

Program Initiation/Modification Form

Note: This form is used after labor market information (LMI) is obtained through the Center of Excellence (COE, www.coecc.net).

Section 1 – Program Information

Name of Persons Submitting this Proposal:

*Keith Kawamoto
Dr. Kathy Bakhit
Harriet Happel*

Name of Proposed Program:

Fire Academy: Firefighter I

Date of Proposal Submission:

May 6, 2021

Type of Program (choose one or more):

- Credit Certificate of Specialization or Achievement
- AA/AS or AA-T/AS-T
- Noncredit Certificate of Completion or Competency

Type of Proposal (choose one):

- Initiation
- Substantial Modification

Program Description

Please provide a short overview of the proposed program, its purpose, and goals:

The purpose of this program is to enhance course offerings in the fire technology program and pathways to a career in the fire service through the development of an Accredited Fire Academy. The Accredited Fire Academy shall focus on Firefighter I Certification. The California Office of the State Fire Marshal describes a Fire Fighter I academy as one that “includes instruction on how to perform essential and advanced fireground tasks with minimal supervision; use, inspect, and maintain firefighting and rescue equipment; and perform basic rescue operations and fire prevention and investigation tasks.”

Section 2 – Program Need and Justification

1. How is this program discipline/field relevant for either transfer or CTE preparation?

This program is very relevant for CTE preparation in the Fire Technology program. The Fire Academy is a requirement that must be completed in order to be employed in a Fire Department in Los Angeles County. By requiring completion in the Fire Academy, we are assisting students to become a firefighter.

2. What data and feedback are there from CTE Advisory Committees in support of this proposal?

The Santa Clarita Community College District (SCCCD) has enjoyed a long-standing partnership with the Los Angeles County Fire Department (LACoFD). Beginning in Summer 2000, the District offered the first Instructional Service Agreement (ISA) course for Fire Technology -- FIRETC-198. The District now offers more than 100 Fire Technology courses in both credit and noncredit serving more than 3000 students annually. In 1997, the District hired a full-time Fire Science faculty member to help lead the development of a Fire Technology program which now offers 17 courses and Associate in Science Degrees in Fire Management In-Service and Fire Technology Pre-Service and a Certificate of Achievement in Fire Technology – Pre-Service awarding students more than 70 certificates and degrees annually.

As the SCCCD and LACoFD partnership has grown and the Fire Technology courses and programs expanded, discussions began between District administration and faculty and the LACoFD partners about possible facilities expansion. In 2006, the LA County Firefighters and the Association of Los Angeles Deputy Sheriffs endorsed Measure M, a ballot initiative to provide funding for critically needed College facilities, including the proposal of an off-site training facility that would benefit both SCCCD and LACoFD. Measure M passed and the District continued planning that would result in the construction of the Del Valle Regional Training Center in Castaic, California.

In April 2007, the LA County Fire Department and the SCCCD provided a presentation of the proposed Del Valle facilities to the SCCCD Board of Trustees (BOT). This presentation outlined the proposed facilities and partnership opportunities planned that would benefit both, including expanded ISAs and learning opportunities for the College's Fire Technology and Administration of Justice programs. In November 2008, the District developed, and the BOT approved, a Joint-Use Agreement for Use of Shared Facilities. This 2008 Joint-Use Agreement (JUA) outlined the District's agreement and commitment to providing up to \$15 million at the discretion of the College District for improvements to and equipment for the creation of the Del Valle facility. The 2007-2012 Educational and Facilities Master Plan noted the intent to move ISA trainings to the Del Valle site when the site was completed (p.29).

The planning for building and opening the Del Valle site included internal discussions between College faculty and administration reflected in the Fire Technology academic department and the Instructional Service Agreements sections of the 2007-2012 Educational & Facilities Master Plan and continued in the 2012-2018 Educational and Facilities Master Plan. This planning includes potential development of a fire academy and the transition and expansion of programming to the Del Valle site once opened.

This Joint Use Agreement between LACoFD and the District has been renewed, update regularly, and incorporated into the most current Instructional Services Agreement Regarding Educational Courses which extends to June 30, 2023. The Instructional Services Agreement provides instructional services and courses for the LACoFD delivered by LACoFD employees hired by the District. The College, the entity responsible for the educational program, developed the curriculum for the courses, which includes a Course Outline of Record for every course, and is approved by the Curriculum Committee and the SCCCD Board of Trustees.

The Joint-Use Agreement and updated Instructional Service Agreements have provided increased opportunities for contextualized instruction in support of both LA County Fire Department and LA Country Sheriff and further expansion of the Fire Science Technology program through joint use of the Del Valle facility. District-wide discussions and planning involving faculty and administration has been underway and documented as Goals and Needs in numerous planning documents: the 2007-2012 Educational and Facilities Master Plan, the 2012-2018 Educational and Facilities Master Plan and the current 2016-2022 Educational

and Facilities Master Plan. With the completion of construction of the Del Valle Facility and subsequent approval by the Division of the State Architect (DSA) on October 15, 2020, the District is now prepared to offer classes at this site and fully realize the vision established in 2000 by both the SCCCD and the LACFD

As identified in the February 18, 2021 Instructional Service Agreement meeting between the SCCCD and the LACFD discussions are now underway to develop ISAs and fire academies to be held at Del Valle to improve educational and career preparation pathways for students and ensure that local community has a return on their investment in Del Valle. These Fire Academies would operate on the weekends to avoid competing for facility space with the Fire Academies held on the weekdays. The goal is to have the Academy course ready and in the College Catalog by Fall 2021.

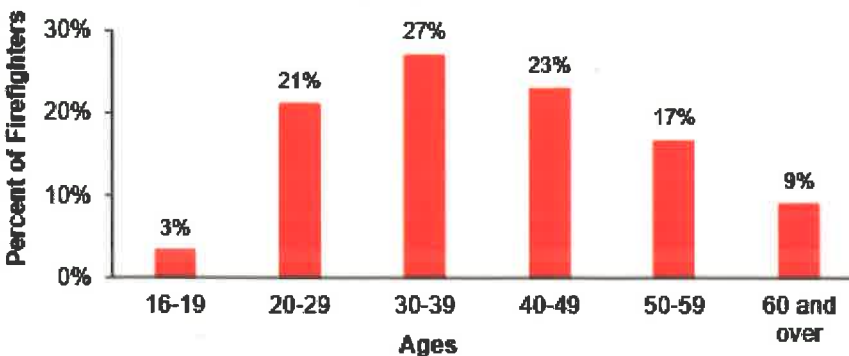
Now that the District has secured DSA approval of the Del Valle Regional Training Center (Spring 021), the College has submitted a report to the Accrediting Commission for Community and Junior Colleges (ACCJC) to seek approval to offer instructional programming at this new location.

