

SEPTEMBER 2018

LABOR MARKET ANALYSIS

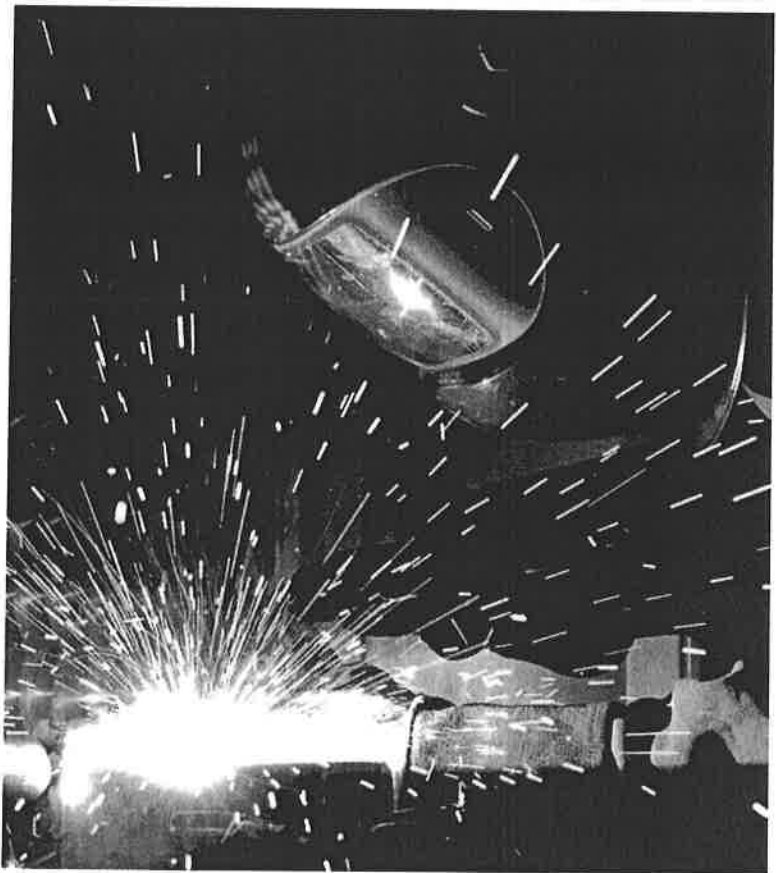
Welding



CALIFORNIA COMMUNITY COLLEGES
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FOR JOBS AND THE ECONOMY



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Prepared by the Central Valley/Mother Lode Center of Excellence

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SUMMARY

This study conducted by the Central Valley/Mother Lode Center of Excellence examine labor market demand, wages, skills and community college supply for occupations related to welding. Two occupations were identified: welders, cutters, solderers, and brazers (SOC 51-4121); and welding, soldering, and brazing machine setters, operators, and tenders (SOC 51-4122).

KEY FINDINGS:

- **Occupational demand** — The larger of the two occupations is welders, cutters, solderers and brazers with 1,949 workers in 2017 and 234 annual openings.
- **Wages** — The highest paid occupation is welders, cutters, solderers and brazers. Both occupations exceed the region's self-sufficiency wage and living wage at entry-level.
- **Employers** — Top employers in the region include Simpson Strong Tie Company, Schuff Steel and The Hedy Company.
- **Job titles** — The most common occupational title in job postings is welders, cutters and welder fitters. The most common job title is welder.
- **Skills and certifications** — The top baseline skill requirement is work area maintenance, and the top specialized skill is welding. The top certification is welding.
- **Education** — The education required for the two occupations is a high school diploma with moderate on-the-job training.
- **Supply** — Analysis of community college completions in the region shows that, on average, 152 certificates and 27 degrees are conferred each year related to the two occupations analyzed in this study.

Based on a comparison of occupational demand and subregional and regional supply, there is an undersupply of 223 trained workers in the subregion and 378 trained workers in the region. As a result, the Center of Excellence recommends that Modesto Junior College work with the region's Proposition 39 Director, the deputy sector navigator for agriculture, water and environmental technologies, the agriculture and welding advisory boards, and local industry in an expansion of the college's welding programs.

