January 18, 2022

Community Risk Assessment and Standards of Cover

Rocklin Fire Department
Rocklin, California

Prepared by:

FITCH & ASSOCIATES, LLC
2901 Williamsburg Terrace #G ▪ Platte City ▪ Missouri ▪ 64079
816.431.2600 ▪ www.fitchassoc.com

CONSULTANT REPORT

COMMUNITY RISK ASSESSMENT AND STANDARDS OF COVER
ROCKLIN FIRE DEPARTMENT, ROCKLIN, CA

TABLE OF CONTENTS

ATTACHMENTS –

EXECUTIVE SUMMARY

In late 2019, the Rocklin Fire Department (hereinafter "RFD") contracted with Fitch & Associates to objectively evaluate the fire department's operations, deployment, and staffing. The Department was motivated by the desire to ensure that the current level of performance was meeting the expectations of the community they serve, and that the methodologies utilized to evaluate community risk and response were aligned with the performance goals, performance objectives, and outcome measures established by the fire department administration and the community-driven strategic planning process.

A fire department's Standards of Cover (SOC) document is defined by the Commission on Fire Accreditation International (CFAI) as the "adopted written policies and procedures that determine the distribution, concentration and reliability of fixed and mobile response forces for fire, emergency medical services, hazardous materials and other technical types of responses." For the elected body and city administrators to have confidence that their fire department is meeting the needs of the community, a complete assessment of the risks must be honestly undertaken. Only after the application of a proven and consistent risk assessment model is made can a fire department develop an SOC performance contract.

It is the responsibility of an agency to provide the City's decision makers with an educated calculation of the expected risk, what resources are available to respond to that risk, and what outcomes can be expected. All these factors play a role in providing the community's emergency services. It is best that communities set response standards based on the identified risks within their jurisdictions. Fire departments that do not apply a valid risk assessment model to their community are not able to adequately educate their community leaders of their true needs. The application of a tested risk assessment model allows the fire department and elected officials to make educated decisions about the level of emergency service they desire.

The RFD is committed to the philosophy of risk management that is embedded within the accreditation process. It is this process of risk assessment that is most crucial to the operation of the fire department. In addition, the process of performing continuous risk assessment of the community provides vital information for not only first responders, but for elected officials, city administrators, and residents as well. Important community policy decisions cannot be made without properly and thoroughly assessing the potential risk.

The RFD utilizes a Risk Hazard and Valuation Evaluation to help determine fire risk within the community. This analysis utilizes building occupancy classifications that establish base risk ratings on the occupancy classification alone. Moderating values for the presence of automatic sprinkler systems, fire pumps, and standpipes were included to reduce the occupancy classification base risk rating. These data were used to establish a quantifiable risk-rating matrix that was utilized to categorize 605 occupancies into high, moderate, and low risks. The utilization of the Occupancy Classification is an effective and accepted practice; however, it is likely overstating community fire occupancy-related risk. Therefore, it is recommended the RFD design and develop desired occupancy-level variables that take into consideration square footage, building height, building construction, combustion rates, and human occupancy to

complement the passive mitigation data currently available. Historical data such as call volume and the location of calls, as well as other pertinent geographic information system (GIS) data, were also used to help determine the best possible deployment model of fire department assets throughout the agency. Armed with this information, Department leaders, elected officials, and residents are better informed and make more educated decisions about the level of emergency service they can anticipate.

This SOC represents that commitment to a comprehensive assessment of our community's risks. The key elements of this SOC include levels of service to be provided, analysis of current response capabilities by geographic area, and recommendations to maximize efficiency of all resources to obtain the best possible emergency response, keeping consistent with community expectations. The RFD evaluated the performance of the first arriving unit (distribution) and the arrival of the effective response force (ERF; concentration). ERF is the minimum number of personnel, equipment, and apparatus needed to mitigate a given type of incident and its level of risk (low, moderate, and high/special).

Additionally, in 2021 the RFD completed a community-driven strategic planning session to establish goals, objectives, and outcome measures that will be worked toward over the next five years. The RFD will utilize both the strategic planning findings and the standards of cover data to ensure the agency is providing the most effective and efficient service possible to the community.

This report is concluded with an overall evaluation and series of recommendations for the agency to consider as they work to improve its effectiveness and efficiency.

Summary of Recommendations

Recommendation:
It is recommended the Department consider classifying motor vehicle accidents as rescue calls within their records management system for future analysis and annual reporting.

Recommendation:
It is recommended the Department consider interconnecting the AVL systems between the Rocklin Fire units and the units most likely to mutually respond on incidents in the region.

Recommendation:
It is recommended the Department consider specifically re-evaluating workload and performance indicators for every 1,000-call increase, or every five-years, to ensure system stability.

Recommendation:
The utilization of the Occupancy Classification is an effective and accepted practice; however, it is likely overstating community fire occupancy-related risk. Therefore, it is recommended that the Department design and develop the desired occupancy-level variables such as square footage, building height, building construction, combustion rates, and human occupancy to complement the passive mitigation data currently available.

Recommendation:
It is recommended the Department review travel time performance again once the streets are fully built out in the northeast section of the City (Whitney Ranch area) and consider a future analysis for future fire station locations to maintain first suppression unit response performance (distribution) over time.

Recommendation:
It is recommended the Department consider implementing a CAD-to-CAD between the dispatch centers of all high-frequency mutual aid providers, to include the ambulance dispatch center.

Recommendation:
It is recommended that outcome measures are adopted and serve as the primary evaluation tool and that the traditional performance objectives and measures presented previously are utilized primarily as a management tool. In this manner, the Department will not be overly sensitized to incremental changes in performance criteria if the outcomes continue to be met.

DESCRIPTION OF COMMUNITY SERVED

Introduction

Rocklin, in the late 1800s' was known for the light-gray granite building stone prevalent in the local quarries. The community was also located along the railroad line which spurred commerce and brought in a concentration of people in support of both industries. Much of the city of Sacramento and the State Capitol building was built with quarried stones from Rocklin and transported via the railroad system. Over the years, Rocklin became more bedroom community for the larger Sacramento region and is currently known as a family-friendly town with high quality schools and a very high park-acreage to population ratio. Rocklin is located in the western edge of Placer County in California, approximately 20 miles northeast of the city of Sacramento, along the western boundary/foothills of the Sierra Nevada mountain range, and at the junction of Interstate 80 and State Highway 65. The city of Rocklin has a population of 70,469[1] and is part of the Sacramento-Roseville metropolitan statistical area with a total population of approximately 2.7 million.[2]

The Rocklin Fire Department is a full-service emergency services organization providing for fire suppression, emergency medical services (EMS) first response, technical rescue, hazardous materials, fire prevention and life safety education. The RFD serves an area of 20 square miles from three fixed-facility fire stations strategically located throughout the community. The Department also utilizes a headquarters co-located within one of the stations for administrative and support personnel. The RFD also shares a communications dispatch center located within the adjacent Rocklin Police Department.

Legal Basis[3] [4]

The city of Rocklin was legally established as a municipality in 1893. The city of Rocklin is a general law city within the State of California and operates under a Council/Manager form of local government. The residents of the city of Rocklin elect five council members alternately in November of even-numbered years. All elections are non- partisan and conducted at-large. Terms are four years in length with no term limits. From the five council members one is selected as Mayor and one as Vice Mayor for a one-year term.

The Council appoints a City Manager who serves as the chief administrative officer of the city. The City Manager supervises, directs, and coordinates the various departments throughout City Hall. The manager prepares the budget for the Council's consideration and makes reports and recommendations to the City Council. The manager is an at-will position with authority to appoint support staff, including the Fire Chief.

---

[1] https://www.rocklin.ca.us/sites/main/files/file-attachments/reso_exhibit_a_final_budget_2021-22_resized.pdf?1624477482 – city of Rocklin FY 2021/22 Budget

[2] https://en.wikipedia.org/wiki/Sacramento_metropolitan_area accessed August 21, 2021

[3] https://en.wikipedia.org/wiki/Rocklin,_California/ accessed July 7, 2021.

[4] https://www.rocklin.ca.us/government accessed July 7, 2021

History of the Agency

In the early 1890's, demand for Rocklin's light-gray granite building stone grew steadily and Rocklin's quarries were at peak activity. Rocklin's railroad roundhouse employed over 300 people and businesses flourished along Granite Avenue (now Rocklin Road), Front Street and Railroad Avenue, however, periodic fires continued to plague Rocklin's downtown business district as they had since the late 1860's. In 1893, as a nationwide economic depression was forming, a large fire broke out and consumed 25 businesses, from the Trott Hotel (now the Crossroads Church) southward along Front Street. An equally disastrous fire a year later flattened the business block on the opposite side of the tracks along Railroad Avenue. It was in this context that Rocklin Judge John H. Gregory convened a series of meetings in the spring of 1894 for the purpose of forming a fire company. On June 4, 1894, seventeen men paid a$2.00 initiation fee, elected officers, and founded Rocklin Hose Company Number One: Rocklin's first fire department. The group elected William J. Byrne as company foreman; Rocklin's first fire chief.

Every man was an unpaid volunteer. The company's fire rig was a two-wheeled hose cart stored in a barn-like garage in the south side of Rocklin's first city hall on Front Street, on the exact spot of today's Old Saint Mary's Chapel. The cart carried a 150-foot reeled fire hose. Rocklin employed a fire bell located near city hall for the purpose of reporting a fire and summoning help. A person from the east side of town might have to wait for a train to pass before crossing the tracks to pull the rope. On hearing the bell, firefighters rushed to city hall, rolled the hose cart from its garage, and moved it quickly to the fire. Sometimes they ran with it on foot.

Sometimes they paid as much as $1.00 to the owner of any nearby team of horses that they could recruit to pull it. In 1910 quarry owner Adolf Pernu offered his quarry whistle as an alarm bell substitute for east side residents, and later the hose company installed a fire siren east of the tracks and across the street from today's Rocklin rail station.

By the early 1930s Rocklin's volunteer firefighters had acquired a four-wheeled fire cart that they sometimes pulled with an automobile. They acquired their first motorized fire unit, a Dodge Van Pelt, in 1936. This 1936 Dodge is proudly stored at Fire Station 23 today.

Over the past 125 years the department has evolved and grown to meet the expanding mission and needs of the community. Today the agency is comprised of 35 full-time employees, operating out of three fire stations, protecting a population of over 70,000 residents.

On October 28, 2019, after going through a detailed evaluation process, the city of Rocklin and the RFD achieved a new Public Protection Classification (PPC) rating of 2 from the Insurance Services Organization (ISO). This is an improvement from a Class 3 rating and is currently an accomplishment obtained by less than 22% of all evaluated fire departments in California, and less than 6% of all fire departments across the United States[5].

Financial Basis[6]

Overview

The budget is a tool with which the city of Rocklin can allocate its financial, human, and capital resources in an effective and efficient manner to meet residents' needs. Through the budget process, the City makes decisions on the allocation of human and financial resources to achieve long- and short-term goals and objectives as set forth by the City Council. The city of Rocklin prides itself on being fiscally responsible and providing financial transparency.

The City's budgeting process is compliant with the Government Finance Officers Association (GFOA), as well as meeting the standards by Generally Accepted Accounting Principles (GAAP), and the recommended best practices of the Governmental Accounting Standards Board (GASB). The city of Rocklin and the fire department have maintained an excellent level of service for many years through conservative financial management. The adopted budget for FY 2021/22 is $98,674,700 for all funds with $54,782,400 available for General Fund expenditures. The chart below provides a historical comparison of budgeted expenditures by fund.

[5] ISO Mitigation July 2021

[6] City of Rocklin Budget FY 2021-2022

Table 1: Department Expenditure Summary FY 2021-2022

	FY 2020-21 Budget	FY 2020-21 Projected Actual	FY 2021-22 Budget
ALL DEPARTMENTS			
TOTAL POSITION COUNT	256.00*	256.00*	258.60*
EXPENDITURE CATEGORIES			
CAPITAL EXPENSE TOTAL	$ 9,156,700	$ 5,152,700	$ 13,540,900
COMPENSATION TOTAL	48,927,400	52,728,100	49,652,900
OPERATING EXPENSE TOTAL	27,112,500	26,407,000	28,746,300
TOTAL ALL DEPARTMENTS	**$ 85,196,600**	**$ 84,287,800**	**$ 91,940,100**

* Includes 15 positions that are not full-time equivalents.

The city of Rocklin's largest revenue sources come primarily from property tax (41%) and sales tax (35%). In 2020, the City had an assessed value of $10.5 billion with significant growth since 2013, however sales tax has fluctuated more, especially since 2019.

Figure 1: Historical Property and Sales Tax Revenue

The budget for RFD is found in the General Fund. The General Fund accounts for the revenues and expenditures necessary to carry out basic governmental activities of the city such as police and fire protection, recreation, and legal and administrative services. The FY 2021/2022 budget for the Department is $12,061,500, with $11,121,900 in General Fund expenditures, representing 22% of the City's allocation departmental operations.

Table 2: FY 2020 General Fund Expenditures by Department/Category FY 2020 through FY 2022

	FY 2020-21 Budget	FY 2020-21 Projected Actual	FY 2021-22 Budget
OPERATIONS EXPENDITURES			
ADMINISTRATIVE SERVICES	$ -	$ -	$ 10,563,100
CITY ATTORNEY	969,000	982,200	1,040,200
CITY CLERK	316,200	329,700	346,700
CITY COUNCIL	47,500	47,800	97,800
CITY MANAGER	954,500	1,159,800	1,350,300
COMMUNITY DEVELOPMENT	6,074,200	5,363,800	5,881,100
FINANCE	10,413,100	13,528,400	-
FIRE	10,729,600	11,436,300	11,121,900
HUMAN RESOURCES	912,600	916,400	-
INFORMATION TECHNOLOGY	2,981,400	2,882,800	3,242,300
PARKS & RECREATION	6,740,600	6,589,700	6,920,600
POLICE	19,244,000	19,455,200	20,330,300
PUBLIC SERVICES	16,657,200	16,443,000	17,504,900
TOTAL OPERATIONS EXPENDITURES:	**$ 76,039,900**	**$ 79,135,100**	**$ 78,399,200**

Figure 2: General Fund Expenditures by Department/Category FY 2021/22

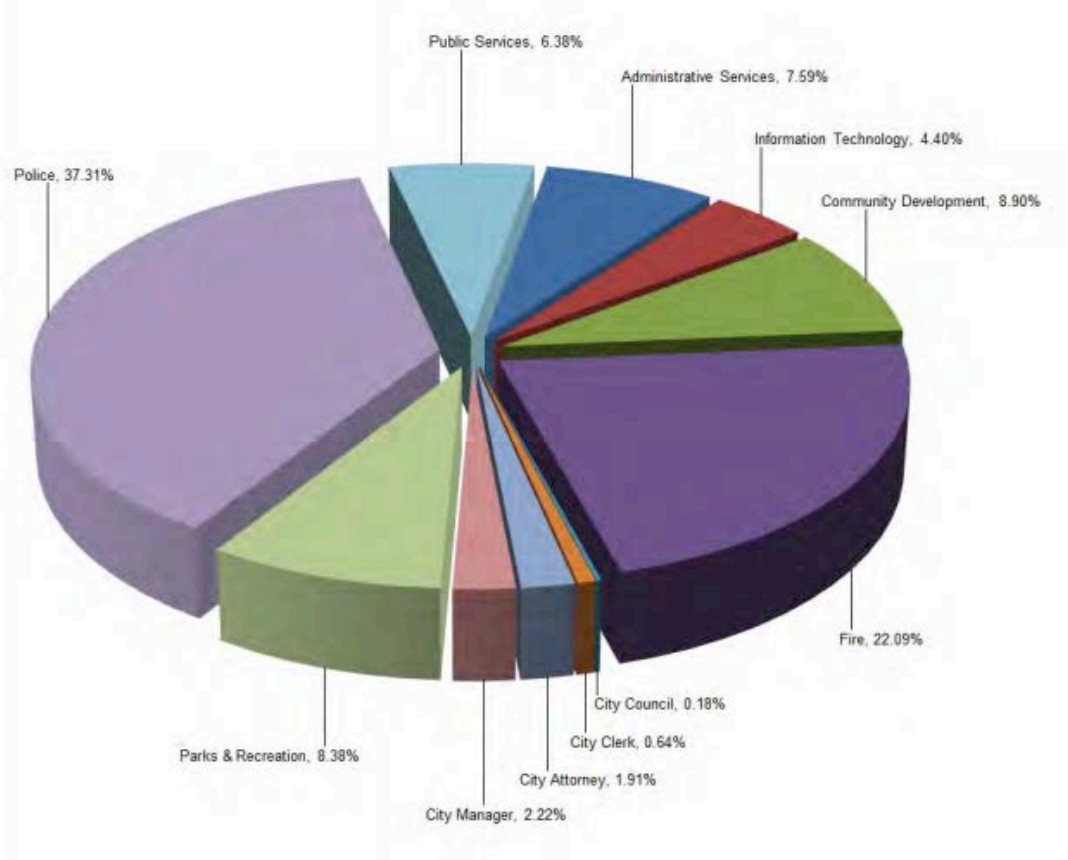


Table 3: Rocklin Fire Department Expenditures by Program/Category FY 2020 through FY 2022

DEPARTMENT EXPENDITURE SUMMARY
BUDGET YEAR 2021-22
FIRE

	FY 2020-21 Budget	FY 2020-21 Projected Actual	FY 2021-22 Budget
FIRE			
FIRE CHIEF	1.00	1.00	1.00
DEPUTY FIRE CHIEF	1.00	1.00	1.00
BATTALION CHIEF	3.00	3.00	3.00
FIRE MARSHAL	0.00	0.00	1.00
FIRE CAPTAIN	9.00	9.00	9.00
FIRE ENGINEER	9.00	9.00	9.00
FIREFIGHTER **	15.00	15.00	14.00
FIRE PREVENTION PLANS EXAMINER	1.00	1.00	1.00
FIRE INSPECTOR I/II	0.00	0.00	1.00
DEPARTMENTAL ADMINISTRATIVE SPECIALIST	1.00	1.00	1.00
SENIOR OFFICE ASSISTANT	1.00	1.00	1.00
TOTAL POSITION COUNT	**41.00**	**41.00**	**42.00**
EXPENDITURE CATEGORIES			
CAPITAL EXPENSE	$ 50,000	$ 50,000	$ 939,600
COMPENSATION	9,140,000	9,930,200	9,573,600
OPERATING EXPENSE	1,589,600	1,506,100	1,548,300
TOTAL EXPENSE	**$ 10,779,600**	**$ 11,486,300**	**$ 12,061,500**
FUNDING SOURCES			
GENERAL FUND	$ 10,710,500	$ 11,417,000	$ 12,026,400
CFD #1	19,100	19,300	20,100
CAPITAL CONSTRUCTION FEES	50,000	50,000	15,000
TOTAL FUNDING SOURCES	**$ 10,779,600**	**$ 11,486,300**	**$ 12,061,500**

** One frozen position (not funded for 2021-22)

Area Description

Geography

The city of Rocklin is in western Placer County, California, approximately 20 miles northeast of Sacramento. It is located at the junction of Interstate 80 and State Highway 65. The City covers approximately 20 square miles and is bordered by the city of Lincoln to the north, unincorporated areas of Placer County to the east and south, and the city of Roseville to the west.

Figure 3: Placer County, California

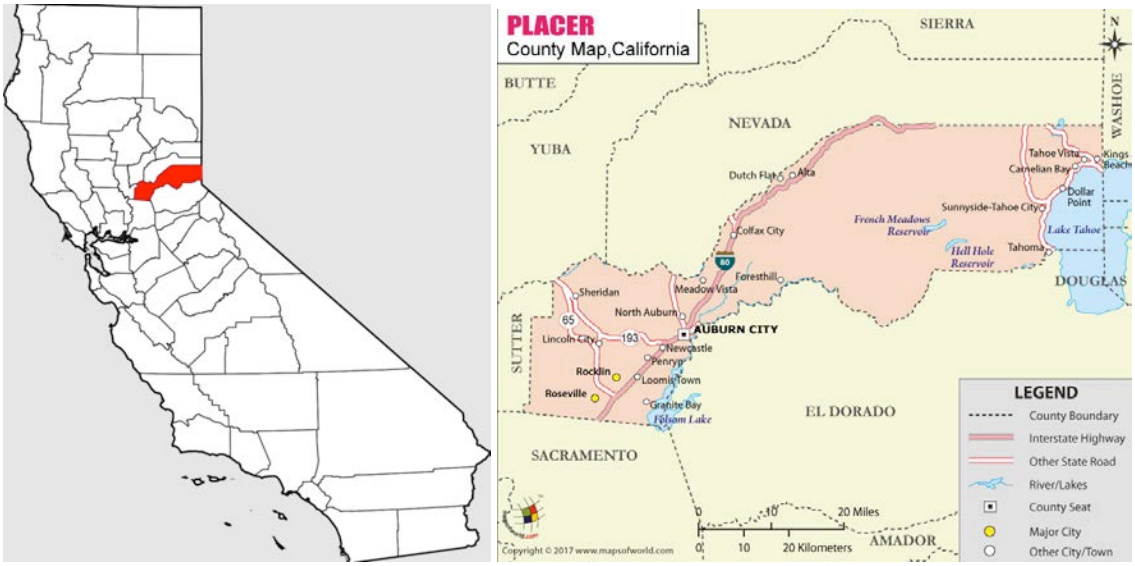
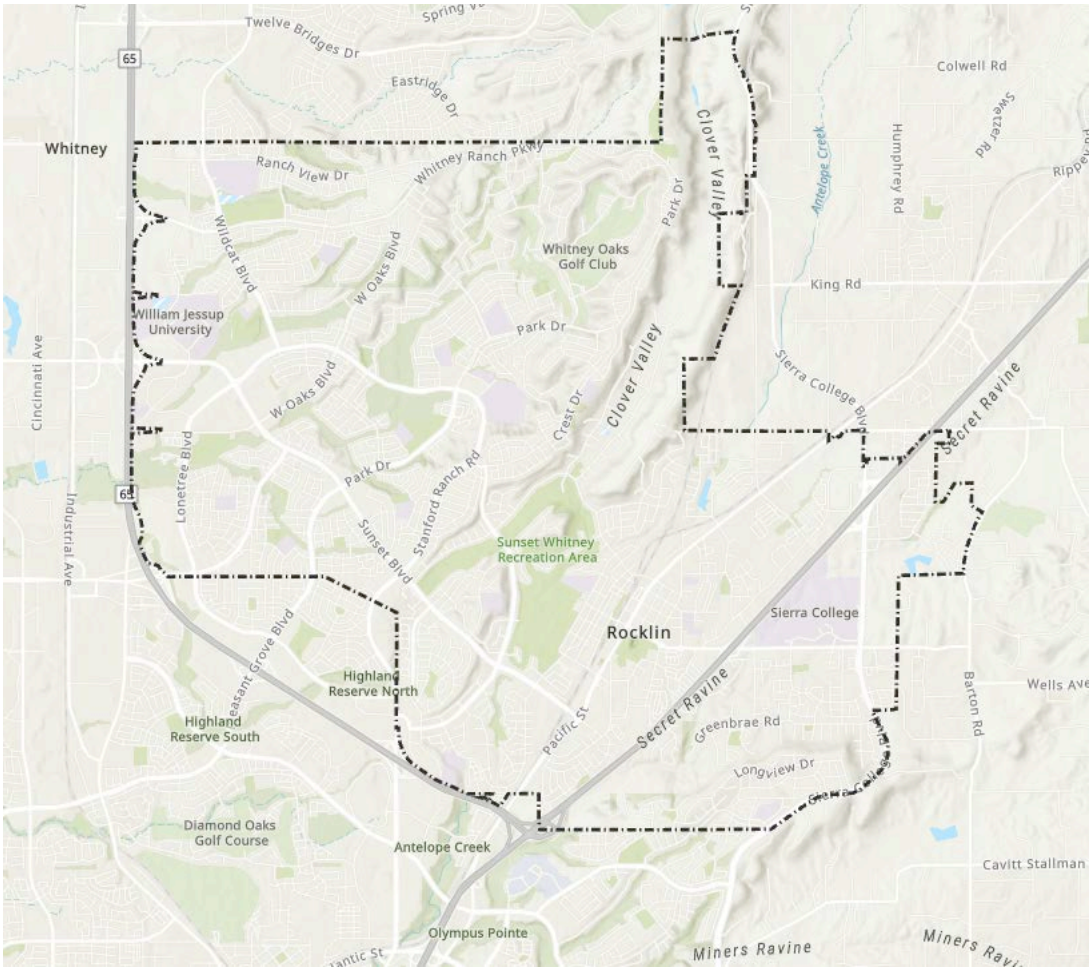


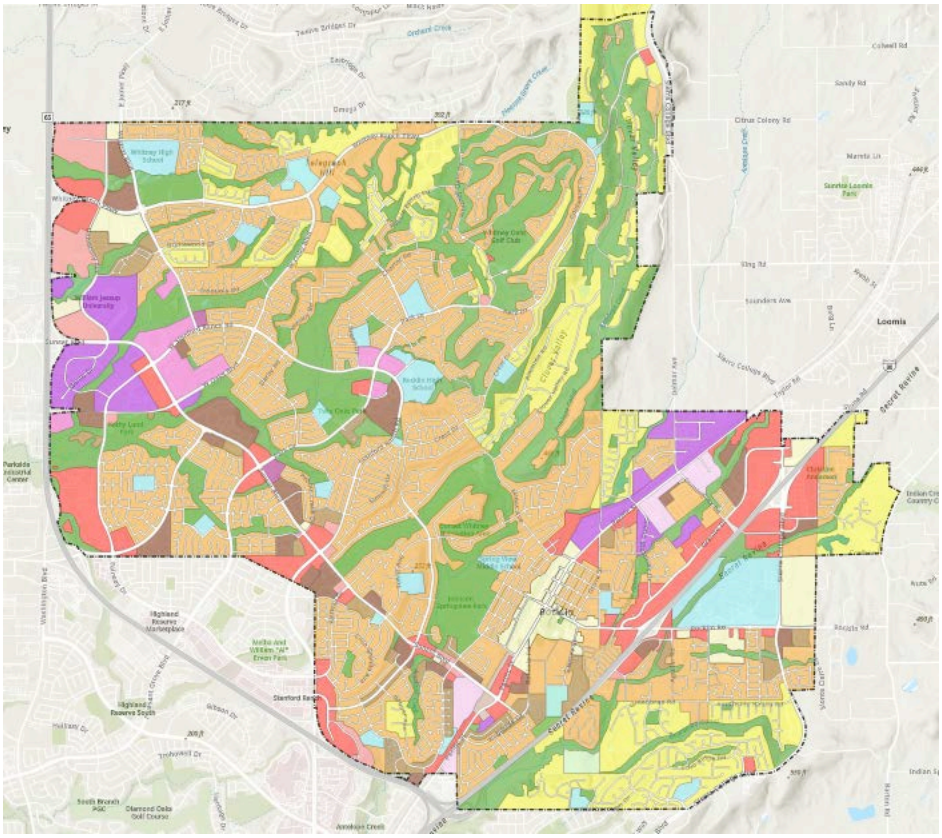
Figure 4: Rocklin, California



Topography

The area is the beginning of the western slope of the Sierra Nevada mountain range, with the western portions of the community characterized as primarily low rolling hills covered with annual grass and shrubs. The elevation climbs from 150 to 525 as low rolling hills transition to more foothills and steeper hillsides popular with housing development due to the views of the Sacramento Valley to the west. Higher elevations are characterized by a transition to more deciduous and some evergreen trees.

Figure 5: City of Rocklin – Land Use Map



Climate[7]

Rocklin has a Mediterranean climate characterized by hot dry summers and mild winters. Summer months are hot with July average highs around 96.5 degrees (F). Winter months with December/January average lows of 34.9 degrees (F). Summers see primarily hot and dry conditions, which makes the region highly prone to wildland fires, but will experience some rain primarily as thunderstorms, that have formed in the high Sierra, migrate downslope into the area. Winter months are when most rain events occur, primarily between December and March. The average annual rainfall per year is 22 inches.

