

LABOR MARKET ANALYSIS

FOR PROGRAM RECOMMENDATION



C·O·E

CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

FIREFIGHTING OCCUPATIONS IN THE FAR NORTH

Far North
Center of Excellence

SEPTEMBER 2022

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SUMMARY

The Far North Center of Excellence for Labor Market Research prepared this report to provide a labor market analysis of educational supply and occupational demand for middle-skilled career pathways in the Far North subregion. This report aims to determine if demand in the local labor market is unmet by the supply from existing community college programs and other postsecondary training providers.

This report primarily focuses on training that leads to jobs in middle-skilled occupations - jobs that typically require education beyond a high school diploma but less than a Bachelor's degree - but may include higher-skilled occupations for training pathways that lead to a Bachelor's degree. Lowered skilled occupations are rarely considered in this analysis due to the lessened barriers for entry-level work, such as no formal education and on-the-job training requirements.

Key findings include:

- The Far North held 1,651 firefighting jobs in 2021. Firefighting jobs are projected to increase by 4% over the next five years, adding 63 new jobs to the subregion by 2026.
- Over the next five years, firefighting jobs are projected to have 163 annual openings in the Far North subregion.
- Wage data shows that firefighters earn \$11 to \$44 above the subregion's living wage of \$12.74 per hour.
- Awards data analysis shows that Far North training providers conferred an average of 315 awards (certificates and associate degrees) in fire technology and fire academy programs over the last three academic years.

Recommendations include:

- Due to an apparent oversupply of trained firefighters, the Far North Center of Excellence recommends caution in developing and implementing new firefighting programs.
- The Far North Center of Excellence also recommends that community colleges interested in establishing new firefighting programs partner with local firefighting agencies to ensure job placement for students once they've completed the program.

INTRODUCTION

The Far North Center of Excellence (COE) was asked to provide labor market information for a proposed program at a regional community college. This report focuses on the following Standard Occupational Classification (SOC) occupations and codes:

- These middle-skill occupations require more education and training beyond a high school diploma but less than a four-year degree:
 - First-Line Supervisors of Firefighting and Prevention Workers (33-1021)
 - Firefighters (33-2011)
 - Fire Inspectors and Investigators (33-2022)

A review of related programs revealed the following Taxonomy of Programs (TOP) title(s) and code(s) are appropriate for inclusion in this report:

- Fire Technology (2133.00)
- Fire Academy (2133.50)

The corresponding Classification of Instructional Program (CIP) title(s) and code(s) are:

- Fire Science/Firefighting (43.0203)*

* There were no programs offered in this CIP code within the study region.

OCCUPATIONAL DEMAND

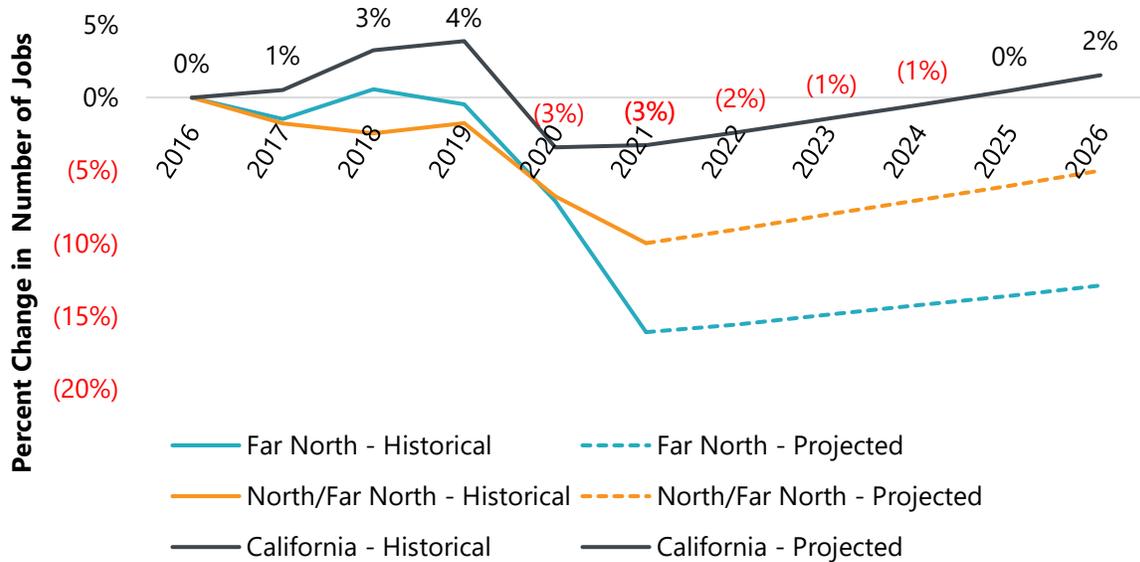
Exhibit 1 summarizes the five-year projected job growth for middle-skill and high-skill occupations in the Far North, North/Far North, and California.