INTRODUCTION

The Central Valley/Mother Lode Center of Excellence was asked by the Modesto Junior College to provide labor market information for Taxonomy of Programs (TOP) code 095650-Welding Technology. This analysis focuses on the North Central Valley/Northern Mother Lode (NCV/NML) subregion. Occupational demand, supply and wage data for the region are also included for broader applicability and use. Analysis of the program and occupational data related to welding resulted in the identification of two applicable occupations. The Standard Occupational Classification (SOC) System titles and codes are:

- Welders, cutters, solderers, and brazers (SOC 51-4121); and
- Welding, soldering, and brazing machine setters, operators, and tenders (SOC 51-4122).

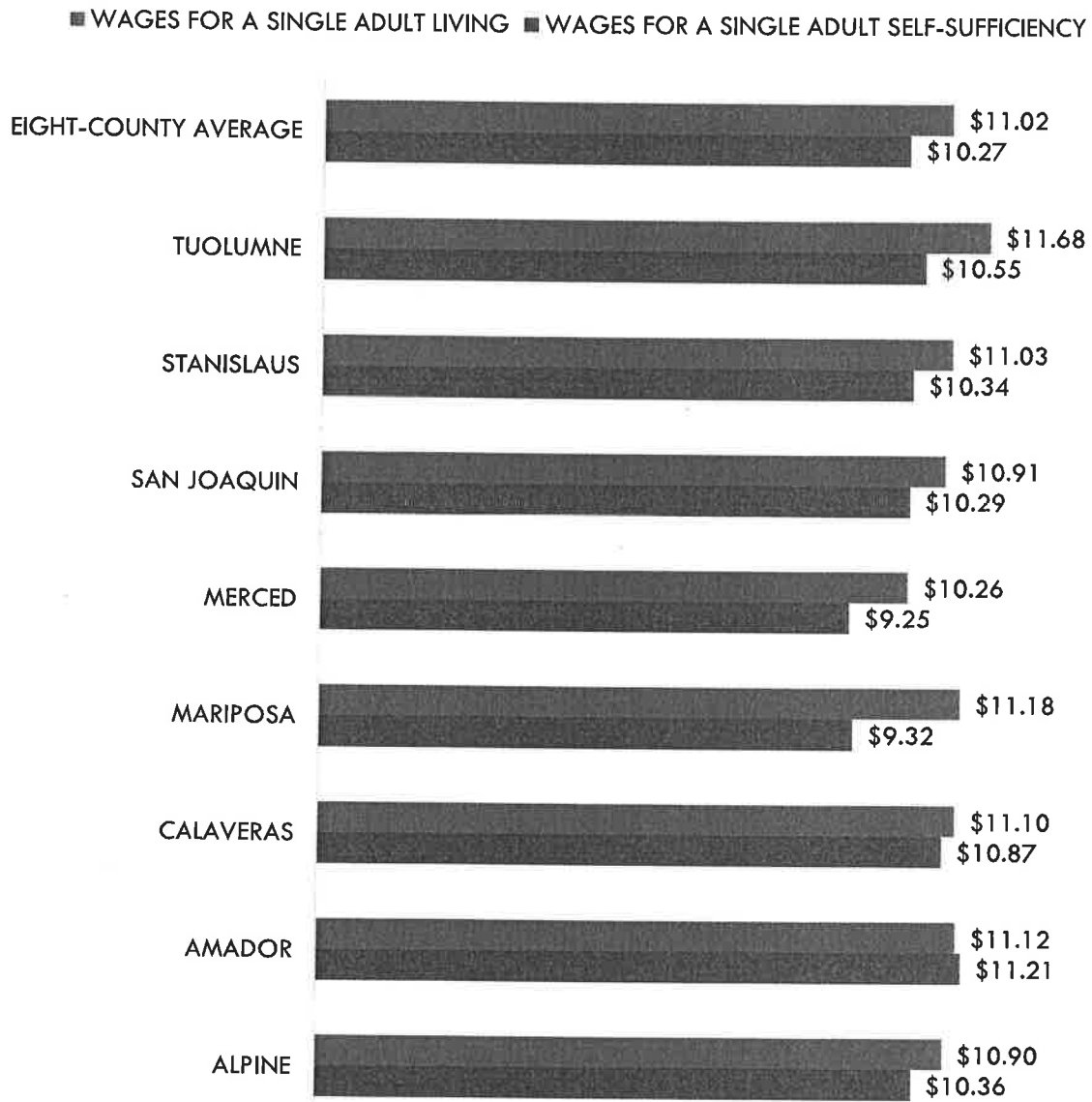
The SOC codes, occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O*NET OnLine are shown in Exhibit 1.

