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# Labor Market Analysis

## Heavy Equipment Operator



POWERED BY



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 Heavy Equipment Operator. Three occupations related to Heavy Equipment Operator were identified for Reedley College:

- 47-2073, Operating Engineers and Other Construction Equipment Operators
- 49-3041, Farm Equipment Mechanics and Service Technicians
- 49-3042, Mobile Heavy Equipment Mechanics, Except Engines

## Key findings:

- **Occupational demand** — Nearly 5,160 workers were employed in jobs related to Heavy Equipment Operator in 2021 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is operating engineers and other construction equipment operators with 2,423 workers, a projected growth rate of 2% over the next five years, and 274 annual openings.
- **Wages** — Operating engineers and other construction equipment operators earn the highest entry-level wage, \$22.49/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Equipmentshare, Waste Management, and state of California.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Mobile Heavy Equipment Mechanics, Except Engines. The most common job title is Heavy Equipment Operator.
- **Skills and certifications** — The top baseline skill is physical abilities, the top specialized skill is repair, and the top software skill is Microsoft Excel. The most in-demand certification is a driver's license.
- **Education** — A high school diploma or equivalent is typically required for the three occupations.
- **Supply** — Analysis of postsecondary completions shows that on average 390 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 334 trained workers in the subregion and 543 workers in the region. The Center of Excellence recommends that Reedley College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Heavy Equipment Operator workers in the region.

# Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Reedley College to provide labor market information for Heavy Equipment Operator. 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 Heavy Equipment Operator resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 47-2073, Operating Engineers and Other Construction Equipment Operators
- 49-3041, Farm Equipment Mechanics and Service Technicians
- 49-3042, Mobile Heavy Equipment Mechanics, Except Engines

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.

## **Operating Engineers and Other Construction Equipment Operators**

**Job Description:** Operate one or several types of power construction equipment, such as motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete or other hard surface pavement. May repair and maintain equipment in addition to other duties.

**Knowledge:** Mechanical, English Language, Public Safety and Security

**Skills:** Operation and Control, Equipment Maintenance, Operations Monitoring, Monitoring, Active Listening

## **Farm Equipment Mechanics and Service Technicians**

**Job Description:** Diagnose, adjust, repair, or overhaul farm machinery and vehicles, such as tractors, harvesters, dairy equipment, and irrigation systems.

**Knowledge:** Mechanical, Customers and Electronics, Computer and Personal Service, English Language, Mathematics

**Skills:** Equipment Maintenance, Repairing, Troubleshooting, Operation and Control, Critical Thinking

## **Mobile Heavy Equipment Mechanics, Except Engines**

**Job Description:** Diagnose, adjust, repair, or overhaul mobile mechanical, hydraulic, and pneumatic equipment, such as cranes, bulldozers, graders, and conveyors, used in construction, logging, and mining.

**Knowledge:** Mechanical, Customer and Personal Service, Mathematics, Computers and Electronics, Building and Construction

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

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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/>.

# Occupational Demand

The SCV/SML subregion employed 5,158 workers in Heavy Equipment Operator occupations in 2021 (Exhibit 1). The largest occupation is operating engineers and other construction equipment operators with 2423 workers. This occupation is projected to grow by 2% over the next five years and has the greatest number of projected annual openings, 274.

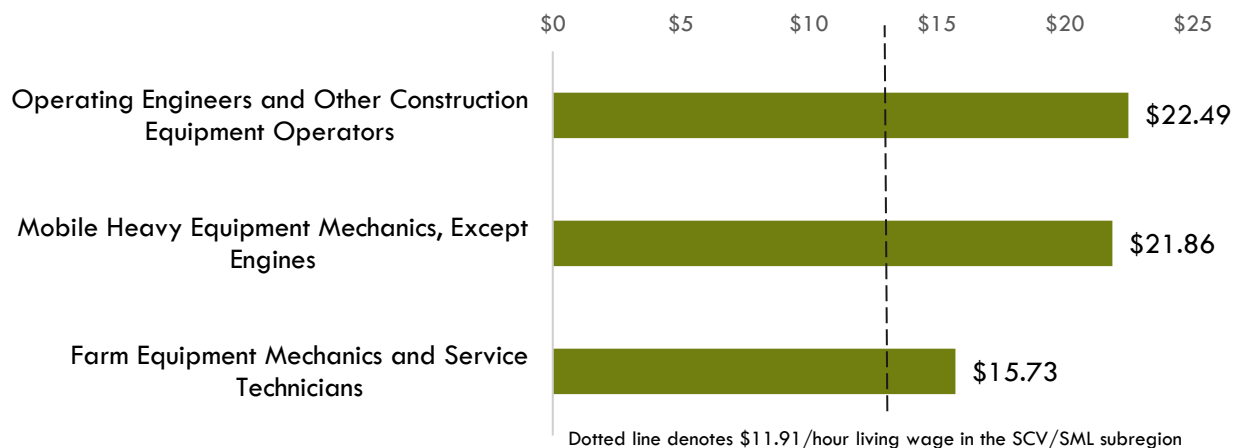
**Exhibit 1. Heavy Equipment Operator employment and occupational projections in the SCV/SML subregion**

