

Labor Market Analysis for Program Recommendation: 2133.00/Fire Technology

(Firefighter- Level 1, Associate Degree)

(Firefighter- Level 1, Certificate of Achievement)

Orange County Center of Excellence, December 2024



FOR LABOR MARKET RESEARCH

ORANGE COUNTY

Summary

Program LMI Endorsement	Endorsed: All LMI Criteria Met <input type="checkbox"/>	Endorsed: Some LMI Criteria Met <input checked="" type="checkbox"/>	Not LMI Endorsed <input type="checkbox"/>
-------------------------	---	---	---

Program LMI Endorsement Criteria

	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Supply Gap:	<p><i>Comments:</i> there is projected to be 756 annual job openings throughout Los Angeles and Orange counties for these firefighting occupations, which is less than the 1,128 awards conferred by educational institutions.</p> <p>Firefighting is an essential public safety job and agencies throughout the state and nation have reported ongoing shortages. Demand is likely understated due to the fact that firefighter/paramedic/emergency medical technician (EMT) jobs may be classified as either <i>firefighters</i> (33-2011), <i>paramedics</i> (29-2043), or <i>emergency medical technicians</i> (29-2042). The COE is unable to quantify the impact of these potential misclassifications.</p>	
Self-Sufficiency Standard Living Wage ¹ :	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	<p><i>Comments:</i> all annual job openings for these firefighting occupations have entry-level hourly wages significantly above the OC living wage of \$27.13.</p>	
Education:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	<p><i>Comments:</i> Though one of these firefighting occupations typically requires a high school diploma and three typically require a postsecondary nondegree award, between 47% and 60% of workers in the field have completed some college or an associate degree as their highest level of education.</p>	

Additional Considerations

	Yes <input type="checkbox"/>	Some <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Emerging Occupation(s):	<p><i>Comments:</i> N/A</p>		
OC Resilient Job(s):	Yes <input type="checkbox"/>	Some <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	<p><i>Comments:</i> See Resilient Jobs and US News & World Report Best Jobs</p>		
U.S. News & World Report 2024 Best Jobs List ² :	Yes <input type="checkbox"/>	Some <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	<p><i>Comments:</i> See Resilient Jobs and US News & World Report Best Jobs</p>		

¹ At the direction of the California Community College Chancellor's Office, the living wage endorsement criteria in this report uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard, which the COE refers to as a living wage, to determine Orange County's living wage of \$27.13, last updated in March 2024.

² "100 Best Jobs of 2024," U.S. News & World Report, accessed May 7, 2024, <https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs>.

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to determine whether there is a supply gap in the Los Angeles/Orange County regional labor market related to four middle-skill occupations:

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

Wildfires across the U.S. and California have strained limited resources to calm and contain their spread. Nationwide, there have been reports of an alarming shortage of firefighters; within the past four decades, emergency calls have tripled, and the amount of available personnel has waned with the number of volunteer firefighters having dropped by 25% (200,000 volunteers).³ Just within the past few months, firefighters were stretched thin as wildfires burned homes and engulfed hundreds of thousands of acres across Southern California – including within the Angeles National Forest and the San Bernardino and Santa Ana mountains.⁴ Staffing shortages across California firefighting units, “create punishing shifts, forced overtime and long deployments.”⁵

Labor market demand for these fire technology occupations is likely understated due to the fact that firefighter/paramedic/EMT jobs may be classified as either *firefighters (33-2011)*, *paramedics (29-2043)*, or *emergency medical technicians (29-2042)*. Additionally, though fire departments generally prefer to hire candidates trained as both firefighters and EMTs/paramedics, many agencies are waiving EMT/paramedic requirements due to the lack of qualified candidates.⁶

Federal, state, and local/municipal fire departments typically require additional training at in-house academies beyond the training offered at community college fire technology and fire academy programs. Larger agencies, such as the Los Angeles City Fire Department, have in-house academies that range from 15 to 22 weeks, while others throughout the state can range from 14 to 22 weeks.

Based on the available data there does not appear to be a supply gap for these fire technology occupations, but there are several challenges to quantifying the labor gap for these occupations, as noted above. That being said, firefighting is an essential public safety job, particularly with the increased severity of wildfires throughout the state. Typical education requirements for these occupations align with a community college education and entry-level wages are above the Self-Sufficiency Standard living wage. **Therefore, due to some of the regional labor market criteria being met, the COE endorses this proposed program.**

³ Mark Hyman and Larry Deal, "Alarming Shortage: the nation is facing an alarming shortage of firefighters," ABC 33/40 News, last modified March 7, 2024, <https://abc3340.com/news/inside-your-world/alarming-shortage-the-nation-is-facing-an-alarming-shortage-of-firefighters>.

⁴ Alex Wigglesworth, Hayley Smith, and Hannah Fry, "Southern California wildfires worsen firefighter shortage as West explodes," *Los Angeles Times*, September 11, 2024, xx, <https://www.latimes.com/california/story/2024-09-11/southern-california-wildfires-worsening-u-s-firefighting-shortage-as-west-ex>.

⁵ Julie Cart, "Overworked California firefighters struggle with PTSD, suicide, fatigue, intensifying wildfires," *CalMatters*, June 13, 2022, xx, <https://calmatters.org/environment/2022/06/california-firefighter-trauma-ptsd/?series=california-firefighters-trauma-wildfires>.