EXHIBIT 1. Welding SOC titles, job descriptions, sample job titles, and knowledge and skills

SOC CODE & TITLE	DESCRIPTION	SAMPLE JOB TITLES	KNOWLEDGE AND SKILLS
51-4121.06 Welders, Cutters, and Welder Fitters	Use hand-welding or flame-cutting equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.	Aluminum Welder, Fabrication Welder, Fabricator, Fitter/Welder, Maintenance Welder, Mig Welder, Sub Arc Operator, Welder, Welder-Fitter, Welder/Fabricator	Knowledge -Production and processing -Design -Administration and management -Mechanical -Mathematics Skills -Critical thinking -Operation and control -Monitoring -Reading comprehension
51-4121.07 Solderers and Brazers	Braze or solder together components to assemble fabricated metal parts, using soldering iron, torch, or welding machine and flux.	Assembly Line Brazer, Brazer, Connector, Electronic Technician, Fabricator, Production Technician, Refrigeration Brazer/Solderer, Refrigeration Specialist, Solderer, Wirer	Knowledge -Production and processing Skills -Quality control analysis
51-4122 Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	Set up, operate, or tend welding, soldering, or brazing machines or robots that weld, braze, solder, or heat treat metal products, components, or assemblies. Includes workers who operate laser cutters or laser-beam machines.	Braze Operator, Fabricator, Finishing Technician, Fitter-Welder, Machine Operator, Mig Welder, Operator, Robot Operator, Spot Welder, Technical Associate (TA)	Knowledge -Mathematics Skills -Operation monitoring -Active listening -Critical thinking -Operation and control -Speaking

The 2014 average self-sufficiency wage for a single adult in the North Central Valley/Northern Mother Lode (NCV/NML) subregion is \$10.27/hour, and the current average living wage for a single adult is \$11.02/hour. Self-sufficiency and living wage data by county and the overall seven-county average are shown in Exhibit 2. In the wages sections of this report, Pct.10 hourly denotes entry-level wages, and median represents experienced wages.

EXHIBIT 2. Self-sufficiency and living wages in the NCV/NML subregion



OCCUPATIONAL DEMAND

There were 2,061 welders employed in 2017 in the North Central Valley/Northern Mother Lode subregion (Exhibit 3). The largest occupation is welders, cutters, solderers and brazers with 1,949 workers in 2017. This occupation is expected to increase by 6% over the next five years and has the greatest number of projected annual openings, 234. The second occupations is welding, soldering and brazing machine setters, operators and tenders. This occupation is substantially smaller with only 111 jobs in 2017 and has no projected growth (0%), with only 12 annual openings.

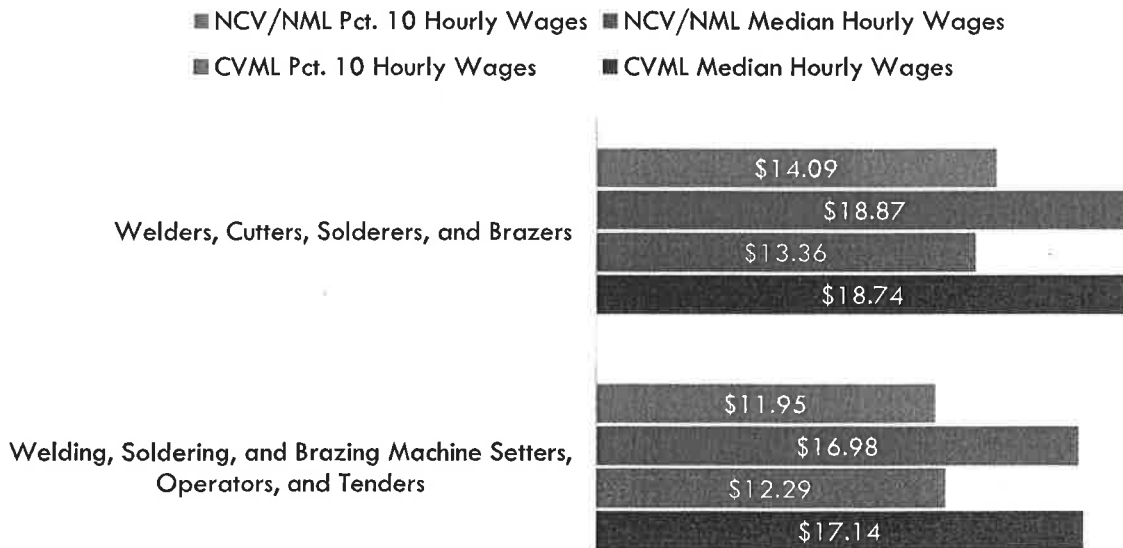
EXHIBIT 3. Welding employment and occupational projections in the NCV/NML subregion