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Operating Engineers and Other Construction Equipment Operators	2,423	2,472	49	2%	274
Mobile Heavy Equipment Mechanics, Except Engines	1,529	1,543	14	1%	157
Farm Equipment Mechanics and Service Technicians	1,206	1,265	59	5%	131
<b>TOTAL</b>	<b>5,158</b>	<b>5,280</b>	<b>122</b>	<b>2%</b>	<b>563</b>

# Wages

Exhibit 2 shows the entry-level hourly wages of the Heavy Equipment Operator occupations. Operating engineers and other construction equipment operators earn the highest entry-level wage, \$22.49/hour in the subregion<sup>2</sup>.

**Exhibit 2. Heavy Equipment Operator entry-level wages in the SCV/SML subregion**



# Job Postings

There were 199 job postings for the three occupations in the SCV/SML subregion from December 2021 to May 2022.<sup>3</sup> The employers with the most job postings are listed in Exhibit 3.

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

<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 3. Top employers of Heavy Equipment Operator by number of job postings**

Employer	Job Postings	% Job Postings
Equipmentshare	8	6%
Waste Management	8	6%
state of california	8	6%
Crown Equipment Corporation	6	4%
Lockheed Martin Corporation	5	4%
City Fresno	4	3%
County Of Fresno	4	3%
Fresno County	4	3%
Gilliam Sons Incorporated	3	2%
Kern Pacific Construction Company	3	2%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across three O\*NET OnLine occupations. The occupational title Mobile Heavy Equipment Mechanics, Except Engines is listed in 106 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Heavy Equipment Operator in 39 job postings, Heavy Equipment Mechanic in 16 job postings, and Heavy Equipment Shop Technician in nine job postings.

**Exhibit 4. Top occupational titles in job postings for Heavy Equipment Operator**

Occupational Title	Job Postings	% of Job Postings
Mobile Heavy Equipment Mechanics, Except Engines	106	53%
Operating Engineers and Other Construction Equipment Operators	81	41%
Farm Equipment Mechanics and Service Technicians	12	6%

**Salaries**

Exhibit 5 shows the “Market Salaries” for Heavy Equipment Operator 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.

**Exhibit 5. Salaries for Heavy Equipment Operator occupations**

Market Salary Percentile	Salary Amount
10th Percentile	\$33,024
25th Percentile	\$36,519
50th Percentile	\$41,970
75th Percentile	\$48,481
90th Percentile	\$54,598

**Education**

Of the 199 job postings, 62 listed an education level preferred for the positions being filled. Among those, 98% requested high school or vocational training, and 3% requested an associate 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%.

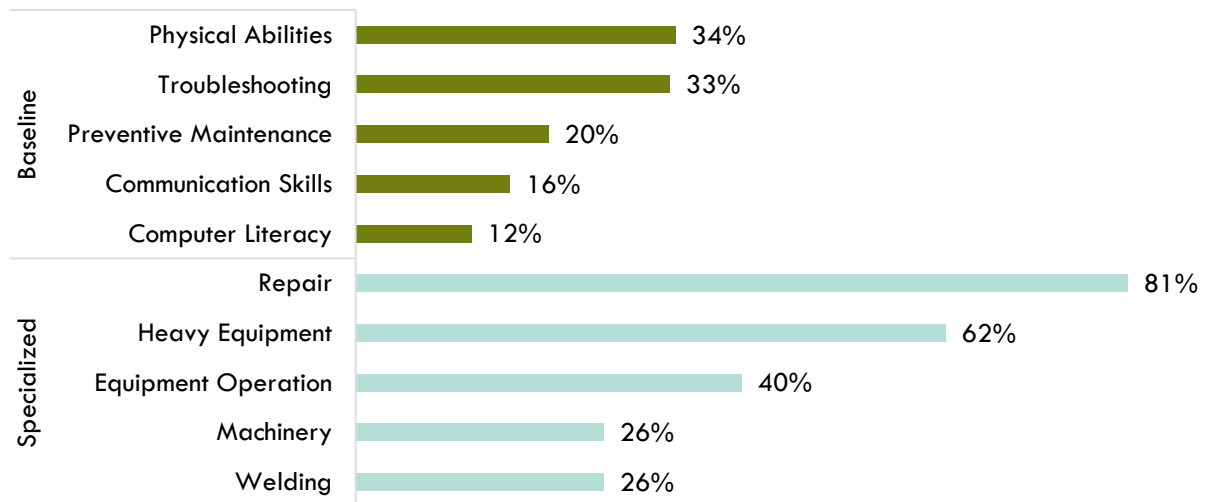
**Exhibit 6. Education levels requested in job postings for Heavy Equipment Operator**