3. Does the Regional Labor Data support this proposal? If so, how? Please attached labor market research report as an appendix.

The Regional Labor Data (Appendix A) shows that there is an oversupply of awards in Fire Technology in relationship to the job of Fire Fighter. Given the way that Public Safety jobs are posted by LA County, the data from COE is not always accurate as many times the Public Safety postings are not captured by Burning Glass and EMSI. Most of the times the county agencies post on their own websites and as a result, the postings are not captured in the COE data.

What is of key importance to consider is that the quantitative data does not account for the qualitative data such as the number of retirements that are projected in the next five years and beyond that will create a significant job demand. The chart below illustrates employment as firefighter nationally by age group. Over 25% of those currently employed as firefighters have a significant probability of retirement in the next 5 years.

Figure 3. Number of Firefighters in the US by Age Group, 2018



Source: See Appendix B.

The other item to consider is the emerging role of Wildland Fire as California has now declared that Wildland Fire Prevention is no longer a seasonal priority but is now a permanent priority 12

months a year for the state. This will result in more job openings.

4. If transfer a program, are there local universities with this program for students to transfer to? If so, please list these institutions.

NA

5. Are there similar programs in surrounding community college districts? If so, which districts?

For LA County Fire: Glendale Community College and a partial academy at Antelope Valley College.

6. What have the enrollment trends been over the past 5 years, and how are they favorable to this proposal?

The enrollment trends over the past 5 years have been consistent. Enrollment over the past 5 years has been 1093. The addition of a Fire Academy will provide a clear pathway to employment in the fire service.

7. What is the projected demand for this program in the future, and how is that demand favorable to the committee supporting this proposal?

A career in the fire service is a public good and will continue to have favorable demand given the need to provide for community safety.

8. Is there any other relevant data from program review? How does it support this proposal?

The most relevant data is the ongoing discussion between LA County Fire and the College for the need of a fire academy in the Santa Clarita Community College District and the resulting bond measure that was supported by the tax payers for construction of the Del Valle Training Center to support this partnership.

9. (Program Modification Only) What is the productivity in terms of WSCH per FTE ratios, and how does it support this proposal?

FTES has been remaining constant between 76 and 85 since 2015. Given the concentration of units for the Fire Academy, FTES is projected to increase.

10. (Program Modification Only) What is the frequency of course section offerings? If there has been (or will be) a reduction in course section offerings, what is the rationale for that reduction?

The frequency of the course section offerings will be a minimum of once a year. Depending on the Office of the State Fire Marshal new curriculum, it could be as often as once per semester.

11. (Program Modification Only) What is the term to term persistence of students within the program?

90%

12. (Program Modification Only) If applicable, what are the success rates of students passing state and national licensing exams and how do they support this proposal?

80%

Section 3 – Program and Curriculum Design

Program Requirements:

13. Please a brief narrative about the program requirements.

The proposed fire academy will comply with the requirements established by the program will meet requirements for an Accredited Regional Training Program as established by the California Office of the State Fire Marshal.

14. Using the template below, fill in the table which asks for information regarding courses, unit requirements (hours for noncredit), and sequencing/frequency of course offerings for the program using the template below:

Course Identifier	Title	Lecture hours and/or Lab hours	Units (hours for noncredit)	Frequency of offering Year/Semester (Y1 or S1)	Existing or new course?
FF 1A	Structure Firefighter 1A	Combined 305 hours	19		New
FF 1B	Hazardous Material/Weapons of Mass Destruction	Combined 40 hours	2.5		New
FF 1C	Wildland	Combined 112 hours	3.5		New
CSRA	Confined-Space Rescue Awareness	Combined 16 hours	1		New
		TOTAL UNITS REQUIRED	26		

15. For the new courses that need to be created, please provide a short course description and included proposed units (hours for noncredit) in the table above.

FF 1A Structure Firefighter 1A:

This course includes instruction on how to perform essential and advanced fireground tasks with minimal supervision; use, inspect, and maintain firefighting and rescue equipment; and perform basic rescue operations and fire prevention and investigation tasks."

FF 1B Hazardous Materials/Weapons of Mass Destruction:

The Hazardous Materials Operations/ Weapons course trains first responders how to respond to, identify, and properly mitigate hazardous materials/Weapons of Mass Destruction incident. Topics are based on OSHA 29 CFR 1910.120 and NFPA 472 Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.

FF IC Wildland:

Wildland classes are focused on acquainting firefighters and other first responders with the skills needed to address wildfires. This course explores wildfires in urban and urban/rural environments.

CSRA Confined Space Rescue Awareness:

The Confined Space Rescue Awareness course trains Firefighters in safe practices to enter and remove victims from inside a confined space. Course content is based on NFPA 1670, Standard on Operations and Training for Technical Search and Rescue Incidents; NFPA 1006, Standard for Technical Rescuer Professional Qualifications; and OSHA CFR 1910.146, Standard on Permit-required confined spaces.

16. What is the timeline for implementing the new courses required for the program?

The anticipated initial course offering is planned for the fall 2022 semester.

17. Given the programs course requirements, general education requirements, and frequency of course offerings, are students able to complete the program in a timely manner and under a certain amount of units (as required by AD-T regulations)?

Time to course/certificate completion is largely influenced by the California Office of the State Fire Marshal program requirements. Every effort will be made to create a timely and linear pathway to degree completion, while maintaining academic rigor and compliance with Accredited Regional Training Program requirements.

External Factors

18. Please explain how the proposed program design will meet the standards of outside accreditation agencies, if applicable?

Outside accreditation will be sought in two forms. First, the program will seek Accredited Regional Training Program status from the California Office of the State Fire Marshal. Second, additional accreditation will be sought through the International Fire Service Accreditation Congress. Collectively, these two accreditations represent the goal standard in fire service professional development.