Exhibit 1. Employment and projected demand, 2021-2026

Occupation	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	2021-2026 Annual Openings
First-Line Supervisors of Firefighting and Prevention Workers	191	200	9	5%	19
Firefighters	1,345	1,395	50	4%	126
Fire Inspectors and Investigators	115	119	4	3%	18
Far North	1,651	1,714	63	4%	163
First-Line Supervisors of Firefighting and Prevention Workers	566	603	37	7%	59
Firefighters	3,446	3,631	184	5%	310
Fire Inspectors and Investigators	221	234	13	6%	34
North/Far North	4,234	4,468	234	6%	403
First-Line Supervisors of Firefighting and Prevention Workers	5,110	5,386	276	5%	582
Firefighters	28,195	29,559	1,364	5%	2,582
Fire Inspectors and Investigators	1,321	1,399	78	6%	200
California	34,626	36,344	1,718	5%	3,364

Exhibit 2 compares the percent change in jobs between 2016 through 2021 and the projected changes through 2026. The rate of change is indexed to the total number of jobs in 2016.

Exhibit 2. Changes in employment, 2016-2026



WAGES

Exhibit 3 compares the entry-level, median, and experienced wages for the selected occupations to the Far North living wage for a single adult (\$12.74 per hour) and a small family¹ (\$24.66 per hour).

Exhibit 3. Comparison of wages by occupation, 2021



¹ A small family is defined as a single adult and one school aged child (between the ages of 5 and 12 years).

JOB POSTINGS

This section analyzes recent data from online job postings (real-time LMI). Online job postings may provide additional insight into recent changes in the labor market that are not captured by historical trends.

The Far North COE identified 74 online job postings for the selected occupations in the 15-county Far North subregion. Job posting data comes from Burning Glass Labor Insights and represents new listings posted online within the last year, from September 1, 2021, to August 31, 2022.

Occupations and Job Titles

Exhibit 4 details the number of online job postings for the selected occupations.

Exhibit 4. Number of job postings by occupation

Occupation	Job Postings	Share of Job Postings
Municipal Fire Fighting and Prevention Supervisors	36	49%
Municipal Firefighters	27	36%
Fire Inspectors	8	11%
Forest Fire Fighting and Prevention Supervisors	3	4%
Total Job Postings	74	100%

Exhibit 5 shows the top 10 job titles with the most job postings and the share. All job postings included a job title.

Exhibit 5. Top jobs titles

Job Title	Job Postings	Share of Job Postings
Battalion Chief	14	19%
Assistant Fire Chief	5	7%
Fire Chief	4	5%
Firefighter Type	3	4%
Volunteer Firefighter	3	4%

Job Title	Job Postings	Share of Job Postings
Wildland Firefighter	3	4%
Firefighter	2	3%
Firefighter, On-Call	2	3%
Firefighter/Emt Or Paramedic	2	3%
Firefighter/Paramedic	2	3%

Employers

Exhibit 6 shows the top 10 employers with the most job postings for the selected occupations. Forty-one percent (n= 30) of job postings did not include an employer.