⁶ "Entry-Level Firefighting Careers," Centers of Excellence for Labor Market Research, last modified June 14, 2023, <https://coecc.net/california/2023/03/entry-level-firefighting-careers/>.

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for the occupations included in this report.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25 th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
First-Line Supervisors of Firefighting and Prevention Workers (33-1021)	LA: 115	LA: 37			
	OC: 28	OC: 0	OC: \$48.45	Postsecondary nondegree award	53%
	TTL: 143	TTL: 37			
Firefighters (33-2011)	LA: 467	LA: 705			
	OC: 119	OC: 386	OC: \$34.16	Postsecondary nondegree award	60%
	TTL: 586	TTL: 1,091			
Fire Inspectors and Investigators (33-2021)	LA: 15	<i>Accounted for Above</i>	OC: \$38.29	Postsecondary nondegree award	47%
	OC: 4				
	TTL: 19				
Forest Fire Inspectors and Prevention Specialists (33-2022)	LA: 7	<i>Accounted for Above</i>	OC: \$30.85	High school diploma or equivalent	47%
	OC: 2				
	TTL: 8				
Total	756	1,128	N/A	N/A	N/A

Demand:

- The number of jobs related to these firefighting occupations is projected to increase 9% through 2028, equating to 756 annual job openings.
- Hourly entry-level wages for these firefighting occupations range from \$30.85 to \$48.45 in Orange County; all annual job openings have entry-level wages above the Self-Sufficiency Standard living wage.
- There were 258 online job postings for these firefighting occupations throughout Los Angeles and Orange counties over the past 12 months. The highest number of postings were for firefighters, firefighters/paramedics, and fire inspectors. However, the number of job postings for firefighters is low because public agencies, such as the Orange County Fire Authority and Huntington Beach Fire Department, use a single job posting to create a pool of qualified applicants and fill positions as needed.
- The typical entry-level education for these firefighting occupations ranges from a high school diploma or equivalent to a postsecondary nondegree award.
- Between 47% and 60% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Supply:

- There was an average of 1,088 awards conferred by 10 community colleges in Los Angeles and Orange Counties from 2020 to 2023.
- Non-community college institutions conferred an average of 40 awards from 2019 to 2022.
- Orange County community college students that exited fire technology programs in the 2020-21 academic year had a median annual wage of \$90,932 (\$43.72 per hour) after exiting the program and 70% attained the regional living wage.
- Throughout Orange County, 85% of fire technology students that exited their program in 2019-20 reported that they are working in a job closely related to their field of study.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for these firefighting occupations from 2018 through 2028. Though there was a 7% decline across all occupations in Los Angeles and Orange counties from 2019 to 2020 due to the COVID-19 pandemic, employment in these firefighting occupations decreased 10% during the same period.

In the two years preceding the pandemic, employment for these occupations increased in Orange County. After a decrease in employment in 2020, increases in 2021 and 2022, and sharp decline in 2023, employment for these four occupations in Orange County is projected to increase 2% through 2028, experiencing a higher rate relative to all occupations in Los Angeles and Orange counties.

Exhibit 2: Annual Percent Change in Jobs for Firefighting Occupations, 2018-2028

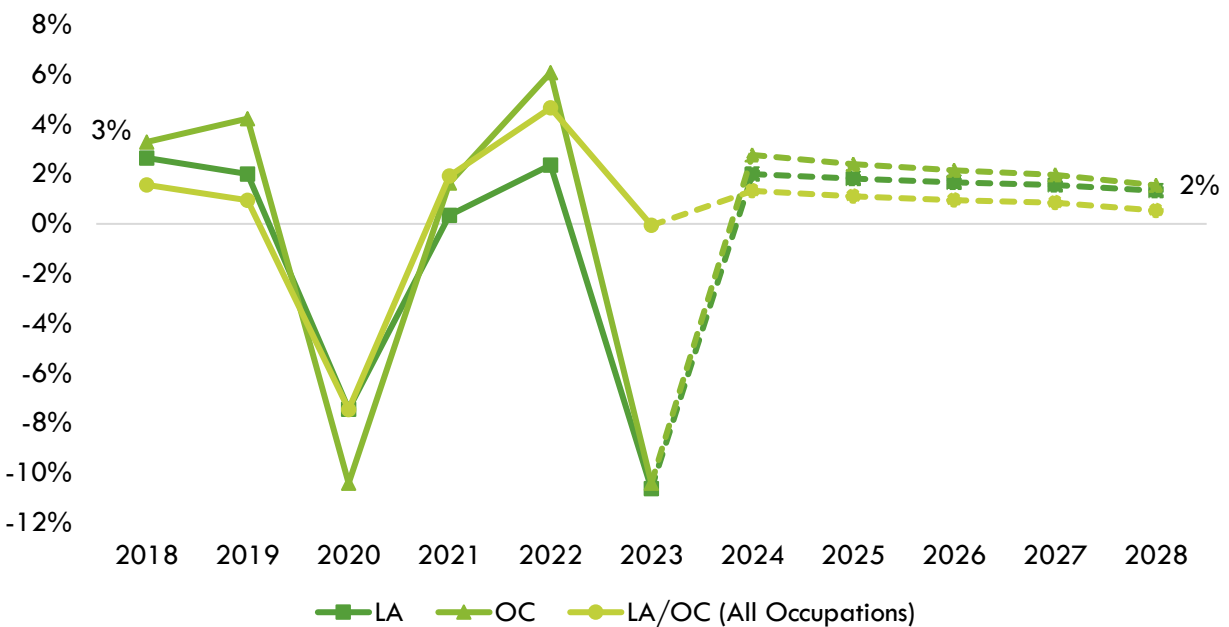


Exhibit 3 shows the five-year occupational demand projections for these firefighting occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 9% through 2028. There is projected to be 756 jobs available annually.