[7] https://en.wikipedia.org/wiki/Rocklin,_California, accessed August 21, 2021

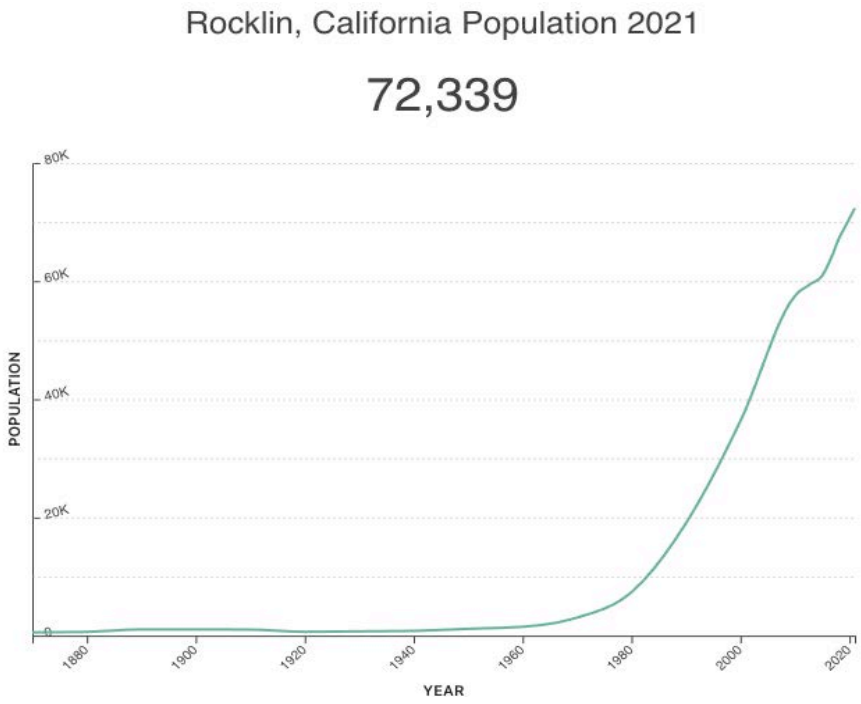
Table 4: Rocklin Climate Data

Climate data for Rocklin, California [hide]													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	76 (24)	82 (28)	90 (32)	97 (36)	107 (42)	115 (46)	115 (46)	118 (48)	114 (46)	105 (41)	88 (31)	80 (27)	118 (48)
Average high °F (°C)	53.7 (12.1)	59.3 (15.2)	64.5 (18.1)	71.2 (21.8)	79.8 (26.6)	89.0 (31.7)	96.5 (35.8)	95.0 (35.0)	89.2 (31.8)	78.5 (25.8)	65.4 (18.6)	54.7 (12.6)	74.7 (23.7)
Daily mean °F (°C)	44.3 (6.8)	48.4 (9.1)	52.2 (11.2)	57.3 (14.1)	64.1 (17.8)	71.3 (21.8)	77.2 (25.1)	75.6 (24.2)	70.9 (21.6)	62.4 (16.9)	52.0 (11.1)	44.9 (7.2)	60.1 (15.6)
Average low °F (°C)	34.9 (1.6)	37.6 (3.1)	39.9 (4.4)	43.4 (6.3)	48.3 (9.1)	53.7 (12.1)	57.9 (14.4)	56.2 (13.4)	52.6 (11.4)	46.2 (7.9)	38.7 (3.7)	34.9 (1.6)	45.4 (7.4)
Record low °F (°C)	14 (−10)	20 (−7)	23 (−5)	27 (−3)	19 (−7)	34 (1)	34 (1)	33 (1)	29 (−2)	25 (−4)	20 (−7)	14 (−10)	14 (−10)
Average precipitation inches (mm)	4.89 (124)	3.86 (98)	3.27 (83)	1.79 (45)	0.76 (19)	0.28 (7.1)	0.03 (0.76)	0.03 (0.76)	0.32 (8.1)	1.25 (32)	2.57 (65)	3.75 (95)	22.80 (579)
Average precipitation days	10	9	7	5	3	1	0	0	1	3	6	8	53
Source: Western Regional Climate Center[15]													

Population and Demographic Features[8]

The RFD serves a year-round population of approximately 72,000. Most residents reside in single-family homes (67%) but there are growing number of multi-family dwelling units due to the need provide housing for a population growth within a city that has reached its terminal growth boundaries. The city of Rocklin has observed manageable growth over the years, experiencing a 20% increase in population since the last U.S. Census dated April 1, 2010, or approximately 2.2% per year. The average population density is approximately 3,652 people per square mile.

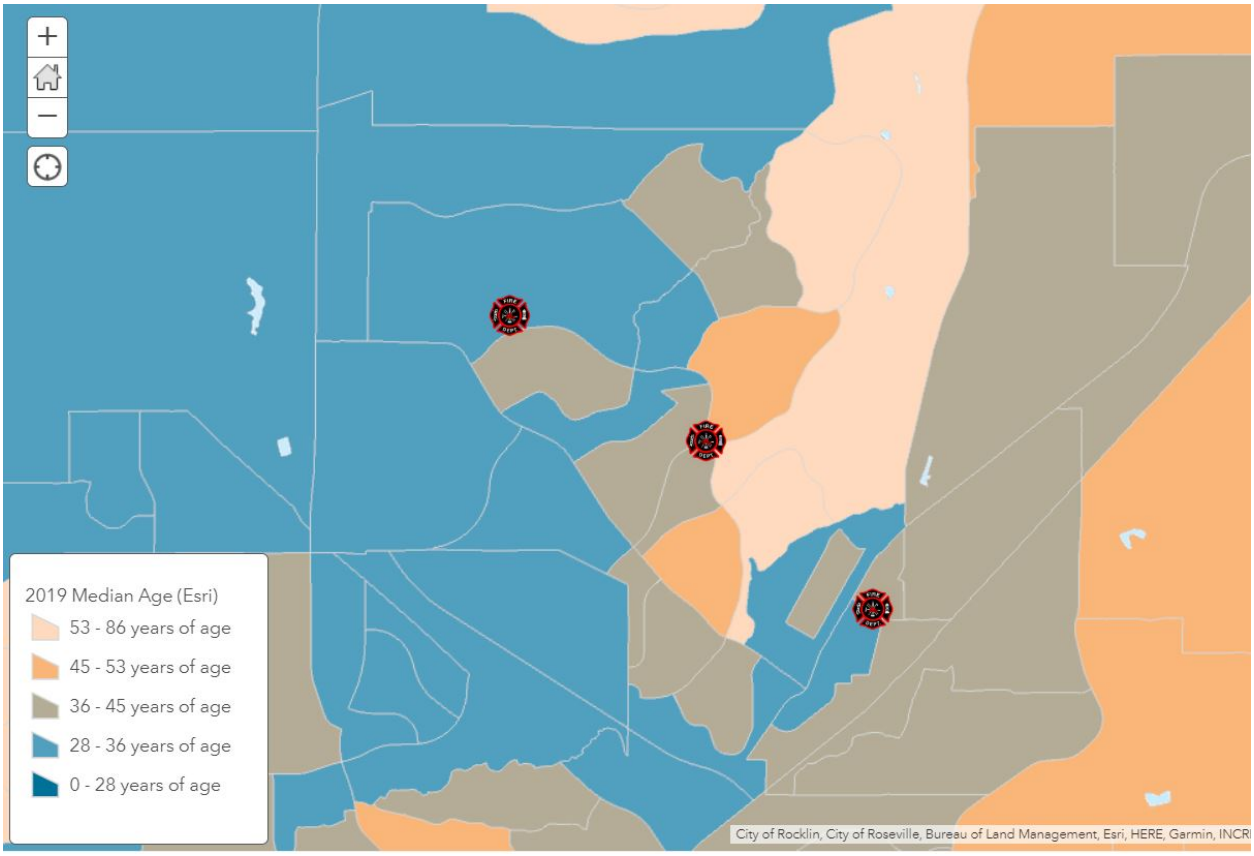
Figure 6: Annual Population Growth



[8] https://worldpopulationreview.com/us-cities/rocklin-ca-population

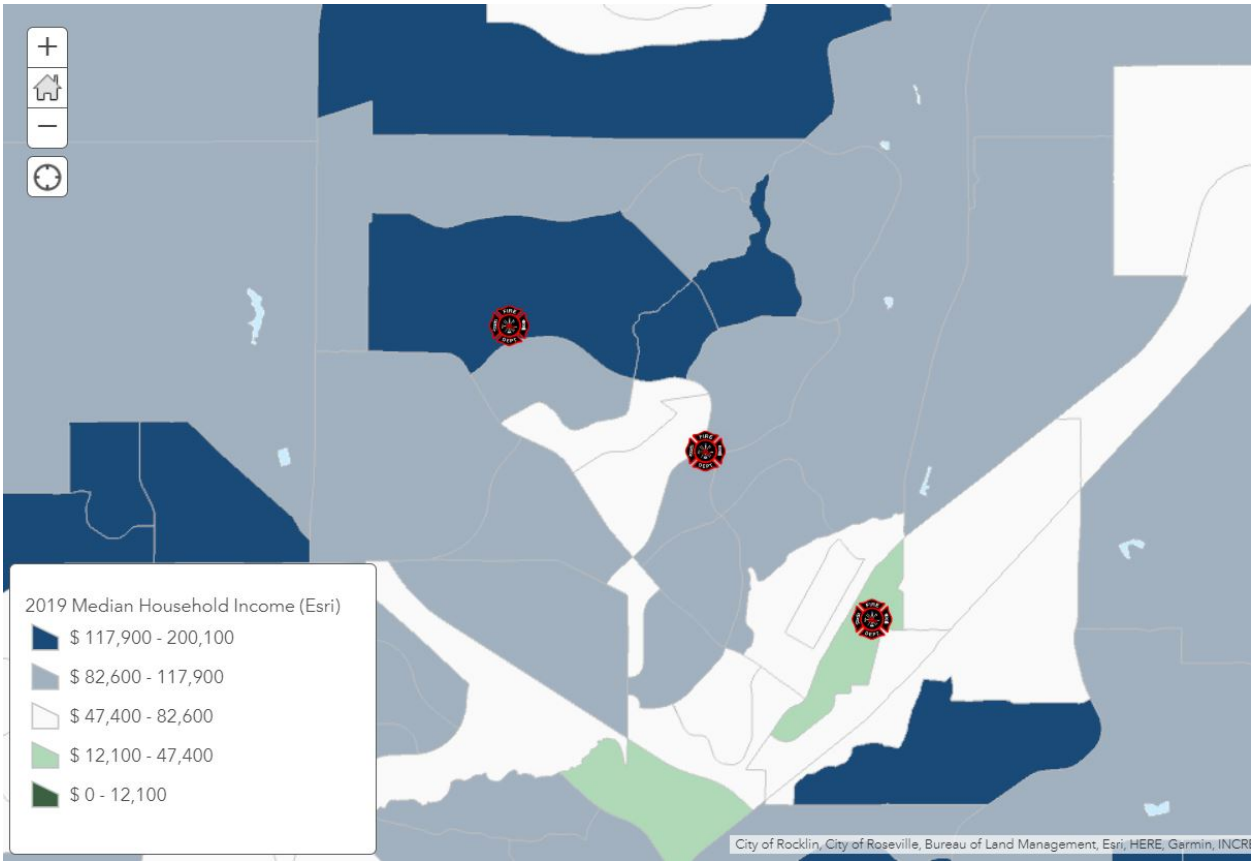
Generally, older populations and very young populations are considered to be most vulnerable to the frequency and incidents of fire. In addition, older populations historically utilize EMS services with greater frequency. It is important to understand, what field crews often recognize intuitively, that the distribution of population risks is not uniform across the jurisdiction. According to these data, the census block areas in the jurisdiction have populations with median ages of various ranges. The median age for the lightest peach shaded areas ranges from 53 to 86 years.

Figure 7: Median Age – 2019



Finally, population alone is not the sole variable that influences demand for services, as socioeconomic and demographic factors have greater influence over demand. Median household income was evaluated to determine the degree to which the community had underprivileged populations. According to the US Census Bureau, the 2018 (i.e., most recent data available) national median household income is reported at $63,179. The median household income in the light green shaded area surrounding Station 23 is $44,775.

Figure 8: Median Household Income – 2019



Disaster Potentials[9]

The city of Rocklin is primarily vulnerable to natural hazards of severe weather, localized flooding, earthquakes, and wildfire. In addition, the City is also vulnerable to technological (human-caused) hazards associated with pandemics, hazardous materials spills, Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) terrorism, civil disturbances, and transportation accidents. A snapshot of the overall hazard probability is referenced in Table 5 below. Key specific hazards are discussed in detail in the Community Characteristics of Risk section.

Table 5: Overall Hazard Probability

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Unlikely	Limited	Low	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Negligible	Medium	High
Earthquake	Significant	Occasional	Limited	Low	Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Limited	Low	Medium
Floods: Localized Stormwater	Limited	Likely	Negligible	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Critical	High	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Significant	Occasional	Negligible	Low	Low
Tree Mortality	Significant	Highly Likely	Limited	Low	High
Wildfire	Significant	Highly Likely	Limited	Medium	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths.
Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability.
Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability.
Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

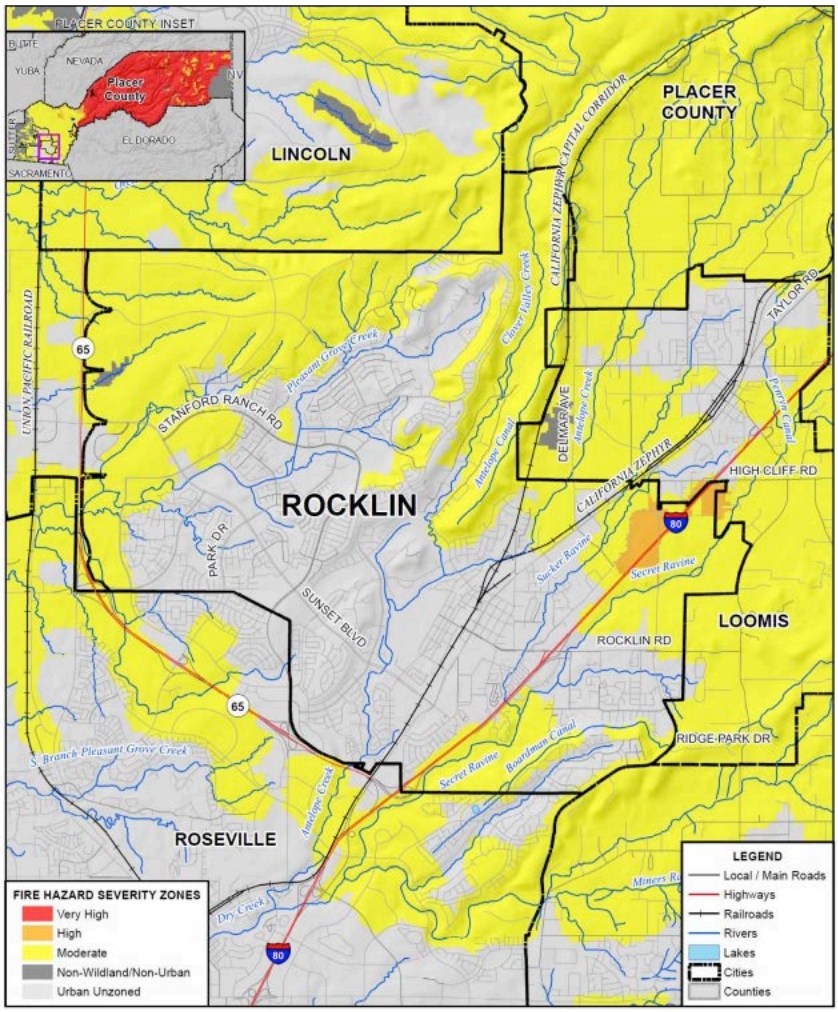
Climate Change Influence
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

In particular, wildland fire is one of the most significant hazards and one that the RFD takes a sizeable role in mitigating. In addition to emergency response, the adoption of vegetation management code, inspection and vegetation reduction strategies have been valuable in limiting the severity of wildfire within the community. One of the best practices implemented by the fire department is to promote the

[9] Placer County Local Hazard Mitigation Plan – May 2021 – Public Review Draft

use of goats and sheep as an environmentally friendly way to reducing vegetation in the high severity zone.

Figure 9: Fire Hazard Severity Zones



SERVICES PROVIDED

Service Delivery Programs

Fire Suppression

The RFD provides high-quality fire suppression services within the City while assisting surrounding communities as requested through the establishment of automatic and mutual-aid agreements. Fire suppression services are currently provided from three fixed-facility fire stations that are strategically distributed throughout the City. All members of RFD are minimally trained as state certified firefighters and Emergency Medical Technicians (EMT's), while several members are trained at the Paramedic level to allow each engine or truck company to provide advanced life support (ALS) medical care. Minimum staffing per day is currently 10 personnel including the on-duty Battalion Chief. In 2019, fire suppression incidents accounted for 24.1% of the total incidents responded to by RFD. The following is a description of resource and staffing configurations currently deployed by RFD.

- Two Engine companies (Stations 23, 25)
- One Tiller Truck (Station 24)
- One Battalion Chief (Station 24)

Rescue

The RFD provides initial response for technical rescue services within the City. RFD will respond to technical rescue incidents and is equipped to extricate and treat injured patients and victims involved in specialty rescue situations. All units have sufficient and equipment and operational capabilities to begin mitigation strategies for most technical rescue incidents occurring within the City, however, for high-risk incidents requiring additional personnel and equipment, RFD relies on mutual aid from surround Placer County agencies that capable of responding to and mitigating incidents related to structural collapse, high-angle rescue, machinery entrapment, trench rescue, and confined space rescue. The region also benefits from the city of Sacramento as host agency for Federal Emergency Management Agency - Urban Search and Rescue team (US&R) – CA Taskforce 7. In 2019, rescue incidents accounted for less than 1% of the total incidents responded to by RFD.

Recommendation:
It is recommended the Department consider classifying motor vehicle accidents as rescue calls within their records management system for future analysis and annual reporting.

Emergency Medical Services

The RFD provides ALS first-response treatment services to residents and visitors. All personnel within the organization are trained and certified to a minimum of EMT-Basic while many members are trained at the EMT-Paramedic level. Paramedics provide ALS interventions including, but not limited to, 12-lead electrocardiograms, cardio-pulmonary resuscitation (CPR), defibrillation and synchronized cardioversion, advanced airway management, and intravenous (IV) fluid and medication administration. Within the daily

minimum staffing requirements, a minimum of three paramedics are required to be on duty, with at least one on each engine company and one on the truck company. In 2019, EMS incidents accounted for 74.7% of the total incidents responded to by RFD.

Hazardous Materials

Although the frequency of hazardous materials incidents is relatively low within the RFD response area, the potential for a low-frequency high-risk event remains a potential through natural gas leaks, chemical spills, and transportation accidents. All firefighters are trained and certified to the Hazmat Operations level while three members are further trained to the Hazmat Technician level. The engine and truck companies at each station are equipped with spill kits, absorbents, and 4-gas atmospheric monitoring capabilities so most low-risk incidents can be managed at the company level. For moderate- or high-risk incidents requiring additional personnel and equipment, RFD relies on mutual aid from the Placer County and Roseville Fire Departments. In 2019, hazardous materials accounted for 1.2% of the total incidents responded to by RFD.

Current Deployment Strategy

Like most communities, the geographical placement of physical resources available for deployment is determined by such factors as call volume, geographical concerns, and risk-assessment criteria throughout the community. While each fire station in Rocklin has a defined first-response area, the deployment of resources is determined in real-time utilizing the response apparatus GPS location detected by Automatic Vehicle Locator (AVL) technology located on all response units. The Computer-Aided Dispatching (CAD) system assigns the closest and most appropriate apparatus to the emergency based on factors such as the type and severity of the emergency. One challenge with the deployment strategy is the AVL system is not connected to adjacent agencies so RFD cannot see units from surrounding agencies and the surrounding agencies cannot see the RFD units.

Recommendation:
It is recommended the Department consider interconnecting the AVL systems between the Rocklin Fire units and the units most likely to mutually respond on incidents in the region.

Figure 10: Rocklin Fire Stations and Service Area

Fire Stations and Apparatus

Station 23: 4060 Rocklin Road

Table 6: Station 23 Resources

Apparatus Identifier and Capability	Minimum Number of Personnel Assigned
Engine 23 – Type 1	3
Engine 23B – Type I reserve	
Breathing Support Unit	Cross-staffed
Brush 23 – Type III	Cross-staffed
Foam Tender	Cross-staffed
EUV 23 - Emergency Utility Vehicle	Cross-staffed
Command Vehicle - Reserve	
Total	**3**

Station 24: 3401 Crest Drive

Table 7: Station 24 Resources

Apparatus Identifier and Capability	Minimum Number of Personnel Assigned
Truck 24 – Type I	3
Battalion Chief 24	1
Truck – Type I reserve	
Engine 24 – Type I reserve	
Brush 24 – Type III	Cross-staffed
Total	**4**

Station 25: 2001 Wildcat Boulevard

Table 8: Station 25 Resources

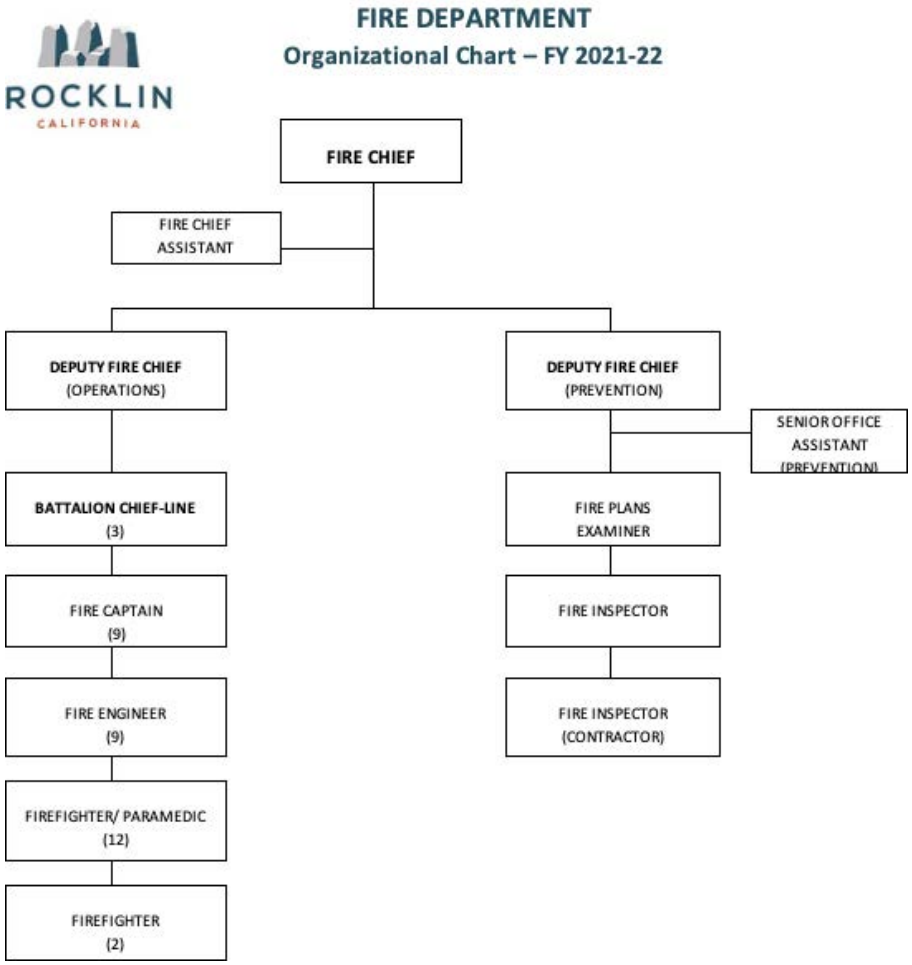
Apparatus Identifier and Capability	Minimum Number of Personnel Assigned
Engine 25	3
Brush 25 – Type III	Cross-staffed
Total	**3**

Current Staffing Strategy

Organizational Structure

The RFD currently responds to emergency and non-emergency incidents out of three fire stations, with its administrative headquarters building located at 4060 Rocklin Road, Rocklin, CA. The organizational chart below illustrates the general organizational structure for RFD.

Figure 11: Organizational Chart



Administration, Emergency Services, and Support Staff

The RFD organizational structure reflects a typical paramilitary fire service organization. The Executive Team is composed of the Fire Chief, two Deputy Chiefs and three Battalion Chiefs. The Fire Chief is responsible for the overall fiscal and operational management of the organization and reports directly to the City Manager. The Executive Team are tasked with providing oversight and day-to-day management within the organization, including leading the Operations, Training, and EMS Divisions, Emergency Preparedness, Fleet Repair and Maintenance, Fire Prevention, Inspection, and Code Enforcement.

The Deputy Chiefs primarily handle management of the Prevention Division and the Operations Divisions respectively. The Operations Division supported by three Battalion Chiefs assigned to shift work who are tasked with managing on-duty line personnel and serving as the Incident Commander during emergency events. RFD currently has 42 full-time employees with 35-line personnel assigned across three shifts working 48 hours on / 96 hours off work schedules, composing a 56-hour work week. Each shift currently has an authorized staffing level of 10 personnel assigned, with a minimum daily staffing of 10 personnel on duty each shift. The Battalion Chief of Emergency Medical Services and the Battalion Chief of Training also support the Deputy Chief with ensuring all personnel are compliant with all required training set forth by the organization, NFPA, ISO, and the Medical Director.

COMMUNITY RESPONSE HISTORY

Methodology

The process secured two unit-level (or response-level) CAD data files and two call-level CAD data files from the Rocklin Fire Department (RFD). Collectively, files spanned six calendar years of data, from January 1, 2014, to December 31, 2019. As such, we present six full reporting periods of baseline data in the last section of this report. All other analyses throughout the report are based on 2019 data from the CAD unit-level and call-level data files (Table 81).

Two distinct measures were utilized in this report—call volume and workload. Number of requests for service are defined as "incidents" or "calls" (i.e., call volume). Call volume reflects the number of times a distinct incident was created involving one or more RFD units, and/or calls received in RFD's jurisdiction. "Responses" are the number of times that an individual unit (or units) responded to a call (i.e., workload).

Audits of the CAD data files were first conducted to identify any anomalies for attention and reconciliation prior to data analysis. Exclusion criteria were applied to records prior to call volume and temporal analyses, and prior to response volume and busy time analyses. Exclusion criteria were further applied to records prior to the analysis of performance time metrics (e.g., dispatch time; turnout time). Entries with negative times or with times of 0 minutes, and entries with extremely high busy or performance times (i.e., outliers) were excluded.

Responses were classified based on call status and the role of the responding unit. Analyses of performance times focused on emergency (lights and sirens) responses from RFD's first arriving primary front-line units for all unique incidents. Records with a "Call Priority" value of 1 were considered to be emergency (lights and sirens) responses throughout this report. RFD units considered by department leadership to be primary front-line units appropriate for inclusion in performance time analyses included select battalion chiefs, type 3 brush trucks, breathing support unit, engines, water tenders, and trucks. The majority of analyses related to performance (e.g., travel time) were restricted based on these classifications to include only primary front-line units responding to emergency (lights and sirens) calls and are identified in the report where applicable.

Any reduced sample sizes due to missing or excluded data are noted in the report where applicable.

Overview of Community Response Performance

During the 2019 reporting period (i.e., January 1, 2019, to December 31, 2019; hereinafter referred to as 2019), community demand for RFD services included 3,838 EMS related requests for service (74.7%), 1,238 fire related requests for service (24.1%), 60 hazmat related requests for service (1.2%), and four rescue related requests for service (0.1%; Figure 12; Table 9). Demand from the community **across all programs and call types during 2019 totaled 5,140 requests for service**.

Calls were classified as originating from the RFD community based on an examination on the "SRA" or reporting district variable in the CAD data file. Reporting districts beginning with numerical values were identified by the RFD CAD data team as representative of being within RFD's jurisdiction and reporting districts not beginning with numerical values were identified by the RFD CAD data team as representative of being outside of RFD's jurisdiction. Calls for which the reporting district was missing from the CAD data file were considered part of RFD's community demand if the reported city was Rocklin. Classifications of incident types from the CAD data file into program and call category are presented in Table 81.