Exhibit 6. Employers with the most job postings

Employer	Job Postings	Share of Job Postings
Daily Dispatch	8	18%
State of California	7	16%
Gfp Enterprises	4	9%
Butte County Fire Department	3	7%
Arcata Fire District	3	7%
Tehama County	3	7%
City Ukiah	2	5%
Burney Fire Protection District	2	5%
The Great Basin Institute	1	2%

Certifications, Skills, and Experience

Exhibit 7 shows the most relevant certifications requested by employers for the selected occupations. Forty-two percent (n = 31) of job postings did not include certification information.

Exhibit 7. Most in-demand certifications

Certification	Job Postings	Share of Job Postings
Wildland Firefighter I	10	23%
Firefighter I	10	23%
Emergency Medical Technician (EMT)	10	23%
Paramedic Certification	4	9%
National Registry of Emergency Medical Technicians (NREMT)	4	9%
Certified Patient Account Technician	4	9%

Exhibit 8 shows the top 10 skills across three categories for the studied occupations: specialized, human-centered, and technical skills.

Exhibit 8. Most in-demand specialized skills

Top 10 Specialized Skills	Top 10 Human-Centered Skills	Top 10 Technical Skills
Fire Protection	Editing	Microsoft Office
Fire Suppression	Physical Abilities	Public administration
Occupational Health and Safety	Organizational Skills	Adobe Acrobat
Repair	Communication Skills	Adobe Creative Suite
Self-Contained Breathing Apparatus (SCBA)	Planning	Adobe Indesign
Supervisory Skills	Writing	Adobe Photoshop
Telecommunications	Bilingual	Microsoft Excel
Cardiopulmonary Resuscitation	Building Effective Relationships	Microsoft Powerpoint

Top 10 Specialized Skills	Top 10 Human-Centered Skills	Top 10 Technical Skills
(CPR)		
Exercise Treadmill	English	Microsoft Word
Informed Consent Procedures	Teamwork / Collaboration	Word Processing

Exhibit 9 shows employers' minimum level of education for job postings for the selected occupations. Seventy-six percent (n= 56) of job postings did not include a preferred education level.

