction, and utilities, 43%. They are underrepresented by a similar proportion in agriculture, water, and environmental technologies, 30%; business and entrepreneurship, 32%; health, 34%; and ICT/digital media, 33%.

White workers comprise 41% of the workforce and are noticeably overrepresented in the agriculture, water, and environmental technologies sector, 56%. Overrepresentation also appears to exist in the business and entrepreneurship sector, 47%, and ICT/digital media sector, 45%. White workers are underrepresented in advanced manufacturing, 37%; advanced transportation and logistics, 36%; education, 36%; and health sector, 34%.

## In-demand occupations

The 10 occupations with the most annual openings across all sectors are listed below. Given that these are highly in-demand jobs in the subregion, these occupations can provide a promising entry-point for students transitioning to the workforce.

In addition, some sectors contain more than one of these occupations due to strong projected growth projections or large employment size for these occupations. These occupations' sectors are highlighted to bring attention to the fact that there are certain areas with more job opportunities than others. To demonstrate this, each occupation with the most annual openings is listed along with the name of the sector in which it occurs. For example, the ICT/digital media sector contains two of these occupations, as does the retail, hospitality, and tourism.

1. Heavy and tractor-trailer truck drivers, 2,352 annual openings (advanced transportation and logistics)

2. Industrial truck and tractor operators, 1,264 (energy, construction, and utilities)
3. Office clerks, general, 1,252 annual openings (ICT/digital media)
4. Teaching assistants, except postsecondary, 1,072 annual openings (education)
5. First-line supervisors of food preparation and serving workers, 987 (retail, hospitality, and tourism)
6. General and operations managers, 897 (business and entrepreneurship)
7. Cooks, restaurant, 846 annual openings (retail, hospitality, and tourism)
8. Farmers, ranchers, and other agricultural managers, 819 annual openings (agriculture, water, and environmental technologies)
9. Secretaries and administrative assistants, except legal, medical, and executive, 780 annual openings (ICT/digital media)
10. Registered nurses, 748 annual openings (health)

### **Well-paid occupations**

There are 10 occupations in the subregion that pay median wages above \$40/hour and that have more than 50 annual openings. These occupations present a particularly promising opportunity for students preparing to enter the workforce. College administrators and faculty may choose to highlight these occupations as avenues that can advance economic opportunities for students.

1. Registered nurses, \$62.35 (health)
2. Industrial production managers, \$51.13 (advanced manufacturing)
3. Dental hygienists, \$50.53 (health)
4. General and operations managers, \$47.59 (business and entrepreneurship)
5. Facilities managers, \$46.12 (business and entrepreneurship)
6. Administrative services managers, \$46.32 (business and entrepreneurship)
7. Musicians and singers, \$45.34 (retail, hospitality, and tourism)
8. Sales representatives, wholesale and manufacturing, technical and scientific products, \$44.45 (business and entrepreneurship)
9. Correctional officers and jailers, \$43.98 (public safety)
10. Construction managers, \$42.04 (energy, construction, and utilities)

