



Central County
FIRE DEPARTMENT
Burlingame, California

March 2023

Community Risk Assessment

Standards of Cover & Deployment Analysis



AP TRITON
VISION • INNOVATION • SOLUTIONS

Contents

Acknowledgments.....	iii
Introduction.....	iv
SECTION I: THE FIRE DEPARTMENT & EMERGENCY SERVICES SYSTEM	1
Overview of the Central County Fire Department	2
CCFD Organizational Structure	2
City of Millbrae Contract for Service	3
Services Provided by CCFD.....	3
Emergency Services in San Mateo County	6
Staffing & Personnel	8
Administrative & Support Staffing	8
Operational Staffing.....	9
Financial Overview	13
Revenue	13
Expenditures.....	14
Capital Facilities & Apparatus	17
CCFD Facilities & Fire Stations	19
Fire Stations Discussion	26
Apparatus & Vehicles Inventory	26
Capital Medical Equipment Inventory	30
SECTION II: COMMUNITY RISK ASSESSMENT	31
Description of the Communities Served	32
San Mateo County.....	32
Overview of the Cities Served by CCFD	33
Population & Demographics.....	36
Risk Classification.....	48
Risk Assessment Methodology	48
Physical Hazards	57
Technological (Human-Caused) Hazards.....	70
Land Use.....	72
Physical Assets Protected.....	75
Critical Infrastructure.....	84
Comparison of Fire Risk in Other Communities.....	93

SECTION III: STANDARDS OF COVER	96
Historical Response Workload	97
Service Demand.....	97
Resource Distribution.....	107
Resource Reliability	116
Historical System Performance	119
Response Time Components	119
Population & Incident Workload Projections.....	131
Population Growth Projections	131
Service Demand Projections.....	132
Performance Objectives & Measures	133
Critical Tasking	135
Alarm Assignments	140
SECTION IV: FINDINGS & RECOMMENDATIONS	147
Findings & Observations	148
Proposed Strategies & Recommendations.....	153
Response Performance	153
Operations & Deployment	155
Fire Stations & Facilities & Apparatus	156
Organizational Structure.....	159
Governance & Mutual Cooperation	160
Miscellaneous Recommendations	162
SECTION V: APPENDICES	165
Appendix A: Risk Classifications	166
Appendix B: Summary of Stakeholder Interviews	170
Appendix C: Table of Figures.....	182
Appendix D: References	187

Acknowledgments

AP Triton Consulting wishes to extend its sincere appreciation to each individual whose contributions and assistance made this project possible.

Our sincere appreciation is extended to each of you...

Central County Fire Department

Bruce Barron

Fire Chief

Ken Giacotto

Deputy Fire Chief

Casey Pera

Battalion Chief

Rubina Ellam

Administrative Services Manager

Adam McClure

Hillsborough GIS Coordinator

Tim Louis

Battalion Chief

Jeff Baker

Battalion Chief

Christine Reed

Fire Marshal

Jasmine Del Chiaro

Management Assistant

Pat Murphy

Training Battalion Chief

...and to each of the firefighters, officers, and support staff who daily serve the citizens and visitors of their cities, towns, and communities.

Introduction

The Central County Fire Department (CCFD) engaged AP Triton Consulting, LLC (Triton) to conduct what was identified in the department's Request for Proposals (RFP) as the provision of a Community Risk Assessment (CRA) and Standards of Cover (SOC) analysis.

The study closely follows the Center for Fire Public Safety Excellence (CPSE) Standards of Coverage model, 6th Edition, which develops written procedures to determine the community risk, distribution, and concentration of a fire and emergency service agency's fixed and mobile resources. The purpose of completing the CRA/SOC document is to assist the agency in ensuring a safe and effective response force for fire suppression, emergency medical services, and specialty response situations.

Creating a Community Risk Assessment/Standards of Cover document requires that a number of areas are researched, studied, and evaluated. Therefore, this report begins with an overview of the community and the agency. Following the overview, the plan will discuss topics such as community risk assessment, critical task analysis, agency service level objectives, and distribution and concentration measures. Finally, the report will analyze historical performance and conclude with policy and operational recommendations.

AP Triton extends its appreciation to the staff and elected officials of the cities of Burlingame and Millbrae, the Town of Hillsborough, and to the staff and personnel of the Central County Fire Department, and all others who contributed to this study.

Section I: THE FIRE DEPARTMENT & EMERGENCY SERVICES SYSTEM

Overview of the Central County Fire Department

The Central County Fire Department (CCFD) was established as a Joint Powers Authority (JPA) by an agreement between the City of Burlingame and the Town of Hillsborough in April 2004. CCFD was originally created from the Burlingame and Hillsborough fire departments, which were organized more than a century ago.

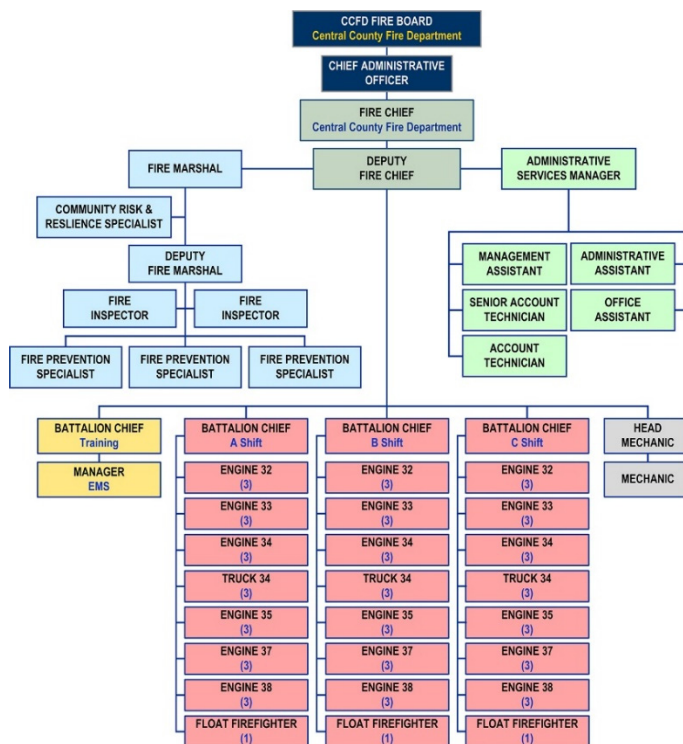


The fire department's service area is comprised of nearly 15 square miles of 34% urban and 66% suburban communities.¹ The 2019 U.S. Census estimated a population of nearly 65,000 persons (more details about the population will be addressed in the Community Risk Assessment section).² In 2017, the Central County Fire Department was given a Public Protection Classification (PPC®) score of 2 by the Insurance Services Office (ISO).

CCFD Organizational Structure

The Central County Fire Department is overseen by a four-member Fire Board whose members are appointed from the Burlingame and Hillsborough City Councils. In addition, the City Managers rotate as the Chief Administrative Officer (CAO) position.

Figure 1: CCFD Organizational Structure (2021)



As shown, the Fire Chief answers directly to the CAO, and the Deputy Fire Chief (DFC) and Administrative Services Manager report to the Fire Chief. The DFC supervises the Fire Marshal, three shift Battalion Chiefs (BC) and one BC in the Training Division. In addition, the Battalion Chiefs supervise the operations staff assigned to the six engine companies and one truck company. The Mechanic Shop personnel are supervised by a shift BC.

The Fire Marshal and Deputy Fire Marshal supervise a staff of Fire Inspectors, Fire Prevention Specialists, and a Community Risk & Resiliency Specialist. Five administrative support staff report to the Administrative Services Manager.

City of Millbrae Contract for Service

The Central County Fire Department's Joint Powers Authority agreement (JPA) consists of the City of Burlingame and the Town of Hillsborough. CCFD currently provides fire and emergency medical services for the City of Millbrae via a Contract for Service, and Millbrae is not part of the JPA. The City of Millbrae Fire Department was formed in 1932 and became part of CCFD in 2014. The current contract for service between CCFD and the City of Millbrae expires in 2024.

Services Provided by CCFD

The Central County Fire Department is an all-hazards public safety organization providing traditional fire suppression and wildland firefighting, medical first-response at the Advanced Life Support (ALS) level, hazardous materials response at the Fire Responder Operational level, Tactical EMS, emergency preparedness, and special operations that include Structural Collapse Response, Trench, Confined Space, and Rope Rescue.

The Fire Marshal maintains a full-service prevention division that includes fire inspections, code enforcement, plan reviews, fire and arson investigations, community risk and resiliency (emergency preparation) and public education and prevention programs.

CCFD Study Area

The following figure illustrates the Central County Fire Department's study area. The CCFD study area map shows CCFD's fire response zones which in some cases do not match the city limits and reflects response areas including one way interstate lanes.

Figure 2: CCFD Study Area Map

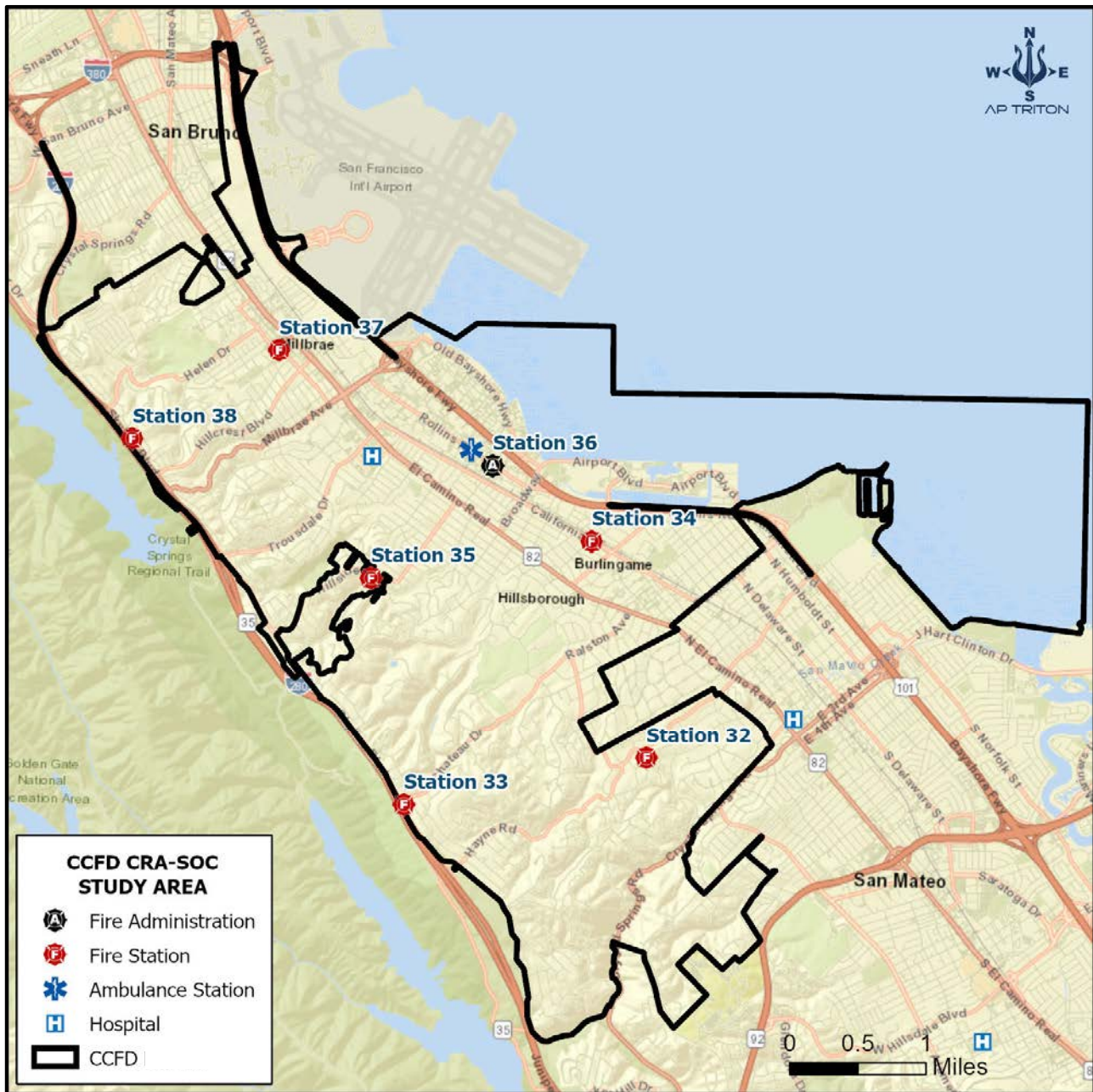
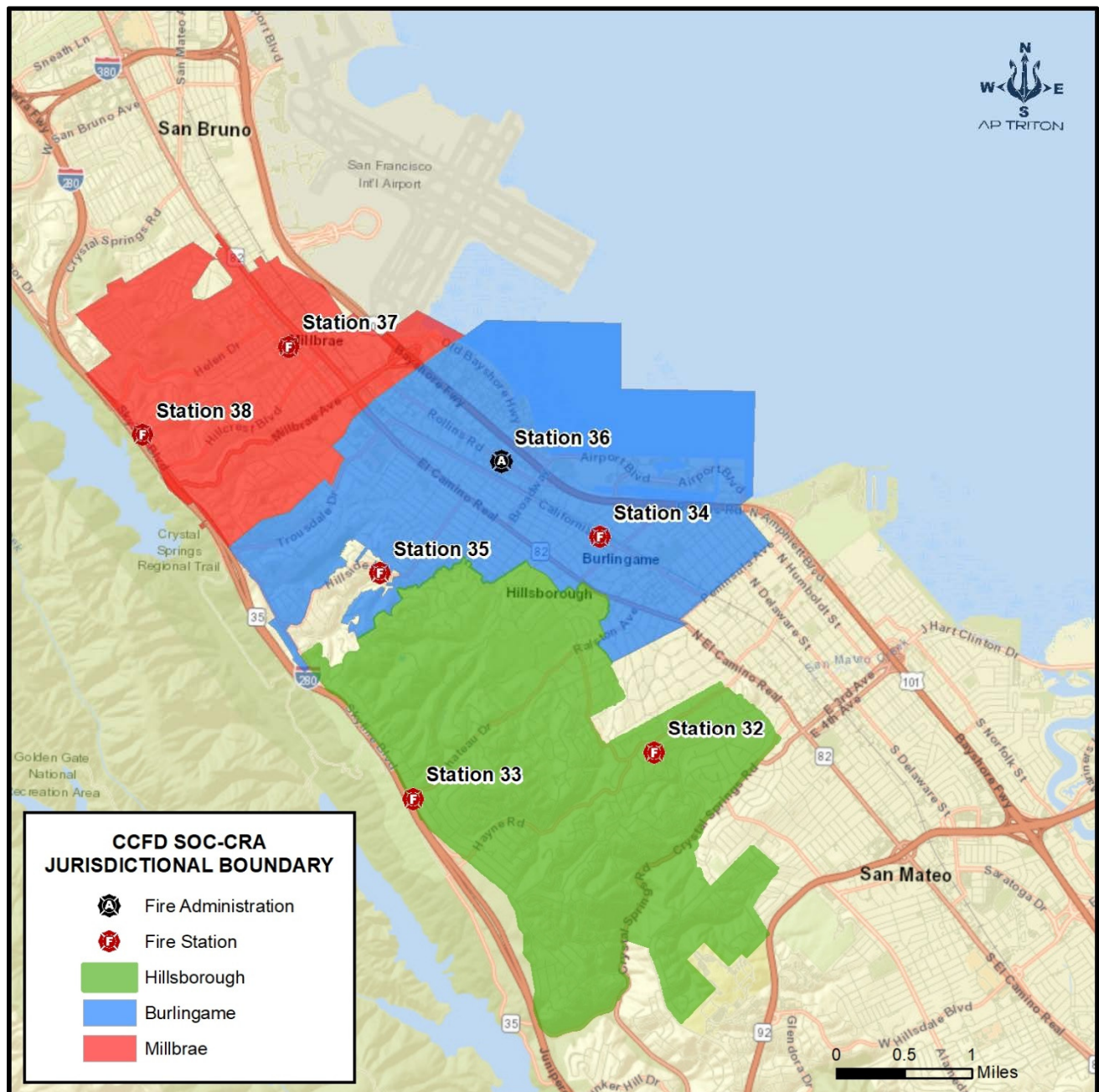


Figure 3: CCFD Jurisdictional Boundary



Emergency Services in San Mateo County

The following section is a brief overview of other emergency services and mutual aid organizations in San Mateo County.

EMS Transport

Since 1998, American Medical Response (AMR) has served as the primary provider of 911 ground emergency medical transport (GEMT) at the ALS level in San Mateo County. AMR is under contract with the County, which in 2019 renewed its contract with AMR for an additional 10 years. The company employs Paramedics, Emergency Medical Technicians, and support staff. Throughout San Mateo County, AMR transports about 40,000 patients annually.³ In addition, the South San Francisco Fire Department can deploy ALS transport units from Stations 61 and 63.

Air Medical Transport

Three organizations are available to CCFD for rotary-wing scene response: Stanford Life Flight, CALSTAR Air Medical Services, and REACH Air Medical Services. Life Flight is based at Stanford Hospital, CALSTAR has multiple bases throughout California, and REACH is affiliated with CALSTAR.

Stanford Life Flight is staffed with specially trained Flight Nurses, and the agency is accredited by the Commission on Accreditation of Medical Transport Systems (CAMTS). In addition, CALSTAR utilizes Flight Nurses and Paramedics with advanced training and is also accredited by CAMTS.

Hospitals & Tertiary Care Facilities in San Mateo County

The primary hospitals in San Mateo County include:

- Seton Medical Center (Daly City & Moss Beach)—maintains an emergency department & has a catheterization lab equipped to treat strokes and STEMI cases.
- San Mateo Medical Center—maintains an emergency department and has interventional radiology capabilities for strokes and STEMI cases.
- Kaiser Permanente (Redwood City & South San Francisco).
- Mills-Peninsula Health Services (Burlingame & San Mateo).
- Stanford Hospital (Palo Alto, Santa Clara County)—trauma center and catheterization lab equipped to treat strokes and STEMI cases.
- Sequoia Hospital (Redwood City).

- Zuckerberg San Francisco General Hospital & Trauma Center (in San Francisco County)—maintains a fully equipped and staffed emergency department and is a Level 1 Trauma Center with interventional radiology capabilities for strokes STEMI.

Automatic Aid Providers

San Mateo County has at least 13 fire departments available for automatic aid responses. The next figure shows the locations of many (but not all) of the fire stations.

Figure 4: Mutual & Automatic Aid Fire Station Locations in San Mateo County



Staffing & Personnel

The greatest asset for any organization is its personnel. Therefore, managing an organization's human capital is essential in ensuring that maximum production is achieved while employees also enjoy high job satisfaction. Job satisfaction is typically a combined result of several factors, including consistent management practices, a safe working environment, recognition of positive workforce practices, inclusion and equitable treatment, and the encouragement of workforce input.

The size and structure of an organization's staffing depend on the organization's specific needs. Organizational priorities should correlate to the community in which they serve. Several national organizations provide staffing guidance and recommendations, including the Occupational Health and Safety Administration (OSHA), the National Fire Protection Association (NFPA), and the Center for Public Safety Excellence (CPSE). This section provides an overview of the Central County Fire Department's staffing configuration.

Two distinct groups of staff are common in most fire service organizations. The first group is the administrative and support staff that directly services both internal customers by providing the management and support needed to deliver effective and efficient emergency services, as well as external customers such as contractors, residents, and property owners. The second group is the operational staff, or internal customers, who provide emergency services to external customers and are typically the most recognized group to the citizens. Ensuring a balance between these two groups is essential in providing effective and efficient emergency services and high-quality customer service.

Administrative & Support Staffing

Providing the operational staff with the means and ability to respond to and mitigate emergencies safely, effectively, and efficiently is one of the primary responsibilities of administrative and support staff. Additional responsibilities of this group include planning, organizing, directing, coordinating, and evaluating the various programs utilized within CCFD. In many cases, the administrative and support staff handle various responsibilities, some of which do not fall under the previously mentioned responsibilities. Some of these ongoing responsibilities include records management, payroll, purchasing, travel/per diem, and training documentation requirements.

The following figure illustrates the administrative and support staffing structure for CCFD.

Figure 5: CCFD Administrative & Support Staffing

Position Title	No. of FTEs	Hours per Week
Fire Chief	1	40
Deputy Fire Chief	1	40
Administrative Services Manager	1	40
Training Battalion Chief	1	40
Fire Marshal	1	40
Deputy Fire Marshal	1	40
Fire Inspectors	2	40
Fire Prevention Specialist	3	40
Community R&R Specialist	1	40
Management Assistant	1	40
Administrative Assistant	1	40
Account Technician	2	40
Office Assistant	1	40
Mechanics	2	40
Total:	19	

As with many fire service organizations, administrative and support staff typically serve multiple roles with varying job responsibilities. For CCFD, the Prevention Division is an example. The division includes eight full-time equivalents (FTE): a Fire Marshal, Deputy Fire Marshal, two Fire Inspectors, three Fire Prevention Specialists, and a Community Risk and Resiliency Specialist. These positions handle fire inspections, plan reviews, fire investigations, and coordinate public education and community engagement. Administrative and support staffing represents 20% of the total CCFD employees.

Operational Staffing

As previously discussed, the operational staff is typically the face of any fire service organization due to its increased interaction with the citizens they serve. This group is involved with nearly every facet of the organization's operations. For example, CCFD includes fire suppression, emergency medical response, technical rescue, fire investigations, public education, and pre-incident planning.

Several national organizations recommend standards to address staffing issues. The Occupational Health & Safety Administration (OSHA) CFR 1910.134, Section (g)(4) *Respiratory Protection Standard*, National Fire Protection Association (NFPA) 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* and the Center for Public Safety Excellence (CPSE) publishes benchmarks on the number of personnel recommended on the emergency scene for various risk levels.

The following figure illustrates the operational staffing structure for CCFD.

Figure 6: CCFD Operational Staffing

Position Title	Number of FTEs	Hours Worked per Week	Work Schedule
Battalion Chief	3	56	48/96
Captain	21	56	48/96
Firefighter/Paramedic	29	56	48/96
Firefighter/EMT	16	56	48/96
Total:	69		

A three-platoon system working 48-hour shift rotations that yield an average 56-hour workweek accomplishes shift operations. The minimum staffing goal for CCFD is 22 personnel responding from six fire stations on seven apparatus plus one command Battalion Chief for each 24-hour period. In addition, CCFD has one relief firefighter (floater) per shift to help fill vacation/sick leave vacancies.

The following figure illustrates the current minimum staffing model for CCFD.

Figure 7: CCFD Current Staffing Model

Apparatus	Minimum Staffing
Engine 32	3 personnel
Engine 33	3 personnel
Engine 34	3 personnel
Engine 35	3 personnel
Engine 37	3 personnel
Engine 38	3 personnel
Truck 34	3 personnel
Battalion Chief 8	1 personnel
Total:	22 personnel

Responding the appropriate units with sufficient responders is critical for all emergency incidents but is especially true for fire suppression operations. Staffing methodologies for fire suppression operations are typically derived from numerous national organizations that have been previously mentioned. For example, OSHA safety regulations (CFR 1910.120) require that personnel entering a building involved in a fire must do so in groups of two. Further, before personnel can enter a building, at least two additional Firefighters must be on-scene and assigned to conduct search and rescue if the initial crew becomes trapped. This is referred to as the “two-in, two-out rule.”

As previously discussed, CCFD has a minimum staffing requirement of 22 personnel on duty for each 24-hour period. Several fire suppression apparatus types are housed at the six staffed CCFD fire stations, and cross-staffing is used to respond to emergencies such as wildland fires. The CCFD's actual response to incidents and performance will be analyzed in a separate section of this report.

Industry standards guide the staffing level that will meet service demand. NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (2020 Edition) provides specific definitions and operational standards for CCFD:

- A career fire department is an organization that utilizes full-time or equivalent station-based personnel immediately available to comprise at least 50% of an initial full alarm assignment.
- Four Firefighters must be on the scene to proceed with an interior fire attack. This portion of the standard mirrors the OSHA Regulation "two-in, two-out" policy (29 CFR 1910.134 (g)(4)) that states that for an atmosphere immediately dangerous to life and health (IDLH) such as a structure fire, two personnel can fight the fire, but at least two standby persons must be present before entry should be made into the structure.
- Company staffing (crew size) should be Engine = minimum four on duty, and Truck = minimum four on duty.
- Initial Alarm Deployment (number of Firefighters including officers) is Low Hazard = 15 Firefighters, Medium Hazard = 28 firefighters, and High Hazard = 43 firefighters.
- A fire department should identify minimum staffing requirements to ensure the number of members available to operate based on the community's needs.

CCFD does not currently meet the NFPA 1710 minimum four-person staffing standards for any of its six full-time staffed fire engines or its full-time staffed aerial truck. NFPA 1710 minimum staffing standards are the goal for fire departments based on safety standards and fireground critical tasks but can be challenging to attain based on budgetary and other locally driven economic factors for communities

Financial Overview

As a JPA, CCFD's funding mechanism is different when compared to other Fire Districts. CCFD does not receive direct property tax allocation and therefore operations must be funded by the member agencies.

CCFD primarily utilizes the General Fund for operating revenue and expenditures and uses special funds as appropriate. Specifically, the Department has a Capital Project Fund and two Internal Service Funds—one for Workers' Compensation and one for Vehicle Replacement. The focus of this section of the report is the General Fund.

CCFD's budget development is headed by the Department's Management, the Finance Director, and the City Managers of the member agencies. The Chief's FY 2021/22 Budget Message noted increasing CalPERS costs, workers' compensation, and workforce housing costs as being at the forefront of CCFD financial concerns.

As indicated in the adopted budget, CCFD operates under a set of policies that guide their budget development and administration. It is an industry best practice to have such budget policies, which can be reviewed yearly as part of the budget process. CCFD's budget policies are Balanced Budget, Budget Basis, Budget Administration and Level of Control, Budget Term, and User Fee Cost Recovery Levels. The details of each can be found in the budget document.

Revenue

The General Fund includes program revenues and contributions from the City of Burlingame, the City of Millbrae, and the Town of Hillsborough. In accordance with the contract for fire services with the City of Millbrae, Millbrae is responsible for 30% of the operational budget. The remaining 70% is split between the City of Burlingame and the Town of Hillsborough, with 60% allocated to Burlingame and 40% allocated to Hillsborough.

The next figure illustrates the total General Fund revenue for the most recent five fiscal years.

Figure 8: CCFD General Fund Revenue

Description	FY 17/18 Actual	FY 18/19 Actual	FY 19/20 Actual	FY 20/21 Budgeted	FY 21/22 Budgeted
Permits & Licenses	\$231,010	\$159,909	\$350,792	\$300,000	\$305,000
Intergovernmental					
Burlingame	\$9,973,599	\$10,789,979	\$11,482,359	\$11,892,419	\$12,501,367
Hillsborough	\$6,649,066	\$7,193,306	\$7,654,908	\$7,928,279	\$8,334,245
Millbrae	\$6,326,189	\$6,891,612	\$7,337,244	\$7,604,468	\$7,993,414
Subtotal from Partners:	22,948,854	24,874,897	26,474,511	27,425,166	28,829,026
Other Agencies	\$436,571	\$361,590	\$394,574	\$389,588	\$389,588
Charges for Services	\$509,547	\$375,335	\$249,868	\$468,252	\$432,252
Other Revenue	\$1,746,054	\$1,520,645	\$998,641	\$528,197	\$495,761
Total Revenue:	\$25,872,036	\$27,292,376	\$28,468,386	\$29,111,203	\$30,451,627

The member agency funding increased by 5.1% between FY 2020/21 and FY 2021/22. The breakdown of contribution rates for the current fiscal year is Burlingame at 43%, Hillsborough at 29%, and Millbrae at 28%.

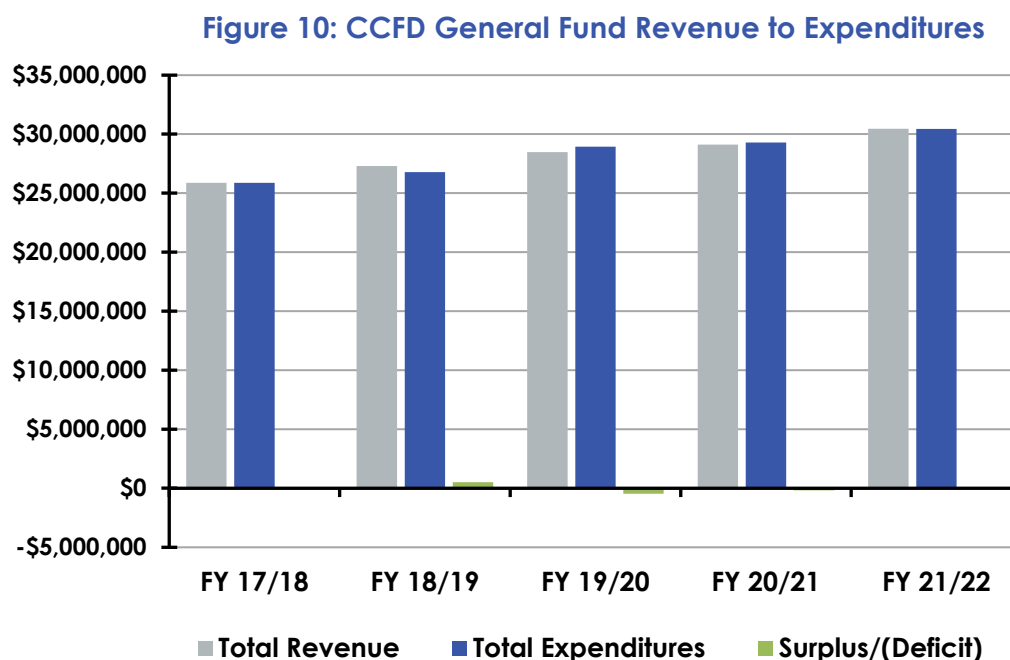
Expenditures

As with most service industries, most expenditures are driven by employee salary and benefit costs. A summary of total General Fund expenditures for the most recent five fiscal years is provided in the following figure.

Figure 9: CCFD General Fund Expenditures

Description	FY 17/18 Actual	FY 18/19 Actual	FY 19/20 Actual	FY 20/21 Budgeted	FY 21/22 Budgeted
Salaries & Benefits	\$23,389,694	\$23,944,158	\$25,833,252	\$26,240,254	\$27,305,169
Materials & Services	\$1,607,344	\$1,961,490	\$1,955,695	\$2,100,949	\$2,058,329
Total Operating Costs:	\$24,997,038	\$25,905,648	\$27,788,947	\$28,341,203	\$29,363,498
Capital Outlay/Reserves	\$875,000	\$875,000	\$1,150,000	\$950,000	\$1,075,000
Total Expenditures:	\$25,872,038	\$26,780,648	\$28,938,947	\$29,291,203	\$30,438,498

The following figure represents the most recent five fiscal years' General Fund revenue to expenditures and the resultant surplus or deficit.



As shown in the preceding figure, the General Fund operates at a very close margin for a department of this size.

Additional Observations

The adopted FY 2021/22 funding for the CCFD operations reflects an increase in required PERS contributions, a 3% cost of living increase based on a Memorandum of Understanding (MOU), and transfers to the Replacement Fund, resulting in a 5.1% increase from the FY 2020/21 adopted budget.

As with most governmental agencies, pension-related benefits are a large long-term expense of the department. The 2020 Annual Comprehensive Financial Report (ACFR) indicates that the department has a net pension obligation of \$45,230,293. However, the member agencies retain responsibility for Other Post-Employment Benefits (OPEB) for personnel who retired prior to June 21, 2010. In FY 2021/22, CCFD projects its OPEB funding requirement at \$1,364,000.

The 2020 ACFR indicates a net OPEB liability of \$12,104,000, which is down from \$13,569,000 in 2019. The department is paying OPEB obligations on both a pay-go basis for current healthcare premiums and pre-funding through the CalPERS California Employers' Retiree Benefit Trust (CERBT). The 2020 ACFR broke down the FY 2019/20 contributions, including \$670,000 in pay-go premiums and \$742,000 to the trust. The department pays the full Actuarially Determined Contribution (ADC) to the trust. This is a best practice to reduce the overall OPEB liability over time, as investment earnings are allocated toward funding the total obligation.

The Capital Projects and Replacement Funds seem to be maintaining reasonable fund balances. However, the Joint Training and Insurance Funds appear to be operating in a deficit position for the last four fiscal years. According to information obtained from staff and the ACFR, the Insurance Fund contributions are established by the Board, based on an actuarial valuation, and funded by the General Fund.

Capital Facilities & Apparatus

Trained personnel, apparatus and vehicles, firefighting and emergency medical equipment, and fire stations are the essential capital resources necessary for a fire department to carry out its mission. No matter how competent or numerous the Firefighters are, if appropriate capital equipment is not available for operations personnel, it would be impossible for the Central County Fire Department to perform its responsibilities effectively. This report section assessed CCFD's fire stations, vehicles, and apparatus.

Fire Stations Features

Fire stations play an integral role in delivering emergency services for several reasons. To a large degree, a station's location will dictate response times to emergencies. A poorly located station can mean the difference between confining a fire to a single room and losing the structure, or survival from sudden cardiac arrest. Fire stations also need to be designed to adequately house equipment and apparatus and meet the needs of the organization and its personnel.

Fire station activities should be closely examined to ensure the structure is adequate in size and function. Examples of these functions can include the following:

- Kitchen facilities, appliances, and storage
- Residential living space and sleeping quarters for on-duty personnel (all genders)
- Bathrooms and showers (all genders)
- Training, classroom, and library areas
- Firefighter fitness area
- The housing and cleaning of apparatus and equipment, including decontamination and disposal of biohazards
- Administrative and management offices, computer stations, and office facilities
- Public meeting space

In gathering information from CCFD, Triton asked the department to rate the condition of its fire stations using the criteria from the following figure. The results will be seen in the figures after that.

Figure 11: Criteria Utilized to Determine Fire Station Condition

Excellent	Like new condition. No visible structural defects. The facility is clean and well-maintained. The Interior layout is conducive to function with no unnecessary impediments to the apparatus bays or offices. No significant defect history. Building design and construction match the building's purposes. Age is typically less than ten years.
Good	The exterior has a good appearance with minor or no defects. Clean lines, good workflow design, and only minor wear on the building interior. The roof and apparatus apron are in good working order, absent any significant full-thickness cracks, crumbling of the apron surface, or visible roof patches or leaks. Building design and construction match the building's purposes. Age is typically less than 20 years.
Fair	The building appears structurally sound with a weathered appearance and minor to moderate non-structural defects. The interior condition shows normal wear and tear but flows effectively to the apparatus bay or offices. Mechanical systems are in working order. Building design and construction may not match the building's purposes well. Showing increasing age-related maintenance but with no critical defects. Age is typically 30 years or more.
Poor	The building appears to be cosmetically weathered and worn with potentially structural defects, although not imminently dangerous or unsafe. Large, multiple full-thickness cracks and crumbling of concrete on the apron may exist. The roof has evidence of leaking and multiple repairs. The interior is poorly maintained or shows signs of advanced deterioration with moderate to significant non-structural defects. Problematic age-related maintenance and major defects are evident. It may not be well-suited to its intended purpose. Age is typically greater than 40 years.

CCFD Facilities & Fire Stations

The following figures list the features of the CCFD fire stations.

Figure 12: CCFD Station 32


Address/Physical Location:		330 Ascot Road, Hillsborough, CA 94010					
		General Description: This station houses an engine and reserve engine. The interior was renovated in 2022 & the generator was updated in 2022–2023. Vehicle storage areas are at maximum, and no room for additional units. It does have a vehicle exhaust system. Station does not meet seismic standards.					
Structure							
Date of Original Construction		1982					
Seismic Protection		None					
Auxiliary Power		Yes					
General Condition		Fair					
Number of Apparatus Bays		Drive-through Bays		0	Back-in Bays		2
ADA Compliant		No					
Total Square Footage		4,685					
Facilities Available							
Sleeping Quarters		5	Bedrooms	11	Beds	0	Dorm Beds
Maximum Staffing Capability		5					
Exercise/Workout Facilities		Apparatus floor					
Kitchen Facilities		Yes					
Individual Lockers Assigned		Yes					
Bathroom/Shower Facilities		Yes					
Training/Meeting Rooms		No					
Washer/Dryer		Yes					
Safety & Security							
Station Sprinklered		No					
Smoke Detection		Yes					
Decontamination/Bio. Disposal		Yes					
Security System		Nexkey, Gate, Ring Camera					
Apparatus Exhaust System		Yes					

Figure 13: CCFD Station 33**Address/Physical Location:**

835 Chateau Drive, Hillsborough, CA 94010

**General Description:**

This station houses an engine and heavy rescue. Also houses San Mateo County Tactical EMS vehicle. Interior has been renovated and kitchen updated. Generator is 15 years old and needs replacing. Vehicle storage areas are at maximum. It does have a vehicle exhaust system. Station does not meet seismic standards.

Structure

Date of Original Construction	1952			
Seismic Protection	None			
Auxiliary Power	Yes			
General Condition	Fair			
Number of Apparatus Bays	Drive-through Bays	0	Back-in Bays	2
ADA Compliant	No			
Total Square Footage	4,200			

Facilities Available

Sleeping Quarters	4	Bedrooms	9	Beds	0	Dorm Beds
Maximum Staffing Capability	4					
Exercise/Workout Facilities	Apparatus floor					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	Yes					
Training/Meeting Rooms	No					
Washer/Dryer	Yes					

Safety & Security

Station Sprinklered	No					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Nexkey, Gate, Ring Camera					
Apparatus Exhaust System	Yes					

Figure 14: CCFD Station 34


Address/Physical Location:		799 California Dr., Burlingame, CA 94010				
	General Description: This station houses a shift BC, an engine, ladder truck, and reserve engine. Also includes the fleet maintenance shop, a training tower, a community meeting room, and an SCBA fill station. Vehicle storage areas are at a maximum. Firefighter turnout gear is stored in the apparatus bay area.					
	Structure					
Date of Original Construction	1994					
Seismic Protection	Built to 1994 seismic standards					
Auxiliary Power	New generator Q4 2021					
General Condition	Fair					
Number of Apparatus Bays	Drive-through Bays		0	Back-in Bays		4
ADA Compliant	Downstairs only					
Total Square Footage	16,255					
Facilities Available						
Sleeping Quarters	8	Bedrooms	24	Beds	0	Dorm Beds
Maximum Staffing Capability	8					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Nexkey, Gate, Ring Camera					
Apparatus Exhaust System	Yes					

Figure 15: CCFD Station 35


Address/Physical Location:		2832 Hillside Drive, Burlingame, CA 94010					
		General Description: This station houses an engine and a reserve engine. Sleeping area and main office were renovated in 2020. Day room and kitchen are original from 1950 and need renovation. Generator was updated in 2021. Vehicle storage areas are at maximum. The workout area and firefighter turnout gear is located in the apparatus bay area. Station does not meet seismic standards.					
Structure							
Date of Original Construction		1950. Partial remodel in 2020					
Seismic Protection		None					
Auxiliary Power		New generator Q4 2021					
General Condition		Poor					
Number of Apparatus Bays		Drive-through Bays		0	Back-in Bays		2
ADA Compliant		Partial					
Total Square Footage		5,616					
Facilities Available							
Sleeping Quarters		3	Bedrooms	9	Beds	0	Dorm Beds
Maximum Staffing Capability		3					
Exercise/Workout Facilities		Apparatus floor					
Kitchen Facilities		Yes					
Individual Lockers Assigned		Yes					
Bathroom/Shower Facilities		Yes					
Training/Meeting Rooms		No					
Washer/Dryer		Yes					
Safety & Security							
Station Sprinklered		No					
Smoke Detection		Yes					
Decontamination/Bio. Disposal		Yes					
Security System		Nexkey					
Apparatus Exhaust System		Yes					

Figure 16: CCFD Station 36 (Administration)


Address/Physical Location:		1399 Rollins Road, Burlingame, CA 94010											
	General Description:												
	This facility was previously a fire station that is now used for the Administrative Offices and headquarters for the Central County Fire Department. No on-duty crews or fire apparatus are housed at this facility. Station does not meet seismic standards.												
Structure													
Date of Original Construction		1961											
Seismic Protection		None											
Auxiliary Power		New generator Q4 2021											
General Condition		Poor											
Number of Apparatus Bays		Drive-through Bays		0		Back-in Bays		0					
ADA Compliant		No											
Total Square Footage		8,730											
Facilities Available													
Sleeping Quarters		0		Bedrooms		0		Beds		0		Dorm Beds	
Maximum Staffing Capability		0											
Exercise/Workout Facilities		Yes											
Kitchen Facilities		Yes											
Individual Lockers Assigned		No											
Bathroom/Shower Facilities		Yes											
Training/Meeting Rooms		Yes											
Washer/Dryer		Yes											
Safety & Security													
Station Sprinklered		No											
Smoke Detection		No											
Decontamination/Bio. Disposal		No											
Security System		Nexkey, Ring camera											
Apparatus Exhaust System		Yes											

Figure 17: CCFD Station 37



Address/Physical Location:		511 Magnolia Ave., Millbrae, CA 94030					
		General Description: This station houses an engine, a reserve engine, and a reserve truck. Includes training offices, training tower with several training props, a training classroom, and SCBA fill station. Station interior needs renovation. Vehicle storage areas are at maximum. The workout area and firefighter turnout gear is located in the apparatus bay area.					
Structure							
Date of Original Construction		1956					
Seismic Protection		Upgraded to 1997 Standards					
Auxiliary Power		Common with City Hall and police					
General Condition		Poor					
Number of Apparatus Bays		Drive-through Bays		0	Back-in Bays		3
ADA Compliant		Yes					
Total Square Footage		9,269					
Facilities Available							
Sleeping Quarters		4	Bedrooms	10	Beds	0	Dorm Beds
Maximum Staffing Capability		4					
Exercise/Workout Facilities		Apparatus floor					
Kitchen Facilities		Yes					
Individual Lockers Assigned		Yes					
Bathroom/Shower Facilities		Yes					
Training/Meeting Rooms		Yes					
Washer/Dryer		Yes					
Safety & Security							
Station Sprinklered		Yes					
Smoke Detection		Yes					
Decontamination/Bio. Disposal		Yes					
Security System		Nexkey, Gate, Ring Camera					
Apparatus Exhaust System		Yes					

Figure 18: CCFD Station 38

Address/Physical Location:		785 Crestview Dr., Millbrae, CA 94030					
		General Description:					
		This station houses an engine, a reserve engine, and an OES Type 6 wildland response engine. Interior needs renovation. Vehicle storage areas are at maximum. Station does have a vehicle exhaust system. The workout area and firefighter turnout gear is located in the apparatus bay area. Station does not meet seismic standards.					
Structure							
Date of Original Construction		1974					
Seismic Protection		None					
Auxiliary Power		New generator 2020					
General Condition		Fair					
Number of Apparatus Bays		Drive-through Bays		1	Back-in Bays		2
ADA Compliant		Yes					
Total Square Footage		4,340					
Facilities Available							
Sleeping Quarters		3	Bedrooms	7	Beds	0	Dorm Beds
Maximum Staffing Capability		3					
Exercise/Workout Facilities		Apparatus floor					
Kitchen Facilities		Yes					
Individual Lockers Assigned		Yes					
Bathroom/Shower Facilities		Yes					
Training/Meeting Rooms		No					
Washer/Dryer		Yes					
Safety & Security							
Station Sprinklered		No					
Smoke Detection		Yes					
Decontamination/Bio. Disposal		Yes					
Security System		Nexkey					
Apparatus Exhaust System		Yes					

Fire Stations Discussion

The following figure summarizes the seven fire stations operated by the Central County Fire Department.

Figure 19: Summary of the CCFD Fire Station Features

Station	Square Footage	Apparatus Bays	Maximum Staffing	General Condition	Station Age
Station 32	4,685	2	5	Fair	39
Station 33	4,200	2	4	Fair	69
Station 34	16,255	4	8	Fair	27
Station 35	5,616	2	3	Poor	71
Administration	8,730	N/A	N/A	Poor	60
Station 37	9,269	3	4	Poor	65
Station 38	4,340	3	3	Fair	47
Totals:	53,095	16	27		

The Central County Fire Department is operating from aging fire stations. As shown, CCFD fire stations range in age from 27 to 71 years, with an average of 54 years. Station 35 is the oldest of the stations and was partially remodeled in 2020.

Four of the stations were given a rating of “Fair” and three of the stations were given a rating of “Poor”. The department does not currently have a long-term Capital Facilities Replacement Plan.

Except for Stations 34 and 36 (Administration), Firefighter exercise and workout equipment is located on the apparatus floor of each of the other fire stations. In addition, all stations have apparatus exhaust systems and security systems, with two having sprinkler systems.

Apparatus & Vehicles Inventory

Fire apparatus, command vehicles, and other emergency response units must be sufficiently reliable to transport Firefighters and equipment rapidly and safely to an incident scene. In addition, such vehicles must be properly equipped and function appropriately to ensure that the delivery of emergency services is not compromised.

As a part of this study, Triton requested that the Central County Fire Department provide a complete inventory of its fleet (suppression apparatus, command and support vehicles, specialty units, etc.). For each vehicle listed, CCFD was asked to rate its condition utilizing the criteria described in the following figure (shown in the apparatus inventory figures).

Figure 20: Criteria Used to Determine Apparatus & Vehicle Condition

Components	Points Assignment Criteria	
Age:	One point for every year of chronological age, based on the date the unit was originally placed into service.	
Miles/Hours:	One point for every 10,000 miles or 1,000 hours	
Service:	1, 3, or 5 points are assigned based on service type received (e.g., a pumper would be given a 5 since it is classified as severe duty).	
Condition:	This category considers body condition, rust, interior condition, accident history, anticipated repairs, etc. The better the condition, the lower the assignment of points.	
Reliability:	Points are assigned as 1, 3, or 5, depending on the frequency a vehicle is in for repair (e.g., a 5 would be assigned to a vehicle in the shop 2 or more times per month on average; while a 1 would be assigned if in the shop on average once every 3 months or less.	
Point Ranges	Condition Rating	Condition Description
Under 18 points	Condition I	Excellent
18–22 points	Condition II	Good
23–27 points	Condition III	Fair (consider replacement)
28 points or higher	Condition IV	Poor (immediate replacement)

The Central County Fire Department operates six frontline Type 1 structural engines, a single frontline 105-foot aerial truck, an OES-owned Type 6 engine, and a heavy rescue unit. The department also maintains four engines and a truck in reserve.

The following figure lists the frontline units for CCFD.

Figure 21: CCFD Frontline Apparatus Inventory (2022)

Unit	Type	Manufacturer	Year	Condition	Features
Engine 32	Type 1	Pierce	2016	Good	1750 gpm, 680 gal.
Engine 33	Type 1	Pierce	2002	Poor	1750 gpm, 680 gal.
Engine 34	Type 1	Pierce	2019	Excellent	1750 gpm, 680 gal.
Engine 35	Type 1	Pierce	2016	Good	1750 gpm, 680 gal.
Engine 37	Type 1	Pierce	2016	Good	1750 gpm, 680 gal.
Engine 38	Type 1	Pierce	2017	Good	1750 gpm, 680 gal.
Engine 2608	Type 1	Athens-Fox	2020	Excellent	500 gpm, 280 gal.
Truck 34	Aerial	Pierce	2022	Excellent	105' ladder
Rescue 133	Rescue	SVI	2008	Fair	Heavy rescue

One of CCFD's frontline engines (Engine 33) is considered in "Poor" condition, four were rated as "Good," and one (Engine 34) in "Excellent" condition. The frontline aerial apparatus (Truck 34) was rated in "Excellent" condition, while the reserve Truck 134 was rated as "Poor." The CCFD apparatus inventory also includes a California Office of Emergency Services (OES) owned resource assigned to CCFD (Engine 2608) that was rated as "Excellent." The following lists CCFD's command and some primary staff vehicles.

Figure 22: CCFD Frontline Command & Other Vehicles

Unit	Assigned To	Manufacturer	Year	Condition
Chief 8	Fire Chief	Tesla Model 3	2019	Excellent
Chief 8A	Deputy Chief	Chevy Silverado	2020	Excellent
Battalion 8	Battalion Chief	Ford F-350	2018	Excellent
Prevention 8	Fire Marshal	Ford Explorer	2016	Excellent
Prevention 8A	Deputy Fire Marshal	Ford Explorer	2015	Excellent

As shown in the preceding figure, each vehicle was rated between "Poor" and "Excellent" as per the vehicle condition rating criteria.

The following two figures list CCFD's reserve apparatus inventory and reserve command, staff and other vehicle inventory.