Figure 12: Percentage of Total Incidents by Program

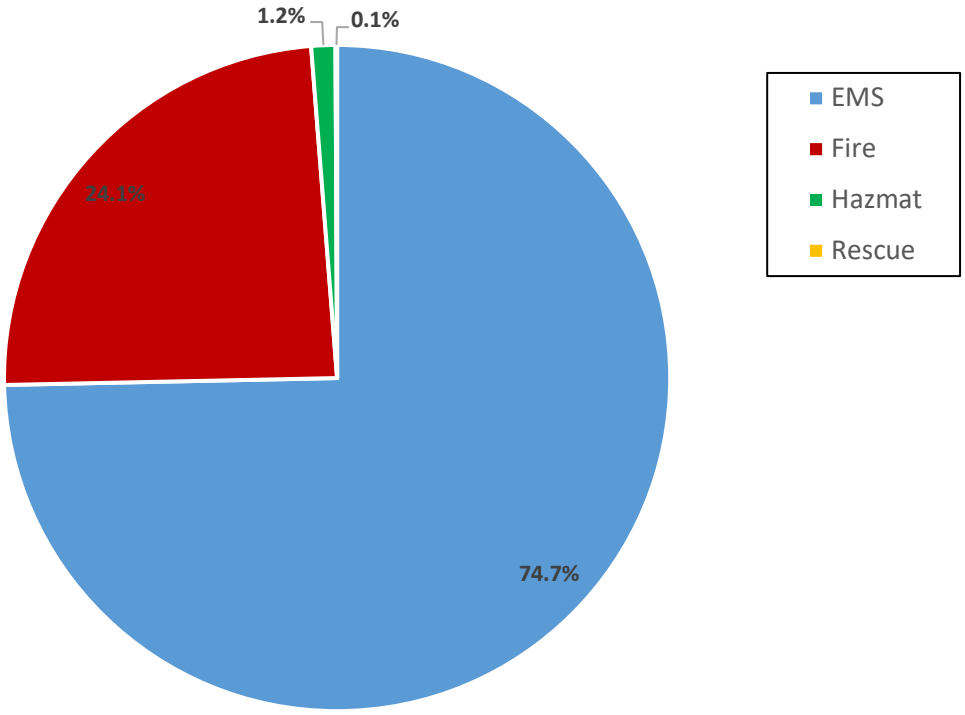


Table 9: Number of Incidents by Call Category

Call Category	Number of Calls	Average Calls per Day	Call Percentage
CPR	56	0.2	1.1
Man Down	42	0.1	0.8
Medical Aid	3,740	10.2	72.8
EMS Total	**3,838**	**10.5**	**74.7**
CO Alarm	86	0.2	1.7
Fire Alarm	302	0.8	5.9
Fire Investigation	97	0.3	1.9
Fire Other	21	0.1	0.4
Flooding Condition	69	0.2	1.3
Mutual Aid	10	< 0.1	0.2
MVA	207	0.6	4.0
Outside Fire	35	0.1	0.7
Police Assist	18	< 0.1	0.4
Public Assist	311	0.9	6.1
Strike Team	1	< 0.1	< 0.1
Structure Fire	62	0.2	1.2
Vehicle Fire	19	0.1	0.4
Fire Total	**1,238**	**3.4**	**24.1**
Hazmat	60	0.2	1.2
Hazmat Total	**60**	**0.2**	**1.2**
Rescue	4	< 0.1	0.1
Rescue Total	**4**	**< 0.1**	**0.1**
Total	**5,140**	**14.1**	**100.0**

Combined, all RFD units made 5,140 responses, and were busy on calls for a total of 1,817 hours in 2019. Overall, average busy minutes per response was 18.6 minutes, but varied based on call type. Average number of responses per call was 1.2.

Table 10: Number of Calls, Number of Responses, and Total Busy Time by Call Category

Program	Number of Calls[1]	Number of Responses[2]	Avg Responses per Call	Total Busy Hours	Avg Busy Minutes per Response	Avg Calls per Day	Avg Responses per Day
EMS	3,745	4,115	1.1	1,202.9	17.6	10.3	11.3
Fire	1,215	1,654	1.4	575.6	20.9	3.3	4.5
Hazmat	59	92	1.6	33.4	21.8	0.2	0.3
Rescue	4	13	3.3	6.0	27.5	< 0.1	< 0.1
Total	**5,023**	**5,874**	**1.2**	**1,817.8**	**18.6**	**13.8**	**16.1**

[1]"Number of Calls" reflects an adjusted number of calls following any exclusion activity to align with responses made by valid units assigned to RFD (see Appendix).
[2]"Number of Responses" reflects the total number of records in the data file associated with responses made by valid units assigned to RFD, regardless of calculated busy time.
[3]"Responses with Time Data" reflects the number of records in the data file associated with responses made by valid units assigned to RFD with calculated busy time not otherwise excluded.

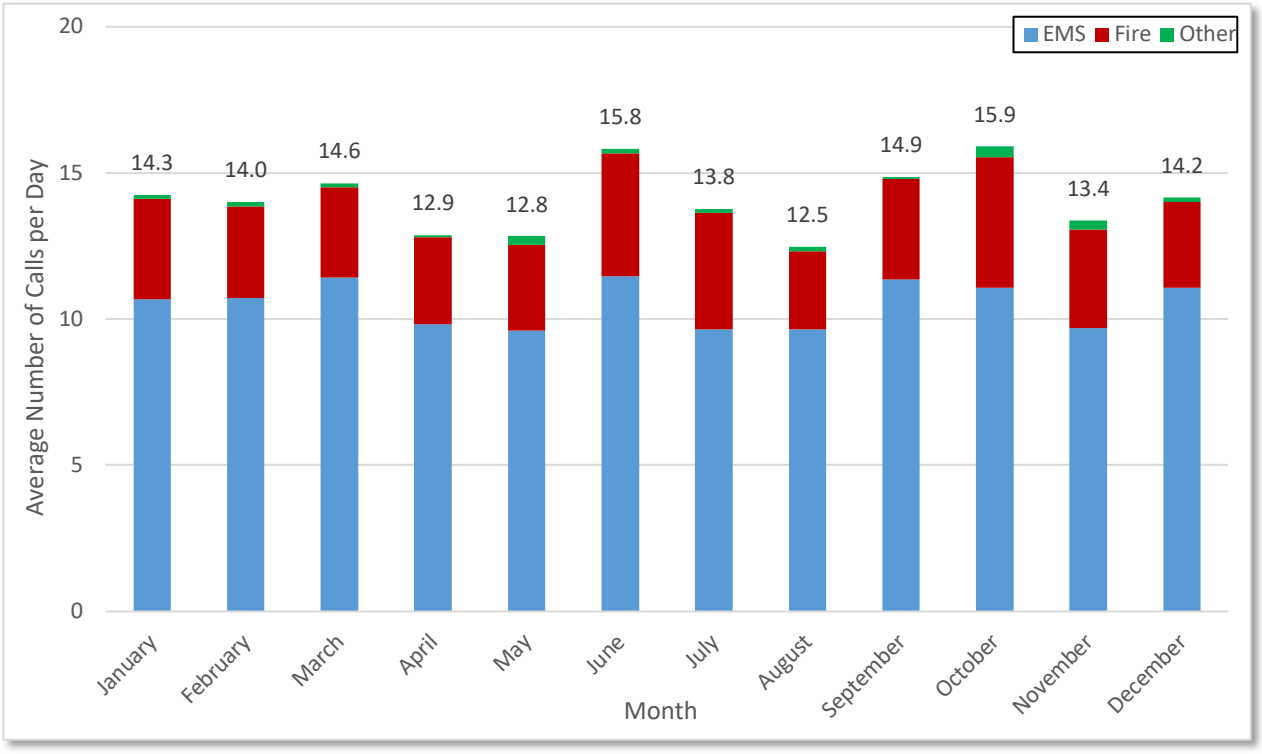
Temporal analyses were conducted to evaluate patterns in community demands. These analyses are based on the 5,140 requests for service received by RFD during 2019, and examine the frequency of incidents by month, day of week, and hour of day. In the following analyses, calls that were not classified as "EMS" or "Fire" were grouped into an "Other" category for presentation purposes.

Overall, average requests per month ranged from a low of 12.5 calls per day in August to a high of 15.9 calls per day in October. The three months with the most requests for service in descending order were: October (15.9 per day), June (15.8 per day), and September (14.9 per day). The three months with the fewest requests for service in ascending order were: August (12.5 per day), May (12.8 per day), and April (12.9 per day).

Table 11: Overall: Total Calls and Average Calls per Day by Month

Month	Number of Calls	Average Calls per Day	Call Percentage
January	442	14.3	8.6
February	392	14.0	7.6
March	454	14.6	8.8
April	386	12.9	7.5
May	398	12.8	7.7
June	475	15.8	9.2
July	427	13.8	8.3
August	387	12.5	7.5
September	446	14.9	8.7
October	493	15.9	9.6
November	401	13.4	7.8
December	439	14.2	8.5
Total	**5,140**	**14.1**	**100.0**

Figure 13: Overall: Average Calls per Month



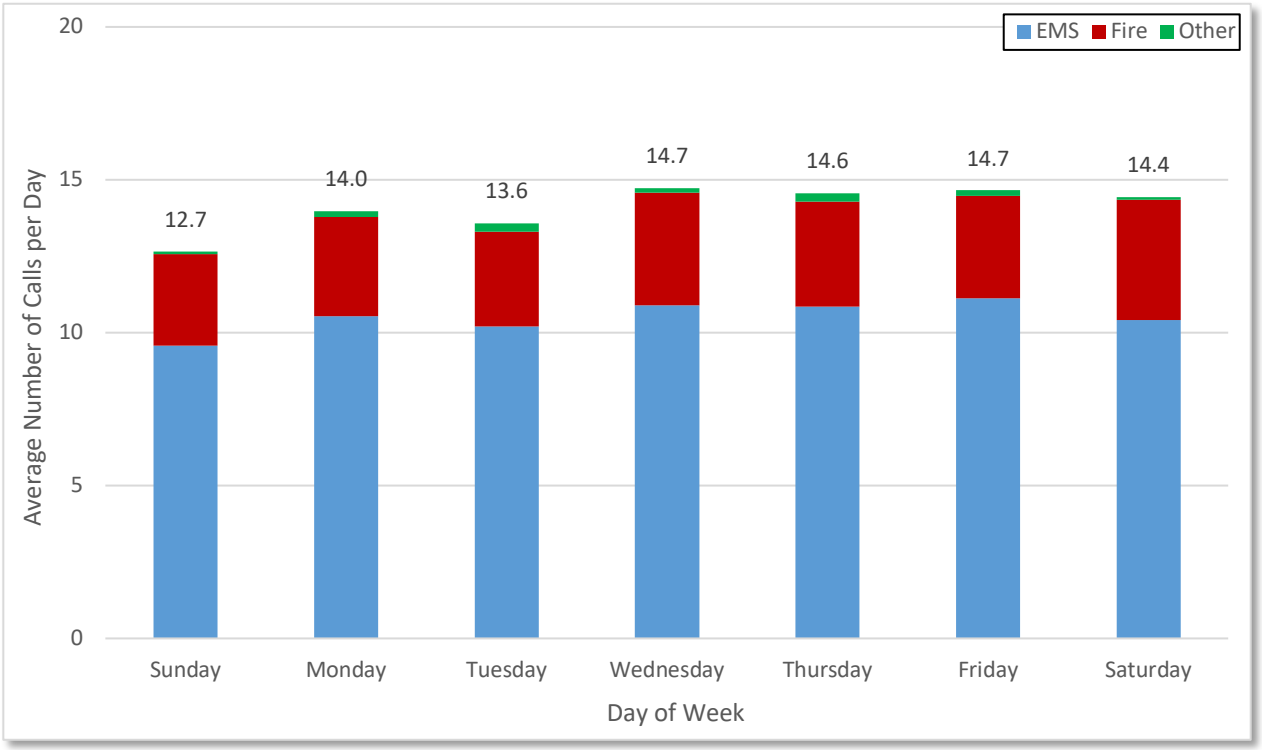
Similar analyses were conducted for requests by day of week. The lowest average number of calls per day occurred on Sunday (12.7 per day), and the highest average number of calls per day occurred on Wednesday (14.7 per day).

Table 12: Overall: Total Calls and Average Calls per Day by Day of Week

Day of Week	Number of Calls	Average Calls per Day	Call Percentage
Sunday	658	12.7	12.8
Monday	727	14.0	14.1
Tuesday[1]	719	13.6	14.0
Wednesday	766	14.7	14.9
Thursday	757	14.6	14.7
Friday	762	14.7	14.8
Saturday	751	14.4	14.6
Total	**5,140**	**14.1**	**100.0**

[1]There were 53 Tuesdays in 2019, and 52 of all other days of the week in 2019.

Figure 14: Overall: Average Calls per Day by Day of Week



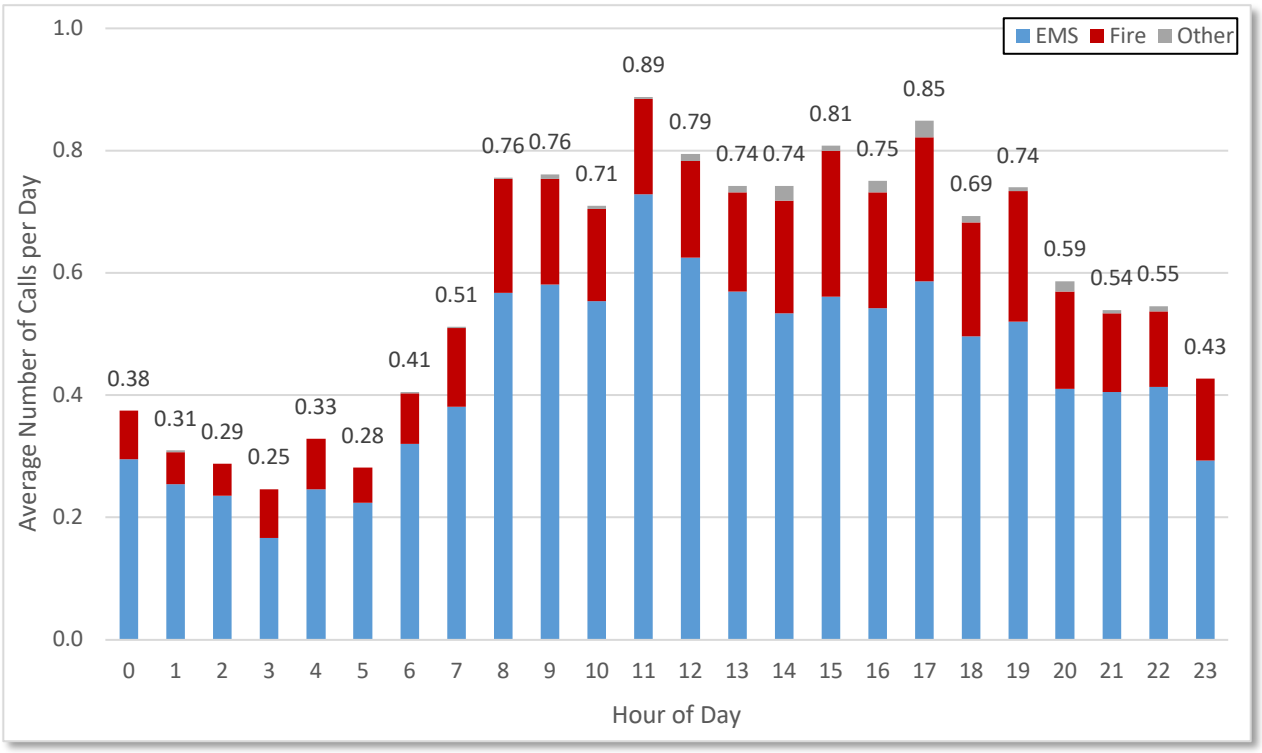
Overall demands were also evaluated by hour of day. Variability exists in the time of day that requests for services were received. Peak demand occurred at 1100 (0.89 calls per day). The hours of the day with the lowest average number of calls per day (ranging from 0.25-0.38 per day) were between 0000 and 0500.

Table 13: Overall: Total Calls and Average Calls per Day by Hour of Day

Hour of Day	Number of Calls	Average Calls per Day	Call Percentage
0	137	0.38	2.7
1	113	0.31	2.2
2	105	0.29	2.0
3	90	0.25	1.8
4	120	0.33	2.3
5	103	0.28	2.0
6	148	0.41	2.9
7	187	0.51	3.6
8	276	0.76	5.4
9	278	0.76	5.4
10	259	0.71	5.0
11	324	0.89	6.3
12	290	0.79	5.6
13	271	0.74	5.3
14	271	0.74	5.3
15	295	0.81	5.7
16	274	0.75	5.3
17	310	0.85	6.0
18	253	0.69	4.9
19	270	0.74	5.3
20	214	0.59	4.2
21	197	0.54	3.8
22	199	0.55	3.9
23	156	0.43	3.0
Total	**5,140**	**14.1**	**100.0**

To provide a more granular understanding of the community's demand for services, this temporal analysis included the average number of calls per hour. In other words, when referring to Figure 15 below, the busiest hour was at 1100 with 324 calls occurring during that hour in 2019. The average number of calls per hour is a daily average for those 324 calls if they were distributed equally across the year (i.e., 324/365 = 0.89). Therefore, the busiest hour per day was at 1100 with an average hourly call volume of 0.89 calls per day. The second busiest hour occurred at 1700 with 310 calls during that hour in 2019, and an average hourly call volume of 0.85 calls per day.

Figure 15: Overall: Average Calls per Day by Hour of Day



Overall, RFD made 5,874 responses, and the total busy hours were 1,817 hours during 2019. The station-level demand is more reflective for deployment decisions, and the unit-level workload will help evaluate the utilization of physical apparatus and assist with apparatus procurement or maintenance decisions.

Station 24 was the busiest station based on total busy hours during 2019 as well as the greatest number of responses to calls across the department.

Table 14: Overall Workload by Station

Reporting District	Station	Number of Responses Made by Units Assigned to Station[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response	Percentage of Total Busy Hours
RFD	23	2,078	2,075	604.4	17.5	33.2
	24	2,296	2,293	747.7	19.6	41.1
	25	1,500	1,498	465.8	18.7	25.6
	Total	**5,874**	**5,866**	**1,817.8**	**18.6**	**100.0**
Outside or Unknown	23	251	248	102.2	24.7	34.7
	24	320	319	140.2	26.4	47.6
	25	158	157	52.1	19.9	17.7
	Total	**729**	**724**	**294.4**	**24.4**	**100.0**
All	23	2,329	2,323	706.5	18.2	33.4
	24	2,616	2,612	887.8	20.4	42.0
	25	1,658	1,655	517.9	18.8	24.5
	Total	**6,603**	**6,590**	**2,112.2**	**19.2**	**100.0**

[1]"Number of Responses" reflects the total number of records in the data file associated with responses made by valid units assigned to RFD, regardless of calculated busy time.

[2]"Responses with Time Data" reflects the number of records in the data file associated with responses made by valid units assigned to RFD with calculated busy time not otherwise excluded.

First Arriving Unit Performance

The analysis in this section focuses on performance times related to dispatch, turnout, travel, and response times of first arriving units of distinct incidents. We focused our analysis on emergency (lights and sirens) responses from the first-arriving front-line units for all unique incidents in all demand zones.

The average dispatch time was 2.0 minutes. The average turnout time was 1.5 minutes, travel time was 3.8 minutes, and the total average response time was 7.3 minutes.

However, a more conservative and reliable measure of performance is the fractile or percentile. This measure is more robust, or less influenced by outliers, than measures of central tendency such as the average. Best practice is to measure at the 90th percentile. In other words, 90% of all performance is captured, expecting that 10% of the time the department may experience abnormal conditions that would typically be considered an outlier. For example, if the department were to report an average response time of six minutes, then in a normally distributed set of data, half of the responses would be longer than six minutes and half of the responses would be less than six minutes. The 90th percentile communicates that 9 out of 10 times the department performance is predictable and thus more clearly articulated to policy makers and the community.

The performance for dispatch time at the 90th percentile was 3.1 minutes, turnout time at the 90th percentile was 2.6 minutes, travel time at the 90th percentile was 5.7 minutes, and total response time at the 90th percentile was 9.8 minutes.

Typically, performance varies across call types or categories for a variety of reasons. For example, turnout time may be longer for fire related calls because the crews must dress in their personal protective ensemble (bunker gear) prior to leaving the station, whereas on an EMS incident, they do not. Similarly, the larger fire apparatus may require longer travel and overall response times due to its size and lack of maneuverability.

Table 15: Average Dispatch, Turnout, Travel, and Response Times by Program and Determinant - First Arriving Units

Reporting District	Program	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)	Sample Size[1]
RFD	EMS	2.0	1.5	3.7	7.1	3,507
	Fire	2.1	1.9	3.9	7.8	708
	Hazmat	1.9	1.8	4.6	8.3	56
	Rescue	1.3	1.5	3.6	6.4	3
	Total	**2.0**	**1.5**	**3.8**	**7.3**	**4,274**
Outside or Unknown	EMS	3.7	1.8	7.9	13.3	59
	Fire	2.5	2.0	7.4	11.1	117
	Hazmat	2.3	1.4	6.9	10.6	6
	Rescue	--	--	--	--	1
	Total	**3.0**	**1.9**	**7.6**	**12.0**	**183**
All	EMS	2.0	1.5	3.8	7.2	3,566
	Fire	2.2	1.9	4.4	8.2	825
	Hazmat	1.9	1.7	4.8	8.5	62
	Rescue	7.3	2.0	6.1	15.4	4
	Total	**2.0**	**1.6**	**3.9**	**7.5**	**4,457**

[1]Sample sizes reflect the number of responses made to emergency (lights and sirens) calls by first arriving primary front-line units assigned to RFD; due to missing or excluded time data, sample sizes corresponding to individual table metrics may be smaller.

Figure 16: Average Dispatch, Turnout, Travel, and Response Times by Program - First Arriving Units

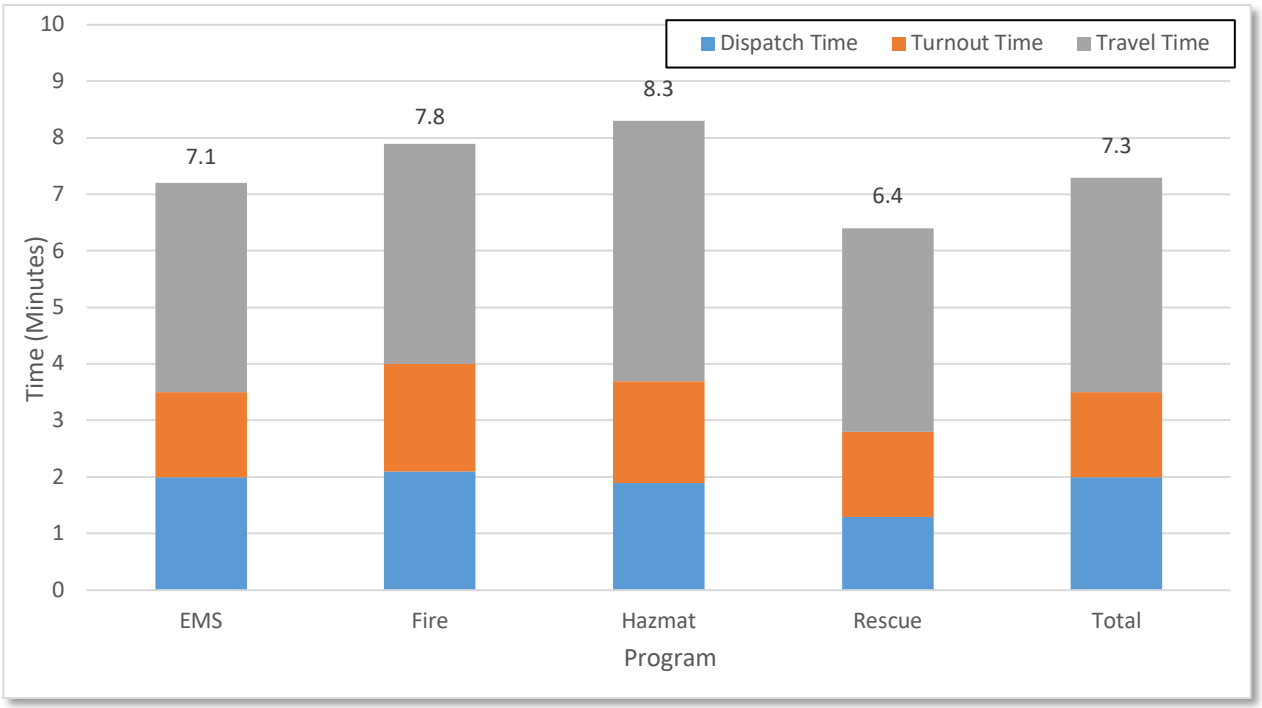


Table 16: 90th Percentile Dispatch, Turnout, Travel, and Response Times by Program and Determinant - First Arriving Units

Reporting District	Program	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)	Sample Size[1]
RFD	EMS	2.9	2.5	5.5	9.5	3,507
	Fire	3.9	2.9	6.3	10.7	708
	Hazmat	3.2	2.8	6.9	12.5	56
	Rescue	--	--	--	--	3
	Total	**3.1**	**2.6**	**5.7**	**9.8**	**4,274**
Outside or Unknown	EMS	10.4	3.2	13.0	19.8	59
	Fire	6.2	3.1	12.3	19.2	117
	Hazmat	--	--	--	--	6
	Rescue	--	--	--	--	1
	Total	**7.1**	**3.1**	**12.8**	**19.5**	**183**
All	EMS	3.0	2.5	5.7	9.7	3,566
	Fire	4.3	2.9	7.3	11.9	825
	Hazmat	3.4	2.7	8.2	12.6	62
	Rescue	--	--	--	--	4
	Total	**3.2**	**2.6**	**6.1**	**10.3**	**4,457**

[1]Sample sizes reflect the number of responses made to emergency (lights and sirens) calls by first arriving primary front-line units assigned to RFD; due to missing or excluded time data, sample sizes corresponding to individual table metrics may be smaller.

Table 17: 90th Percentile Travel Times by Unit Type - First Arriving Units

Reporting District	Unit Type	Travel Time (Minutes)	Number of First Arrivals	Number of First Arrivals with Travel Times
RFD	Battalion Chief	7.2	46	41
	Engine	5.5	3,067	3,009
	Truck	6.3	1,144	1,120
	Type 3 Brush	4.3	17	13
Outside or Unknown	Battalion Chief	13.9	57	55
	Engine	8.6	107	102
	Truck	24.3	12	10
	Type 3 Brush	--	7	4
All	Battalion Chief	13.0	103	96
	Engine	5.7	3,174	3,111
	Truck	6.4	1,156	1,130
	Type 3 Brush	9.3	24	17

The distributions of turnout and travel time were also analyzed. A total of 12.9% of calls had turnout times of one minute or less, 53.4% of calls had turnout times of 1.5 minutes or less, and 75% of calls had turnout times under 2.0 minutes. A total of 83.2% calls had a travel time of five minutes or less and 91.6% of calls had travel times under six minutes.