OCCUPATION	2017 JOBS	5-YEAR CHANGE	5-YEAR % CHANGE	ANNUAL OPENINGS
Welders, Cutters, Solderers and Brazers	1,949	112	6%	234
Welding, Soldering and Brazing Machine Setters, Operators and Tenders	111	0	0%	12
TOTAL	2,061	111	5%	247

WAGES

Exhibit 4 compares the entry-level and experienced wages of the two welding occupations. The entry-level wages for both occupations exceeds the average self-sufficiency wage for a single adult in the eight-county subregion, \$10.27/hour. Entry-level wages are also higher than the average living wage for a single adult, \$11.02/hour, in the subregion.

EXHIBIT 4. Entry-level and experienced wage comparison in the region and subregion



JOB POSTINGS

There were only 173 job postings for the two welding occupations in the eight counties of the North Central Valley/Northern Mother Lode subregion from September 2017 through August 2018. The top employers advertising for the 173 jobs are listed in Exhibit 5.

EXHIBIT 5. Top welding employers by number of job postings

EMPLOYER	JOB POSTINGS
Simpson Strong Tie Company Inc	6
The Hedy Company Inc	5
Schuff Steel	5
Core & Main	4
Oldcastle Precast Inc	4

Exhibit 6 shows how job postings for the two targeted welding occupations in the subregion were distributed across one primary occupation. The majority of job postings use the occupational title welders, cutters and welder fitters.

EXHIBIT 6. Occupational titles related to welding in job postings

OCCUPATIONAL TITLE	JOB POSTINGS
Welders, cutters and welder fitters	172
Welding, soldering and brazing machine setters, operators and tenders	1

JOB TITLES

Analysis of the 173 advertised job titles for the targeted occupations reveals that the top job title is welder. Exhibit 7 shows the top job titles among the job postings.

EXHIBIT 7. Top welding job titles by number of job postings

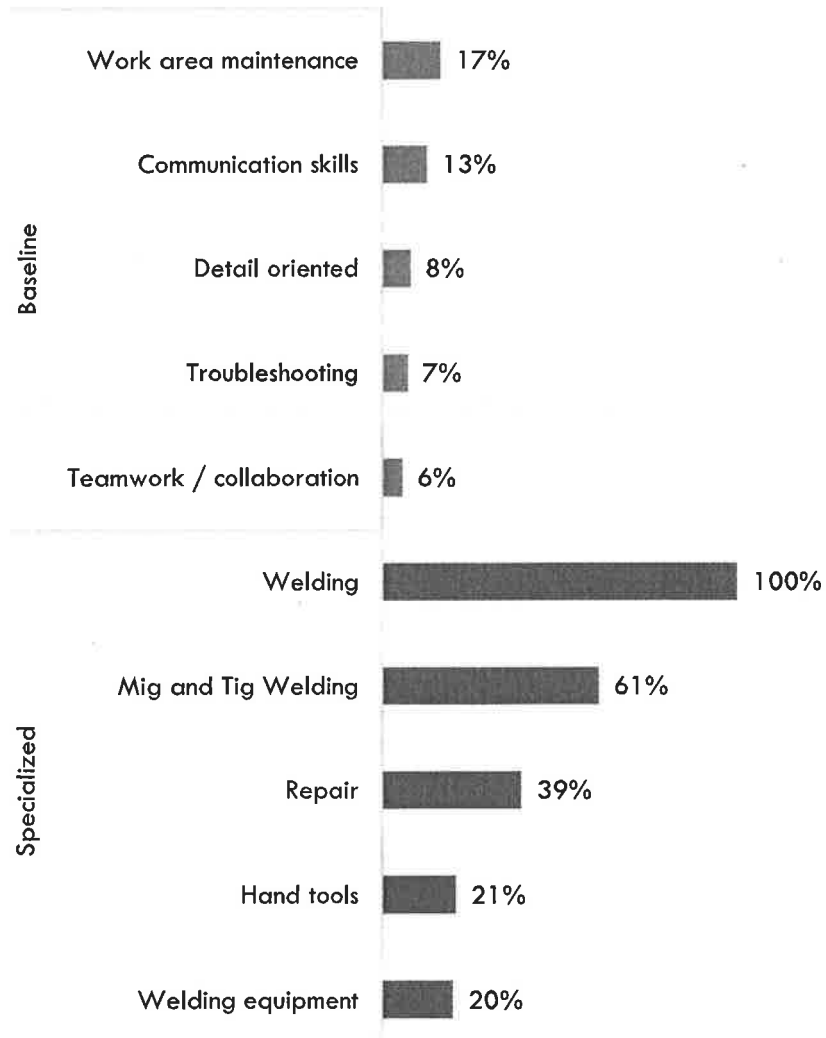
JOB TITLE	JOB POSTINGS
Welder	143
Mechanic	8
Production Welder	6
Mig Welder	3
Structural Welder	3
Plasma Operator	2
Tig Welder	2