Exhibit 3: Occupational Demand in Los Angeles and Orange Counties⁷

Geography	2023 Jobs	2028 Jobs	2023-2028 Change	2023-2028 % Change	Annual Openings
Los Angeles	6,618	7,192	573	9%	603
Orange	1,566	1,743	177	11%	153
Total	8,184	8,935	751	9%	756

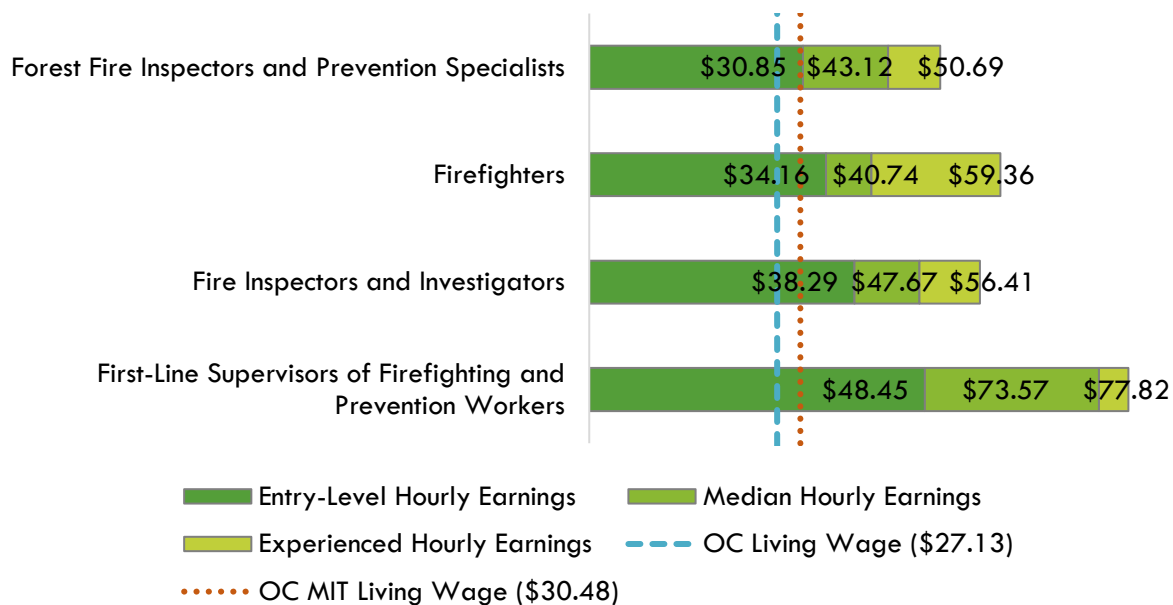
Wages:

The labor market endorsement in this report considers the entry-level hourly wages for these firefighting occupations in Orange County as they relate to the county’s living wage. Los Angeles County wages are included below to provide a complete analysis of the LA/OC region.

At the direction of the California Community College Chancellor’s Office, the living wage endorsement criteria in this report uses the University of Washington’s Center for Women’s Welfare Self-Sufficiency Standard, which the COE refers to as a living wage, to determine Orange County’s living wage of \$27.13, last updated in March 2024. Additionally, data for the MIT Living Wage, updated on February 14, 2024, is provided as a reference. Currently, the MIT Living Wage in Orange County is \$30.48. Both figures, which account for geographic-specific costs of necessities such as housing, food, health care, and transportation to assess the cost of living, are notated in the exhibits below.

All annual openings for these firefighting occupations have entry-level wages significantly above the Self-Sufficiency Standard living wage for one adult (\$27.13 in Orange County). Typical entry-level hourly wages range between \$30.85 and \$48.45. Orange County’s average wages of \$49.75 are significantly above the average statewide wage of \$46.31 for these occupations. Exhibit 4 shows the wage range for each of these firefighting occupations in Orange County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