Figure 17: Distribution of Turnout Time of First Arriving Unit - All Emergency Calls

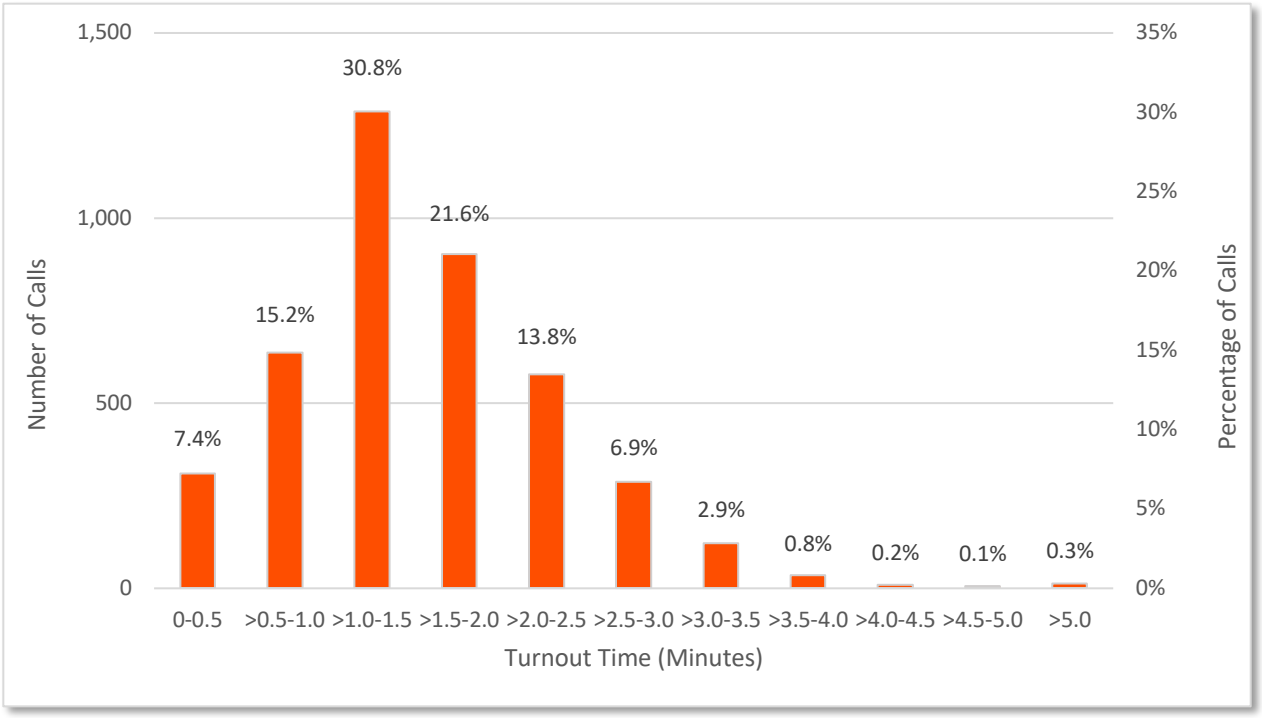
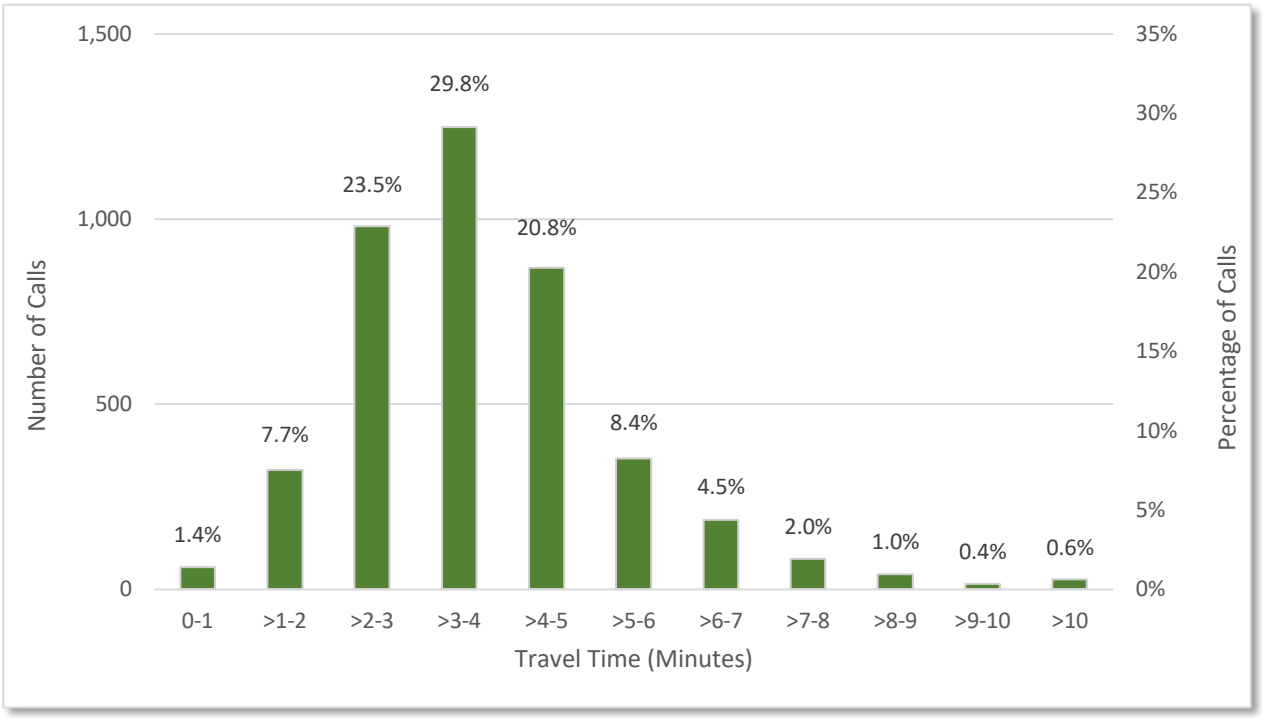


Figure 18: Distribution of Travel Time of First Arriving Unit - All Emergency Calls



COMMUNITY EXPECTATIONS AND PERFORMANCE GOALS

Stakeholder Input Process

A Strategic Planning process was conducted by RFD in February of 2021, during which time twenty-one-member group of internal and external stakeholders completed a strategic visioning process. The process included a review of the value of strategic planning; a review of the community stakeholders' perception of the Rocklin Fire Department before and after the facilitated process; an analysis of the agency's strengths, weaknesses, opportunities, and challenges; an introduction to the Commission on Fire Accreditation International fire agency accreditation process; plus, a review of the agency's desired strategic planning statements for final inclusion into a strategic plan. At the conclusion of the process, the stakeholders derived three key themes:

1. How do we continue to improve on saving lives, property, and the environment during and prior to emergency events?
2. How do we meet the increasing service demands over the coming years?
3. How do we better market our services and demonstrate our value to our community?

From these key themes, members of the agency's command staff developed a list of 12 strategic objectives, 19 outcome measurements and 53 unique supporting goals to prepare the Rocklin Fire Department to meet the needs and expectations of their community, and to communicate performance and progress in a way that would be easily understood by the community Guiding Principles and Internal Performance Expectations and Goals.

Mission

Our mission is to minimize risk, increase safety, and improve the quality of life in our community by responding quickly, solving problems, and being nice!

Vision

Our Vision is to provide first class fire, emergency medical, and public safety services to this community and to create and maintain a predictable, sustainable economic future. We will maintain a "customer first" service model to our internal and external customers while representing, supporting, and maintaining our fire department and city *family* with pride and honor.

- **We will** recruit, hire, train, and retain exceptional personnel that will endeavor to meet and honor our mission, maintain the public trust, be innovative and efficient in thoughts and actions, and maintain collaborative relationships between leadership, workforce, and all other stakeholders for their service career.
- **We will** honor both names on our turnout coats and uniforms equally understanding that just like the two names, we have two families: our city family and our birth family.

- **We will** exercise selfless devotion to our career while maintaining physical, mental, and emotional wellbeing for each of our members.
- **We will** plan for success and succession because we know that hoping for them is ineffective and purposeful actions and participation will position us for the future.
- **We will** be responsive to our stakeholders; internal and external.
- **We will** embrace diversity and inclusion within the Fire Department and community, ensuring equity for all.
- **We will** train and educate our citizens through community engagement of risk reduction practices.
- **We will** challenge the status quo in pursuit of efficiency and effectiveness through innovation, accountability, and professional growth as individuals and as a team.
- **We will** develop and maintain strategic partnerships throughout the city and community that help us address the unique challenge of rapid growth while promoting personalized service delivery with the highest quality of pride and professionalism.
- **We will** be successful through continued execution of funding policies for strategic reserves and capital acquisition accounts that bolster fiscal responsibility and position this Fire Department to successfully meet the defined level of service delivery that this community has come to expect even during times of economic difficulty and/or uncertainty.

Values

- *Trustworthy*
- *Professionals with professional qualities, behaviors, and skills*
- *Embrace flexibility*
- *Desire authority to exercise independent judgement*
- *Accept responsibility and accountability for actions and outcomes*

Motto

"Respond Quickly, Solve Problems, Be Nice"

COMMUNITY RISK ASSESSMENT AND RISK LEVELS

Risk Assessment Methodology

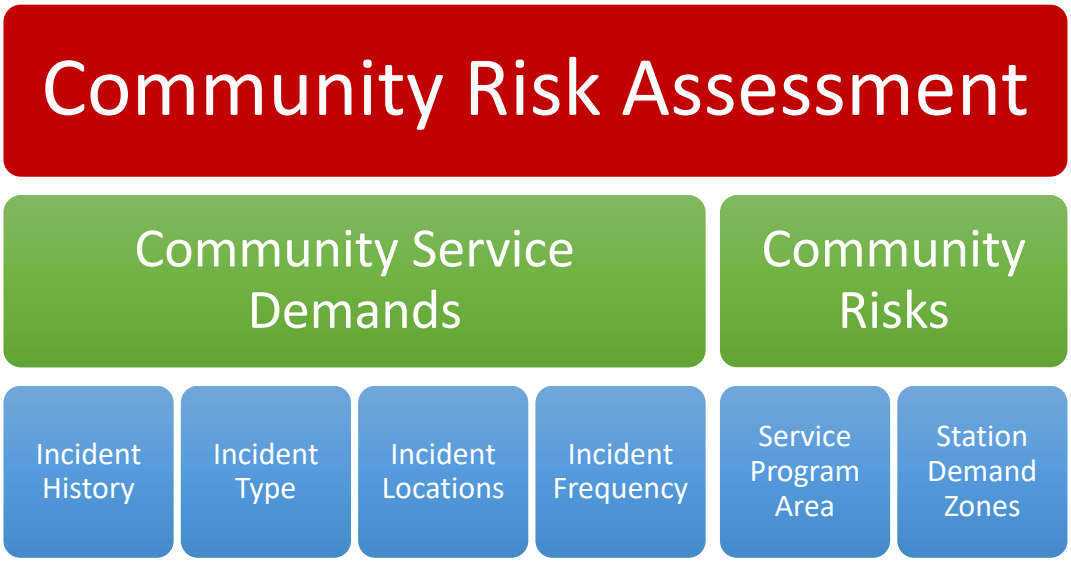
Methodology

The risk assessment process utilized a systematic methodology to evaluate the unique risks that are specific to RFD's response areas. This process evaluated risk from two broad perspectives. First, risk is identified through retrospective analyses of historical data. Second, risk is evaluated prospectively providing the necessary structure to appropriately allocate personnel, apparatus, and fire stations that afford sufficient distribution and concentration of resources to mitigate those risks. This methodology also provides information for the City to consider alternative solutions to assist in the mitigation of risks.

Service areas that either had little quantitative data or did not require that level of analysis were evaluated through both retrospective analysis as well as structured interviews with Department staff members. In an effort to improve clarity, the following terminology is used for the remainder of the risk assessment description and analyses: retrospective risk will use the term Community Service Demands and prospective risk will use the term Community Risks.

The overall community risk assessment process and methods utilized by the RFD are presented in the figure below.[10]

Figure 19: Community Risk Assessment Process



Community service demands were analyzed by the incident history, type, locations, and incident frequencies. Within this process, a temporal analysis was completed for each major program area and

[10] Olathe Fire Department. (2012). Adapted from Community Risk and Emergency Services Analysis: Standard of Cover. Olathe, Kansas: Author.

evaluated by station demand zone and the frequency of incidents. Each program area evaluated community risks, and risks are identified in each demand zone.

This methodology not only provides for sufficient allocation of resources to manage the readiness or preparedness aspects of the deployment strategy, but also balances the costs of readiness with an in-depth understanding of the probability of events through historical analyses.

Probability

Probability is defined as the relative frequency of occurrence of the risk as determined by the RMS system for unique incidents. The following matrix was utilized to calculate a quantitative value for frequency. The ranges were created to afford the maximum value of the preceding frequency prior to graduating to the next most frequent temporal element.

Table 18: Probability Risk Matrix

Incident Frequency	Range-Low	Range-High	Risk Score
Quarterly	0	0.0328	**2**
Monthly	0.0329	0.1424	**4**
Weekly	0.1425	0.99	**6**
Daily	0.991		**8**

Consequence

Consequence is defined as the relative consequence of the event occurring. This measure is generally the most subjective of the three variables. In other words, it reinforces the enhanced value of an occupancy-level risk approach that is a more refined assessment at the building level rather than the code description. However, value is found in a systematic approach to measuring the potential consequence of differentiated risks in an escalation model.

Table 19: Consequence Risk Matrix

Incident Frequency	Risk Score
Individual / Business	**2**
Multiple People / Businesses	**4**
Multiple People / Businesses / Financial Impact to the City	**6**
City Community Region	**8**

Impact

Impact is defined as the relative impact of the event occurring on the agency. In other words, what is the risk to the Department's resiliency to handle the residual incidents in the community during these events? The following risk matrix utilized an escalating model in 25% increments to department drawdown based on the critical tasking presented in the next section and the Department's minimum daily staffing.

Table 20: Impact Risk Matrix

Resource Drawdown	Resource Resiliency	Range-Low	Range-High	Score
25%	**75%**	0	7.221	**2**
50%	**50%**	7.25	14.471	**4**
75%	**25%**	14.5	21.721	**6**
>75%	**<25%**	21.75	29	**8**

Ultimately, the three dimensions were utilized to create a mathematical score for each variable and create three-dimensional models that are helpful in visualizing the contribution of each variable to the overall risk rating by risk classifications of low, moderate, high, and maximum risks.

Planning Areas/Zones

The RFD has three distinct Station Demand Zones (SDZ) that are determined by utilizing the closest fire station based on the road network and distance serving that part of the community. SDZs are used to evaluate demand for services, demographic characteristics, and risks that are associated within each of the respective zones. The risks analyzed within each SDZ can include factors such as the probability and consequence of a given emergency, historical call demand, population density, and the type of construction and occupancies in the SDZ that may have an impact on factors such as fire flow and water distribution capacity. Effective planning efforts and analysis within each of the SDZs allow RFD to ensure the proper concentration and distribution of resources are present to meet the unique risks associated with each SDZ.

Community Characteristics of Risk

The risk categories presented in this section are described as hazards that the city of Rocklin may be vulnerable to and can have a significant impact on the local economy, residents of the community, and the City's service delivery capabilities. Hazards were assessed by probability of occurrence over ten years and vulnerability as well as the likely impact on the community. The city of Rocklin utilizes the Placer County- Local Hazard Mitigation Plan[11] which evaluates hazards using numerous criteria including:

- Geographic location: Should the event occur, will it affect the entire state, region, or local jurisdiction?
- Previous occurrences: How often has this type of event occurred in the past?
- Future probability: What is the likelihood of this type of event occurring in the future?
- Magnitude/Severity: If the event were to occur, what would the impact be on the community and the economy?

[11] https://www.placer.ca.gov/DocumentCenter/View/52176/Placer-County-LHMP-Update-Complete-Public-Review-Draft-1?bidId= Accessed August 2021

Table 21: Overall Hazard Probability

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Unlikely	Limited	Low	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Negligible	Medium	High
Earthquake	Significant	Occasional	Limited	Low	Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Limited	Low	Medium
Floods: Localized Stormwater	Limited	Likely	Negligible	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Critical	High	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Significant	Occasional	Negligible	Low	Low
Tree Mortality	Significant	Highly Likely	Limited	Low	High
Wildfire	Significant	Highly Likely	Limited	Medium	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths.
Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability.
Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability.
Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Climate Change Influence
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Transportation Risks

Aviation

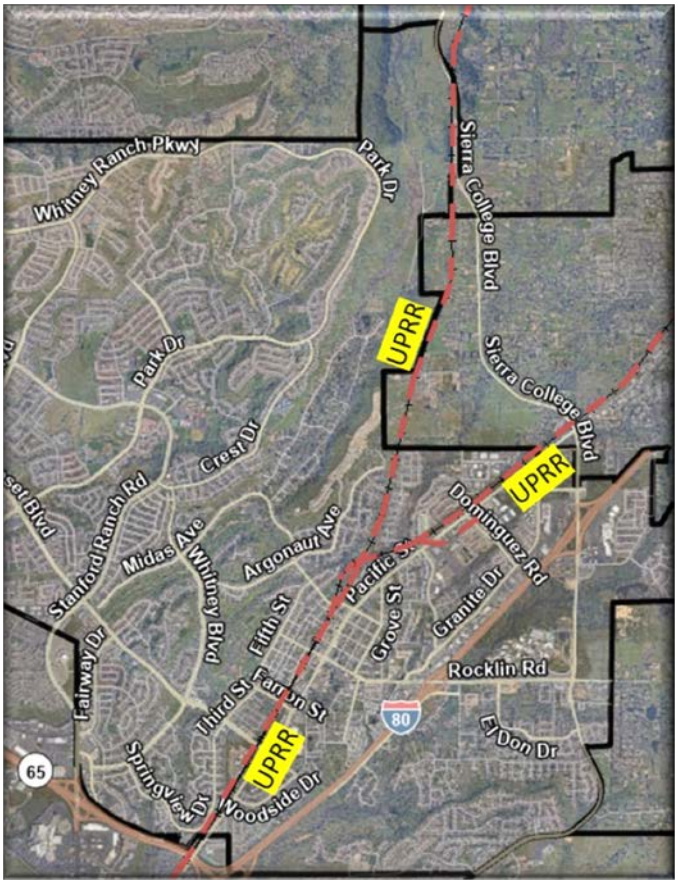
The city of Rocklin does not have an airport within the jurisdiction. There are a number of large airports in the region, the risk of an aircraft incident within the jurisdiction is low.

Railroad

The city of Rocklin has approximately 7.35 miles of railroad that transects the City from the west, at the city of Roseville, to the northwest, at the town of Loomis (see Figure 19). The railway is owned and

operated by the Union Pacific Railroad Company and is part of a network consisting of 32,313 miles of track located in 23 U.S. States[12]. Tracks within the City are active with freight and passenger trains which travel through commercial and residential communities along Pacific Street and Taylor Road.

Figure 20: Union Pacific Railroad



Highway

The city of Rocklin is located along the intersection of Interstate 80 and State Highway 65. Interstate 80 is a controlled six-lane road with an average annual daily traffic (AADT) count of over 125,000 vehicles.[13] The RFD responds to approximately 200 motor vehicle accidents per year which makes MVA's the fourth most frequent call for service per year, which accounted for 4% of total calls for service in 2019.

---

[12] https://www.up.com/cs/groups/public/@uprr/@corprel/documents/up_pdf_nativedocs/pdf_up_2020_build_america_rep.pdf

[13] 2017 CalTrans Report – Rocklin Road/Interstate 80 - https://dot.ca.gov/programs/traffic-operations/census/traffic-volumes/2017/route-71-80

Population Density, Development, and Growth

As of the 2010 census, the overall density for the city of Rocklin is urban as defined by the CFAI.[14] The Commission's definition is that urban designations are populations with over 30,000 people and/or more than 2,000 per square mile. The City has an overall population density of approximately 3,680 per square mile within its 19 square miles of land. There are several clearly defined areas within the City that have rural population densities of less than 1,000 people per square mile, primarily in the Clover Valley area, however, much of the jurisdiction and built-out areas meet the urban standard. Traditionally, the recommended service level for urban population is that the first due unit is capable of arriving within 6 minutes and 30 seconds travel time with a goal of 5 minutes. However, the CFAI has combined urban and suburban densities for first arriving apparatus at a baseline of 5 minutes and 12 seconds with a goal of 4 minutes in the more recently released 9th edition Interpretation Guide that accompanies the 9th edition Self-Assessment Manual.[15]

Table 22: Comparison of Response Times by Agency to Best Practices and National Experience

Call Category	Average Travel Time	90th Percentile Travel Time	CFAI[16] 90th Percentile Urban/Suburban Travel Time	CFAI[17] 90th Percentile Rural Travel Time	NFPA 1710[18] 90th Percentile Travel Time
Fire	3:54	6:18	5:12	13:00	4:00
EMS	3:42	5:30	5:12	13:00	4:00

[14] CFAI. (2009). Fire & Emergency Service Self-Assessment Manual, 8th (ed.). Chantilly, Virginia: Author. (p. 71)

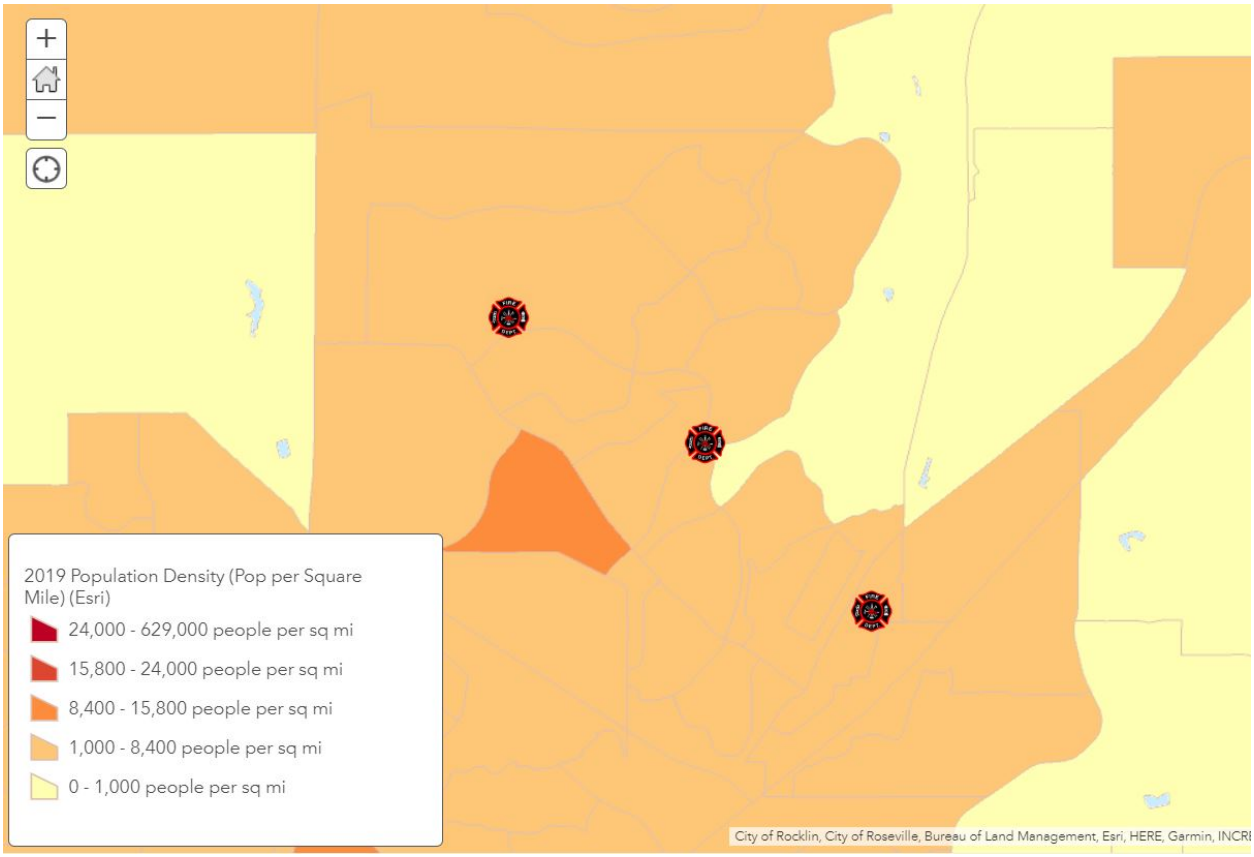
[15] CFAI. (2016). Fire & Emergency Service Self-Assessment Manual: Interpretation Guide, 9th (ed.). Chantilly, Virginia: Author. (p. 99)

[16] CFAI. (2009). Fire *& emergency service self-assessment manual*, (8th ed.). Chantilly, Virginia: Author.

[17] Ibid.

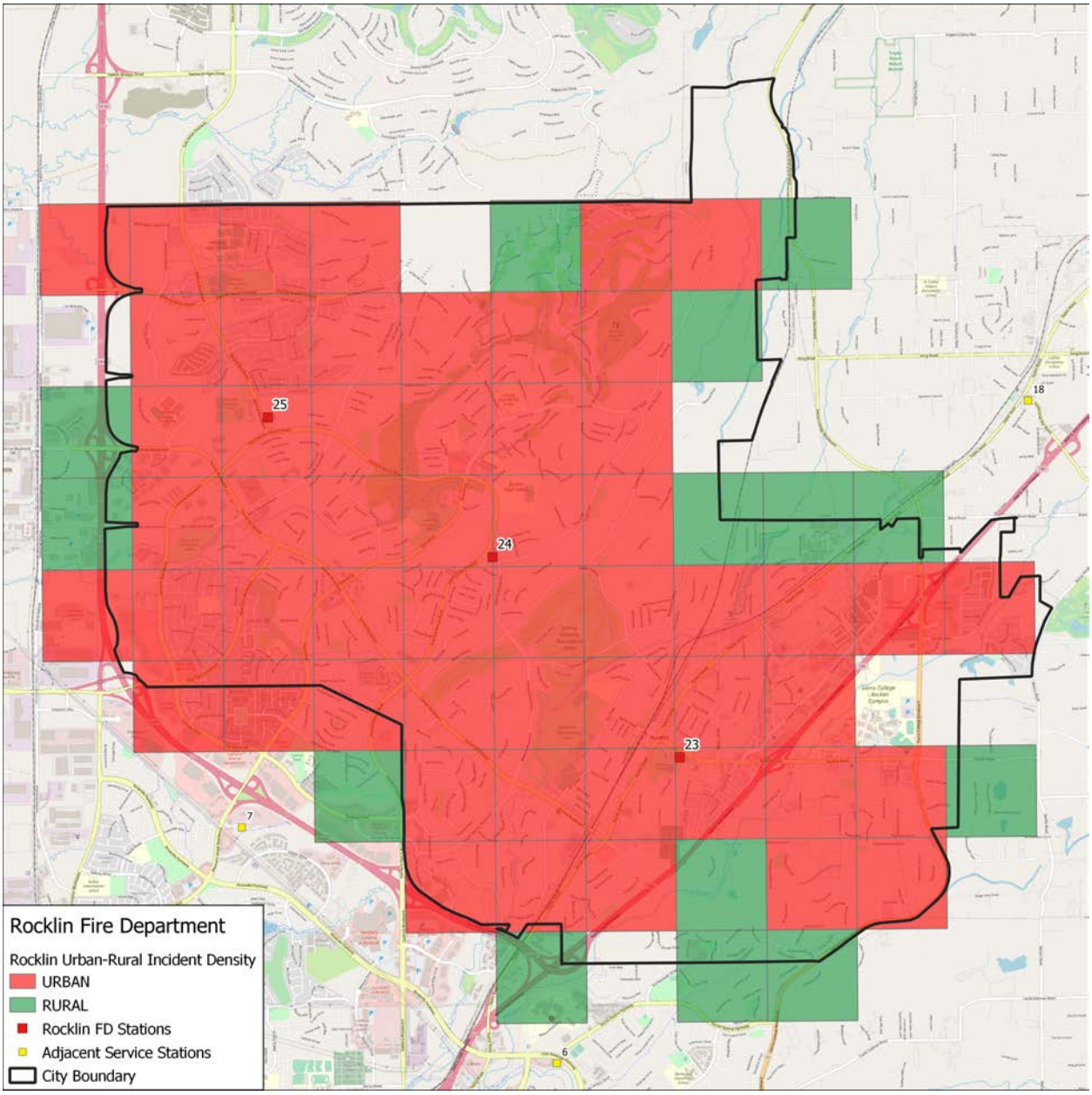
[18] National Fire Protection Association. (2016). NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. Boston, MA: National Fire Protection Association.

Figure 21: Population Density by Census Block – 2019



United States Census data is utilized to approximate the distribution of population throughout the Department's jurisdiction. Therefore, historical call demand analysis was used to identify urban and rural areas of the RFD jurisdiction. Since demand often correlates with population density, this method provides a sound approach to understanding the population density of the community from a demand perspective. We calculated call density based on the relative concentration of incidents based on approximately 0.5-mile geographic areas as well as the adjacent 0.5-mile areas. The results demonstrate a primarily urban designation based on call density for services and not based on population. The red areas are designated as urban service areas and the green areas are designated as rural service areas. Any area that is not colored has less than one call every six months in the 0.5-mile area and the adjacent areas.