SKILLS

Exhibit 8 depicts the top baseline and specialized skills for the two targeted welding occupations. Nearly 75% of the 173 job postings contained skills data.

Of the job postings with skills data, the three most important baseline skills are work area maintenance, 17% of job postings, communication, 13%, and detail oriented, 8%. The top three specialized skills are welding, 100% of job postings, mig and tig welding, 61%, and repair, 39%.

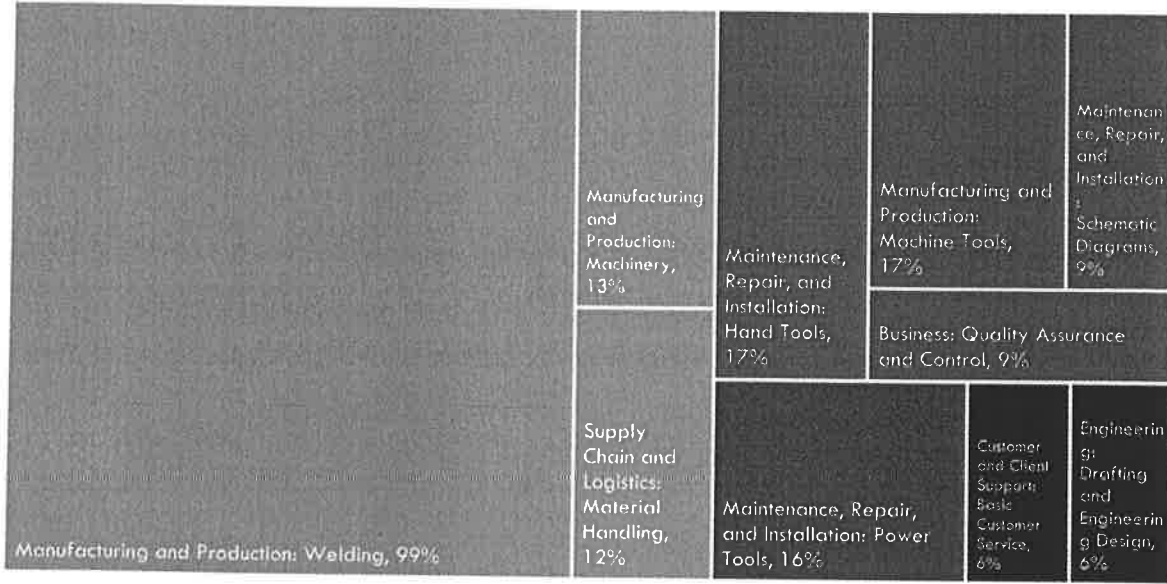
EXHIBIT 8. Top baseline and specialized skills for welders in job postings



SKILL CLUSTER PROJECTIONS

Less than half of the 173 job postings contain skill cluster projections data. An evaluation of the top skill clusters that will have the greatest gains in level of importance shows that the top area is manufacturing and production: welding, 99% (Exhibit 9). Other clusters with large gain projections include maintenance, repair and installation: hand tools (17%); manufacturing and production: machine tools (17%); and maintenance, repair and installation: power tools (16%).