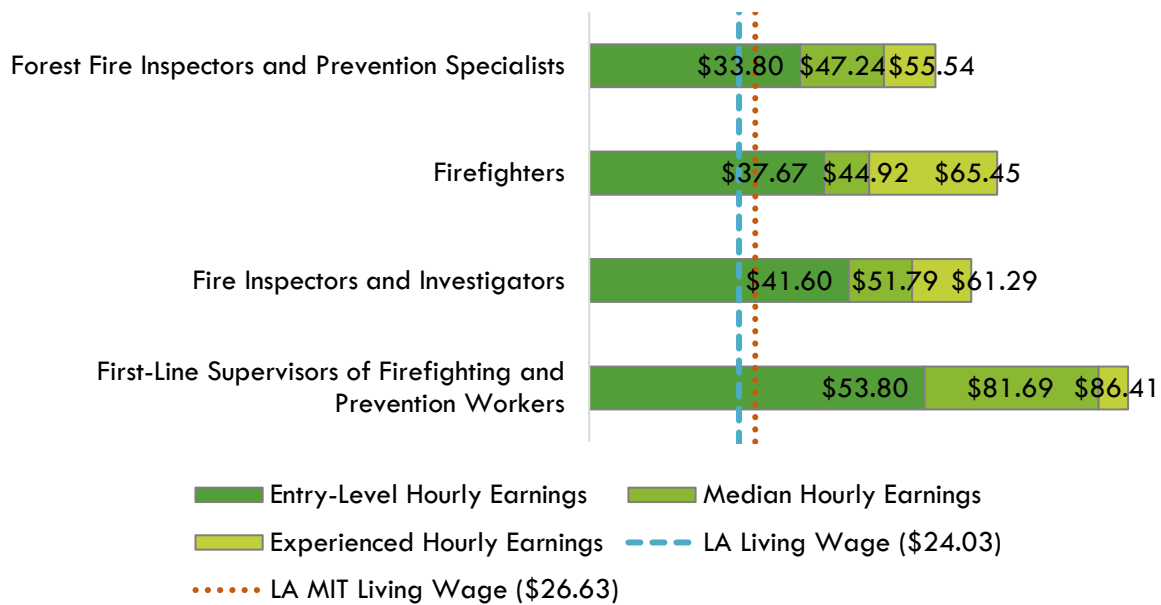
Exhibit 4: Wages by Occupation in Orange County



⁷ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

All annual openings for these firefighting occupations have entry-level wages significantly above the Self-Sufficiency Standard living wage for one adult (\$24.03 in Los Angeles County). Typical entry-level hourly wages range between \$33.80 and \$53.80. Los Angeles County’s average wages of \$55.10 are significantly above the average statewide wage of \$46.31 for these occupations. Exhibit 5 shows the wage range for each of these firefighting occupations in Los Angeles County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 5: Wages by Occupation in Los Angeles County



Resilient Jobs and U.S. News & World Report Best Jobs:

Exhibit 6 shows if each occupation is considered an Orange County Great Recession-Resilient, COVID-19 Pandemic Recession-Resilient Job, or a 2024 U.S. News & World Report (USN&WR) Best Job. None of the four firefighting occupations met the criteria to be considered any of the three designations.

Exhibit 6: Resilient Jobs and USN&WR Best Jobs Designations

Occupation	Great Recession-Resilient Job	COVID-19 Pandemic Recession-Resilient Job	2024 USN&WR Best Job
First-Line Supervisors of Firefighting and Prevention Workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Firefighters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Inspectors and Investigators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest Fire Inspectors and Prevention Specialists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Job Postings:

Important Online Job Postings Data Note: Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.⁸ For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast’s database.

Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

There were 258 online job postings related to these firefighting occupations listed in the past 12 months throughout Los Angeles and Orange counties. However, the number of job postings for firefighters is low because public agencies, such as the Orange County Fire Authority and Huntington Beach Fire Department, use a single job posting to create a pool of qualified applicants and fill positions as needed. Exhibit 7 shows the number of job postings by occupation. The plurality of job postings was for *firefighters* (41%), followed closely by *fire inspectors and investigators* (38%).

Exhibit 7: Number of Job Postings by Occupation (n=258)

Occupation	Job Postings	Percentage of Job Postings
Firefighters	105	41%
Fire Inspectors and Investigators	98	38%
First-Line Supervisors of Firefighting and Prevention Workers	51	20%
Forest Fire Inspectors and Prevention Specialists	4	2%
Total Postings	258	100%

The top employers in the region, by number of job postings, are shown in Exhibit 8.

Exhibit 8: Top Employers by Number of Job Postings (n=258)

Employer	Job Postings	Percentage of Job Postings
Orange County Fire Authority	17	7%
Johnson Controls	16	6%
Securitas	9	3%
Allied Universal	7	3%
Northrop Grumman	7	3%
Daily Dispatch	6	2%
Boeing	5	2%
City Of Montebello	5	2%
City Of South Pasadena	5	2%
College Of The Canyons	5	2%

⁸ K. R. Chowdhary, *Fundamentals of Artificial Intelligence* (Basingstoke: Springer Nature, 2020), <https://link.springer.com/book/10.1007/978-81-322-3972-7>.

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 9.

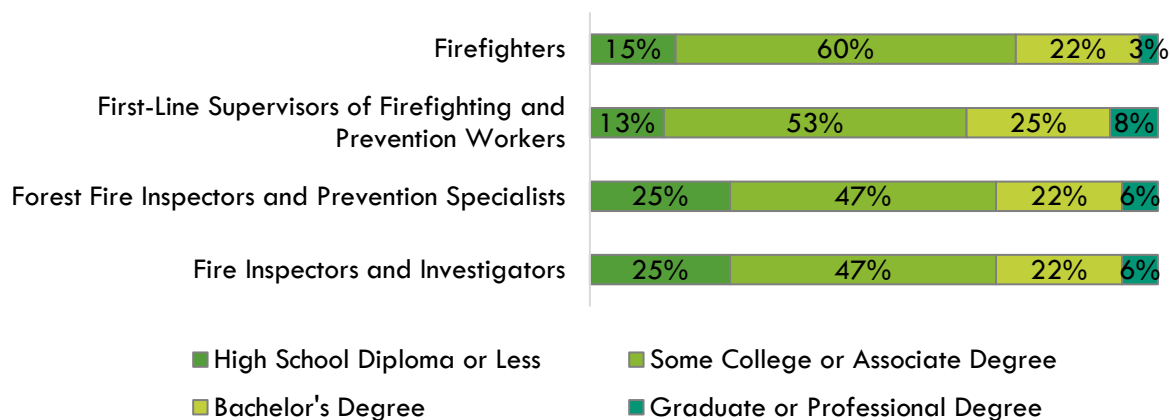
Exhibit 9: Top Skills by Number of Job Postings (n=258)