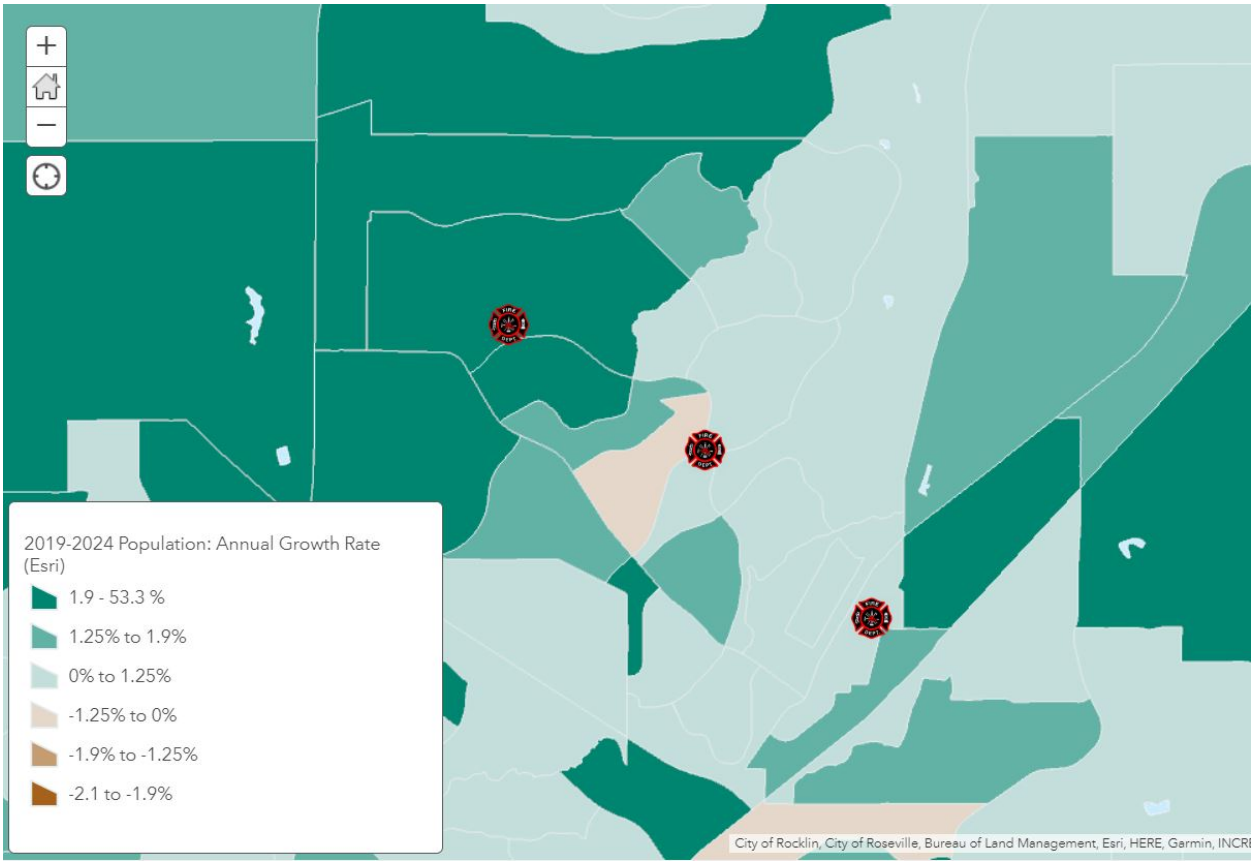
Figure 22: Urban and Rural Call Density Map



Projected Growth

The annual population growth rate is predicted at > 0.27% to 2.8% for the majority of census block areas in the jurisdiction. The annual population growth rate for the darkest green shaded area appearing just southeast of Station 23 is predicted to be 5.21%.

Figure 23: Annual Population Growth - 2019-2024



Finally, population alone is not the sole variable that influences demand for services, as socioeconomic and demographic factors have greater influence over demand. Median household income was evaluated to determine the degree to which the community had underprivileged populations. According to the US Census Bureau, the 2018 (i.e., most recent data available) national median household income is reported at $63,179. The median household income in the light green shaded area surrounding Station 23 is $44,775.

The two following maps depict median home value and per capita income, respectively. The per capita income in the light blue shaded area near Station 23 is $21,326.

Figure 24: Median Household Income - 2019

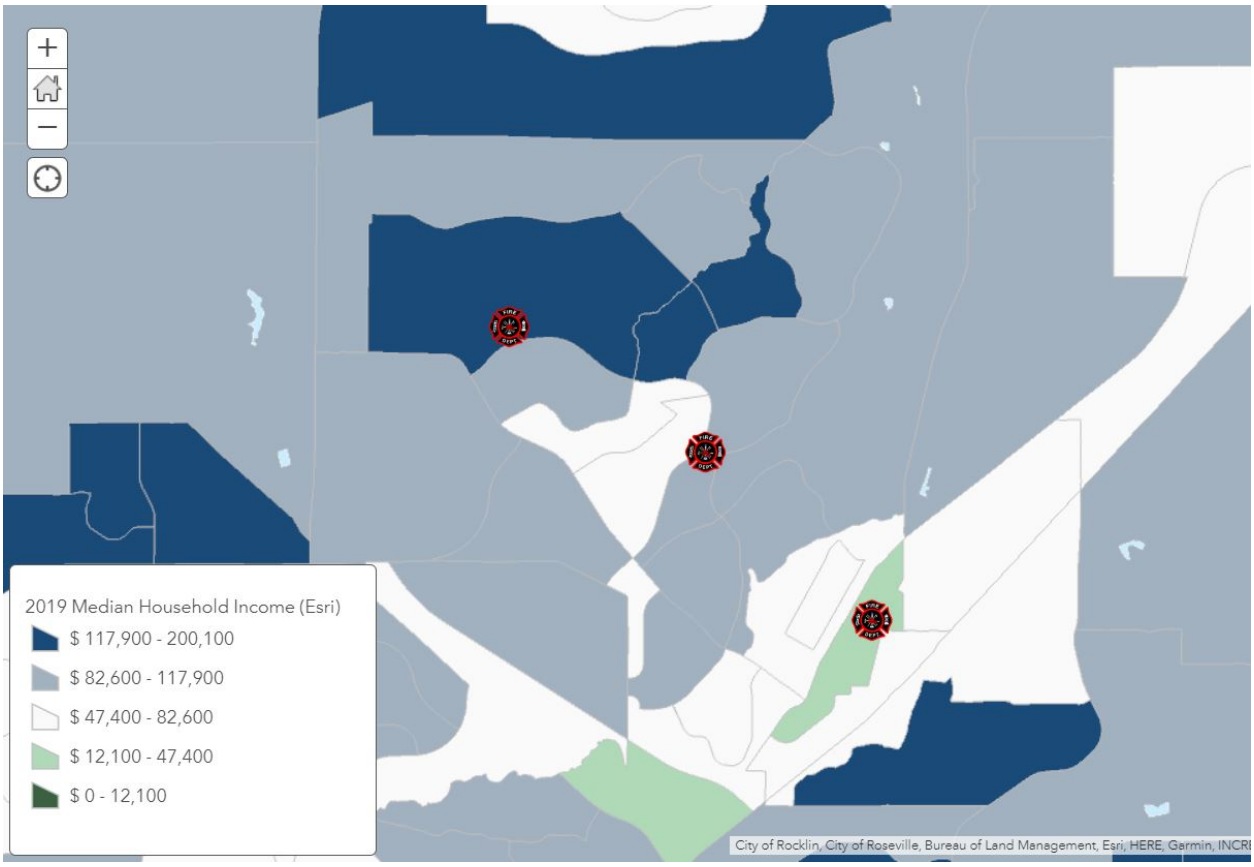
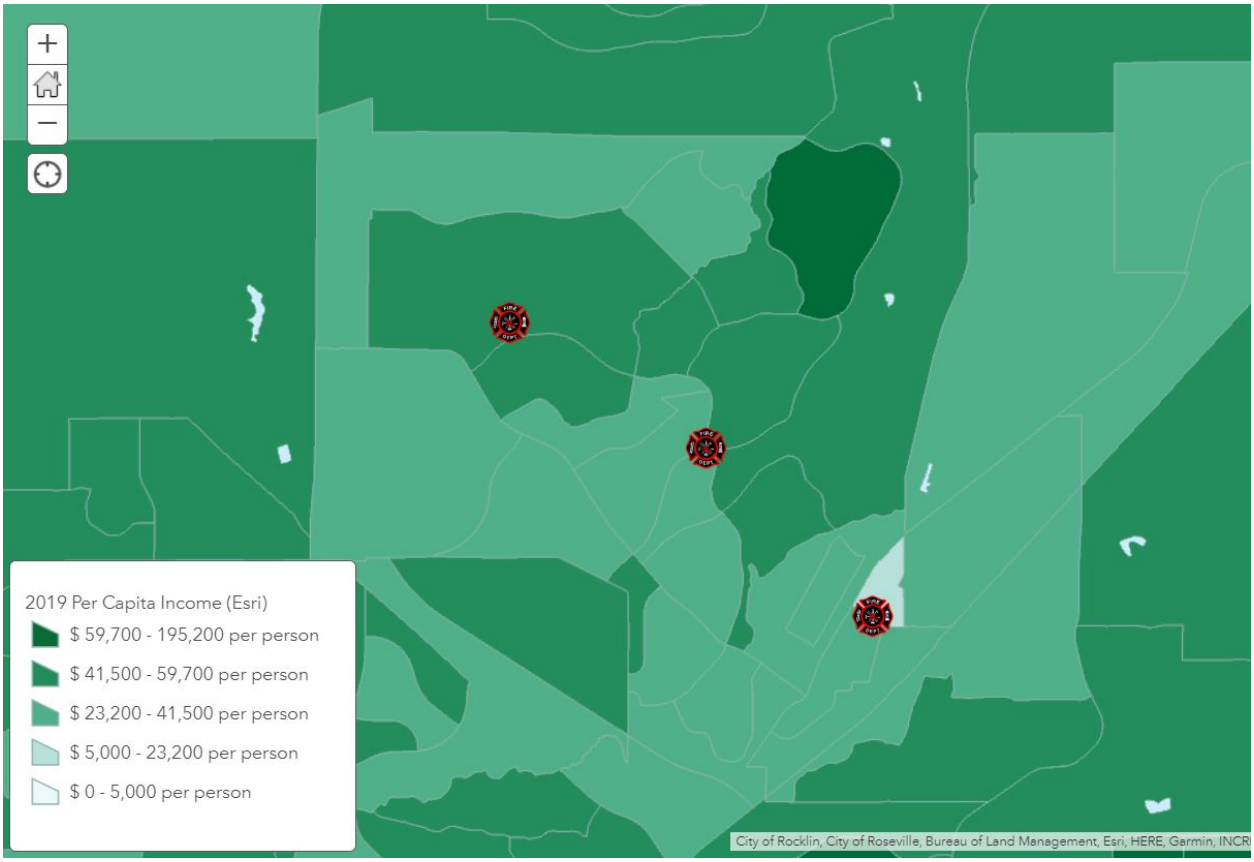


Figure 25: Per Capita Income - 2019



An increasing amount of literature is drawing attention to the anticipated acceleration of EMS demand by older populations.[19,20] Coupled with the anticipated growth in elderly population across the US,[21] EMS systems should be evaluating these specific demographic changes in order to better anticipate the rising demand on EMS services. Demographic trends indicate population shifts will be more dramatic, with an accompanying dramatic increase in EMS services.

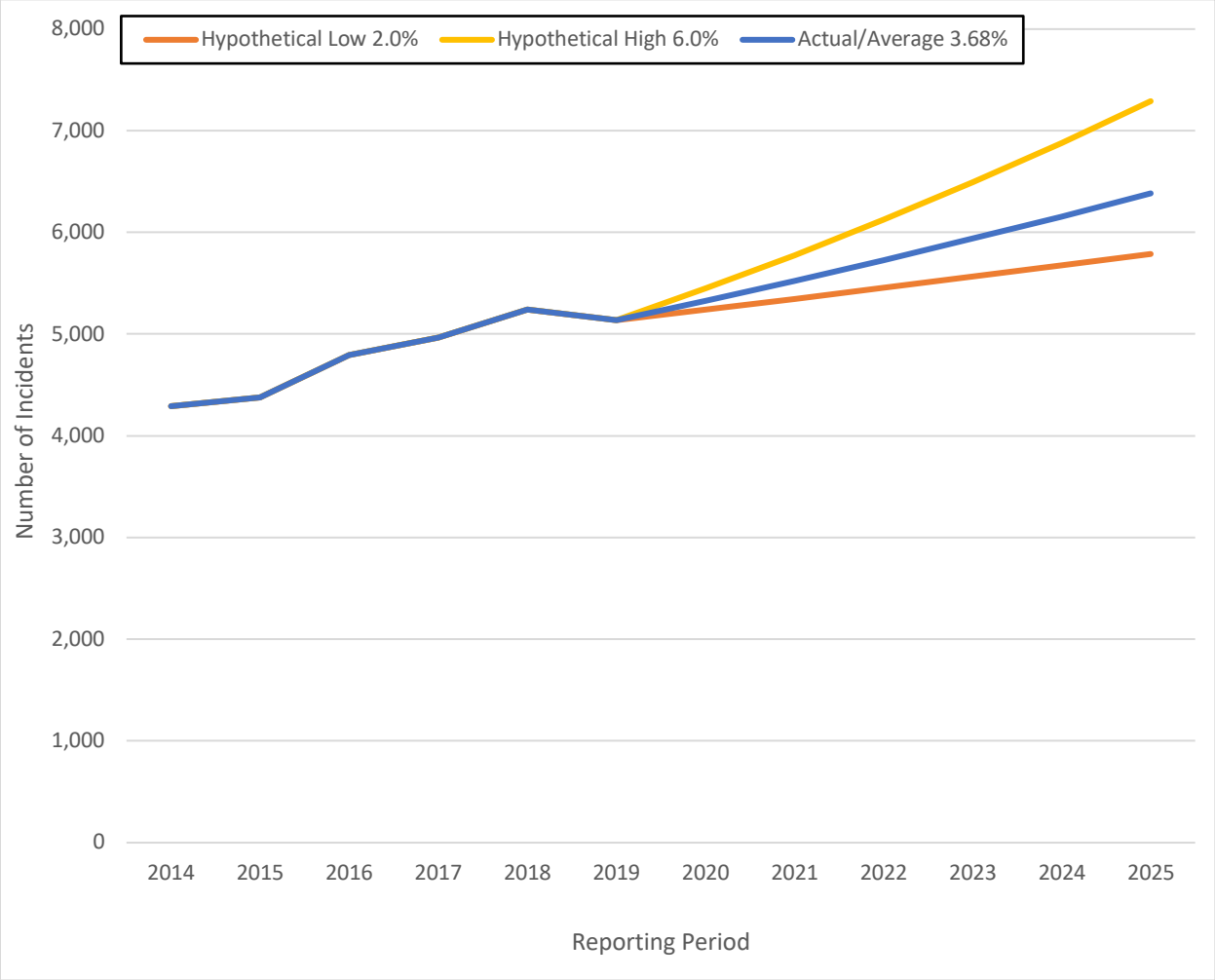
The available data set included six reporting periods of data, representing calendar years 2014 through 2019. During that time, calls increased from 4,291 to 5,140, with an average growth rate of 3.68% per year. The figure below depicts observed call volume during the last six years and various hypothetical growth scenarios over the next six years. These projections should be used with caution due to the variability in growth observed across calendar years. In all cases, data should be reviewed annually to ensure timely updates to projections.

[19] Clark, M. and FitzGerald, G. (1999). Older people's use of ambulance services: a population-based analysis. J Accid Emerg Med 16:1

[20] Tokuda, Y. et.al. (2010). Ambulance transport of the oldest old in Tokyo: a population-based study. J Epidemiol 20:6

[21] See for example An Aging Nation. Accessed November 26, 2017, at https://www.census.gov/library/visualizations/2017/comm/cb17-ff08_older_americans.html.

Figure 26: Observed and Hypothetical Growth in Call Volume



Assuming that future demands may not be reasonably distributed across the various stations in the system, the system may ultimately require a redistribution of workload and ultimately reinvestment in resources to meet the growing demand. While the system should be evaluated continuously for performance and desired outcomes, the department should specifically re-evaluate workload and performance indicators for every 1,000-call increase to ensure system stability.

Recommendation:
It is recommended the Department consider specifically re-evaluating workload and performance indicators for every 1,000-call increase, or every five-years, to ensure system stability.

Risk Assessment

Fire Suppression Services

RFD provides services for the suppression of fires using three fixed facilities housing two Engines that are fully equipped with water supply, hose, portable ladders, and various tools such as axes and forceable entry equipment. There is one Ladder Truck Tiller with specialized firefighting, rescue, and extrication tools as well as a 100-foot aerial ladder. There is one Battalion Chief on duty each day who provides command and control activities at significant fire and rescue incidents.

Community Service Demands – Fire

The RFD responded to a total 1,215 fire incidents, accounting for 24.2% of the total requests for service during FY 2018-19 and averaged 4.5 requests per day. On 31.3% of the fire related incidents, units were dispatched and arrived on scene to find a smoke detector or alarm system activation that was a confirmed unintentional activation or system malfunction. There were 62 structure fires and 19 vehicle fires accounting for 6.6% of fires in structures or vehicles, which usually account for highest dollar loss. Overall, 79.3% of fire related calls were responded to by one unit, and 10.5% were responded to by two units. For structure fire calls, 100% of calls were responded to by three or more units (RFD entire complement of suppression units).

Table 23: Number of Calls, Number of Responses, and Total Busy Time by Program in FY 2018-19

Program	Number of Calls[1]	Number of Responses[2]	Avg Responses per Call	Total Busy Hours	Avg Busy Minutes per Response	Avg Calls per Day	Avg Responses per Day
EMS	3,745	4,115	1.1	1,202.9	17.6	10.3	11.3
Fire	1,215	1,654	1.4	575.6	20.9	3.3	4.5
Hazmat	59	92	1.6	33.4	21.8	0.2	0.3
Rescue	4	13	3.3	6.0	27.5	< 0.1	< 0.1
Total	**5,023**	**5,874**	**1.2**	**1,817.8**	**18.6**	**13.8**	**16.1**

Table 24: Total Fire Related Calls by Nature of Call

Nature of Call[1]	Number of Calls	Percentage of Total Fire Service Demands
PUBLIC/INVALID ASSIST	311	25.1
COMMERCIAL FIRE ALARM	207	16.7
VEHICLE ACCIDENT (LOW)	182	14.7
FIRE INVESTIGATION (SMOKE IN AREA)	97	7.8
RESIDENTIAL FIRE ALARM	95	7.7
CARBON MONOXIDE ALARM	86	6.9
FLOODING CONDITION	69	5.6
VEGETATION FIRE SUMMER	27	2.2
VEHICLE ACCIDENT (HIGH)	24	1.9
RESIDENTIAL STRUCTURE FIRE (LOW)	22	1.8
HAZARDOUS WIRES	21	1.7
VEHICLE FIRE	19	1.5
COMMERCIAL STRUCTURE FIRE (LOW)	18	1.5
POLICE ASSIST	18	1.5
RESIDENTIAL STRUCTURE FIRE (HIGH)	13	1.1
MUTUAL AID	10	0.8
COMMERCIAL STRUCTURE FIRE (HIGH)	9	0.7
TRASH/DUMPSTER FIRE	7	0.6
STRIKE TEAM REQUEST	1	0.1
VEGETATION FIRE WINTER	1	0.1
VEHICLE ACCIDENT W/FIRE	1	0.1
Total	**1,238**	**100.0**

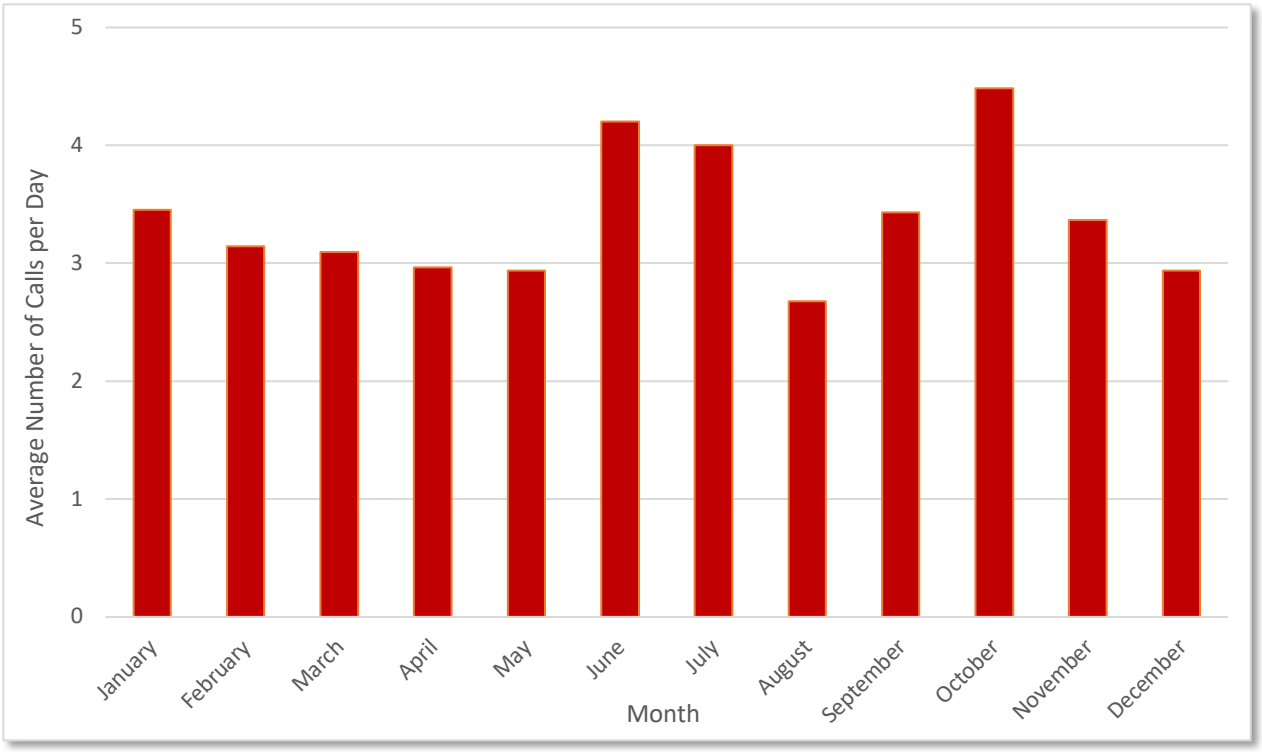
[1]Entries are presented verbatim from the data file

Temporal analyses were conducted to evaluate patterns in community demand for fire related services. These analyses are based on the 1,238 fire related requests for service received from the community, and an examination of the frequency of requests for service in 2019 by month, day of week, and hour of day. Results found that there was variability by month (Table 25; Figure 27). The three months with the most fire related calls in descending order were: October (4.5 per day), June (4.2 per day), and July (4.0 per day). The three months with the fewest fire related calls in ascending order were: August (2.7 per day), December (2.9 per day), and May (2.9 per day).

Table 25: Total Fire Related Calls and Average Calls per Day by Month

Month	Number of Calls	Average Calls per Day	Call Percentage
January	107	3.5	8.6
February	88	3.1	7.1
March	96	3.1	7.8
April	89	3.0	7.2
May	91	2.9	7.4
June	126	4.2	10.2
July	124	4.0	10.0
August	83	2.7	6.7
September	103	3.4	8.3
October	139	4.5	11.2
November	101	3.4	8.2
December	91	2.9	7.4
Total	**1,238**	**3.4**	**100.0**

Figure 27: Average Fire Related Calls per Day by Month



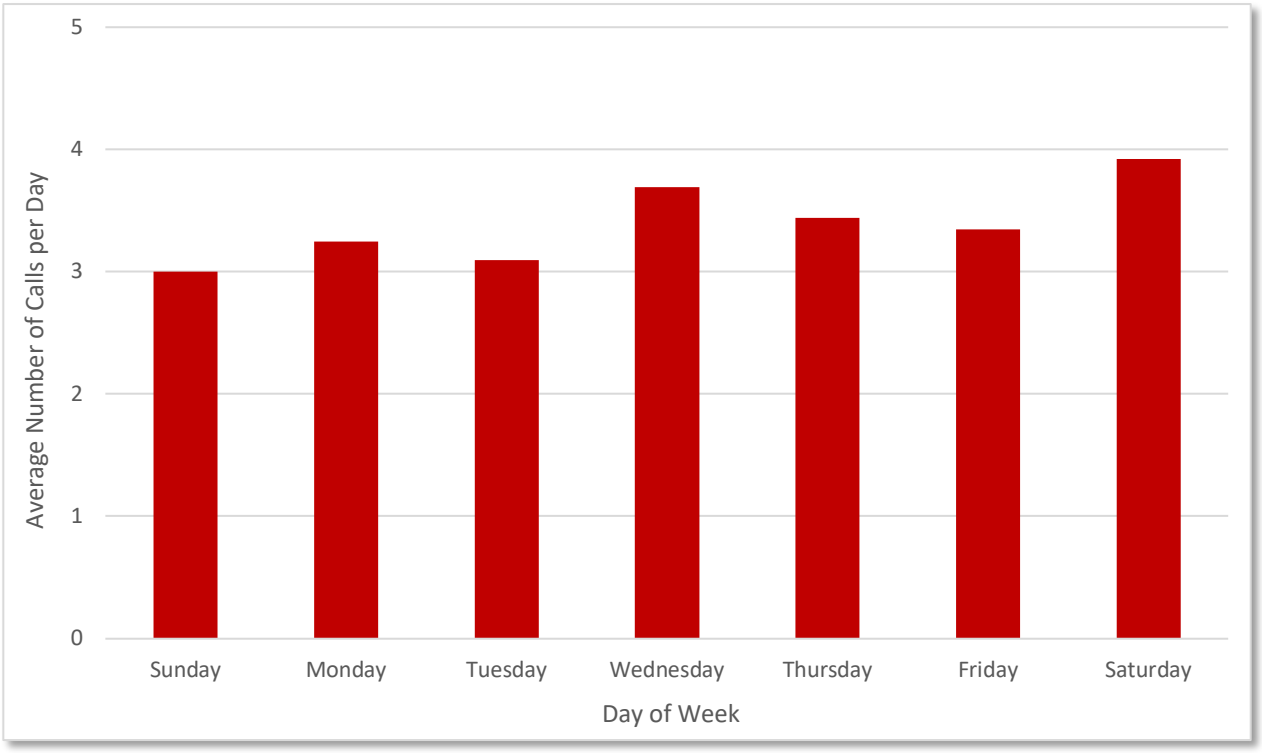
Similar analyses were conducted for fire related calls by day of week (Table 26; Figure 28). The data revealed that there is some variability in the demand for services by day of week. The three days with the most fire related calls in descending order were: Saturday (3.9 per day), Wednesday (3.7 per day), and Thursday (3.4 per day). The three days with the fewest fire related calls in ascending order were: Sunday (3.0 per day), Tuesday (3.1 per day), and Monday (3.3 per day).

Table 26: Total Fire Related Calls and Average Calls per Day by Day of Week

Day of Week	Number of Calls	Average Calls per Day	Call Percentage
Sunday	156	3.0	12.6
Monday	169	3.3	13.7
Tuesday[1]	164	3.1	13.2
Wednesday	192	3.7	15.5
Thursday	179	3.4	14.5
Friday	174	3.3	14.1
Saturday	204	3.9	16.5
Total	**1,238**	**3.4**	**100.0**

[1]There were 53 Tuesdays in 2019, and 52 of all other days of the week.

