

December 2020

Labor Market Analysis

Firefighters



California
Community
Colleges



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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 firefighters. Four occupations related to firefighters were identified for San Joaquin Delta College:

- 33-2011, Firefighters
- 33-1021, First-Line Supervisors of Firefighting and Prevention Workers
- 33-2021, Fire Inspectors and Investigators
- 33-2022, Forest Fire Inspectors and Prevention Specialists

Key findings:

- **Occupational demand** — More than 2,030 workers were employed in jobs related to firefighters in 2019 in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. The largest occupation is firefighters with 1,847 workers in 2019, a projected growth rate of 6% over the next five years, and 152 annual openings.
- **Wages** — Fire inspectors and investigators earn the highest entry-level wages, \$34.61/hour in the subregion and \$38.98/hour in the region.
- **Employers** — Employers with the most job postings in the subregion are Equity Lifestyle Properties, City Stockton, and Core And Main.
- **Occupational titles** — The most common occupational title in job postings in the subregion is municipal fire fighting and prevention supervisors. The most common job title is batallion chief.
- **Skills and certifications** — The top baseline skill is communication, the top specialized skill is fire protection, and the top software skill is Microsoft Excel. The most in-demand certification is a driver's license.
- **Education** — Three of the four occupations typically require a postsecondary nondegree award as entry-level education, and a high school diploma or equivalent is typically required for forest fire inspectors and prevention specialists.
- **Supply** — Analysis of postsecondary completions in the region shows that on average 172 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 98 trained workers in the subregion and 210 workers in the region. The Center of Excellence recommends that San Joaquin Delta College work with the college's advisory board, and local industry in the expansion or development of programs to address the shortage of firefighters workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by San Joaquin Delta College to provide labor market information for firefighters. The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) 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 North Central Valley/Northern Mother Lode (NCV/NML) subregion is \$10.27/hour.¹

Analysis of the program and occupational data related to firefighters resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 33-2011, Firefighters
- 33-1021, First-Line Supervisors of Firefighting and Prevention Workers
- 33-2021, Fire Inspectors and Investigators
- 33-2022, Forest Fire Inspectors and Prevention Specialists

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.

Firefighters

Job Description: Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster assistance.

Knowledge: Public Safety and Security, Building and Construction, Customer and Personal Service, Education and Training, Mechanical

Skills: Active Listening, Monitoring, Coordination, Operation Monitoring, Critical Thinking

First-Line Supervisors of Firefighting and Prevention Workers

Job Description: Directly supervise and coordinate activities of workers engaged in firefighting and fire prevention and control.

Knowledge: Public Safety and Security, Customer and Personal Service, Administration and Management, English Language, Education and Training

Skills: Critical Thinking, Monitoring, Speaking, Active Listening, Complex Problem Solving

Fire Inspectors and Investigators

Job Description: Inspect buildings to detect fire hazards and enforce local ordinances and state laws, or investigate and gather facts to determine cause of fires and explosions.

Knowledge: Public Safety and Security, Building and Construction, Customer and Personal Service, Law and Government, Education and Training

Skills: Active Listening, Critical Thinking, Speaking, Judgement and Decision Making, Complex Problem Solving

¹ 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/>.

Forest Fire Inspectors and Prevention Specialists

Job Description: Enforce fire regulations, inspect forest for fire hazards, and recommend forest fire prevention or control measures. May report forest fires and weather conditions.

Knowledge: Administration and Management, Customer and Personal Service, Education and Training, Personnel and Human Resources, Public Safety and Security

Skills: Critical Thinking, Coordination, Speaking, Active Listening, Judgement and Decision Making

Occupational Demand

The North Central Valley/Northern Mother Lode subregion employed 2,033 workers in firefighter occupations in 2019 (Exhibit 1). The largest occupation is firefighters with 1,847 workers in 2019. This occupation is projected to grow by 6% over the next five years and has the greatest number of projected annual openings, 152.