Education Level	Job Postings	% of Job Postings
High school or vocational training	61	98%
Associate's degree	2	3%

**Baseline and Specialized Skills**

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are physical abilities, 34% of job postings, troubleshooting, 33%, and preventive maintenance, 20%. The top three specialized skills are repair, 81% of job postings, heavy equipment, 62%, and equipment operation, 40%.

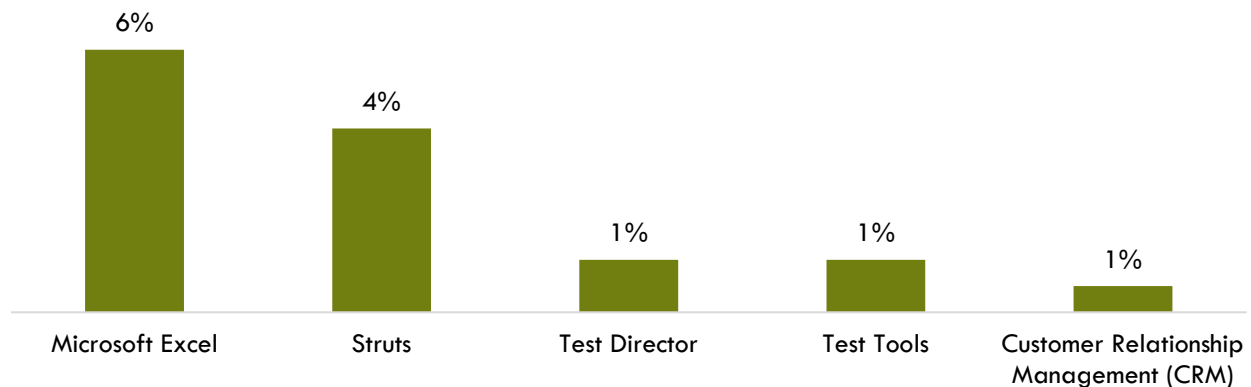
**Exhibit 7. In-demand Heavy Equipment Operator baseline and specialized skills**



**Software Skills**

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

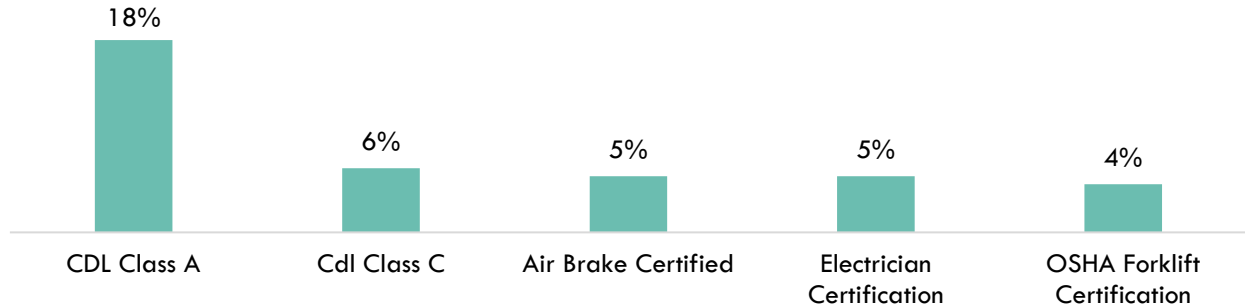
**Exhibit 8. In-demand Heavy Equipment Operator software skills**



## Certifications

Of the 199 job postings, 135 contained certification data. Among those, 18% indicated a need for a CDL class A. The next top certifications are a cdl class C and air brake (Exhibit 9).

**Exhibit 9. Top Heavy Equipment Operator certifications requested in job postings**



## Education, Work Experience & Training

A high school diploma or equivalent is typically required for the three occupations (Exhibit 10).