Exhibit 9. Employer-preferred minimum education levels

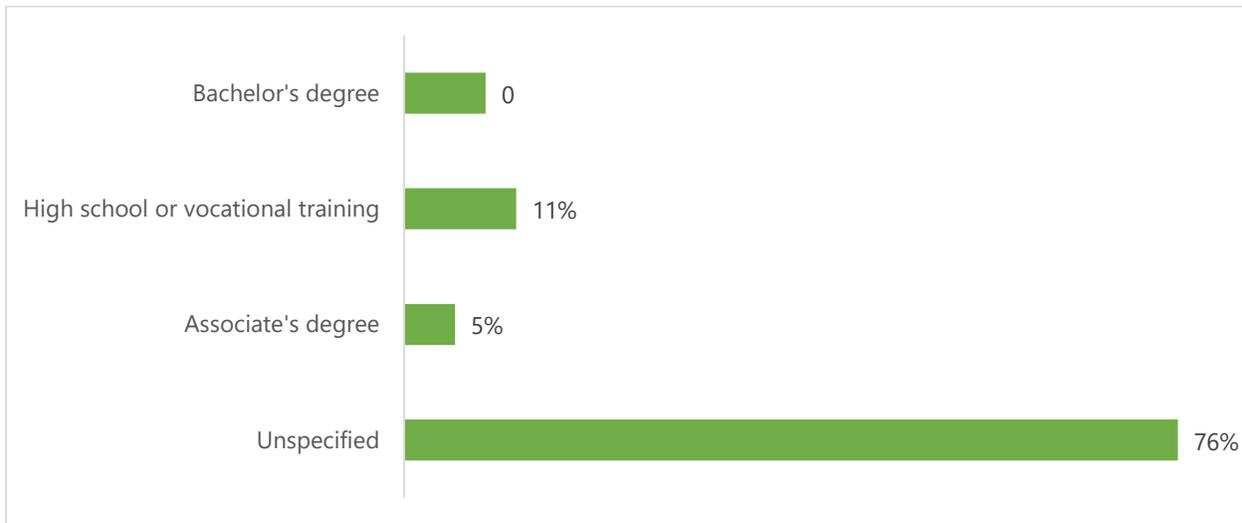
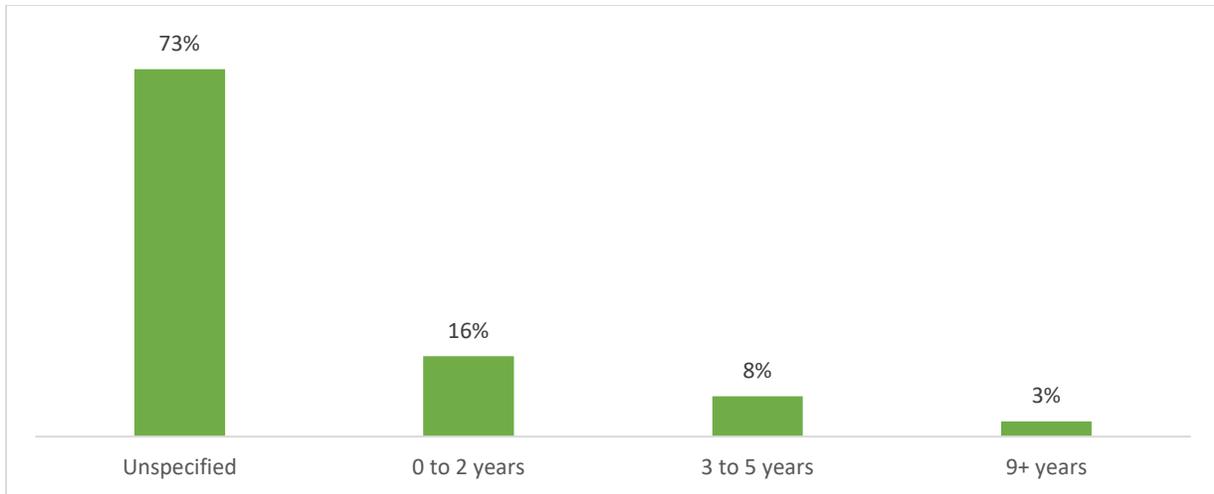


Exhibit 10 shows the experience levels required by employers for job postings for the selected occupations. Seventy-three percent (n = 54) of job postings did not include a preferred experience level.

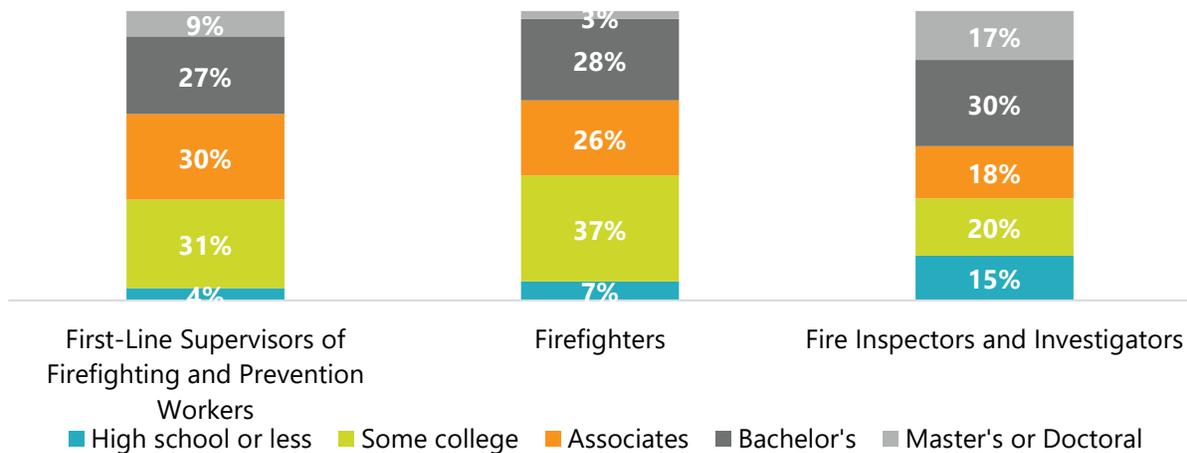
Exhibit 10. Employer-preferred experience levels



EDUCATION AND TRAINING

The U.S. Census Bureau collects data on education achieved by workers employed in occupations. Exhibit 11 shows the state-level educational attainment of the current workforce in the selected occupations.