Figure 23: CCFD Reserve Apparatus Inventory (2022)

Unit	Type	Manufacturer	Year	Condition	Features
Engine 132	Type 1	Pierce	2002	Poor	1750 gpm, 500 gal.
Engine 134	Type 1	Pierce	2007	Poor	1750 gpm, 500 gal.
Engine 137	Type 1	Pierce	2001	Poor	1750 gpm, 500 gal.
Engine 138	Type 1	Pierce	2002	Poor	1750 gpm, 500 gal.
Truck 134	Aerial	Pierce	2007	Poor	105' ladder

Figure 24: CCFD Reserve Command, Staff, & Other Vehicles

Unit	Assigned To	Manufacturer	Year	Condition
Prevention 8B	Fire Inspector	Ford Escape	2010	Fair
Prevention 8C	Prevention Specialist	Dodge Durango	2007	Poor
Prevention 8D	Fire Inspector	Ford Explorer	2015	Good
Prevention 8E	Prevention Specialist	Chevy Bolt	2020	Excellent
Prevention 8F	Prevention Specialist	Ford Escape	2010	Fair
Mechanic 8	Head Mechanic	Dodge 4500	2018	Excellent
Battalion 108	Out of County STL	Ford F250 4x4	2010	Poor
Utility 233-FD12	Storm Cache/Intern	Ford F-250	2000	Poor
Utility 234-FD 18	Storm Cache/Intern	Ford F-250	2015	Good
Utility 237-FD19	Storm Cache/Intern	Ford F-250 4x4	2015	Good
Medcat-FD21	Tactical EM Team	Ford	2016	Excellent
N/A	Clinical Ed Specialist	Ford Expedition	2010	Poor
N/A	Community Risk	GMC Yukon	2008	Poor
N/A	Training BC	GMC Yukon 2500	2007	Poor
N/A	WUI Inspector	Ford Expedition	2006	Poor
N/A	Mechanic	Ford F-350	2001	Poor

In its fleet inventory, CCFD listed multiple command response vehicles, staff cars, utility vehicles, and trailers assigned to the various divisions within CCFD.

All reserve engines and aerial apparatus were listed as “Poor” and a total of 62% of the CCFD command, staff, and other vehicles are rated as “Poor” or “Fair”. CCFD will need to focus on frontline vehicle replacement needs in addition to its reserve apparatus inventory.

Fleet Maintenance

Fleet maintenance at the Central County Fire Department is done primarily by the department's two full-time Mechanics. However, mechanical work requiring specialty services may be outsourced when necessary.

Capital Medical Equipment Inventory

The Central County Fire Department must maintain and utilize advanced-level capital medical equipment as an ALS provider. Likely the most expensive items are the cardiac monitor/defibrillators that must be assigned to each of the frontline apparatus. These devices are a critical part of delivering ALS-level care. Aside from the basic features of cardiac monitoring and defibrillation, the devices have other capabilities, including 12-lead ECG, blood pressure monitoring, pulse oximetry, CO₂ monitoring, and other features.

CCFD utilizes the Physio-Control Lifepak® 15 monitor/defibrillator. Currently, it uses seven of these, made in 2016 and provided through a contract with American Medical Response. The contract includes the provision of all repairs and maintenance. Two additional Lifepak® 15s were purchased by CCFD and manufactured in 2017 and 2021, respectively. In addition to the Lifepak® 15s, CCFD maintains two Physio-Control Automated External Defibrillators (AED). One is a Lifepak® 500 and the other a Lifepak® 1000.

Another expensive but valuable piece of equipment is the Stryker LUCAS® Chest Compression System. This device automatically delivers high-performance continuous chest compressions. CCFD owns five of these, which include both the newer LUCAS-3 model, and the older LUCAS-2 model manufactured in 2013.

Section II:

COMMUNITY RISK ASSESSMENT

Description of the Communities Served

CCFD serves the City of Burlingame, the Town of Hillsborough, and the City of Millbrae. The CCFD is located in San Mateo County on the western shore of the San Francisco Bay, approximately 10 miles south of the City of San Francisco and 30 miles north of San Jose. Formed in April 2004, the CCFD provides all-risk fire protection, emergency medical, and community risk reduction services to nearly 65,000 residents and thousands of visitors annually. In December 2014, CCFD entered into a contract for fire services with the City of Millbrae, including fire suppression, fire prevention, and administrative oversight and support. CCFD's service area is approximately 15 square miles around the San Francisco International Airport (SFO). The communities are a primary stopping point for SFO's 53 million passengers yearly. Some of the main features are the Millbrae BART station, which is the largest intermodal terminal in the West and includes a cross-platform connection to Caltrain. In addition, CCFD serves a diverse area of single-family homes, multi-residential buildings, retail and business districts, hotels, a regional hospital, care facilities, and a large industrial area.

San Mateo County

San Mateo County is located in the San Francisco Bay area. It is in the San Francisco-Oakland-Berkeley, California, Metropolitan Statistical Area (MSA), and Redwood City is the county seat. The estimated population of the MSA in 2019 was 4,731,803, representing an increase of 9.1% since 2010. San Mateo County's population, according to the 2020 Census, is 764,442 and has increased 6.4% since 2010.⁴ It is the home of San Francisco International Airport, which is in the northeastern section of the County. The County is considered suburban with interspersed pockets of urban areas.

The southern end of the County borders Silicon Valley. It is the home of many innovative companies such as *"bioscience, computer software, green technology, hospitality, financial management, health care, education, and transportation."* The County is 455 square miles of land and *"bordered by the Pacific Ocean to the west and San Francisco Bay to the east."*⁵

According to the U.S. Census 2019 American Community Survey, the median age in San Mateo County is 39.9, at-risk populations under five years old is 5.7%, and those older than 65 is 15.8%. In addition, the median household income is \$122,641, while the percentage of those in poverty is 6.1%.

Overview of the Cities Served by CCFD

City of Burlingame

The City of Burlingame is an American suburban city in San Mateo County, California. It is located on the San Francisco Peninsula and has a significant shoreline on San Francisco Bay. The city is named after Anson Burlingame, an attorney, legislator, and diplomat. Burlingame was settled by wealthy San Franciscans looking for a better climate. It is known for its high residential quality of life and is often referred to as the City of Trees. Industrial growth was spurred in the 1960s and 1970s by proximity to the San Francisco International Airport. The City of Burlingame has many beautiful hotels along the San Francisco Bay front and is a significant spot for people wishing to visit the San Francisco Bay Area.

The City of Burlingame is a California General Law City incorporated in 1908 that operates under the Council/Manager form of government. Municipal services include police and fire protection, public works, community development; parks and recreation; library services, water/sewer, parking, solid waste, and storm drainage. General government activities include finance, human resources, legal services, and city administration. While the Burlingame community has been growing for more than a hundred years, it has retained the original qualities that made it such an attractive prospect in the first place.

Among its many attributes, one of its residents' favorite factors is the city's climate. Sheltered by the hills from the strong winds and heavy fogs that San Francisco is known for, Burlingame enjoys such mild weather that it gained "San Francisco's Sunny Suburb" as a moniker. With mild weather year-round, the city is a great place to enjoy views of the Bay and the city. It's also a top place to participate in outdoor activities.

In addition to its weather, Burlingame enjoys a high quality of residential life. With more than 12,000 households and an average household income of approximately \$120,000, the suburb is an attractive choice for the wealthier residents of the County.

Town of Hillsborough

The Town of Hillsborough is an entirely residential community located in San Mateo County, California, west of Burlingame. In 1824, a 16-year-old named William Davis Merry Howard, son of a wealthy Hillsboro, New Hampshire, shipping magnate, sailed on one of his father's ships from Boston around Cape Horn to the West Coast. Upon returning home, he convinced his father of the fortunes to be made in the West and returned to California fifteen years later. Thus, the Town is named after the city from which Mr. Howard came. Hillsborough was incorporated on May 5, 1910.

The Town has continually worked to preserve the “nature of Hillsborough.” In 1953, the Town changed its minimum lot size to one-half acre, which is still in effect today. Large homes dominate Hillsborough's landscape; the Town enforces a 2,500-square-foot (230 m²) minimum house size and a minimum lot size of 0.5 acres (2,000 m²) to preserve exclusivity. As a result, there are no apartments, condominiums, or businesses in the city limits. In addition, Hillsborough residents have continually worked to preserve the Town's relaxed country setting. With only a few traffic lights and streetlights, trees, flowers, and shrubbery continue to typify the Town's landscape.

The Town offers its residents a rural charm and is one of the wealthiest communities in America, with the highest income of places in the United States with populations of at least 10,000. It is located 17 miles (27 km) south of San Francisco on the San Francisco Peninsula, and is bordered by Burlingame to the north, San Mateo to the east, Highlands-Baywood Park to the south, and Interstate 280 to the west.

In addition to its quiet atmosphere, it offers excellent, award-winning public schools, outstanding police, fire, and emergency services, public work services, and a sense of community. The City Council is responsible, among other things, for passing ordinances, adopting the budget, appointing committee and board members, and hiring the City Manager and the City Attorney. The City Manager is responsible for carrying out the policies and ordinances of the City Council, overseeing the day-to-day operations, and appointing the department heads.

City of Millbrae

The City of Millbrae (the "City") was founded in 1856, incorporated in 1948, and operates as a General Law City serving a population of over 20,000. The city is located on the California Peninsula, 15 miles south of San Francisco. The city's boundaries extend roughly from the Bayshore Freeway on the east to Skyline Boulevard on the west. This distance is approximately 1.7 miles. The distance between the north and south city limit line is approximately 2.05 miles. Adjacent to the San Francisco International Airport and located in the heart of San Mateo County, Millbrae is gently cradled in the sun-warmed hills that separate the Pacific Ocean from the San Francisco Bay.

The City of Millbrae has enjoyed a colorful history since the 1860s when investor Darius Ogden Mills purchased land from the Sanchez family to build his country estate. Mills' estate grew to span from Skyline Boulevard to the Bayshore Highway and Millbrae Avenue to Trousdale Drive.

Children swam in the three lakes on the estate and sold acacias to visitors before the Mills family began to sell the land for development. Transportation has, to a great extent, shaped Millbrae's growth. Many hillside homes enjoy beautiful bay views. Well-cared-for middle-class neighborhoods, fourteen local parks, and the Green Hills Country Club add to the charm of the residential community. Millbrae's economic community is a vital mix of retail, shopping, restaurants, service businesses, hotels, and public services.

From the turn of the century, the "interurban" streetcar traveled through Millbrae, linking the City with San Francisco and San Mateo. Major freeways border both its eastern and western boundaries, making Millbrae easily accessible from all parts of the Bay Area. With the Bay Area Rapid Transit (BART)/San Francisco (SFO) Extension, the City has adopted the Millbrae Station Area Specific Plan to attract hotel, office, retail, and housing development to the area around the Millbrae BART Station. The Millbrae BART Station provides the only Intermodal rail connection and the first regional rail system in the Bay Area. This unique station, which is connected to and adjacent to the San Francisco International Airport, allows BART, CalTrain, and SamTrans to connect under one roof, thereby maximizing regional travel options for passengers in the Bay Area.

The City acknowledges the importance of and continually strives toward preserving, enhancing, and managing open spaces, trees, and wetlands. The City continues to implement sustainable programs that will improve the health of the community and environment and will ensure that future generations may live healthy, productive, and comfortable lives.

Population & Demographics

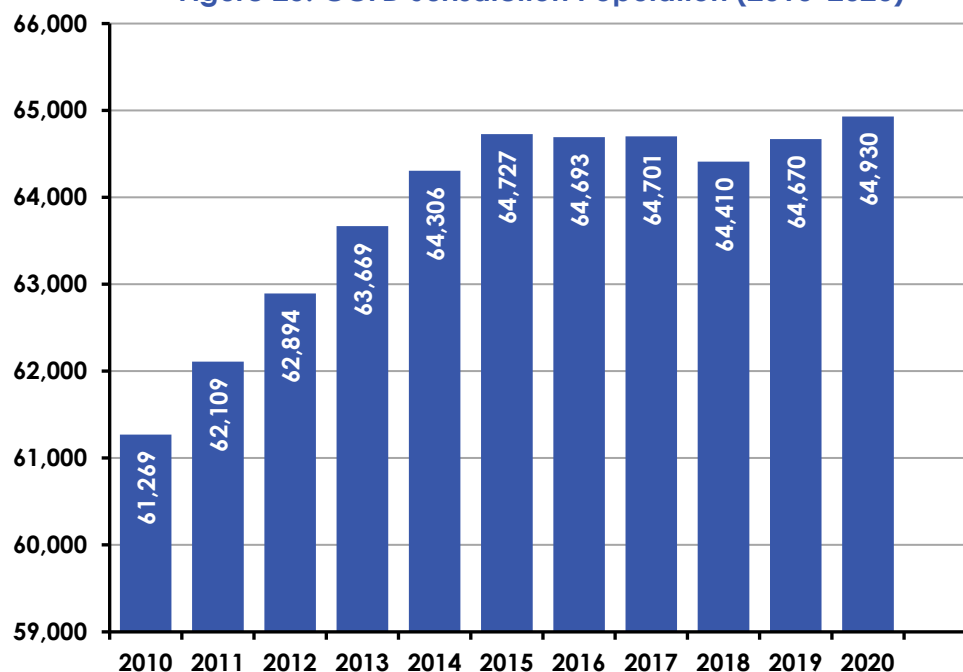
Risk factors influence the types of services a community provides. Identification of hazards is the process of recognizing the natural or human-caused events that threaten a community. Every community must prepare for and respond to events, including natural disasters like an earthquake, pandemic, or wildfire. In addition, the degree to which a community exhibits certain social conditions, including poverty levels, vehicle access, or the number of individuals in a household, may affect the community's ability to prevent suffering and financial loss in the event of a disaster. These factors describe a community's risk.

A community's risk is assessed based on numerous factors, including socioeconomic status, household composition, minority status and language, population and density and housing types, local land use and development, and the geography and natural hazards present throughout the community. These factors affect the number and type of resources—both personnel and apparatus—necessary to control or mitigate an emergency. As a result, the community's risk assessment provides relevant information to help public officials and agencies better prepare their communities to respond to emergency events and help them recover faster.

- Population density is a risk factor, and demographics present another unique risk. For example, over 55.4% of the population is 65 years of age, and over 40% of the population speaks languages other than English at home.
- The physical characteristics of the area and the resultant natural hazards are risk factors. For example, CCFD is located near the San Francisco Airport, and the San Francisco Bay, and they are at risk of entirely different hazards like wildland fires and earthquakes.
- Land use and zoning risk can be characterized as low (e.g., agricultural or low-density housing), moderate (e.g., small commercial and office), or high (e.g., large commercial, industrial, wildland exposures, and high-density residential).

Population

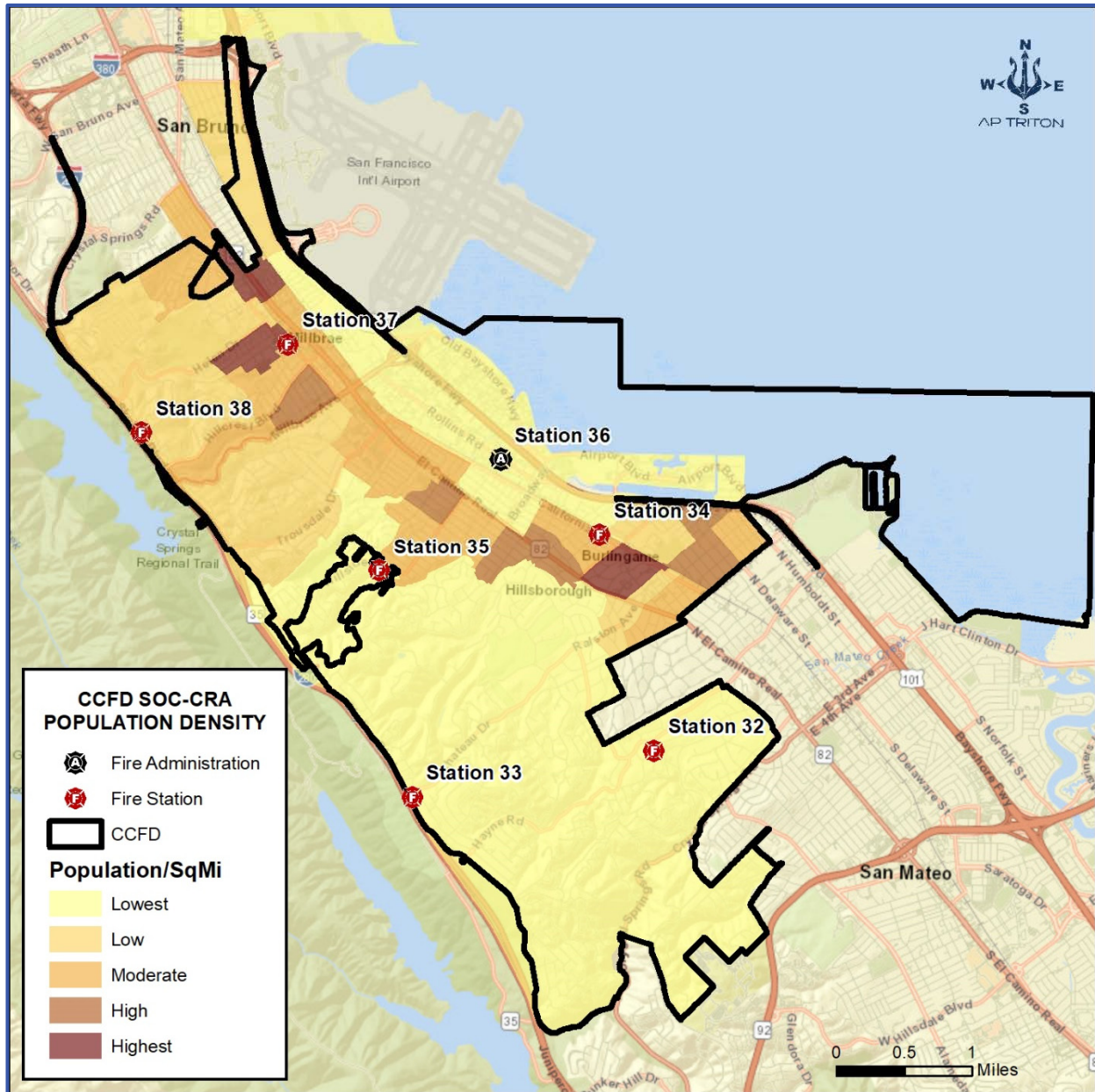
The CCFD jurisdiction has seen an increase in population based on the U.S. Census data⁶ from the America Community Survey, except for the last couple of years. The following figure illustrates the population trends of the community from 2010 through 2020 for the CCFD response area.

Figure 25: CCFD Jurisdiction Population (2010–2020)**Figure 26: Burlingame, Millbrae, & Hillsborough Population (2010–2020)**

Year	Burlingame	Millbrae	Hillsborough	Total
2010	28,838	21,572	10,859	61,269
2011	29,261	21,847	11,001	62,109
2012	29,640	22,123	11,131	62,894
2013	29,928	22,480	11,261	63,669
2014	30,258	22,669	11,379	64,306
2015	30,458	22,803	11,466	64,727
2016	30,439	22,764	11,490	64,693
2017	30,588	22,649	11,464	64,701
2018	30,434	22,530	11,446	64,410
2019	30,889	22,394	11,387	64,670
2020	31,344	22,258	11,328	64,930

The following figure shows the current population density of the Central County Fire Department's service area.

Figure 27: Population Density in the CCFD Jurisdiction



Demographics

At-Risk Populations

Specific populations are at higher risk of fires and other unintentional injuries, and these incidents directly affect service delivery. Several factors place groups of people in higher-risk categories in urban and suburban areas. For example, NFPA reports identified groups with a higher risk of injury or death in a fire as follows:⁷

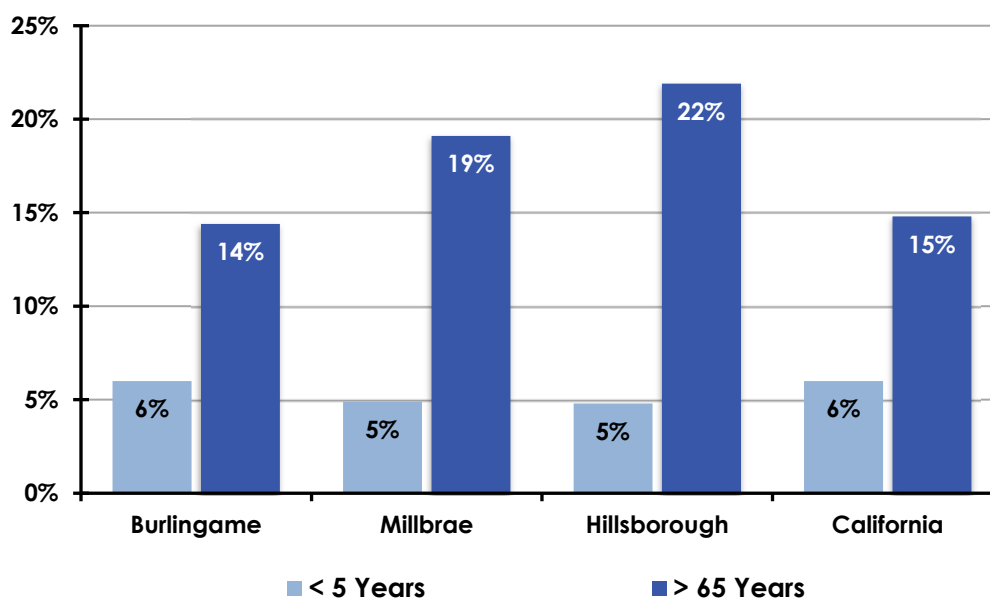
- Children under 5 years of age
- Older adults over 65 years of age
- People with disabilities
- Language barriers
- People in low-income communities

Information from the U.S. Census data⁸ estimates identified several groups that fall into these categories. These groups are more likely to need additional emergency services, specifically EMS, than other population groups.

Age

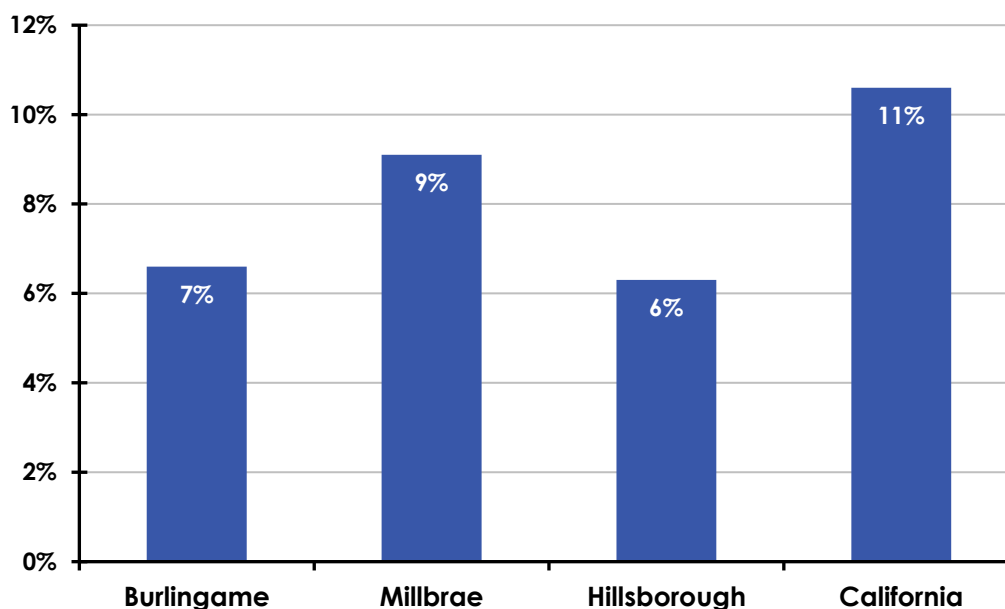
The age of young children and older adults may directly relate to increased medical responses. Young children under five may need additional assistance when evacuating a building during a fire or other event, which poses a higher risk to this age group. In CCFD's response area, percentages of the population under five range from a low of 4.8% in Hillsborough, 4.9% in Millbrae, and 6.0% in Burlingame. This compares to the state at 6.0%

As people age, their mobility decreases, placing them at a higher risk during a fire, and they are more likely to fall and need assistance from CCFD. The percentage of adults older than 65 is 14.4% in Burlingame, 19.1% in Millbrae, and 21.9% in Hillsborough, which means the CCFD response area is higher than California at 14.8%

Figure 28: CCFD Area Percentage of Population by Age Risk

Disabilities

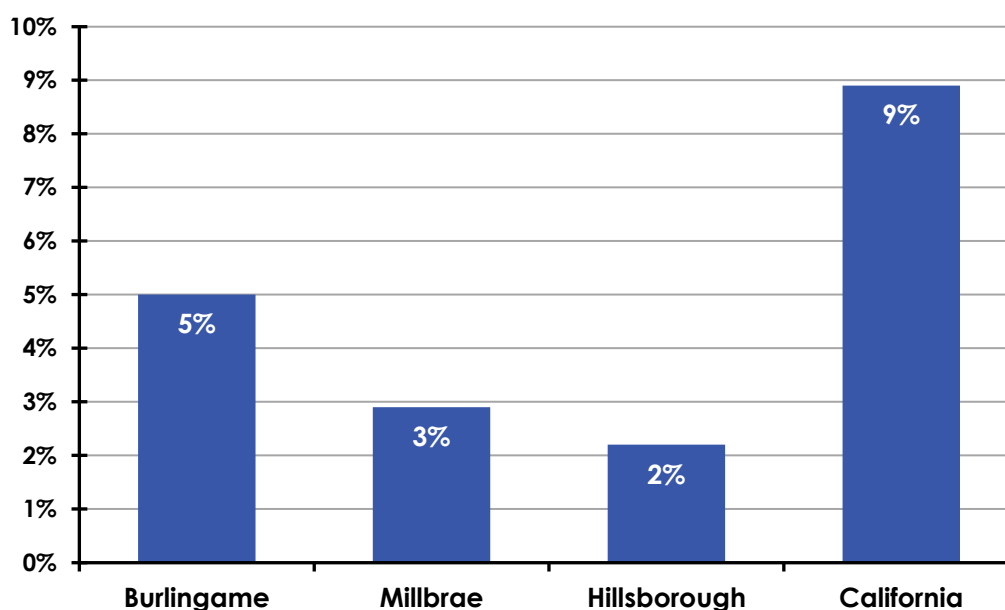
People with disabilities are at a higher risk because they may not be able to self-evacuate a building or their home during a fire. In addition, Emergency Medical Services will increase for people with disabilities as they age. The percentage of people with a disability is 6.3% in Hillsborough, 6.6% in Burlingame, and 9.1% in Millbrae. Each of these is lower than the state average at 10.6%.

Figure 29: CCFD Area Percentage of Population with Disabilities

Persons Without Health Insurance

This group is likely to require additional emergency medical assistance because they did not seek treatment for chronic illnesses. The lack of health insurance affects lower-income populations since they cannot pay or have difficulty paying for medical visits because of the lack of insurance. The percentage of people without health insurance under the age of 65 is the highest in Burlingame at 5.0%, which is lower than in California at 8.9%. Millbrae is 2.9%, and Hillsborough is 2.2%.

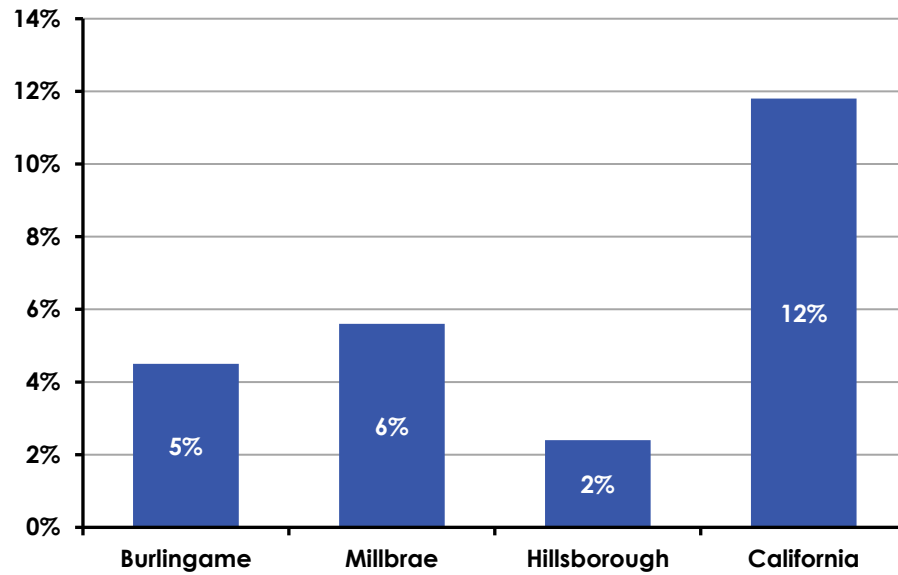
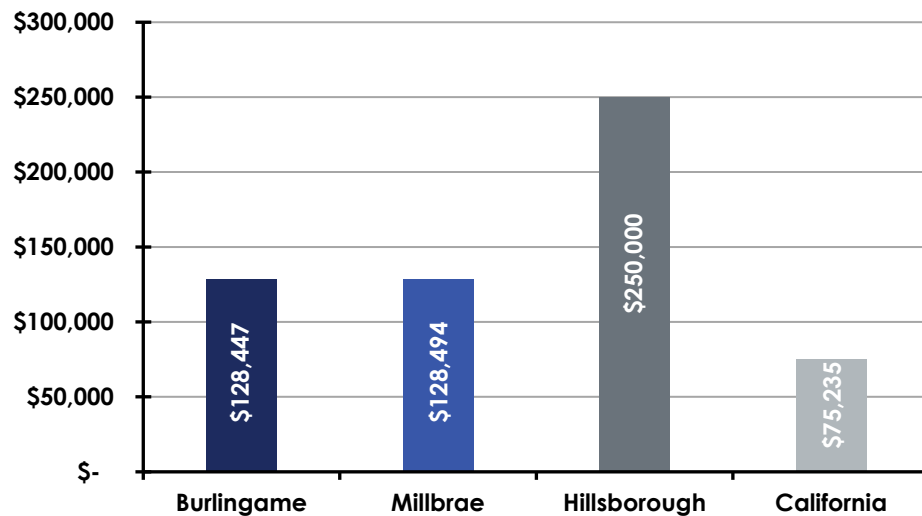
Figure 30: CCFD Percentage of Population Without Health Insurance



Low-Income Persons

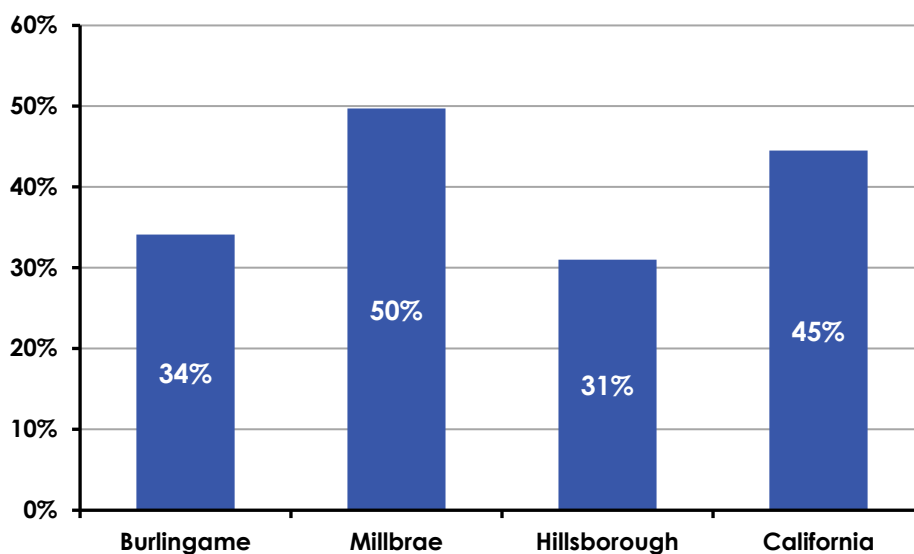
Low incomes increase the risk of fires and medical responses in the community. Without higher incomes, it becomes difficult to live in a properly maintained residence or receive adequate medical care. People living below the poverty level are considered at the highest risks when combined with other factors such as education levels, disabilities, or inability to work. Each of the three cities in the CCFD jurisdiction all have a lower percentage of the population in poverty than California (11.8%). Millbrae is the highest at 5.6%, while Hillsborough is the lowest at 2.4%, and Burlingame is 4.5%.

The U.S. census data shows the median household income is similar in all three cities, with the highest in Hillsborough at \$250,000 plus, Millbrae at \$128,494, and Burlingame at \$128,447, and much higher than the state at \$75,235.

Figure 31: CCFD Percent of Population Below the Poverty Level**Figure 32: CCFD Median Household Income**

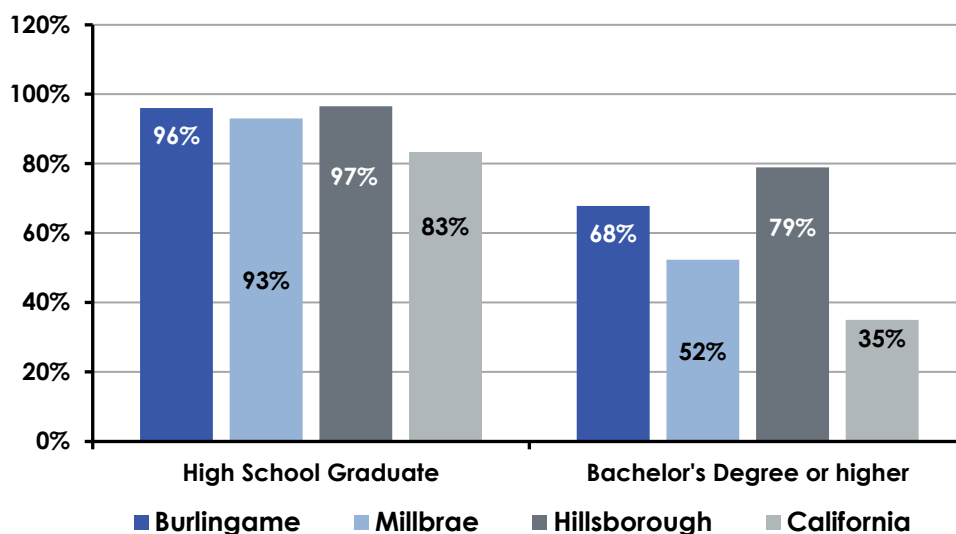
Language Barriers

Language barriers may create problems when the person does not understand English. The percentage of people who speak a language other than English is the highest in Millbrae at 49.7%, while Burlingame is 34.1% and Hillsborough is the lowest at 31.0%, compared to the state at 44.5%.

Figure 33: CCFD Percent of Population Who Speak Language Other Than English

Education Levels

According to the U.S. Bureau of Labor Statistics, the higher the educational levels attained is directly related to higher wages. For example, in 2019, the median weekly earnings with a high school diploma and no college education were \$746, 40% less than someone with at least a bachelor's degree who earned \$1,248.

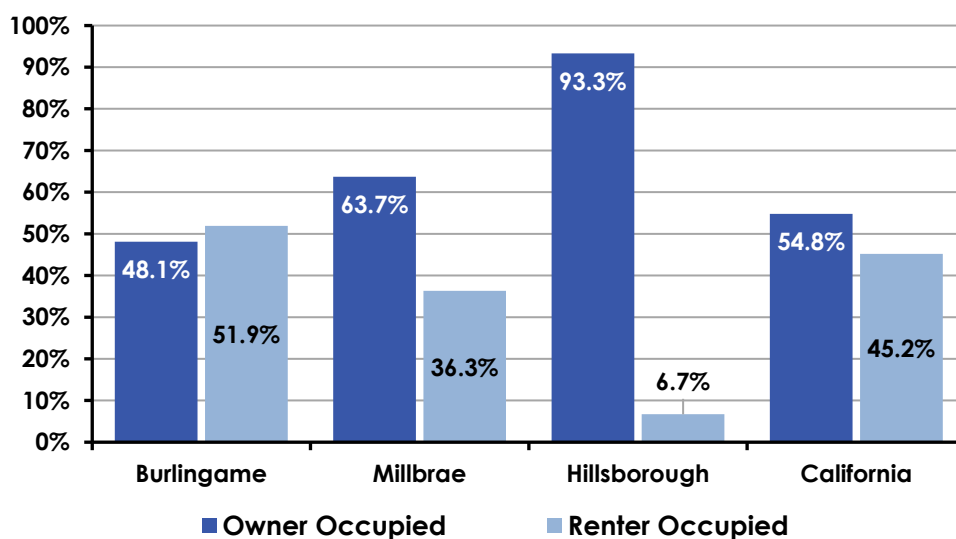
Figure 34: CCFD Educational Levels 25 Years & Older

Housing

Although housing is not considered a significant risk compared to income or age, it can provide information for selected housing types, such as older multifamily apartments built before fire sprinkler requirements or vacant homes. The housing types vary in a community and can provide insight into ownership, the age of the home, and the number of units in the building. In CCFD's response area, there are approximately 25,105 units (23,759 occupied: 14,314 owner-occupied, 9,445 renter-occupied).

Vacant structures can pose a risk for the fire department and community if the building is not secured to prevent entry. If the building is not maintained, the structural integrity can degrade and present problems during a fire. Vandalism may create additional problems for the fire department and law enforcement. In Hillsborough, owner-occupied housing is 93.3% and is the highest in the CCFD response area. Millbrae is 63.7%, and Burlingame is 48.1%, slightly lower than the state at 54.8%.

Figure 35: CCFD Housing Types: Owner- or Renter-Occupied



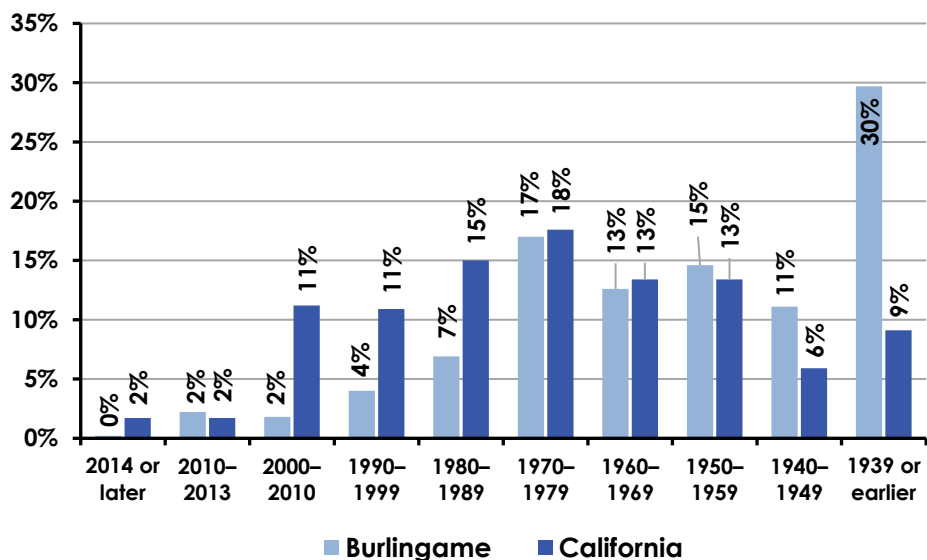
Age of Housing

Understanding the age of housing is essential based on the requirements for smoke alarms in residential occupancies and when building and fire codes were adopted. In addition, older homes eventually need repairs as they age, and lack of repair can lead to more fires, especially from electrical systems.

Burlingame

In Burlingame, 32.1% of the housing was built after 1970, which is lower than the state at 58.2%. The highest percentage of housing was built in the 1930s, at 29.7%.

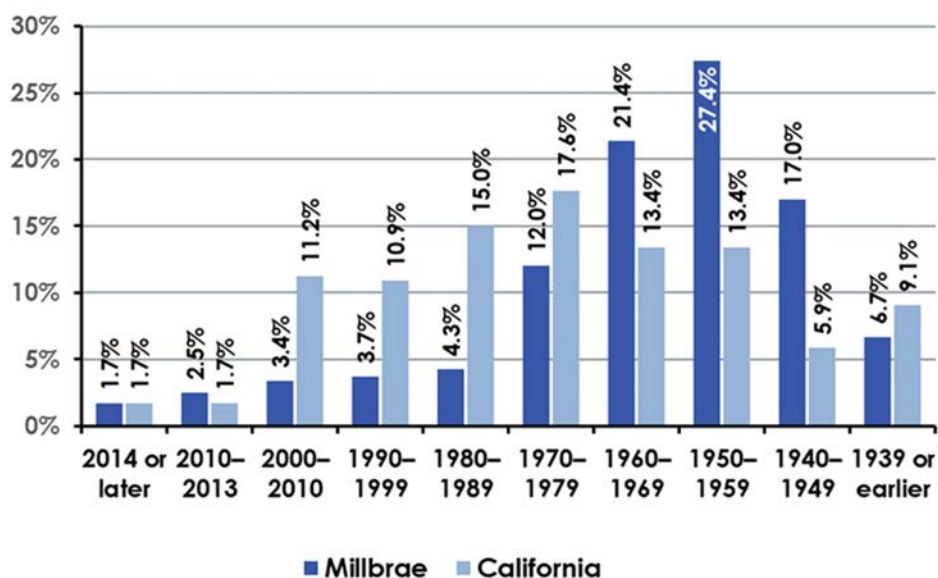
Figure 36: Burlingame Percentage of Homes Built by Year



Millbrae

In Millbrae, 27.6% of the housing was built after 1970, which is lower than the state at 58.2%. The highest percentage of housing was built in the 1950s, at 27.4%.

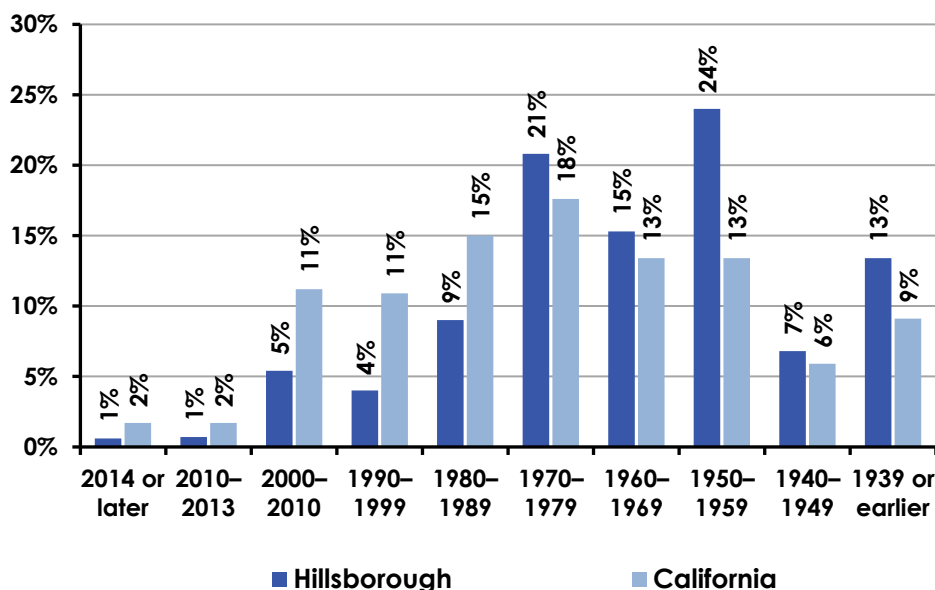
Figure 37: Millbrae Percentage of Homes Built by Year



Hillsborough

In Hillsborough, 35.1% of the housing was built after 1970, which is lower than the state at 58.2%. The highest percentage of housing was built in the 1950s, at 24.0%.

Figure 38: Hillsborough Percentage of Homes Built by Year

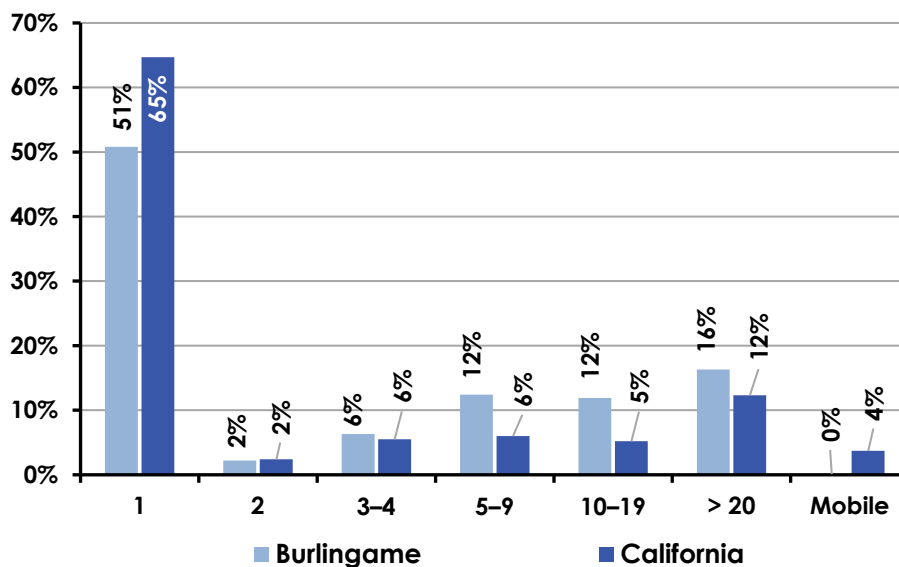


Housing Unit Types

Burlingame

The percentage of people living in one or two-family dwellings in Burlingame is 53.0%, corresponding with 28.2% of people living in large multifamily apartment buildings.

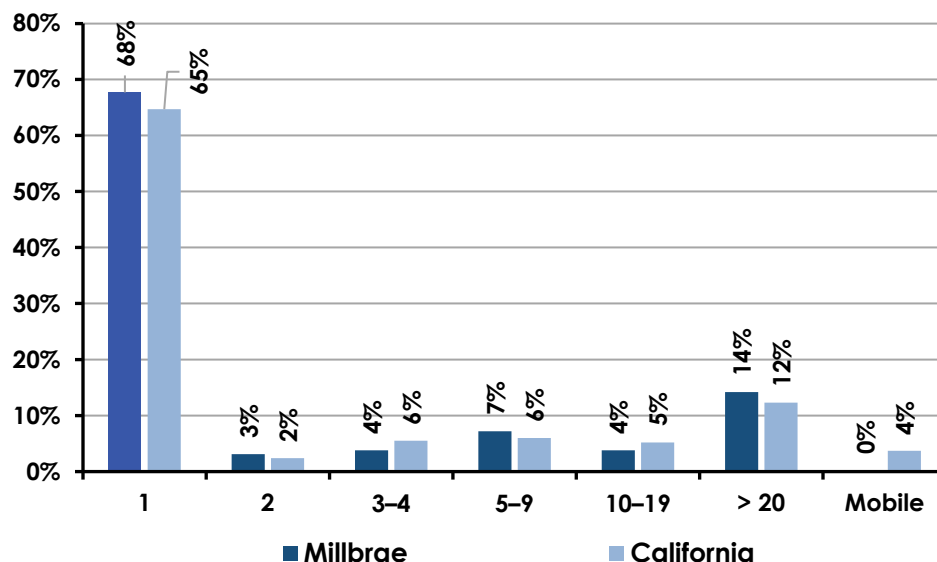
Figure 39: Burlingame Housing Unit Types by Percentages



Millbrae

The percentage of people living in one or two-family dwellings in Millbrae is 70.8%, corresponding with 18.0% of people living in large multifamily apartment buildings with more than ten units per building.

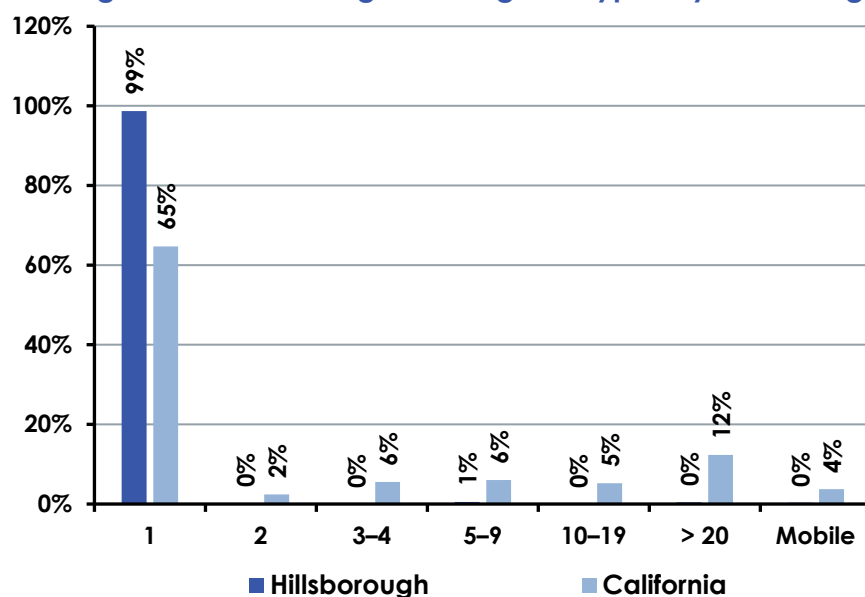
Figure 40: Millbrae Housing Unit Types by Percentage



Hillsborough

The percentage of people living in one or two-family dwellings in Hillsborough is 98.9% compared to 65% in the state of California.

Figure 41: Hillsborough Housing Unit Types by Percentage



Risk Classification

Risk Assessment Methodology

Developing a risk score to determine risks in a community is necessary to provide an organization with a method for creating response protocols for an incident. The Three-Axis Heron model establishes a score by reviewing probability, consequence, and impact factors and assigning a score between 2–10 in each category.⁹ A description of the incident types for each risk is located in Appendix A.

