

July 2022

# Labor Market Analysis

## Industrial Maintenance Technician



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Prepared by the Central Valley/Mother Lode Center of Excellence

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**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.

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# Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for Industrial Maintenance Technician. Five occupations related to Industrial Maintenance Technician were identified for Madera College:

- 49-2094, Electrical and Electronics Repairers, Commercial and Industrial Equipment
- 49-9041, Industrial Machinery Mechanics
- 49-9071, Maintenance and Repair Workers, General
- 49-9099, Installation, Maintenance, and Repair Workers, All Other
- 51-1011, First-Line Supervisors of Production and Operating Workers

## Key findings:

- **Occupational demand** — Nearly 17,400 workers were employed in jobs related to Industrial Maintenance Technician in 2020 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is maintenance and repair workers, general with 9,754 workers, a projected growth rate of 7% over the next five years, and 1,076 annual openings.
- **Wages** — Electrical and electronics repairers, commercial and industrial equipment earn the highest entry-level wage, \$27.17/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Mammoth Mountain Ski Area, Winncompanies, and state of california.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Maintenance and Repair Workers, General. The most common job title is Maintenance Technician.
- **Skills and certifications** — The top baseline skill is troubleshooting, the top specialized skill is repair, and the top software skill is Microsoft Office. The most in-demand certification is a CDL Class A.
- **Education** — A high school diploma or equivalent is typically required for maintenance and repair workers, general, first-line supervisors of production and operating workers, industrial machinery mechanics, and installation, maintenance, and repair workers, all other. A postsecondary nondegree award is typically required for electrical and electronics repairers, commercial and industrial equipment.
- **Supply** — Analysis of postsecondary completions shows that on average 259 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 1,640 trained workers in the subregion and 2,906 workers in the region. The Center of Excellence recommends that Madera College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Industrial Maintenance Technician workers in the region.

# Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Madera College to provide labor market information for Industrial Maintenance Technician. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the SCV/SML subregion is \$11.91/hour.<sup>1</sup> Analysis of the program and occupational data related to Industrial Maintenance Technician resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 49-2094, Electrical and Electronics Repairers, Commercial and Industrial Equipment
- 49-9041, Industrial Machinery Mechanics
- 49-9071, Maintenance and Repair Workers, General
- 49-9099, Installation, Maintenance, and Repair Workers, All Other
- 51-1011, First-Line Supervisors of Production and Operating Workers

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O\*NET OnLine are shown below. Please note there was no O\*Net data available for Installation, Maintenance, and Repair Workers, All Other

## **Electrical and Electronics Repairers, Commercial and Industrial Equipment**

**Job Description:** Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas.

**Knowledge:** Computers and Electronics, Mechanical, Production and Processing, Customer and Personal Service, Mathematics

**Skills:** Operations Monitoring, Repairing, Critical Thinking, Equipment Maintenance, Quality Control Analysis

## **Industrial Machinery Mechanics**

**Job Description:** Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems. May also install, dismantle, or move machinery and heavy equipment according to plans.

**Knowledge:** Mechanical, English Language, Production and Processing, Engineering and Technology, Design

**Skills:** Equipment Maintenance, Operation and Control, Operations Monitoring, Repairing, Troubleshooting

## **Maintenance and Repair Workers, General**

**Job Description:** Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of a building in repair. Duties may involve pipe fitting; HVAC maintenance; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.

**Knowledge:** Mechanical, Building and Construction, English Language, Mathematics, Production and Processing

**Skills:** Equipment Maintenance, Repairing, Troubleshooting, Critical Thinking, Active Listening

## **First-Line Supervisors of Production and Operating Workers**

**Job Description:** Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators. Excludes team or work leaders.

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<sup>1</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/>.