Top Specialized Skills	Top Soft Skills	Top Computer Skills
Firefighting (115)	Operations (92)	Microsoft Office (18)
Fire Prevention (78)	Communication (90)	Microsoft Outlook (18)
Fire Alarm Systems (68)	Management (61)	Microsoft Excel (15)
Fire Suppression Systems (51)	Customer Service (60)	Microsoft Word (5)
NFPA (National Fire Protection Association) Codes (47)	Good Driving Record (46)	Microsoft PowerPoint (4)
Fire Protection (45)	Writing (43)	SAP Applications (4)
Fire Service (39)	Interpersonal Communications (33)	Spreadsheets (4)
Fire Science (38)	Computer Literacy (32)	AutoCAD (2)
Fire And Life Safety (37)	Investigation (31)	Bluebeam Revu (2)
Fire Investigation (37)	First Aid (30)	Microsoft Internet Explorer (2)

Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education for *forest fire inspectors and prevention specialists* and a postsecondary nondegree award for *firefighters, first-line supervisors of firefighting and prevention workers, and fire inspectors and investigators*. However, the national-level educational attainment data indicates between 47% and 60% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 10 shows the educational attainment for each occupation, sorted by highest community college educational attainment to lowest.

Exhibit 10: National-level Educational Attainment for Occupations



Of the 65% of the cumulative job postings for these firefighting occupations that listed a minimum education requirement in Los Angeles/Orange County, 80% (134) requested a high school diploma or an associate degree and 18% (30) requested a bachelor's degree.

Educational Supply

Community College Supply:

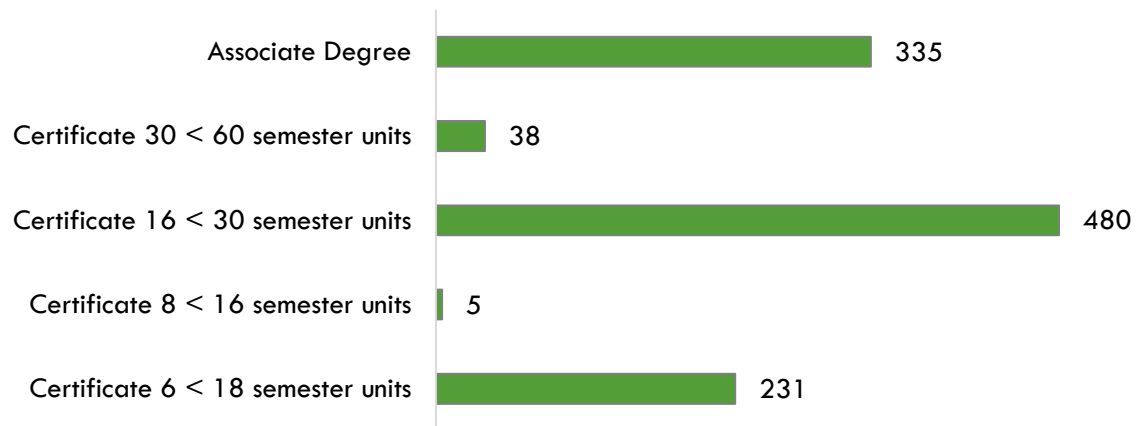
Exhibit 11 shows the three-year average number of awards conferred by community colleges in the related TOP code: Fire Technology (2133.00), Wildland Fire Technology (2133.10), and Fire Academy (2133.50). The colleges with the most completions in the region are Santa Ana, Rio Hondo, and East LA. Over the past 12 months, there were no other related program recommendation requests from regional community colleges.

Exhibit 11: Regional Community College Awards (Certificates and Degrees), 2020-2023

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
2133.00	Fire Technology	East LA	24	24	21	23
		El Camino	33	46	26	35
		Glendale	40	20	23	28
		LA Valley	11	13	8	11
		Long Beach	36	56	89	60
		Mt San Antonio	84	124	100	103
		Pasadena	2	3	0	2
		Rio Hondo	211	176	180	189
		West LA	7	4	8	6
		LA Subtotal	448	466	455	456
		Santa Ana	421	378	360	386
		OC Subtotal	421	378	360	386
		Supply Subtotal/Average			869	844
2133.10	Wildland Fire Technology	Rio Hondo	9	11	11	10
		LA Subtotal	9	11	11	10
		-	-	-	-	-
		OC Subtotal	-	-	-	-
Supply Subtotal/Average			9	11	11	10
2133.50	Fire Academy	East LA	23	180	180	128
		El Camino	37	39	10	29
		Rio Hondo	94	65	77	79
		LA Subtotal	154	284	267	235
		-	-	-	-	-
		OC Subtotal	-	-	-	-
Supply Subtotal/Average			154	284	267	235
Supply Total/Average			1,032	1,139	1,093	1,088

Exhibit 12 shows the annual average community college awards by type from 2020-21 to 2022-23. The plurality of the awards are for certificates between 16 and less than 30 semester units, followed by associate degrees and certificates between 6 and less than 18 semester units.