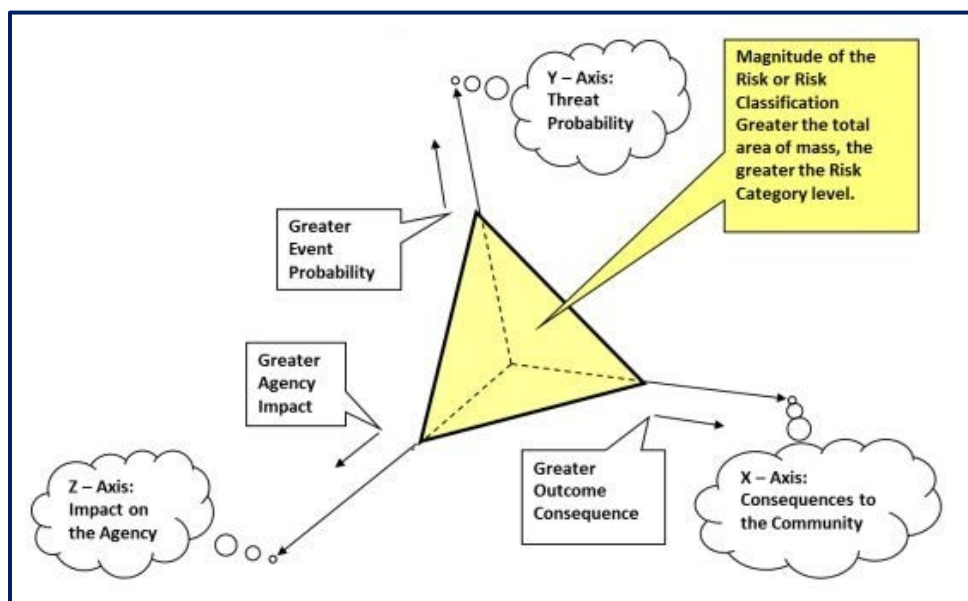
Use of the Three-Axis Heron Formula includes the following equation:

$$\text{Risk} = \sqrt{\frac{(P * C)^2}{2} + \frac{(C * I)^2}{2} + \frac{(I * P)^2}{2}}$$

The risk is graphically illustrated through a three-axis model as follows:

- **P** = Probability (Y-Axis)
- **C** = Consequences (X-Axis)
- **I** = Impact (Z-Axis)

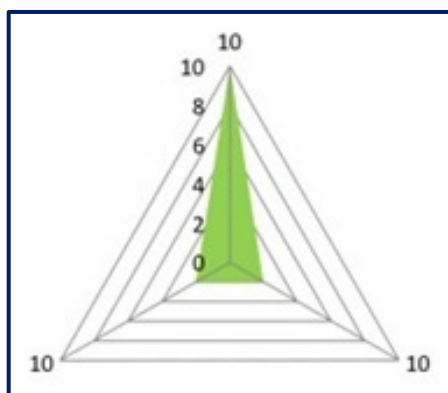
Figure 42: Three-Axis Risk Classification Process



When developing the score, it should be recognized that each of the three scoring components is based on incident data from CCFD. Although a low risk may have a higher consequence or impact than a moderate or high risk, the probability is a significant factor in the score. In many instances, the number of low-risk incidents is high, while the consequence and impact on the department are low.

For example, a BLS low priority EMS response can be used. The likelihood (probability) of this occurring would be high (occurs multiple times every day) by a factor of 10. The consequence would be minor (affects one person) by a factor of 2. The impact on the Department's ability to respond would be minor (one crew) by a factor of 2. Using the calculator, here is what it looks like: Heron's formula value is 20.2. This equates to a "Low Risk" incident, as shown in the next figure.

Figure 43: Heron's Formula Example



Probability = 10 Consequence = 2 Impact on Department = 2

The three-axis scoring methodology uses the square root of each risk element to determine the "surface area." The Magnitude of the Risk or Risk Classification is based on the greater the total surface area of mass, the greater the surface area the Risk Category level. The scores derived from this method indicate the level of risk associated with certain types of incident responses. The scores are sorted into three different risk classifications: Low, Moderate, and High risk. The figure below demonstrates the score range for each type.

Figure 44: Three-Axis Scoring Range**Probability**

Probability is the likelihood of an incident occurring in the community over time. This axis reflects the probability of a particular type of incident occurring, which contributes to the level of risk. Many factors are considered, such as time of day, location, hazard present, the season of the year, building construction and maintenance, demographic factors, and more. It can range from a rare event to one that occurs often.

Figure 45: Probability or Likelihood of Occurrence

Score	Category	Probability or Likelihood
2	Minor	Unlikely: < 0.02% of call volume. Expected to occur rarely
4	Low	Possible: 0.02%–0.07% of call volume. Expected to occur rarely
6	Moderate	Probable: 0.07–0.3% of call volume. Expected to occur monthly
8	High	Likely: 0.3%–2% of call volume. May occur multiple times per week
10	Extreme	Frequent: >2% of call volume. May occur once or more daily

Consequence

The consequence of an incident can vary from minor casualties to severe impacts that may destroy historical or major facilities in the community and create a large loss of employment or life.

Figure 46: Consequences to the Community

Score	Category	Consequence to the Community
2	Minor	1–2 people affected (injuries/deaths). < \$10,000 loss.
4	Low	< 5 people affected (injuries/deaths). < \$500,000 loss
6	Moderate	5–50 people affected (injuries/deaths). \$500,000–\$1,000,000 loss
8	High	51–100 people affected (injuries/deaths). \$1,000,000–\$5,000,000 loss
10	Extreme	>100 people affected (injuries/deaths). >\$5,000,000 loss

Impact

The third factor in determining the risk is the fire department's impact and the critical tasking needed to control or mitigate an incident. This includes the number of emergency responders and apparatus available internally or from external agencies. It measures the department's ability to respond to a given risk or incident while providing service to the remaining parts of the service area.

Figure 47: Impact on Operational Forces

Score	Category	Impact on Operational Forces
2	Minor	≥ 90% Remaining Apparatus/Crews
4	Low	≥ 75% Remaining Apparatus/Crews
6	Moderate	≥ 50% Remaining Apparatus/Crews
8	High	≥ 25% Remaining Apparatus/Crews
10	Extreme	< 25% Remaining Apparatus/Crews

Fire Response

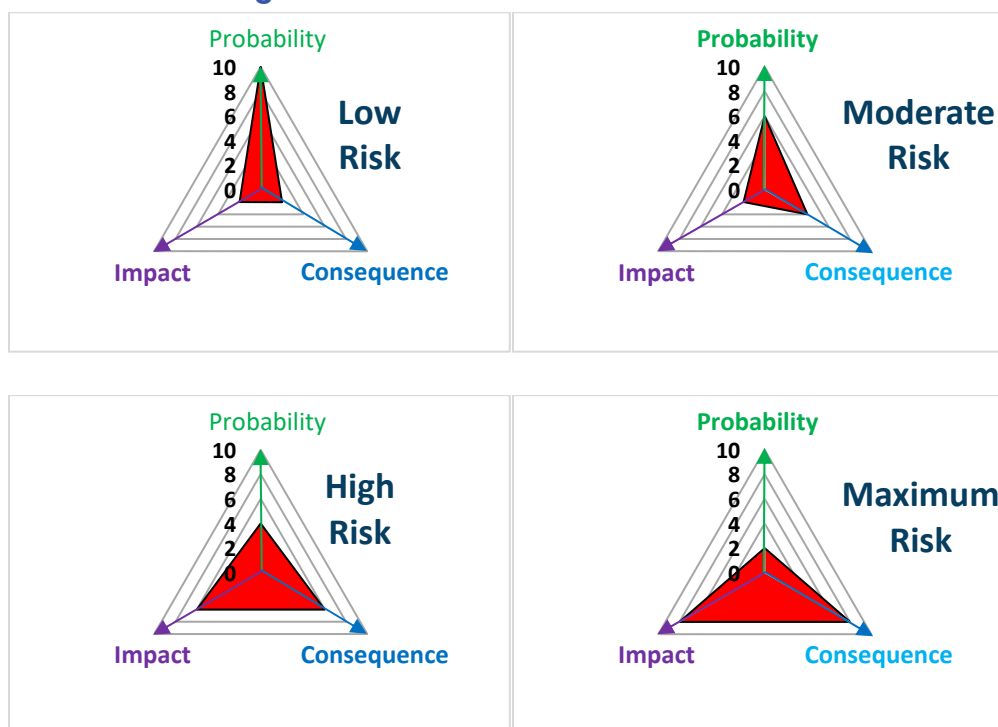
CCFD is the primary provider of prevention and mitigation of fire-related incidents in the jurisdiction. These range from low-risk incidents such as a vehicle fire to a maximum risk for a fire involving a school. Fire risks for a vehicle fire are considered low compared to a maximum risk for a school that houses students. This scoring is applied to four different categories of fire incidents in CCFD's jurisdiction to provide staffing needs to meet critical tasks on the fire ground. The following figures provide the fire response risk assessment scoring and the three-axis risk classifications.

Figure 48: Fire Response Risk Assessment

Description	Low			Moderate			High			Maximum		
	P	C	I	P	C	I	P	C	I	P	C	I
Risk Score	10	2	2	6	4	2	4	6	6	2	8	8
Score Assigned	20.2			19.8			35			48		

The following figures provide the fire risk assessment scoring and the three-axis risk classifications.

Figure 49: Fire 3-Axis Risk Classifications



Emergency Medical Services

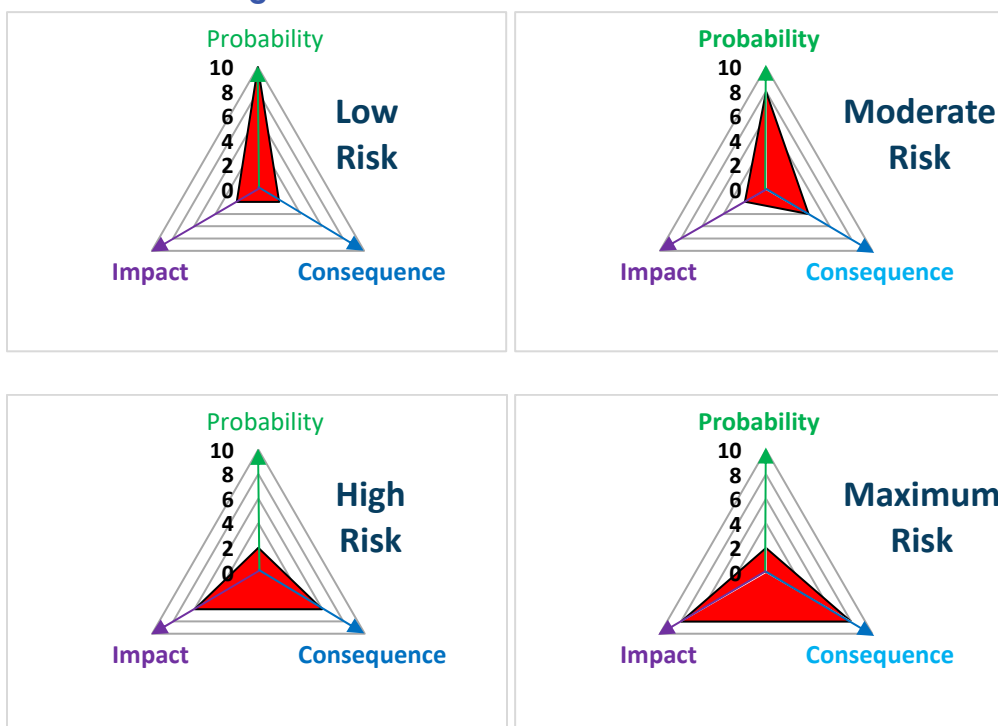
CCFD provides advanced life support emergency medical care in their jurisdiction but does not offer transport services. Low-risk incidents range from a medical assist to a maximum for an active shooter. The following figures provide the EMS risk within the CCFD jurisdiction and the three-axis risk classifications.

Figure 50: EMS Response Risk Assessment

Description	Low			Moderate			High			Maximum		
	P	C	I	P	C	I	P	C	I	P	C	I
Risk Score	10	2	2	8	4	2	2	6	6	2	8	8
Score Assigned	20.2			25.9			28.1			48		

The following figures provide the EMS risk assessment scoring and the three-axis risk classifications.

Figure 51: EMS 3-Axis Risk Classifications



Technical Rescue

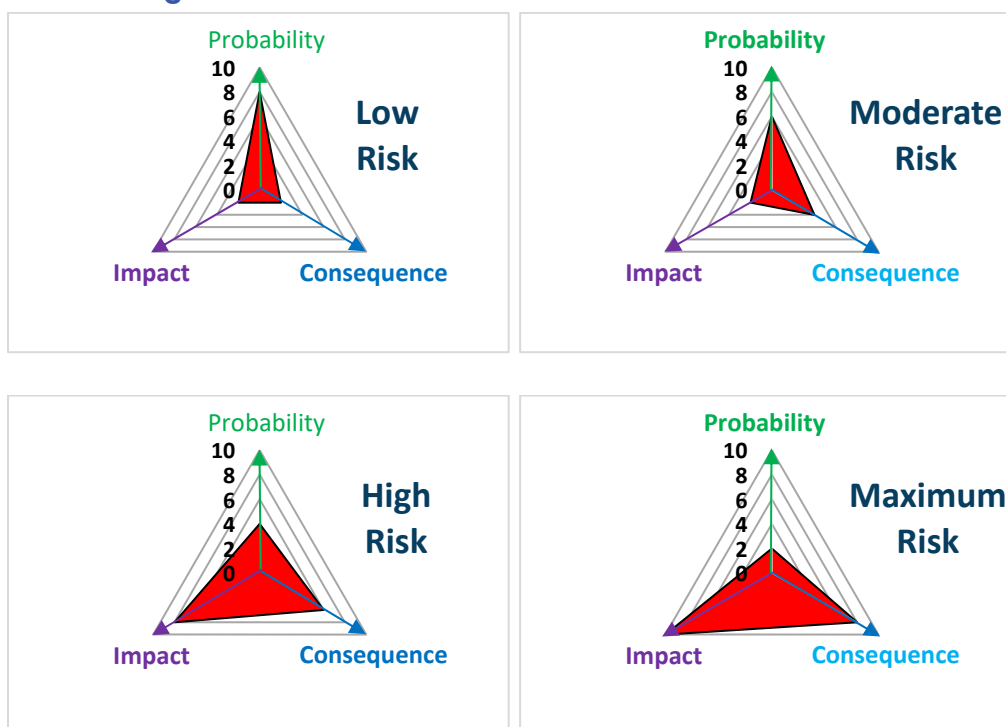
Rescue services can vary from a low-risk incident, such as accessing a locked vehicle with a child inside, to a confined space incident (maximum) that potentially requires many personnel to mitigate the incident. The following figures provide the technical rescue response risk assessment scoring and the three-axis risk classifications within the CCFD jurisdiction.

Figure 52: Technical Rescue Response Risk Assessment

Description	Low			Moderate			High			Maximum		
	P	C	I	P	C	I	P	C	I	P	C	I
Risk Score	8	2	2	6	4	2	4	6	8	2	8	10
Score Assigned	16.3			19.8			44.2			59.4		

The following figures provide the technical rescue risk assessment scoring and the three-axis risk classifications.

Figure 53: Technical Rescue 3-Axis Risk Classification



Hazardous Materials

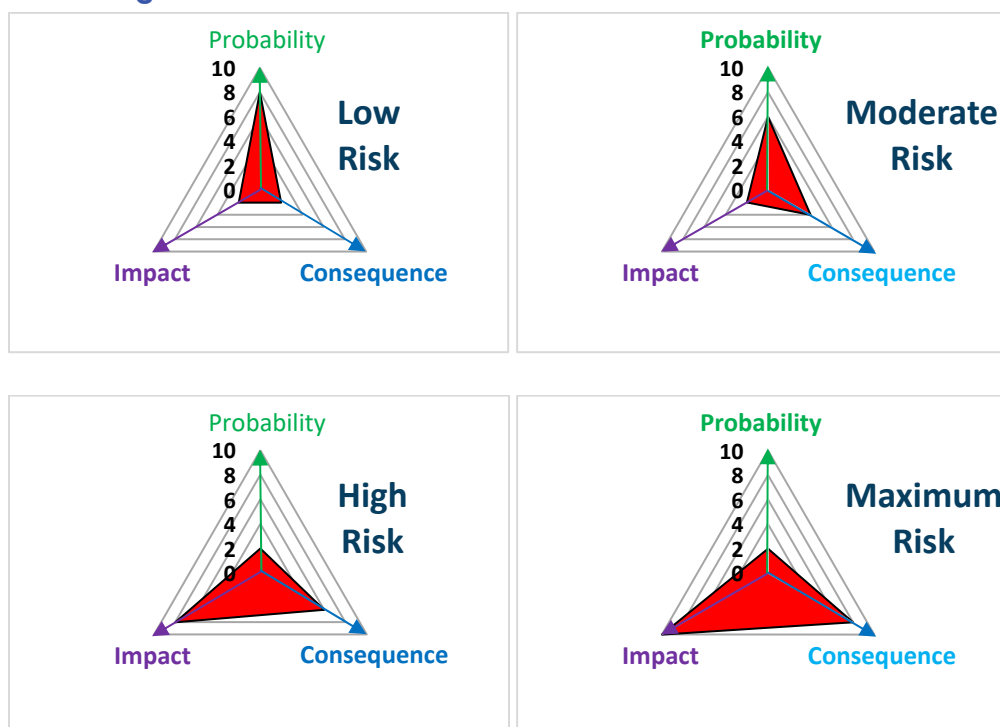
Hazardous materials responses can vary from low-risk odor investigations to the maximum risk for a fuel tanker fire in higher populations. Most of these incidents can be managed by CCFD, but higher risks may need assistance from outside resources. The following figures provide the risk score and classifications assigned to each type of hazardous materials risk within the CCFD jurisdiction.

Figure 54: Hazardous Materials Response Risk Assessment

Description	Low			Moderate			High			Maximum		
	P	C	I	P	C	I	P	C	I	P	C	I
Risk Score	8	2	2	6	4	2	2	6	8	2	8	10
Score Assigned	16.3			19.8			36.8			59.4		

The following figures provide the hazardous materials risk assessment scoring and the three-axis risk classifications.

Figure 55: Hazardous Materials 3-Axis Risk Classifications



Wildland Fires

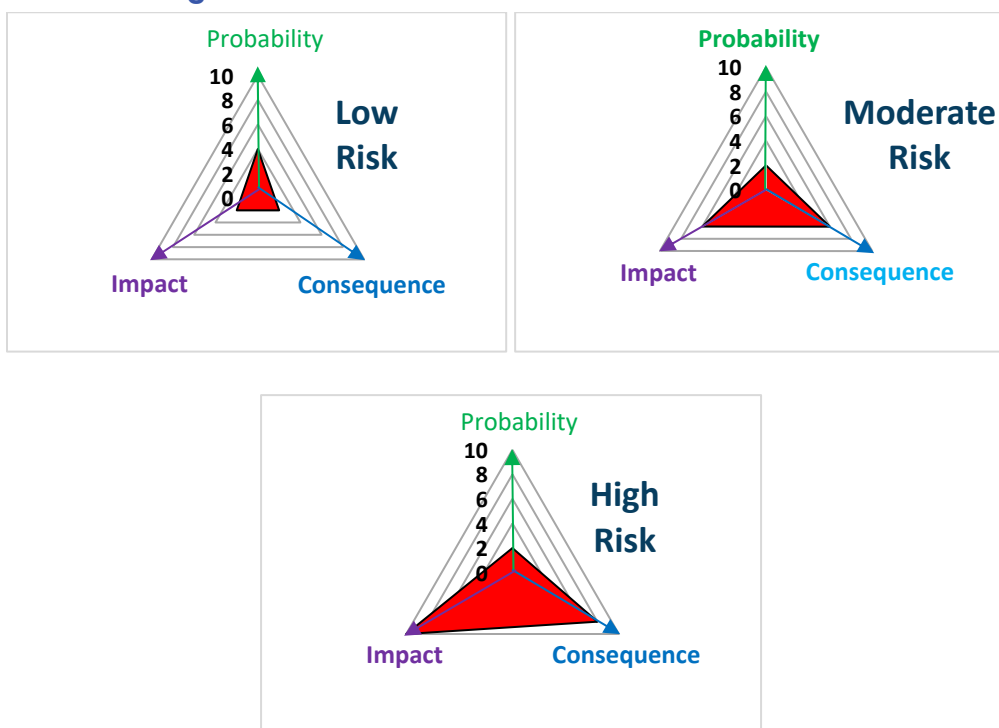
The types of wildland fire risk vary from small grass fires to large forest fires requiring many internal and external resources. The following figures provide the risk score and classifications assigned to each type of wildland fire risk within the CCFD jurisdiction.

Figure 56: Wildland Fires Response Risk Assessment

Description	Low			Moderate			Maximum		
	P	C	I	P	C	I	P	C	I
Risk Score	4	2	2	2	6	6	2	8	10
Score Assigned	8.5			28.1			59.4		

The following figures provide the fire risk assessment scoring and the three-axis risk classifications.

Figure 57: Wildland Fires 3-Axis Risk Classification



Physical Hazards

A physical hazard is a natural or human-caused event that has the potential to cause impacts on people, buildings, infrastructure, agriculture, environmental assets, and communities. Every community faces the risk of being struck by a physical hazard of one type, including natural disasters such as floods, hurricanes, ice storms, wildfires, earthquakes, or technological disasters such as a chemical spill or explosion. When disaster strikes, it can wreak havoc on a community—destroying homes and businesses and leaving people homeless and out of work. Nationwide, property damage from disasters has been increasing steadily, partly because of larger disaster events and partly because more and more people are living in hazard-prone areas.

Without knowledge of the past, we cannot predict what might happen in the future. Historical catalogs are used to understand the frequency of hazard events. They help us develop synthetic event sets that represent, for example, up to 10,000 years of events. This allows us to understand what might be possible in the future and to prepare for events that we have not seen in our lifetime. For rarer hazards such as earthquakes, seismological investigations play a critical role in identifying and characterizing individual pre-historic events that make up the active tectonics record.

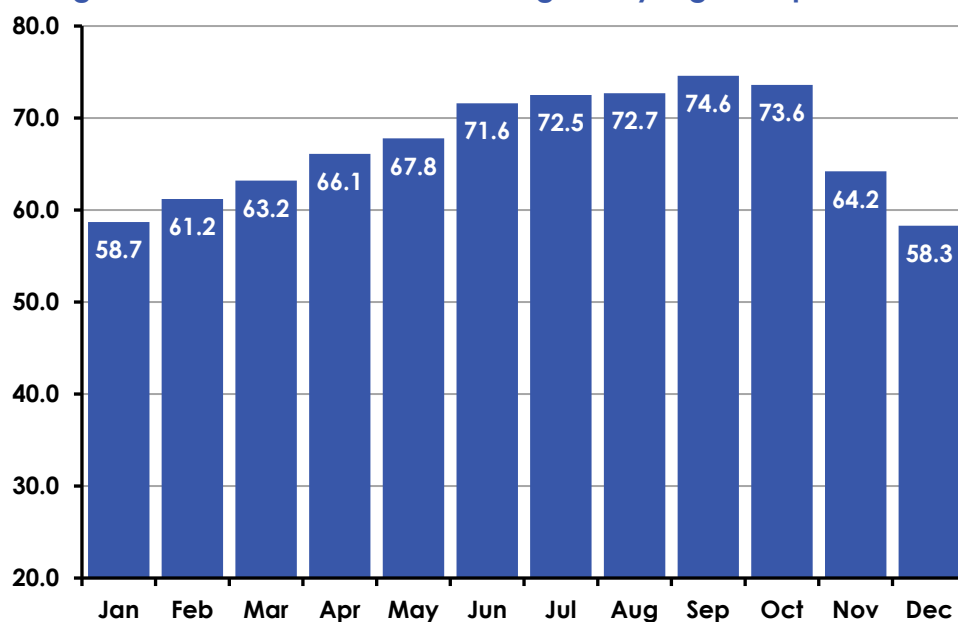
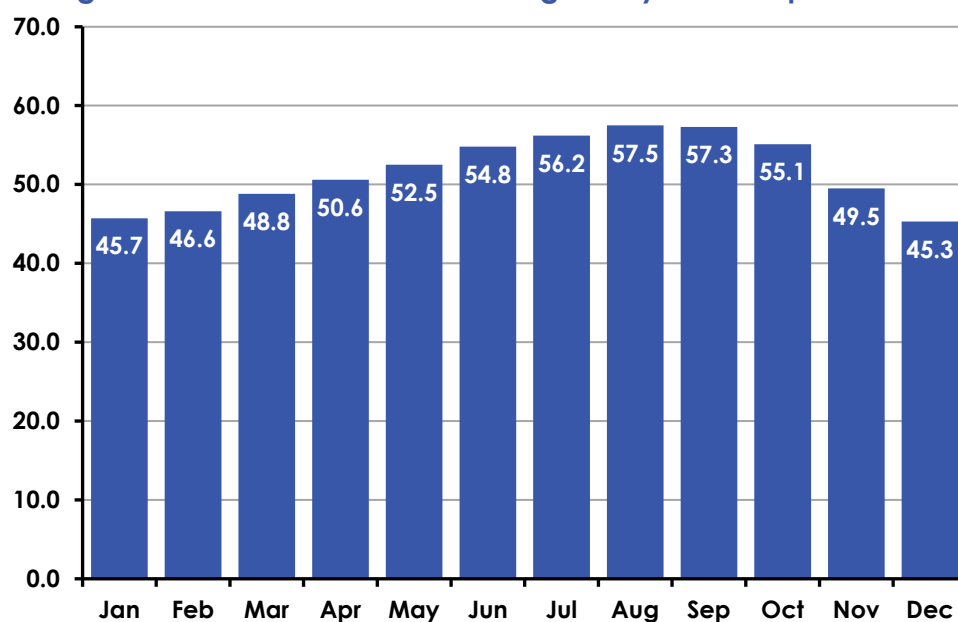
Reducing risk can only be achieved by decreasing the contribution from one or more of these three components. Examples of risk reduction or managing the risk in these components are:

- Hazard: building a flood levee to alter the course of flood events.
- Exposure: land-use planning decisions to ensure that new development has a reduced exposure to hazard events.
- Vulnerability: retrofitting older buildings built to lower building standards or before building codes were enforced.

Weather Conditions

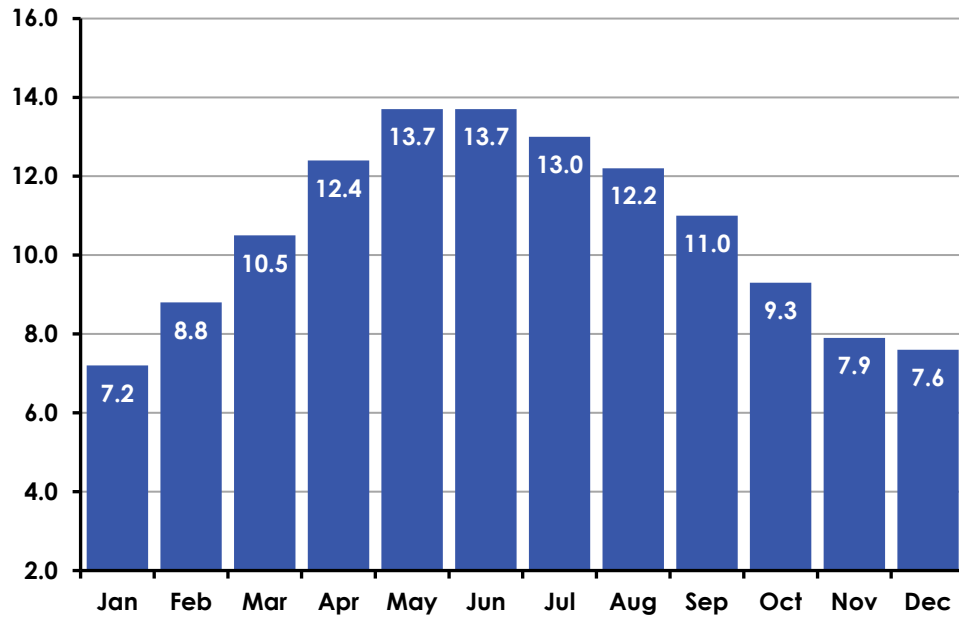
Temperature

The weather conditions in an area can impact not only the fire department but the entire community. When temperatures are high, they affect firefighters during extended incident operations and require rehabilitation to prevent heat exhaustion. For example, although the average temperature in the CCFD jurisdiction is 67.1° F, the temperature can increase from July through October when the average maximum temperature reaches 73° F.

Figure 58: CCFD Jurisdiction Average Daily High Temperatures**Figure 59: CCFD Jurisdiction Average Daily Low Temperatures**

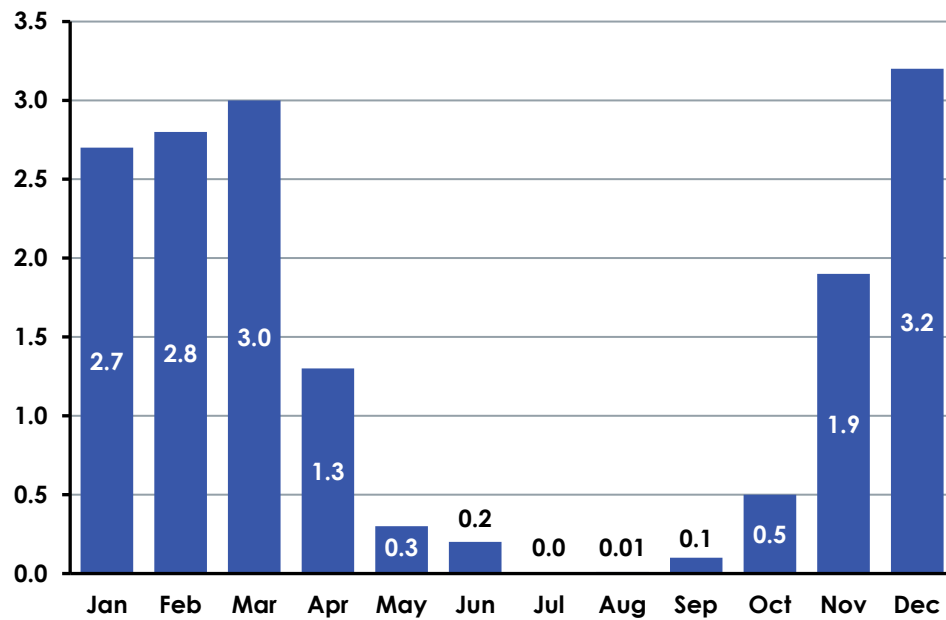
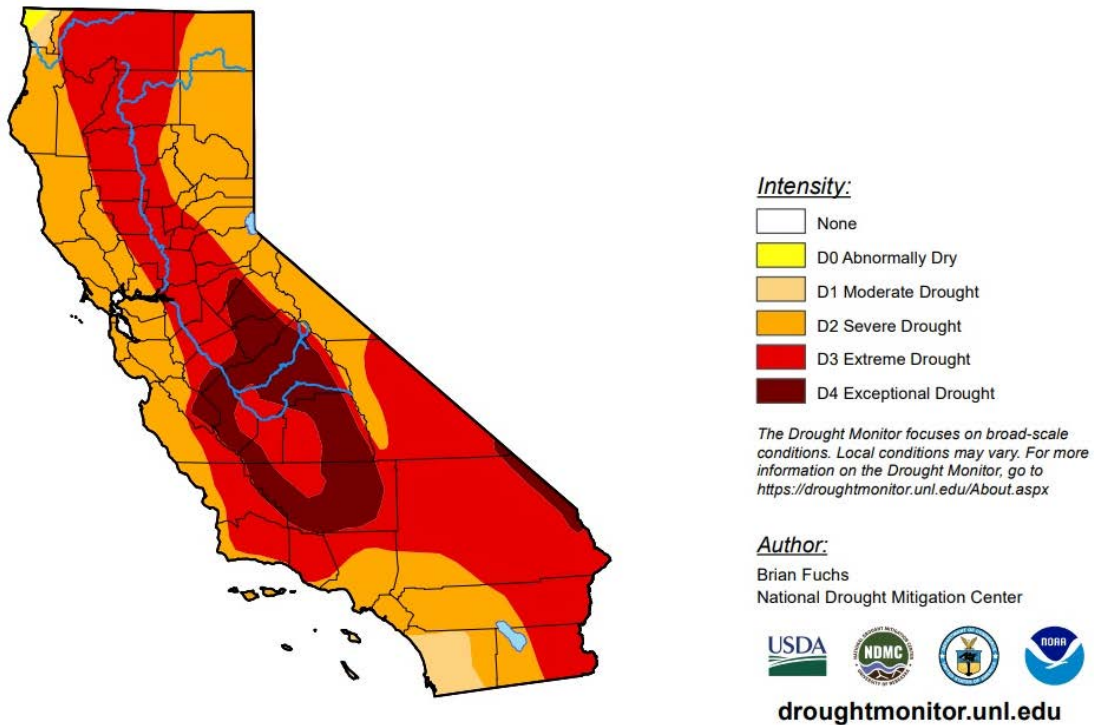
Winds

The direction and speed of winds influence how CCFD plans daily operations, specifically during wildland fire danger. Based on San Francisco International Airport data, the period of May through July has the highest average wind speed, coming predominately from the north or northwest.

Figure 60: CCFD Jurisdiction Average Wind Speeds

Drought

The effects of a drought directly impact the growth of crops and the ability to provide water to replace surface water supplies. In addition, droughts may last for an extended period and create secondary problems during peak wildfire conditions as the vegetation becomes dry and highly combustible. This creates conditions in the community that can cause local resources to become strained during an event.

Figure 61: CCFD Jurisdiction Average Monthly Precipitation**Figure 62: Drought Conditions (August 2022)**

Environmental Hazards

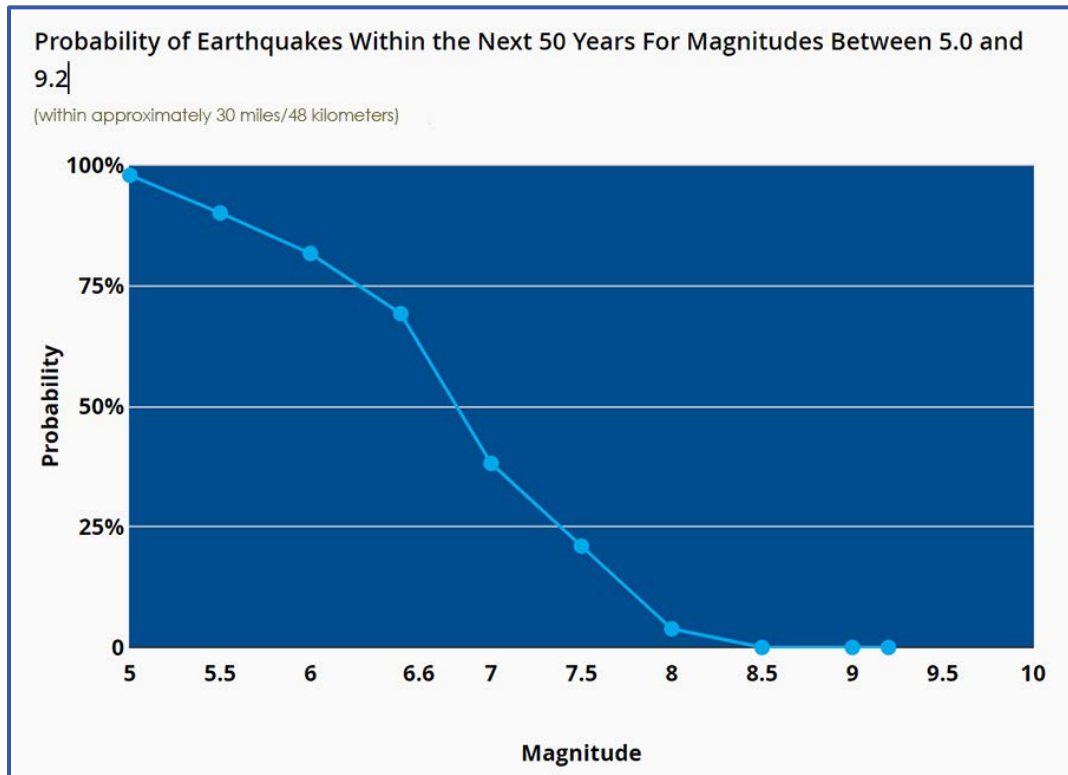
San Mateo County natural disasters (18) are near the U.S. average (15). Major Disasters (Presidential) Declared are 11. In the history of the City of Burlingame, the City of Millbrae, and the Town of Hillsborough, there have been two emergencies declared, and the causes of natural disasters have been: Floods: 11, Storms: 6, Mudslides: 5, Winter Storms: 5, Landslides: 4, Fires: 2, Drought: 1, Earthquake: 1, Freeze: 1.

Earthquakes

The Central County Fire Department is in a high seismic area, and the United States Geological Survey (USGS) has identified several faults in the San Mateo County area, but none are considered active. However, the San Andreas and Serra faults are considered potentially active. Therefore, CCFD's response area has a very high earthquake risk, totaling 3,825 earthquakes since 1931.

Data suggests a 97.71% chance of a major earthquake within 30 miles of CCFD's jurisdiction within the next 50 years. Since the early 1900s, there have been 27 earthquakes 4.5 or greater within 50 miles of CCFD's jurisdiction.¹⁰ These include the great San Francisco 7.8 earthquake in 1906, the Orinda 4.8 earthquake in 1977, the Loma Prieta 7.1 earthquake in 1989, and the West Napa 5.1 earthquake in 2001.

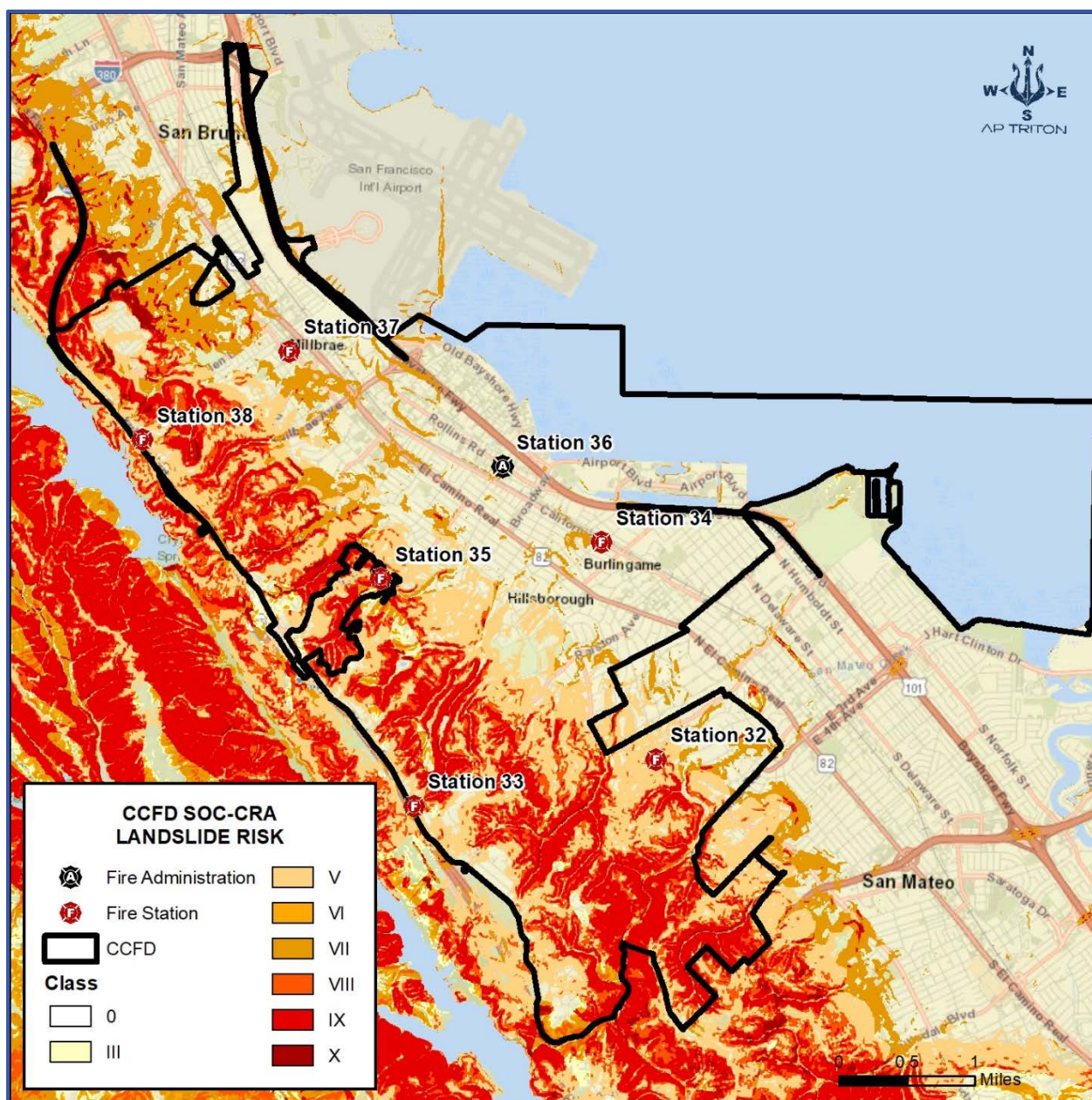
An area of concern is the possibility of soil liquefaction. There are locations along the coast and the bay where high severity groundwater and liquefaction are present and may present problems during earthquakes

Figure 63: CCFD Earthquake Probability

Landslides

The risk of a landslide in CCFD's jurisdiction varies and overall, is considered moderate. There are areas within the three cities that have a high potential for landslides, especially along hills or canyons. Landslides commonly occur because of slope failure due to erosion from surface water runoff, mudflows when the water has saturated the ground, or debris flows after a wildland fire. These locations are along the western portion of the cities near the hills and canyons.

Figure 64: Landslide Risk in the CCFD Jurisdiction



Wildland Fires

Wildland fires can create special hazards in a community without proper planning. Reducing the chance of a fire or substantial damage from a wildland fire in the urban interface requires appropriate prevention and mitigation efforts.

Implementing proactive mitigation efforts can reduce the risk of a fire damaging or destroying a building in an urban interface. This defensible space surrounding the property focuses on vegetated or landscaped areas and how to harden the home or building from fire. Removing fuels such as dead trees, plants, grasses, or weeds is a first step for the property owner. The National Fire Protection Association (NFPA) provides information on developing defensible spaces by breaking the property into three zones.¹¹

There are areas within CCFD where the urban interface is a higher risk. The 2018 Santa Cruz County San Mateo County Community Wildfire Protection Plan places CCFD in the “Bayside” planning area east of Hwy 280. CCFD has created an online map identifying locations as wildland urban interface risks. This map allows residents and business owners to determine if their property is at a higher risk.

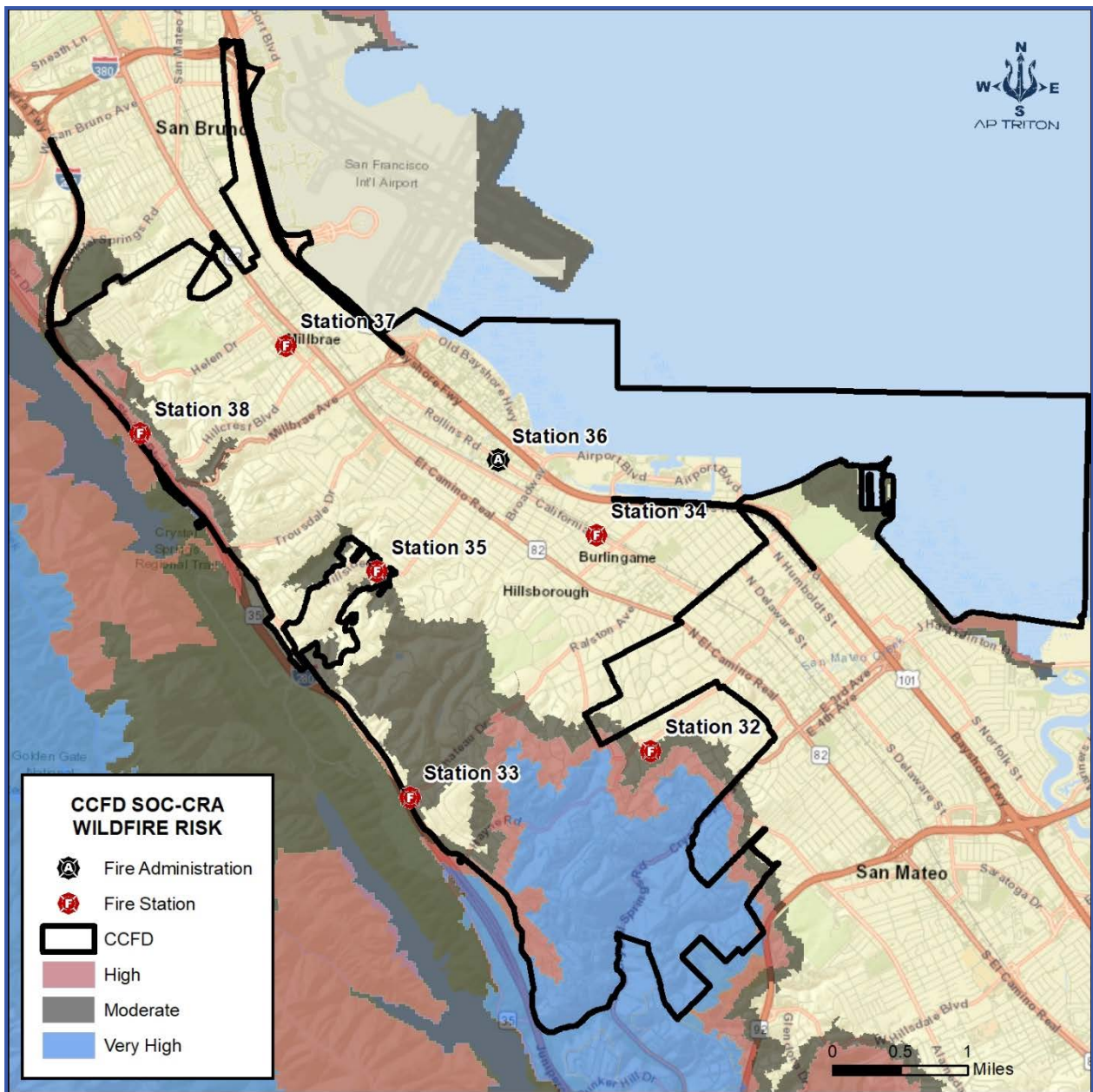
Much of the Town of Hillsborough is in a high fire severity area. Much like many areas in San Mateo County, the threat of wildland fire in CCFD's jurisdiction is a significant risk. The greatest wildfire threat to the CCFD comes from fires spreading out of the Town of Hillsborough, or undeveloped San Mateo County lands west of CCFD's response area and the coast range to the west. The Town of Hillsborough is the largest area of concern as specific parts have been assessed as very high fire severity zone (VHFSZ) by the State of California.

The Town of Hillsborough has, on average, a greater risk than 52% of communities in California compared to Millbrae at 4% and Burlingame at 6%. Populated areas in the Town of Hillsborough are predominantly exposed to wildfire from direct sources, such as adjacent flammable vegetation. The community is substantially at risk of damage or loss from wildfires due to its proximity to the wildland vegetation and direct and indirect exposure to the Crystal Springs Watershed. Data indicates the Town of Hillsborough is listed as 43% directly exposed and 18% indirectly exposed to wildfire, the City of Millbrae has an indirect exposure of 36%, and the City of Burlingame is the lowest at 5%. These areas produce unique risks because of limited egress and access due to reduced fire road widths and challenges for vehicles attempting to pass during an emergency. In addition, a delayed response may occur when emergency vehicles need access during an incident because other vehicles use the same roads.

CCFD has implemented programs to mitigate hazardous WUI issues to reduce damages during an event. In addition, CCFD presented to the Town Hillsborough City Council in June 2019, providing an overview of the fire migration plan and the adoption of the International Wildland Fire Urban-Interface Code 2018 edition.

CCFD oversees the Wildland Fire Hazard Mitigation Program. The ordinance established that the Town will work with CCFD to review and update the Town's regulations and strategy regarding defensible space, fire-resistive vegetation, wildland mitigation, and fire protection within Hillsborough, to ensure adequate protection. Since the Town is mainly residential and developed, the program focuses on reducing the risk of fire to and from individual properties.