19. If a transfer program, how will the proposed new courses and program articulate with other institutions of higher education?

The option exists to seek articulation agreements with other institutions of higher learning. However, this program will initially be constructed a stackable certificate program.

20. What is the input about the quality of the program's design from program review, student evaluations, articulating universities, local business and/or industry, advisory committees, and/or the community?

Currently, limited feedback is available from all stakeholders. However, the State of California is widely regarded as one of the most progressive and academically rigorous providers fire service professional development in the country. Therefore, securing Accredited Regional Training Program status from the California Office of the State Fire Marshal is a substantive reflection of program quality.

Section 4 – Implementation Plan and Institutional Support

Academic Organization and Faculty Support:

21. Which school houses or will house this program?

Allied Health and Public Safety.

22. What department houses or will house this program?

Fire Technology

23. Will AP 4023 (Procedures for Merging/Splitting Departments) be needed?

No.

Human Resources

24. Which current faculty will be responsible for this program? If there are no current faculty available to support the program, what is the plan for academic support?

Program Chair and Full-time Faculty Keith Kawamoto. Given the specialized nature of the curriculum, an external consultant has been hired to support Keith in the development of the fire academy and corresponding curriculum.

25. Are faculty in the school, department, or proposed program discipline supportive of this program? List faculty:

Keith Kawamoto

26. What will be the program impact on instructional support staff (deans, directors, administrative assistants, lab technicians)? Are they available to support this program?

See #27.

27. What additional staffing resources will be needed to support this program? What is the plan for obtaining those resources?

A full-time Director will need to be hired to support the Academy.

A full-time administrative assistant will need to be hired to support the adjudicating agency compliance paperwork requirements

Physical Resources

28. Are there facilities available for this program? If so, identify these facilities. If not, what is the plan for obtaining facilities? If external facilities (i.e. sites off-campus, such as clinical sites) have been identified, then attach letters of support.

Yes, the LA County Fire Del Valle Training Center in Castaic. A substantive change for a new location has been submitted to ACCJC. DSA approval has already been received.

29. Will additional equipment, supplies, and/or instructional materials need to be obtained? If so, identify what will be needed.

The District will negotiate a Facilities Use agreement that will include maintenance fees for use of the equipment.

The District will be responsible for instructional supplies.

Financial Support:

30. What is the funding source for this program?

Strong Workforce Partnership.

31. What is the plan for institutionalization of this program if grant funded?

Program growth to support institutionalization.

Section 4 – Alignment of Program

32. How does this program relate to current college curriculum and offerings in the context of the academic mission of the College?

The Fire Academy aligns with the Fire Technology curriculum for those students who are completing in the pathway for entry into the workforce. Employment by a fire department requires completion of an OSFM accredited fire academy.

33. How does this program align with the mission, values, and goals of College of the Canyons as outlined in the most recent Strategic Plan?

This program aligns with the College's mission and goals for access, engagement and success. The ability to serve students in the Fire Technology career pathway contributes to the mission, values and goals in the most recent strategic plan by providing a pathway for employment at above a living wage and to provide social and economic mobility.

34. How does this program align with access and equity goals for students? How will this program have an impact on diversity?

The program demographics illustrate that over 54% of our current award earners in the program are Latinx. Additionally, there is strong support for this pathway from our K12 partners as they have a cadet academy for Fire Technology now located at Castaic High School. Many of the students in the cadet academy will be first generation college students.

Please attach appendices of supporting data and information here:

Appendix A: COE Labor Market Report

Appendix B: NFPA Fire Survey



Fire Academy (TOP 2133.50)

April 2021

Prepared by the South Central Coast Center of Excellence for
Labor Market Research

Program Recommendation - South Central Coast Region and Los Angeles County

This report was compiled by the South Central Coast¹ Center of Excellence to provide labor market data for the program recommendation – Fire Academy. This report can help determine whether there is demand in the local labor market that is not being met by the supply from programs of study (CCC and non-CCC) that align with this occupation group.

Key Findings

- In the South Central Coast Region and Los Angeles County, **the number of jobs related to Fire Academy are expected to decrease** for Health and Safety Engineers, Except Mining Safety Engineers and Inspectors (-13%), **remain steady** for Firefighters (+2%), and **increase** for the First-Line Supervisors of Firefighting and Prevention Workers (+12%), Fire Inspectors and Investigators (+20%), and Forest Fire Inspectors and Prevention Specialists (+28%).
- Fire Academy is anticipated to experience a **medium risk of automation** for Firefighters and a **low risk of automation** for the other four fire related occupations.
- In 2019 there were 3,704 completions, South Central Coast Region and Los Angeles County, in programs related to the occupations identified as aligned with Fire Academy and 859 openings, indicating an **oversupply**.
- Completers of South Central Coast and Los Angeles Fire Academy programs from the 2017-2018 academic year had a **median annual earnings upon completion of \$80,801**.
- 67% of students are **employed within a year** after completing a program.
- 78% of students **attained a living wage** within a year of completion.
- +46% **change in earnings** for completers.
- 86% of students were **part time**, 25% **skill builders**, 9% **first-generation**, and 36% **economically disadvantaged**.

¹ The South Central Coast Region consists of San Luis Obispo County, Santa Barbara County, Ventura County, and the following cities from North Los Angeles County: Canyon Country, Castaic, Lake Hughes, Lancaster, Littlerock, Llano, Newhall, Palmdale, Pearblossom, Santa Clarita, Stevenson Ranch, and Valencia.

Occupation Codes and Descriptions

There are five occupations in the standard occupational classification (SOC) system that were identified as related to Fire Academy for this analysis. The occupation titles and descriptions, as well as reported job titles are included in Exhibit 1.