Exhibit 11. California worker educational attainment for selected occupations, 2019



The Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which the BLS publishes projections data. Exhibit 12 shows the selected occupations' entry-level job requirements.

Exhibit 12. Typical education, work experience, and on-the-job training requirements

Occupation	Typical Entry-level Education	Work Experience Required	On-the-job Training Required
First-Line Supervisors of Firefighting and Prevention Workers	Postsecondary nondegree award	Less than 5 years	Moderate-term
Firefighters	Postsecondary nondegree award	None	Long-term
Fire Inspectors and Investigators	Postsecondary nondegree award	5 years or more	Moderate-term

EDUCATIONAL SUPPLY

Educational supply for an occupation can be estimated by analyzing the number of awards issued in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. Exhibit 13 shows the TOP and CIP codes for educational programs related to the selected occupations.

Exhibit 13. TOP and CIP codes for training programs related to the selected occupations

TOP Programs and Codes	Aligned CIP Programs and Codes
Fire Technology (2133.00) Fire Academy (2133.50)	Fire Science/Firefighting (43.0203*)

* There were no programs offered in these TOP or CIP codes within the study region.

Community College Supply

Exhibit 14 displays the average number of certificates and degrees from selected Far North community college programs over the last three academic years.

Exhibit 14. Annual average community college awards by program, 2018-19 through 2020-21

Program - TOP Code	College	Annual Awards 2018-19	Annual Awards 2019-20	Annual Awards 2020-21	3-Yr Annual Awards Average
Fire Technology (2133.00)	Butte	67	27	45	46
	Lassen	2	2	18	7
	Mendocino	1	1	2	1
	Shasta	3	3	5	4
	Siskiyou	37	20	30	29
	Subtotal	110	53	100	88
Fire Academy (2133.50)	Butte	113	118	72	101
	Shasta	133	81	165	126

Program - TOP Code	College	Annual Awards 2018-19	Annual Awards 2019-20	Annual Awards 2020-21	3-Yr Annual Awards Average
	Subtotal	246	199	237	227
	Total	356	252	337	315

Other Postsecondary Supply

No other post-secondary training providers conferred awards in related CIP codes in the Far North over the last three academic years.

FINDINGS

- This report focuses on three occupations in the firefighting occupations pathway: fire-line supervisors of firefighters and prevention workers, firefighters, and fire inspectors and investigators.
- The Far North subregion held 1,651 firefighting jobs in 2021. These jobs are projected to increase by 4% over the next five years, adding 63 new jobs to the subregion by 2026.
- Jobs for firefighters are projected to grow at about the same rate in the Far North subregion as in California.
- Over the next five years, firefighting jobs are projected to have 163 annual openings across the Far North.
- Wage data shows that firefighting occupations earn \$11 to \$44 above the single adult living wage of \$12.74 per hour.
- According to real-time labor market information, there were 74 online job postings for firefighting jobs between September 1, 2021, and August 31, 2022. A majority (85%) of postings are for municipal firefighters and municipal firefighting and prevention supervisors.
- Between 38% and 61% of incumbent workers in the studied occupations have educational attainment levels consistent with community college offerings (some college or associate degrees). Another 27% to 30% of workers in these occupations hold a bachelor's degree.
- Five Far North community colleges offer degrees and certificates in programs related to firefighting. Together, these programs conferred an average of 315 awards (certificates and associate degrees) in fire technology and fire academy programs over the last three academic years (2018-19 through 2020-21).
- Between 2018-19 and 2020-21, no non-community college training providers conferred awards related to firefighting occupations. Please note that non-community college awards data often lags by one year.