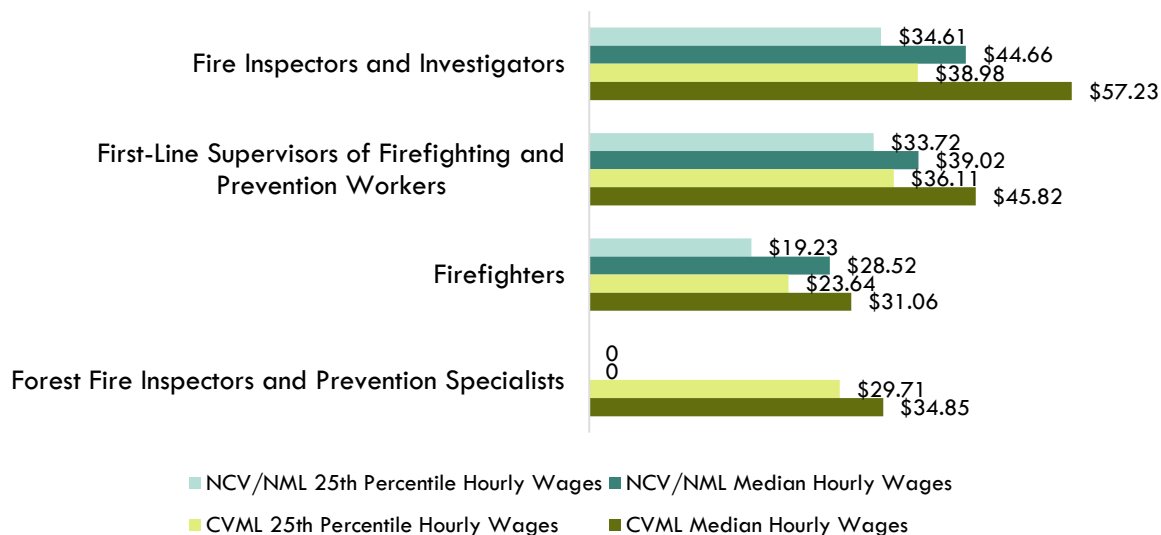
Exhibit 1. Firefighter employment and occupational projections in the NCV/NML subregion

Occupation	2019 Jobs	2024 Jobs	5-Year Change	5-Year % Change	Annual Openings
Firefighters	1,847	1,958	111	6%	152
First-Line Supervisors of Firefighting and Prevention Workers	124	137	13	11%	11
Fire Inspectors and Investigators	61	66	5	9%	7
Forest Fire Inspectors and Prevention Specialists	<10	<10	Insf. Data	Insf. Data	0
TOTAL	2,033	2,163	130	6%	170

Wages

Exhibit 2 compares the entry-level and experienced wages of the firefighter occupations. Fire inspectors and investigators earn the highest entry-level wages, \$34.61/hour in the subregion and \$38.98/hour in the region.

Exhibit 2. Entry-level and experienced wage comparison in the NCV/NML subregion and region



Job Postings

There were 46 job postings for the four occupations in the NCV/NML subregion from May to October 2020.² The employers with the most job postings are listed in Exhibit 3.

Exhibit 3. Top employers of firefighters by number of job postings

Employer	Job Postings	% Job Postings
Equity Lifestyle Properties	4	11%
City Stockton	2	6%
Core And Main	2	6%
Northgate Resorts	2	6%
University California	2	6%
University California Merced	2	6%
state of california	2	6%
Bay Alarm	1	3%
Capstone Fire & Safety Management	1	3%
City Modesto	1	3%

Exhibit 4 shows how job postings for the targeted occupations in the NCV/NML subregion are distributed across four O*NET OnLine occupations. The occupational title municipal fire fighting and prevention supervisors is listed in 18 job postings. Note how a higher proportion of job postings are for this occupational title. Common job titles in postings include battalion chief in eight job postings, ranger in eight job postings, and fabricator fire protection in three job postings.