Exhibit 1 – Occupation, description, and sample job titles

SOC Code	Title	Description	Sample of Reported Job Titles
17-2111.02	Fire Prevention and Protection Engineers	Research causes of fires, determine fire protection methods, and design or recommend materials or equipment such as structural components or fire-detection equipment to assist organizations in safeguarding life and property against fire, explosion, and related hazards.	Chief Engineer, Consulting Engineer, Engineer, Fire Protection Engineer, Fire Protection Engineer and Code Consultant, Lead Fire Protection Engineer, Senior Engineer, Senior Fire Protection Engineer
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	Directly supervise and coordinate activities of workers engaged in firefighting and fire prevention and control.	First-Line Supervisors of Firefighting and Prevention Workers
33-2011	Firefighters	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.	Firefighters
33-2021	Fire Inspectors and Investigators	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.	Fire Inspectors and Investigators
33-2022	Forest Fire Inspectors and Prevention Specialists	Enforce fire regulations, inspect forest for fire hazards, and recommend forest fire prevention or control measures. May report forest fires and weather conditions.	Fire Management Officer, Fire Operations Forester, Fire Prevention Officer, Fire Prevention Technician, Fire Technician, Forest Officer, Forest Patrolman, Forestry Patrolman, Wildfire Mitigation Specialist, Wildfire Prevention Specialist

Source: O*NET Online

Current and Future Employment

In the South Central Coast Region and Los Angeles County, the number of jobs related to Fire Academy are expected to decrease for Health and Safety Engineers, Except Mining Safety Engineers and Inspectors, remain steady for Firefighters, and increase for the First-Line Supervisors of Firefighting and Prevention Workers, Fire Inspectors and Investigators, and Forest Fire Inspectors and Prevention Specialists.

Exhibit 2 – Five-year projections for Fire Academy in the South Central Coast Region and Los Angeles County

SOC	Occupation	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change
17-2111 (for 17-2111.02)	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors (for Fire Prevention and Protection Engineers)	762	664	-98	-13%
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	593	665	72	12%
33-2011	Firefighters	9,754	9,942	188	2%
33-2021	Fire Inspectors and Investigators	222	267	45	20%
33-2022	Forest Fire Inspectors and Prevention Specialists	99	127	28	28%

Source: Economic Modeling Specialists International (EMSI)

Earnings

In the South Central Coast Region and Los Angeles County, the average wage for the listed occupations is \$46.03 per hour.

Exhibit 3 contains hourly wages and annual average earnings for these occupations. Entry-level hourly earnings are represented by the 25th percentile of wages, median hourly earnings are represented by the 50th percentile of wages, and experienced hourly earnings are represented by the 75th percentile of wages, demonstrating various levels of employment.

Exhibit 3 – Earnings for Fire Academy in the South Central Coast Region and Los Angeles County

SOC	Occupation	Entry-Level Hourly Earnings	Median Hourly Earnings	Experienced Hourly Earnings
17-2111 (for 17-2111.02)	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors (for Fire Prevention and Protection Engineers)	\$47.39	\$56.96	\$66.30
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	\$61.96	\$86.46	\$101.46
33-2011	Firefighters	\$35.23	\$43.76	\$61.75
33-2021	Fire Inspectors and Investigators	\$48.09	\$67.19	\$77.01
33-2022	Forest Fire Inspectors and Prevention Specialists	\$35.58	\$45.05	\$55.38

Source: Economic Modeling Specialists International (EMSI)

Employer Job Postings

In this research brief, real-time labor market information is used to provide a more nuanced view of the current job market, as it captures job advertisements for occupations relevant to the field of study. Employer job postings are consulted to understand who is looking for fire related workers, and what they are looking for in potential candidates. To identify job postings related to Fire Academy the following standard occupational classifications were used:

17-2111.02	Fire Prevention and Protection Engineers
33-1021	First-Line Supervisors of Firefighting and Prevention Workers
33-2011	Firefighters
33-2021	Fire Inspectors and Investigators
33-2022	Forest Fire Inspectors and Prevention Specialists

Top Occupations

In 2019, there were 392 employer postings for the occupations related to Fire Academy.

Exhibit 4 – Top occupations in job postings and risk of automation tables

SOC Code	Occupation	Job Postings, Full Year 2019
33-2011	Firefighters	113
17-2111.02	Fire Prevention and Protection Engineers	83
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	71
33-2021	Fire Inspectors and Investigators	61
33-2022	Forest Fire Inspectors and Prevention Specialists	58

Source: Labor Insight/Jobs (Burning Glass)

SOC Code	Occupation	Risk of Automation
33-2011	Firefighters	Medium
17-2111.02	Fire Prevention and Protection Engineers	Low
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	Low
33-2021	Fire Inspectors and Investigators	Low
33-2022	Forest Fire Inspectors and Prevention Specialists	Low

Source: Labor Insight/Jobs (Burning Glass)

Top Titles

The top job titles for employers posting ads for jobs related to Fire Academy are listed in Exhibit 5. Fire Protection Engineer is mentioned as the job title in 5% of all relevant job postings (21 postings).

Exhibit 5 –Job Titles

Title	Job Postings, Full Year 2019
Fire Protection Engineer	21
Fire Protection Engineer S	17
Firefighter	16
Firefighter/Paramedic	9
Senior Fire Protection Engineer	8

Source: Labor Insight/Jobs (Burning Glass)

Top Employers

Exhibit 6 lists the major employers hiring professionals in the field. The top employer posting job ads was National Testing Network. The top worksite cities in the region for these occupations were Los Angeles, Pasadena, Long Beach, Palmdale, and San Luis Obispo.

Exhibit 6 – Top Employers (n=303)

Employer	Job Postings, Full Year 2019
National Testing Network	20
California Conservation Corps	13
County of Los Angeles	10
Allied Universal	9
Johnson Controls Inc	9

Source: Labor Insight/Jobs (Burning Glass)

Skills

Fire Protection is the most sought after skill for employers hiring for jobs related to fire.

Exhibit 7 –Job Skills (n=281)

Skills	Job Postings, Full Year 2019
Fire Protection	134
Fire Suppression	85
Project Management	57
System Design	54
Revit	47
AutoCAD	45
Simulation	43

Source: Labor Insight/Jobs (Burning Glass)

Industry Concentration

Exhibit 8 shows the industries with the most fire related postings in the South Central Coast Region and Los Angeles County. Note: 28% of records have been excluded because they do not include an industry. As a result, the chart below may not be representative of the full sample.

Exhibit 8 – Industries employing the most in the field, 2019

Industry	Occupation Group Jobs in Industry	% of Occupation Group in Industry
Public Administration	85	31.1%
Professional, Scientific, and Technical Services	44	16.1%
Information	25	9.2%
Administrative and Support and Waste Management and Remediation Services	23	8.4%
Manufacturing	23	8.4%

Source: Labor Insight/Jobs (Burning Glass)

Education and Training

Exhibit 9 shows the typical entry-level education requirement for the occupations of interest, along with the typical on-the-job training needed to attain competency in the occupation.