**Knowledge:** Production and Processing, Administration and Management, Personnel and Human Resources, English Language, Administrative

**Skills:** Active Listening, Management of Personnel Resources, Speaking, Time Management, Coordination

## Occupational Demand

The SCV/SML subregion employed 17,398 workers in Industrial Maintenance Technician occupations in 2020 (Exhibit 1). The largest occupation is maintenance and repair workers, general with 9,754 workers in 2020. This occupation is projected to grow by 7% over the next five years and has the greatest number of projected annual openings, 1,076.

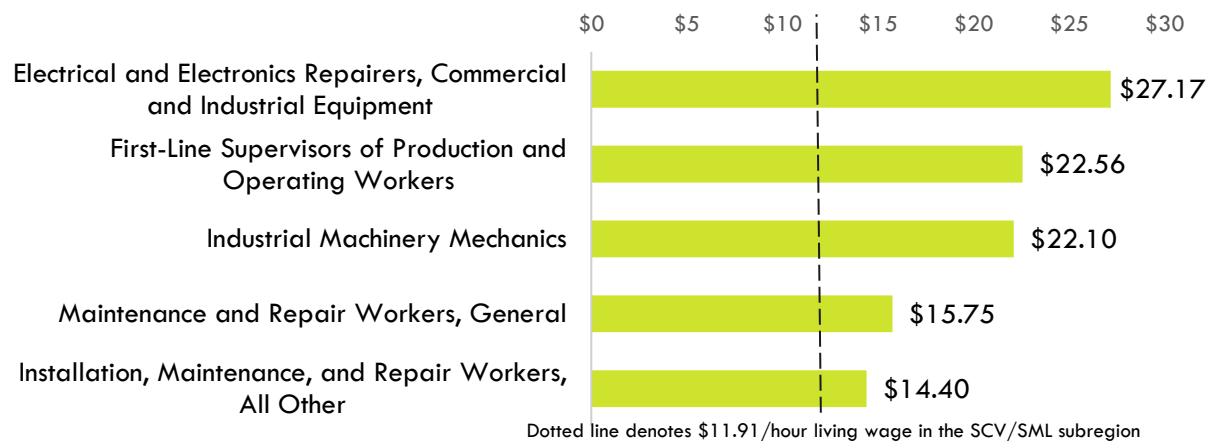
**Exhibit 1. Industrial Maintenance Technician employment and occupational projections in the SCV/SML subregion**

| Occupation  | 2020 Jobs     | 2025 Jobs     | 5-Year Change | 5-Year % Change | Annual Openings |
|---|---------------|---------------|---------------|-----------------|-----------------|
| Maintenance and Repair Workers, General                                   | 9,754         | 10,408        | 653           | 7%              | 1,076           |
| First-Line Supervisors of Production and Operating Workers                | 3,125         | 3,264         | 139           | 4%              | 340             |
| Industrial Machinery Mechanics  | 2,676         | 2,910         | 234           | 9%              | 284             |
| Installation, Maintenance, and Repair Workers, All Other                  | 1,477         | 1,515         | 38            | 3%              | 165             |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment | 366           | 372           | 6             | 2%              | 31              |
| <b>TOTAL</b>  | <b>17,398</b> | <b>18,469</b> | <b>1,070</b>  | <b>6%</b>       | <b>1,896</b>    |

## Wages

Exhibit 2 shows the entry-level hourly wages of the Industrial Maintenance Technician occupations. Electrical and electronics repairers, commercial and industrial equipment earn the highest entry-level wage, \$27.17/hour in the subregion<sup>2</sup>.

**Exhibit 2. Industrial Maintenance Technician entry-level wages in the SCV/SML subregion**



<sup>2</sup> Entry-level wages are derived from the 25<sup>th</sup> percentile.

# Job Postings

There were 2,778 job postings for the five occupations in the SCV/SML subregion from January 2022 to June 2022.<sup>3</sup> The employers with the most job postings are listed in Exhibit 3.