Figure 28: Average Fire Related Calls per Day by Day of Week

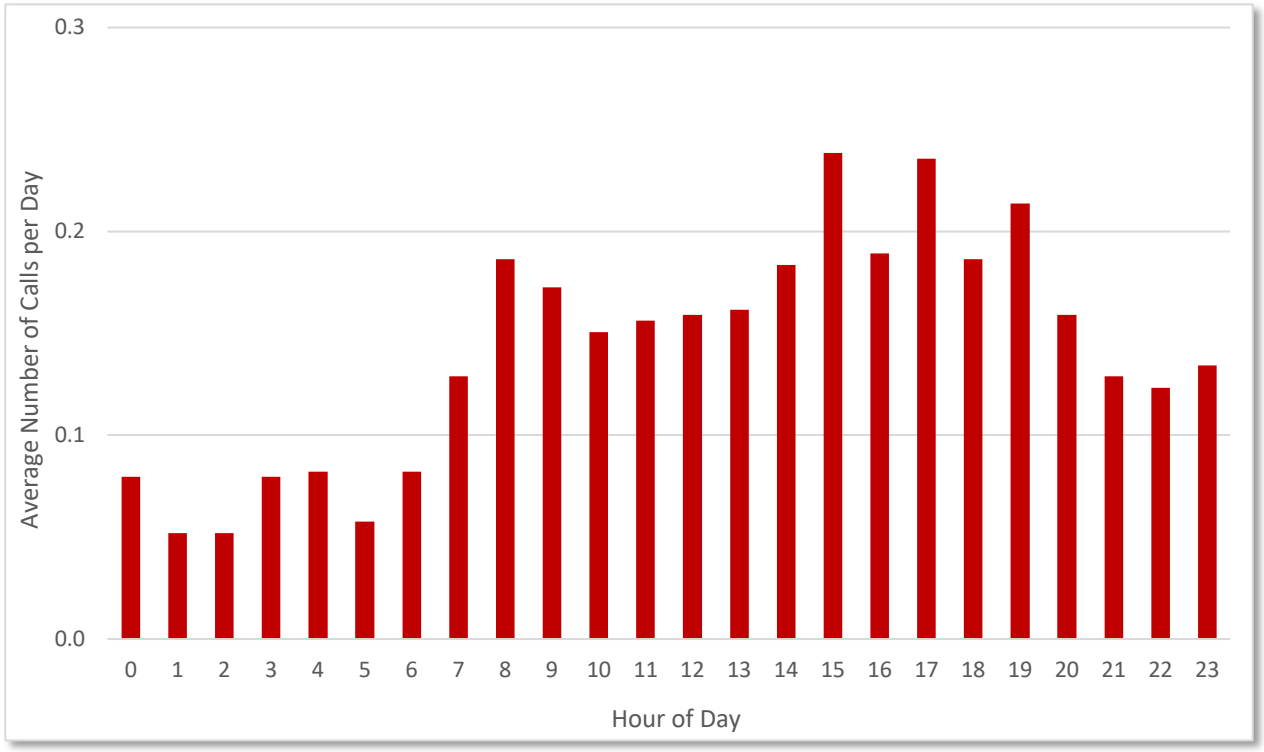


Fire related calls were also evaluated by hour of the day (Table 27; Figure 29). Some variability exists in the time of day that requests for fire related services were received. The hours between 0000 and 0600 had the lowest demands, where average number of calls per day for each of those hours ranged from 0.05 to 0.08. The highest demand for fire related services occurred at 1500 (87 total calls during that hour in 2019), when average number of calls per day during that hour was 0.24.

Table 27: Total Fire Related Calls and Average Calls per Day by Hour of Day

Hour of Day	Number of Calls	Average Calls per Day	Call Percentage
0	29	0.08	2.3
1	19	0.05	1.5
2	19	0.05	1.5
3	29	0.08	2.3
4	30	0.08	2.4
5	21	0.06	1.7
6	30	0.08	2.4
7	47	0.13	3.8
8	68	0.19	5.5
9	63	0.17	5.1
10	55	0.15	4.4
11	57	0.16	4.6
12	58	0.16	4.7
13	59	0.16	4.8
14	67	0.18	5.4
15	87	0.24	7.0
16	69	0.19	5.6
17	86	0.24	6.9
18	68	0.19	5.5
19	78	0.21	6.3
20	58	0.16	4.7
21	47	0.13	3.8
22	45	0.12	3.6
23	49	0.13	4.0
Total	**1,238**	**3.4**	**100.0**

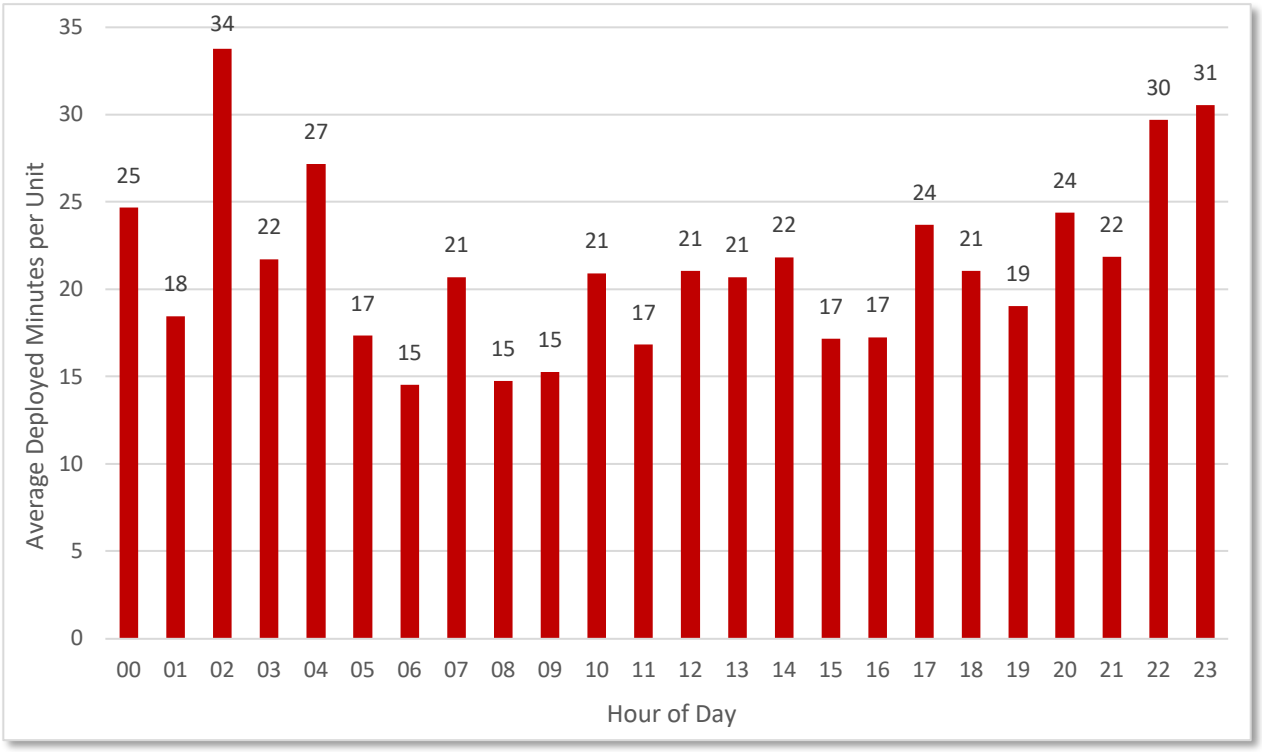
Figure 29: Average Fire Related Calls per Day by Hour of Day



In addition, the average time on task was evaluated to assess the demand for resources through the lens of time commitment per hour of day (Figure 30). Overall, RFD units were busy for an average of 20.9 minutes per unit-level response to fire related calls within the RFD reporting districts.

The unusually high average time of 34 minutes per unit response at 0200 was due primarily to a vegetation fire call and a commercial structure fire call; the unusually high average time of 31 minutes per unit response at 2300 was due primarily to one residential structure fire call and one vehicle accident call; and the unusually high average time of 30 minutes per unit response at 2200 was due primarily to a residential structure fire call.

Figure 30: Average Deployed Minutes per Unit by Hour of Day for Fire Related Responses



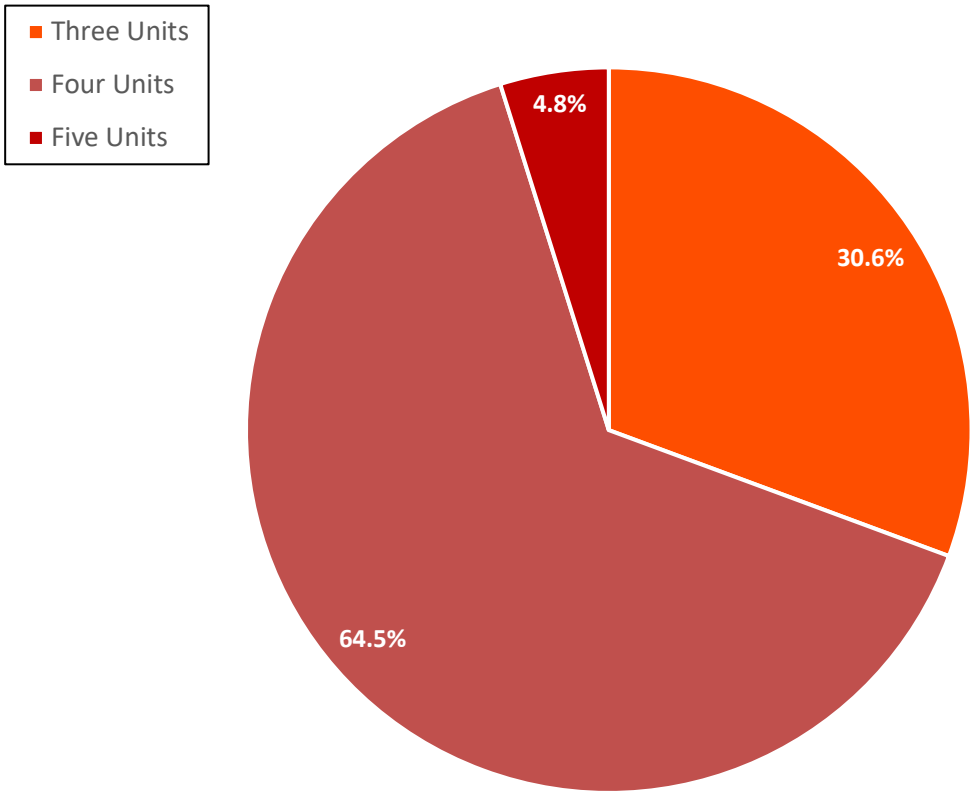
We also analyzed number of responding RFD units by fire related call type (Table 28). Overall, 79.3% of fire related calls were responded to by one unit, and 10.5% were responded to by two units within the RFD reporting districts. Average number of responses per call was 1.4.

However, for structure fire calls, 100.0% of calls (62/62) were responded to by three to five RFD units (Table 28; Figure 31). RFD units were busy on structure fire calls within the RFD reporting districts for 139.4 hours during 2019, making 232 responses to 62 structure fire calls, and averaging 3.7 responses per call. Average busy minutes per response to structure fire calls within the RFD reporting districts was 36.1 minutes.

Table 28: Number of Responding Units by Fire Related Call Type

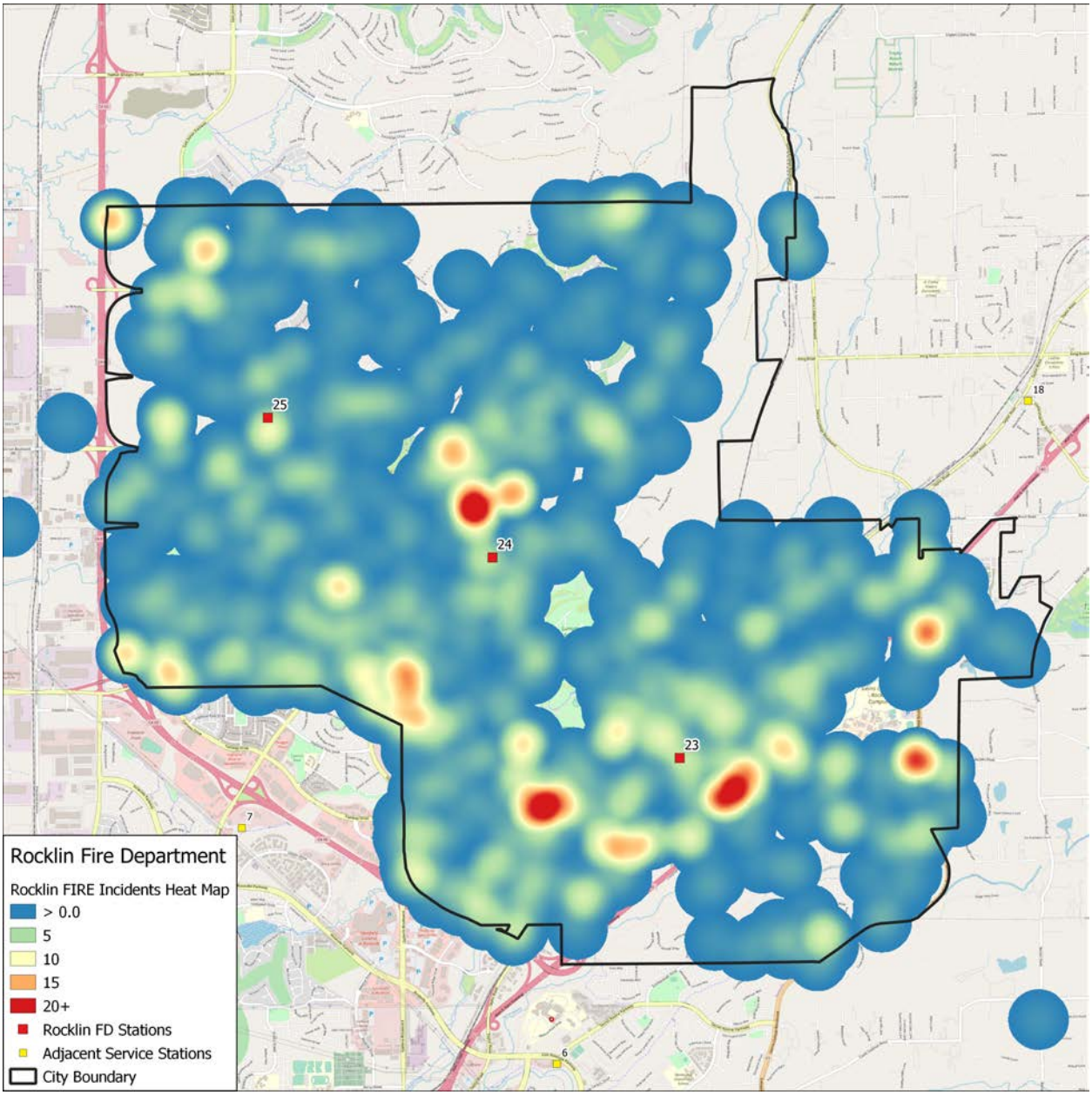
Call Category	Number of Responding Units						Total
	1	2	3	4	5	6 or More	
CO Alarm	78	7	1	0	0	0	86
Fire Alarm	268	23	2	0	0	0	293
Fire Investigation	83	8	2	0	0	0	93
Fire Other	15	4	1	0	0	0	20
Flooding Condition	63	5	1	0	0	0	69
Mutual Aid	8	1	0	0	0	0	9
MVA	131	48	22	2	0	0	203
Outside Fire	5	5	10	13	2	0	35
Police Assist	15	2	1	0	0	0	18
Public Assist	287	19	1	0	0	0	307
Strike Team	1	0	0	0	0	0	1
Structure Fire	0	0	19	40	3	0	62
Vehicle Fire	10	6	3	0	0	0	19
Total	**964**	**128**	**63**	**55**	**5**	**0**	**1,215**
Percentage	**79.3**	**10.5**	**5.2**	**4.5**	**0.4**	**0.0**	**100.0**

Figure 31: Percentage of Structure Fire Calls by Number of Responding Units



Heat maps were created to identify the concentration of the historic demand for service by program area. Therefore, the following mapping will present the relative concentration of service demands by fire. The blue areas have the lowest concentration of demand, and the dark red areas have the highest concentration of demand.

Figure 32: Heat Map for Fire Calls



Occupancy-Level Risk

Occupancy risk was evaluated across the jurisdiction utilizing the Insurance Services Organization (ISO) batch report. Records provided variables for the construction class, total square footage, needed fire flow, and the number of stories (elevation). Secondarily, the risk ratings were moderated if the building had an

automatic sprinkler system. Ultimately, a risk-rating matrix was developed that categorized 605 occupancies within the jurisdiction into high, moderate, and low risks (Table 29).

Due to the relatively higher demands for personnel and apparatus required for fire events that have occupancy classifications deemed high risk, these risks garnished the highest ratings. Conversely, the presence of an automatic sprinkler system elicited a moderating value. In this manner, the fact that 96% of the fires are controlled with sprinkler activation is included into the matrix for a more realistic risk factor rating. The results of the risk assessment process categorized the 605 occupancies into 22 high-risk structures, 494 moderate structures, and 89 low risk structures.

Geospatial analyses were completed to map the locations of each of the commercial occupancies included in the risk matrix process and specifically overlaid within each of the fire station locations. This analysis lends validity to the risk assessment matrix and the process utilized by the Department as the concentration of risks is correlated with the historical demand for fire related services. The results of the geospatial analyses of all, high, moderate, and low risk structures are presented below as Figures 33-35, respectively. From a broad perspective, this provides validation to the risk assessment process developed with the Department as well as the necessary deployment strategy to cover the historical demand for services.

Recommendation:
The utilization of the Occupancy Classification is an effective and accepted practice; however, it is likely overstating community fire occupancy-related risk. Therefore, it is recommended that the Department design and develop the desired occupancy-level variables such as square footage, building height, building construction, combustion rates, and human occupancy to complement the passive mitigation data currently available.

Table 29: Summary of Occupancy Risk Matrix

Risk Class	Fire Flow		Number of Stories		Square Footage		Construction Class		Full Credit Sprinkler System (Yes/No)	Total Risk Score
	Value	Scale	Value	Scale	Value	Scale	Value	Scale	Value	Scale
High	3	≥ 1500 GPM	5	≥ 4	5	>=100k GPM	5	Combustible or Frame	-5/0	≥ 14
Moderate	2	> 499 and < 1500 GPM	3	> 1 and < 4	3	> 10k GPM < 100k GPM	3	Joisted Masonry	-5/0	>6 and <14
Low	1	≤ 499 GPM	1	1	1	< 10k GPM	1	Non-Combustible Masonry Non-Combustible Fire Resistive	-5/0	≤ 6

Figure 33: High-Risk Occupancies by Station Demand Zone

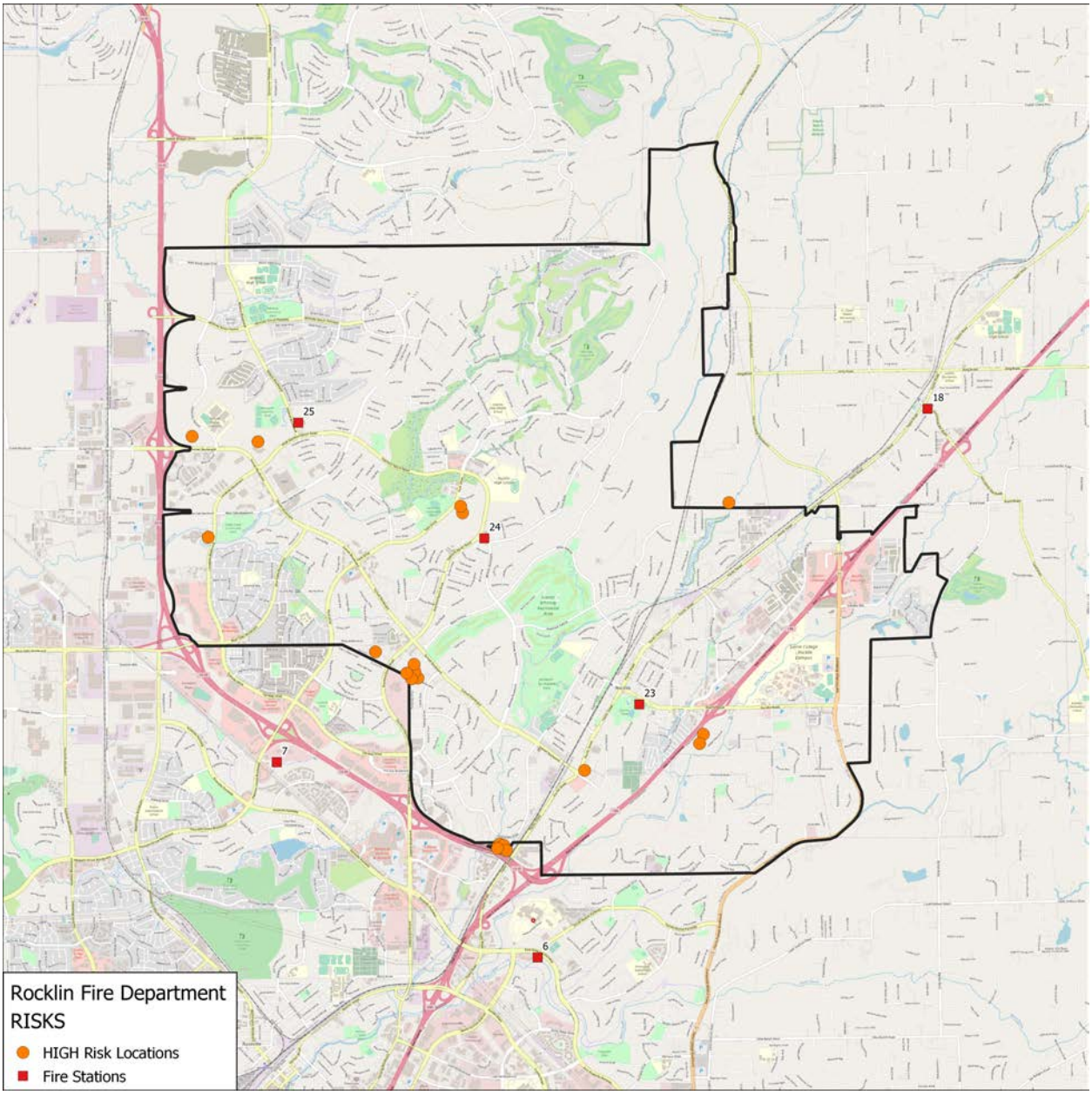


Figure 34: Moderate-Risk Occupancies by Station Demand Zone

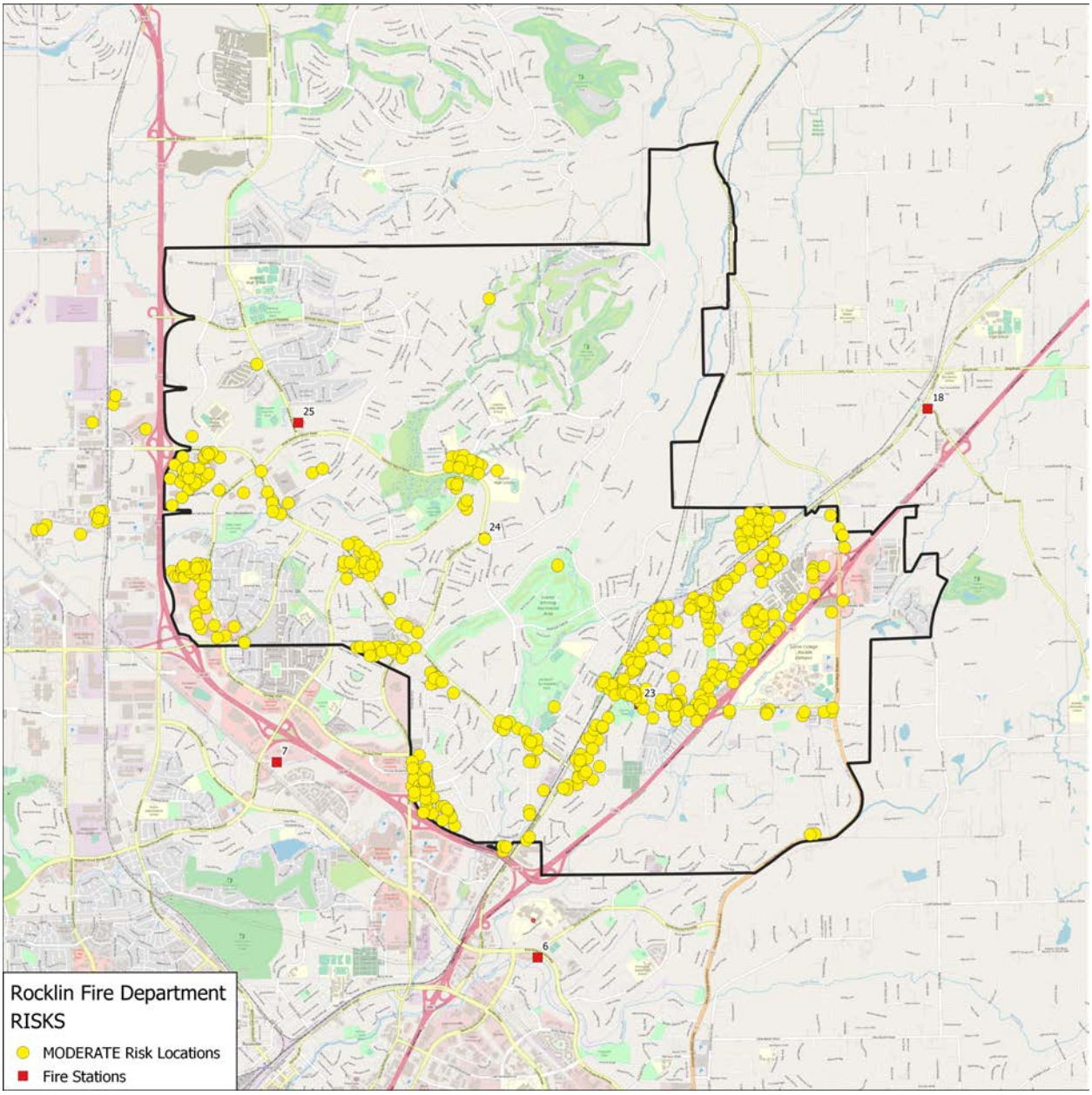
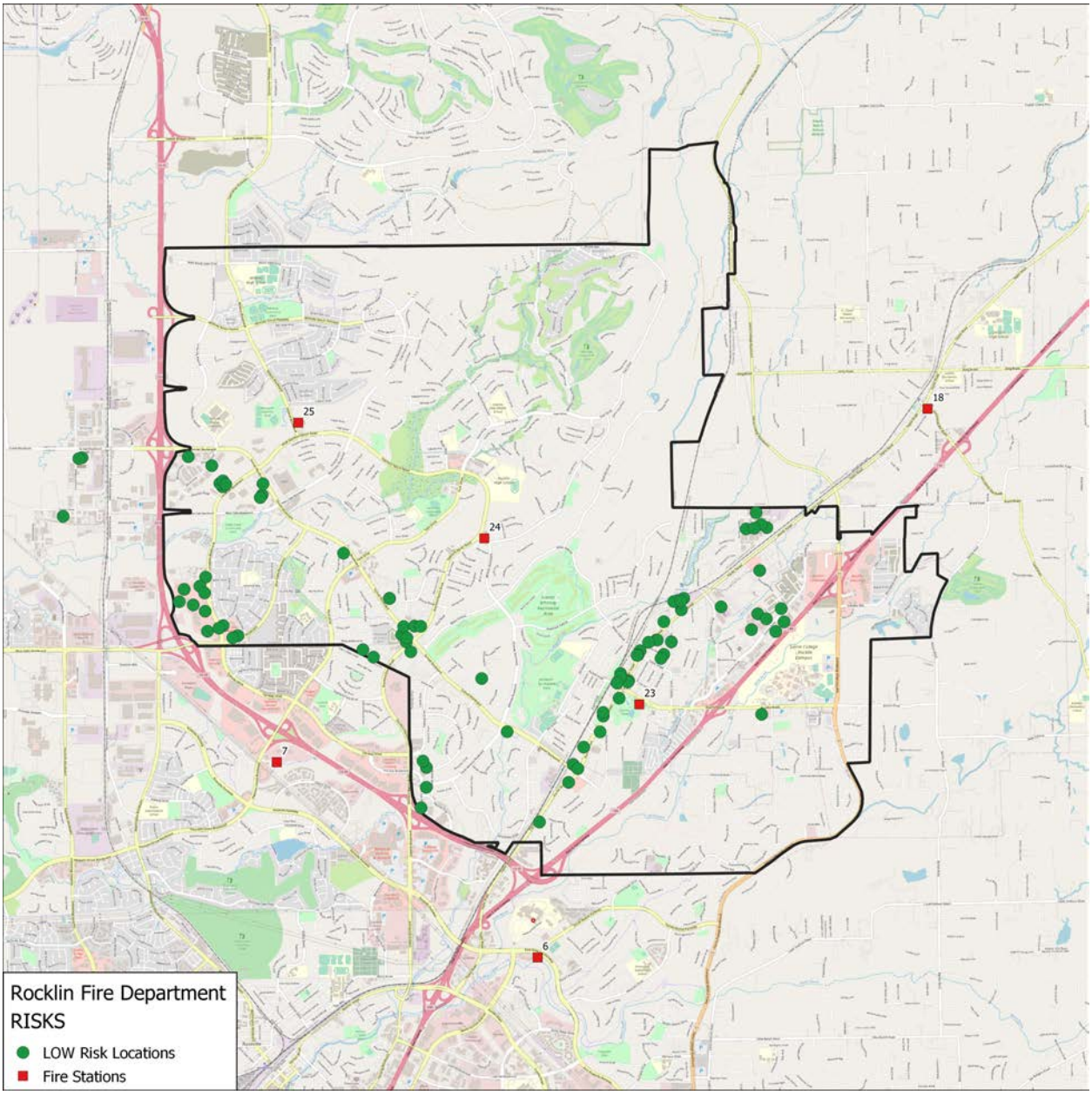


Figure 35: Low-Risk Occupancies by Station Demand Zone



Concentration of Risks by Station Demand Zone

Analyses were conducted to describe and measure the relative concentration of risks in each of the fire station demand zones. Therefore, a station demand zone risk matrix was developed to quantitatively evaluate the relative risk by including measures for the frequency of moderate and high-risk occupancies in each fire demand zone that are directly correlated to the necessity of higher concentrations of resources. In addition, several measures were used that both serves the distribution aspect of the risk evaluation, but also contributes to the need for higher concentrations of resources. For example, a higher call volume may serve to drive the need for additional resources to cover the community's demand.