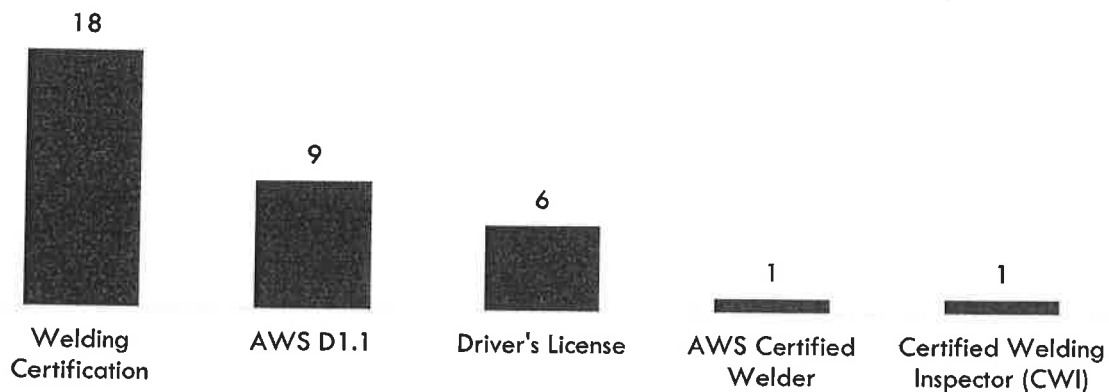
EXHIBIT 9. Skill cluster projections for welding occupations



CERTIFICATIONS

Of the 43 postings that contain certification data, 18 indicate a need for a welding certification. The next two top certifications are AWS D1.1 certification and a driver's license (Exhibit 10).

EXHIBIT 10. Welding certifications requested in job postings



EDUCATION, WORK EXPERIENCE AND TRAINING

The typical entry-level education for welders is a high school diploma (Exhibit 11). Beyond the need for on-the-job training, the two occupations also qualify as relevant to community colleges due to one or more of the following requirements:

- State of California certification requirements,
- Specialized industry knowledge, and
- Performance of duties that are taught through programs offered by local community colleges.

EXHIBIT 11. Education, work experience, training and Current Population Survey results¹

OCCUPATION	TYPICAL ENTRY-LEVEL EDUCATION	WORK EXPERIENCE REQUIRED	TYPICAL ON-THE-JOB TRAINING	CPS
Welders, cutters, solderers and brazers	HS Diploma	None	Moderate	30.6%
Welding, soldering and brazing machine setters, operators and tenders	HS Diploma	None	Moderate	30.6%

SUPPLY

Analysis of California Community Colleges Chancellor's Office Curriculum Inventory (COCI) program data shows there are 11 community colleges in the region offering a total of 28 programs (nine degree programs and 19 certificate programs). The colleges offering programs are:

- Bakersfield
- Cerro Coso
- Columbia
- Fresno City
- Merced
- Modesto Junior
- Reedley
- San Joaquin Delta
- Sequoias
- Taft
- West Hills Coalinga

Analysis of the last three years of TOP code data, from 2014 through 2017, showed that, on average, 152 certificates and 27 degrees were conferred in the Central Valley/Mother Lode region each year (Exhibit 12).