Exhibit 9 – Education and Training Requirements

SOC	Occupation	Typical entry-level education	Typical on-the-job training
17-2111.02	Fire Prevention and Protection Engineers	Bachelor's degree	None
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	Postsecondary nondegree award	Moderate-term on-the-job training
33-2011	Firefighters	Postsecondary nondegree award	Long-term on-the-job training
33-2021	Fire Inspector and Investigator	Postsecondary nondegree award	Moderate-term on-the-job training
33-2022	Forest Fire Inspectors and Prevention Specialists	High school diploma or equivalent	Moderate-term on-the-job training

Source: Bureau of Labor Statistics Employment Projections (Educational Attainment)

Regional Completions and Openings

There were 3,704 completions (2019) and 859 openings (2019) in the South Central Coast Region and Los Angeles County in programs related to the occupations identified as aligned with Fire Academy.

Exhibit 10 – Completions and Openings

15 Regional Institutions had Related Programs (2019)	3,704 Regional Completions (2019)	859 Annual Openings (2019)
--	---	--------------------------------------

Source: Economic Modeling Specialists International (EMSI)

Related Programs

CIP Code	Program	Completions (2019)
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	960
43.0104	Criminal Justice/Safety Studies	941
43.0201	Fire Prevention and Safety Technology/Technician	802
14.0102	Pre-Engineering	245
14.0101	Engineering, General	186
43.0203	Fire Science/Fire-fighting	129
14.1401	Environmental/Environmental Health and Engineering	91
43.0106	Forestry Science and Technology	75
43.0301	Homeland Security	68
43.9999	Homeland Security, Law Enforcement, Firefighting and Related Protective Services, Other	63
03.0501	Forestry, General	49
43.0202	Fire Services Administration	40
43.0206	Wildland/Forest Firefighting and Investigation	23
46.0403	Building/Home/Construction Inspection/Inspector	23
43.0299	Fire Protection, Other	9

Source: Economic Modeling Specialists International (EMSI)

Student Outcomes

The CTE LaunchBoard provides student outcome data on the effectiveness of CTE programs. The following student outcome information was collected from exiters of Fire Academy Programs (TOP: 2133.50) for the 2017-18 academic year in the **South Central Coast and Los Angeles Regions**.

- Completers of South Central Coast and Los Angeles Fire Academy programs from the 2017-2018 academic year had a **median annual earnings upon completion of \$80,801**.
- 67% of students are **employed within a year** after completing a program.
- 78% of students **attained a living wage** within a year of completion.
- +46% **change in earnings** for completers.
- 86% of students were **part time**, 25% **skill builders**, 9% **first-generation**, and 36% **economically disadvantaged**.

Source: CTE LaunchBoard

Sources

O*Net Online, Labor Insight/Jobs (Burning Glass), Economic Modeling Specialists International (EMSI), MIT Living Wage Calculator, Bureau of Labor Statistics (BLS) Education Attainment, California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart, CTE LaunchBoard, Statewide CTE Outcomes Survey, Employment Development Department Unemployment Insurance Dataset

Notes

Data included in this analysis represent the labor market demand for relevant positions most closely related to Fire Academy. 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 and 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.



US Fire Department Profile 2018

Ben Evarts and Gary P. Stein
February 2020

Key Findings

There were an estimated 1,115,000 career and volunteer firefighters in the United States in 2018.

The 370,000 career firefighters in 2018 represented a decrease of 1 percent from the previous year.

There were 745,000 volunteer firefighters in 2018, an increase of 9 percent from the previous year, but similar to the 2016 number.

In 2018, 93,700, or 8 percent, of the firefighters were female. Of the career firefighters, 15,200 (4 percent) were female firefighters. There were 78,500 volunteer firefighters who were female, which was 11 percent of the total number of volunteer firefighters.

Fifty percent of firefighters are between 30 and 49 years old.

Forty-one percent of volunteer firefighters have more than 10 years of active service (tenure period).

There were 29,705 fire departments in the United States in 2018. Of these, 18 percent were all career or mostly career departments and protected 68 percent of the US population.

Nationwide 38 percent of fire departments provided no emergency medical services, 45 percent provided basic life support (BLS), and 17 percent provided advanced life support (ALS).

From 1980 to 2019, local fire protection service expenditures (adjusted for inflation in 2017 dollars) increased 196 percent.

Background and Objectives

This report provides an overview of local and municipal fire departments in the United States. The analysis includes firefighters, fire departments, apparatus, and stations. The results are based on

data collected during the NFPA Survey of Fire Departments for US Fire Experience During 2018 and the NFPA Fire Service Survey, in which data was collected over the period 2016–2018. An earlier report, *Fire Loss in the United States during 2018*, measured the national fire experience in terms of the number of fires that fire departments responded to and the resulting civilian deaths, civilian injuries, and property losses that occurred. Estimates of non-fire incidents were also included.

Firefighters

There were approximately 1,115,000 career and volunteer firefighters in the US in 2018, according to estimates based on NFPA's Survey of Fire Departments for US Fire Experience During 2018. This is a 6 percent increase from 2017.

Career firefighters include full-time uniformed firefighters regardless of assignments (e.g., suppression, prevention/inspection, and administrative). For the purpose of this survey, career firefighters include only firefighters in municipal fire departments that protect people, residences, and public buildings; they do not include firefighters working in private fire brigades or for state and federal agencies.

Volunteer firefighters include any active part-time (call or volunteer) firefighters. Active volunteers are defined as being involved in firefighting. Of the total number of firefighters, 370,000 (33 percent) were career, while 745,000 (67 percent) were volunteers.¹

Most career firefighters (67 percent) work in communities that protect 25,000 or more people. Most volunteer firefighters (95 percent) are in departments that protect fewer than 25,000 people. Approximately half (49 percent) of the volunteer firefighters are with small, rural departments that protect fewer than 2,500 people.

Since 1986, the number of career firefighters in the US has increased steadily from 237,750 in 1986 to 370,000 in 2018, an increase of

¹ Note that these results are based on a sample survey, and as a result there is a 95 percent confidence interval associated with each estimate. Based on the data reported by the fire departments responding to the 2018 National Fire Experience Survey, the NFPA is confident that the actual number of career firefighters falls between 357,800 and 382,200; and the actual number of volunteer firefighters falls between 724,000 and 766,000.