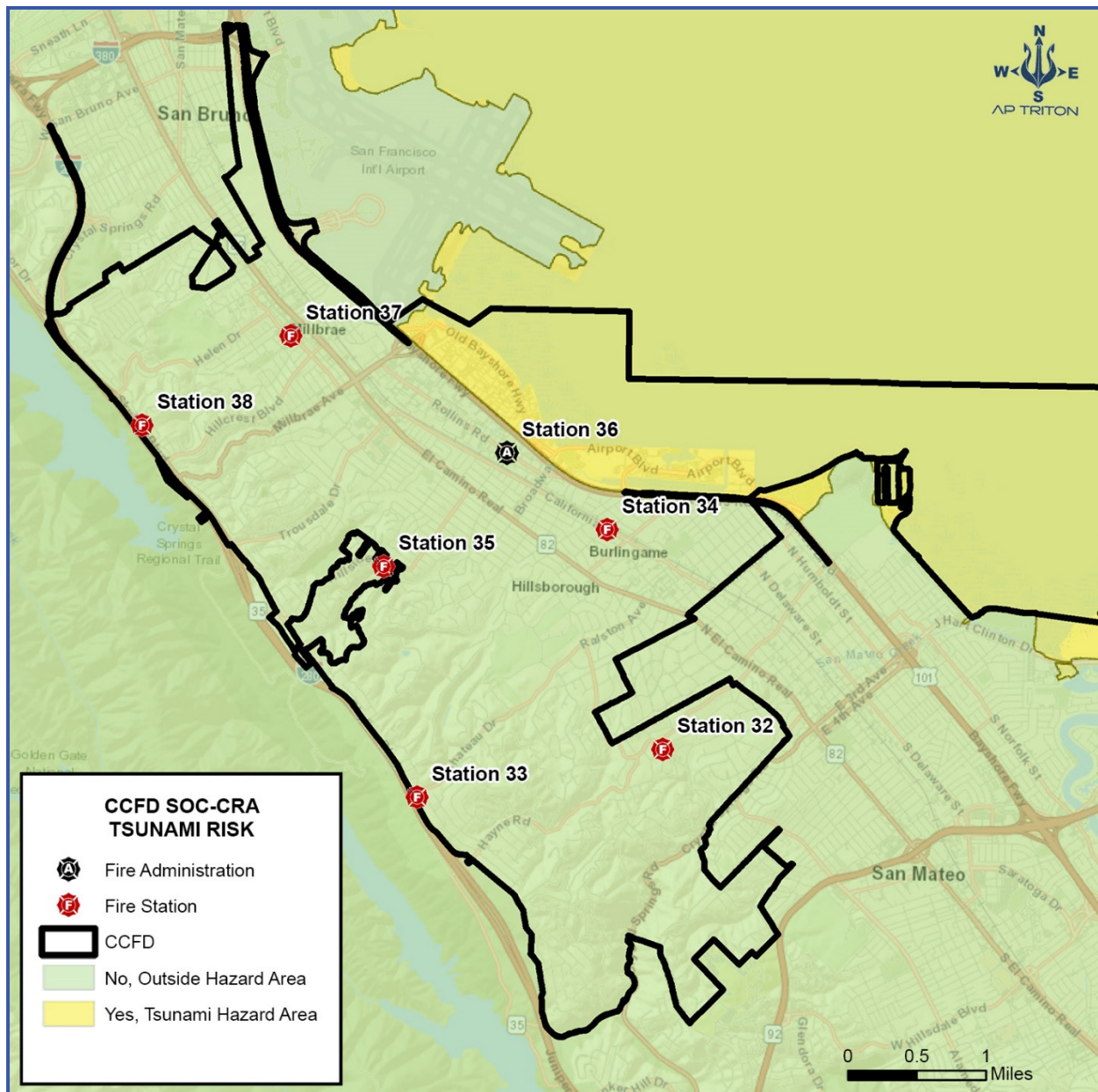
Figure 65: CCFD Jurisdiction Wildfire Risk Map



Tsunami

The probability of a tsunami occurring in CCFD's jurisdiction is low. Still, there are areas adjacent to San Francisco Bay that could receive flooding during an event. Inundation maps from California Geological Survey display the most significant area east of Highway 101 to the San Francisco Bay, and this area includes commercial properties.

Figure 66: CCFD Jurisdiction Tsunami Risk Map

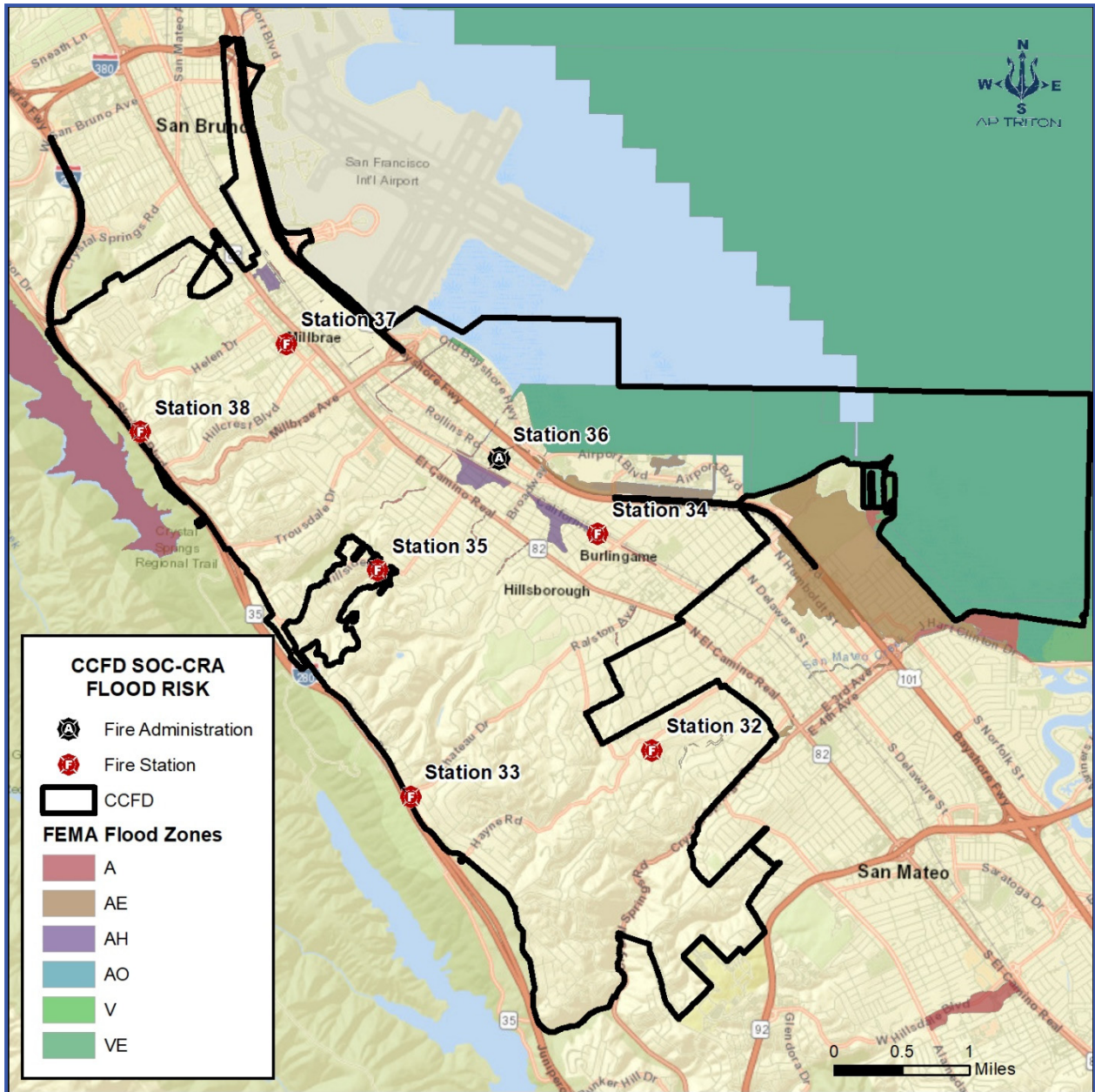


Floods

CCFD's jurisdiction is at risk of flooding along the creeks flowing into San Francisco Bay. Flooding typically occurs during the highest rainfall, the seasonable variations can cause localized flooding along the creek channels during high-intensity rainfall events and high tides. However, the events are usually brief since there is a short distance from San Francisco Bay to the Pacific Ocean. Additional problems could occur with flash flooding in urban areas, but they are usually short-lived.

According to FEMA's website, there are "AE" regulatory floodways in CCFD. The AE designation is considered "*areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods.*" and is further defined as a 26% chance of a flood occurring in 30 years. An area classified as an "A" zone is exposed to a 1% chance of a flood event but does not have a "*...detailed hydraulic analysis.*" Zone "AH" is subject to a 1% chance of shallow flooding where ponding may occur with average depths of 1'–3' and base flood elevations resulting from a detailed hydraulic analysis. Zone "VE" areas are along the immediate coast and are "*... subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action.*"

Figure 67: CCFD Jurisdiction Flood Risk Map



Technological (Human-Caused) Hazards

Events that occur without warning or that are unknown and suddenly appear are considered technological hazards. Examples include industrial accidents or hazardous chemical releases. Each community should create contingency plans for the specific risks in its jurisdiction. This may consist of permitting, fire and life safety inspections periodically, and pre-incident planning. These activities are designed to reduce risks and provide on-site visits for fire department personnel.

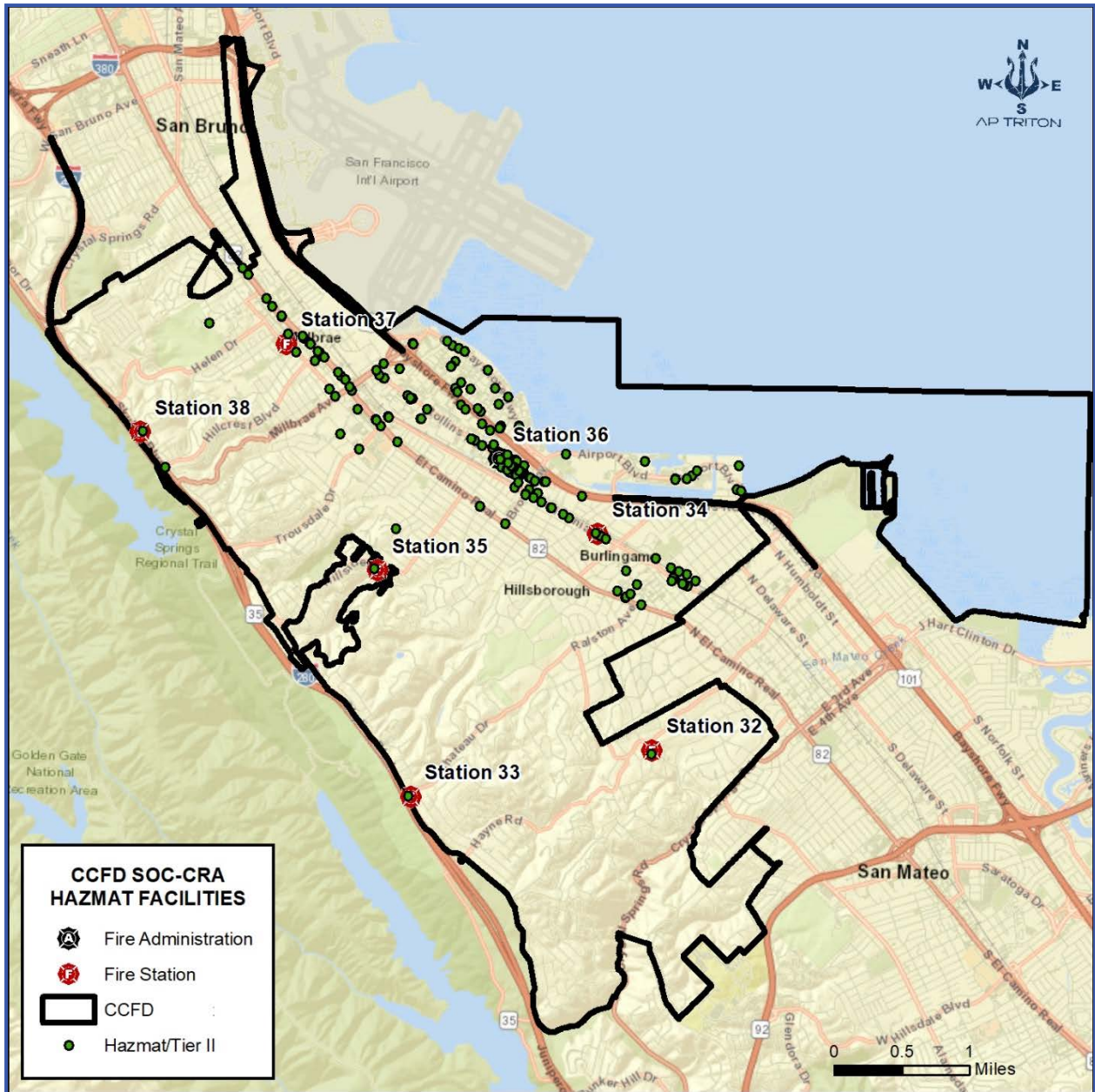
If a building or facility has been identified that stores or produces hazardous materials, it may require special personal protective clothing and equipment to control or mitigate the event. Locations with hazardous materials on-site during the year exceeding the limits established by the Environmental Protection Agency are required to file Tier II reports. These reports are provided to local jurisdictions, local emergency planning committees, and the State's Emergency Response Commission as required by the Emergency Planning and Community Right-to-Know Act of 1986, also known as SARA Title III. These thresholds require submission:

- Ten thousand pounds for hazardous chemicals
- Lesser than 500 pounds or the threshold planning quantity for extremely hazardous chemicals
- California requires additional reporting quantities through a five-tier system that authorizes the treatment and storage of hazardous waste.

Hazardous Materials

There are numerous facilities in CCFD's jurisdiction that store hazardous materials, but there are no locations that produce or store any extremely hazardous substances. U.S. Hwy 101, CA Hwy 82 and 35, and Interstate 280 are the primary transportation corridors passing through the service area. This presents the possibility of a hazardous materials incident involving motor vehicles and trucks.

CCFD provides the initial basic hazardous materials incident response at the Operations response level. However, if there is a need for an in-depth response, it is accomplished through a regional hazmat response team from the San Mateo Consolidated Fire Department. This response includes an initial hazmat unit with a Battalion Chief and the Department of Emergency Management.

Figure 68: CCFD Jurisdiction Hazardous Material Facilities

Land Use

Land use for a community is designed to classify properties within a geographical area normally under governmental control. The concept of land use regulation is to provide attractive social and environmental outcomes to assist in the management of development. Zoning areas may vary within one portion of the service area with a mixture of low, moderate, and high-risk properties.

- Low Risk: Areas zoned for agricultural purposes, open spaces, low-density residential, and other low-intensity use.
- Moderate Risk: Areas zoned for medium-density single-family properties, small commercial and office uses, low-intensity retail sales, and similarly sized business activities.
- High Risk: High-intensity business districts, mixed-use areas, high-density residential, industrial, storage facilities, and large mercantile centers.

The vision of the Cities of Burlingame, Millbrae, and Hillsborough land use goal is a General Plan that promotes balanced development and outlines strategies for conserving established neighborhoods. In addition, policies for expanding the City's affordable housing stock and promoting mixed-use development are included.

The City of Millbrae General Plan seeks to conserve existing natural resources, and policies are designated to minimize hazards. The majority of Millbrae is characterized as a suburban residential community. Residential neighborhoods in the city are fully developed, primarily with well-kept single-family homes on 5,000-square-foot lots. Larger lot developments occur in the hillside areas, and multifamily units are primarily near El Camino Real and Richmond Drive, with a few complexes at the southern city limits. Commercial property is mostly concentrated along El Camino Real, Broadway, and Millbrae Avenue. In addition, there is a small industrial area along Adrian and Rollins Roads. The current General Plan for Millbrae was completed in 1998. The city is currently updating the plan for the vision of the city through 2040 and has currently completed phase one of this project.

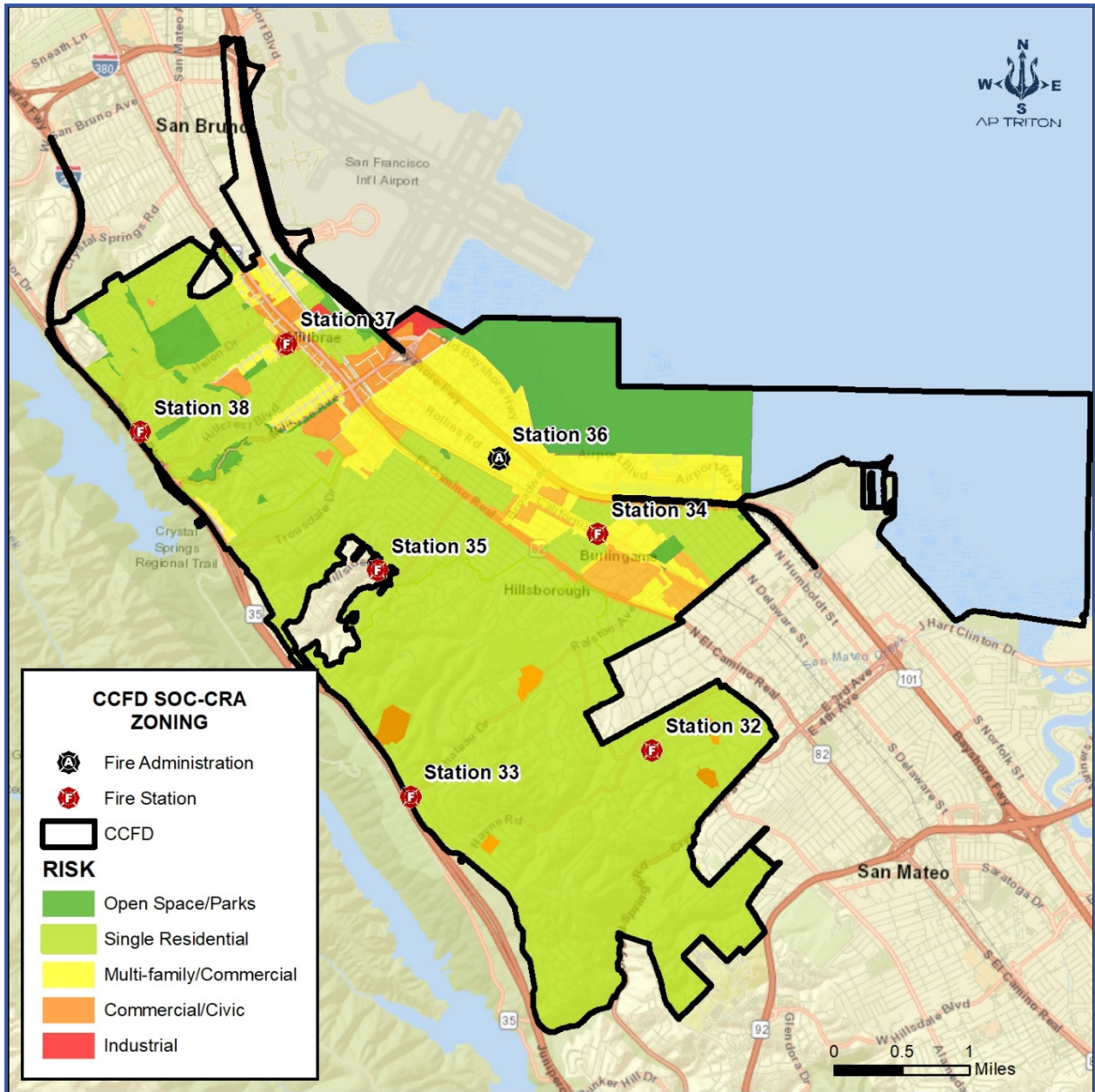
For the City of Burlingame, the General Plan articulates the shared community vision for preservation and change in the community. This General Plan is a long-range policy document that guides the design and development of new projects, conservation of resources, economic development, mobility and infrastructure improvements, expansion of public services, and community amenities. As the blueprint for the future, this General Plan was recently adopted and directs how Burlingame will look and how residents, business owners, and visitors will experience the city today and in the future. It is intended to provide direction through the year 2040.

The new General Plan focuses on seven different principles and the need to grow in a manner that supports inclusivity and access while protecting community assets. CCFD and the city need to be aware of the future development and changes occurring in the Rollins and Bayside areas with limited access. It recognizes the importance of a diverse economic base to provide sustainable, reliable revenue to the city and access to economic opportunities for residents. The health and safety of the city's residents and its natural environment are fundamental to the many goals of the General Plan. Residents value Burlingame for the opportunities it offers, including access to outstanding education for all ages.

The Town of Hillsborough has a long history extending for almost 100 years. The community's desire to preserve the original character continues today. The Town is unique in that it consists mainly of low-density residential development, with a minimum lot size of ½ acre, with no commercial or industrial uses. Over the years, the residents have shown interest in maintaining a lower-density residential community and preserving the low-density residential character by preserving large lots, open spaces, and mature trees. The only non-residential uses within the Town are public facilities, parks, open space land, private and public schools, the Burlingame Country Club, and the Hillsborough Racquet Club.

While limited land is available for additional housing and the possibility of slight change on the non-residential parcels, Hillsborough is mainly built out. Therefore, an important issue related to community character is how new development fits into the existing fabric of the community and how established neighborhoods should evolve over time.

Figure 69: CCFD Jurisdiction Land Use/Zoning Map



Physical Assets Protected

Structural Risks

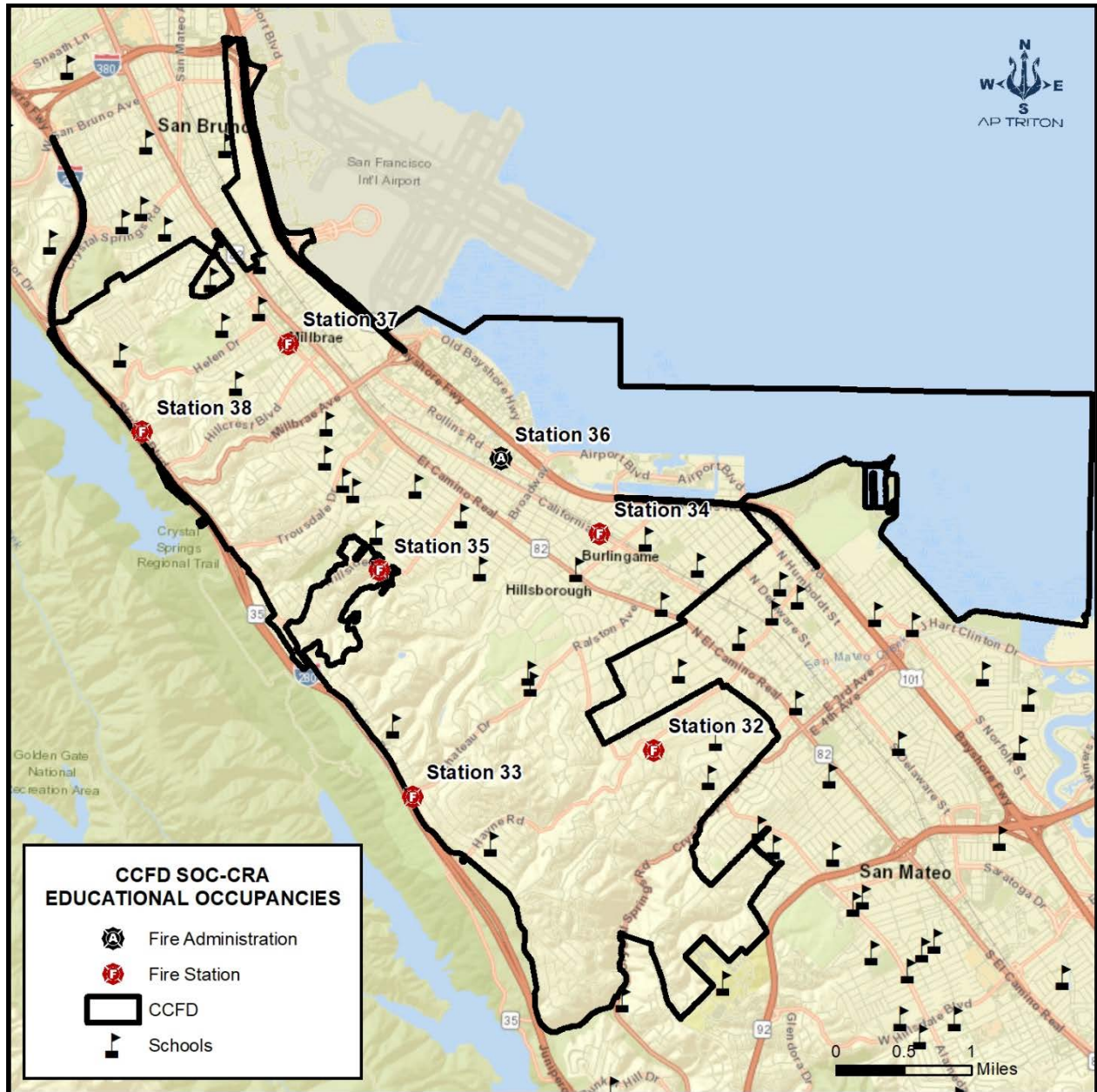
Fires occurring in buildings can present responding personnel with special or unique problems. Many different types of occupancies may exist in a response area, and CCFD should have a comprehensive pre-incident planning process to develop strategies and tactics during a fire or other emergency.

Schools

The Hillsborough City School District serves approximately 1,300 students in three elementary and one middle school, and there are five private schools. The Burlingame School District serves approximately 3,500 as a medium school district with seven schools, six elementary and one middle school, Burlingame High School, and 24 private schools. The Millbrae School District serves approximately 2,200 as a small school district with five schools, four elementary and one middle school. There are eight private schools, and Mills High School serves 1,200 students. Therefore, there are 56 schools within CCFD's response area, and these locations should be considered target hazards because of the many students and teachers in a single place.

Childcare Facilities

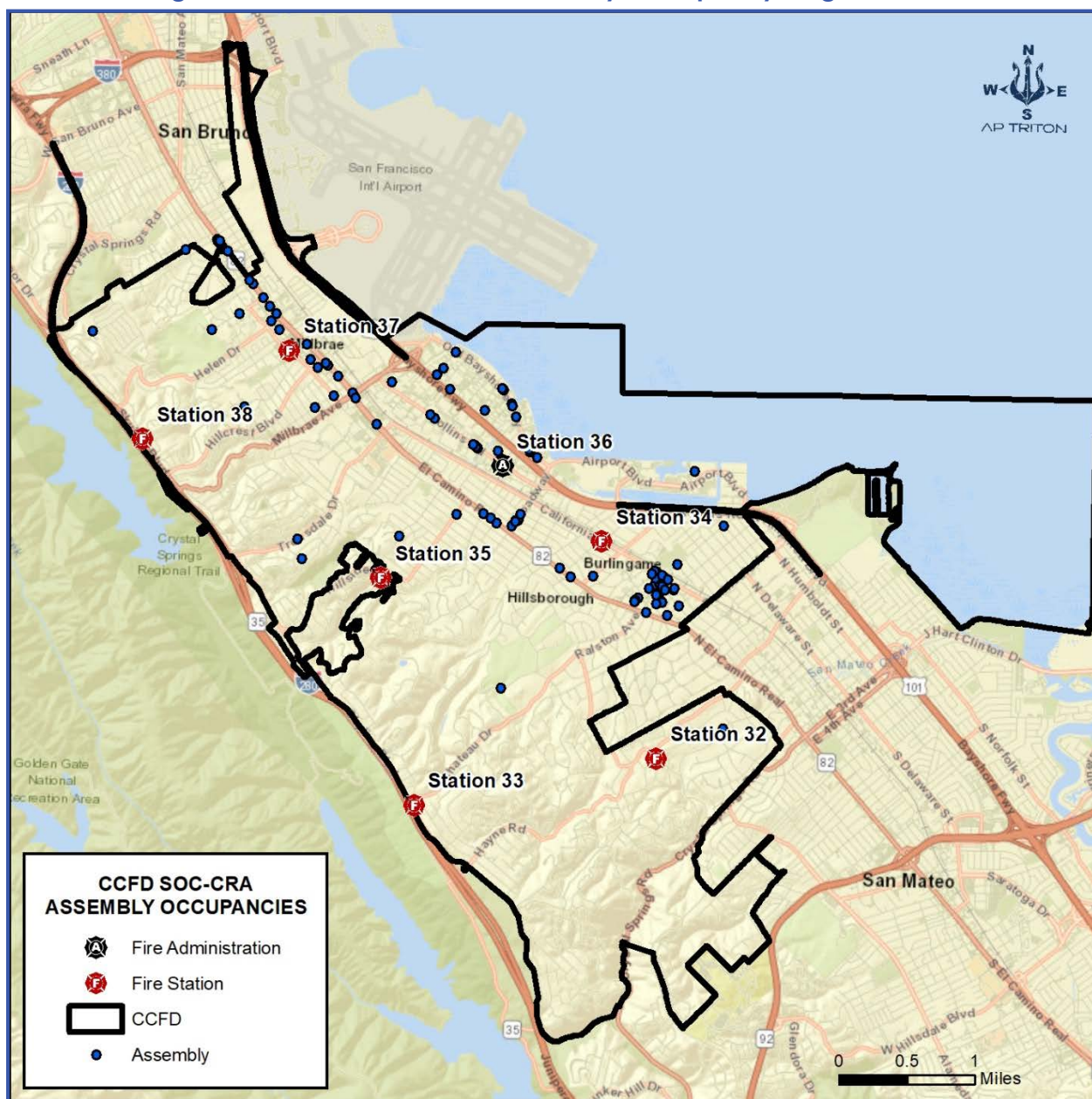
Childcare facilities pose a special concern because of the children's young age and, in some cases, the inability to evacuate during an emergency. These facilities require childcare workers to assist small children or physically carry infants when an evacuation is necessary.

Figure 70: CCFD Jurisdiction Educational Occupancy Target Hazard

Assembly

Assembly occupancies create unique risks because of the large number of people in a single location. These occupancies include restaurants, theaters, nightclubs, sporting events, or large outside festivals, all locations where people gather. These occupancies may require many emergency response personnel during an event such as a fire or active shooter. These locations should have pre-incident plans completed for use by personnel during a response.

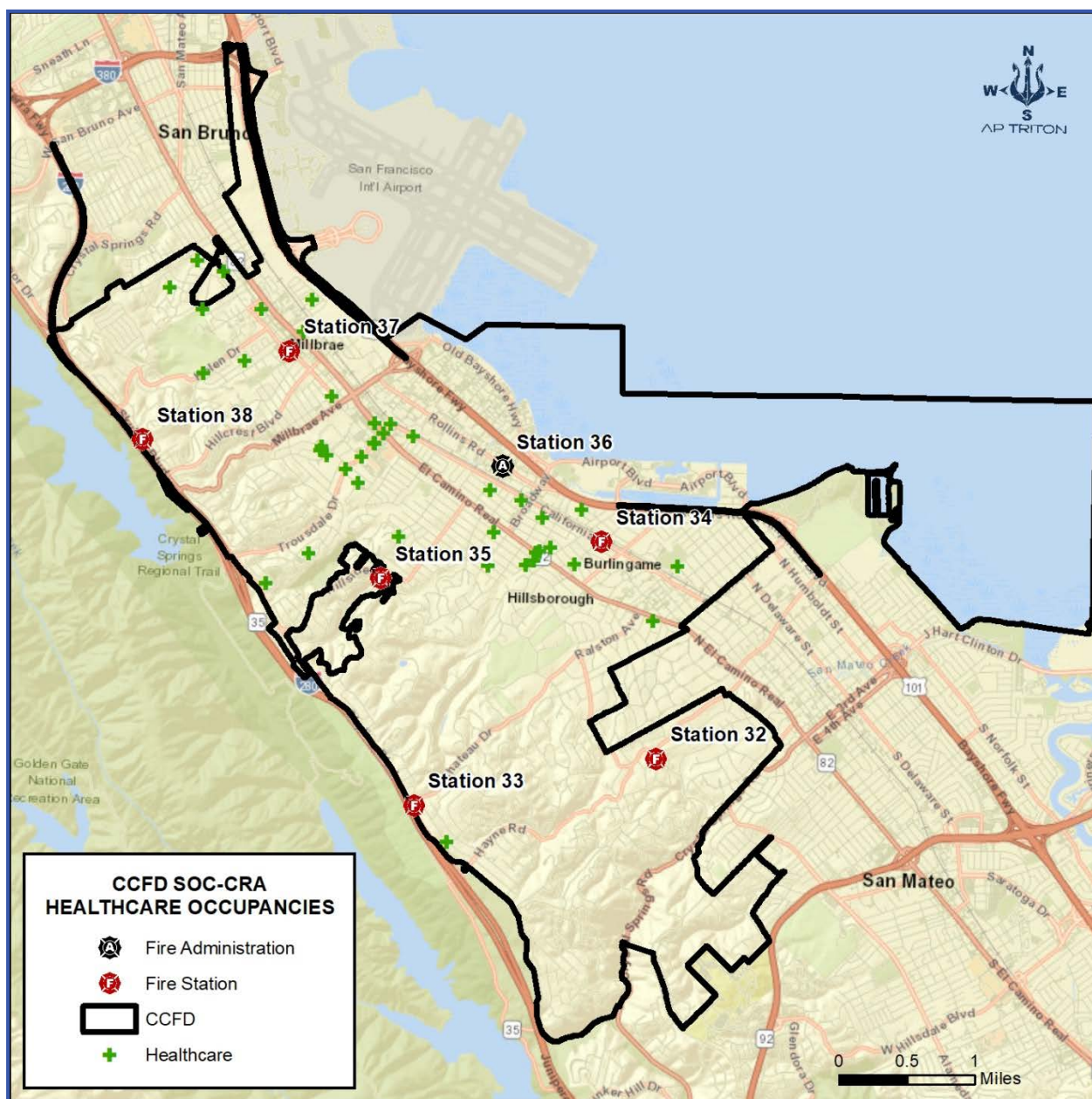
Figure 71: CCFD Jurisdiction Assembly Occupancy Target Hazard



Institutional & Healthcare Facilities

These types of buildings are where occupants may be unable to leave without assistance from the employees. Examples include assisted living, nursing homes, medical facilities, and jails.

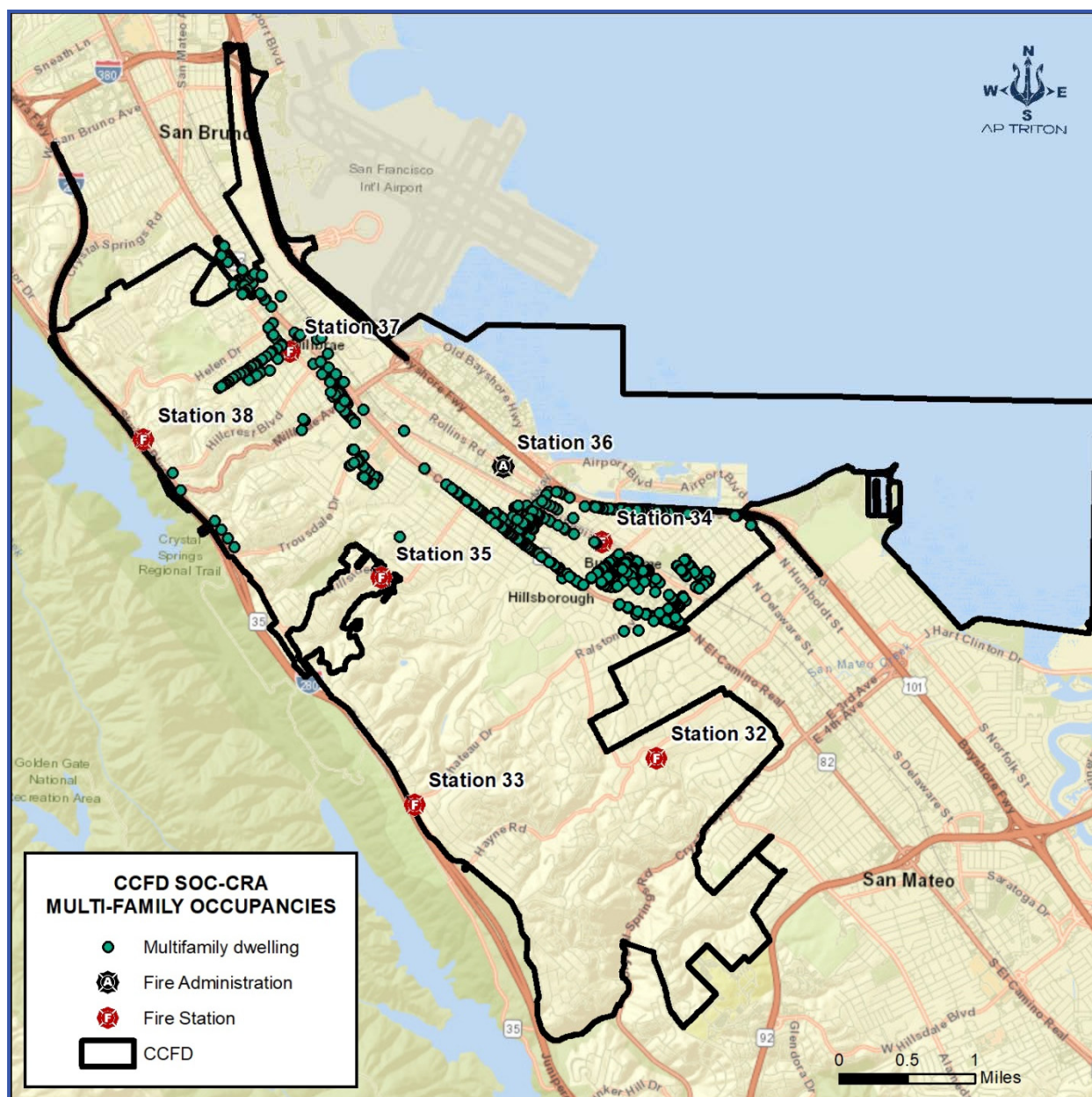
Figure 72: CCFD Jurisdiction Healthcare Facilities Target Hazard Maps



Residential Multi-Family Occupancies

Residential multi-family properties create a higher risk for occupants than most commercial buildings. Most fire fatalities occur in these locations, representing numerous risks, such as occupants with accessibility issues or buildings built without fire sprinkler protection. The common areas of these occupancies are required to be inspected annually to ensure fire code compliance.

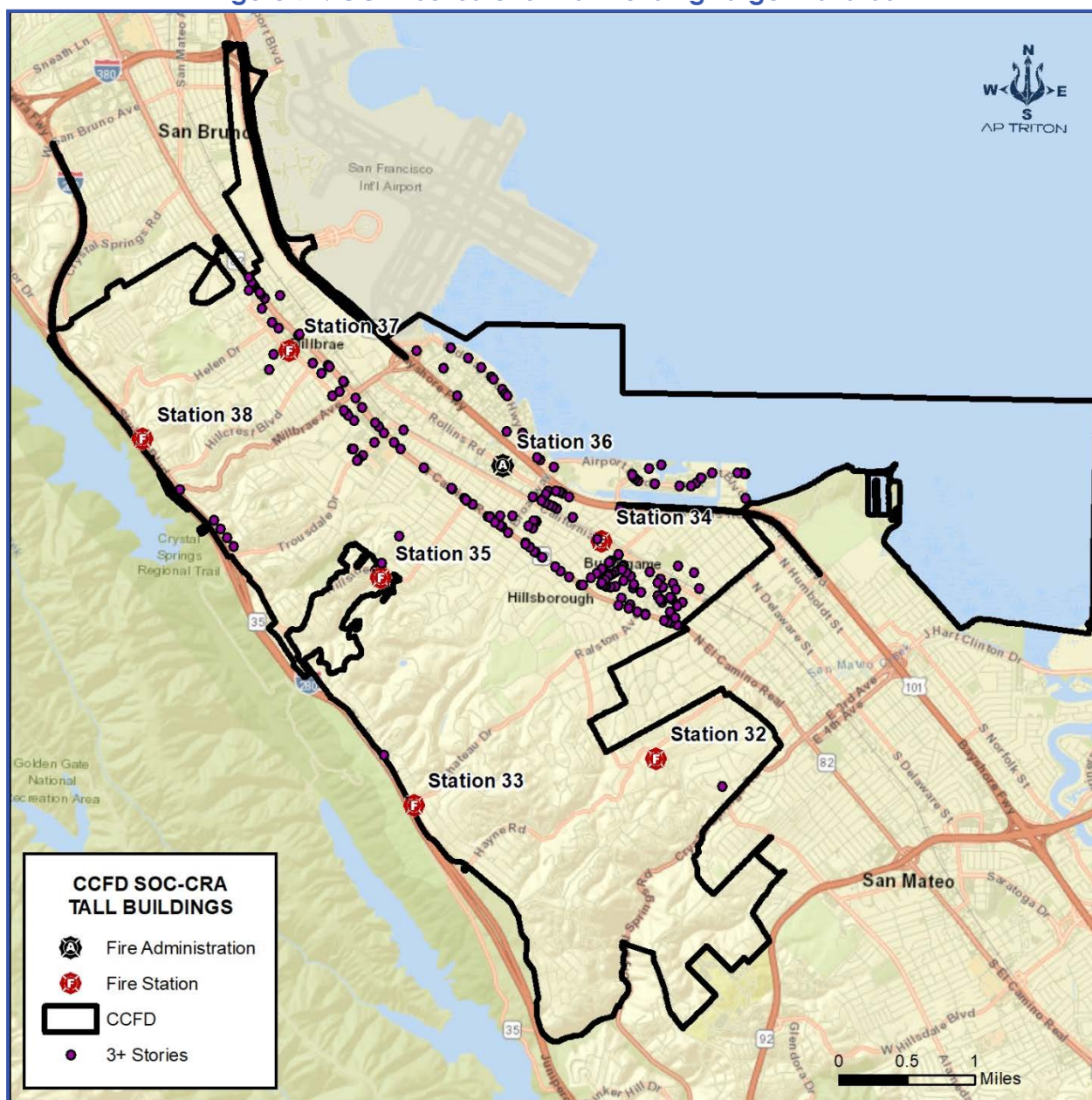
Figure 73: CCFD Jurisdiction Multi-Family Occupancies



Tall Buildings Three or More Stories in Height

Structures three or more stories in height typically require an aerial apparatus with an elevated master stream. The Insurance Service Office reviews the coverage area for a ladder truck for all buildings within 2.5 miles. A ladder truck may be necessary to access these higher buildings' upper floors or roofs since most ground ladders cannot reach these heights. The following figure provides locations of all buildings three or more stories.

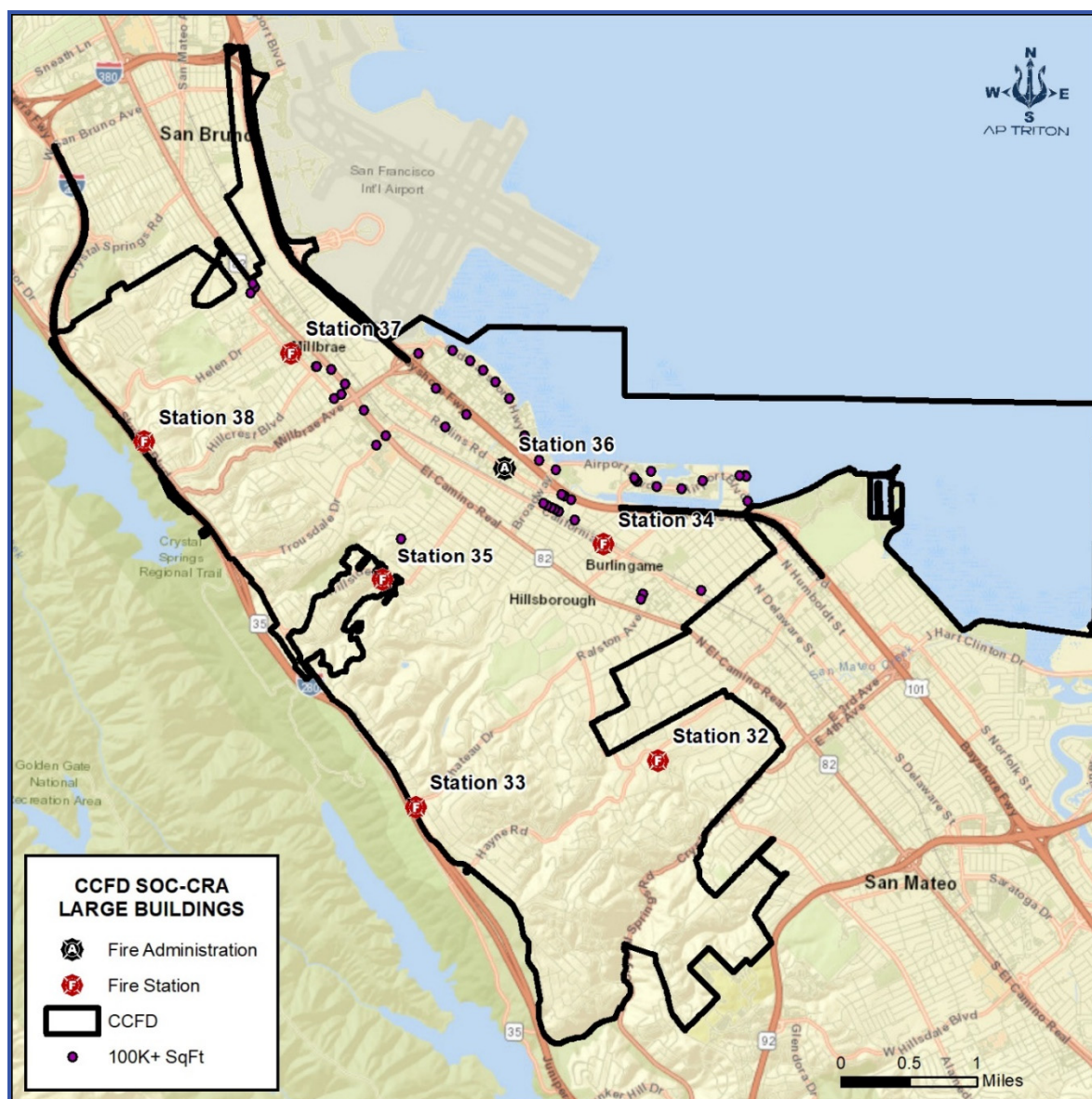
Figure 74: CCFD Jurisdiction Tall Building Target Hazards



Large Square Footage Buildings

Large buildings, such as warehouses, strip malls, and large “box” stores, need more significant volumes of water for firefighting and require more firefighters to advance hose lines long distances into the building. Although the number of large square footage buildings is low, the fire flow may be more significant for smaller buildings because of construction type, distance to exposures, and lack of built-in fire protection systems such as fire sprinklers. The following figure shows locations of buildings 100,000 square feet or more.

Figure 75: CCFD Jurisdiction Large Building Target Hazard Map



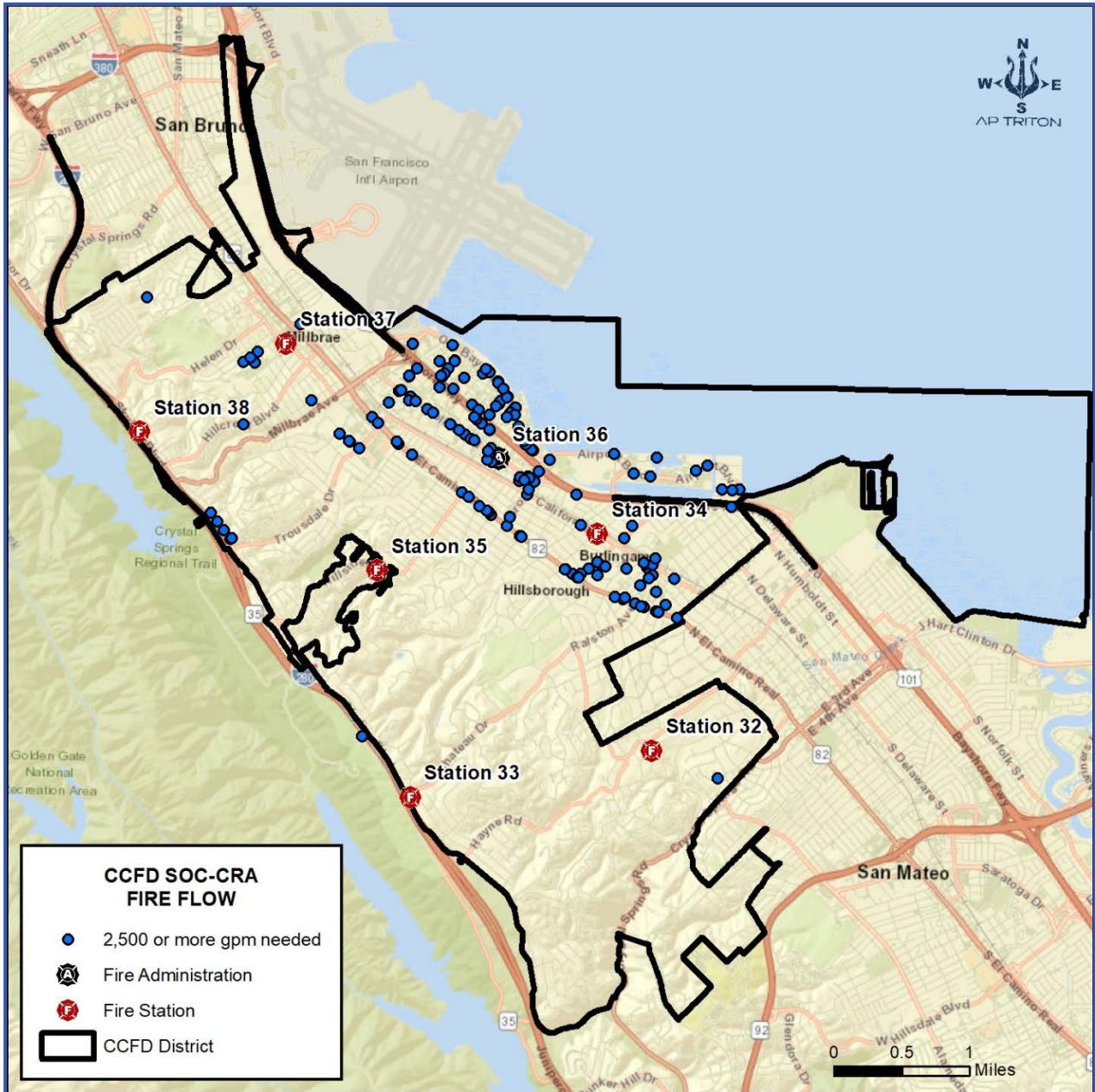
Large Fire-Flow Occupancies

Occupancies can be classified according to their risk level. Risk factors that classify occupancies as low, medium, or high include the size of the building(s), construction type, the presence or absence of fire suppression features such as sprinklers and standpipes, the needed fire flow, the risk to life, the presence of chemicals or hazardous processes, and the amount of water available relating to the required fire flow.

The Insurance Service Office developed the Batch Report that lists the needed fire flow (NFF) for most commercial occupancies in CCFD. The NFF formula was developed based on a review of large-loss fires by ISO that included the construction and occupancy type, area of the building, and exposures.

The following figure lists the properties with an NFF of 2,500 gallons per minute or greater.