**Exhibit 3. Top employers of Industrial Maintenance Technician by number of job postings**

| Employer                    | Job Postings | % Job Postings |
|-----------------------------|--------------|----------------|
| Mammoth Mountain Ski Area   | 67           | 3%             |
| Winncompanies               | 37           | 2%             |
| state of california         | 33           | 2%             |
| Gsf Properties              | 27           | 1%             |
| Gsf Properties Incorporated | 23           | 1%             |
| McDonald's                  | 22           | 1%             |
| Foster Farms                | 19           | 1%             |
| Gap Inc.                    | 18           | 1%             |
| The Home Depot Incorporated | 17           | 1%             |
| Northrop Grumman            | 16           | 1%             |

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across six O\*NET OnLine occupations. The occupational title Maintenance and Repair Workers, General is listed in 1,954 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Maintenance Technician in 214 job postings, Maintenance Mechanic in 181 job postings, and Field Service Technician in 112 job postings.

**Exhibit 4. Top occupational titles in job postings for Industrial Maintenance Technician**

| Occupational Title  | Job Postings | % of Job Postings |
|---|--------------|-------------------|
| Maintenance and Repair Workers, General                                   | 1,954        | 70%               |
| First-Line Supervisors of Production and Operating Workers                | 426          | 15%               |
| Industrial Machinery Mechanics  | 232          | 8%                |
| Installation, Maintenance, and Repair Workers, All Other                  | 162          | 6%                |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment | 2            | 0%                |
| Geothermal Technicians  | 2            | 0%                |

## Salaries

Exhibit 5 shows the “Market Salaries” for Industrial Maintenance Technician occupations. These are calculated by Burning Glass using a machine learning model built off of millions of job postings every year. This accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

<sup>3</sup> Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

**Exhibit 5. Salaries for Industrial Maintenance Technician occupations**

| Market Salary Percentile | Salary Amount |
|--------------------------|---------------|
| 10th Percentile          | \$28,500      |
| 25th Percentile          | \$31,668      |
| 50th Percentile          | \$36,789      |
| 75th Percentile          | \$45,994      |
| 90th Percentile          | \$59,378      |

**Education**

Of the 2,778 job postings, 1,417 listed an education level preferred for the positions being filled. Among those, 86% requested high school or vocational training, 15% requested an associate degree, and 12% requested a bachelor’s degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

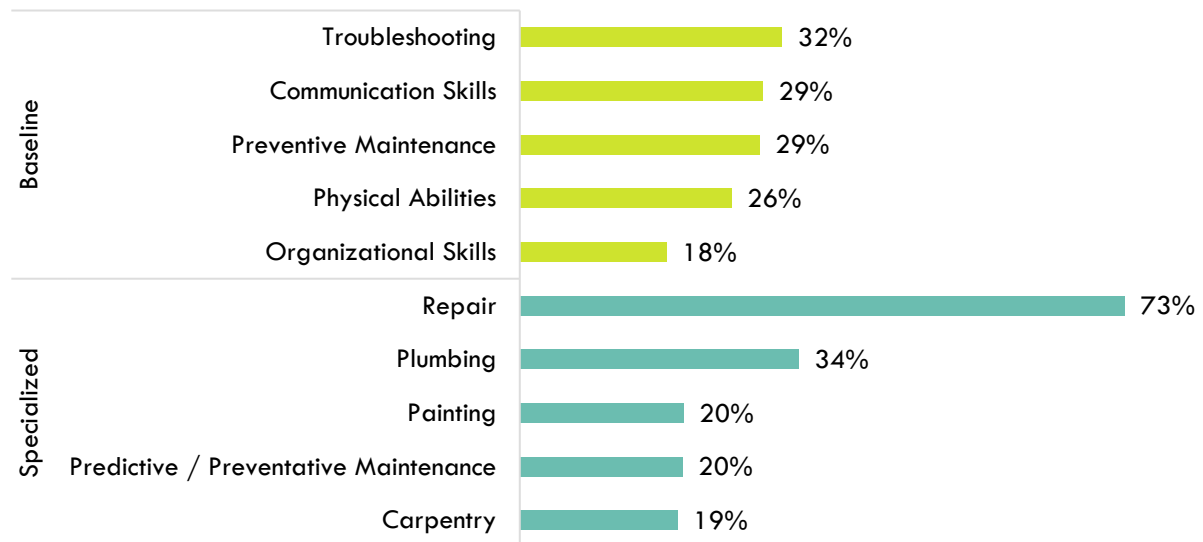
**Exhibit 6. Education levels requested in job postings for Industrial Maintenance Technician**