56 percent over this period (see Figure 1). For mostly career or all career departments, the rates of career firefighters per 1,000 people protected have remained in a range of 1.54 to 1.81 this period (see Figure 1). Even though the number of career firefighters has increased over time, the number of people protected by career firefighters has remained relatively consistent as the population in the US has increased.

Number and Rates of Firefighters

The number of volunteer firefighters declined in the late 1980s and late 1990s, each time returning to the same level soon after. From 2005 through 2009, the number of volunteer firefighters was stable at a level slightly higher than any previously recorded other than in 1995 (see Figure 2). After a dip in 2010 through 2011, the number of volunteers appeared to increase and was in the range of 783,300 to 814,850, an increase of 4.0 percent over this period. In 2018 the number of volunteer firefighters increased to 745,000. When the rates of volunteer firefighters per 1,000 people protected for mostly volunteer or all volunteer departments are examined, the rates show a downward trend and range from a high of 8.05 in 1987 to a low of 5.8 in 2017 per 1,000 population protected.

According to the US Department of Labor, Bureau of Labor Statistics, from 2014-2018 8.0 percent of career firefighters were Hispanic or Latino; 8.4 percent were African-American; 1.1 percent were Asian; and 4.7 percent were female.²

Figure 1. Number of Career Firefighters and Rate per 1,000 People

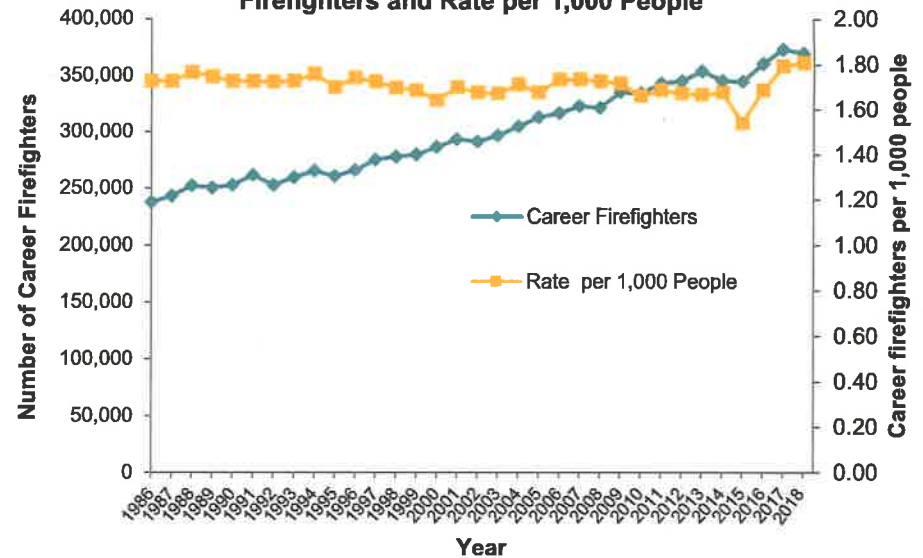
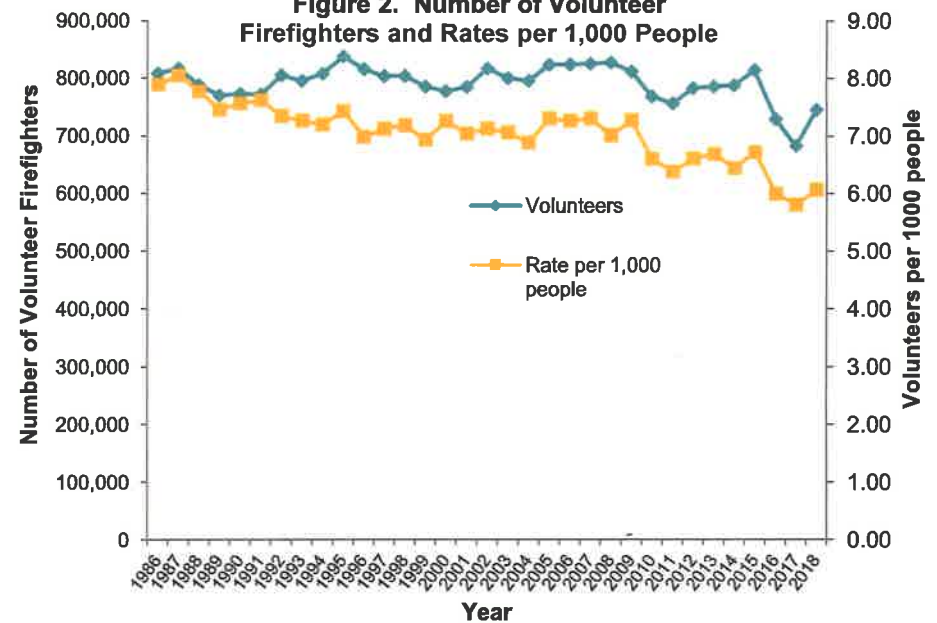


Figure 2. Number of Volunteer Firefighters and Rates per 1,000 People



² Figures are from the *Annual Averages Tables Employment and Earnings (2013–2017)* Bureau of Labor Statistics, Washington D.C. These numbers can change considerably from year to year because of their small size and sample variability.

NFPA estimates that in 2018, there were 15,200 female career firefighters and 78,500 female volunteer firefighters employed by local fire departments.³

A good way to develop a sense of the size of departments relative to the population they protect is to examine the rate of firefighters per 1,000 population as shown in Table 3 and Table 4 in the [supporting tables document](#).

It is important to note that the rates are based on data reported to the NFPA and do not reflect recommended rates or some defined fire protection standard.