## Recommendations

- **Close workforce gaps through careful program outcome analysis.** The gap analysis identifies areas in which an undersupply of workers exists. The largest undersupplies exist for health, business and entrepreneurship, and energy, construction, and utilities. More comprehensive analysis may be warranted, in particular, for the energy, construction, and utilities sector because it has a shortage of 4,718 workers in the subregion, yet the number of awards (degrees and certificates) conferred in the subregion, only 326. A localized examination of program offerings by college and how they supply students for career pathways leading into top occupations in this sector may be warranted to address the shortage and ensure that employer needs are being met in the subregion.
- **Assess the support and services available to help underrepresented students access and succeed in careers in which they may be a minority.** Based on the findings on the composition of the workforce by sector in terms of gender and race/ethnicity, the community colleges in the subregion are encouraged to conduct a comparison with the demographic composition of students in programs that they offer, in order to evaluate whether programs are moving the needle regarding equitable access for and diversity of students entering related pathways. The colleges may want to take a closer look at what types of supports are needed for underrepresented students to succeed in careers in sectors containing disparities in terms of gender or race/ethnicity.
- **Target high-wage, in-demand occupations as workforce entry-points for students.** Community colleges in the region may want to conduct deep-dive analyses into program outcomes to determine if existing programs are targeting this report's top occupations that are well paid and in high demand as workforce entry-points for students. The occupations with high annual openings, high wages, or both that are highlighted in this section are particularly worth noting. In particular, two standout occupations are general and operations managers, \$47.59/hour median with 897 annual openings in the business and entrepreneurship sector, and registered nurses, \$62.35/hour median with 748 annual openings in the health sector.
- **Evaluate the role that specific skills may be playing in employer hiring decisions by sector.** During the pandemic, the value that employers place on skills as opposed to degrees and certificates increased due to the widespread workforce shortage affecting nearly every sector and transforming many jobs. Employers are requiring workers to be adept at many different types of tasks to compensate for positions that are unfilled or experiencing high turnover. Community colleges can use the in-demand certifications and specialized skills identified for each sector to calibrate programs to meet employer needs in the subregion.

# APPENDIX A: BELOW-MIDDLE-SKILL OCCUPATIONS

**Exhibit A1. A list of all below-middle-skill occupations with 25 or more annual openings for the NCV/NML subregion. Each occupation's respective number of annual openings and median hourly wage are presented.**

OCCUPATION	ANNUAL OPENINGS	MEDIAN HOURLY WAGES
Fast Food and Counter Workers	4,653	\$15.65
Laborers and Freight, Stock, and Material Movers, Hand	3,880	\$21.73
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	3,523	\$14.91
Cashiers	3,342	\$15.30
Stockers and Order Fillers	3,292	\$17.96
Retail Salespersons	2,145	\$16.17
Waiters and Waitresses	1,526	\$14.52
Cooks, Fast Food	1,178	\$15.36
Packers and Packagers, Hand	918	\$16.30
Light Truck Drivers	897	\$19.89
Landscaping and Groundskeeping Workers	869	\$17.81
Food Preparation Workers	800	\$15.73
Maids and Housekeeping Cleaners	786	\$16.24
Security Guards	713	\$16.66
Construction Laborers	671	\$21.17
Cleaners of Vehicles and Equipment	513	\$16.22
Miscellaneous Assemblers and Fabricators	491	\$17.91
Farmworkers, Farm, Ranch, and Aquacultural Animals	465	\$15.33
Dining Room and Cafeteria Attendants and Bartender Helpers	408	\$14.66
Driver/Sales Workers	377	\$17.95
Amusement and Recreation Attendants	370	\$15.03
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	358	\$14.76
Dishwashers	353	\$15.69



OCCUPATION	ANNUAL OPENINGS	MEDIAN HOURLY WAGES
Bartenders	322	\$14.56
Counter and Rental Clerks	308	\$17.64
Production Workers, All Other	300	\$16.84
Animal Caretakers	290	\$15.96
Agricultural Workers, All Other	235	\$16.17
Painters, Construction and Maintenance	230	\$22.32
Helpers--Production Workers	198	\$16.95
Food Batchmakers	193	\$17.79
Graders and Sorters, Agricultural Products	189	\$15.60
Cooks, Institution and Cafeteria	186	\$17.84
Food Servers, Nonrestaurant	184	\$16.46
Couriers and Messengers	176	\$16.67
Shuttle Drivers and Chauffeurs	170	\$17.06
Bus Drivers, School	165	\$23.63
Cement Masons and Concrete Finishers	163	\$24.09
Ushers, Lobby Attendants, and Ticket Takers	156	\$17.22
Bakers	151	\$17.00
Hotel, Motel, and Resort Desk Clerks	149	\$15.52
Dispatchers, Except Police, Fire, and Ambulance	141	\$22.80
Food Preparation and Serving Related Workers, All Other	133	\$15.57
Machine Feeders and Offbearers	132	\$20.41
Butchers and Meat Cutters	128	\$18.36
Crossing Guards and Flaggers	118	\$17.70
Merchandise Displayers and Window Trimmers	117	\$18.41
Taxi Drivers	113	\$15.98
Laundry and Dry-Cleaning Workers	99	\$15.10
Refuse and Recyclable Material Collectors	98	\$24.85
Slaughterers and Meat Packers	98	\$15.35
Tire Repairers and Changers	97	\$17.20
Cooks, Short Order	97	\$16.74
Food Processing Workers, All Other	96	\$17.16