| Education Level                    | Job Postings | % of Job Postings |
|------------------------------------|--------------|-------------------|
| High school or vocational training | 1,216        | 86%               |
| Associate's degree                 | 214          | 15%               |
| Bachelor's degree                  | 169          | 12%               |
| Master's degree                    | 20           | 1%                |
| Doctoral degree                    | 2            | 0%                |

**Baseline and Specialized Skills**

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are troubleshooting, 32% of job postings, communication skills, 29%, and preventive maintenance, 29%. The top three specialized skills are repair, 73% of job postings, plumbing, 34%, and painting, 20%.

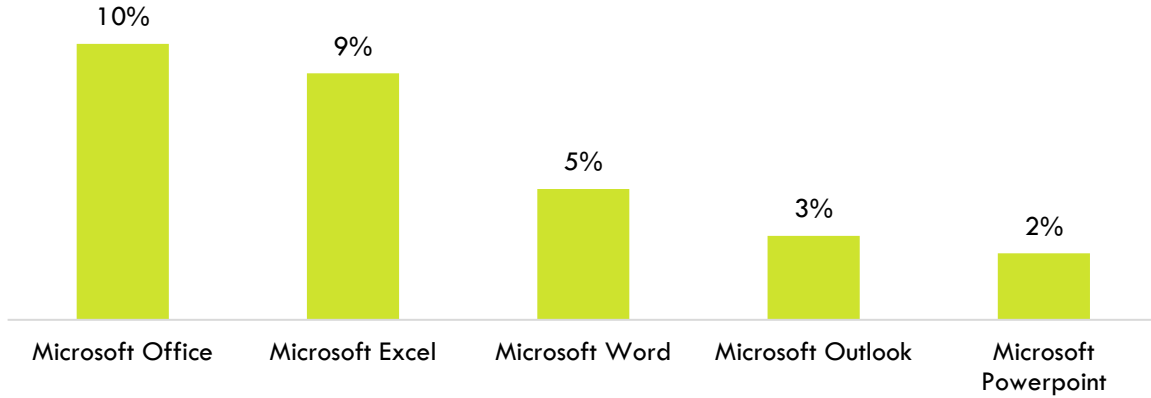
**Exhibit 7. In-demand Industrial Maintenance Technician baseline and specialized skills**



### Software Skills

Analysis also included the software skills most in demand by employers. Microsoft Office and Excel were the top two software skills identified in job postings (Exhibit 8).

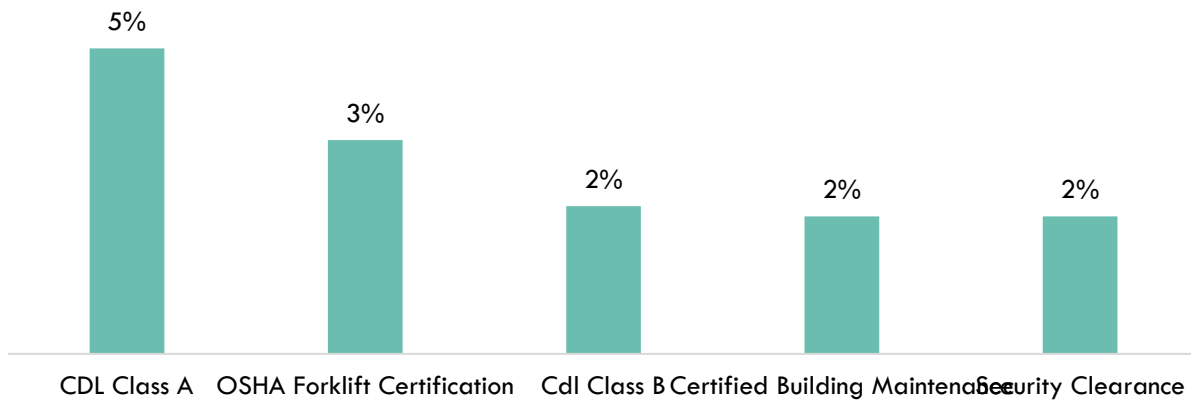
**Exhibit 8. In-demand Industrial Maintenance Technician software skills**