Figure 76: CCFD Jurisdiction Large Fire Flow Facilities



Critical Infrastructure

Critical infrastructure and key resources (CIKR) explain what is crucial for a community to function in a modern economy. Critical infrastructure is defined as a sector “whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof.” There are sixteen defined Critical Infrastructure Sectors (CIS):¹²

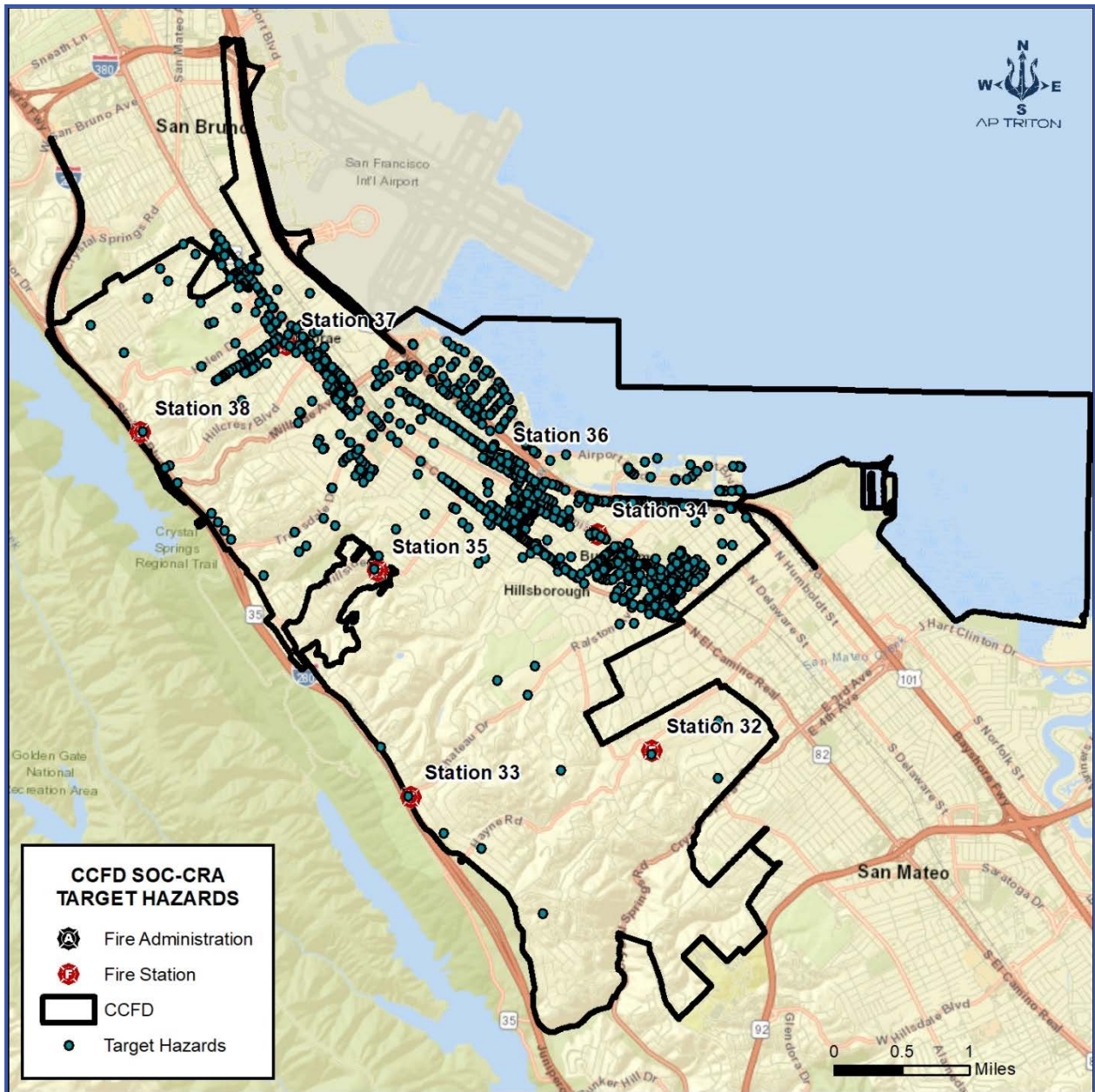
- Chemical Sector
- Commercial Facilities Sector
- Communications Sector
- Critical Manufacturing Sector
- Dams Sector
- Defense Industrial Base Sector
- Emergency Services Sector
- Water & Wastewater Systems Sector
- Energy Sector
- Financial Services Sector
- Food and Agriculture Sector
- Government Facilities Sector
- Healthcare and Public Health Sector
- Information Technology Sector
- Nuclear Reactors, Materials, & Waste Sector
- Transportation Systems Sector

All these sectors may not be in the CCFD service area and each community must determine critical infrastructure locations and develop pre-incident plans for responding personnel.

Other buildings to consider as target hazards could include occupancies with a potential for a significant loss of life, such as places of public assembly, schools and childcare centers, medical and residential care facilities, and multifamily dwellings. Other considerations include buildings with substantial value to the community—economic loss, replacement cost, or historical significance—that, if damaged or destroyed, would have a significant negative impact. Responses to target hazards may require significant CCFD resources and automatic aid during an incident.

The following figure provides the locations of target hazards the CCFD has identified.

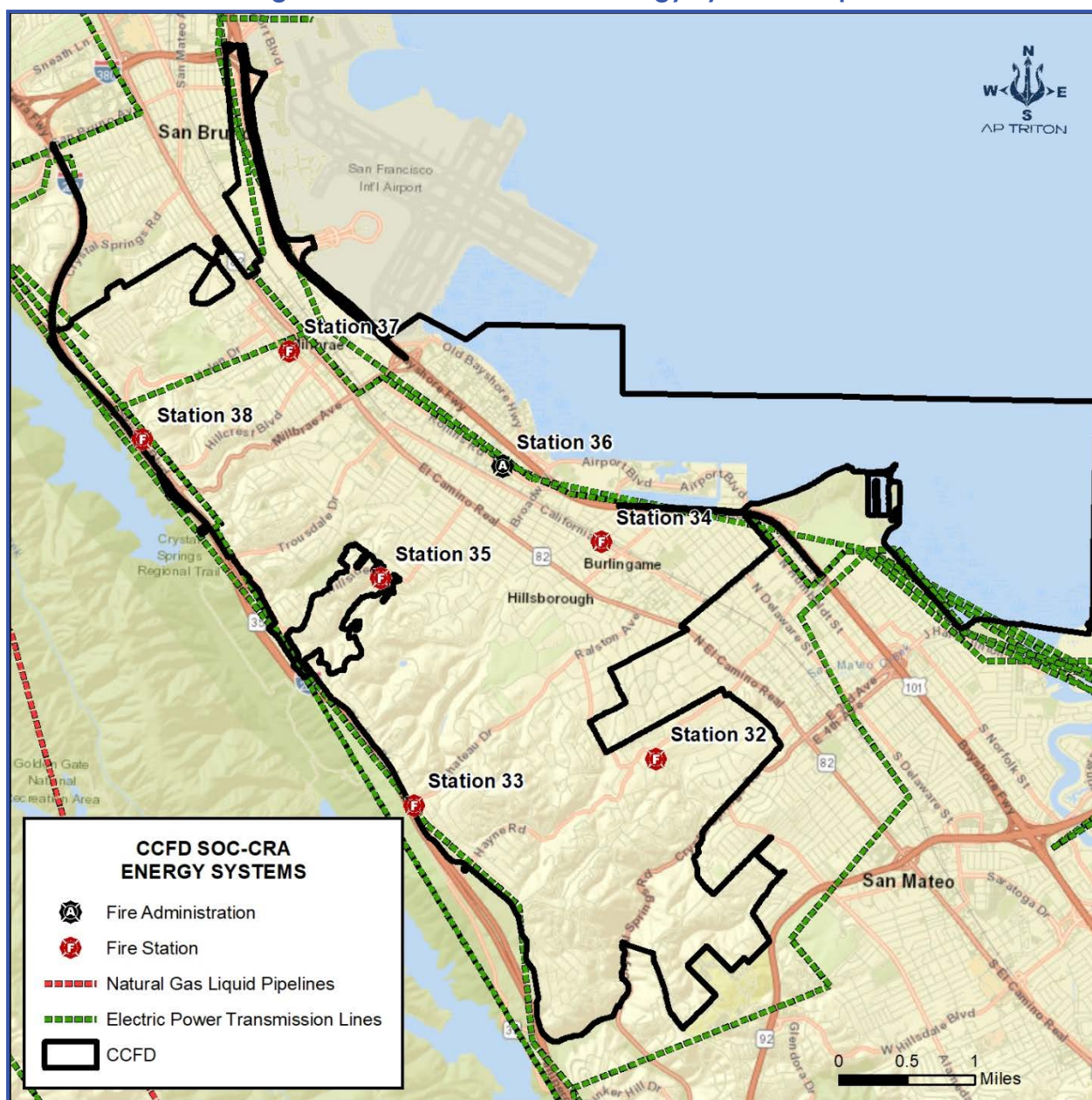
Figure 77: CCFD Jurisdiction Target Hazards



Energy

The use of electrical power is required for many day-to-day activities. The need for electricity requires lines throughout the service area and can be broken down into a distribution network. The highest voltage lines in CCFD are 66 kV, 230 kV, and 130 kV, all owned and operated by Pacific Gas & Electric. The two major natural gas transmission lines travel along Interstate 280 and Highway 35, and the other line travels along Highway 82 & 101.

PG&E may implement Public Safety Power Shutoffs when wildfire dangers exist to prevent a fire from igniting from power lines. These shutoffs are typically temporary. PG&E provides alerts for customers before the power is shut off, but the customer must sign up for text, phone messages, or email notifications.¹³ If these shutoffs occur, CCFD must be prepared if its stations are impacted or understand how the community may be affected.

Figure 78: CCFD Jurisdiction Energy Systems Map

Transportation Network

Most of the transportation network consists of collector streets fed by residential roads throughout CCFD. These roads provide interconnectivity for emergency responders, but some no-outlet roads could impact response if the roads are impassable. Traffic signal preemption allows responding units to modify the signal plan and change the light to green to allow safe and quick passage through a controlled intersection.

These systems can reduce vehicle crashes with apparatus or between private vehicles. There is currently no traffic signal preemption in the service area.

The main highways that transverse CCFD's jurisdiction are US Hwy 35, U.S. Highway 101, and Route 82. There is also one interstate located in CCFD's response area, which is Interstate 280. According to *Caltrans*, the 2018 peak monthly average volume for passenger vehicles at Millbrae Avenue and Highway 101 was approximately 258,500, and more than 10,925 were trucks.¹⁴ It is unknown how many of these trucks transport hazardous materials. Based on accident data, the CCFD experiences more auto accidents in April, July, September, and December on Monday mornings than any other day of the week. This data also indicates that fatal auto accidents have occurred on El Camino Real (82) between Oak Grove and Howard Avenue.

Figure 79: CCFD Average Daily Traffic Counts

Location	Avg. Annual Daily Traffic–Vehicles	Avg. Annual Daily Traffic–Trucks
Center Street and Ludeman Lane	26,000	754
Millbrae Avenue and Hwy 101	258,500	10,925
Route 35 and Larkspur Road	136,200	327
Broadway and Hwy 101	258,500	10,630
Route 280 and Trousdale Drive	120,800	542

Rail

The San Francisco & San Jose Railroad was completed on January 16, 1864, and the railroad known today as "Caltrain" is the oldest in the West, with continuous passenger service passing through CCFD's jurisdiction. Several rail crossings at street level located at Center Street, Howard Avenue, Broadway, North Lane, Peninsula, Baywater, and Oak Grove Avenue can pose a threat to the train or a passenger vehicle if they ignore warnings of an approaching train in CCFD's area. The other crossings are all overpasses by the rail tracks. Caltrain has a passenger train that runs every hour through CCFD's jurisdiction with several stations for passengers; one at 100 California Drive in Millbrae, one at Broadway, Burlingame and one at Burlingame Avenue.

Water Supply

Without an adequate water supply and distribution system consisting of water storage, mains, and a fire hydrant system, it will be challenging to control and extinguish a fire. A system of well-distributed hydrants and properly sized water mains are necessary to provide the needed water for fireground use and alleviate this problem.

The water systems and infrastructure in all three cities is aging and will be a critical challenge going forward for CCFD to work with the cities on a plan to update and upgrade the water distribution systems and needed infrastructure.

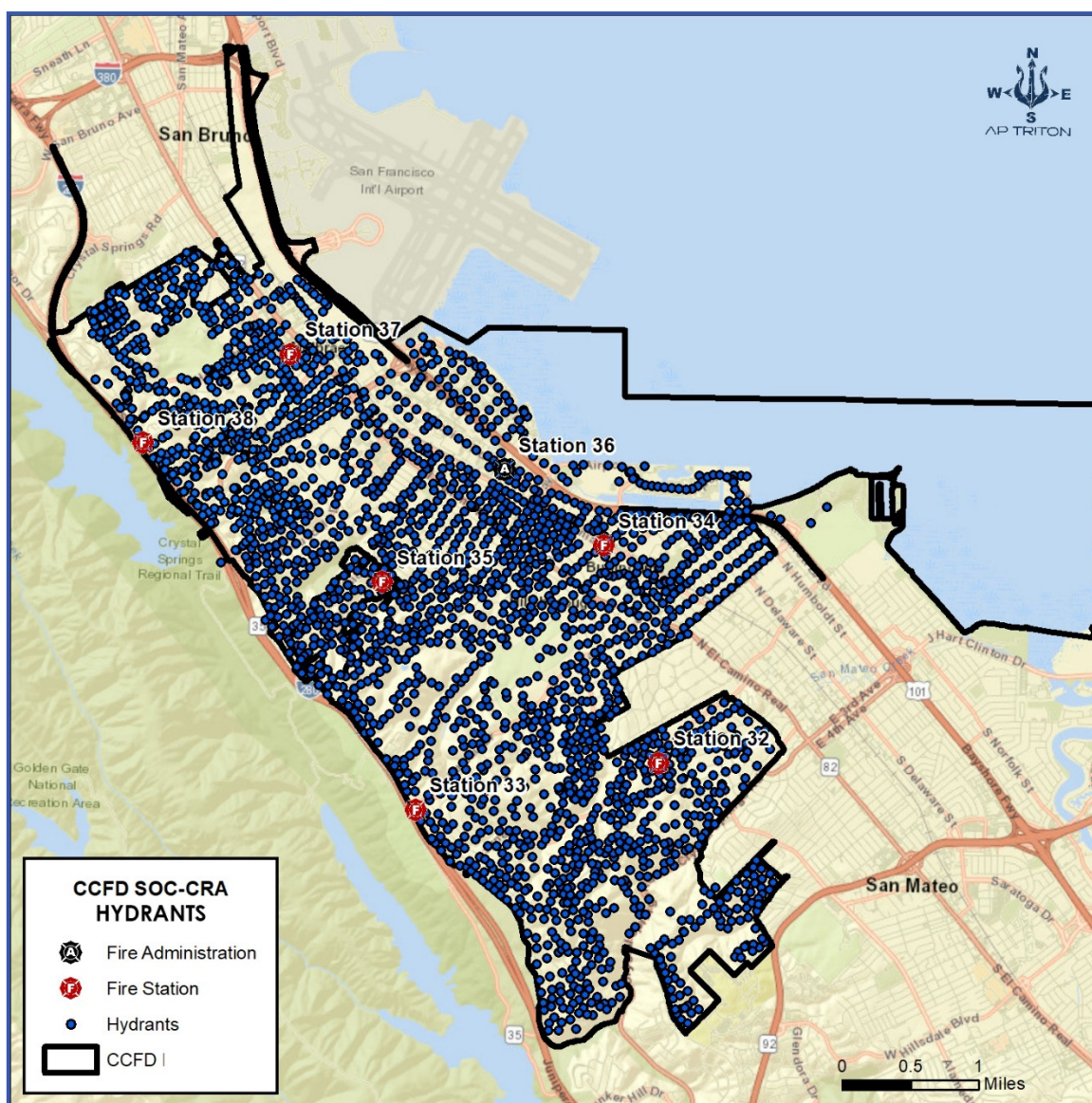
The City of Millbrae's water system is a public community water system under the City Department of Public Works; they are responsible for the operation and maintenance of the City's water production and distribution facilities. The City water utility's customer base is predominantly residential, with residential customers accounting for approximately 92% of total accounts and 70% of water consumption. The City owns and operates a water distribution system with 11 pressure zones, 6 pumps, 4 operational water storage tanks, and almost 70 miles of water distribution pipelines. In addition, the City relies on imported water from the San Francisco Public Utility Commission (SFPUC) for 100% of the community's water supply.

The City of Burlingame water system is a public community water system under the City Department of Public Works; they are responsible for the operation and maintenance of the City's water production and distribution facilities. The city water utility's customer base is predominantly residential, with residential customers accounting for approximately 65% of total accounts and 58% of water consumption. The city owns and operates a water distribution system with 10 pressure zones, 5 pumps, 5 operational water storage tanks, and almost 70 miles of water distribution pipelines. In addition, the city relies on imported water from the San Francisco Public Utility Commission (SFPUC) for 100% of the community's water supply.

The Town of Hillsborough water system is a public community water system under the Town's Department of Public Works; they are responsible for the operation and maintenance of the Town's water production and distribution facilities. The Town operates and maintains a water distribution system to serve its residents and other water users. It is a complex system with varying topography and interconnected zones. The system's principal components are 18 pressure zones, 15 pumps, 18 operational water storage tanks, and almost 108 miles of water distribution pipelines. The Town relies on imported water from the San Francisco Public Utility Commission (SFPUC) for 100% of the community's water supply.

The City of Millbrae, the City of Burlingame, and the Town of Hillsborough are members of the Bay Area Water Supply and Conversation Agency (BAWSCA), representing the collective interests of over 25 agencies that obtain water supply from the SFPUC. It allows San Mateo County and its cities, water districts, and private utilities to coordinate to ensure the continuous water supply necessary to maintain the community's health, safety, and economic well-being. BAWSCA agencies manage two-thirds of water consumption from the Hetch Hetchy Water System, providing water to 2.4 million people in San Francisco, Santa Clara, Alameda, and San Mateo Counties.

Figure 80: CCFD Jurisdiction Hydrant Map



Government & Public Safety Facilities

Buildings that provide services for the public from local or other governmental units are considered essential facilities and should receive special attention. These facilities are for the public to receive community services, and fire department personnel should be familiar with the properties during an emergency. Pre-incident plans should be completed and updated annually.

Communications

The ability to receive and transmit incident information requires an emergency communication center. All 911 calls are received by San Mateo County's Public Safety Center (SMPSC).

The Burlingame & Hillsborough police departments receive and answer 911 calls for those two individual cities, then transfer EMS and fire calls to the County of San Mateo Public Safety Center (SMPSC). Emergency calls within the City of Millbrae are answered directly by SMPSC.

SMPSC telecommunicators provide Emergency Medical Dispatch for EMS responses. Dispatching services are provided utilizing shift personnel specifically assigned as Telecommunicators. At this time, the 911/Communications Center works 12-hour shifts and has a staff of more than 60 employees. SMPSC uses Versaterm computer-aided dispatch to receive incident data and dispatch the appropriate unit.

The Public Safety Communications (PSC) is the ninth Emergency Communications Center in California, the 97th in the world, to become an Accredited Dispatch Center of Excellence for providing medical priority dispatch services to those who call for emergency medical services. Standards include processing high-priority service calls within established timeframes and customer satisfaction. The Center continually meets the call processing standards and rates over 99% in customer satisfaction. The Center's performance is closely monitored and reports performance measures to the County Board of Supervisors bi-annually.

In addition to these standards, PSC dispatch staff have job-related performance standards used during the performance evaluation process and compliance standards (95% or above) for Emergency Medical Dispatch. PSC continually exceeds the National Academy standards and Center of Excellence averages for EMD compliance (98%).

SMPSC is the only Communications Center in the county to manage multi-discipline incidents (police, fire, and medical), resulting in overall efficiency, accuracy, and expedited service. Field Communications Teams (IDTs and Tactical Dispatchers) respond to greater alarm fires. Staff can cross-train on all radios (police, fire, and medical) or remain “specialists” in either Law or Fire/EMS dispatching.

Comparison of Fire Risk in Other Communities

Fire Loss

In 2020, fire departments responded to more than 1.4 million incidents in the United States that caused 3,500 civilian fire fatalities and over 15,200 civilian fire injuries. The property damage was estimated at more than \$21.9 billion. The NFPA reported that 64% of the fire deaths occurred in one-or two-family dwellings. In addition, the report stated that \$4.2 billion of property fire losses occurred in California from wildland-urban interface incidents.¹⁵

The number of fires per 1,000 population in CCFD jurisdiction is 2.0, which is lower than the national average of 3.2, while the property loss per capita in 2020 was \$27.02 compared to \$45.64 for the United States, as shown in the following figure.

Figure 81: Fires and Fire Loss

Community Size 50,000 to 99,999	No. Fires per 1,000 Population	Property Loss per Capita
CCFD Jurisdiction	2.0	\$27.02
The U.S.	3.2	\$45.64

Intentionally Set Fires

Intentionally set fires—typically considered arson—are defined as “any willful or malicious burning or attempt to burn, with or without intent to defraud, a dwelling house, public building, motor vehicle or aircraft, personal property of another.”¹⁶

CCFD uses internal investigators to determine the origin and cause of a fire and collaborates with local law enforcement when necessary. Law enforcement assists with the interview and arrest if a fire involves a juvenile. Fire investigation records are available electronically, and any evidence collected is stored by law enforcement. Based on data from CCFD, there have only been two intentionally set fires since 2018, as shown in the following figure.

Figure 82: Intentionally Set Fires

Year	Intentionally Set Fires
2018	0
2019	2
2020	0

Insurance Services Office

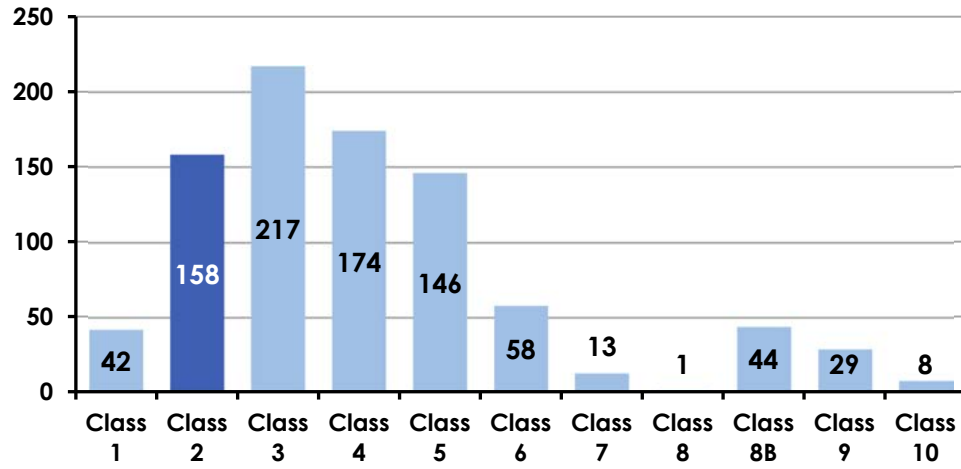
The Insurance Services Office, Inc. (ISO®) is an independent organization that collects and analyzes data from fire departments in communities throughout the United States to determine rates for fire insurance. According to its report, ISO's Public Protection Classification program, or PPC, "is a proven and reliable predictor of future fire losses." Therefore, commercial property insurance rates are expected to be lower in areas with a lower (better) ISO PPC Class rating.

The ISO Fire Suppression Rating Schedule (FSRS) measures four primary elements of a community's fire protection system: *Emergency Communications* (max 10 points); *Fire Department* (max 50 points); *Water Supply* (max 40 points); and *Community Risk Reduction* (max 5.5 points), for a maximum possible total of 105.5 points. ISO then assigns a grade using a scale of 1 to 10, with Class 1 representing the highest degree of fire protection and Class 10 designating a fire suppression program that does not meet ISO's minimum criteria.

In 2017, the CCFD was assigned an ISO classification of 2. CCFD is one of 158 communities out of 890 surveyed across the state to achieve the rating, as shown in the following figure. CCFD received 80.45 points which translates to its assigned classification.

A review of the Public Protection Classification Summary Report revealed:

Figure 83: Comparison of ISO Class Rating (California)



Section III: STANDARDS OF COVER

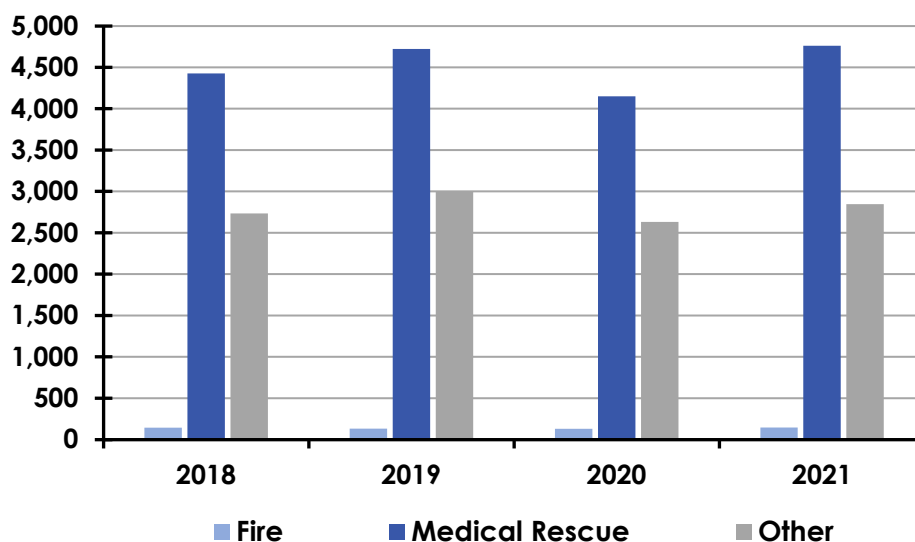
Historical Response Workload

In analyzing the service delivery and performance of CCFD, the study team requested incident and individual unit response data for the calendar years 2018 through June 30, 2021. The department provided data from its records management system (RMS) and dispatch center.

Service Demand

The following figure shows the response workload by general type for the last four years. The total response workload has remained fairly constant and has increased in 2021 after a reduction in 2020, mostly attributed to lower responses due to COVID-19 restrictions. EMS still shared the majority of the total volume; however, it decreased by 6.3% in 2020 due to the pandemic effects of less traffic and less personal interaction before increasing to a record high of 4,761 total EMS calls for CCFD in 2021.

Figure 84: CCFD Response Workload History



CCFD responded to nearly 30,000 incidents over the four-year period. The following figure shows incidents by type. Emergency medical responses and motor vehicle collisions were the most common incident types, comprising 62% of the total responses

Figure 85: Responses by Incident Type

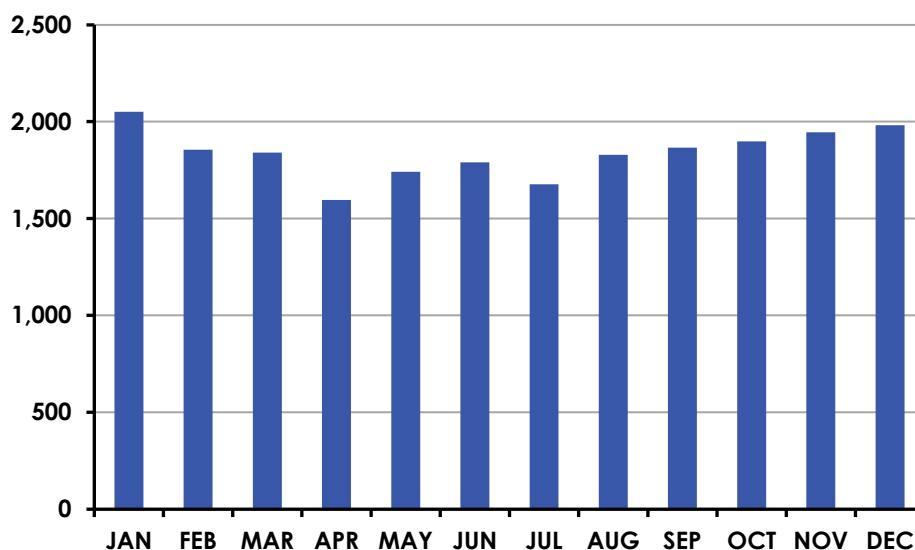
Incident Type	Percent of Total*
Medical	60%
Other	25%
Alarm	10%
Hazard	3%
Fire, other	< 1%
Rescue	< 1%
Building Fire	< 1%
Wildland Fire	< 1%
Vehicle Fire	< 1%

*Percentages rounded to the nearest integer.

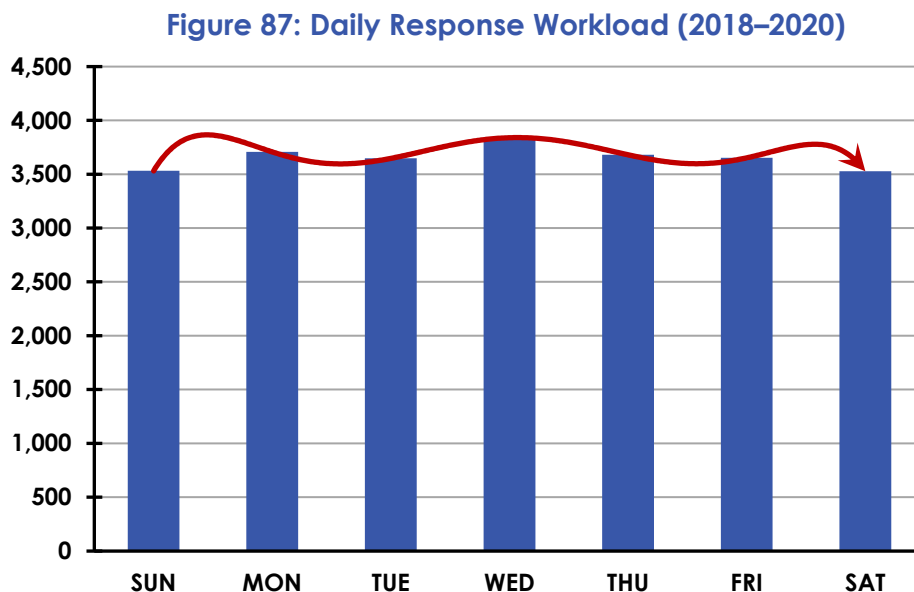
Temporal Analysis

This analysis shows how responses change in volume over various measures of time. For example, the following figure shows the change in volume over the months during the study period, indicating seasonality in the response pattern.

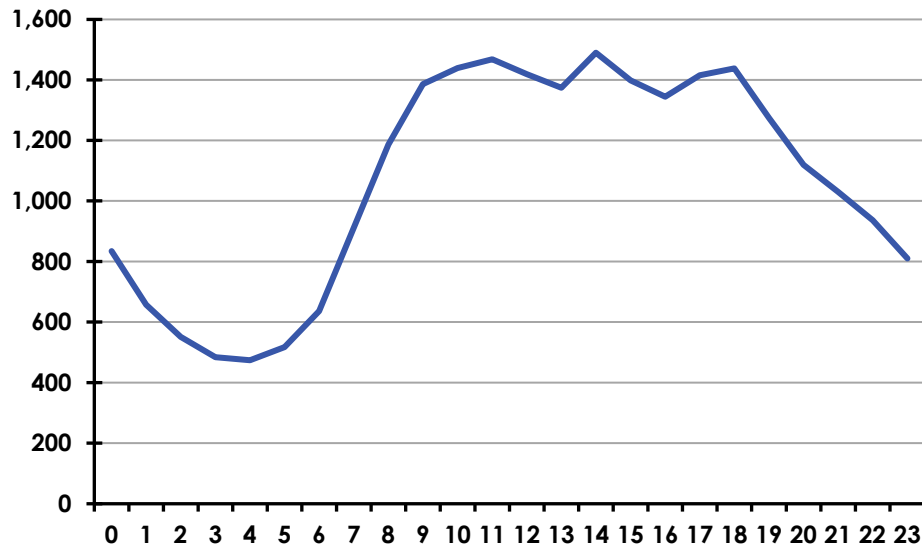
The busiest months for CCFD have been November-January, after which total monthly volume generally declines until July, then rises.

Figure 86: Monthly Response Workload (2018–2020)

Next, the response workload is shown by the day of the week. Mondays and Wednesdays tend to have slightly more responses.

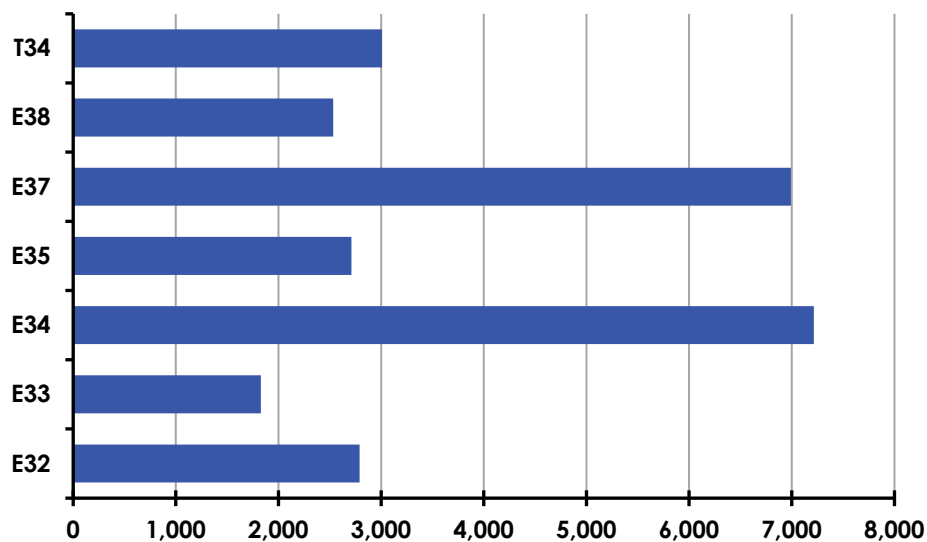


Response workload by the hour typically shows fire department activity higher during daytime hours, as in the case of CCFD. This is because response workload correlates with the time of day in which people are most active. In Central County, the department's activity begins to increase from 4:00 to 5:00 a.m. until it reaches its first peak at 11 a.m. This level is generally maintained until it gradually decreases at 6:00 p.m. when it begins to decrease more rapidly.

Figure 88: Hourly Workload

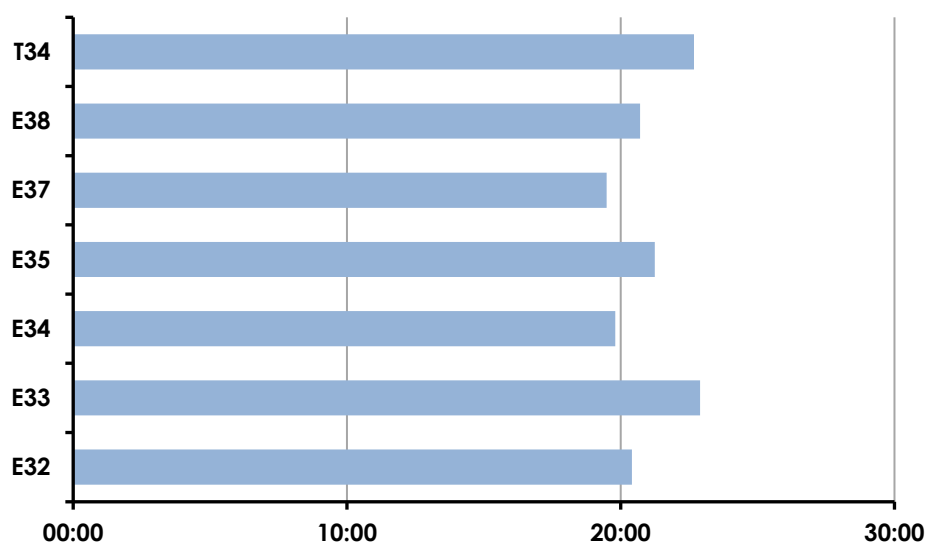
Response Unit Workload

The response workload for each CCFD apparatus is shown in the following figure. Many incidents, like structure fires and severe motor vehicle collisions, require more than one unit to respond. Engine 34 is the busiest unit, followed by Engine 37.

Figure 89: Unit Workload

The amount of time spent on the scene can affect Firefighters' workload and the availability of resources for the next, or concurrent, incident. The following figure details the average time each unit was committed to a scene. Understandably for fire incidents, the amount of time committed to the scene by a unit is longer than for the other call types.

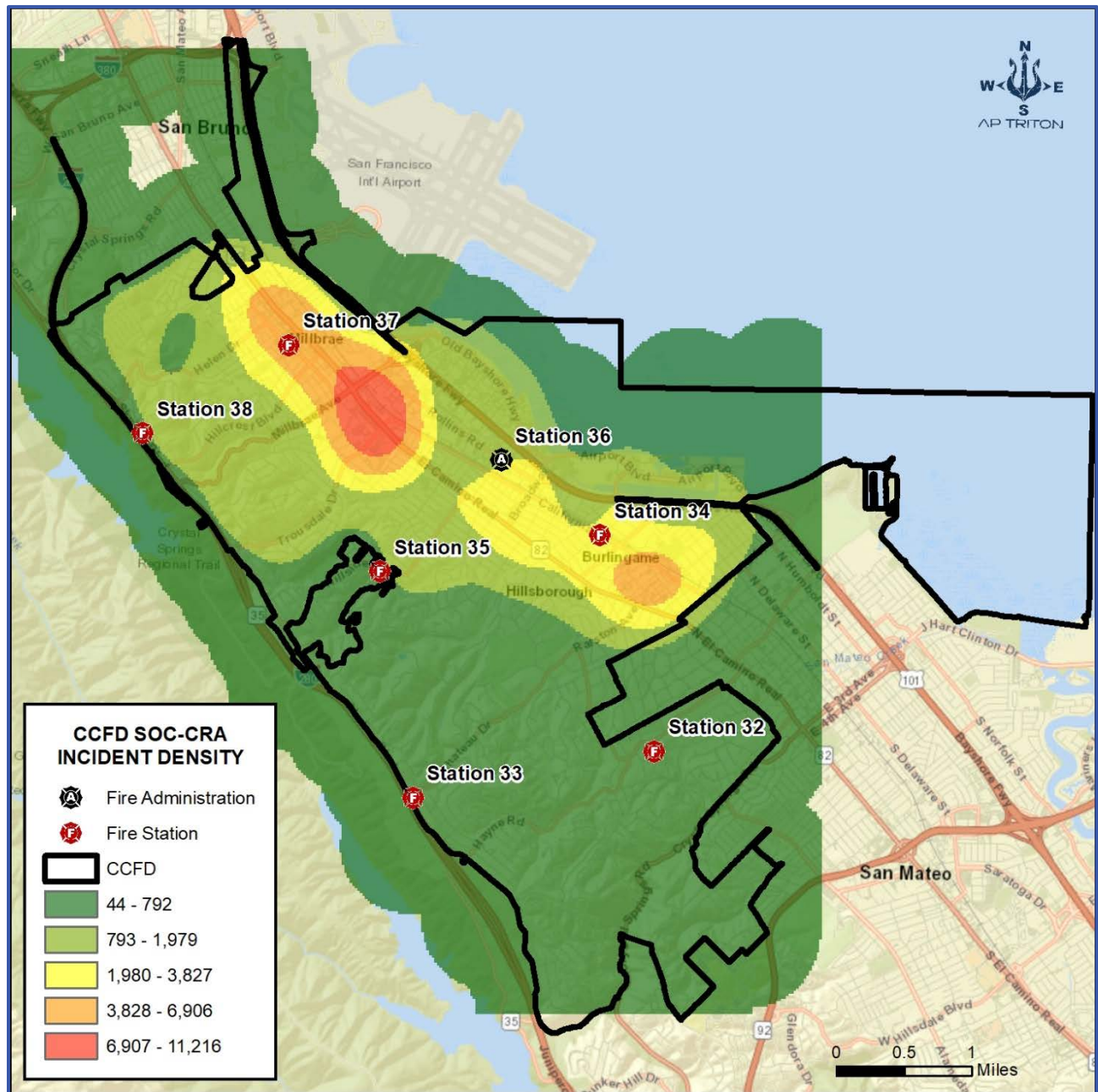
Figure 90: Average Unit Time on Scene



Engine 33 and Truck 34 spend the most time on the scene. The remaining frontline units spend a similar amount of time on the scene.

Spatial Analysis

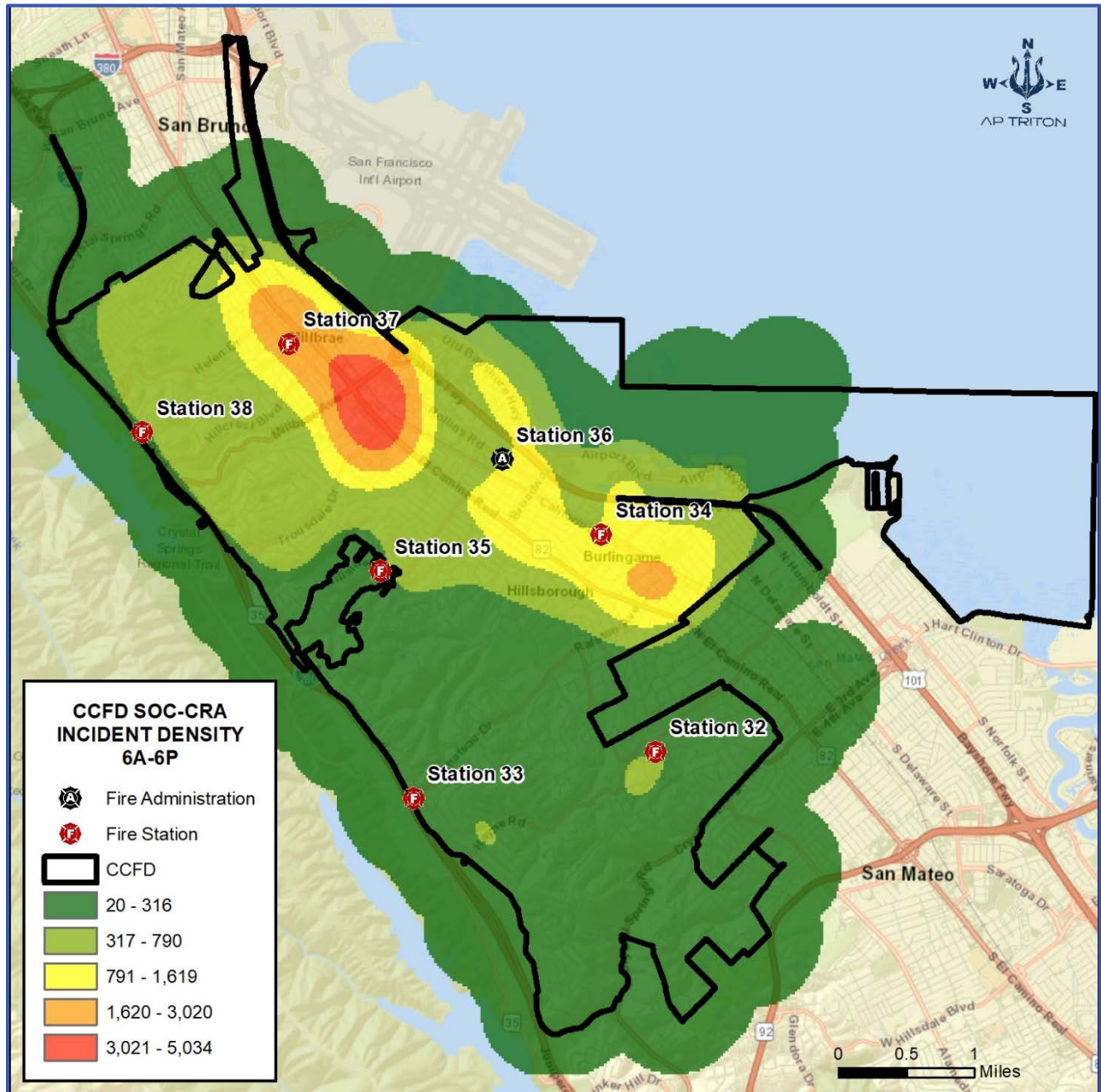
AP Triton also examined response workload geographically. Therefore, the distribution of heavier service demand can be evaluated against the location of the fire station. The following figure shows the density of response workload during the study period.

Figure 91: CCFD Jurisdiction All Incidents Demand Density

The previous figure reflected the predominance of emergency medical incidents within the dataset. Most demand was located near a transit center and El Camino Boulevard. There is a moderate level located near Station 34 as well. During the day, the pattern closely mimics the overall demand. As noted previously, the workload during the evening is

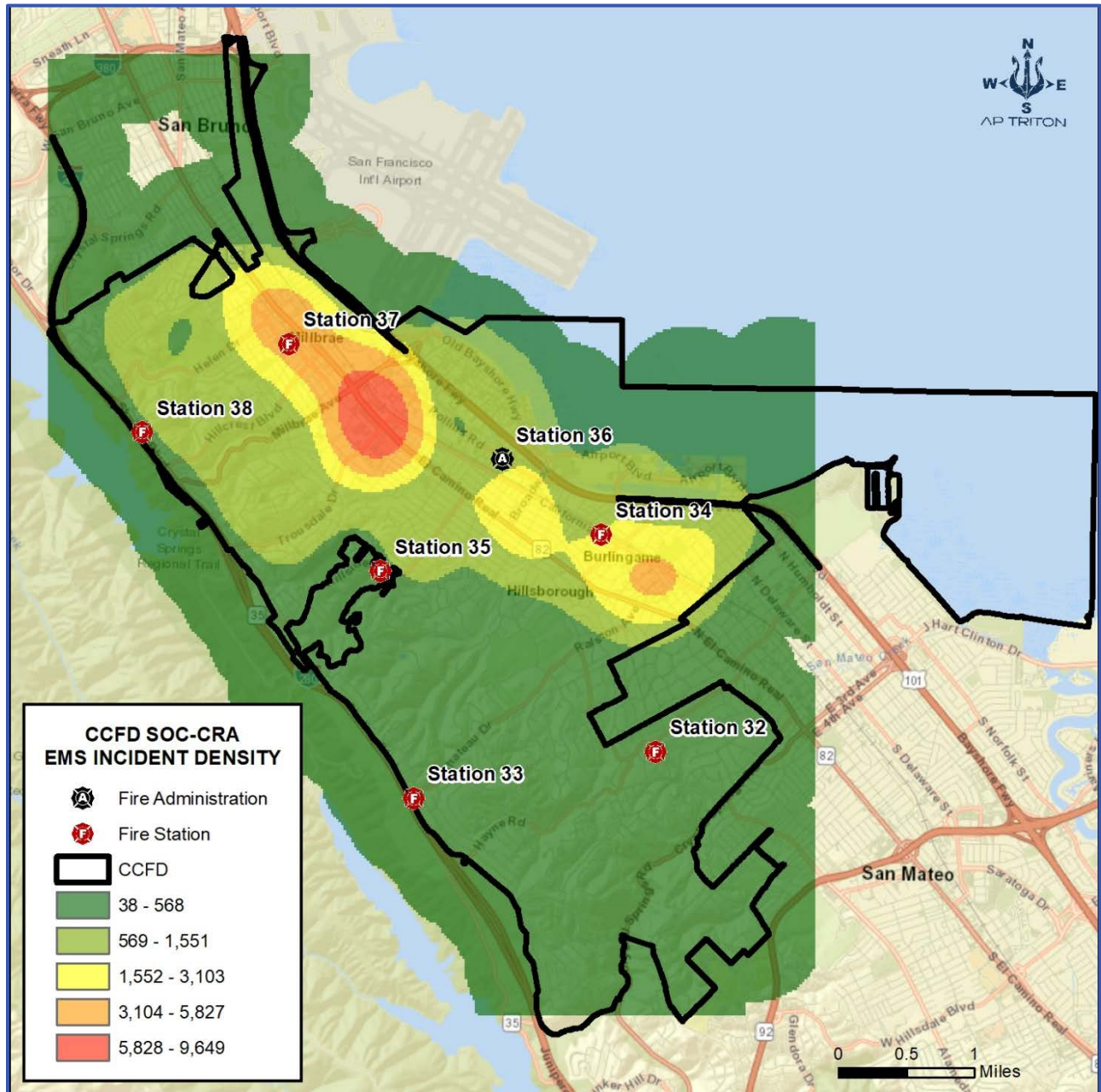
lower, but the heavier demand density intensifies in the previously mentioned neighborhoods and near Station 34.