The variables included in the risk matrix are the demand for services for each station demand zone, the number of high and moderate-risk occupancies, and the impact of simultaneous events in each station demand zone. All measures were weighted equally, however, two variables have surrogate relationships with historical community demands and one variable is dedicated to prospective occupancy risk. Community demands were rated more heavily in an effort to provide a realistic balance between the potential risk and historical experience. The risk tool and the scoring template are provided below.

Table 30: Station Demand Zone Risk Concentration Matrix

Station Demand Zone	Community Demand	Call Concurrency	High/Moderate Risk Occupancies	Total risk Score	Risk Rating
23	4	3	6	22.85	Moderate
24	4	2	3	11.05	Low
25	3	2	2	6.63	Low

Overall, the risk assessment identified that Station 23 is a moderate risk stations and Stations 24 and 25 was calculated as low risk station demand zones.

Table 31: Summary of Station Fire Demand Zone Risk Concentration Matrix

Risk Class	Community Demand (D)		Call Concurrency (C)		High/Moderate Risk Occupancies (R)		Total Risk Score
	Value	Scale (Calls)	Value	Scale (%)	Value	Scale (Occupancies)	$\sqrt{\frac{(CD)^2+(CR)^2+(RD)^2)}{2}}$
Maximum	≥10	≥5,400	≥10	≥ 31.5	≥10	≥450	≥72
High	7 – 9	≥ 3,600 and < 5,400	7 – 9	≥ 21 and < 31.5	7 to 9	≥ 300 and <449	≥ 39.35 and < 72
Moderate	4 to 6	≥ 1,800 and < 3,600	4 to 6	≥ 10.5 and < 21	4 to 6	≥ 150 and < 300	≥ 16.49 and < 39.35
Low	1 to 3	< 1,800	1 to 3	< 10.5	1 to 3	< 150	< 16.49

** Definitions for Occupancy Risk Type were provided as part of the full risk assessment previously.*

These analyses result in a three-dimensional model that illustrates the representativeness of each of the variables as they contribute to each station's risk profile. For example, one station may score heavily in potential risk and have moderate or low demand for services and another station may have little potential risk but have high demand and call concurrency that drives the necessity for a greater concentration of resources.

Graphic representations of the three axis risk matrices are provided below (Figures 36 – 38). When reviewing these radar figures, the larger the shaded area, the greater the risk. In addition, each axis is labeled so that the reader can determine the relationship between the risk drivers for each station area.

Figure 36: Station 23 Risk Profile

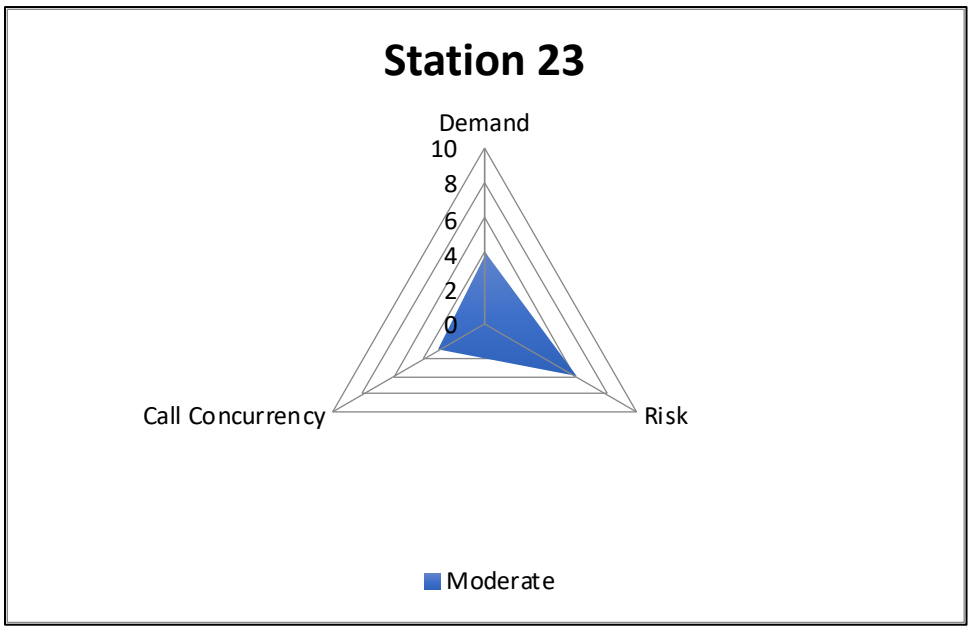


Figure 37: Station 24 Risk Profile

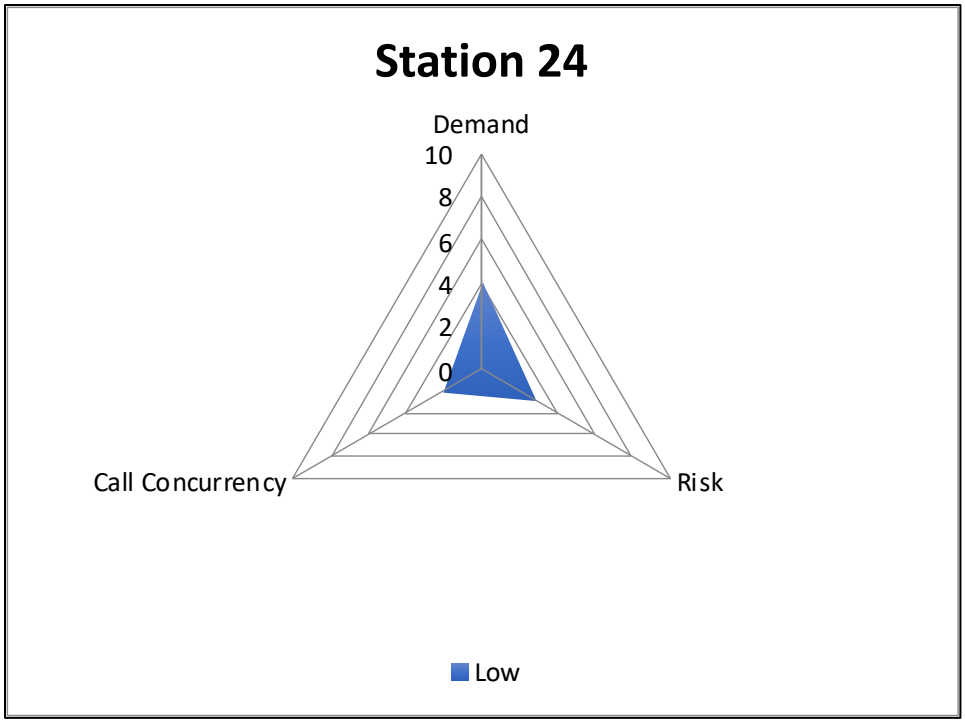
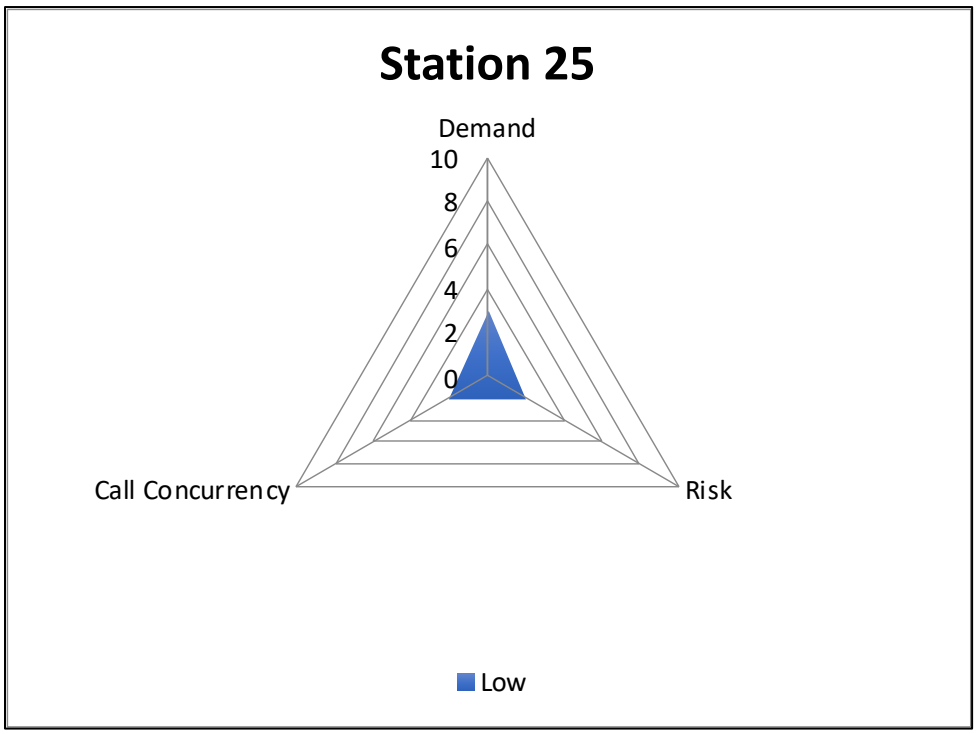


Figure 38: Station 25 Risk Profile



Critical Task Analysis for Fire Suppression

The critical tasks were developed by the RFD staff through a facilitated process that includes recommendations from the CFAI and the NFPA, as well as the current staffing and deployment model operating within the Department. Risks were categorized by program area and stratified by risk by the Department based on the CAD "Event Type" prior to the development of the critical task matrices. Critical tasks were developed for low-, moderate-, high-, and maximum-risk fire events. In addition to the critical tasks for personnel requirements, a similar process was conducted to establish the appropriate apparatus required to assemble the requisite personnel and equipment. A spreadsheet of all CAD "Event Types" and the associated risk severity is provided in the appendices.

The RFD has very robust response matrices for all call types, and this section is intended as a reference for non-system experts as to what resource commitment is typically sent to each risk level and the critical tasks required to mitigate events. Examples of critical tasks are provided below for low-, moderate-, high-, and maximum-risk fire events.

Table 32: Critical Tasks for Fire Reponses - Low Risk

Critical Task	Needed Personnel
Incident Command	1
Investigation / Extinguishment	2
Total	**3**

Table 33: Apparatus and Personnel Requirements for Fire Responses - Low Risk

Responding Units	Minimum Staffing
Engine/ Truck	3
Total Response Provided	**3**
Personnel Required by Critical Tasks	**3**

Table 34: Critical Tasks for Fire Responses - Moderate Risk

Critical Task	Needed Personnel
Incident Command	1
Pump Operator	1
Fire Attack	4
Ventilation/Utilities	2
Primary Search	2
Water Supply/2-Out	3
Back-Up Attack Line	2
Sub-Total Critical Tasks	**15**
Medical / Rehab	2
Safety / Accountability	1
Total	**18**

Table 35: Apparatus and Personnel Requirements for Fire Responses - Moderate Risk

Responding Units	Minimum Staffing
Battalion Chief	1
Battalion Chief	1
Engine	3
Engine	3
Engine	3
Truck	3
Truck	3
Ambulance	2
Total Response Provided	**19**
Personnel Required by Critical Tasks	**18**

Table 36: Critical Tasks for Fire Responses - High Risk

Critical Task	Needed Personnel
Incident Command	1
Fire Attack	5
Primary Search	3
Ventilation/Utilities	3
Water Supply/2-Out	3
Pump Operator	1
Back-Up Attack Line	3
Sub-Total Critical Tasks	**19**
Medical / Rehab	2
Safety /Accountability	1
Total	**22**

Table 37: Apparatus and Personnel Requirements for Fire Responses - High Risk

Responding Units	Minimum Staffing
Battalion Chief	1
Battalion Chief	1
Engine	3
Engine	3
Engine	3
Engine	3
Truck	3
Truck	3
Ambulance	2
Total Response Provided	**22**
Personnel Required by Critical Tasks	**22**

Table 38: Critical Tasks for Wildland Fire Reponses - Low Risk

Critical Task	Needed Personnel
Incident Command	1
Investigation / Extinguishment	2
Total	**3**

Table 39: Apparatus and Personnel Requirements for Wildland Fire Responses - Low Risk

Responding Units	Minimum Staffing
Engine/ Truck	3
Total Response Provided	**3**
Personnel Required by Critical Tasks	**3**

Table 40: Critical Tasks for Wildland Fire Responses - High Risk

Critical Task	Needed Personnel
Incident Command	1
Fire Control	6
Pump Operator	3
Total	**10**

Table 41: Apparatus and Personnel Requirements for Wildland Fire Responses - High Risk

Responding Units	Minimum Staffing
Battalion Chief	1
Engine	3
Engine	3
Engine	3
Total Response Provided	**10**
Personnel Required by Critical Tasks	**10**

Emergency Medical Services

The RFD provides for Advanced Life Support (ALS) first response. All personnel of the RFD are certified to a minimum provider level of EMT, while many members are licensed Paramedics. All personnel are able to size-up a medical situation, conduct patient assessment, obtain vital signs and patient medical history, and initiate medical intervention efforts.

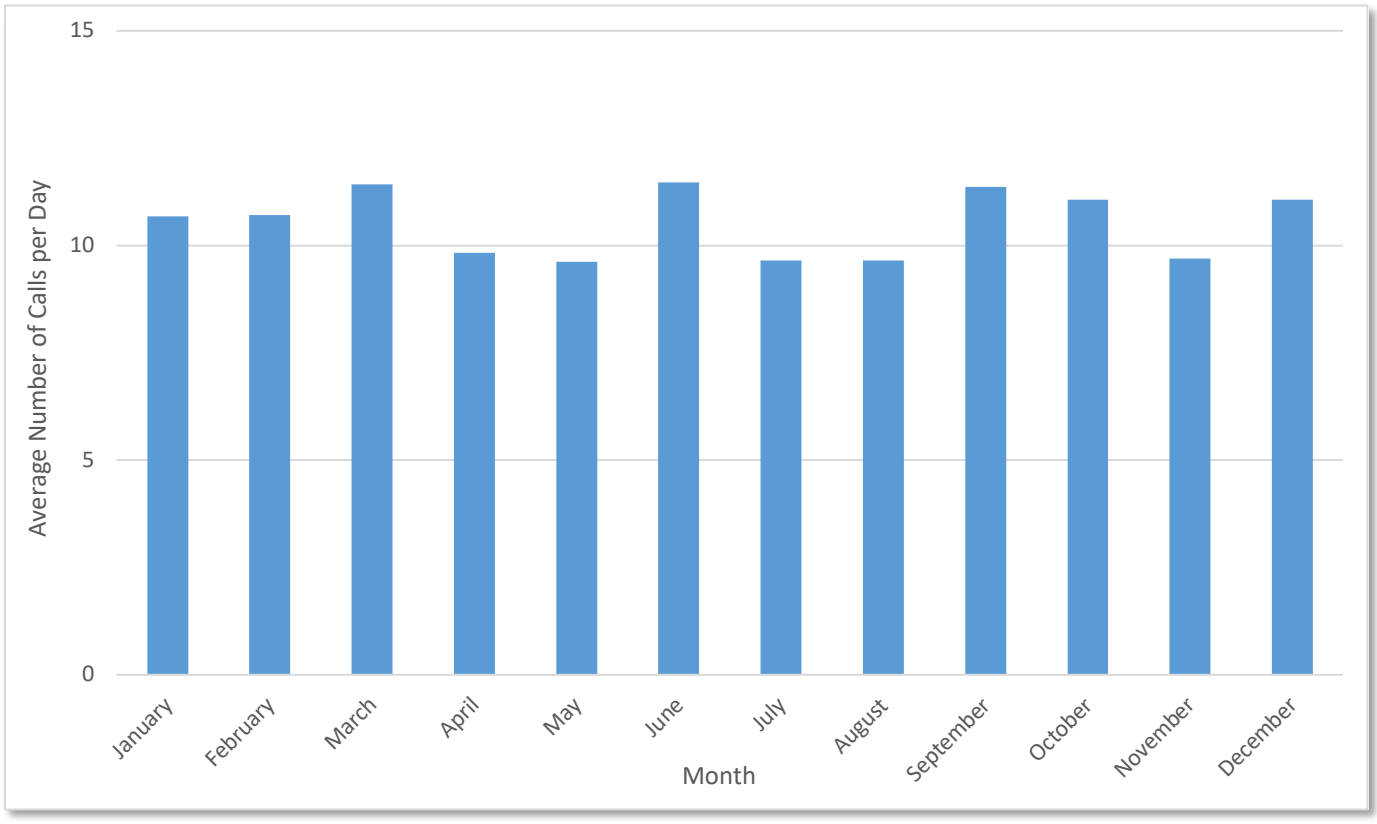
Community Service Demands - EMS

Temporal analyses were conducted to evaluate patterns in community demands for EMS related services. These analyses are based on the 3,838 EMS related requests for service received from the community and examined the frequency of requests for service in 2019 by month, day of week, and hour of day. Results found that there was variability by month (Table 42; Figure 39). The three months with the most EMS related calls in descending order were: June (11.5 per day), March (11.4 per day), and September (11.4 per day). The three months with the fewest EMS related calls in ascending order were: May (9.6 per day), August (9.6 per day), and July (9.6 per day).

Table 42: Total EMS Related Calls and Average Calls per Day by Month

Month	Number of Calls	Average Calls per Day	Call Percentage
January	331	10.7	8.6
February	300	10.7	7.8
March	354	11.4	9.2
April	295	9.8	7.7
May	298	9.6	7.8
June	344	11.5	9.0
July	299	9.6	7.8
August	299	9.6	7.8
September	341	11.4	8.9
October	343	11.1	8.9
November	291	9.7	7.6
December	343	11.1	8.9
Total	**3,838**	**10.5**	**100.0**

Figure 39: Average EMS Related Calls per Day by Month



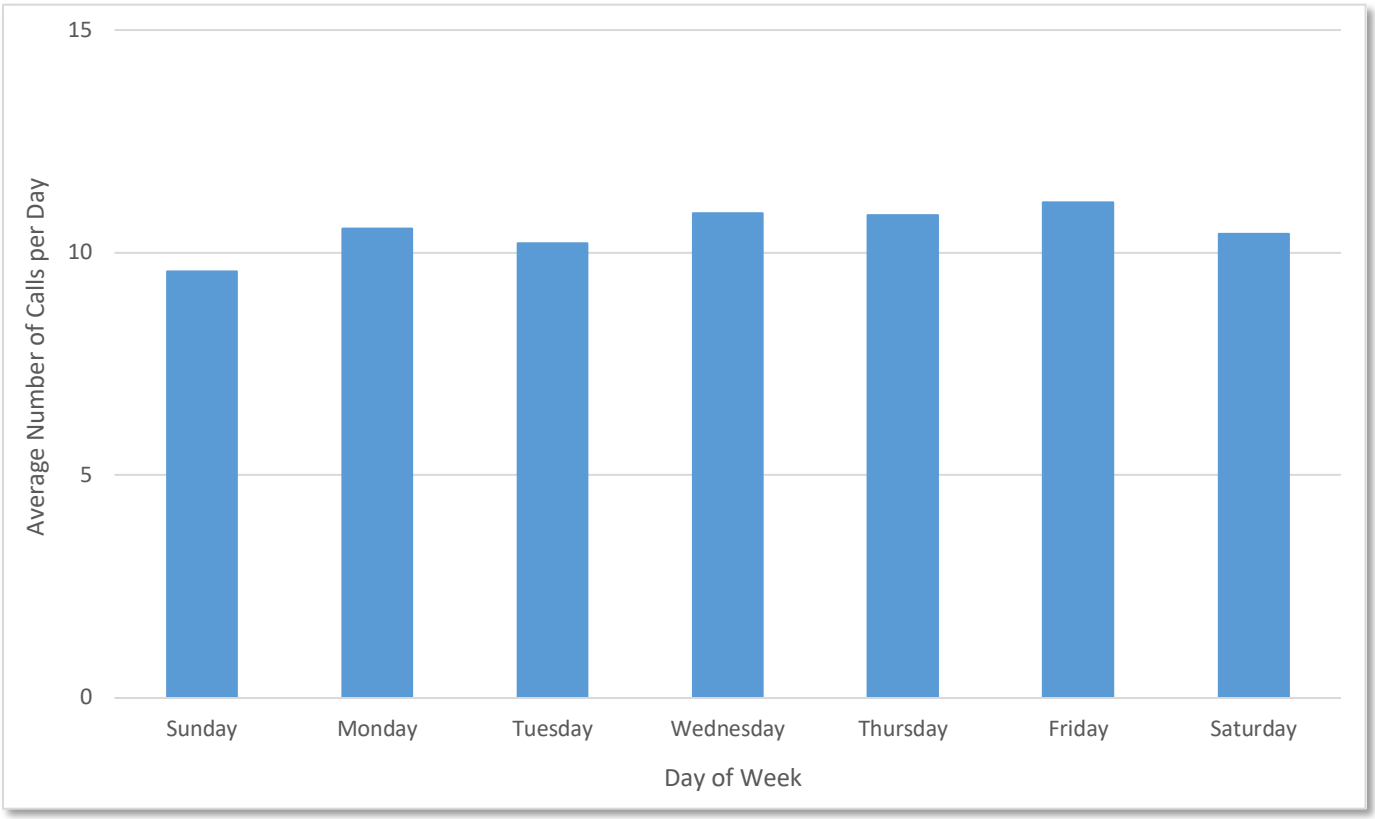
Similar analyses were conducted for EMS related calls by day of week (Table 43; Figure 40). The data revealed that there was some variability in demand for services by day of week. Friday had the highest frequency of requests for EMS related services, averaging 11.1 calls per day and accounting for 15.1% of all EMS related calls. Sunday had the lowest frequency of requests for EMS related services, averaging 9.6 calls per day and accounting for 13.0% of all EMS related calls.

Table 43: Total EMS Related Calls and Average Calls per Day by Day of Week

Day of Week	Number of Calls	Average Calls per Day	Call Percentage
Sunday	498	9.6	13.0
Monday	548	10.5	14.3
Tuesday[1]	541	10.2	14.1
Wednesday	566	10.9	14.7
Thursday	564	10.8	14.7
Friday	579	11.1	15.1
Saturday	542	10.4	14.1
Total	**3,838**	**10.5**	**100.0**

[1]There were 53 Tuesdays in 2019, and 52 of all other days of the week in 2019.

Figure 40: Average EMS Related Calls per Day by Day of Week

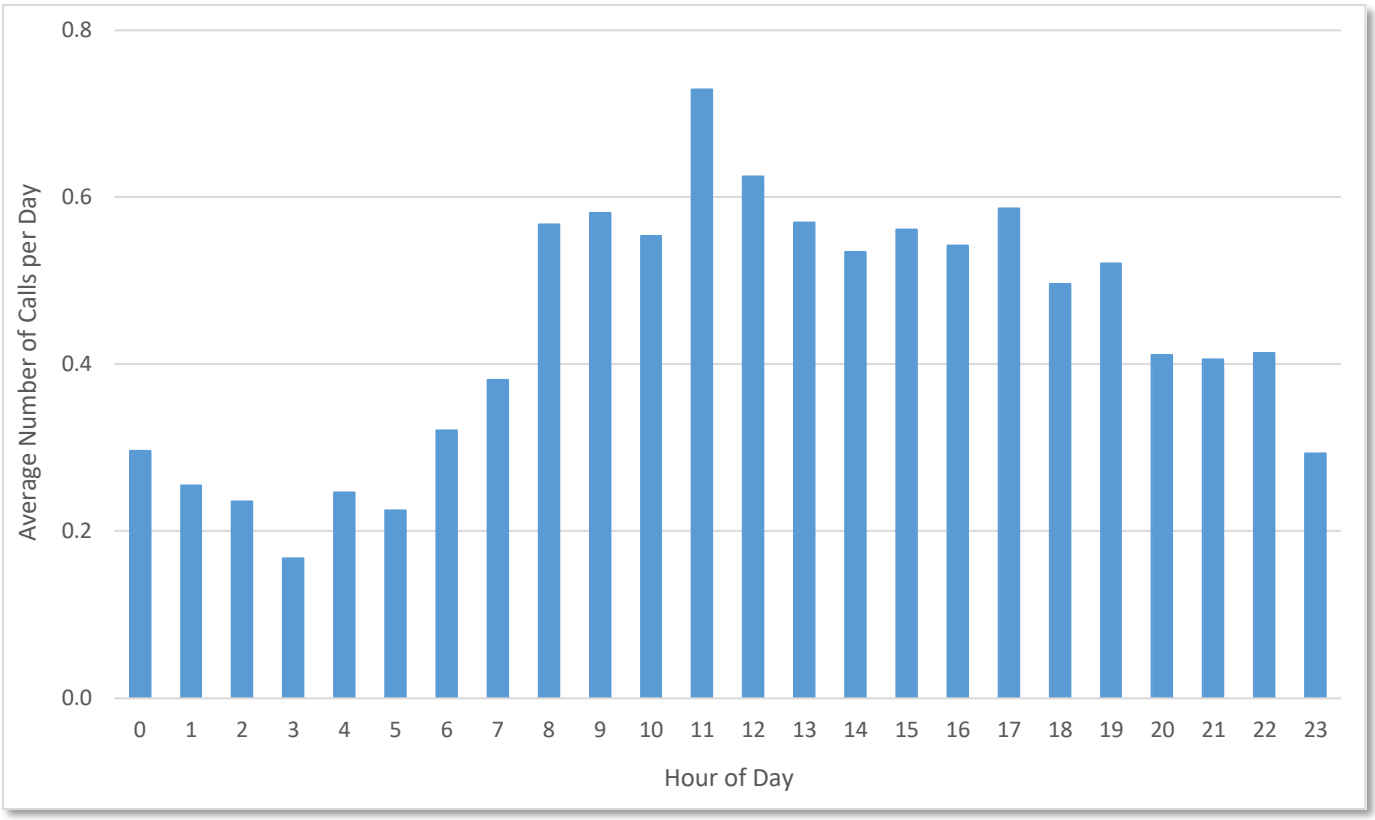


EMS related calls were also evaluated by hour of the day (Table 44; Figure 41). Some variability exists in the time of day that requests for EMS related services were received. The hours from 0100 to 0500 had the lowest demands, where average number of calls per day for each of those hours ranged from 0.17 to 0.25. The highest demand for EMS related services occurred at 1100, when average number of calls per day during that hour was 0.73.