### Certifications

Of the 2,778 job postings, 1,222 contained certification data. Among those, 5% indicated a need for a CDL Class A. The next top certifications are a OSHA Forklift Certification and Cdl ClassB (Exhibit 9). Please note 83% of job posting indicated a need for a driver's lienense, however it is not a certification.

**Exhibit 9. Top Industrial Maintenance Technician certifications requested in job postings**





# Education, Work Experience & Training

A high school diploma or equivalent is typically required for maintenance and repair workers, general, first-line supervisors of production and operating workers, industrial machinery mechanics, and installation, maintenance, and repair workers, all other. A postsecondary nondegree award is typically required for electrical and electronics repairers, commercial and industrial equipment (Exhibit 10).

**Exhibit 10. Education, work experience, training, and Current Population Survey results for Industrial Maintenance Technician occupations<sup>4</sup>**

| Occupation  | Typical Entry-level Education     | Work Experience Required | Typical On-The-Job Training | CPS   |
|---|-----------------------------------|--------------------------|-----------------------------|-------|
| Maintenance and Repair Workers, General                                   | High school diploma or equivalent | None                     | Moderate-term               | 37.9% |
| First-Line Supervisors of Production and Operating Workers                | High school diploma or equivalent | Less than 5 years        | None                        | 35.3% |
| Industrial Machinery Mechanics  | High school diploma or equivalent | None                     | Long-term                   | 40.9% |
| Installation, Maintenance, and Repair Workers, All Other                  | High school diploma or equivalent | None                     | Long-term                   | 36.8% |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment | Postsecondary nondegree award     | None                     | Long-term                   | 44.4% |

<sup>4</sup> "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

# Supply

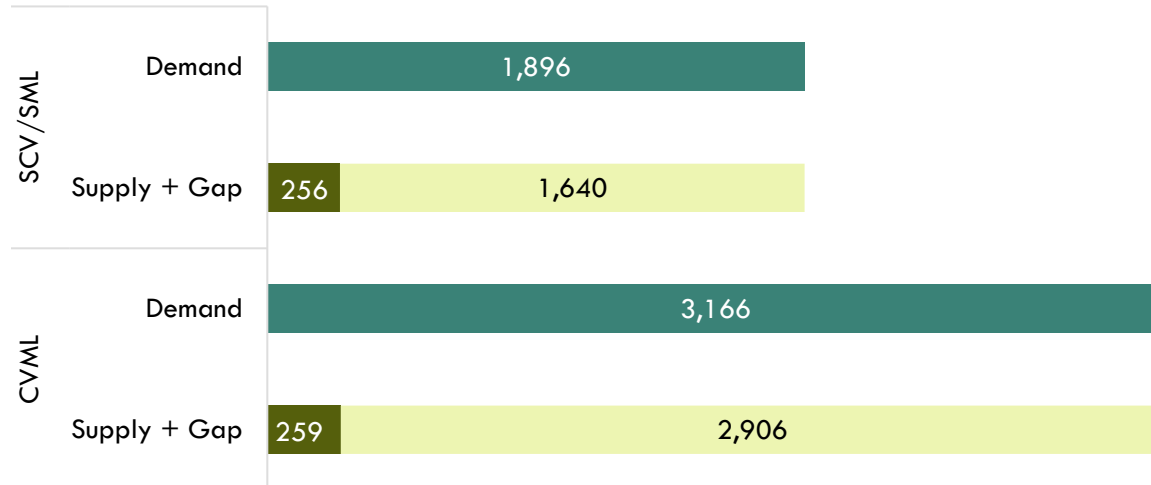
Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP and CIP codes and titles: 095650 - Welding Technology and 48.0508 - Welding Technology/Welder. Analysis of the last three years of data shows that, on average, 259 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