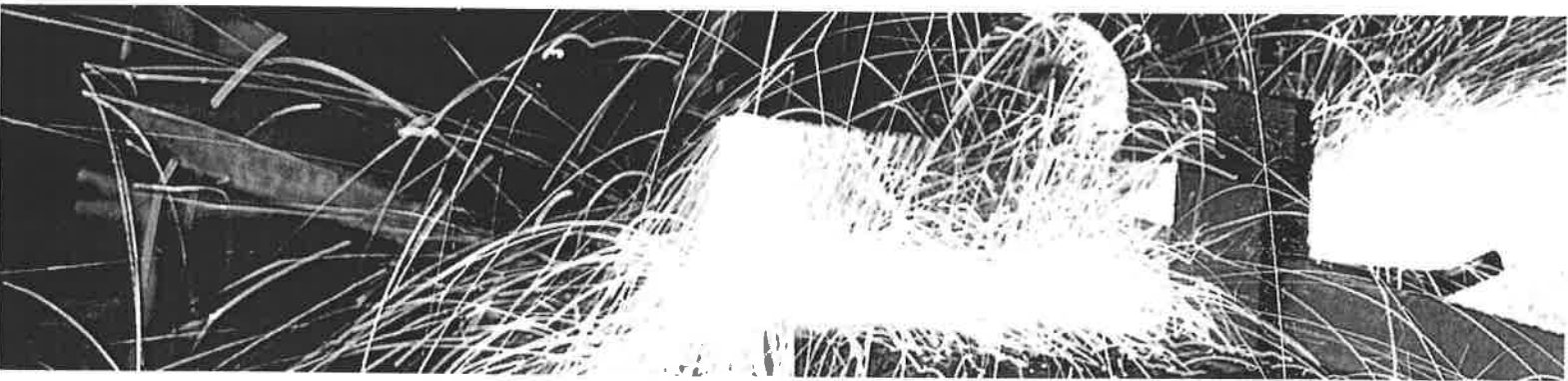
¹ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

EXHIBIT 12. Community college supply for welding occupations in the subregion and region

TOP CODE & TITLE	COLLEGE	3-YEAR AVERAGE	
		CERTIFICATES	DEGREES
095650 – Welding Technology	Bakersfield	75	5
	Cerro Coso	26	5
	Fresno City	10	4
	Merced	2	3
	Modesto	12	3
	Reedley College	9	2
	San Joaquin Delta	4	0
	Sequoias	8	4
	Taft	7	1
TOTAL		152	27

An undersupply of welders appears to exist in the region and subregion. In the subregion, there is a shortage of 223 trained workers. In the region, the shortage is 378 trained workers (Exhibit 13).

EXHIBIT 13. Welding workforce annual demand and supply in the subregion and region



STUDENT OUTCOMES

Exhibit 14 summarizes employment and wage outcomes from the California Community College Chancellor's Office Cal-PASS Plus Launchboard for TOP code 095650. Respondents report that 30 students transferred after their community college studies, while 69% of respondents were employed in the second quarter after exit, and 56% attained a living wage.

Exhibit 14: Career Technical Education Outcomes Survey, Central Valley/Mother Lode²

METRIC	095650 WELDING TECHNOLOGY
Course Enrollments	3,522
Students Who Got a Degree or Certificate	110
Number of Students Who Transferred	30
Employed in the Second Fiscal Quarter after Exit	69% (n=574)
Attained a Living Wage	56% (n=355)

CONCLUSION

The entry-level wages for welders exceed the average self-sufficiency and living wages at the regional and subregional levels for a single adult. There were 173 job postings in the past 12 months for occupations related to welders in the North Central Valley/Northern Mother Lode subregion. Analysis of skills and certificate requirements in job postings indicates:

- The top baseline skill requirement is work area maintenance, and the top specialized skill is welding.
- The top certification is welding.

There are 11 community colleges in the region offering a total of 28 programs with the TOP code 095650-Welding Technology in the region, but there remains an undersupply of trained workers, a shortage of 378 in the region and 223 in the subregion.

RECOMMENDATION

It is recommended that Modesto Junior College work with the Proposition 39 Director, the deputy sector navigator for agriculture, water and environmental technologies, the agriculture and welding advisory boards, and local industry in the expansion the college's welding programs.

² The Cal-PASS launchboard is a California Community College Chancellor's Office dashboard that compiles management information system, unemployment insurance supply and EMSI demand data. Detail information can be obtained by following this link: <https://doingwhatmatters.cccco.edu/LaunchBoard.aspx>

APPENDIX A: METHODOLOGY & DATA SOURCES

DATA SOURCES

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

DATA TYPE	SOURCE
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry: economicmodeling.com .
Living Wage	A living wage calculator that estimates the cost of living in a specific community or region: livingwage.mit.edu .
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: www.bls.gov/emp/ep_education_tech.htm .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division, labormarketinfo.edd.ca.gov
Job Posting and Skills Data	Burning Glass, http://www.burning-glass.com/
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: www.onetonline.org

KEY TERMS AND CONCEPTS

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

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

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

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

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

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

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

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

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

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

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