RECOMMENDATIONS

- Based on a three-year average of annual awards in the Far North firefighting programs and projected yearly openings, the supply gap analysis shows that the region seems to have an oversupply of training.
 - Community colleges and other postsecondary training providers issued an average of 315 awards over the last three years.
 - There are 163 projected annual openings for firefighting jobs.
- Due to an apparent oversupply of trained firefighters, the Far North Center of Excellence recommends caution in developing and implementing new firefighting programs.
- The Far North Center of Excellence also recommends that community colleges interested in establishing new firefighting programs partner with local firefighting agencies to ensure job placement for students once they've completed the program.

New Program Recommendation		
Move forward with the new program	Proceed with caution	A new program is not recommended
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

APPENDIX A. METHODOLOGY AND SOURCES

This report identified Occupations using the Center of Excellence TOP-to-CIP-to-SOC crosswalk and O*Net OnLine. This report's findings were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

Lightcast (Formerly EMSI/Burning Glass) 2022.3; QCEW Employees, Non-QCEW Employees, and Self-Employed. <https://www.economicmodeling.com/>. *Note: EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors).*

Integrated Postsecondary Education Data System (IPEDS). National Center for Education Statistics. U.S. Department of Education. <https://nces.ed.gov/ipeds/>.

Labor Market Information Division. California Employment Development Department. <https://labormarketinfo.edd.ca.gov/>.

Management Information Systems (MIS) Data Mart. California Community Colleges Chancellor's Office. <https://datamart.cccco.edu/>.

O*NET OnLine. U.S. Department of Labor/Employment and Training Administration (DOL ETA). <https://www.onetonline.org/>.

Public Use Microdata Sample (PUMS). U.S. Census Bureau American Community Survey (ACS). <https://www.census.gov/programs-surveys/acs/microdata.html>

Self-Sufficiency Standard Tool for California. The University of Washington. <http://www.selfsufficiencystandard.org/>

"Taxonomy of Programs." California Community Colleges Chancellor's Office. June 2012, 6th Edition. <https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Educational-Services-and-Support/Academic-Affairs/What-we-do/Curriculum-and-Instruction-Unit/Files/TOPmanual6200909corrected12513pdf.ashx>

"TOP-CIP-SOC Crosswalk." Centers of Excellence for Labor Market Research. June 2021 Edition. <http://coecc.net/>

APPENDIX B. GLOSSARY OF KEY TERMS

Key Terms	Definition
Occupation	Occupation refers to professions, or careers, in the workforce. Occupations differ from jobs in that jobs show the number of positions held in a given occupation.
Jobs	<p>A job is any position where a worker provides labor for monetary compensation.</p> <p>Job numbers include employees (those who work for businesses) and proprietors (those who work for themselves). Full- and part-time jobs are included and counted equally (i.e., not adjusted to full-time equivalents). Data for jobs, or employment, are annual averages.</p>
Job Change	Job change is the net increase or decrease of jobs over a given timeframe.
Job Openings	<p>Job openings are the projected number of positions available for workers entering an occupation.</p> <p>Openings include growth and replacement jobs. Growth jobs are the positive change in the total number of workers employed. Replacement jobs are the estimates of new workers needed to replace workers permanently leaving the occupation.</p>
Wages	Wages, or compensation, show workers' percentile and average earnings in a given occupation. The 25th-percentile and 75th-percentile hourly wages are used as a proxy for entry-level and experienced-level wages.
Living Wage	The living wage is the level of income a single adult with no children must earn to meet basic needs. The living wage is calculated using basic levels of allowances for food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs.
Educational Attainment	Educational attainment is the level of education achieved by workers in a given occupation. The data includes workers aged 25 years and older.
Typical Entry-level Education	The education level generally required for employment in an occupation. It may differ from the actual educational levels attained by workers in any given occupation.
Work Experience Required	The level of prior experience a worker needs to enter a job in a given occupation.
On-the-job Training Required	The level of on-the-job training a worker needs to obtain competency in a given occupation.
Awards	Awards are the number of certificates and degrees conferred for a specific course of study in a given year. Awards counts "papers" and, as a result, may be greater than the actual number of students who complete a program.

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

Important Disclaimer: 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. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

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Centers of Excellence for Labor Market Research, Economic and
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