OCCUPATION	ANNUAL OPENINGS	MEDIAN HOURLY WAGES
Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	93	\$15.15
Meat, Poultry, and Fish Cutters and Trimmers	92	\$15.13
Postal Service Mail Carriers	88	\$27.60
Personal Care and Service Workers, All Other	85	\$16.38
Automotive and Watercraft Service Attendants	80	\$16.86
Material Moving Workers, All Other	75	\$18.99
Demonstrators and Product Promoters	73	\$17.22
Drywall and Ceiling Tile Installers	69	\$24.53
Roofers	64	\$28.99
Cabinetmakers and Bench Carpenters	61	\$17.93
Tree Trimmers and Pruners	56	\$21.65
Highway Maintenance Workers	54	\$24.36
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	51	\$18.64
Helpers--Installation, Maintenance, and Repair Workers	50	\$18.42
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	50	\$18.75
Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	49	\$19.53
First-Line Supervisors of Entertainment and Recreation Workers, Except Gambling Services	49	\$19.29
Motor Vehicle Operators, All Other	48	\$21.14
Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	46	\$22.24
Tile and Stone Setters	44	\$27.37
Paper Goods Machine Setters, Operators, and Tenders	44	\$22.96
Parking Attendants	43	\$15.47
Molders, Shapers, and Casters, Except Metal and Plastic	43	\$21.96
Residential Advisors	41	\$19.12
Plasterers and Stucco Masons	40	\$23.65
School Bus Monitors	39	\$16.02
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	37	\$18.27
Gambling Dealers	35	\$18.25
Tour and Travel Guides	34	\$19.12

OCCUPATION	ANNUAL OPENINGS	MEDIAN HOURLY WAGES
Umpires, Referees, and Other Sports Officials	33	\$31.75
Word Processors and Typists	32	\$18.84
Conveyor Operators and Tenders	30	\$18.52
Passenger Attendants	29	\$19.87
Religious Workers, All Other	29	\$21.26
Coin, Vending, and Amusement Machine Servicers and Repairers	29	\$23.00
Helpers--Carpenters	28	\$20.58
Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	28	\$18.05
Structural Metal Fabricators and Fitters	26	\$24.77
Sawing Machine Setters, Operators, and Tenders, Wood	25	\$19.66
Food Cooking Machine Operators and Tenders	25	\$17.06
Jewelers and Precious Stone and Metal Workers	25	\$21.56
Sewing Machine Operators	25	\$17.07

# APPENDIX B: TERMS & DEFINITIONS

## 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 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 are affected by county-level Lightcast earnings by industry: <a href="https://lightcast.io/">https://lightcast.io/</a> .
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: <a href="https://www.bls.gov/emp/tables/educational-attainment.htm">https://www.bls.gov/emp/tables/educational-attainment.htm</a> .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: <a href="http://labormarketinfo.edd.ca.gov">labormarketinfo.edd.ca.gov</a> .
Job Posting and Skills Data	Lightcast.
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: <a href="http://ononline.org">ononline.org</a> .

## Key Terms and Concepts

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

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

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

**Employment Projections:** Projections of employment are calculated by a proprietary 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 region for one adult and no children. The cost increases with the addition of children.

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

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

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

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