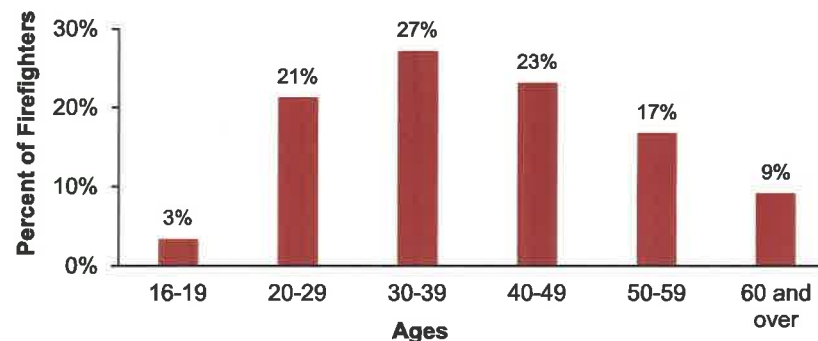
Fire departments protecting communities of 25,000 people or more had median rates of 0.87 to 1.32 career firefighters per 1,000 people. Departments experience great variation in their specific circumstances and policies, including length of work week, unusual hazards, geographical dispersion of the community, and scope of services provided (e.g., whether the department handles emergency medical calls).

Fire departments protecting less than 25,000 people had median rates of volunteer firefighters per 1,000 persons in the range of 0.96 to 18.96. This wide range in median rates for smaller communities reflects the minimum number of firefighters needed to staff a department regardless of community size. Volunteer firefighters are often available on a part-time basis only; it may take more volunteers to ensure an adequate response to each alarm. The median rate for volunteer firefighters increases as population protected decreases.

Length of work week and its effect on rate of career firefighters per 1,000 population by size of community is provided in Table 5 of the [supporting tables document](#). Generally, longer workweeks correlate with fewer career firefighters per 1,000 population protected. Tables 6 and 7 of the [supporting tables document](#) provide median rates for career and volunteer firefighters by region and size of community.

Of the 1,115,000 firefighters, the age group accounting for the largest share of firefighters was the 30–39 group, 27 percent of all firefighters (see Figure 3).

Figure 3. Number of Firefighters in the US by Age Group, 2018



Age group patterns did vary somewhat by population of community protected. Departments protecting less than 25,000 people and comprised mostly of volunteers tended to have higher proportions of firefighters in the under-30 age group, while departments that protect 25,000 people or more and are comprised mostly of career firefighters had higher proportions of firefighters in the 30–39 and 40–49 age groups. Departments protecting less than 2,500 people had the highest percentage of firefighters age 50 and older (34 percent).

When age group patterns by year are examined for the 1997–2018 period, there were slight changes over time (see Figure 4). The 30–39 and the 40–49 age groups showed slight decreases over the period, while the 50–59 and 60 and over groups showed moderate increases over the period. Volunteer firefighter tenure periods show that more than two of every five (41 percent) volunteers have more than 10 years of active service. Almost two-thirds (63 percent) of volunteer firefighters have more than 5 years of active service.

³ Note that these results are based on a sample survey, and as a result there is a 95 percent confidence interval associated with each estimate. Based on the data reported by the fire departments responding to the 2018 National Fire Experience Survey, the NFPA is confident that the actual number of female career firefighters falls between 14,000 and 16,400; and the actual number of female volunteer firefighters falls between 73,400 and 83,600.

Fire Departments

There are an estimated 29,705 fire departments⁴ in the United States. Of these, 3,009 (10 percent) of departments are comprised solely of career firefighters⁵, and 19,122 (64 percent) of departments are comprised of all volunteer firefighters. An estimated 2,368 (8 percent) are mostly career, while 5,206 (18 percent) are mostly volunteer firefighters.

Fire departments categorized as all career or mostly career represent one-sixth (18 percent) of all departments and protect more than two-thirds (68 percent) of the US population, while departments categorized as mostly volunteer or all volunteer represent five-sixths (82 percent) of all departments and protect one-third (32 percent) of the US population.

The number of all career or mostly career departments increased from 3,043 in 1986 to 5,377 in 2018, an increase of 77 percent, while the number of all volunteer or mostly volunteer departments decreased from 26,797 in 1986 to 24,328 in 2018, a decrease of 9 percent.

The number of fire departments by size of community is provided in Table 13 of the [supporting tables document](#). Department type varied considerably by population protected. For community sizes 25,000 and above, the percentage of departments classified as all career or mostly career ranged from 75 percent to 100 percent, while for community sizes less than 25,000, the percentage of departments classified as all volunteer or mostly volunteer ranged from 49 percent to 97 percent.

Figure 4: Percent of Firefighters in the US by Age Group, 2018

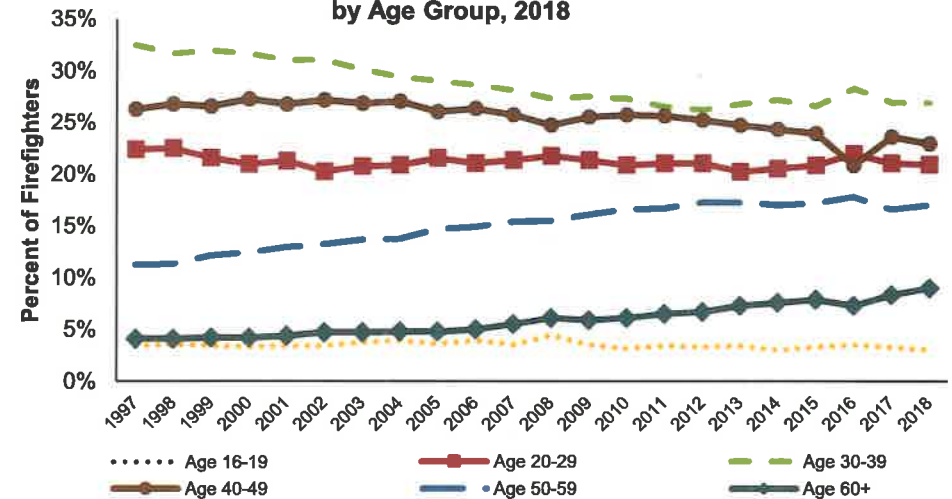
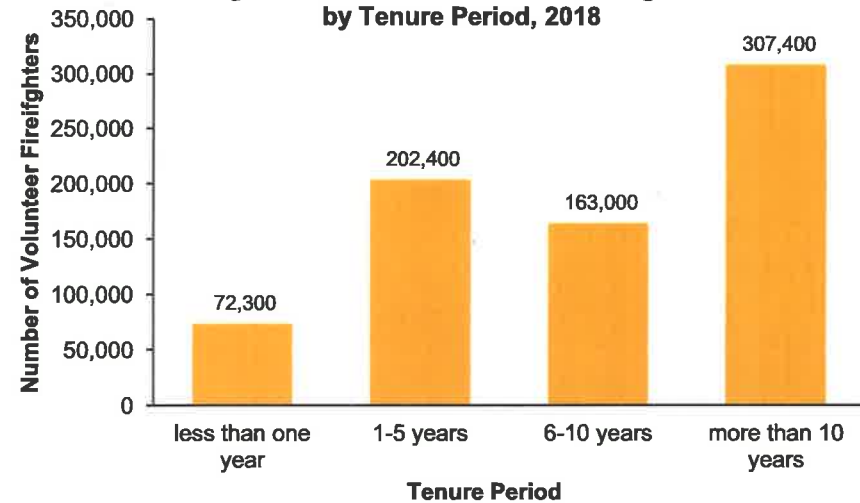