Exhibit 4. Top occupational titles in job postings for firefighters

Occupational Title	Job Postings	% of Job Postings
Municipal Fire Fighting and Prevention Supervisors	18	39%
Fire Inspectors	12	26%
Forest Fire Inspectors and Prevention Specialists	11	24%
Municipal Firefighters	5	11%

Salaries

Exhibit 5 shows the “Market Salaries” for firefighter occupations that are calculated by Burning Glass which uses a machine learning model built off of millions of job postings every year, and accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 5. Salaries for firefighters

Market Salary Percentile	Salary Amount
10th Percentile	\$26,017
25th Percentile	\$28,535
50th Percentile	\$49,707

² 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.

Market Salary Percentile	Salary Amount
75th Percentile	\$78,074
90th Percentile	\$95,872

Education

Of the 46 job postings, 28 listed an education level preferred for the positions being filled. Of those, 75% requested high school or vocational training, 32% requested a bachelor's degree, and 21% requested an associate degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below total more than 100%.

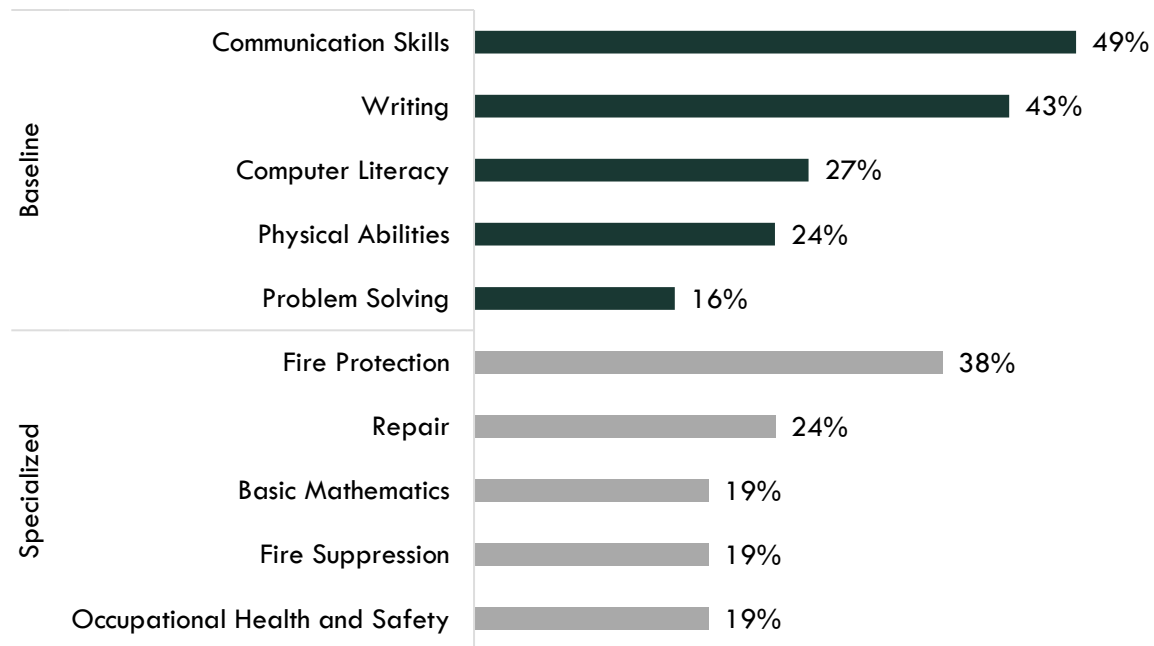
Exhibit 6. Education levels requested in job postings for firefighters

Education level	Job Postings	% of Job Postings
High school or vocational training	21	75%
Bachelor's degree	9	32%
Associate degree	6	21%
Doctoral degree	6	21%
Master's degree	4	14%

Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication, 49% of job postings, writing, 43%, and computer literacy, 27%. The top three specialized skills are fire protection, 38% of job postings, repair, 24%, and basic mathematics, 19%.