Exhibit 12: Annual Average Community College Awards by Type, 2020-2023



Community College Student Outcomes:

Exhibit 13 shows the Strong Workforce Program (SWP) metrics for fire technology programs in Coast Community College District (CCCD), the Orange County Region, and California. Per the Chancellor’s Office Curriculum Inventory System (COCI), there are no fire technology programs or courses currently offered by CCCD colleges. Therefore, student outcomes data is not available at the district level.

Of the 29,555 fire technology students in the 2021-22 academic year, 16% (4,817) attended an Orange County community college. Orange County students that exited fire technology programs in the 2021-22 academic year had higher median annual earnings (\$90,932 or \$43.72 per hour) compared to all fire technology students in California (\$63,232 or \$30.40 per hour). An equal percentage of Orange County fire technology students attained the living wage (70%) when compared to all fire technology students statewide (70%).

Exhibit 13: Fire Technology (2133.00) Strong Workforce Program Metrics, 2021-22⁹

SWP Metric	CCCD	OC Region	California
SWP Students	N/A	4,817	29,555
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	N/A	12%	24%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	N/A	Insufficient Data	61%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	N/A	253	1,928
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2019-20)	Insufficient Data	44	411
SWP Students with a Job Closely Related to Their Field of Study (2019-20)	N/A	85%	70%

⁹ All SWP metrics are for 2021-22 unless otherwise noted.

SWP Metric	CCCD	OC Region	California
Median Annual Earnings for SWP Exiting Students (2020-21)	N/A	\$90,932 (\$43.72)	\$63,232 (\$30.40)
Median Change in Earnings for SWP Exiting Students (2020-21)	N/A	33%	29%
SWP Exiting Students Who Attained the Living Wage (2020-21)	N/A	70%	70%

Non-Community College Supply:

To comprehensively analyze the regional supply, it is crucial to include data from other institutions offering firefighting training programs. Exhibit 14 displays the annual and three-year average awards granted by these institutions under the related Classification of Instructional Programs (CIP) codes: Fire Services Administration (43.0202) and Fire Science/Fire-fighting (43.0203). No awards were conferred under the following related CIP codes: Fire Prevention and Safety Technology/Technician (43.0201), Fire/Arson Investigation and Prevention (43.0205), and Wildland/Forest Firefighting and Investigation (43.0206). The available data covers 2019 to 2022. During this period, non-community college institutions in the region conferred an average of 40 awards annually in related programs.

Exhibit 14: Regional Non-Community College Awards, 2019-2022

CIP Code	Program	College	2019- 2020 Awards	2020- 2021 Awards	2021- 2022 Awards	3-Year Award Average
43.0202	Fire Services Administration	California State University-Los Angeles	46	33	32	37
Supply Subtotal/Average			46	33	32	37
43.0203	Fire Science / Fire-fighting	University of Antelope Valley	5	4	0	3
Supply Subtotal/Average			5	4	0	3
Supply Total/Average			51	37	32	40

Regional Demographics

This section examines demographic data for Orange County community college students in fire technology programs compared to the OC population, along with occupational data, to identify potential diversity and equity issues addressable by community college programs. Of the four occupations examined in this report, two have identical demographic data: *fire inspectors and investigators* and *forest fire inspectors and prevention specialists*.

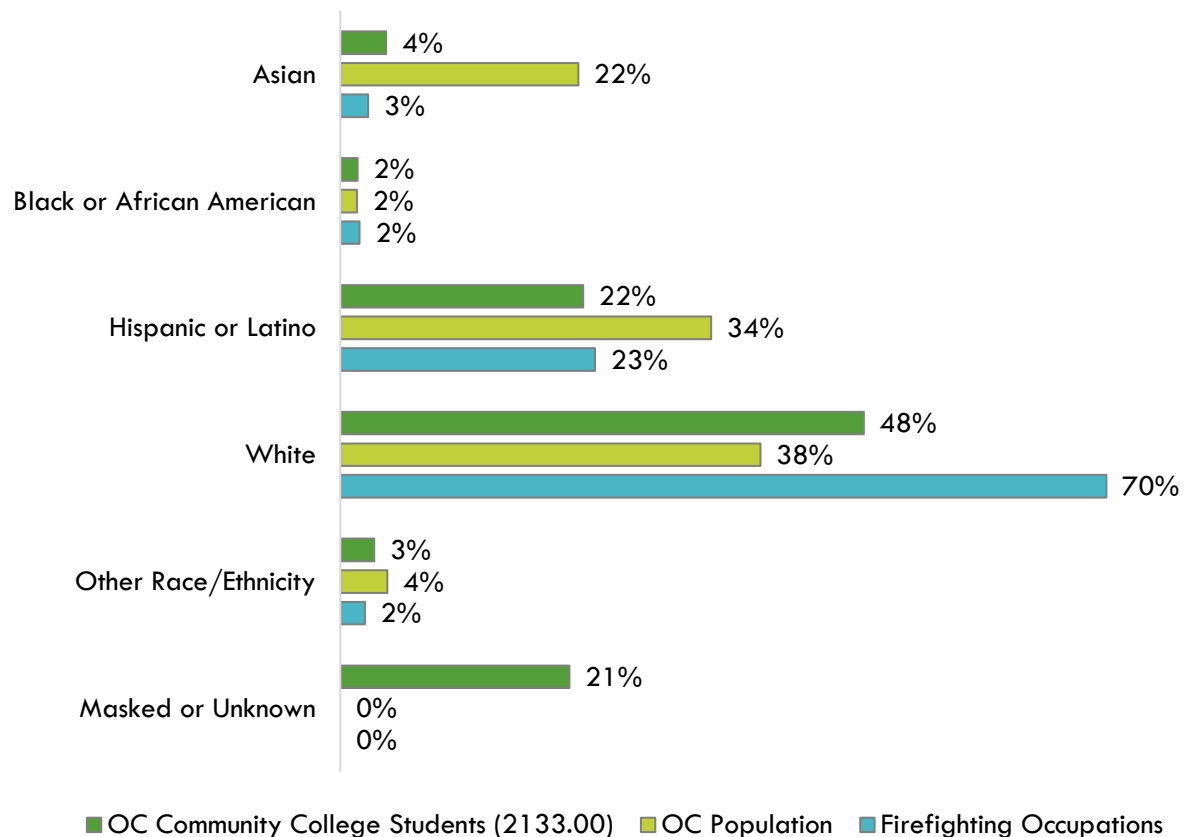
Ethnicity:

Exhibit 15 compares the ethnicity of Orange County community college students enrolled in fire technology programs, the overall Orange County population, and occupation-specific data for the four firefighting occupations included in this report.

Notably, 70% of workers employed in these firefighting occupations are white, which is much higher than the population (38%) and community college fire technology students (48%). Though the percentage of fire technology community college students and the percentage of workers in these occupations align, within their respective demographic groups, for Asian and Hispanic or Latino individuals, these percentages are significantly lower than their shares of the population.

Examining disaggregated data for each occupation (not shown), the occupations with the highest percentage of Hispanic or Latino workers are *forest fire inspectors and prevention specialists* and *fire inspectors and investigators* (27% each). Of the four firefighting occupations, these two occupations offer the lowest and second highest entry-level wages, respectively. *Firefighters*, which offers the second lowest entry-level wages of the four occupations, has the highest percentages of workers who are Asian (3%), Black or African American (2%), and another race or ethnicity (3%).

Exhibit 15: Program and County Demographics by Ethnicity



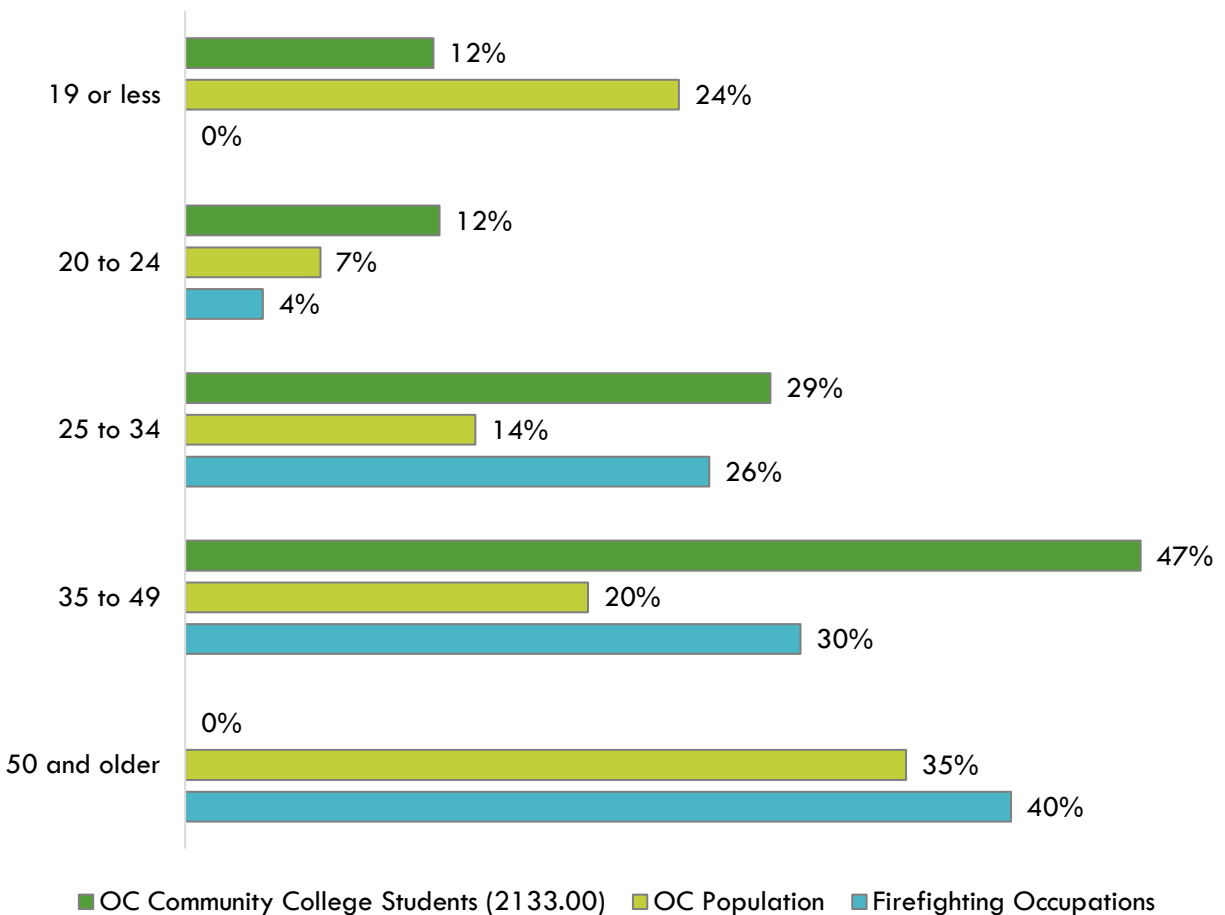
Age:

Exhibit 16 compares the age of Orange County community college students enrolled in fire technology programs, the overall Orange County population, and occupation-specific data for the four firefighting occupations included in this report.