Figure 5: Number of Volunteer Firefighters by Tenure Period, 2018



⁴ A fire department is a public organization that provides fire prevention, fire suppression and associated emergency and non-emergency services to a jurisdiction such as a county, municipality, or organized fire district.

⁵ Department type is broken into four categories. All career departments are comprised 100 percent of career firefighters. Mostly career is comprised of 51 to 99 percent career firefighters, while mostly volunteer is comprised of 1 to 50 percent career firefighters. All volunteer departments are comprised 100 percent of volunteer firefighters.

Fire Department Apparatus and Stations

Estimates of the number of apparatus and stations in the United States for the 2016–2018 period indicate that there were 72,100 pumpers, 7,400 aerial apparatuses, 80,900 other suppression vehicles (e.g., pumpers less than 1,000 gpm, brush vehicles, tankers), 50,700 other vehicles (e.g., rescue, lighting, and ambulance vehicles), and 57,500 stations. A breakdown of average apparatus and station rates by community size and trend data can be found in Table 15 and Appendix B of the [supporting tables document](#)⁶.

It is worth emphasizing what the indicated rates in Table 15 represent. The numbers reflect apparatus averages and station rates per 1,000 people by population protected reported to the NFPA. They do *not* represent recommended rates or some defined fire protection standard.

The rates are higher for departments protecting smaller communities (under 2,500). This is because it takes a minimum number of apparatus and stations to operate a fire department regardless of the number of people protected. For example, for a department protecting 1,000 people, you would expect according to Table 15 an average of 1.13 pumpers, 1.84 other suppression vehicles, 0.04 aerial apparatus, and 0.91 stations. The 0.91 stations per 1,000 people is the highest rate shown in Table 15, but for this community size it is equivalent to roughly one station per department. In other words, for every 100 departments protecting 1,000 people, you would expect approximately 113 pumpers, 184 other suppression vehicles, 4 aerial apparatus, and 91 stations.

The prevalence of pumpers, other suppression vehicles, aerial apparatus, and stations by size of community are covered in Tables 16–19 in the [supporting tables document](#).

Emergency Medical Services

The level of emergency medical service (EMS) provided by fire departments by size of community protected for the 2016–2018 period is provided in Table 20 of the [supporting tables document](#).

The larger the community, the more likely EMS service was provided. Nationwide, 45 percent of departments provided EMS with basic life support, 17 percent of departments provided EMS with advanced life support, and 38 percent of departments did not provide EMS.

US Expenditures on Local Fire Protection

Table 21 of the [supporting tables document](#) provides expenditures on local fire protection by governments, with and without adjustment for inflation. Note that these expenditures, when adjusted for inflation, have risen 196 percent from 1980 to 2015. Other municipal service costs like police protection have risen in a similar manner.

Fire protection costs have risen 135 percent since 1986, while the number of career firefighters has increased 57 percent. (See Table 2 in the [supporting tables document](#)). Since chiefs of fire departments serving larger communities report problems with shrinking budgets or with level budgets combined with increasing responsibilities, this clear pattern of increasing fire department resources nationwide is difficult to interpret. Some of the factors possibly contributing to this increase in costs are (1) shrinkage of the work week⁷ for some departments, which results in a need to increase staffing and apparatus or to pay firefighters at overtime rates; (2) increased EMS responsibilities that require increased staffing and, in some communities, a more frequent replacement of apparatus; and (3) rising costs of retirement and health benefits.

Methods

The report is primarily based on two data sources: the annual NFPA Survey of Fire Departments for US Fire Experience During 2018 and the NFPA Fire Service Survey, 2016–2018.

The Survey of Fire Departments for US Fire Experience utilizes a sample of fire departments in the United States to make national projections of the fire problem. The sample is stratified by the size of the community protected by the fire department. All US fire departments that protect communities with a population of more than 5,000 are included in the sample. The 8,854 departments in the eight highest strata protect a population of 283 million or 85 percent of the US population as of July 2018.

The remainder of the sample included 14,338 randomly selected departments in the smallest communities (less than 5,000 population protected), for a total sample size of 23,192 (78 percent) of all known fire departments to the NFPA in the United States.

A total of 2,631 departments responded to the Survey of Fire Departments for US Fire Experience During 2018. National projections are made by weighting sample results according to the proportion of total US population accounted for by communities of each size. There is a confidence interval that measures the statistical certainty (or uncertainty) of the estimate around any estimate based on a sample survey. We are confident that the actual number of total firefighters falls within 5 percent of the estimate.

The NFPA Fire Service Survey is a 3-year cycle survey that reaches about one-third of the states in the country each year. The survey includes questions on the number of career firefighters, the number of volunteer firefighters, length of work week, number of apparatus and stations, etc. In recent years, the survey has had a response rate of between 13–16 percent from departments.

The results in this report are based on local and municipal fire departments. State and federal firefighting entities were not included in this sample. No adjustments were made for private fire brigades, such as industrial or military installations.

Acknowledgments

The authors would like to thank the fire departments who participated in this annual NFPA Survey of Fire Departments for US Fire Experience and/or the NFPA Fire Service Survey.

The authors would also like to thank the members of the NFPA staff who worked on the 2018 US Fire Experience Survey, Frank Deely, Steve Belski, and Jay Petrillo for editing the survey form and making follow-up calls to fire departments.

To learn more about research at NFPA, visit [nfpa.org/research](https://www.nfpa.org/research).

Email: research@nfpa.org.

NFPA No. USS07