**Exhibit 11. Postsecondary supply for Industrial Maintenance Technician occupations in the region**

| TOP/ CIP Code- Title   | College                            | Associate Degree | Award 1 < 2 Academic Years | Certificate 16 < 30 Semester Units | Certificate 18 < 30 Semester Units | Certificate 30 < 60 Semester Units | Credit Award, < 6 Semester Units | Noncredit Award 192 < 288 Hours | Subtotal   |
|--|------------------------------------|------------------|----------------------------|------------------------------------|------------------------------------|------------------------------------|----------------------------------|---------------------------------|------------|
| <b>094500 - Industrial Systems Technology and Maintenance</b>    | Clovis                             | 0                |                            | 0                                  | 0                                  |                                    |                                  |                                 | 1          |
|  | Fresno City                        |                  |                            | 8                                  |                                    |                                    |                                  | 31                              | 39         |
|  | Merced                             | 1                |                            |                                    |                                    | 1                                  |                                  |                                 | 1          |
|  | San Joaquin Delta                  |                  |                            | 1                                  | 1                                  | 1                                  |                                  |                                 | 3          |
|  | Sequoias                           | 7                |                            | 6                                  |                                    | 51                                 | 17                               |                                 | 81         |
|  | West Hills Lemoore                 |                  |                            | 1                                  |                                    |                                    |                                  |                                 | 1          |
| <b>47.0303 - Industrial Mechanics and Maintenance Technology</b> | San Joaquin Valley College-Visalia | 15               | 117                        |                                    |                                    |                                    |                                  |                                 | 132        |
| <b>TOTAL</b>   |                                    | <b>23</b>        | <b>117</b>                 | <b>16</b>                          | <b>1</b>                           | <b>53</b>                          | <b>17</b>                        | <b>31</b>                       | <b>259</b> |

There is an undersupply of 1,640 Industrial Maintenance Technician workers in the SCV/SML subregion and 2,906 workers in the region (Exhibit 12).

**Exhibit 12. Industrial Maintenance Technician workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the SCV/SML subregion and region**



## Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor’s Cal-PASS Plus LaunchBoard for the TOP code related to Industrial Maintenance Technician. Of note, 96 students received a degree or certificate or attained apprenticeship journey status; 100% of students obtained a job closely related to their field of study; 31% had a median change in earnings; and 70% of students attained a living wage.

**Exhibit 13. Regional metrics for the TOP code related to Industrial Maintenance Technician**

| Metric   | Industrial Systems Technology and Maintenance<br>094500 |
|--|---|
| Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status | 96  |
| Number of Students Who Transferred   | *   |
| Job Closely Related to Field of Study  | 100%  |
| Median Change in Earnings  | 31%   |
| Attained a Living Wage   | 70%   |
| * denotes data not available.  |   |

# Conclusion

The entry-level wages of the five occupations exceed the SCV/SML subregion's average living wage. There were 2,778 job postings in the past six months for occupations related to Industrial Maintenance Technician in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is troubleshooting, and the top specialized skill is repair.
- The top software skill is Microsoft Office.
- The top certification is a CDL Class A.

There is an undersupply of trained workers, a shortage of 1,640 in the SCV/SML subregion and 2,906 in the region.

# Recommendation

Based on these findings, it is recommended that Madera College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Industrial Maintenance Technician workers in the region.

# 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: <a href="http://economicmodeling.com">economicmodeling.com</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  | Burning Glass: <a href="http://burning-glass.com/">burning-glass.com/</a> .   |
| Additional Education Requirements/<br>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://onetonline.org">onetonline.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 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.