**Exhibit 10. Education, work experience, training, and Current Population Survey results for Heavy Equipment Operator occupations<sup>4</sup>**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	None	Moderate-term	24.5%
Mobile Heavy Equipment Mechanics, Except Engines	High school diploma or equivalent	None	Long-term	35.2%
Farm Equipment Mechanics and Service Technicians	High school diploma or equivalent	None	Long-term	35.2%

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



# Supply

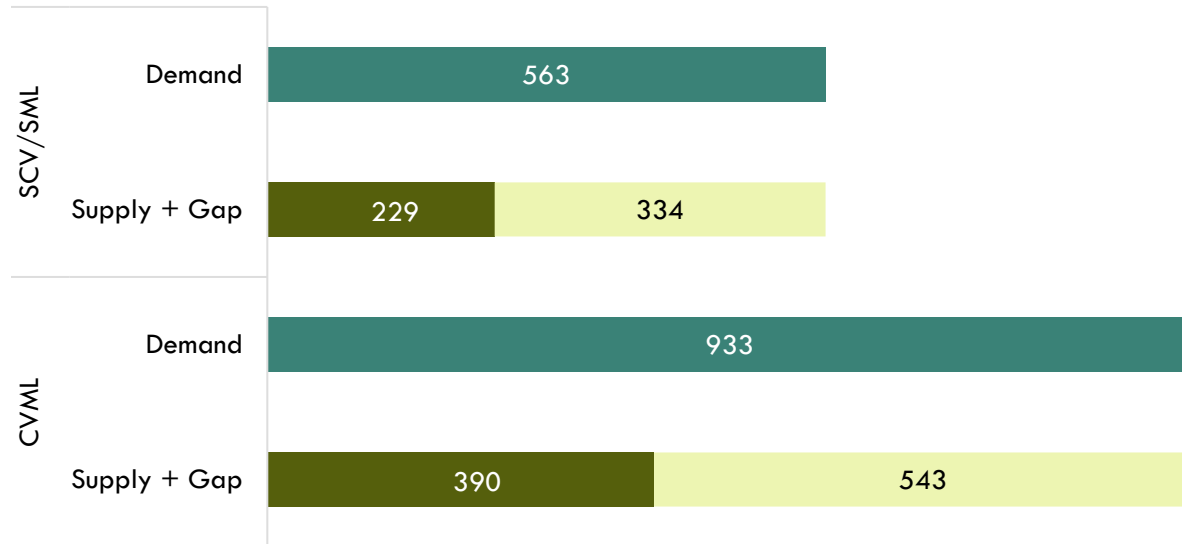
Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP codes and titles: 011600 - Agricultural Power Equipment Technology, 094700 - Diesel Technology, 094720 - Heavy Equipment Maintenance, and 094730 - Heavy Equipment Operation. Analysis of the last three years of data shows that, on average, 390 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

**Exhibit 11. Postsecondary supply for Heavy Equipment Operator occupations in the region**

TOP/CIP Code- Title	College	Associate Degree	Certificate 12 < 18 Semester Units	Certificate 16 < 30 Semester Units	Certificate 18 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 6 < 18 Semester Units	Certificate 8 < 16 Semester Units	Subtotal
<b>011600 - Agricultural Power Equipment Technology</b>	Bakersfield	4				1			6
	Merced	5		3	8	46			63
	Modesto	7	19	3	3			4	36
	Reedley College	18		92	81	27			218
	San Joaquin Delta				4	1			5
	Sequoias	1			0		0		2
<b>094700 - Diesel Technology</b>	San Joaquin Delta	2		2		11			15
<b>094720 - Heavy Equipment Maintenance</b>	San Joaquin Delta	25		1	6	11			42
<b>094730 - Heavy Equipment Operation</b>	West Hills Coalinga			4					4
<b>TOTAL</b>		<b>62</b>	<b>19</b>	<b>105</b>	<b>102</b>	<b>97</b>	<b>0</b>	<b>4</b>	<b>390</b>

There is an undersupply of 334 Heavy Equipment Operator workers in the SCV/SML subregion and 543 workers in the region (Exhibit 12).

**Exhibit 12. Heavy Equipment Operator 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 Heavy Equipment Operator. Of note, 13 heavy equipment operation students received a degree or certificate or attained apprenticeship journey status.

**Exhibit 13. Regional metrics for the TOP code related to Heavy Equipment Operator**

Metric	Agricultural Power Equipment Technology 011600	Diesel Technology 094700	Heavy Equipment Maintenance 094720	Heavy Equipment Operation 094730
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	128	*	*	13
Number of Students Who Transferred	*	*	*	*
Job Closely Related to Field of Study	85%	*	*	*
Median Change in Earnings	80%	*	*	*
Attained a Living Wage	72%	*	*	*
* denotes data not available.				

## Conclusion

The entry-level wages of the three occupations exceed the SCV/SML subregion's average living wage. There were 199 job postings in the past six months for occupations related to Heavy Equipment Operator in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is physical abilities, and the top specialized skill is repair.
- The top software skill is Microsoft Excel.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 334 in the SCV/SML subregion and 543 in the region.

## Recommendation

Based on these findings, it is recommended that Reedley College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Heavy Equipment Operator 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/ 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.