Figure 92: CCFD Jurisdiction Night Incident Demand



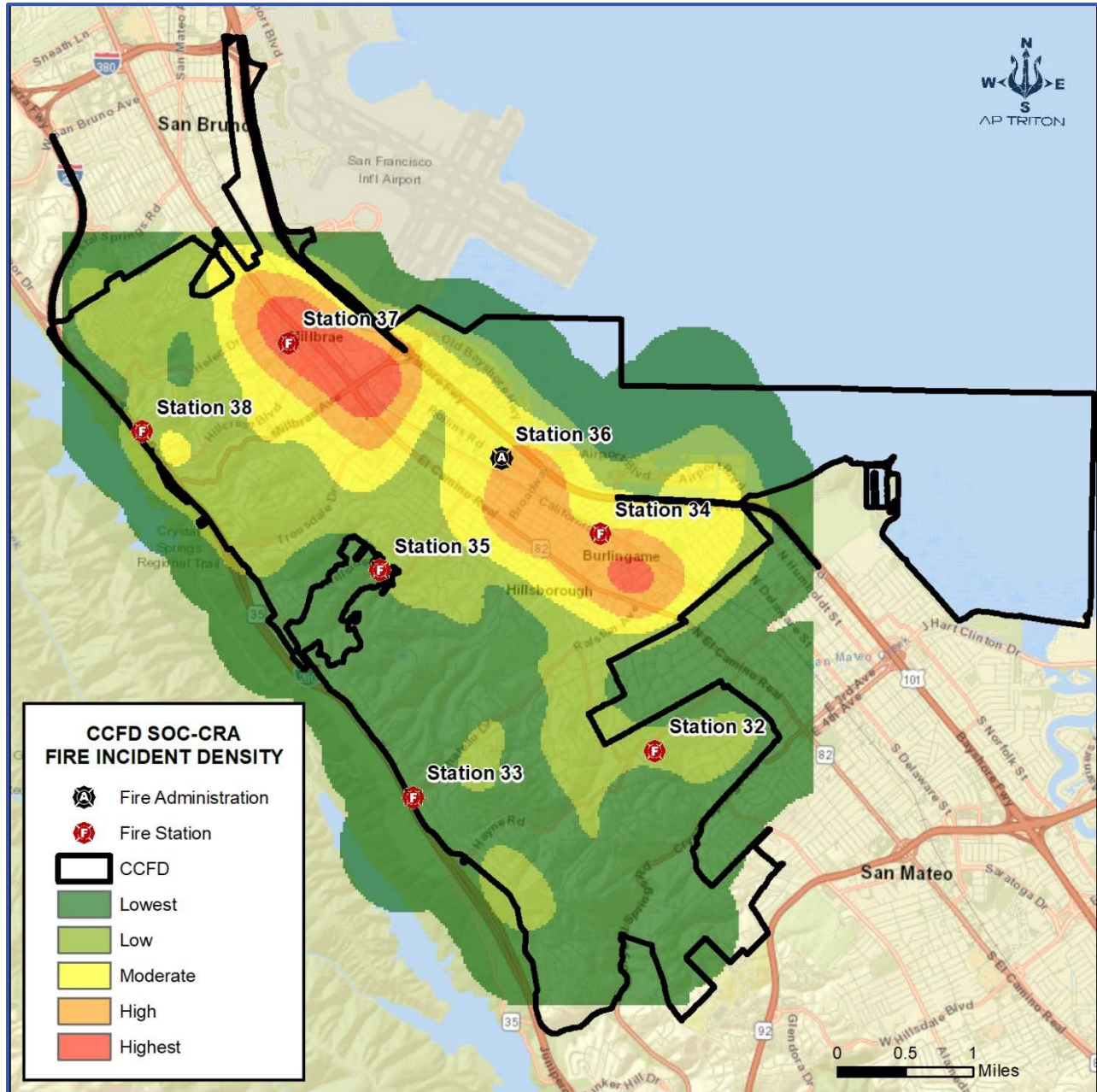
Because of the predominance of EMS-type incidents in the workload data, this map mimics the map of overall demand density.

Figure 93: CCFD Jurisdiction EMS Incident Demand



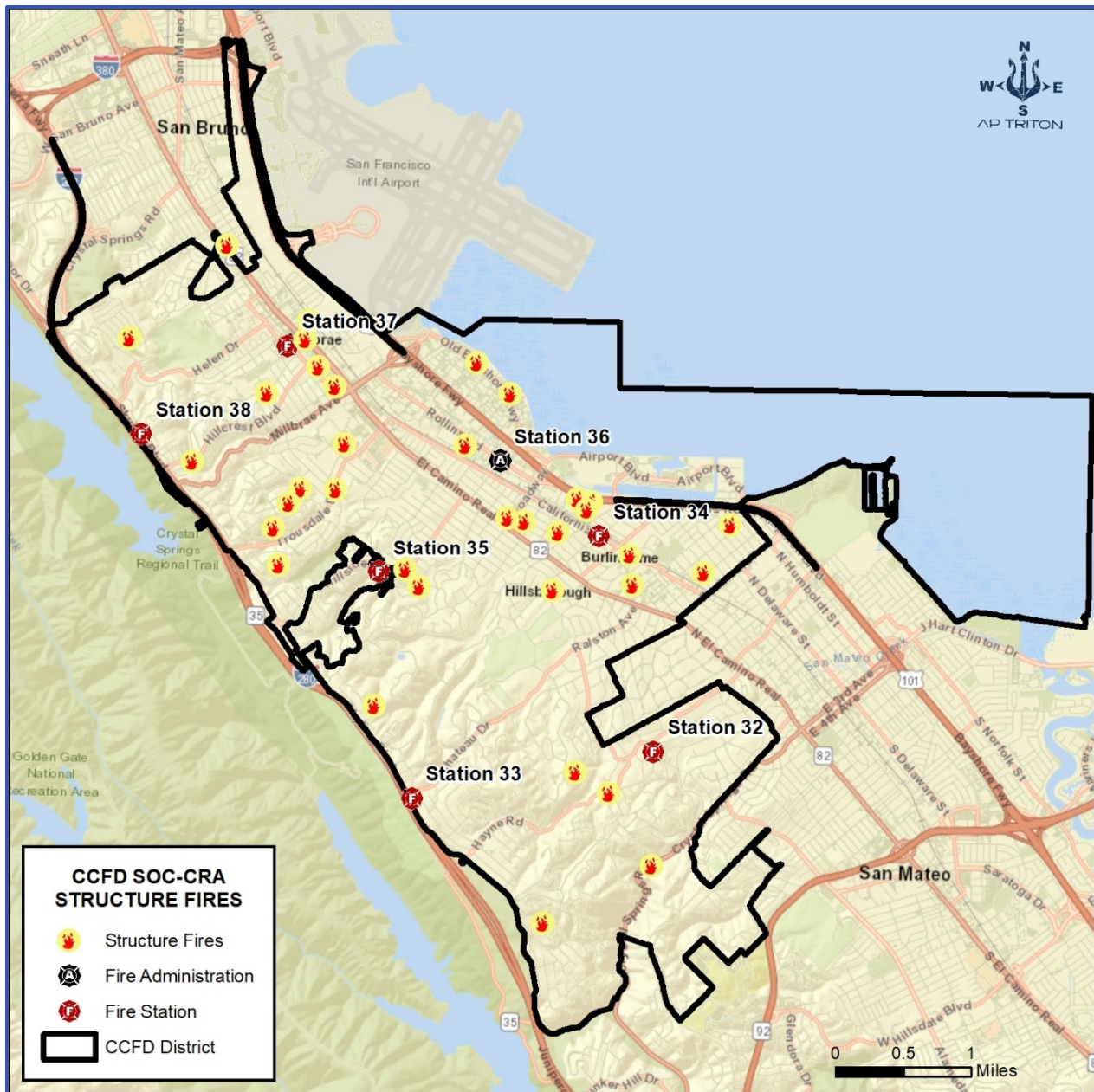
The following figure shows the level of structural fire events within the CCFD jurisdiction.

Figure 94: CCFD Jurisdiction Structure Fire Incident Density



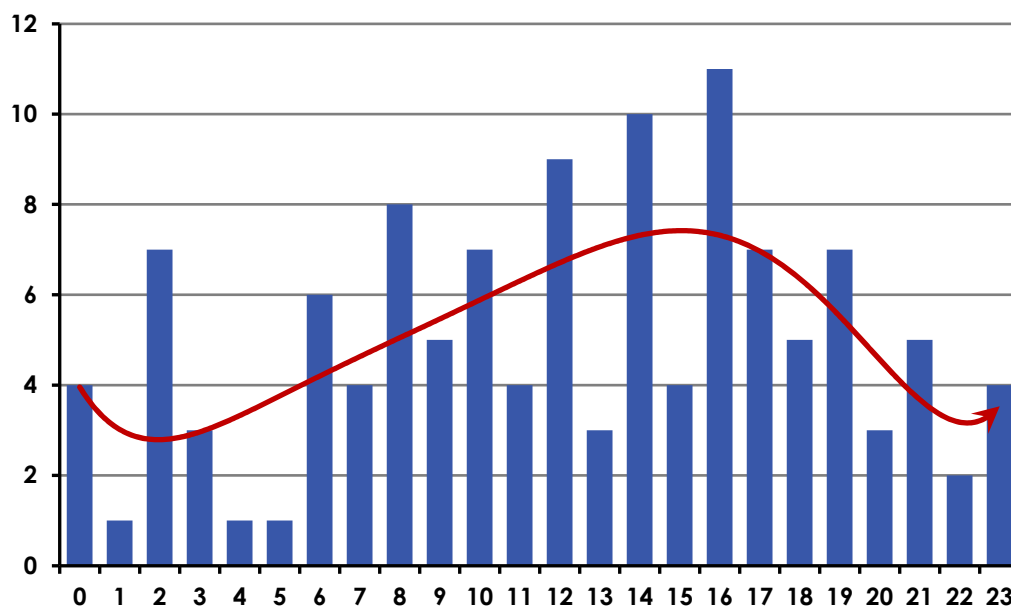
The following figure shows the locations of structural fire events within the CCFD jurisdiction.

Figure 95: CCFD Jurisdiction Structure Fires Locations



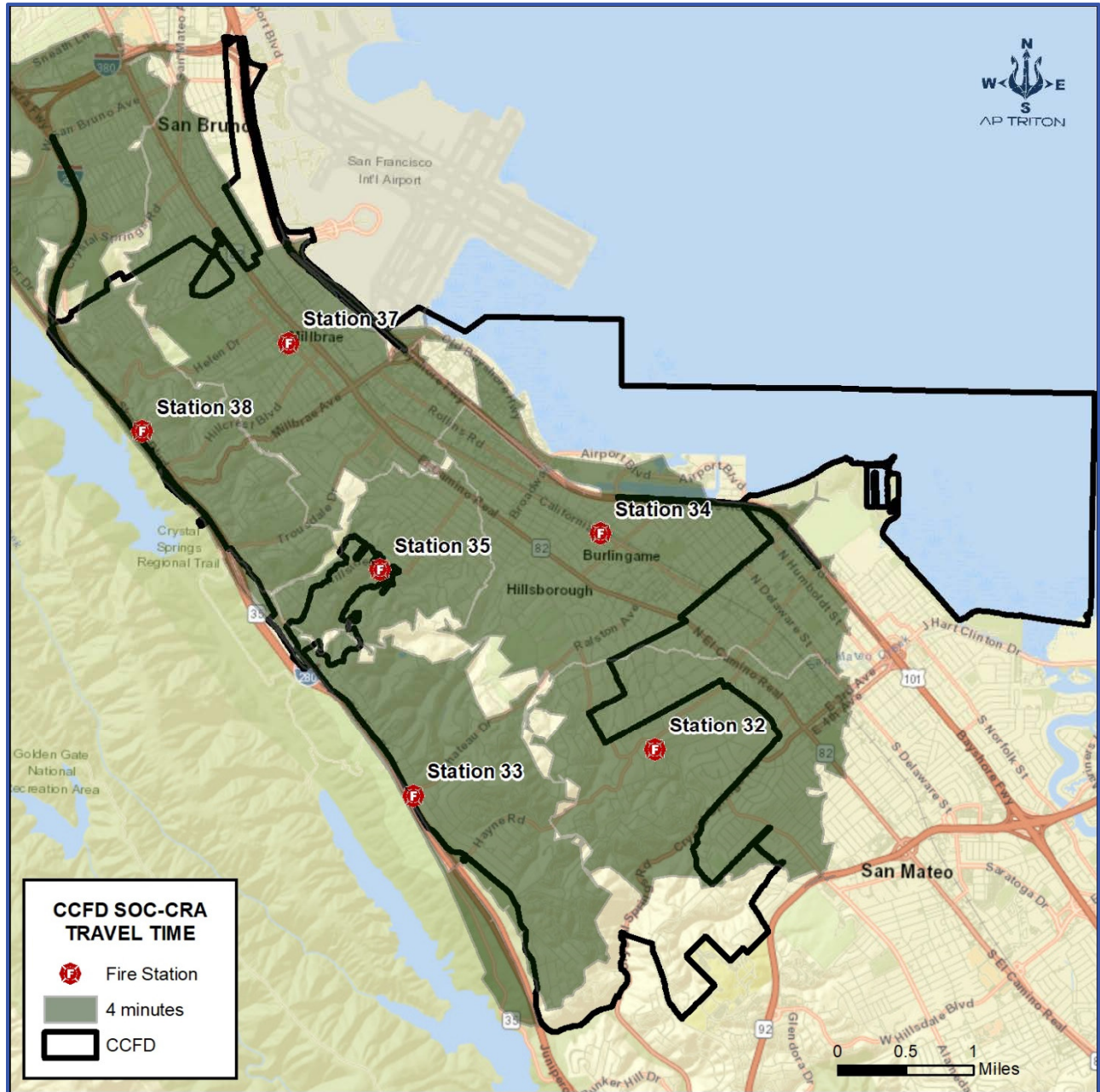
The previous figure reveals that most of the structure fires occur during the afternoon and early evening hours, as shown in the following figure.

Figure 96: Structure Fires by Hour of Day



Resource Distribution

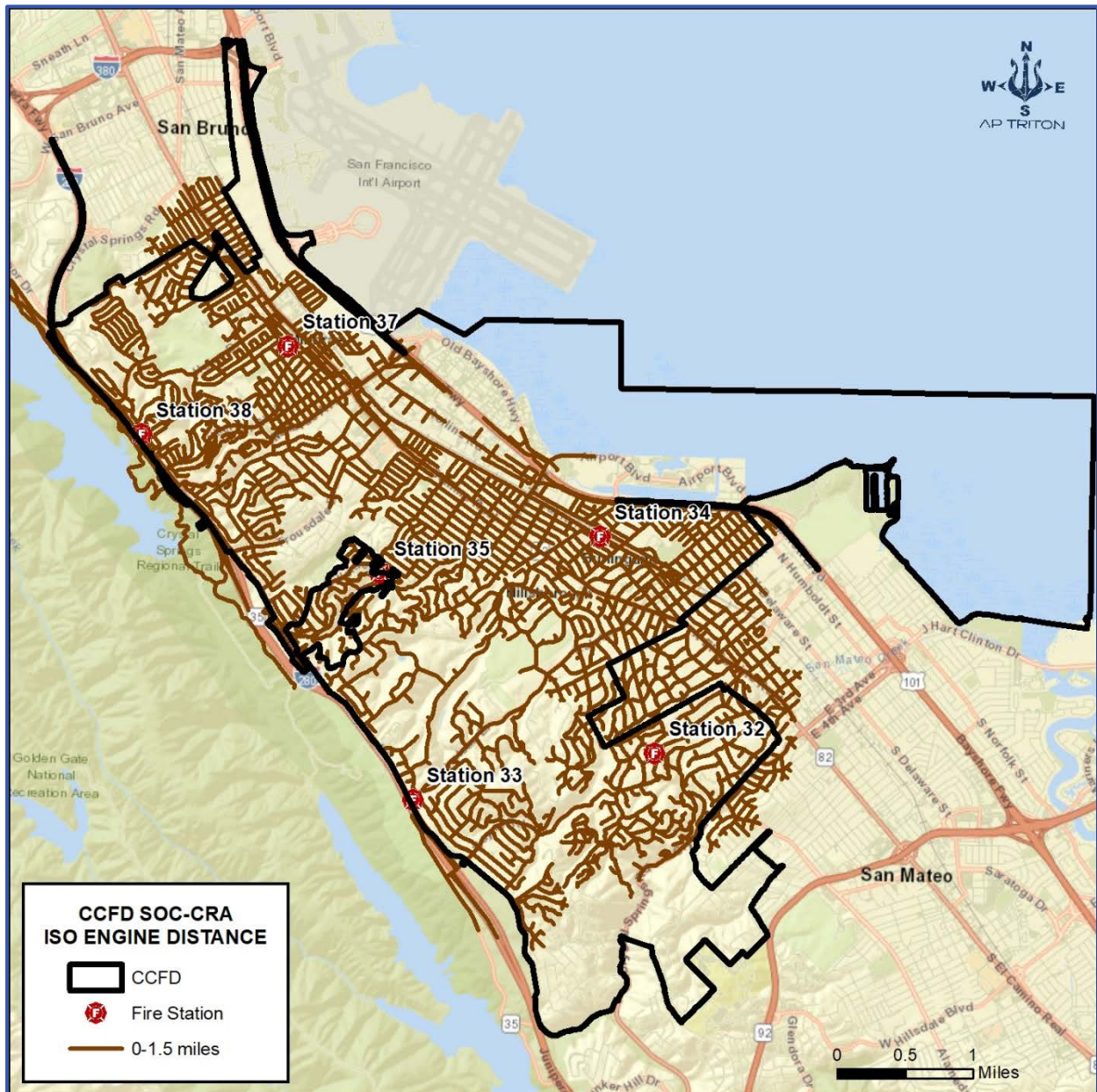
CCFD operates out of six staffed fire stations. The following figure illustrates the street sections that can be reached from each station within 4 minutes or less of travel time. The data is based on posted road speeds modified to account for turning, stops, and acceleration. They do not consider congestion, construction, weather, darkness, and other non-controllable factors.

Figure 97: CCFD Jurisdiction Travel Time Extent

The overall coverage of fire incident demand is 94%, presuming engines are available and responding from their assigned stations. The coverage of EMS incidents was 95%.

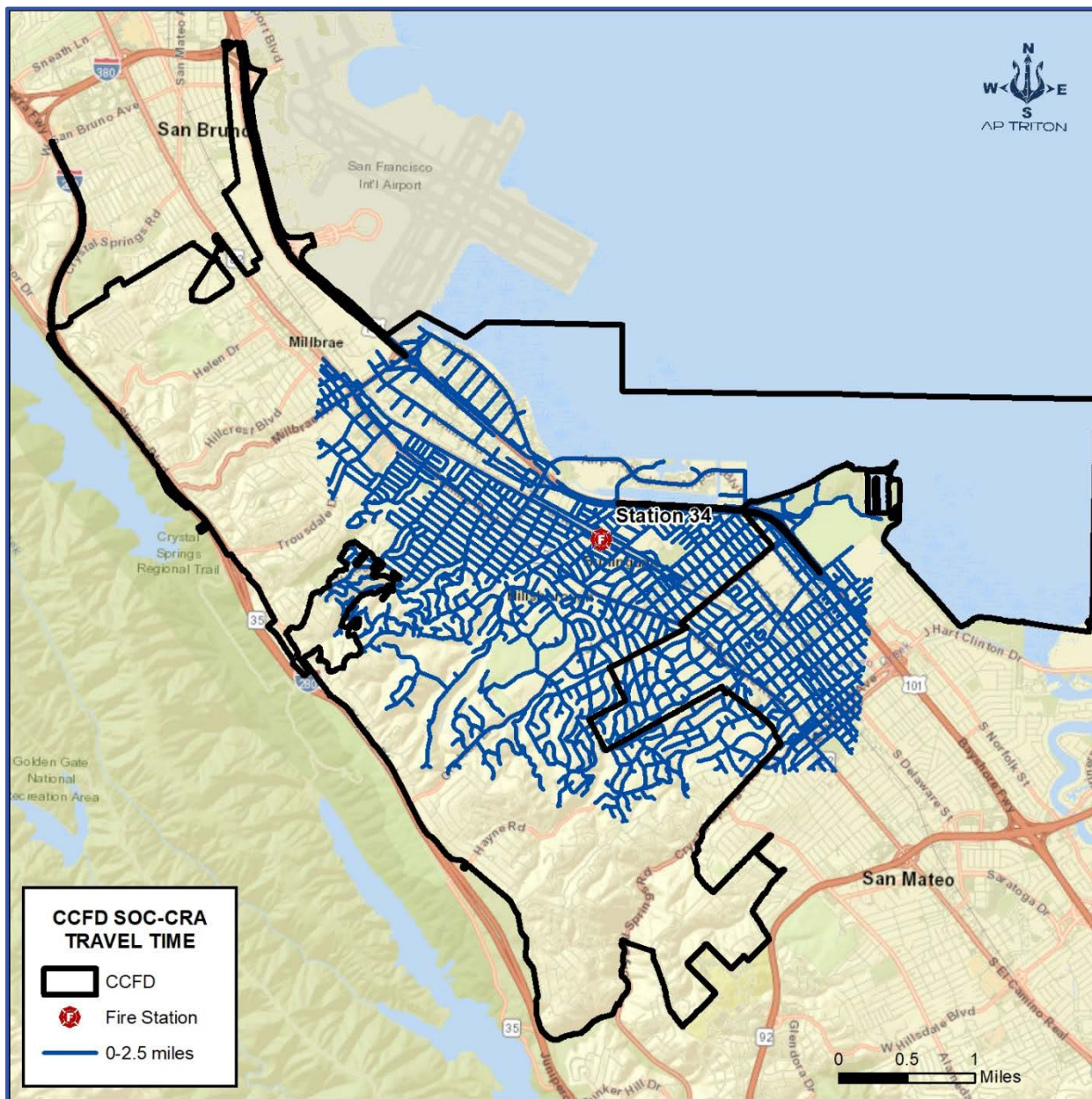
The Insurance Services Office is a major rating bureau that assists insurers in setting insurance prices. Their evaluation of the fire department includes the station location and the distance from which a property is located. For engines, better rates are achieved by being within 1.5 miles of a fire station. The following figure shows this distance for CCFD.

Figure 98: ISO 1.5-Mile Travel Distance from CCFD Fire Stations



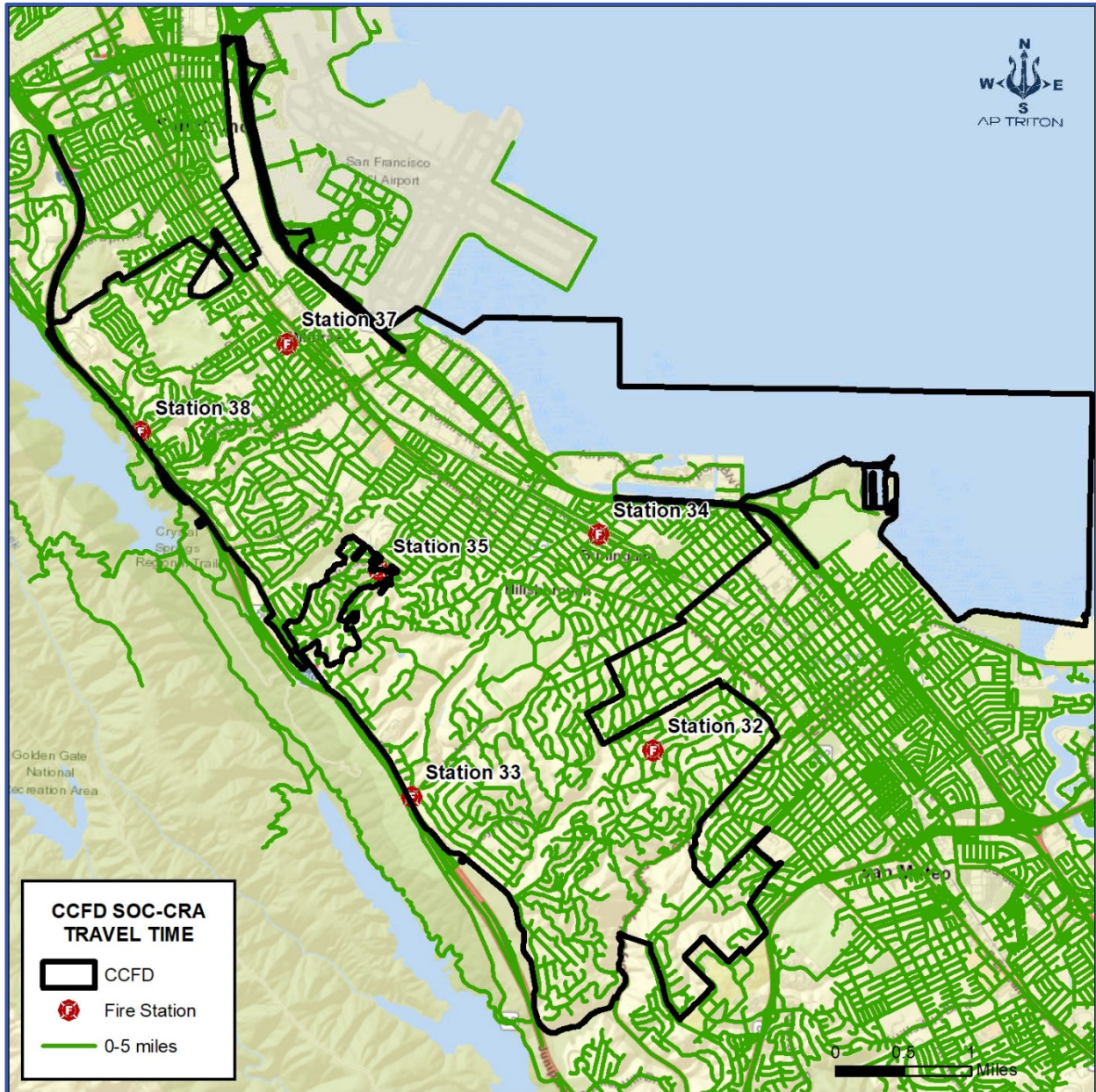
The ISO requirement for ladder truck apparatus is less severe since they should be positioned near multistory or large square footage buildings within a 2.5-mile distance. The figure that follows shows the 2.5-mile distances for CCFD Truck 34.

Figure 99: ISO 2.5-Mile Truck Travel Distance from CCFD Station 34



ISO's worst rates are reserved for properties beyond five miles from a fire station which is not an issue for the CCFD jurisdiction, as shown in the following figure.

Figure 100: ISO 5-Mile Travel Distance from CCFD Fire Stations



Effective Response Force Capability Analysis

Effective Response Force (ERF) is the number of personnel and apparatus required to be present on the scene of an emergency incident to perform the critical tasks in such a manner to effectively mitigate the incident without unnecessary loss of life or property. The ERF is specific to each type of incident and is based on the critical tasks to be performed.

The response time goal for delivering the initial full ERF to a building fire is within 8 minutes, 90% of the time for Low and Medium Risk Hazard structures, and 10 minutes, 10 seconds, 90% of the time for High-Risk Hazard and High-Rise structures. Therefore, CCFD has defined the minimum full effective response force for Low and Medium Risk Hazard building fires as five fire engines, one Ladder Truck, and two Battalion Chiefs for a total of 20 Firefighters, including resources from neighboring fire agencies.

For high-rise and commercial building fires, the defined minimum full ERF is increased to add additional engines, ladders, and Battalion Chiefs for a total of 33 Firefighters.

Additionally, while several units are dispatched when a fire is reported, once the first unit arrives and the scene is assessed, responding units may be canceled while en route.

Impact of Automatic Aid

CCFD relies upon automatic aid from adjacent agencies during a structure fire and other incidents when needed. These are very important relationships that enable the department to ensure it has sufficient staff and apparatus to fight the fire. The following list catalogs the adjacent automatic aid agencies.

- San Bruno Fire Department
- Menlo Park Fire Protection District
- Woodside Fire Protection District
- Redwood City Fire Department
- San Mateo Consolidated Fire Department
- Coastside Fire Protection District
- Kings Mountain Fire Brigade
- South San Francisco Fire Department
- North County Fire Authority
- Colma Fire Protection District

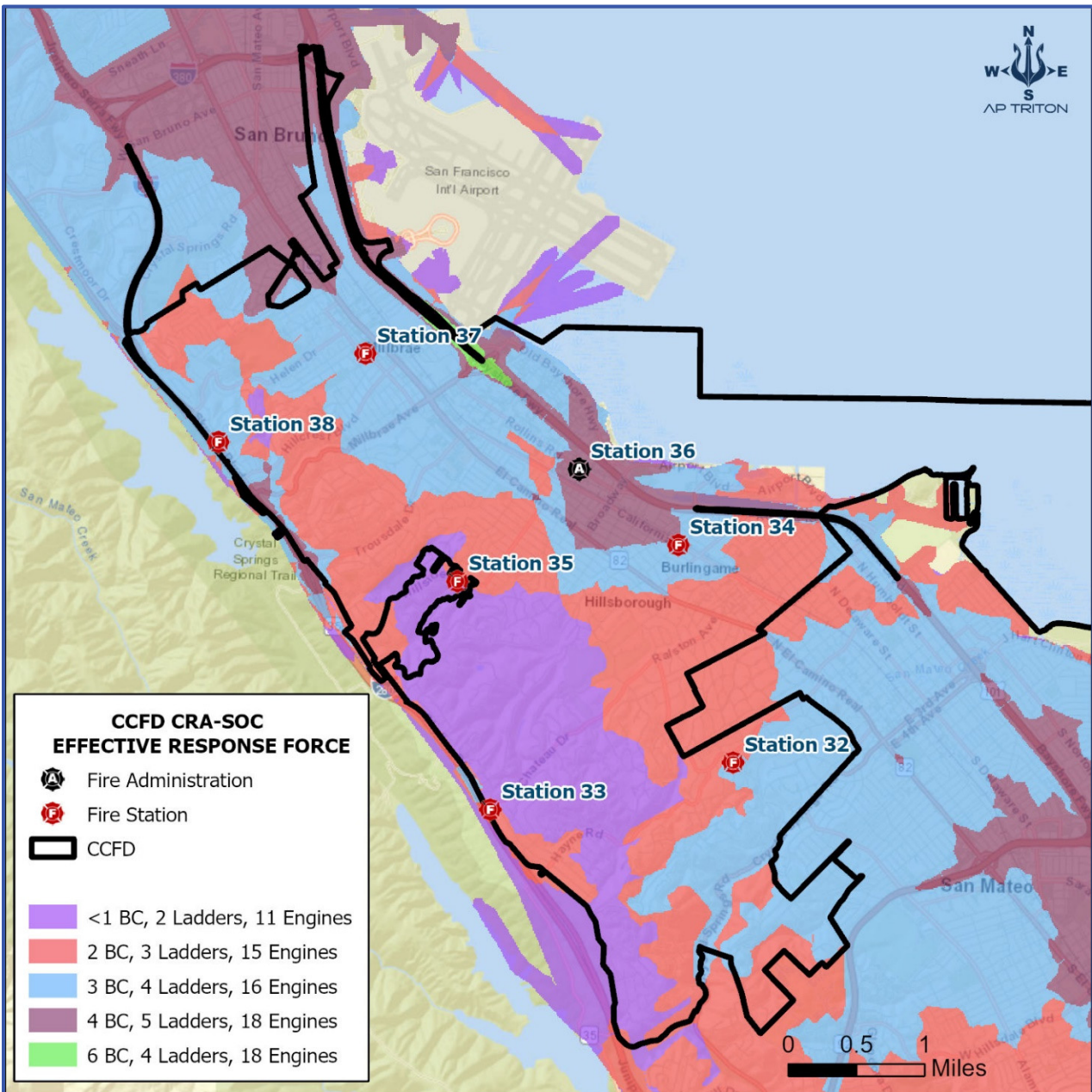
- La Honda Fire Brigade
- California Department of Forestry & Fire Protection

CCFD reciprocates by providing aid to its adjacent agencies when requested. According to CCFD data, 11% of the incidents were recorded as providing automatic aid. The most auto aid was given to San Mateo Consolidated Fire Department, with San Bruno Fire Department the second most.

The concentration analysis reviews the physical capability of CCFD to assemble both apparatus and firefighter resources to achieve its target Effective Response Force (ERF) travel time to its service area. The following figures depict the physical capability of CCFD, including auto aid resources, to assemble apparatus and firefighters by area within an 8-minute travel time. The modeled analysis assumes that all response units are available.

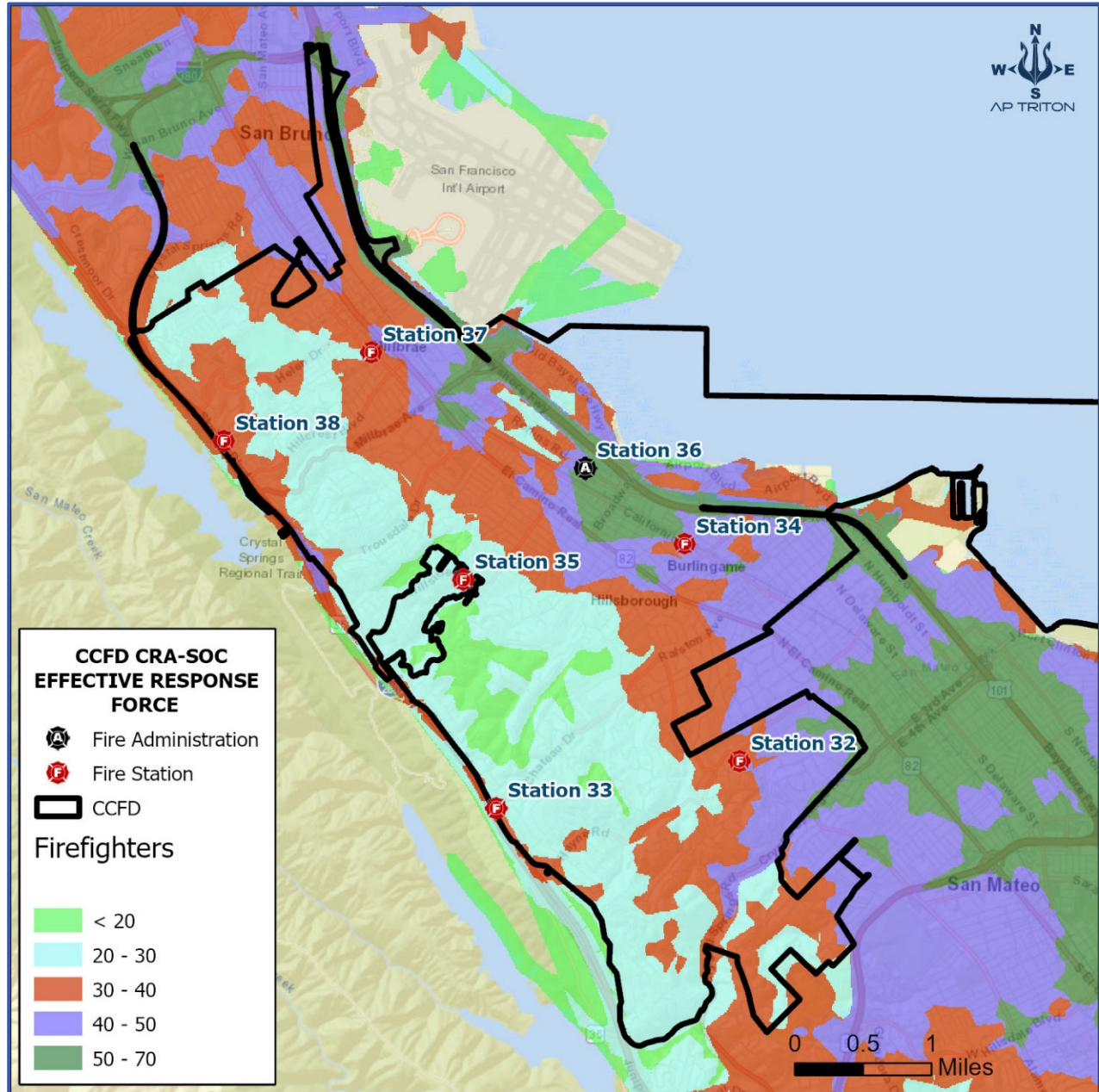
The first figure represents the collective apparatus, including auto-aid resources, needed to achieve the ERF within CCFD's jurisdiction.

.

Figure 101: CCFD Jurisdiction Effective Response Force—Apparatus

The next figure shows where the number of firefighters from CCFD and automatic aid agencies can reach within an eight-minute travel time.

Figure 102: CCFD Jurisdiction Effective Response Force—Firefighters



Resource Reliability

This section analyzes the workload at the unit level rather than at the department level, as previously shown. However, unit-level workload analysis can reveal further insights into the stress level Firefighters and apparatus are experiencing. For instance, units are only effective if available within their station. Therefore, if they are already handling an incident when another incident is reported, a unit from further away must respond, increasing the response times.

Unit Hour Utilization (UHU) calculates the percentage of time a unit is not available for a response because it is committed to an incident during a calendar year. This is important because the higher the percentage, the more time the unit is not available to respond to another incident. This is especially important for agencies like CCFD that measure their performance at the 90th percentile. For example, a unit with greater than 10% utilization cannot provide on-time performance to a 90% target within its response area. This analysis only measures response incidents and does not include other unmeasured activities in the dataset, such as training time and station duties.

Figure 103: Unit Hour Utilization

Unit	2018	2019	2020	2021
Engine 32	4%	4%	4%	3%
Engine 33	2%	3%	3%	2%
Engine 34	9%	10%	9%	8%
Engine 35	3%	4%	4%	3%
Engine 37	9%	9%	8%	8%
Engine 38	3%	3%	3%	3%
Truck 34	4%	5%	4%	3%

No units exceeded a 10% utilization rate, although Engine 34 and Engine 37 were close.

Concurrency

One way to look at resource workload is to examine the number of times multiple incidents occur within the same time frame. Therefore, incidents during the study period were examined to determine the frequency of concurrent incidents. This is important because concurrent incidents can stretch available resources and delay response to other emergencies. Therefore, this factor significantly impacts the jurisdiction's response times to emergencies.

The following figure shows the number of times that one or more incidents occurred concurrently during the study period.

Figure 104: Concurrent Incidents Percentage

No. of Incidents	Percent*
Single Incident	69%
2 Incidents	23%
3 Incidents	6%
4 Incidents	2%
5 or More Incidents	1%

*Rounded to the nearest integer

It is also useful to review the number of times that one or more response units are committed to the same incidents simultaneously. The following figure shows the number of times one or more CCFD response units were committed to incidents. It is more common for multiple response units to be simultaneously committed to incidents, with two to four concurrent responses occurring in significant numbers.

Figure 105: Unit Concurrency

Units/Incident	Percent*
Single Unit Response	92%
2 Units	7%
3 Units	1%
4 Units	1%
5 or More Units	0%

*Rounded to the nearest integer

Fire Station Response Reliability

How reliably a unit is available for a response within its assigned response zone is important to its ability to handle the incident and its response time performance. Other stations must handle incidents outside their response zones when busier units are already on a concurrent assignment. This is especially true during fire events that require multiple units assigned from several stations at the same time. During these concurrencies, CCFD has instituted Automatic Vehicle Locators (AVL) so that the dispatch center can send the closest available unit even if it is not in its response area, which can occur if the zone station is busy on another assignment (concurrency) or on a automatic aid assignment outside of the regular service area.

The following figure shows the fire station response reliability percentage of each CCFD station being available for a call within its individual response zone.

Figure 106: Fire Station First Unit Zone Response Reliability

Station Area	Reliability %
Station 32	69%
Station 33	79%
Station 34	65%
Station 35	81%
Station 37	94%
Station 38	62%

Historical System Performance

Incident data between January 1, 2018, and June 30, 2021, were evaluated in detail to determine CCFD's current performance.

Only priority incidents occurring within the CCFD service area are included in the analysis. Non-emergency public assistance requests were excluded. Performance is reported based on the type of incident as reported. Three categories are used to report performance:

- Fire—Responses to a report of a fire
- Emergency medical—All emergency medical incidents
- Other—Any other incident to which the department responded

Response Time Components

Each phase of the incident response sequence was evaluated to determine current performance. This allows an analysis of each phase to determine where opportunities might exist for improvement.

The total incident response time continuum consists of several steps, beginning with the discovery/initiation of the incident and concluding with its appropriate mitigation. Therefore, the time required for each of the components varies. In addition, the policies and practices of the Central County Fire Department and its dispatch center(s) directly influence some of the steps.

CCFD's response performance was compared to the national consensus standard for response performance found in the National Fire Protection Association's (NFPA) Standard 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2020 Edition.

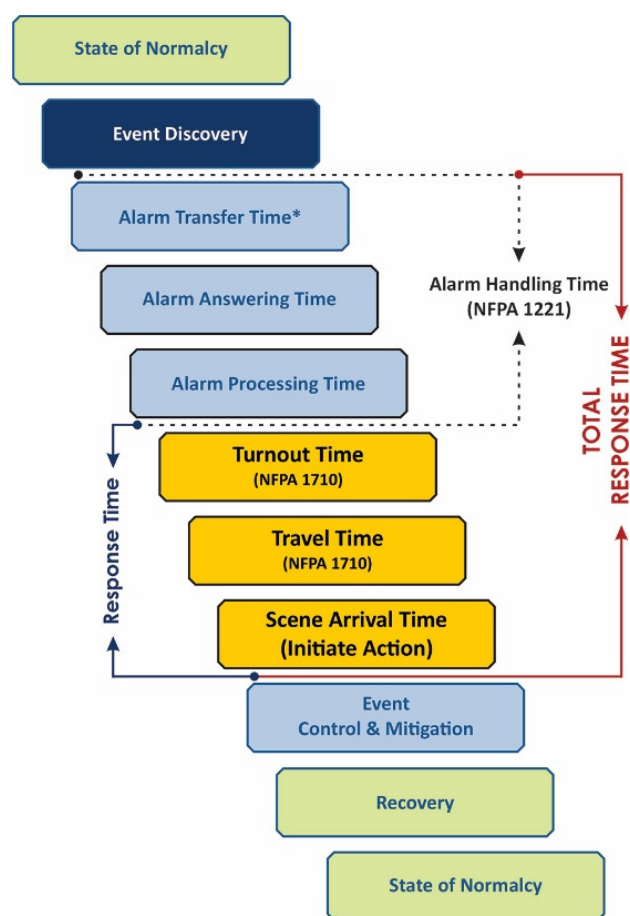
In addition, the dispatch center's performance was compared to standards found in the National Fire Protection Association's Standard 1221: *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2019 Edition.

NFPA 1710, Section A.3.3.64.6, breaks down the overall total response time elements of an emergency call in a graph titled the “Cascade of Events” chart. The Cascade of Events chart is provided to assist in understanding the relationship between NFPA 1221, NFPA 1710, and the event discovery/event initiation time, which is currently not addressed by an NFPA standard.

Two phases are included in “Total Response Time.” Phase one is the alarm handling time, which includes alarm transfer time, alarm answering time, and alarm processing time (addressed by NFPA 1221). Phase two is the turnout and travel time, addressed in NFPA 1710.

The accompanying figure on the right illustrates the typical “Cascade of Events” described by the National Fire Protection Association.

Figure 107: Cascade of Events



*If alarms are received directly at fire department communication center and not transferred from a PSAP, alarm transfer time is zero.

The following figure summarizes the performance standards used in this section to evaluate performance compared to NFPA 1221 and 1710 standards.

Figure 108: Summary of NFPA Performance Goals

Incident Interval	Performance Goal
911 alarm answering time (time from the first ring to answer). NFPA 1221	Within 15 seconds, 90% of the time
Alarm processing time (time from acceptance at the dispatch center until notification of response units). NFPA 1221	Within 60 seconds, 90% of the time
Turnout time (time from notification of response personnel until the initiation of movement towards the incident). NFPA 1710	Within 60 seconds, 90% of the time (EMS) Within 80 Seconds, 90% of the time (Fire)
First unit travel time (time from initiation of response until the arrival of the first unit at the incident). NFPA 1710	Within 4 minutes, 90% of the time
Total Response Time (time from alarm transfer or answering time until the arrival of the first unit at the incident). Both NFPA 1221 & 1710 combined.	Within 6 minutes, 15 seconds, 90% of the time (EMS) Within 6 minutes, 35 seconds, 90% of the time (Fire)
Full effective response force travel time (time from dispatch until all units initially dispatched arrive at the incident. NFPA 1710	Within 8 minutes, 90% of the time (low and medium hazard building risks) Within 10 minutes, 10 seconds, 90% of the time (high hazard & high-rise risks)

In keeping with NFPA Standards 1710 and 1221 and CCFD's performance goals, all response time elements are reported at a given percentile. Percentile represents a methodology by which response times are sorted from least to greatest, and a "line" is drawn at a certain percentage of the calls to determine the percentile. The point at which the "line" crosses the 90th percentile, for example, is the percentile time performance. Thus, 90% of the time was at or less than the result. Only 10% were longer.

The percentile differs greatly from the average. Averaging calculates response times by adding all response times together and dividing the total number of minutes by the total number of responses (mean average). Measuring and reporting average response times is not recommended because it does not identify the number and extent of events with times beyond the stated performance goal.

A detailed description and review of each phase of the response time continuum follow. Finally, all phases will be compared to CCFD's performance goals.

Detection

Detecting a fire (or medical incident) may occur immediately if someone is present or if an automatic system is functioning. Otherwise, detection may be delayed, sometimes for a considerable period. This phase begins with the inception of the emergency and ends when the emergency is detected. It is largely outside the fire department's control and not a part of the event sequence that is reliably measurable.

Alarm Handling Time

The Alarm Handling Time has two parts, the "alarm answering time" and the "alarm processing time." In addition, for agencies that have an initial Public Safety Answering Point (PSAP) that answers and transfers the call to a secondary dispatch center, there is an additional "alarm transfer time" added.

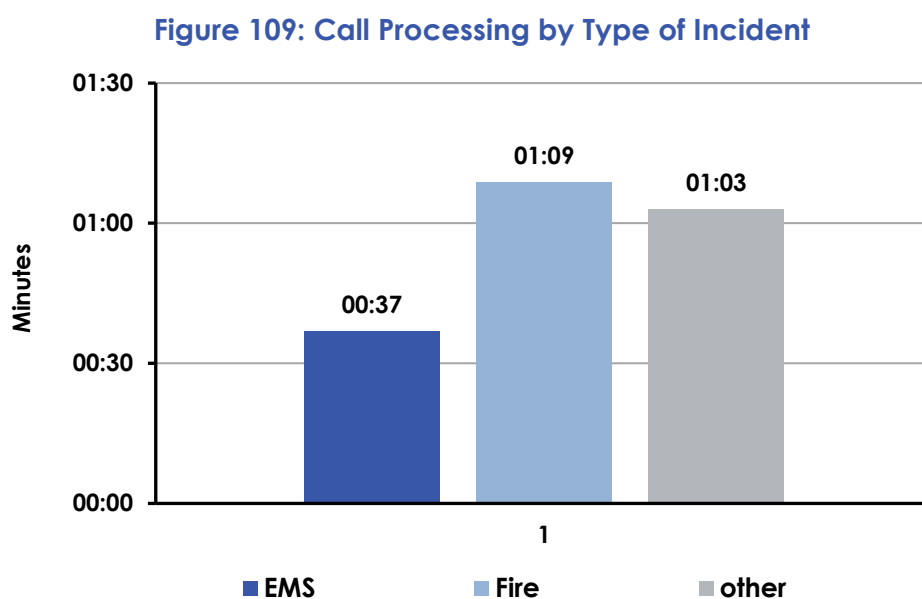
Most emergency incidents are reported by telephone to the 911 center. Call takers must quickly elicit accurate information about the incident's nature and location from persons apt to be excited. Lay people well-trained in reporting emergencies can reduce the time required for the alarm processing phase. The dispatcher must identify the correct units based on incident type and location, dispatch them to the emergency, and continue to update information about the emergency while the units respond.

CCFD has three different call answering points for the three separate cities that it serves. Burlingame and Hillsborough answer their 911 calls, query the caller to determine nature and location, and then transfer the information to the secondary dispatch center at San Mateo County Public Safety Communications Center, which dispatches the CCFD units. The "alarm transfer" time from PSAP to PSAP adds a time element to the sequence. Emergency calls in Millbrae are received directly at the San Mateo County Public Safety Communications Center, eliminating the call transfer time sequence.

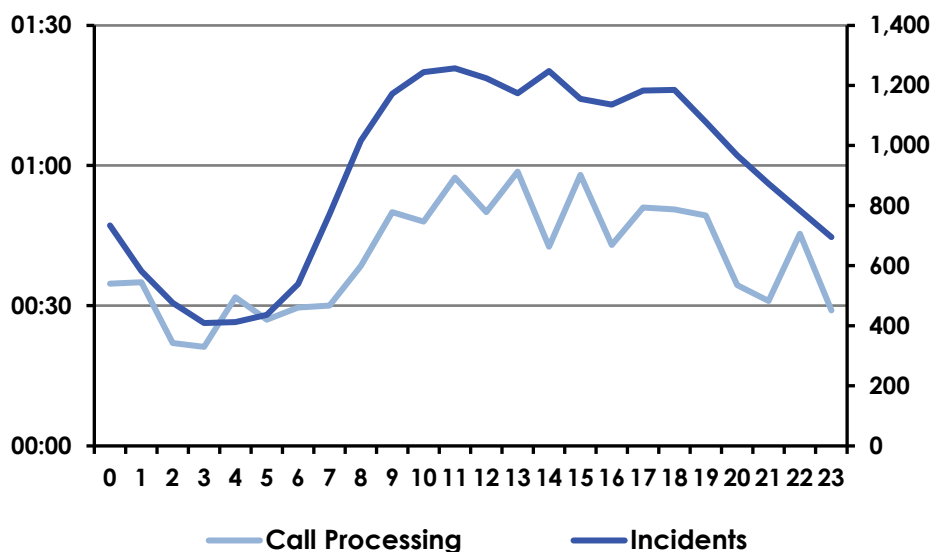
Triton determined that the actual “alarm answering” and “alarm transfer” times for the Burlingame and Hillsborough dispatch performance goal data are non-existent as the Burlingame and Hillsborough Dispatch Centers do not track these times. There is no CAD-to-CAD transfer from the initial PSAP to San Mateo County dispatch. Therefore, the “alarm answering” and “alarm transfer” data were not available in this analysis.

The second part of the alarm handing time is called the “alarm processing time,” which begins when the call is entered into the system at the dispatch center and ends when response units are notified of the incident. NFPA 1221 standards recommend that this phase occurs within 60 seconds, 90% of the time. CCFD has a call processing goal of 60 seconds.