Almost half (47%) of all fire technology community college students is aged 35 to 49, which is significantly higher than workers in the field (30%) and the population (20%). Conversely, though there are no fire technology community college students who are 50 and older, this age group accounts for the plurality of workers in the four firefighting occupations (40%) and the population (35%).

Examining disaggregated data for each occupation (not shown), individuals 50 and older account for the majority of workers across three occupations: *first-line supervisors of firefighting and prevention workers* (70%), *fire inspectors and investigators* (62%), and *forest fire inspectors and prevention specialists* (62%). *Firefighters*, which offers the second lowest entry-level wage relative to all four firefighting occupations, is largely split evenly between individuals 25 to 34 (33%), 35 to 49 (32%), and 50 and older (31%).

Exhibit 16: Program and County Demographics by Age



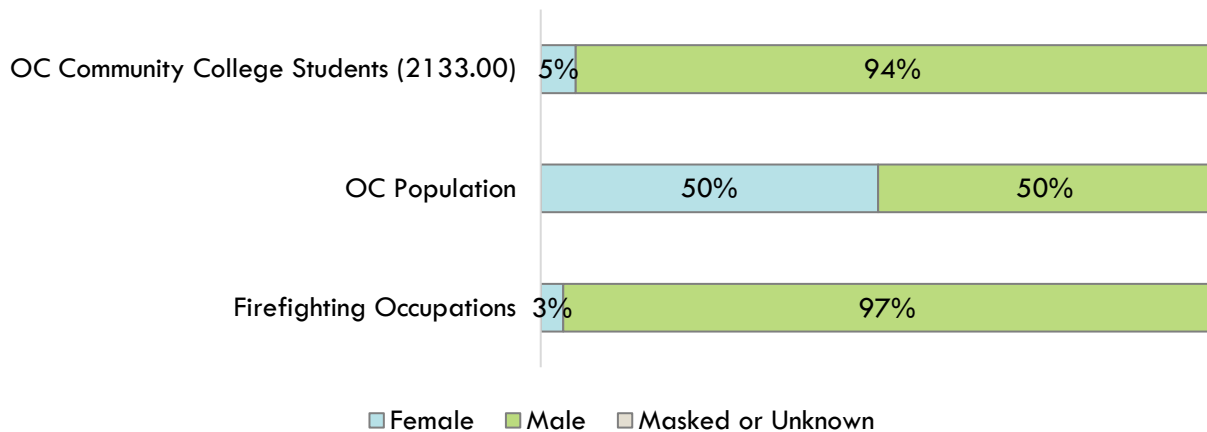
Sex:

Exhibit 17 compares the sex of Orange County community college students enrolled in fire technology programs, the overall Orange County population, and occupation-specific data for these firefighting occupations.

Though the population is split evenly between women and men, only 5% of community college students and 3% of workers in these occupations are women.

Examining disaggregated data for each occupation (not shown), men account for a large majority of workers across all four occupations. The occupations with the highest percentage of women are *forest fire inspectors and prevention specialists* and *fire inspectors and investigators*. Of the four firefighting occupations, these two occupations offer the lowest and second highest entry-level wages, respectively.

Exhibit 17: Program and County Demographics by Sex



Appendix A: Methodology

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a “supply table” with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	<p>Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/</p>
Living Wage	<p>“Living Wage” measures the income necessary for an individual or family to afford basic expenses by assessing the costs such as housing, food, child care, health care, transportation, and taxes.</p> <p>Per the CCCCCO’s this report’s endorsement criteria uses the University of Washington’s Center for Women’s Welfare Self-Sufficiency Standard last updated in March 2024, which is \$27.13 per hour (\$56,451 annually) in Orange County. For more information, see: http://www.selfsufficiencystandard.org/California</p> <p>The MIT Living Wage, updated on February 14, 2024, is a nationally recognized living wage metric and is provided for reference. The current MIT Living Wage in Orange County is \$30.48. For more information, see: https://livingwage.mit.edu/counties/06059</p>
Typical Education and Training Requirements, and Educational Attainment	<p>The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. 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 BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm</p>
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	<p>The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/</p>
Educational Supply	<p>The CCCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu</p> <p>The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions</p>
Student Metrics and Demographics	<p>LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx</p>

Data Type	Source
Population and Occupation Demographics	<p>The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs</p> <p>Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml</p>

For more information, please contact the Orange County Center of Excellence:

Jesse Crete, Ed. D., Director
 crete_jesse@rscdd.edu

Diego Mosquera, Interim Research Coordinator
 mosquera_diego@rscdd.edu

December 2024