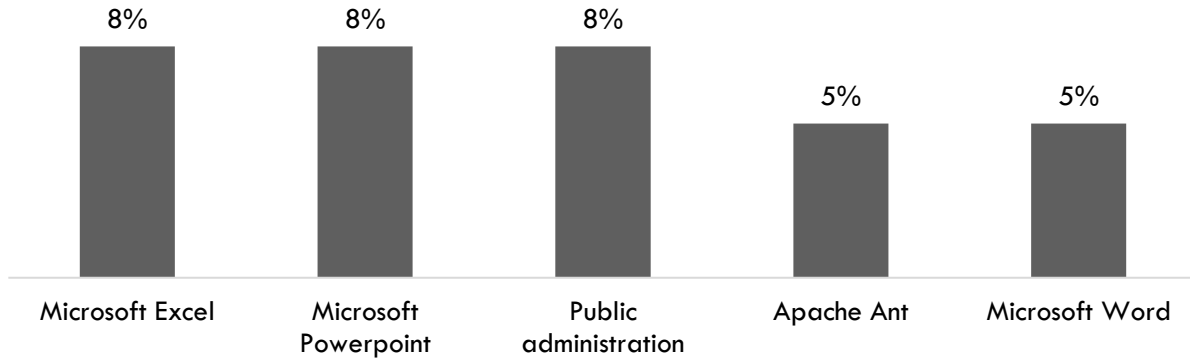
Exhibit 7. In-demand firefighter baseline and specialized skills



Software Skills

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

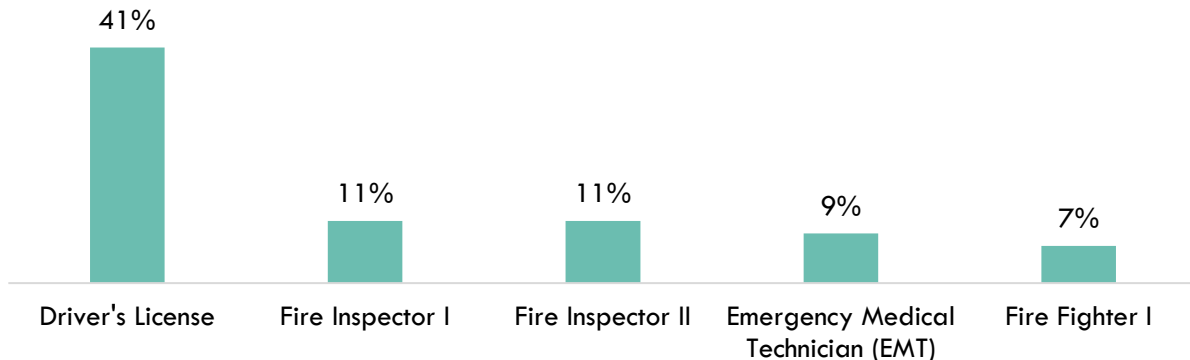
Exhibit 8. In-demand firefighter software skills



Certifications

Of the 46 job postings, seven contained certification data. Among those, 41% indicated a need for a driver's license. The next top certifications are fire inspector I and fire inspector II (Exhibit 9). (Due to the low number of job postings with certifications listed, the chart below may not be representative of the full sample.)