The following figure illustrates the San Mateo County dispatch center's “call processing time” performance from the time it receives the call until it notifies response units. Overall performance during the study period was within the NFPA 1221 guideline.



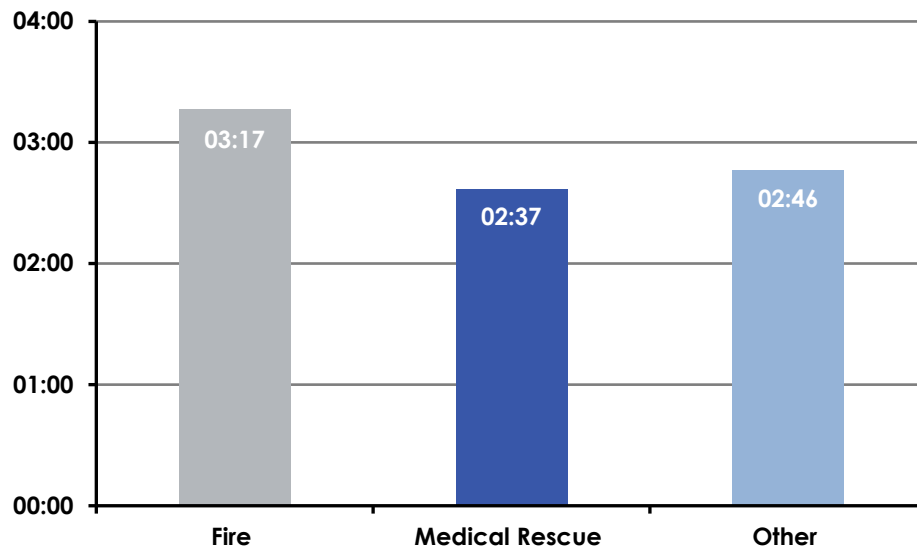
The workload at the dispatch center can influence call processing performance. The following figure illustrates performance at different times of the day compared to CCFD's response workload. Call processing time is below NFPA recommendations despite the variation of being faster in the evening and slightly longer during the day.

Figure 110: Call Processing by Hour of Day

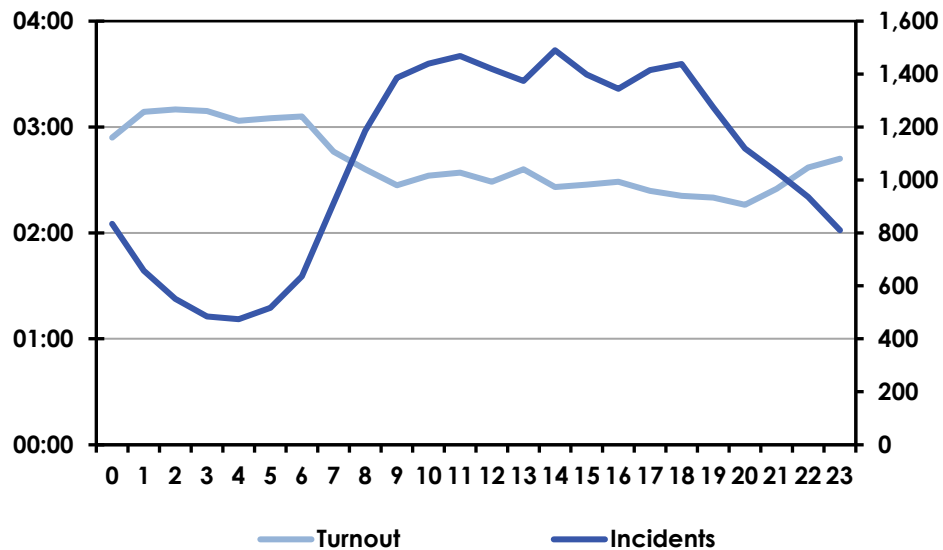
Turnout Time

The turnout time response phase is controllable by CCFD. This phase begins with the dispatch center's notification of an emergency in progress and ends when the personnel and apparatus begin to move toward the incident location. Personnel must don appropriate equipment, assemble on the response vehicle, and begin traveling to the incident. Good training and proper fire station design can minimize the time required for this phase.

The performance goal for turnout time is within 60 seconds, 90% of the time for EMS, and within 80 Seconds, 90% of the time for fire incidents. The following figure lists turnout time by incident types. Turnout times for all incident types failed to meet NFPA standards within the 90% percentile. During the study period, turnout time for EMS incidents was within 2 minutes, 37 seconds, 90% of the time, and turnout time for fire incidents was within 3 minutes, 17 seconds, 90% of the time.

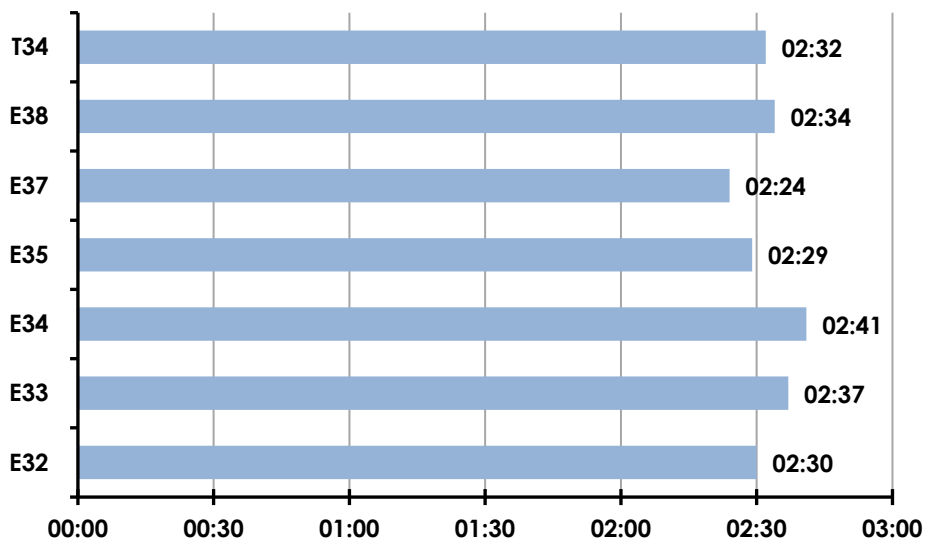
Figure 111: Turnout Time Performance by Call Type

Turnout time can vary by the hour of the day. In this case, turnout time varied by 50 seconds between the early morning hours and daytime hours, as shown in the following.

Figure 112: Turnout Time Performance by Hour of Day

The following figure shows turnout time by unit at the 90th percentile performance measure.

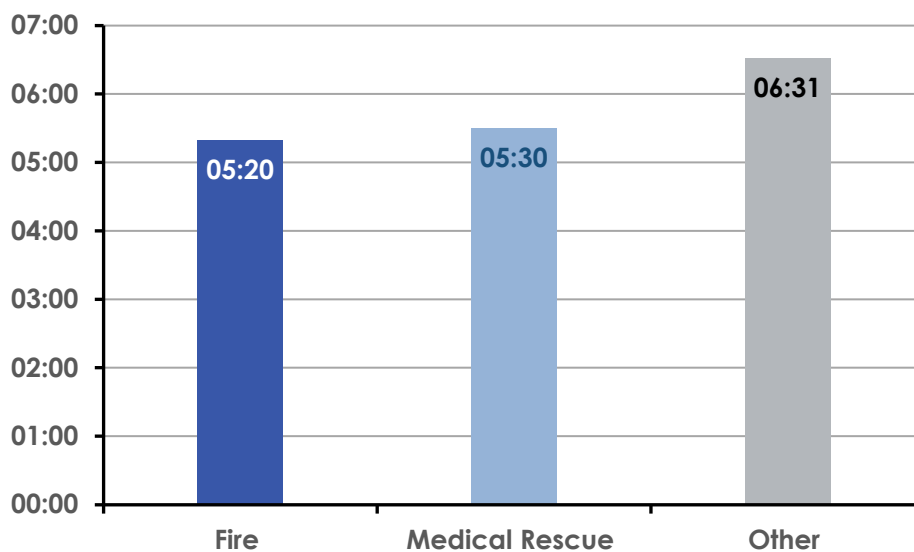
Figure 113: Turnout Time by Unit at the 90th Percentile



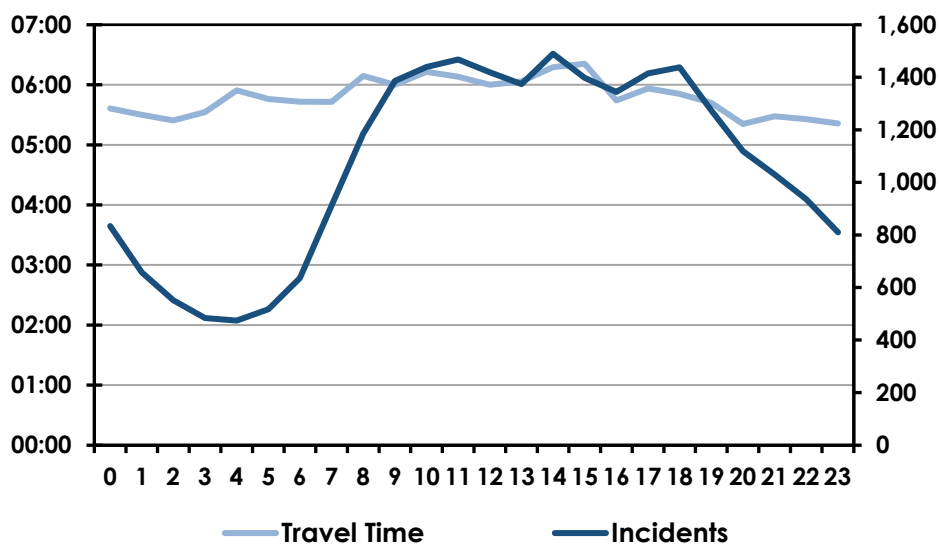
Distribution & Initial Arriving Unit Travel Time

Travel time is potentially the longest of the response phases. The distance between the fire station and the location of the emergency influences response time the most. The quality and connectivity of streets, traffic, driver training, geography, and environmental conditions also are factors. This phase begins with the initial apparatus movement toward the incident location and ends when response personnel and apparatus arrive at the emergency's location. According to NFPA 1710, the performance goal should be 4 minutes for the first response unit to arrive at an incident.

The following figure lists travel times for all priority incidents and incident types. CCFD's travel times exceeded the NFPA 1710 standard in all incident types. Travel time for all incident types was within 5 minutes, 51 seconds, 90% of the time.

Figure 114: Travel Time Performance by Call Type

Travel time can vary considerably by the time of day. Heavy morning and evening traffic can slow the department's response. Concurrent incidents also can increase travel time since units from more distant stations would need to respond. Morning commuter traffic appears to affect travel time more than evening commuter traffic. The following figure shows the travel time performance and the hourly workload.

Figure 115: Travel Time Performance by Hour of Day

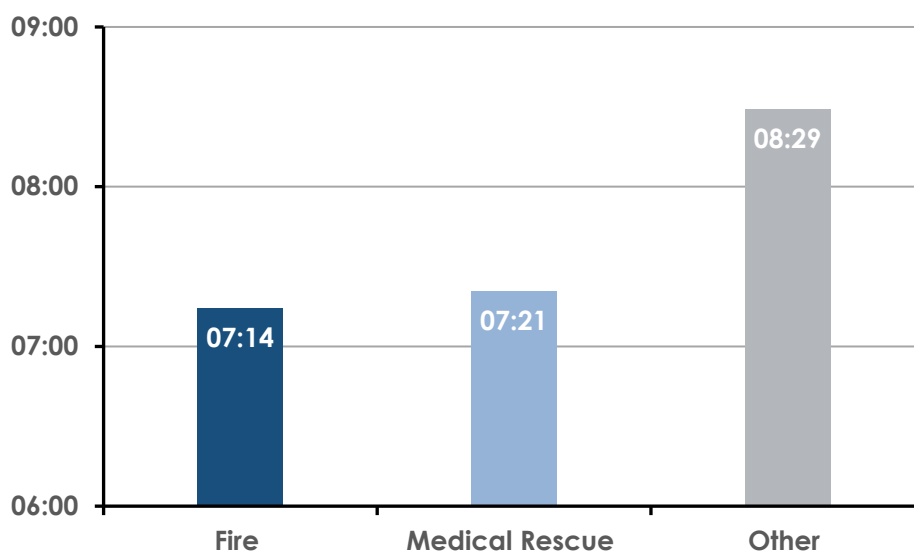
A response unit must be available within four travel minutes of the incident to provide an on-time response. During the study period, 95% occurred within four travel minutes of a fire station.

First Arriving Unit Response Times

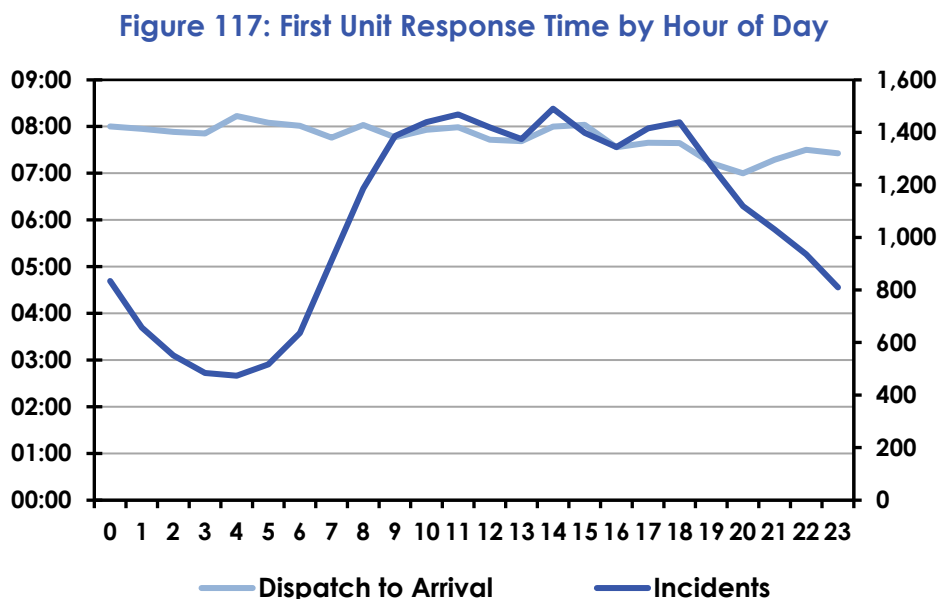
First unit response time is defined as that period between the notification of response personnel by the dispatch center that an emergency is in progress until the arrival of the first fire department response unit at the emergency. When turnout time and travel time are combined, the performance goal for response time is within 5 minutes, 90% of the time for EMS incidents, and within 5 minutes, 20 seconds, 90% of the time for fire incidents.

The following figure illustrates the first unit response time for priority incident types. Overall, response time for all priority incidents was within 7 minutes, 46 seconds, 90% of the time.

Figure 116: First Unit Response Time Performance



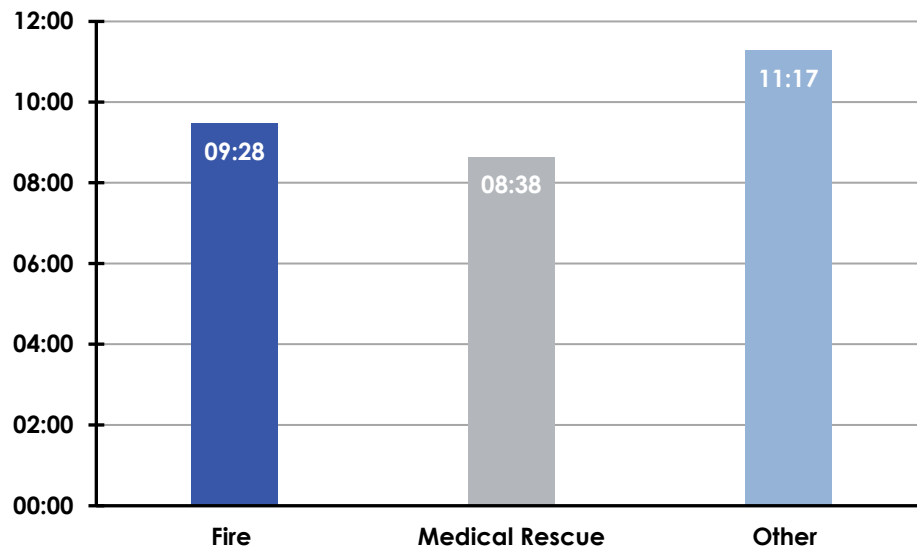
The following figure shows total response time performance by time of the day compared to incident activity by time of day.



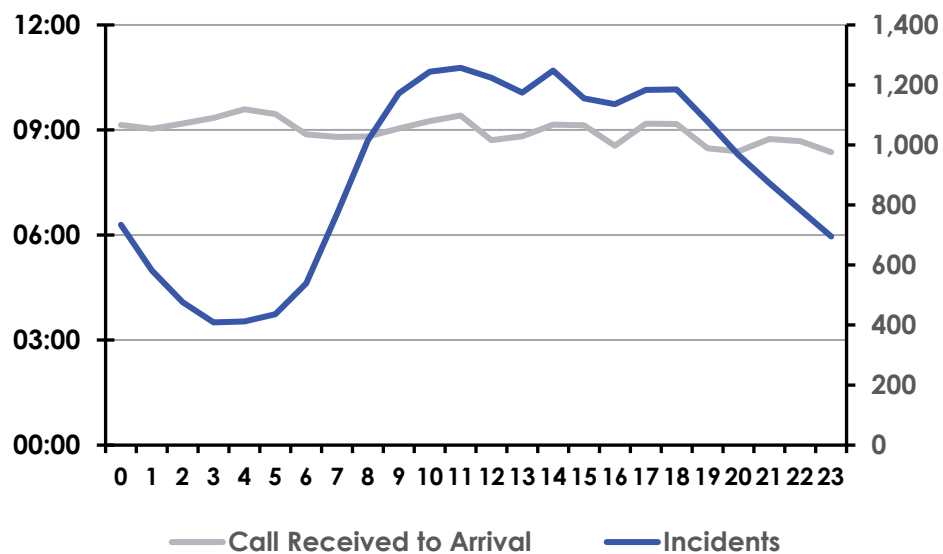
First Arriving Unit Total Response Time

From the customers' standpoint, response time begins when an emergency occurs. Their first contact with emergency services is when they call for help, usually by dialing 911. The alarm received-to-unit arrival time phase combines the alarm answer/transfer, alarm processing, turnout, and travel time phases. When the performance goals are combined, alarm received-to-unit arrival time should be within 6 minutes, 15 seconds, 90% of the time for EMS incidents, and within 6 minutes, 35 seconds, 90% of the time for fire incidents.

The following figure shows alarm received to unit arrival total response times for priority incidents within the CCFD service area. Overall, the total response time was within 9 minutes, 0 seconds, 90% of the time.

Figure 118: Total Response Time by Call Type

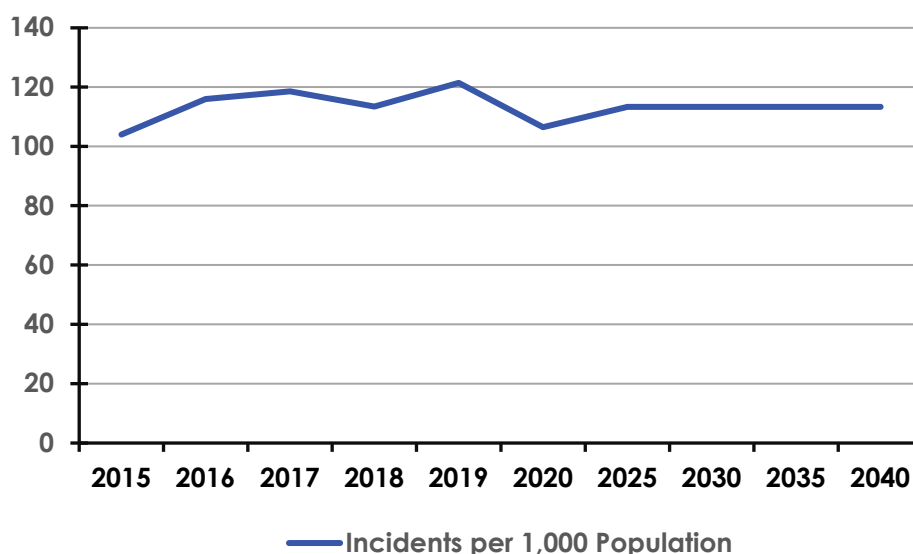
The next figure shows received-to-arrival performance by time of the day compared to incident activity by time of day.

Figure 119: Total Response Time by Hour of Day

Population & Incident Workload Projections

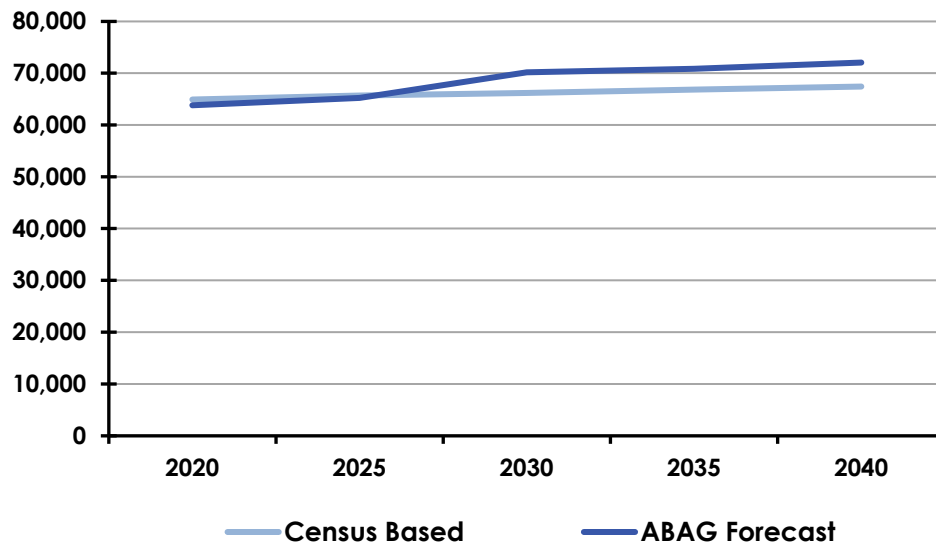
Over the last three years, the utilization rate of the fire department per 1,000 population has fluctuated, as shown in the following figure. The rate during 2019 increased, but in 2020, the rate was lower at 106.4 incidents per 1,000 population. This was likely due to pandemic concerns, traffic reduction, and fears of healthcare settings. It is projected that utilization will stabilize at 113.3 per 1,000 population in the short term and then gradually increase due to increased service demands on CCFD through 2040.

Figure 120: Utilization Rate



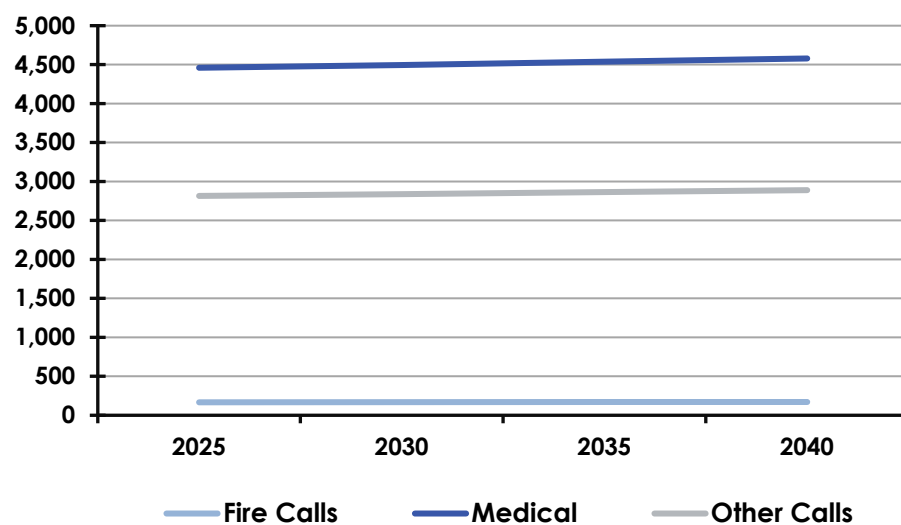
Population Growth Projections

Based on the census, a forecast for the future population can be calculated using the latest growth rate data. This forecast was very close to the population projections provided for Central County by the Association of Bay Area Governments (ABAG) report.¹⁷ Census-based forecast calculated a population of 67,422 in 2040, while the ABAG projected 72,050 residents.

Figure 121: Population Growth Projections

Service Demand Projections

The following figure shows that using the census-based forecasted population growth will potentially increase CCFD's workload. However, the response workload is expected to remain stable, and emergency medical service requests are expected to increase.

Figure 122: Service Demand Projections

Performance Objectives & Measures

Central County Fire Department's service area combines urban and suburban areas with unique risks and response requirements. This can be seen by providing fire protection and EMS coverage to nearly 15 square miles that stretch from Hwy 101 adjacent to San Francisco International Airport and the San Francisco Bay to the high wildfire risk areas of the Burlingame Hills and Wildland Urban Interface (WUI) areas of the Town of Hillsborough. Specific critical tasks must be accomplished with each type of incident and corresponding risk, and certain numbers and types of apparatus should be dispatched.

Tasks that must be performed at a fire can be broken down into two key components: life safety and fire flow. Life safety tasks are based on the number of building occupants, and their location, status, and ability to take self-preservation action. Life safety-related tasks involve the search, rescue, and evacuation of victims. The fire-flow component involves delivering sufficient water to extinguish the fire and create an environment within the building that allows entry by Firefighters.

The number and types of tasks needing simultaneous action will dictate the minimum number of Firefighters required to combat different types of fires. In the absence of adequate personnel to perform concurrent action, the commanding officer must prioritize the tasks and complete some in chronological order rather than concurrently. These tasks include the following:

- Command
- Scene safety
- Search and rescue
- Fire attack
- Water supply
- Pump operation
- Ventilation
- Backup/rapid intervention

Critical task analyses also apply to non-fire-type emergencies, including medical, technical rescue, and hazardous materials emergencies. Numerous simultaneous tasks must be completed to control an emergency effectively. The department's ability to quickly muster needed numbers of trained personnel to make a difference is critical to successful incident outcomes.

The following figure illustrates the minimum emergency incident staffing recommendations of the Commission on Fire Accreditation International (CFAI). The following definitions apply to the figure:

- **Low Risk:** Minor incidents involving small fires (fire flow less than 250 gallons per minute), single patient non-life-threatening medical incidents, minor rescues, small fuel spills, and small wildland fires without unusual weather or fire behavior.
- **Moderate Risk:** Moderate-risk incidents involving fires in single-family dwellings and equivalently sized commercial office properties (fire flow between 250 gallons per minute to 1,000 gallons per minute), life-threatening medical emergencies, hazardous materials emergencies requiring specialized skills and equipment, rescues involving specialized skills and equipment, and larger wildland fires.
- **High Risk:** High-risk incidents involving fires in more significant commercial properties with a sustained attack (fire flows more than 1,000 gallons per minute), multiple patient medical incidents, significant releases of hazardous materials, high-risk rescues, and wildland fires with extreme weather or fire behavior.

Figure 123: CFAI Staffing Recommendation Based on Risk

Incident Type	High Risk	Moderate Risk	Low Risk
Structure Fire	29	15	6
Emergency Medical Service	12	4	2
Rescue	15	8	3
Hazardous Materials	39	20	3

CCFD has developed the following Critical Task Analysis using risk matrices for various incident types. AP Triton's review of the Critical Task Analysis concludes that all are generally in keeping with industry standards and provide the minimum number of personnel needed for effective incident operations.

Establishing resource levels needed for various emergencies is a uniquely local decision. Factors influencing local decisions for incident staffing include the type of equipment operated, training levels of responders, operating procedures, geography, traffic, and the nature of buildings and other risks protected.

Critical Tasking

Critical tasks are those activities that must be conducted early on and promptly by firefighters at emergency incidents to control the situation, to stop loss, and to perform necessary tasks required for a medical emergency. CCFD is responsible for ensuring those responding companies can perform all described tasks promptly, efficiently, and safely. These are the minimum number of personnel needed by incident type. More personnel will be required for incidents of increased complexity or size.

The following figures represent the critical tasking needs and personnel needed as defined by CCFD for the respective call types within their jurisdiction.

Figure 124: Structure Fire w/Hydrants

Task	Number of Personnel
Command & Safety	2
Pump Operations	1
Attack Line	2
Search and Rescue	3
Ventilation	3
Back-up Line	3
RIT	3
Ambulance/EMS	0
Other (Utilities, support)	3
Total:	20

Figure 125: Structure Fire without Hydrants

Task	Number of Personnel
Command & Safety	2
Pump Operations	1
Attack Line	2
Back-up Line	3
Search and Rescue	3
Ventilation	3
RIT	3
Ambulance/EMS	0
Water Tender Operator	1
Total:	18

Figure 126: Commercial Structure Fire

Task	Number of Personnel
Command & Safety	2
Pump Operations (AO)	1
Attack Line	5
Search and Rescue Team	6
Back-Up Line	3
Ventilation/Ground Ladders	3
Aerial Operator (if ladder used)	0
RIT	3
Medical Care	0
Total:	23

Figure 127: High-Rise Structure Fire

Task	Number of Personnel
Command & Safety	2
Division Supervision	1
Pump Operations	1
Attack Line	6
Back-Up Line	3
Vertical Ventilation Crew	3
Victim Search & Rescue Team	6
Interior Staging Manager	1
Evacuation	2
Lobby Control	2
Equipment Transport	3
RIT	3
Ambulance/EMS	0
Total:	33

Figure 128: Wildland Fire—Low Risk

Task	Number of Personnel
Command/Safety	1
Pump Operations/Lookout	1
Attack Line	5
Exposure Lines	3
Structure Protection	—
Water Supply	—
Other (mop-up, overhaul, line)	—
Total:	10

Figure 129: Wildland Fire—High Risk

Task	Number of Personnel
Command & Safety	2
Pump Operations/Lookout	1
Attack Line	8
Exposure Lines	6
Structure Protection	6
Water Supply	3
Other (mop-up, overhaul, line)	—
Total:	26

Figure 130: Aircraft Emergency

Task	Number of Personnel
Command & Safety	2
Pump Operations	1
Attack Line	2
Backup Line	3
Rescue	3
Emergency Medical Care	3
Water Supply	—
Total:	14

Figure 131: Hazardous Materials—Low-Risk (Investigation)

Task	Number of Personnel
Command/Safety	1
Investigation	2
Total:	3

Figure 132: Hazardous Materials—High-Risk (Response)

Task	Number of Personnel
Command/Safety	1
Haz Mat Group Supervisor	1
Haz Mat Safety Officer	1
Entry Supervisor	1
Entry Team	2
Back-Up Team	2
Decontamination	4
Pump Operations	1
Chemist	1
Total:	14

Figure 133: Emergency Medical Aid

Task	Number of Personnel
Patient Management	1
Patient Care	2
Total:	3

Figure 134: Motor Vehicle Accident

Task	Number of Personnel
Command/Safety	1
Patient Care	3
Extrication	3
Pump Operator/Suppression Line	1
Vehicle Stabilization	2
Total:	10

Figure 135: Major Medical Response

Task	Number of Personnel
Command & Safety	2
Medical Group Supervisor	1
Triage	3
Treatment Manager	1
Patient Care	3
Transportation Manager	1
Documentation	1
Total:	12

Figure 136: Technical Rescue (Water Bay/Near Shore)

Task	Number of Personnel
Command/Safety	1
Rescue Boat	3
Backup Boat	3
Patient Care	3
Rope Tender (Swift Water)	
Upstream Spotter (Swift H2O)	
Downstream Safety (Swift H2O)	
Total:	10

Figure 137: Technical Rescue (Rope Rescue)

Task	Number of Personnel
Command/Safety	1
Technical Safety Officer	1
Rigging Team	3
Rescue Team Edge Supervisor	3
Backup Team	3
Patient Care	3
Total:	14

Figure 138: Technical Rescue (Confined Space Rescue)

Task	Number of Personnel
Command/Safety	1
Technical Safety Officer	1
Support Team (air monitor, air supply, communications)	3
Rigging Team	3
Rescue Team	3
Backup Team	3
Patient Care	3
Total:	17

Figure 139: Technical Rescue (Trench Rescue)

Task	Number of Personnel
Command & Safety	2
Support Team (air monitor, air supply, communications)	3
Shoring Team	6
Rescue Team	3
Backup Team	3
Patient Care	3
Total:	20

Alarm Assignments

To ensure sufficient personnel and apparatus are dispatched to an emergency event, the following first alarm response assignments have been established by CCFD to ensure sufficient personnel and apparatus are dispatched to an emergency event. "Total Staffing Needed" is the number identified in the previous Critical Tasking Analysis.

The number of personnel and apparatus required to mitigate an active and complex working incident may require additional resources above and beyond the numbers listed next. With currently available resources, CCFD cannot staff all incident types in accordance with its Critical Tasking Analysis without relying on auto-aid with other neighboring departments. The following are the total alarm assignment and personnel gap/deficit needs as defined per CCFD.

Figure 140: Structure Fire w/Hydrants

Unit Type	Number of Units	Total Personnel
Engine	5	15
Ladder	1	3
Battalion Chief	2	2
Total Units/Staffing Provided:	8	20
Total provided by CCFD Units	7	19
Total provided by Auto Aid Units	1	1
Total Staffing Needed:		20
Gap/Deficit:		0

Figure 141: Commercial Structure Fire

Unit Type	Number of Units	Total Personnel
Engine	5	15
Ladder	1	3
Battalion Chief	2	2
Total Units/Staffing Provided:	8	20
Total provided by CCFD Units	7	19
Total provided by Auto Aid Units	1	1
Total Staffing Needed:		23
Gap/Deficit:		-3

Figure 142: High-Rise Structure Fire

Unit Type	Number of Units	Total Personnel
Engine	6	18
Ladder	3	9
Air Supply		
Battalion Chief	3	3
Total Units/Staffing Provided:	12	30
Total provided by CCFD Units	8	22
Total provided by Auto Aid Units	4	8
Total Staffing Needed:		33
Gap/Deficit:		-3

Figure 143: Wildland Fire—Low Risk

Unit Type	Number of Units	Total Personnel
Engine	3	9
Brush Engine		
Battalion Chief	1	1
Total Units/Staffing Provided:	4	10
Total provided by CCFD Units	4	10
Total provided by Auto Aid Units		
Total Staffing Needed:		10
Gap/Deficit:		0

Figure 144: Wildland Fire—High Risk

Unit Type	Number of Units	Total Personnel
Engine	6	18
Brush Engine	1	3
Battalion Chief	3	3
Water Tender	1	1
Total Units/Staffing Provided:	11	25
Total provided by CCFD Units	7	19
Total provided by Auto Aid Units	4	6
Total Staffing Needed:		26
Gap/Deficit:		-1

Figure 145: Hazardous Materials—Low Risk (Investigation)

Unit Type	Number of Units	Total Personnel
Engine	1	3
Ladder		
Battalion Chief		
Total Units/Staffing Provided:	1	3
Total provided by CCFD Units	1	3
Total provided by Auto Aid Units		
Total Staffing Needed:		3
Gap/Deficit:		0

Figure 146: Hazardous Materials—High Risk (Response):

Unit Type	Number of Units	Total Personnel
Engine	2	6
Ladder	1	3
Battalion Chief	1	1
Hazardous Material Unit	1	6
SMCO Environmental Health Chemist	1	1
Total Units/Staffing Provided:	6	17
Total provided by CCFD Units	4	10
Total provided by Auto Aid Units	2	7
Total Staffing Needed:		14
Gap/Deficit:		+3

Figure 147: Emergency Medical Aid

Unit Type	Number of Units	Total Personnel
Engine or Ladder	1	3
Battalion Chief		
Total Units/Staffing Provided:	1	3
Total provided by CCFD Units	1	3
Total provided by Auto Aid Units		
Total Staffing Needed:		3
Gap/Deficit:		0

Figure 148: Motor Vehicle Accident

Unit Type	Number of Units	Total Personnel
Engine	1	3
Ladder	1	3
Battalion Chief	1	1
Total Units/Staffing Provided:	3	7
Total provided by CCFD Units	3	7
Total provided by Auto Aid Units		
Total Staffing Needed:		10
Gap/Deficit:		-3

Figure 149: Major Medical Response

Unit Type	Number of Units	Total Personnel
Engine	3	9
Ladder	1	3
MCI Trailer		
Battalion Chief	1	1
Total Units/Staffing Provided:	5	13
Total provided by CCFD Units	5	13
Total provided by Auto Aid Units		
Total Staffing Needed:		12
Gap/Deficit:		+1

Figure 150: Technical Rescue Water (Bay/Near Shore)

Unit Type	Number of Units	Total Personnel
Engine	1	3
Boat (Varies on mutual aid)	2	6
Ladder	1	3
Battalion Chief	1	1
Total Units/Staffing Provided:	5	13
Total provided by CCFD Units	3	7
Total provided by Auto Aid Units	2	6
Total Staffing Needed:		10
Gap/Deficit:		+3

Figure 151: Technical Rescue—Trench Rescue

Unit Type	Number of Units	Total Personnel
Engine	3	9
Ladder	1	3
USAR Type 1	1	3
Battalion Chief	1	1
Total Units/Staffing Provided:	6	16
Total provided by CCFD Units	6	16
Total provided by Auto Aid Units	0	0
Total Staffing Needed:		20
Gap/Deficit:		-4

Response Time Performance Objectives

Once CCFD has established response time objectives and identified the critical tasks and number of personnel necessary to achieve those critical tasks (in the preceding section), the department can begin defining emergency response time performance objectives.

The process of setting response time performance objectives will include two primary questions:

- What are the expectations of the community and elected officials regarding the initial response times of CCFD to an emergency incident? What is the public's perception of quality emergency services concerning response time?
- What response time performance would be reasonable and effective in containing the fire, stopping the loss, and saving lives when considering the common types of incidents and fire risks faced by CCFD?

With the CCFD being a career fire department, references to the national consensus standard for career fire departments should be used (NFPA 1710 Standard for Career Fire Departments). Although the NFPA performance recommendations are considered an industry best practice, fire departments working with their governing bodies sometimes implement response performance goals that better suit their communities and are under NFPA best practice standards.

Triton recommends that tiered response performance objectives be developed based on the population density and risks present. This methodology will effectively segregate the service area into response zones reflecting community expectations and fire department capabilities.

The following two figures provide examples of response performance goals based on population and risk response zones. The first example is the "first due" response of a single unit utilizing the industry best practice response time metric, from the time the call is received at 911 to arrival at the 90th percentile.

Figure 152: Example of a First-Due Single-Unit Response Standard

Density	Description	Response Time Goal
Urban	Greater than 1,000 persons/square mile	7 minutes or less at 90%
Suburban	500–1,000 persons/square mile	9 minutes or less at 90%
Rural	Less than 500 persons/square mile	11 minutes or less at 90%

The following example represents the first-alarm response to a moderate-risk structure fire, utilizing the industry best practice response time metric.

Figure 153: Example of First Alarm Response (3 Engines, 2 Medic Units, & 1 BC)

Density	Description	Response Time Goal
Urban	Greater than 1,000 persons/square mile	8 minutes or less at 90%
Suburban	500–1,000 persons/square mile	11 minutes or less at 90%
Rural	Less than 500 persons/square mile	14 minutes or less at 90%

Fire departments throughout the United States use the practice of establishing risk zones based on risk and population density. Using risk or “demand” zones provides a more accurate picture of service-delivery performance. This is especially relevant for fire departments such as CCFD, which provide emergency response to substantial and diverse service areas in the nearly 15 square mile fire department serving the communities of Burlingame, Hillsborough, and Millbrae.

The preceding response standards are presented as examples. The previous discussion provides CCFD with the information necessary to establish response standards and targets. Establishing response standards and performance goals should be viewed as a strategic planning tool for community loss control. Therefore, Central County Fire Department is encouraged to begin the process as soon as feasible to assist with future planning needs.

Section IV: FINDINGS & RECOMMENDATIONS

Findings & Observations

The following section outlines some of Triton's more significant findings and observations during this study based on the data received, onsite observations, and stakeholder interviews. In addition, these follow many of the "critical issues" as listed by the Fire Chief including providing sustainable funding, governance stability, long term planning and solutions for facility needs, and providing exceptional service that is responsive to the evolving needs of the communities CCFD serves.

Operations & Deployment

- Historical incident records show that most of the service demand occurs in Central County's Station 37 response area, particularly in the City of Millbrae and North portions of Burlingame. There is also a moderate demand located near Station 34.
 - Based on the data, Stations 37 and 34 are located in adequate locations.
 - There is additional service demand near the current CCFD Administration office (Station 36) which could justify considering the future re-staffing of Station 36.
 - There is new significant development occurring in the East portion of CCFD's jurisdiction that warrants future service delivery planning for that area including a potential future fire station.
 - Coverage gaps are created during busy periods between 8 a.m. to 6 p.m.
 - Current overall station location configuration meets the overall resource distribution coverage for four-minute travel time throughout CCFD, and for adequate ISO engine distance requirements.
 - Based on the CCFD individual unit workload, the dual companies (engine and truck) at station 34 are placed in an appropriate location, although Truck 34 could be relocated slightly North to Station 36's area for better ISO truck distance requirements.
 - The concentration analysis for CCFD shows that with the current staffing model combined with station locations and automatic aid resources, the physical capacity of CCFD to assemble both apparatus and firefighters by area for an effective response force, is very good and exceeds the capabilities of most agencies.
- CCFD has a current ISO rating of 2. The agency is to be commended for being in one of the top ISO classifications in the state of California.

- CCFD maintains Intergovernmental Agreements (IGA) with other departments to initiate a closest forces response model utilizing Automatic Vehicle Location (AVL) technology.
 - CCFD relies on automatic aid to fill its operational ERF requirements in some areas, just as adjacent agencies rely on CCFD to fill theirs .

Response Performance

- Overall, there is an inability to consistently meet response performance goals and NFPA 1710 best practice time measurements throughout the CCFD area as some of the following performance time measurements show.
- The “alarm processing time,” overall performance of 60 seconds or less, 90% of the time, based on the data provided, was within NFPA 1221 standards.
- The Cities of Burlingame and Town of Hillsborough Police Department PSAP dispatch centers answer the calls for CCFD and the “call answer” and “call transfer” times to San Mateo County Public Safety Communications are not well documented.
- Within the city of Millbrae, 911 calls are answered directly by the San Mateo County Public Safety Communications Center resulting in faster overall alarm handling times for residents of Millbrae due to no call transfer processes from a secondary PSAP.
- NFPA 1221 benchmarks recommending that 911 calls be answered within 15 seconds, 90% of the time (within 20 seconds, 95% of the time), are not able to be determined due to insufficient data by the 2 Police PSAP's and with no current CAD to CAD transfer system in place from either PSAP to San Mateo County dispatch.
- CCFD's turnout time performance goal is 60 seconds or less at 90% for EMS call types.
 - Overall turnout times were 2 minutes, 37 seconds at 90% during the study period.
- CCFD's turnout time performance goal is 80 seconds or less at 90% for priority fire response call types.
 - Overall turnout times were 3 minutes, 17 seconds at 90% during the study period.
- CCFD's travel time performance goal is 4 minutes, 0 seconds at 90%.
 - CCFD's travel time performance was 5 minutes, 25 seconds at 90% for priority fire and EMS incidents during the study period.
- CCFD's first unit response time performance goal is 5 minutes, 0 seconds or less at 90% for all call types.

- For all incident types during the study period, CCFD's first-arriving unit response time was 7 minutes, 46 seconds at 90%, and 7 minutes, 17 seconds at 90% for priority fire and EMS call types.
- CCFD's total call received to first unit arrival response time performance goal is 6 minutes, 30 seconds or less at 90% for all call types.
 - For all incident types during the study period, CCFD's first-arriving unit response time was 9 minutes, 0 seconds at 90%.
- CCFD currently does not regularly conduct performance and outcome measurements.

Personnel & Staffing

- Although NFPA 1710 recommends 4-person staffing on engines and aerial apparatus, CCFD does not maintain this standard as a minimum.
 - Current daily minimum staffing on all 6 engines and one truck is currently three.
 - Current daily minimum staffing for CCFD is 22 firefighters total in six stations.
 - Triton estimates that it would require an additional twenty-one firefighters to maintain 4-person staffing on all seven apparatus.
 - It is well documented that 4-person companies, particularly on aerial apparatus, maintain much greater efficiencies and safety factors when operating on fire and emergency scenes.
 - Four-person staffing would improve deficiencies found in total staffing needed for CCFD critical tasking and alarm assignment totals, and would further increase the ERF assembly capabilities.
- CCFD does not have a formal succession training plan in place and many in the organization listed a formal succession training plan as a needed goal.
- CCFD currently has a limited number of operational management staff consisting of the Fire Chief, Deputy Fire Chief, Training Battalion Chief, and Fire Marshal with the three shift BC's having numerous program responsibilities, in addition to 24/7 emergency response and shift management duties. Numerous input received stated that the current management staff FTEs are inadequate and inefficiencies exist with operational shift BC's also maintaining numerous program responsibilities.
- CCFD previously maintained a shift inspector program who was the 4th FTE on the truck when not conducting inspection duties. The program was regarded very highly by many at all levels within CCFD.

- The need for a fleet/facilities manager FTE for CCFD was stated by many as a needed position to manage the CCFD mechanics and provide much needed facility planning and oversight.
- CCFD shares a current Captain FTE in training with San Bruno Fire Department.

Fire Stations & Facilities

- CCFD is operating from aging fire stations. CCFD's fire stations range in age from 27 to 71 years old, with an average of 54 years. Station 35 is the oldest of the stations and was partially remodeled in 2020. Several facilities have likely reached their useful life as a functional modern fire station.
- Four of the fire stations (station 32, station 33, Station 34, station 38) were given a rating of "Fair" under the general conditions. The other three fire station facilities (station 35, Administration, station 37) were given a rating of "Poor" under the general conditions.
- Except for Stations 34 and 36 (Administration), Firefighter exercise and workout equipment is located on the apparatus floor of each of the other fire stations. In addition, all stations have apparatus exhaust systems and security systems, with only two stations (station 34, station 37) having sprinkler systems.
- There was an identified need at CCFD for more adequate training ground space and equipment. CCFD recently ended a training IGA with San Mateo Consolidated Fire Department.
- All six of CCFD's fire stations store firefighter turnouts in the apparatus bay instead of separate and ventilated turnout storage rooms.
- The current CCFD administrative facility at Station 36 is an inadequate facility not intended and designed to house a modern fire department administration. The CCFD staff have outgrown it and expanding or relocating it should be considered.
- All of CCFD's facilities are owned by the individual jurisdictions of Burlingame, Millbrae, and Hillsborough.
- CCFD's current front-line apparatus has one engine (engine 34) rated as condition I "Excellent", four engines (engine 32, 35, 37, 38) rated as condition II "Good", and one engine (engine 33) rated as condition IV "Poor". CCFD's one front line truck (truck 34) is rated as condition I "Excellent".
- The entire fleet of reserve apparatus for CCFD consisting of four engines and one truck, were all rated as condition IV "Poor."

- A total of 57% of the CCFD command, staff, utility, and other apparatus, are rated in the "Poor" or "Fair" categories.

Miscellaneous Findings & Observations

- It was noted by numerous personnel at all levels that the formation of the CCFD Joint Powers Authority (JPA) agreement and joint cooperation has been successful.
- CCFD's Joint Powers Authority agreement (JPA) consists of only the City of Burlingame and the Town of Hillsborough.
- CCFD currently provides fire and emergency medical services for the City of Millbrae via a Contract for Service, and Millbrae is not part of the JPA. The City of Millbrae Fire Department became part of CCFD in 2014. The current contract for service between CCFD and the City of Millbrae expires in 2024.
- CCFD currently does not have a Capital Facilities Replacement Plan.
- CCFD currently does not have a Master Plan or formal Strategic Plan in place.
- Some of CCFD's standard operating guidelines are outdated and need updating.
- There was universal stakeholder input received at all levels, including from community members and elected officials, about the high level of regard, support, enthusiasm, spirit, and camaraderie within CCFD.
- There is a high level of support at all levels for the current fire department management team and Fire Chief. They are to be commended for continuing to lead the agency forward as CCFD continues to provide the best service possible to the citizens of CCFD.

Proposed Strategies & Recommendations

Response Performance

Recommendation 1: Consider initiating a regular Response Time Performance time tracking and reporting system.

- CCFD does not currently regularly analyze and report operational response performance including turnout time, travel time, total response time, and assembly times for an effective response force.
- Software and reporting programs are readily available to assist with this tracking and regular reports should be conducted quarterly or bi annually to assist both the department's management staff and elected officials in oversight and planning.
- Regular response time performance tracking and reporting will allow CCFD to begin to analyze the reasons for deficiencies under best practices, and methods for improvements.

Recommendation 2: The department should start conducting performance and outcome measurements.

- CCFD needs to look at ways to provide performance and outcome measurements to share with the community and the elected officials. This could include documenting both property loss and property saved. As an example, it is a powerful message to be able to demonstrate every year that CCFD experienced a \$2.5 million loss for the year and was able to save \$6.5 billion of property.
- Other measurements could include: How often is the fire contained to the room of origin? How long does it take to get water on the fire? How long does it take to get fire control? How many animals have been saved for the year? How often is an effective firefighting force on-scene within 8 minutes?
- Outcome measures will determine if a program or practice is working. Each year the CCFD JPA approves a budget to provide funding to operate the agency. Does the funding allow the organization to develop and implement what they believe are the best strategies to improve services? Developing outcome measures permits the CCFD and its JPA member agencies to determine if program activities are beneficial.