Exhibit 9. Top firefighter certifications requested in job postings



Education, Work Experience & Training

Three of the four occupations typically require a postsecondary nondegree award as entry-level education, and a high school diploma or equivalent is typically required for forest fire inspectors and prevention specialists (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for firefighters occupations³

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Firefighters	Postsecondary nondegree award	None	Long-term	60.7%
First-Line Supervisors of Firefighting and Prevention Workers	Postsecondary nondegree award	Less than 5 years	Moderate-term	56.8%
Fire Inspectors and Investigators	Postsecondary nondegree award	5 years or more	Moderate-term	58.4%
Forest Fire Inspectors and Prevention Specialists	High school diploma or equivalent	Less than 5 years	Moderate-term	58.4%

Supply

Analysis of program data from the California Community Colleges Chancellor’s Office Data Mart included the TOP codes: 011400-Forestry/Technical Firefighting Emphasis, 213300-Fire Technology, and 213310-Wildland Fire Technology. Analysis of the last three years of TOP code data shows that, on average, 172 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

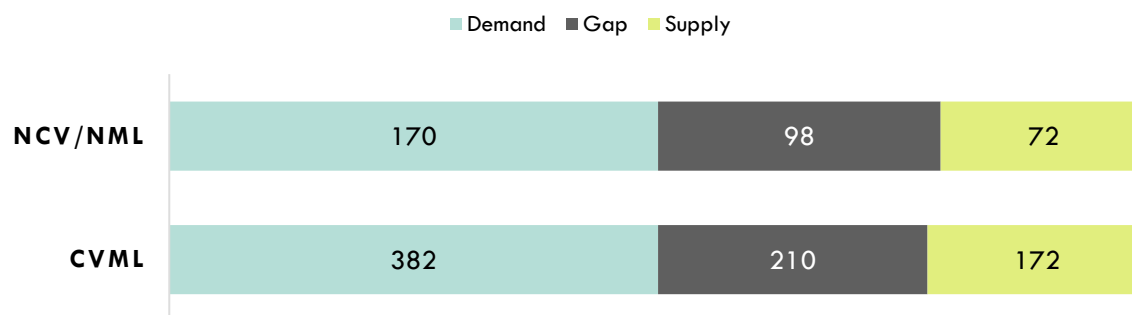
Exhibit 11. Postsecondary supply for firefighter occupations in the region

TOP Code-Title	College	Associate Degree	Certificate 18 < 30 units	Certificate 30 < 60 units	Certificate 6 < 18 units	Subtotal
011400 - Forestry/Technical Firefighting Emphasis	Reedley College		11			11
213300 - Fire Technology	Bakersfield	23		14		37
	San Joaquin Delta	12	26			38
	Fresno City	6				6
	Merced	7		2		9
	Modesto	18		6		24
	Porterville			4		4
	San Joaquin Delta	0				0
	Sequoias	9		1		9
213310 - Wildland Fire Technology	Bakersfield	3			0	3
	Porterville				30	30
TOTAL		78	37	26	30	172

There is an undersupply of 98 firefighters workers in the NCV/NML subregion and 210 workers in the region (Exhibit 12).

³ “Labor Force Statistics from the Current Population Survey,” Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Exhibit 12. Firefighter workforce annual demand and supply in the NCV/NML 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 codes related to firefighters. There were 211 fire technology students who received a degree, certificate, or attained apprenticeship journey status, and 46 transferred. A higher percentage of fire technology students reported obtaining a job closely related to their field of study and attaining a living wage. A higher percentage of wildland fire technology students reported attaining a median change in earnings.

Exhibit 13. Regional metrics for the TOP codes related to firefighters

Metric	Fire Technology	Wildland Fire Technology
	213300	103000
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	211	*
Number of Students Who Transferred	46	*
Job Closely Related to Field of Study	82%	80%
Median Change in Earnings	26%	38%
Attained a Living Wage	78%	68%
* denotes data not available.		

Conclusion

The entry-level wages of the four occupations exceed the NCV/NML subregion’s average living wage. There were 46 job postings in the past six months for occupations related to firefighters in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication, and the top specialized skill is fire protection.
- 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 98 in the NCV/NML subregion and 210 in the region.

Recommendation

Based on these findings, it is recommended that San Joaquin Delta College work with the college's advisory board, and local industry in the expansion or development of programs to address the shortage of firefighters 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: economicmodeling.com .
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: https://www.bls.gov/emp/tables/educational-attainment.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: 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: 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.