Recommendation 3: Consider doing further analysis of the call answering times, call processing times, and specifically call transfer times from the City of Burlingame PD and the Hillsborough PD PSAP Dispatch Centers to San Mateo County Dispatch Center.

- The City of Burlingame and Hillsborough Police Department Dispatch Centers answer the emergency calls for CCFD, then transfer them to San Mateo County Dispatch, and the hand off times are not well documented and the actual “call answer” & “call transfer” times were not readily available for this study.
- NFPA 1221 standard benchmarks recommend that 911 calls be answered within 15 seconds, 90% of the time (within 20 seconds, 95% of the time). This benchmark was unable to be determined due to insufficient data.
- CCFD contacted the Burlingame and Hillsborough Police dispatch centers during the course of this study and Triton sampled some data for “call answer” times from the PSAPS. Burlingame PD provided some sample data that included “call answer” times and the actual time of day of the “call transfer” to San Mateo County Dispatch, which showed the “call answer” times met NFPA 1221, however; this data is not linked nor shared with CCFD or San Mateo County Dispatch.
- More detailed analysis should be conducted for data on the actual call answering times, and call transfer times that the two PD’s are taking to get the calls transferred to San Mateo County.
- Emergency calls in Millbrae are received directly at the San Mateo County Public Safety Communications Center, eliminating the call transfer time sequence.
- Once a call is at San Mateo County dispatch, the data shows the “call processing” time of 60 seconds or less, 90% of the time, was within NFPA 1221 standards.
- Because of questions that arose in the CAD data provided by San Mateo County Dispatch for this study, it is recommended that further analysis on the accuracy of the CAD data is conducted, specifically looking at the time stamp benchmarks provided on all incidents.
- It is further recommended that CCFD and other regional partner fire departments look into a Computer Aided Dispatch (CAD) CAD to CAD transfer system or network. By creating an interconnected network of CAD systems, public safety agencies can communicate faster and more efficiently and track data appropriately.

Recommendation 4: Consider studying turnout time performance measures and possible causes.

- CCFD's turnout times were found to be well above the performance goal of 60 seconds or less at 90% for all call types.
- Overall turnout times were 2 minutes, 41 seconds at 90% during the study period.
- Turnout time is the one area over which CCFD has total control and is not affected by outside influences. Turnout time affects overall response times and reducing this time component reduces total response time.
- Factors that influence turnout time can include station conditions, crew awareness, response procedures, in addition to poor station layouts and inefficient designs.
- New station facilities and better designs can improve turnout performance measures.

Operations & Deployment**Recommendation 5: Consider hiring enough additional firefighters to staff Truck 34 to ensure a minimum of 4-person staffing daily.**

- The department previously had positions on the books to staff the truck with four firefighters using a shift inspector program. The minimum of four meets NFPA 1710, helps the Effective Response Force data, and improves the critical tasking total staffing needed for alarm assignments.
- It is well documented that 4-person truck companies maintain much greater efficiencies and safety factors when operating on fire and emergency scenes.
- The shift inspector program, which had high praise and success within the agency, could be reinstated as an alternative to help accomplish this recommendation.

Recommendation 6: Consider hiring enough additional firefighters to ensure a minimum of 4-person staffing daily on all six CCFD Fire Engines.

- Current daily minimum staffing on all six-engine companies currently three. The minimum of four meets NFPA 1710 standards, and improves the critical tasking total staffing needed for alarm assignments.
- Based on Triton's risk analysis, increasing engine staffing to a four-person company model will result in an enhanced Effective Response Force for potential fires and other significant events to all occupancies, most notably for high-risk occupancies.
- Four-person staffing meets the "two-in, two-out" OSHA respiratory protection safety standard.

- Four person staffing goals could be implemented based on future available JPA funding, potential grants, or other available funding resources, and should be determined by CCFD based on planning needs and performance measures.

Fire Stations & Facilities & Apparatus

Recommendation 7: Consider developing a long-term Capital Facilities Replacement Plan.

- CCFD should plan for facility maintenance, remodel, expansion, and relocation needs to maintain a high degree of safety, efficiency, long-term sustainability, and effectiveness.
- CCFD operates out of six fire station facilities, with a seventh currently being used as an administrative facility, ranging in age from 27-71 years old, with a combined average age of nearly 54 years. Four facilities are rated as "Fair" and three are rated as "Poor."
- The fire station facilities are operated by CCFD but owned by the three separate cities (Burlingame, Hillsborough, Millbrae).
- The department does not currently have a long-term Capital Facilities Replacement Plan and needs to develop a plan and work with the JPA and the cities to plan for the current and future facility maintenance and replacement needs, which include some immediate facility needs and concerns.
- The capital facilities replacement plan, which should include a comprehensive engineering and architectural evaluation, would help determine which CCFD stations could be remodeled and modernized, and which should be razed and replaced.
- The plan should also include future fire station locations based on population growth and CCFD future service-demand projections.

Recommendation 8: Consider modifying and expanding the long-term Apparatus Replacement Plan.

- CCFD's current front-line apparatus inventory has six engines rated as condition I "Excellent", and one engine (engine 33) and one truck (truck 34) rated as condition IV "Poor".
- The two front line apparatus rated as "poor", (engine 33 and truck 34), need to be included in the plan as a high priority replacement.
- With the entire fleet of reserve apparatus for CCFD consisting of five engines and one truck, all rated as condition IV "Poor", CCFD's reserve apparatus also needs to be included in the replacement plan for CCFD's long term needs and sustainability.

Recommendation 9: Consider constructing or relocating the Central County Fire Department Administrative Facility to a more suitable facility location.

- CCFD should consider needed administrative facility changes including the possible relocation of the CCFD administration facilities.
- CCFD administration currently is housed at a previously staffed fire station (station 36), that is 60 years old.
- There is currently limited space within station 36 and the layout was not intended nor designed for an administrative facility. With the CCFD staff continuing to grow, it would be beneficial to keep all of the CCFD administration and administrative support services staff under one roof in an adequate facility.
- Numerous stakeholder interview feedback was received that reported the current inefficient office space, inadequate total office space, and lack of easy public access due to stacked parking out front at the current administrative location.
- CCFD should work with the JPA and the three cities to research and find a suitable location that could be a standalone facility, either owned or leased, that had adequate modern office space, and was more visible and accessible to the public.
- CCFD could look into the feasibility to have the cities implement a fire impact fee for capital improvement needs to assist with this facility need.

Recommendation 10: Consider replacing Station 36 with a new staffed fire station for future growth and consider locating property on the East side of CCFD for a future fire station.

- With the pending growth coming in the Rollins Road area and in the East portion of CCFD on the bay side, there is a need for the future planning of potential additional fire stations. These two potential station locations may be needed based on future traffic growth and future demand of services that will be needed on a daily basis.
- The acquisition of property on the East side could be accomplished soon while property still exists and can be done in cooperation with CCFD's JPA agency partners.
- The recommendation of re-staffing station 36 could be considered at the same time as the CCFD administrative office location needs are assessed. CCFD could rebuild and reopen station 36, while moving administration to another location.

Recommendation 11: Consider hiring a full time FTE Facilities and Fleet Manager.

- CCFD currently has two mechanic positions within its staff and no fleet services manager.
- Stakeholder input was received addressing the need for a fleet services manager who could also manage the CCFD facility program.
- Both of these functions are an integral part of CCFD's needs and the full time FTE is justified as it is attainable to be staffed.

Recommendation 12: Find suitable locations for work out exercise areas, outside of the apparatus bays, at stations 32, 33, 35, 37, and 38.

- There is a significant need for workout exercise areas outside the hazards of the apparatus bays in five of CCFD's fire stations.
- The safety and health risks of exercising in apparatus bays present with diesel exhaust, fuel vapors, turnouts, post incident medical bio and carbon contaminants, and cramped space next to fire apparatus, all contribute to the health and safety risks for firefighting personnel and other staff using the exercise equipment.
- This risk and concern was noted by several CCFD personnel during the stakeholder interviews.
- it is recommended that CCFD work to find suitable locations for exercise equipment outside of the apparatus bays in the immediate future.

Organizational Structure

Recommendation 13: Consider conducting a management staffing analysis to analyze the management staffing needs of CCFD and make adjustments to the organizational structure and chart.

- Stakeholder input was received that CCFD needs to increase and/or adjust the middle management structure of the organization.
- It was identified that there were previously nine operational BC's within the previous member agencies and there are now three within CCFD's organizational structure.
- CCFD currently has a limited number of operational management staff consisting of the Fire Chief, Deputy Fire Chief, Training Battalion Chief, and Fire Marshal with the three shift BC's having numerous program responsibilities, in addition to 24/7 emergency response and shift management duties.
- Numerous inputs received stated that the current management staff FTEs are inadequate and inefficiencies exist with operational shift BC's also maintaining numerous program responsibilities and unable to interact with crews.
- A needs assessment should be completed to determine the actual needs of the management staff for CCFD.
- Adding management staffing and adjusting programs and duties will result in greater efficiencies, including maintaining and implementing new programs, and balancing the workload and shift responsibilities that the current BCs are managing.

Recommendation 14: Consider funding a more aggressive reserve fund for capital replacements.

- With the current condition and needs of many of CCFD's facilities and apparatus, the JPA needs to fund a more aggressive, but sustainable, capital asset replacement reserve fund.
- This would allow CCFD and the JPA to replace apparatus and make facility improvements on a more efficient and acceptable schedule.
- The CCFD fire administration and Fire Board can manage the priorities and expenses separate from the City's budgets. This could potentially allow the department to manage and even possibly own, the facilities in the future.

- While it is understandable that the member agencies do not want to over-contribute, especially during difficult economic times within their own operations, some consideration to increasing the department's capital reserve fund balance would be prudent to replace needed capital assets on a timely schedule and avoid unexpected and unforeseen future expenditures.

Governance & Mutual Cooperation

Recommendation 15: Consider conducting a cooperative services feasibility study for shared services with neighboring agencies.

- Currently, CCFD shares training services with San Bruno Fire Department who provides a training Captain for shared training.
- CCFD shares Automatic Vehicle Locating (AVL) responses via an auto aid agreement with all adjacent agencies who in return, do the same for CCFD.
- In some cases, auto aid and AVL response can create imbalances and can constitute a significant out-of-district impact for agencies. As an example, the data shows that 11% of the total calls that the San Bruno Fire Department responds on are within CCFD, with 99% of those being in Millbrae. In 2021, San Bruno responded to Central County 332 times, vs Central County responding to San Bruno 54 times.
- The City of Millbrae's contract with CCFD expires in 2024, which leads to potential additional opportunities for both CCFD and their other adjacent agencies.
- San Bruno Fire Department considered joint JPA opportunities with CCFD in the past.
- Stakeholders at all levels from all agencies during the course of this study, provided input on the potential collaborative partnership opportunities that exist within CCFD, Millbrae, San Bruno Fire Department, and even San Mateo Consolidated Fire Department, who is also an adjacent partner with CCFD, and also maintains their own separate three member JPA board.
- These potential efforts should be carefully studied when the opportunity is right, to determine the financial and operational impacts and potential benefits, programs that may be shared, and other considerations for CCFD, its JPA members, and the other regional agency partners.

Recommendation 16: Consider implementing a digital record keeping system.

- CCFD currently operates their recording keeping system by archiving hard copies of files, records, and district documents.
- Researching and locating needed files is currently very cumbersome and time consuming.
- Implementing a digital record keeping system would benefit CCFD by giving them the ability to easily access, update, edit, and have better visibility of documents by storing information and records digitally.

Recommendation 17: Consider conducting a feasibility study for the formation of a potential CCFD Fire District.

- One of the CCFD Fire Chief's top critical issues identified is "providing stability and sustainability in funding, operational capabilities, and governance" into the future.
- The CCFD General Fund includes contributions from the City of Burlingame, the City of Millbrae, and the Town of Hillsborough. In accordance with the contract for fire services with the City of Millbrae, Millbrae is responsible for 30% of the operational budget. The remaining 70% is split between the City of Burlingame and the Town of Hillsborough, with 60% allocated to Burlingame and 40% allocated to Hillsborough.
- That equates to Millbrae paying for 30% of the annual budget, Burlingame paying for 42% of the annual budget, and Hillsborough paying for 28% of the annual budget. These agency contribution amounts seem inconsistent compared to other comparable factors of the overall demands that each jurisdiction uses.
- When compared to the overall population of CCFD, Millbrae is 34% of the overall CCFD population, Burlingame is 48%, and Hillsborough is 17%.
- Looking at geography and square miles of service coverage within CCFD, Millbrae is 21% of the overall coverage area, Burlingame is 39%, and Hillsborough is 40%.
- Other fluctuating percentage factors between the three cities include the total assessed evaluations of each, and most notably, the current service demand data. The most dense service demand areas and highest call volume is within Millbrae and in the North portions of Burlingame.
- With the formation of a fire district, all of these inconsistent factors are removed and each resident and business within CCFD would pay an equal proportional share to the fire district based on a separate fire district tax rate, separate from the three jurisdictions.

- This would be a much more stable and sustainable method of funding and governance for CCFD, and with the excellent relationship CCFD already has with all three communities, there is generally little to no differences to the community or loss of control or identities as CCFD already operates as Central County Fire Department.
- Other general advantages of forming a fire district for CCFD could be owning the capital assets and fire stations, funding the needed fire station improvements, adequate funding for the purchase, maintenance, & rotation of fire apparatus, and a better ability to attain operational compliance with OSHA and NFPA staffing standards.
- The formation of a fire district could additionally attract other adjacent partners to consider as well, which could lead to additional efficiencies gained, the elimination of duplication of efforts, and a more regional approach to provide the best overall service possible to the communities that CCFD serves.

Miscellaneous Recommendations

Recommendation 18: Continue to support and update Central County Fire Department's succession planning and career development programs.

- Succession planning and career development is important for CCFD.
- CCFD should continue to support succession planning for each of the critical positions within the organization. This should include all promoted positions:
 - Captains, Battalion Chiefs, Fire Marshal, Deputy Chief, and the Fire Chief.
- Consider utilizing NFPA 1021: Standard for Fire Service Officer Professional Qualifications as a general guide.
- CCFD should consider training options for personnel, such as the National Fire Academy's Command & Control classes, Managing Officer Program, and Executive Officer Program.

Recommendation 19: Consider hiring a full time FTE Plans Reviewer for the Fire Prevention Division.

- CCFD has enough demand for a full time equivalent (FTE) Fire Plan Reviewer, as the demand currently is around 600 plan reviews per year. This would allow the department to not use the private company for plan review and allow CCFD to keep more of the revenue. The private company may still be needed for high-rise projects or specialty reviews. With future development potential, the department could lose a significant source of revenue by continuing doing plan reviews outside of the department.
- The plan reviewer could also do fire permits and building permits, and would allow for the fire inspectors to focus on other responsibilities and needs. Once the plan review is brought on board, staff adjustments are made, and the department starts to see the future revenue, CCFD should review the overall prevention staffing needs and could be the time to add another inspector and/or fire prevention specialist for the WUI.

Recommendation 20: Consider developing a Strategic Plan and Master Plan for Central County Fire Department.

- A strategic plan is a living management tool that provides short-term direction, builds a shared vision, documents goals and objectives, and optimizes the use of resources.
- With the growth and service demands increasing, a Strategic Plan will help CCFD with its future planning efforts.
- As part of the strategic planning process, a formal capital facilities and apparatus replacement plan should also be developed and maintained.
- A master plan is a dynamic long-term planning document that provides a conceptual layout to guide future growth and development and should also be included as part of CCFD's long term planning processes.

Recommendation 21: Develop and update standard operating guidelines.

- It was identified that some SOGs for CCFD are outdated and updating them is a priority. Triton received stakeholder input on the need to update policies.
- The Fire Chief recognizes the need and has the desire to make the process happen.
- Several operational personnel shared their concerns regarding the need to update water rescue operating guidelines and highway safety guidelines. Some of these concerns could be addressed through the training of personnel on current guidelines that do exist within CCFD.
- Once new updated guidelines have been developed, all personnel should be trained in the guidelines.

Section V: APPENDICES

Appendix A: Risk Classifications

The following are the risk classifications determined by incident type.

Fire

Low Risk

These incidents are considered low in risk and are minor in scope and intensity. It requires a single fire apparatus and crew to manage fires involving passenger vehicles, fences, trash or dumpster, downed power lines, residential or commercial alarm investigations, or an odor investigation.

Moderate Risk

These incidents are the first alarm response needed to manage a moderate fire risk incident. These incidents include smoke in a building, small outside building fires, commercial vehicle fire, a single-family residence, lightning strike to a building, automatic fire alarm at a high-risk occupancy, or a hazardous materials pipeline fire.

High Risk

These incidents are a second alarm response needed to manage a high fire risk incident. These incidents include smoke in a high-life hazard property (school, skilled nursing, etc.), single-family residence with injured or trapped victims, multi-family residential building, or a moderate-sized commercial/industrial occupancy.

Maximum Risk

A third alarm response is needed to manage a maximum fire risk incident. These incidents include a hospital, assisted living facility, fire in an apartment building, high-rise building fire, a large commercial or industrial occupancy, hazardous materials railcar, or storage occupancy. Incident assignments will include additional command staff, recalling off-duty personnel, or mutual aid assistance for other critical tasking needs.

EMS Risks

Low Risk

A single EMS unit can manage a low-risk EMS incident involving an assessment of a single patient with a critical injury or illness, no-life threatening medical call, lift assist, or standby.

Moderate Risk

A two-unit response is required to control or mitigate a moderate risk EMS incident. It involves assessing and treating one or two patients with critical injuries or illnesses or a motor vehicle crash with 1-2 patients.

High Risk

A multiple-unit response is required to control or mitigate a high-risk EMS incident. It involves 3-8 patients with injuries ranging from minor to critical. Patient care will involve triage, BLS, ALS treatment, and a coordinated transport of patients.

Maximum Risk

A multiple unit response is required to control or mitigate a maximum risk EMS incident. It involves more than nine patients with injuries ranging from minor to critical. Patient care will involve triage, BLS, ALS treatment, and a coordinated transport of patients. If this is an active shooter incident, the response may require a casualty collection area unit to treat patients, not in the hot zone.

Technical Rescue**Low Risk**

A single fire unit can manage a low-risk technical rescue incident involving rescues that are minor in nature, such as a child locked in a vehicle, elevator entrapment, or minor mechanical entrapment.

Moderate Risk

A two-unit response is required to control or mitigate a moderate technical rescue risk incident. Support is not usually required from a technical rescue team. This type of incident involves a motor vehicle crash that requires patient extrication, removal of a patient entangled in machinery or other equipment, or a person trapped by downed power lines.

High Risk

A multiple-unit response is required to control or mitigate a high-risk technical rescue incident. This type of incident may involve full-scale technical rescue operations ranging from structural collapse to swift water rescues. It may involve multiple motor vehicles that require extrication, commercial passenger carriers, or a vehicle impacting a building. Support is usually required from a technical rescue team. This incident may require multiple alarms.

Maximum Risk

A multiple-unit response is required to control or mitigate a maximum risk technical rescue incident. Support is required from a specialized technical rescue team and may have multiple operations locations. This type of incident will involve full-scale technical rescue operations such as victims endangered or trapped by structural collapse, swift water, or earth cave-ins.

This incident will require multiple alarms and may expand beyond the identified critical tasking. Recall of off-duty personnel or assistance from auto or mutual aid may occur during a disaster or when additional alarms and command staff are needed.

Hazardous Materials

Low Risk

A single fire unit can manage a low-risk hazardous materials incident involving carbon monoxide alarms and other unknown hazmat investigations without symptomatic victims, less than 20 gallons of fuel, natural gas meter incident, downed power lines, equipment, or electrical problems, or attempted burning. This includes automatic alarms that may originate from a hazardous material.

Moderate Risk

A two-unit response is required to control or mitigate a moderate-risk hazardous materials incident. Direct support is not usually required from a hazardous materials team. This type of incident involves a carbon monoxide alarm with symptomatic patients, a fuel spill 20–55 gallons, or a gas or petroleum products pipeline break not threatening any exposures.

High Risk

A multiple-unit response with a hazmat team is required to control or mitigate a high-risk hazardous materials incident. Support is needed for a Level 2 Haz-Mat incident that involves establishing operational zones (hot/warm/cold) and assigning multiple support divisions and groups. This response includes a release with 3–8 victims, gas leaks in a structure, hazmat alarm releases with victims, flammable gas or liquid pipeline breaks with exposures, fuel spills greater than 55 gallons, fuel spills in underground drainage or sewer systems, transportation or industrial chemical releases, or radiological incidents. Additional assistance may be required to expand operations past the identified critical tasks.

Maximum Risk

A multiple-unit response is required to control or mitigate a maximum-risk hazardous materials incident. Support is required from an on-duty hazmat team and their specialized equipment. This type of incident involves establishing operational zones (hot/warm/cold) and assigning multiple support divisions and groups. Examples include nine or more contaminated or exposed victims, a large storage tank failure, hazmat railcar failure, or a weapon of mass destruction incident. This incident will require multiple alarms and may expand beyond the identified critical tasking. Recall of off-duty personnel or assistance from auto or mutual aid may occur during a disaster or when additional alarms and command staff are needed.

Wildland Urban Interface

Low Risk

A single fire unit can manage a low-risk wildland firefighting incident involving a fire minor in scope, structures not threatened, and Red Flag conditions do not exist. These include low-risk wildland or grass fires, an outside smoke investigation, illegal or controlled burns, or small vegetation fires.

Moderate Risk

Multiple units are needed to manage a moderate-risk wildland firefighting incident involving a significant fire in brush, brush pile at a chipping site, grass, or cultivated vegetation. Red Flag conditions do not exist, and structures may or may not be threatened.

High Risk

Multiple units or alarms are needed to manage a high-risk wildland firefighting incident. This level is associated with Red Flag warnings with structures that may or may not be threatened. This fire involves a significant wildfire in brush, grasses, cultivated vegetation, and woodland areas. Additional alarm assignment, command staff, recall of off-duty personnel, and mutual aid assistance may require the operations to extend beyond the identified critical tasks.

Appendix B: Summary of Stakeholder Interviews

Introduction to the Stakeholder Interviews

Triton interviewed stakeholders representing a wide variety of the Central County Fire Department's internal and external stakeholders. The purpose of these interviews was to gain a better understanding of issues, current service levels, concerns, options regarding the emergency service delivery system, opportunities for improvements, and expectations.

It is important to note that the information solicited and provided during this process was in the form of "people inputs" (stakeholders individually responding to Triton's questions), some of which are perceptions reported by stakeholders. All information was accepted at face value without an in-depth investigation of its origination or reliability. The project team reviewed the information for consistency and frequency of comment to identify specific patterns and/or trends. Based on the information reviewed, the team identified a series of observations, recommendations, needs, and general comments that were significant enough to be included in this report.

Stakeholders were identified within the following groups: Elected Officials (Burlingame, Hillsborough, & Millbrae), City Management & Department Heads from all three cities, Rank & File line personnel, Chief Officers, Administrative Staff, and Community Leaders.

Elected Officials, City Management, City Department Heads

What strengths contribute to the successes of the Central County Fire Department?

- CCFD is great to work with and has some of the most fantastic staff.
- CCFD employees are great to work with and open to change.
- The CCFD staff is very adaptive to the needs of our customers.
- Our city building department and CCFD work closely together and have an excellent relationship.
- The department and city do a good job keeping each other in the loop.
- Each city used to have their own department. It's important to be one and we have come a long way operating as one. Our leadership has demonstrated this well.
- Our firefighters have a lot of pride for the organization.
- Our training is very good. Training is critical and needs to be in house.
- They have a collaborative nature and work well together.
- Having city managers rotate on the JPA every 2 years is good.

- We are much more efficient than we were before the merger.
- CCFD is very responsive, easy to talk to, and easy to communicate with.
- CCFD's service is exceptional. They are well trained and they adapt to each of the three cities and political bodies.
- A strength of our community is our diversity.
- CCFD has done a great job of educating and mitigating for Wildland fires.
- We have a great Fire Chief and an outstanding staff.
- The quality of our employees is a strength of CCFD. The core service of CCFD is outstanding.
- The station coverage for the geographic area of CCFD is good.
- Our firefighters are well trained and the service they provide is fantastic.

What does Central County Fire Department do well?

- CCFD has a great relationship with the communities and the cities.
- All three cities feel like CCFD is their fire department and not an external organization.
- They know their tasks well and are very knowledgeable of their craft.
- CCFD is good at communicating with building permit applicants during process.
- CCFD prevention division has good turnaround time on plan checks.
- The level of services CCFD provides is excellent.
- The fire dept has good public interaction. They show up at holiday events, fairs, school fire safety programs, and more. They show up and engage.
- CCFD is very service oriented. They work for the citizens and are stewards of citizens.
- CCFD does a good job managing all three cities. Every city feels that CCFD is theirs.
- CCFD does a great job attending and interacting at community events.
- They are at every one of our council meetings which is excellent.
- We get good feedback regarding CCFD and their performance on medical calls.
- The CCFD Fire Marshal is phenomenal.

What are some areas in which you think the fire dept could make improvements?

- CCFD should work with the cities to develop and implement an impact fee for fire services for the highly developed areas.
- The department needs to grow, with needs based on the community's growth and the demand of service.
- Getting back into engaging the community and at events as restrictions are lifting.
- Improve the plan review expertise with the scale of future development.
- The concern of the departments bandwidth for plan reviews based on future demands.
- Look at the balance of percentage of contributions from the three different cities.
- Continue to work with the different cities in the enforcement of the 7A code.
- Improve the capital budget reserve for the department.
- Concerns with the City of Millbrae not having representation on the fire board.
- Improve reserve fund and cash flow policies.
- The possible need for another station based on the amount of development and growth happening in the next several years.
- The need for expanding the administration building to an adequate admin facility.
- We need to look at our infrastructure, most notably the fire stations.
- Since we merged, we have been in the admin building. We have outgrown it and it was never intended to house an administration facility.
- Fire prevention is physically separated from admin. It results in "Silo" effect.
- Dealing with work place hours during Covid has been challenging. It works much better for employees to be physically working on site.
- We need to work on system improvements in Hillsborough. We have 18 tanks in 14 locations and earthquakes are a huge concern.
- As an elected official, our fire station facility upgrades are important and is critical.
- The most important issue to improve is for every one of CCFD's clients to have proper representation. Central serves three cities. This improvement should be immediate and everything else will follow. A seat at the board is needed.
- As elected officials, I would like to see more after incident post information follow up on significant events such as what happened, what were the response times, and did we have enough personnel to mitigate? There currently is no follow up.

What do you see as Central County Fire's greatest risks?

- The wildfire potential is our greatest risk. 75% of our residents fall within the WUI.
- Earthquakes will continue to occur, although less frequently, but high risk.
- Emergency preparedness. Our residents need to prepare for quakes, power loss, civil disturbance, etc.
- Top concern in Hillsborough is wildfire. High rises and development are top concerns in Burlingame and Millbrae.
- The great resignation is a concern. Maintaining an employee base, developing hybrid models working from home that work, and recruitment and retention.
- We have a 100-year-old plus city (Hillsborough) and our infrastructure is aging and very expensive to make improvements.
- Narrow roads and fire truck access is a growing risk to our community and to our firefighters.
- The ability to fund our true fiscal needs is a critical issue and risk into our future.
- The BART and trains are a huge problem from sweeping trains, homelessness, higher crime, and the demands it places on CCFD responding to BART calls.
- Earthquakes, aircraft accidents, and future increased flooding.
- Labs and bio tech campuses, as we welcome these new businesses, we need to be prepared for the incidents and responses they will create.
- Because of our location, the high-speed rails and the airport affect us.
- Risks include WUI, aircraft, flooding, gas line explosion, climate change, sea level rise, and East winds.

What do you see as the top critical issues face by the Central County Fire Department?

- Infrastructure needs (upgrade stations and apparatus).
- Future development and growth, being able to address future density growth.
- The relationship with the City of Millbrae.
- Projected CCFD budget for the department needs, we currently have limited funds for resources.
- The hiring of future qualified personnel within the department.
- Wildfire risk (WUI).

- Our funding comes from 3 cities. It's a delicate balance working with three separate cities with three separate budget systems.
- Recruitment and retention. Maintaining institutional knowledge is challenging. Most of our firefighters live outside the area.
- The cost of living in our area is a concern. The 48/96-hour schedule fortunately allows firefighters to live elsewhere but maintaining 40-hour admin staffing is a concern.
- There are worries about Millbrae not being on the board. There are pros and cons to adding Millbrae to the JPA.
- We need a long-term vision for our facility needs, staffing needs, and with Millbrae.
- Top critical issues are wildland urban interface, the risk of too much growth and are we ready, and the political issue with the relationship with Millbrae.
- Trying to maintain employees, recruitment, and retention. It's expensive to live here.
- Maintaining a system of equalness so that all three cities are treated the same, have the same services, the same procedures, and the same representation.
- We have challenges in development in both Burlingame and Millbrae.
- It is becoming very challenging to find personnel wanting to work 4-10-hour days.
- The level of service given to each of the three cities and does each city have adequate representation? It is extremely challenging and is paramount to have equal representation.
- We need to address the long-term financing of the station facilities. Three different cities owning different stations, that are at different levels of conditions with repair & replacement needs, with three different city budgets. Bonds are a way we can fund our station needs.
- Our biggest challenge is stability onto the future.
- Do we have enough firefighters, enough stations, and what are the staffing needs?
- The coverages on our East side will continue to be challenging as we continue to develop in that area.
- The future of Millbrae's relationship with CCFD is a critical issue.
- My top three critical issues are the adequate representation for Millbrae, #1 - #3. We want the best possible service available and all options are on the table.
- Millbrae needs to feel like they count and have representation on the fire board.

If you could change one thing in the fire department, what would it be?

- Make adjustments for the huge influx of inspections.
- Housing needs for future fire department hires. New hires can't afford to live in the department's cities.
- Improve the relationship with labor.
- CCFD needs more fire inspectors. Burlingame has 6 inspectors alone.
- Right now, we have multiple separate benefit levels. We can re-align them to be more fair, efficient, and economical.
- We need to find an opportunity to move into and staff a new admin building. It would result in better collaboration, would function better, and be more efficient.
- We need to set up a way to include Millbrae.
- Are alternative service models a possibility including squads, or 12-hour peak activity units? They are nontraditional but what are the costs, benefits and would they make sense? May be worth looking at.
- BART needs to be a partner with CCFD. I have no confidence in BART.
- As an elected official, I would explore further consolidation (forming fire district, further regionalization) as there are lots of benefits.
- The CERT program for Millbrae is broken and needs to be fixed.

How would you describe the level of services provided by the fire department?

- The JPA merger has been a benefit. The 3 jurisdictions have 1 fire department now and we didn't lose any quality level of service, and it improved.
- I could not be happier than I am with CCFD.
- I am quite happy with the services of Central Fire Department to our city.
- I give the fire department an A+ as they are really outstanding and easy to interact with.
- The services provided are outstanding. CCFD participates at community events and always has a presence.
- As an elected official, I believe in regionalism and collaboration. It doesn't matter what's on the door. I would love to have more combined fire departments in the area.

Officers, Rank & File, Firefighter Line Personnel**What strengths contribute to the successes of the Central County Fire Department?**

- A high percentage of those interviewed stated the department's success was due to the department's culture and the employees that work for CCFD.
- CCFD has a family-oriented atmosphere.
- CCFD gets a lot accomplished with little resources.
- The success of training getting back to the basics, standardizing training, and focusing on in house training.

What are some areas in which you think the fire dept could make improvements?

- A high percentage of those interviewed stated the department needs heavier rescue and specialty training. Team members felt they are becoming non proficient on the heavy rescue & equipment.
- We are possibly specializing in too many things and should focus on the basics.
- Two fire stations do half the call workload and there is a need for balance.
- Better communications throughout the department.
- We have a hard time saying "no" from the top down.
- We have a lack of standardized policies in the department.
- The BCs are juggling too many responsibilities. They need to invest more time with their shifts, with the training division, and other areas.

What do you see as Central County Fire Department's greatest risks?

- Wildland fires and response to the Canyon areas.
- Travel for response apparatus on roads with access issues.
- The lack of USAR training and Heavy Rescue training.
- Senior community members with "falling" calls.
- Enforcement of WUI on City owned property.
- Earthquake, highway responses, and bio tech hazmat response.

What do you see as the top critical issues face by the Central County Fire Department?

- The change in businesses and growth happening in the community and being able to keep up with service demands.
- A critical issue brought up by numerous personnel was the lack of qualified candidates and entry applicants.

- Members expressed a concern of the experience and community knowledge gap between senior and new members of organization.
- Fixing the organizational chart within CCFD. The lack support staff in training is very much needed.
- Professional development and succession planning.
- Filling 40-hour positions with so many members living so far away will be a critical issue.
- CCFD needs to make sure the organization keeps up with the community's growth versus the demand for services.
- The aging facilities. Some improvements have been made but some items and facilities still need to be addressed.
- The Millbrae fire tax is up again in 2024. That's on top of the CCFD fire contract renewal coming up as well.

If you could change one thing in the Central County Fire Department, what would it be?

- Several members brought up opening a station on the other side (East) of the tracks on the bay side.
- Change the BCs workload with multi-tasking and the juggling of projects.
- Continuity in working between different BCs as different BCs operate differently.
- Look at moving the heavy rescue to allow for members throughout the department to train on it and become proficient.
- Facilities improvement.
- Staffing model with four-person staffing on the ladder.

You have significant mutual aid partnerships you rely on. How well do you work with Mutual aid (MA) partners?

- Working with our surrounding partners is seamless and smooth.
- We are concerned over the lack of future training with partners.

In your opinion, what are the most serious problems or safety risks in your response area?

- Wildland fires.
- BART and rail incidents.
- Language barriers on incidents.
- Single medic units.

- Several members stated working on the Freeways and Highways was a serious risk and concern.
- Congestion and access issues on tight roadways.
- Alternative dwellings in locations and occupancies not expected to be there.
- Concern with the old infrastructure in the cities.

Think back to a situation where you felt powerless to help a resident in need. What could have helped you in that situation?

- The recent flash floods that occurred. Better training and PPE water rescue equipment would help in water rescue incidents.
- Delayed response of AMR recently. AMR needs to be held accountable.
- Not knowing what to do or how to provide resources for the community with aging services, health services, & services that customers could benefit from by connecting to the right resources.

Fire Department Chief Officers & Administrative Staff

What strengths contribute to the successes of the Central County Fire Department?

- CCFD is very customer service oriented.
- Our CCFD employees have stepped up and have taken on many projects.
- We have developed a family-oriented culture with a lot of pride.
- We have a very positive workforce and people are positive.
- We foster a healthy atmosphere.
- CCFD has very positive customer interactions.
- We have a good attitude to train and are well trained.
- We adapt well to all conditions.
- Our personnel take care of each other.
- We have good Fire Chiefs and leaders.
- We operate now like one fire department.

What are some areas in which you think the fire dept could make improvements?

- We need the 4th firefighter back on the truck. It could even be to re-start the shift inspector program again as a starting point.
- There used to be three battalions (9 BC's). The BCs are so program saturated now that they don't have time to interact with the firefighting crews.

- We would like to see a Fleet/Facilities manager position (FTE).
- We would like to see a full time (FTE) Human Resources Manager as the position is currently part time.
- We would like to increase Firefighter FTE numbers to offset overtime mandatory requirements and overall overtime costs.
- FTEs to increase include increasing the staffing on the truck and staffing the shift inspector positions.
- The three cities own the fire station facilities and need to properly budget for the funding of upgrades and station replacements.
- We need a new tower (truck). The backup truck currently also does not have any equipment which is not efficient.
- Our Battalion Chiefs have too many program responsibilities so interaction with crews is minimal.
- We should have a district model answering to a fire board, not a JPA. Long term capital planning is currently difficult dealing with 3 different cities.
- We do not have a long-term facility replacement plan. It's difficult when the cities own and maintain the facilities. Three different views and approaches.
- We have a lot of demands and expectations put on us by all three cities. Our administrative and prevention staffing is inadequate as we have lots of demands.
- The fire department administration building is an inadequate facility and needs to be relocated or expanded.
- Both the fire prevention and training divisions are physically separated from administration which results in fragmented implementation of department policies, less staff cohesion, and difficulty in collaboration.

Tell us about your daily engine and truck company staffing. Is it adequate staffing day-to-day for your responses?

- The truck needs 4 person staffing full time.
- Our overall staffing has diminished. Two fire stations were closed so 3 & 3 staffing was lost. Four firefighters on the truck has been lost. Two additional BCs on duty have been lost. Three training officers down to one have been lost. Some have forgotten all that we have given up on staffing over the years.

What do you see as Central County Fire Department's greatest risks?

- The Wildland Urban Interface (WUI) is our greatest risk.
- We have more and more high-rise structures, including lots of residential occupancies over businesses.
- The liquid gas pipeline.
- Freeways are risks to our responding personnel.
- A large portion, (70%) of Hillsborough is in the wildland interface area.
- We have more and more life science risks including laboratories, bio tech, & hazardous material risks.

What do you see as the top critical issues faced by the Central County Fire Department?

- We are a young department with 2/3 of the members being new and many on probation. We will need to begin succession planning and training for the future.
- Succession planning. Our BCs are pushed quickly and personnel need to be trained to be ready for the responsibilities.
- Economics. We have a hard time growing and getting back to where we were. Finance with the 3 cities is an issue as its cut, cut, cut.
- Concerns about hiring and getting high quality, qualified candidates.
- In the old days, we had lots of backup personnel in town. Now only about 10% live in the department's area.
- With two prior stations closed and two on duty BC Battalions eliminated between the 3 cities, we need to maintain adequate staffing and coverage.
- Governance frightens me. I am worried about the Millbrae question. We should be open to something that makes sense. The San Bruno collaboration didn't work out and that will hurt us in the long run.

If you could change one thing in the fire department, what would it be?

- We only have limited shore-based water rescue capabilities and no Swiftwater rescue capabilities. We could use better training and better equipment including Personal flotation devices (PFD's) on all apparatus,
- The shift inspector program (the 4th on the truck) did have restraints but it was a good program and many liked it and it could be reinstated.
- Would like to see shift inspectors. We also need one more fire inspector who could help with the overall heavy work load.

Community Members & Others

What strengths contribute to the successes of the Central County Fire Department?

- CCFD knows our territory well and responds quickly and efficiently.
- The fire department has great cooperation with the three separate cities.

What does Central County Fire Department do well?

- The fire department has done a great job supporting the Hillsborough Firewise program and continues to assist with it.

What are some areas in which you think the fire dept could make improvements?

- Keeping staffing up to an acceptable level will be needed.
- Maintaining our fire stations in an acceptable condition. This is challenging with 3 separate cities that own their own stations.

What do you see as Central County Fire Department's greatest risks?

- The Wildland areas of our community, future earthquakes, power grid blackouts.

What do you see as the top critical issues faced by the Central County Fire Department?

- Maintaining economic stability.

How would you describe the level of services provided by the fire department?

- I have been quite impressed with the service provided by CCFD.

Appendix C: Table of Figures

Figure 1: CCFD Organizational Structure (2021)	2
Figure 2: CCFD Study Area Map	4
Figure 3: CCFD Jurisdictional Boundary	5
Figure 4: Mutual & Automatic Aid Fire Station Locations in San Mateo County	7
Figure 5: CCFD Administrative & Support Staffing	9
Figure 6: CCFD Operational Staffing	10
Figure 7: CCFD Current Staffing Model	11
Figure 8: CCFD General Fund Revenue	14
Figure 9: CCFD General Fund Expenditures	14
Figure 10: CCFD General Fund Revenue to Expenditures	15
Figure 11: Criteria Utilized to Determine Fire Station Condition	18
Figure 12: CCFD Station 32	19
Figure 13: CCFD Station 33	20
Figure 14: CCFD Station 34	21
Figure 15: CCFD Station 35	22
Figure 16: CCFD Station 36 (Administration)	23
Figure 17: CCFD Station 37	24
Figure 18: CCFD Station 38	25
Figure 19: Summary of the CCFD Fire Station Features	26
Figure 20: Criteria Used to Determine Apparatus & Vehicle Condition	27
Figure 21: CCFD Frontline Apparatus Inventory (2022)	28
Figure 22: CCFD Frontline Command & Other Vehicles	28
Figure 23: CCFD Reserve Apparatus Inventory (2022)	29
Figure 24: CCFD Reserve Command, Staff, & Other Vehicles	29
Figure 25: CCFD Jurisdiction Population (2010–2020)	37
Figure 26: Burlingame, Millbrae, & Hillsborough Population (2010–2020)	37
Figure 27: Population Density in the CCFD Jurisdiction	38
Figure 28: CCFD Area Percentage of Population by Age Risk	40
Figure 29: CCFD Area Percentage of Population with Disabilities	40
Figure 30: CCFD Percentage of Population Without Health Insurance	41
Figure 31: CCFD Percent of Population Below the Poverty Level	42

Figure 32: CCFD Median Household Income	42
Figure 33: CCFD Percent of Population Who Speak Language Other Than English.....	43
Figure 34: CCFD Educational Levels 25 Years & Older	43
Figure 35: CCFD Housing Types: Owner- or Renter-Occupied	44
Figure 36: Burlingame Percentage of Homes Built by Year.....	45
Figure 37: Millbrae Percentage of Homes Built by Year	45
Figure 38: Hillsborough Percentage of Homes Built by Year	46
Figure 39: Burlingame Housing Unit Types by Percentages.....	46
Figure 40: Millbrae Housing Unit Types by Percentage.....	47
Figure 41: Hillsborough Housing Unit Types by Percentage	47
Figure 42: Three-Axis Risk Classification Process.....	48
Figure 43: Heron's Formula Example	49
Figure 44: Three-Axis Scoring Range	50
Figure 45: Probability or Likelihood of Occurrence.....	51
Figure 46: Consequences to the Community.....	51
Figure 47: Impact on Operational Forces	51
Figure 48: Fire Response Risk Assessment	52
Figure 49: Fire 3-Axis Risk Classifications.....	52
Figure 50: EMS Response Risk Assessment	53
Figure 51: EMS 3-Axis Risk Classifications.....	53
Figure 52: Technical Rescue Response Risk Assessment.....	54
Figure 53: Technical Rescue 3-Axis Risk Classification	54
Figure 54: Hazardous Materials Response Risk Assessment	55
Figure 55: Hazardous Materials 3-Axis Risk Classifications.....	55
Figure 56: Wildland Fires Response Risk Assessment.....	56
Figure 57: Wildland Fires 3-Axis Risk Classification.....	56
Figure 58: CCFD Jurisdiction Average Daily High Temperatures.....	58
Figure 59: CCFD Jurisdiction Average Daily Low Temperatures.....	58
Figure 60: CCFD Jurisdiction Average Wind Speeds	59
Figure 61: CCFD Jurisdiction Average Monthly Precipitation	60
Figure 62: Drought Conditions (August 2022)	60
Figure 63: CCFD Earthquake Probability	62
Figure 64: Landslide Risk in the CCFD Jurisdiction	63

Figure 65: CCFD Jurisdiction Wildfire Risk Map	66
Figure 66: CCFD Jurisdiction Tsunami Risk Map	67
Figure 67: CCFD Jurisdiction Flood Risk Map	69
Figure 68: CCFD Jurisdiction Hazardous Material Facilities	71
Figure 69: CCFD Jurisdiction Land Use/Zoning Map	74
Figure 70: CCFD Jurisdiction Educational Occupancy Target Hazard	76
Figure 71: CCFD Jurisdiction Assembly Occupancy Target Hazard	77
Figure 72: CCFD Jurisdiction Healthcare Facilities Target Hazard Maps	78
Figure 73: CCFD Jurisdiction Multi-Family Occupancies	79
Figure 74: CCFD Jurisdiction Tall Building Target Hazards	80
Figure 75: CCFD Jurisdiction Large Building Target Hazard Map	81
Figure 76: CCFD Jurisdiction Large Fire Flow Facilities	83
Figure 77: CCFD Jurisdiction Target Hazards	85
Figure 78: CCFD Jurisdiction Energy Systems Map.....	87
Figure 79: CCFD Average Daily Traffic Counts.....	88
Figure 80: CCFD Jurisdiction Hydrant Map	90
Figure 81: Fires and Fire Loss	93
Figure 82: Intentionally Set Fires.....	94
Figure 83: Comparison of ISO Class Rating (California).....	95
Figure 84: CCFD Response Workload History.....	97
Figure 85: Responses by Incident Type.....	98
Figure 86: Monthly Response Workload (2018–2020)	98
Figure 87: Daily Response Workload (2018–2020)	99
Figure 88: Hourly Workload	100
Figure 89: Unit Workload	100
Figure 90: Average Unit Time on Scene	101
Figure 91: CCFD Jurisdiction All Incidents Demand Density	102
Figure 92: CCFD Jurisdiction Night Incident Demand	103
Figure 93: CCFD Jurisdiction EMS Incident Demand	104
Figure 94: CCFD Jurisdiction Structure Fire Incident Density	105
Figure 95: CCFD Jurisdiction Structure Fires Locations.....	106
Figure 96: Structure Fires by Hour of Day	107
Figure 97: CCFD Jurisdiction Travel Time Extent	108

Figure 98: ISO 1.5-Mile Travel Distance from CCFD Fire Stations.....	109
Figure 99: ISO 2.5-Mile Truck Travel Distance from CCFD Station 34	110
Figure 100: ISO 5-Mile Travel Distance from CCFD Fire Stations.....	111
Figure 101: CCFD Jurisdiction Effective Response Force—Apparatus.....	114
Figure 102: CCFD Jurisdiction Effective Response Force—Firefighters.....	115
Figure 103: Unit Hour Utilization.....	116
Figure 104: Concurrent Incidents Percentage	117
Figure 105: Unit Concurrency	118
Figure 106: Fire Station First Unit Zone Response Reliability.....	118
Figure 107: Cascade of Events.....	120
Figure 108: Summary of NFPA Performance Goals.....	121
Figure 109: Call Processing by Type of Incident	123
Figure 110: Call Processing by Hour of Day	124
Figure 111: Turnout Time Performance by Call Type.....	125
Figure 112: Turnout Time Performance by Hour of Day	125
Figure 113: Turnout Time by Unit at the 90 th Percentile	126
Figure 114: Travel Time Performance by Call Type	127
Figure 115: Travel Time Performance by Hour of Day.....	127
Figure 116: First Unit Response Time Performance	128
Figure 117: First Unit Response Time by Hour of Day	129
Figure 118: Total Response Time by Call Type	130
Figure 119: Total Response Time by Hour of Day.....	130
Figure 120: Utilization Rate	131
Figure 121: Population Growth Projections	132
Figure 122: Service Demand Projections.....	132
Figure 123: CFAI Staffing Recommendation Based on Risk	134
Figure 124: Structure Fire w/Hydrants	135
Figure 125: Structure Fire without Hydrants	135
Figure 126: Commercial Structure Fire.....	136
Figure 127: High-Rise Structure Fire.....	136
Figure 128: Wildland Fire—Low Risk.....	137
Figure 129: Wildland Fire—High Risk	137
Figure 130: Aircraft Emergency	137

Figure 131: Hazardous Materials—Low-Risk (Investigation)	138
Figure 132: Hazardous Materials—High-Risk (Response).....	138
Figure 133: Emergency Medical Aid	138
Figure 134: Motor Vehicle Accident	138
Figure 135: Major Medical Response.....	139
Figure 136: Technical Rescue (Water Bay/Near Shore)	139
Figure 137: Technical Rescue (Rope Rescue)	139
Figure 138: Technical Rescue (Confined Space Rescue)	140
Figure 139: Technical Rescue (Trench Rescue)	140
Figure 140: Structure Fire w/Hydrants	141
Figure 141: Commercial Structure Fire.....	141
Figure 142: High-Rise Structure Fire.....	141
Figure 143: Wildland Fire—Low Risk.....	142
Figure 144: Wildland Fire—High Risk.....	142
Figure 145: Hazardous Materials—Low Risk (Investigation)	142
Figure 146: Hazardous Materials—High Risk (Response):.....	143
Figure 147: Emergency Medical Aid	143
Figure 148: Motor Vehicle Accident	143
Figure 149: Major Medical Response.....	144
Figure 150: Technical Rescue Water (Bay/Near Shore)	144
Figure 151: Technical Rescue—Trench Rescue	144
Figure 152: Example of a First-Due Single-Unit Response Standard	146
Figure 153: Example of First Alarm Response (3 Engines, 2 Medic Units, & 1 BC).....	146

Appendix D: References

- ¹ Central County Fire Department.
- ² Ibid.
- ³ AMR in the San Mateo Community website.
- ⁴ U.S. Census, QuickFacts website.
- ⁵ County of San Mateo website.
- ⁶ www.census.gov/data.html.
- ⁷ *National Fire Protection Association, 2007; Urban Fire Safety Project, Emmitsburg, MD.*
- ⁸ www.census.gov/data.html.
- ⁹ Quality Improvement for the Fire and Emergency Services.
- ¹⁰ www.usa.com/Millbrae-ca-natural-disasters-extremes.htm
- ¹¹ National Fire Protection Association, Preparing Homes for Wildfire website.
- ¹² Infrastructure Security, Department of Homeland Security.
- ¹³ www.pge.com/en_US/safety/emergency-preparedness/natural-disaster/wildfires/community-wildfire-safety.page?WT.pgeac=Wildfire_CrossPromo-Community
- ¹⁴ dot.ca.gov/programs/traffic-operations/census.
- ¹⁵ Fire Loss on the United States During 2020, NFPA, September 2021.
- ¹⁶ Crime Data Explorer, Federal Bureau of Investigation.
- ¹⁷ <http://projections.planbayarea.org/>