Table 44: Total EMS Related Calls and Average Calls per Day by Hour of Day

Hour of Day	Number of Calls	Average Calls per Day	Call Percentage
0	108	0.30	2.8
1	93	0.25	2.4
2	86	0.24	2.2
3	61	0.17	1.6
4	90	0.25	2.3
5	82	0.22	2.1
6	117	0.32	3.0
7	139	0.38	3.6
8	207	0.57	5.4
9	212	0.58	5.5
10	202	0.55	5.3
11	266	0.73	6.9
12	228	0.62	5.9
13	208	0.57	5.4
14	195	0.53	5.1
15	205	0.56	5.3
16	198	0.54	5.2
17	214	0.59	5.6
18	181	0.50	4.7
19	190	0.52	5.0
20	150	0.41	3.9
21	148	0.41	3.9
22	151	0.41	3.9
23	107	0.29	2.8
Total	**3,838**	**10.5**	**100.0**

Figure 41: Average EMS Related Calls per Day by Hour of Day



EMS related requests accounted for 74.7% of the total requests for service during 2019 and averaged 10.5 requests per day (Figure 12; Table 9). EMS related incidents are an aggregated category of the various final incident types available in the CAD data file. Table 45 provides details for these EMS related incidents by nature of the call (i.e., definition from a data dictionary corresponding to the variable "TYPE" in the CAD data file; entries are presented verbatim from the data file).

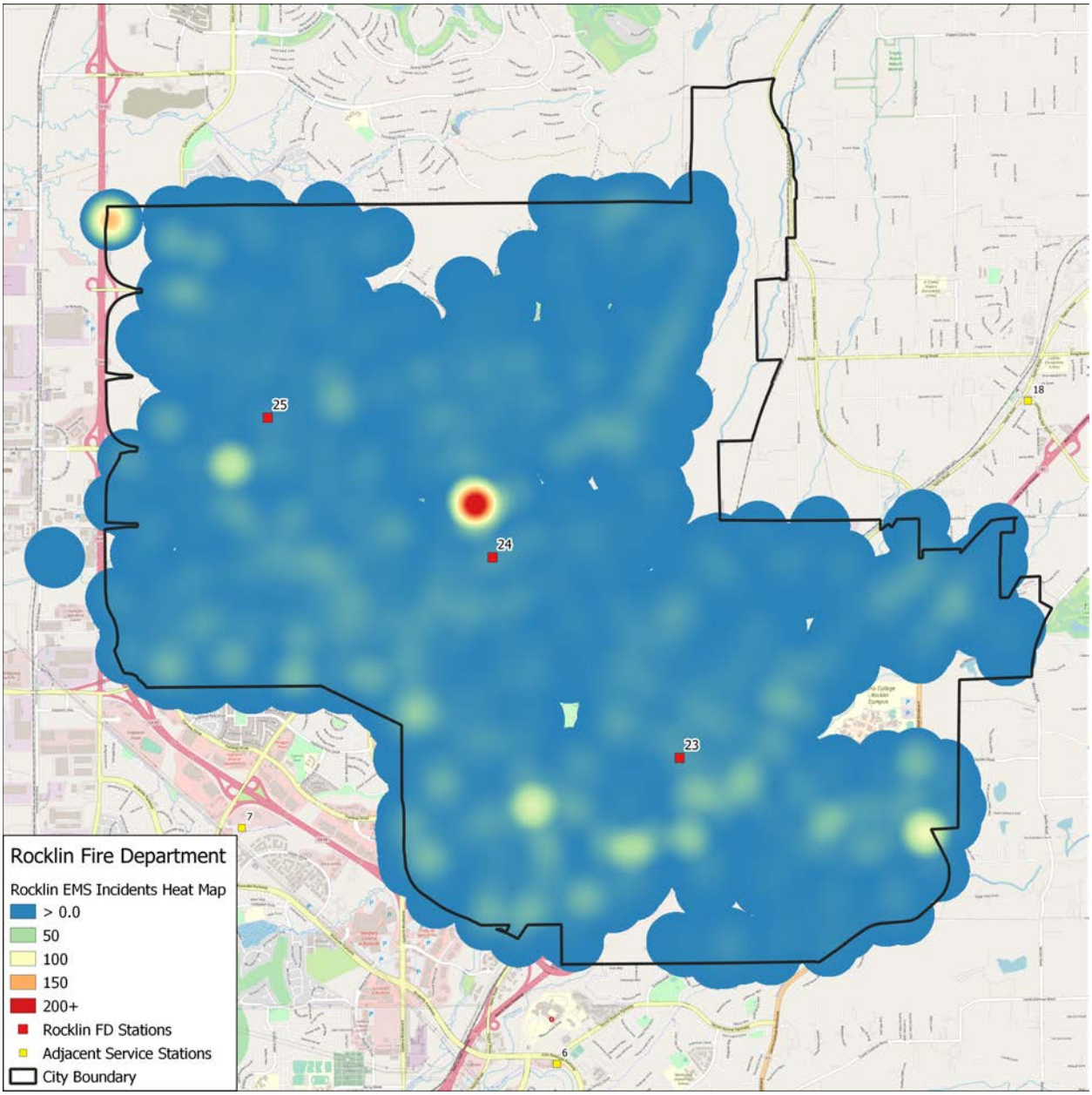
Table 45: Total EMS Related Calls by Nature of Call

Nature of Call[1]	Number of Calls	Percentage of Total EMS Demands
MEDICAL AID	3,740	97.4
CPR	56	1.5
MAN DOWN (SEND POLICE/FIRE)	42	1.1
Total	**3,838**	**100.0**

[1]Entries are presented verbatim from the data file.

Heat maps were created to identify the concentration of the historic demand for service by program area. Therefore, the following mapping will present the relative concentration of service demands by EMS. The blue areas have the lowest concentration of demand, and the dark red areas have the highest concentration of demand.

Figure 42: Heat Map for EMS Calls



Critical Task Analysis For EMS

In order to align resource allocation and risk for EMS, a critical task analysis was completed. Results found that the most efficient and effective utilization of resources is to send the most efficient resources to the level of risk and patient acuity identified. Therefore, low-risk events may receive a single resource while a high-risk incident may receive multiple resources. As a matter of pre-determined dispatch, high risks

required multiple resources to effectively mitigate the identified risk. Similarly, a process was completed to identify the resources allocated to ensure that the personnel required for the critical tasking is accomplished. The tables below reflect call types and resource allocations.

Each of the following risk severity levels follow the internationally protocolized call triage system from Medical Priority Dispatch and the International Academies of Emergency Dispatch (IAED).

Table 46: Critical Tasks for EMS Responses - Low Risk

Critical Task	Needed Personnel
Patient Assessment	1
Medical Support	1
Total	**2**

Table 47: Apparatus and Personnel Requirements for EMS Responses - Low Risk

Responding Units	Minimum Staffing
Engine/Truck	3
Personnel Required by Critical Tasks	**2**

Table 48: Critical Tasks for EMS Responses - Moderate Risk

Critical Task	Needed Personnel
Incident Command	1
Primary Care Provider	1
Medical Treatment	1
Patient Handling/Transport	2
Total	**5**

Table 49: Apparatus and Personnel Requirements for EMS Responses - Moderate Risk

Responding Units	Minimum Staffing
Engine/Truck	3
ALS Ambulance	2
Total Response Provided	**5**
Personnel Required by Critical Tasks	**5**

Table 50: Critical Tasks for EMS Responses - High Risk

Critical Task	Needed Personnel
Incident Command	1
Primary Care Provider	1
Medical Treatment	4
Patient Handling/Transport	3
Total	**9**

Table 51: Apparatus and Personnel Requirements for EMS Responses - High Risk

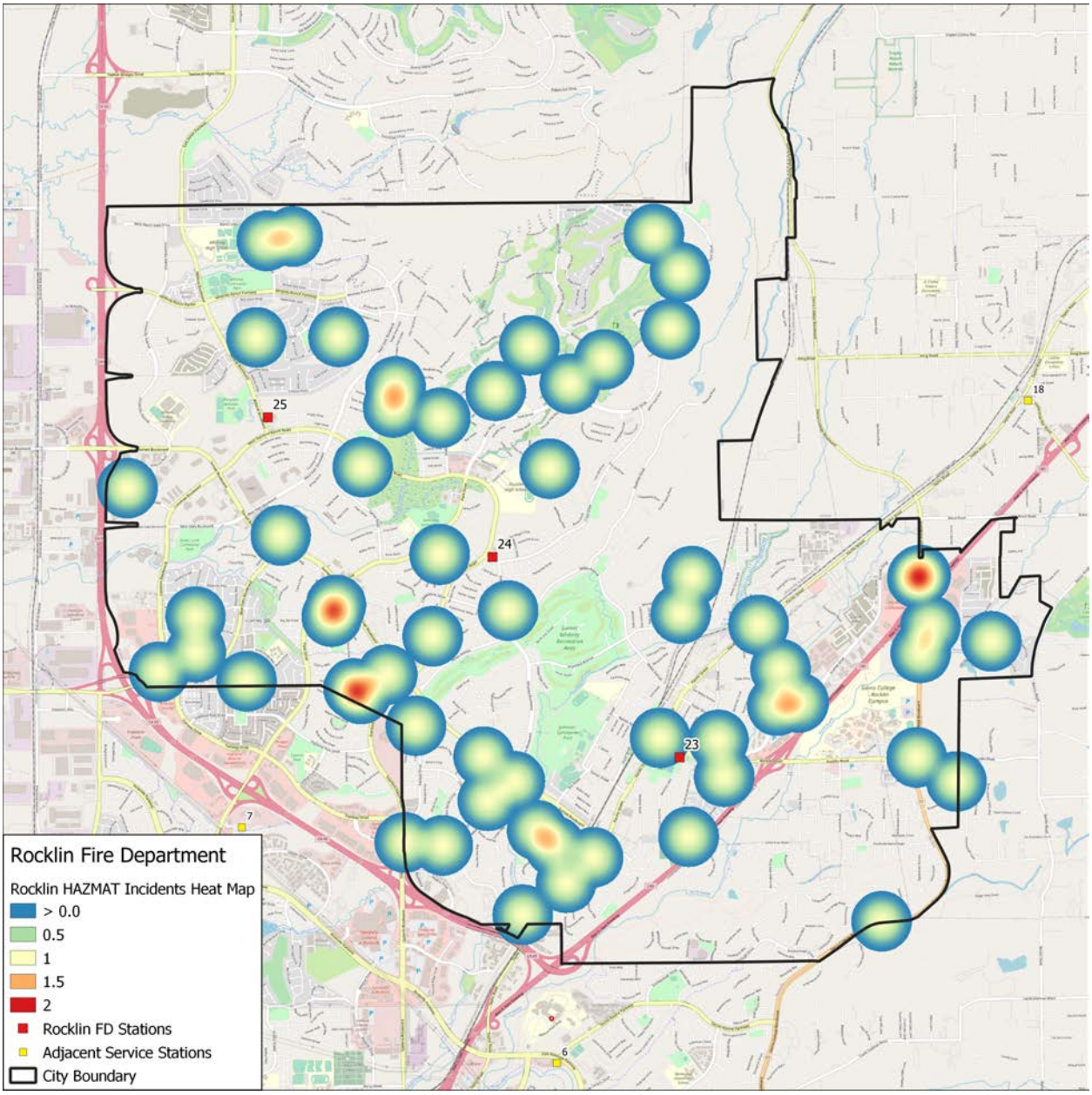
Responding Units	Minimum Staffing
Battalion Chief	1
Engine/Truck	3
Engine/Truck	3
ALS Ambulance	2
Total Response Provided	**9**
Personnel Required by Critical Tasks	**9**

Hazardous Materials Services

The RFD responds to and mitigates hazardous materials incidents. Although the frequency of hazardous materials incidents is relatively low within the RFD response area, the potential for a low-frequency high-risk event remains a potential through natural gas leaks, chemical spills, and transportation accidents. All firefighters are trained and certified to the Hazmat Operations level while three members are further trained to the Hazmat Technician level. The engine and truck companies at each station are equipped with spill kits, absorbents, and 4-gas atmospheric monitoring capabilities so most low-risk incidents can be managed at the company level. For moderate- or high-risk incidents requiring additional personnel and equipment, RFD relies on mutual aid from the Placer County and Roseville Fire Departments. In 2019, hazardous materials accounted for 1.2% of the total incidents responded to by RFD.

Community Service Demands – Hazardous Materials

Figure 43: Heat Map for Hazmat Calls



Community Risks

Hazardous materials are part of everyday life and include everything from industrial chemicals and toxic waste to household detergents. Substances are classified as hazardous materials due to their chemical nature and pose a potential risk to life, health, or property if released or improperly used. Hazards can occur during production, storage, transportation, use, or disposal. Emergency incidents can range from a chemical spill on a highway to groundwater contamination by naturally occurring methane gas. Facilities that manufacture, use, or store hazardous materials are required to report them to county Certified

Unified Program Agency (CUPA)[22] coordinated by the Local Emergency Planning Committees (LEPCs) under the Emergency Planning and Community Right-to-Know Act (EPCRA). This act is also known as Sara Title III.

The frequency of hazardous materials incidents was insufficient to conduct an informative temporal assessment.

Critical Task Analysis

Department staff created the critical tasks required for the mitigation of the various hazardous materials risks in the community. Critical tasks for low-, moderate-, high, and maximum-risk events are presented as well as the resources allocated to each event below.

Table 52: Critical Tasks for Hazardous Materials Responses - Low Risk

Critical Task	Needed Personnel
Incident Command	1
Investigate/Control	2
Total	**3**

Table 53: Apparatus and Personnel Requirements for Hazardous Materials Responses - Low Risk

Responding Units	Minimum Staffing
Engine /Truck	3
Total Response Provided	**3**
Personnel Required by Critical Tasks	**3**

Table 54: Critical Tasks for Hazardous Materials Responses - Moderate Risk

Critical Task	Needed Personnel
Incident Command	1
Investigate	1
Decontamination	3
Safety Officer	1
Isolate/Deny Entry	3
Medical/Rehab	2
Total	**11**

[22] CUPA services coordinated by the Roseville Fire Department

Table 55: Apparatus and Personnel Requirements for Hazardous Materials Responses - Moderate Risk

Responding Units	Minimum Staffing
Battalion Chief	1
Engine	3
Engine	3
Truck	3
ALS Ambulance	2
Total Response Provided	**12**
Personnel Required by Critical Tasks	**11**

Table 56: Critical Tasks for Hazardous Materials Responses - High Risk

Critical Task	Needed Personnel
Incident Command	1
Isolate/Deny Entry	3
Investigate	1
Gross Decontamination	3
Safety Officer	1
Medical/Rehab	2
Sub-Total Critical Tasks	**11**
Haz Mat Group Supervisor	1
Entry/Back-Up	4
Technical Decontamination	3
Medical Supervisor	1
Technical Reference	1
Air Monitoring	1
Total	**22**

Table 57: Apparatus and Personnel Requirements for Hazardous Materials Responses - High Risk

Responding Units	Minimum Staffing
Battalion Chief	1
Engine	3
Engine	3
Truck	3
ALS Ambulance	2
Haz Mat Task Force*	
Total Response Provided	**12**
Personnel Required by Critical Tasks (subtotal)	**11***

*Haz Mat Task Force is 8 to 12 and fills full ERF of 22

Rescue Services

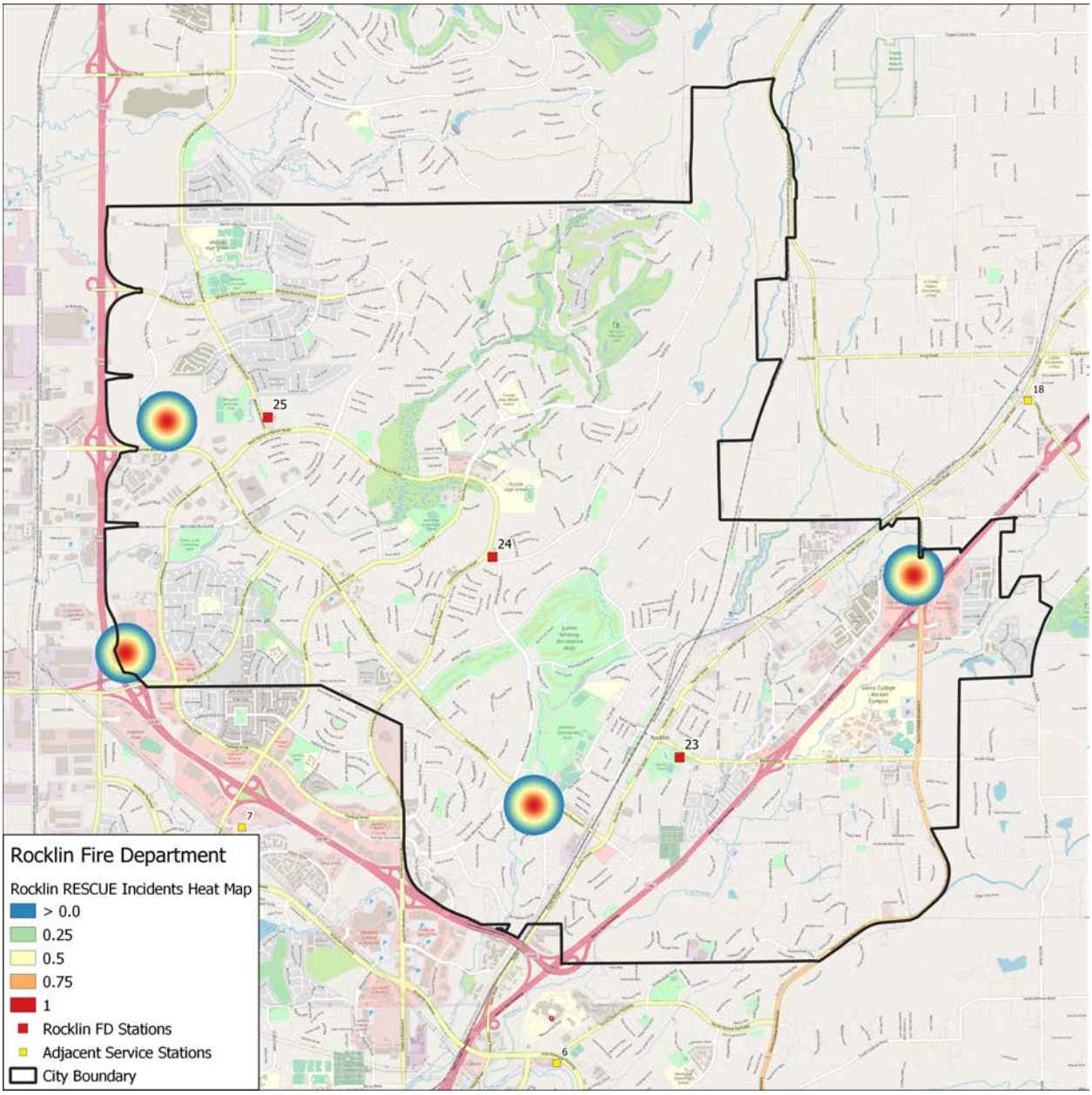
The RFD provides initial response for technical rescue services within the City. The RFD will respond to technical rescue incidents and is equipped to extricate and treat injured patients and victims involved in specialty rescue situations. The RFD trains all firefighters to the rescue operations level and provides specialized equipment and operational capabilities to begin mitigation strategies for most technical rescue incidents occurring within the City. For moderate- or high-risk incidents requiring additional

personnel and equipment, the RFD can request a rescue task force from the Roseville Fire Department. The task force is composed of 8 members and capable of responding to and mitigating incidents related to structural collapse, high-angle rescue, machinery entrapment, trench rescue, and confined space rescue. In FY 2019, rescue incidents accounted for less than 1% of the total incidents responded.

Community Service Demands - Rescue

Similar to the analyses for hazardous materials, the demand for rescue services is low in relation to the primary program areas. The relatively low call volume renders temporal analyses unreliable since the events will be much more random than in larger data sets. In other words, the results would not be intuitive for decision making and no further analytical analyses were conducted. However, a geospatial analysis of the requests for special operations that include rescue incidents was conducted and is represented in the figure below.

Figure 44: Heat Map for Rescue Calls



Community Risks

The Department has experienced a historically low demand for technical rescue services. The greatest concentration of rescue incidents, besides motor vehicle accidents, include victims stuck in elevators, children stuck in a device (usually uninjured), patients that fell and need special assistance out of an elevated area (low angle rescue), etc.

Critical Task Analysis

The RFD staff analyzed the critical tasks required for the mitigation of the various special operations risks in the community. Critical tasks for various events are presented as well as the resources allocated to each event.

Table 58: Rescue Incident - Low Risk (elevator rescue, lock out/tag out, animal rescue)

Critical Task	Needed Personnel
Incident Command	1
Extrication / Rescue	2
Medical	2
Total	**5**

Table 59: Resource Allocation for Tier 1 Technical Rescue Event– Low Risk

Responding Units	Minimum Staffing
Engine/Truck	3
ALS Ambulance	2
Total Response Provided	**5**
Personnel Required by Critical Tasks	**5**

Table 60: Rescue Incident – Moderate Risk – (Water rescue, vehicle or machinery extrication, low angle, water stuff)[23]

Critical Task	Needed Personnel
Incident Command	1
Safety Officer	1
Extrication / Rescue / Removal	5
Medical	2
Total	**9**

Table 61: Resource Allocation for Rescue Incident – Moderate Risk

Responding Units	Minimum Staffing
Battalion Chief	1
Engine	3
Truck	3
ALS Ambulance	2
Total Response Provided	**9**
Personnel Required by Critical Tasks	**9**

Table 62: Rescue Incident - High Risk (Building collapse, trench, confined space, high angle)

Critical Task	Needed Personnel
Incident Command	1
Safety Officer	1
Extrication / Rescue / Removal	5
Medical	2
Incident Support	3
Sub-Total Critical Tasks	**12**
Technical Rescue Team (Roseville technical rescue task force)	8
Total Critical Tasks	**20**

[23] Regional Response from USAR Task Force Team 6

Table 63: Resource Allocation for Rescue – High Risk

Responding Units	Minimum Staffing
Battalion Chief	1
Engine	3
Engine	3
Truck	3
Ambulance	2
Total Response Provided	**12**
Personnel Required by Critical Tasks	**12**

Maximum-risk rescue events require a regional and state mobilization and is an escalating event from the High-risk profile.

REVIEW OF SYSTEM PERFORMANCE

The first step in determining the current state of the RFD deployment model is to establish baseline measures of performance. This analysis is crucial to the ability to discuss alternatives to the status quo and in identifying opportunities for improvement. This portion of the analysis will focus efforts on elements of response time and the cascade of events that lead to timely response with the appropriate apparatus and personnel to mitigate the event. Response time goals should be looked at in terms of total response time, which includes the dispatch or call processing time, turnout time, and travel time, respectively.

Cascade of Events

The cascade of events is the sum of the individual elements of time beginning with a state of normalcy and continuing until normalcy is once again returned through the mitigation of the event. The elements of time that are important to the ultimate outcome of a structure fire or critical medical emergency begin with the initiation of the event. For example, the first on-set of chest pain begins the biological and scientific time clock for heart damage irrespective of when 911 is notified. Similarly, a fire may begin and burn undetected for a period of time before the fire department is notified. The emergency response system does not have control over the time interval for manual recognition or the choice to request assistance.

Therefore, the RFD utilizes quantifiable "hard" data points to measure and manage system performance. These elements include alarm processing, turnout time, travel time, and the time spent on-scene. An example of the cascade of events and the elements of performance utilized by the Department is provided in the figure below.[24]

Detection

Detection is defined as the element of time between the time an event occurs, someone detects it, and the emergency response system has been notified. This is typically accomplished by calling the 911 Public Safety Answering Point (PSAP). The PSAP for the city of Rocklin is located with the Rocklin Police Department dispatch. The fire chief and staff have immediate access to the facility during emergency incidents and work well with the police department trying to maintain performance within the center.

Call Processing

This is the element of time measured between when PSAP answers the 911 call, processes the information, and subsequently dispatches Department resources while the call is processed further using Emergency Medical Dispatching (EMD) procedures. Medical calls are simultaneously transferred verbally to a secondary PSAP operated by American Medical Response (AMR), located at 1040 Fee Drive, Sacramento CA 95815.

[24] Olathe Fire Department. (2012). Adapted from Community Risk and Emergency Services Analysis: Standard of Cover. Olathe, Kansas: Author.

The Rocklin Fire Department has made a policy decision to respond to all medical emergencies in spite of the EMD process due to the perceived extended delay for the EMD process. This policy does result in a number of calls where units are cancelled enroute.

There are two opportunities for improvement within the Rocklin dispatch center. The recommendation to Automatic Vehicle Location (AVL) has already been discussed earlier in the document, under the heading Current Deployment Strategy. Another improvement opportunity is to invest in a CAD-to-CAD connection whereas the Rocklin dispatcher could automatically transfer the EMS call information over to the ambulance dispatch center instantly without the need to verbalize the call information, which would relieve the dispatch for other duties and limit the changes of errors inherent in verbal transfers of information. If the agency decides to invest in CAD-to-CAD, then a natural progression would be to include the city of Roseville and Placer County Sheriff (dispatch provider for South Placer County Fire Department) dispatch centers as well since there is additional efficiencies in streamlining the alerting of all high frequency mutual aid providers as well. There is a CAD-to-CAD already in place between the city of Rocklin and the city of Lincoln.

Recommendation:
It is recommended the Department consider implementing a CAD-to-CAD between the dispatch centers of all high-frequency mutual aid providers, to include the ambulance dispatch center.

Turnout Time

This is the element of time that is measured between the time the fire department is dispatched or alerted of the emergency incident and the time when the fire apparatus or other response unit is enroute to the call.

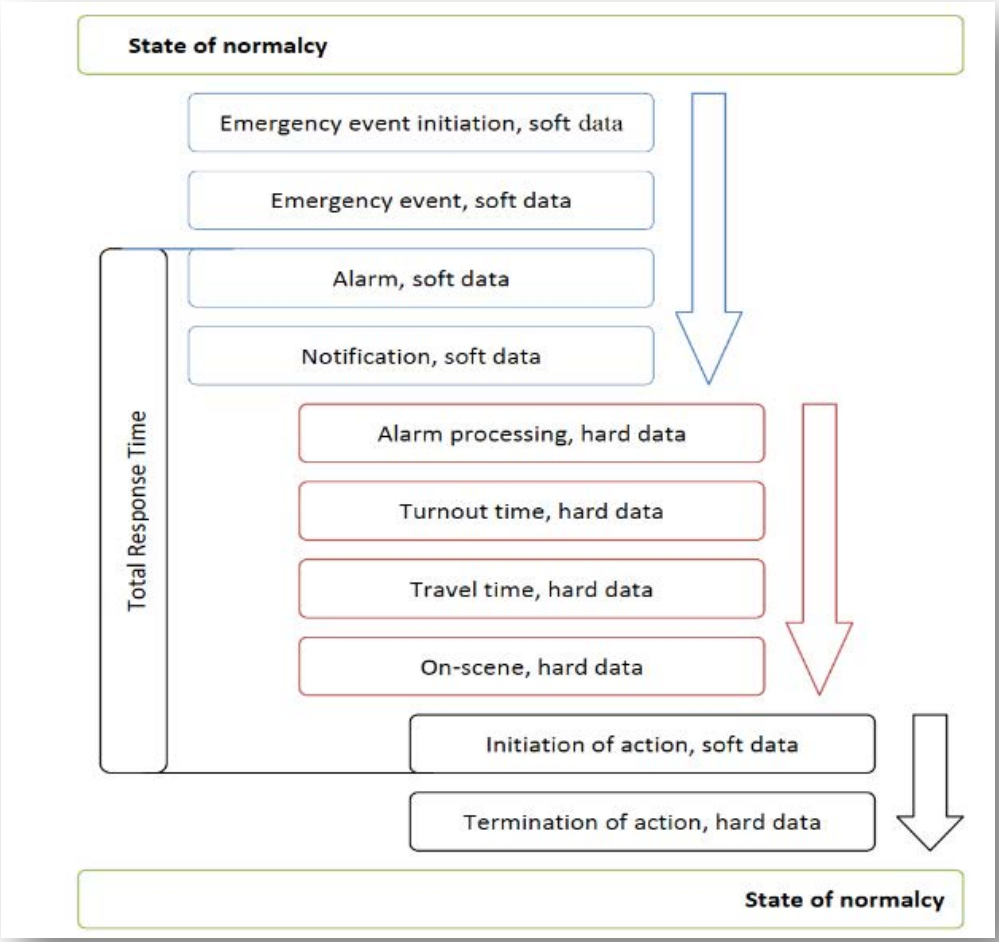
Travel Time

The travel time is the element of time between when the unit went enroute, or began to travel to the incident, and their arrival on scene.

Total Response Time

The total response time is the total time required to arrive on scene beginning with the PSAP answering the phone request for service and the time that the units arrive on scene.

Figure 45: Cascade of Events



Response Time Continuum

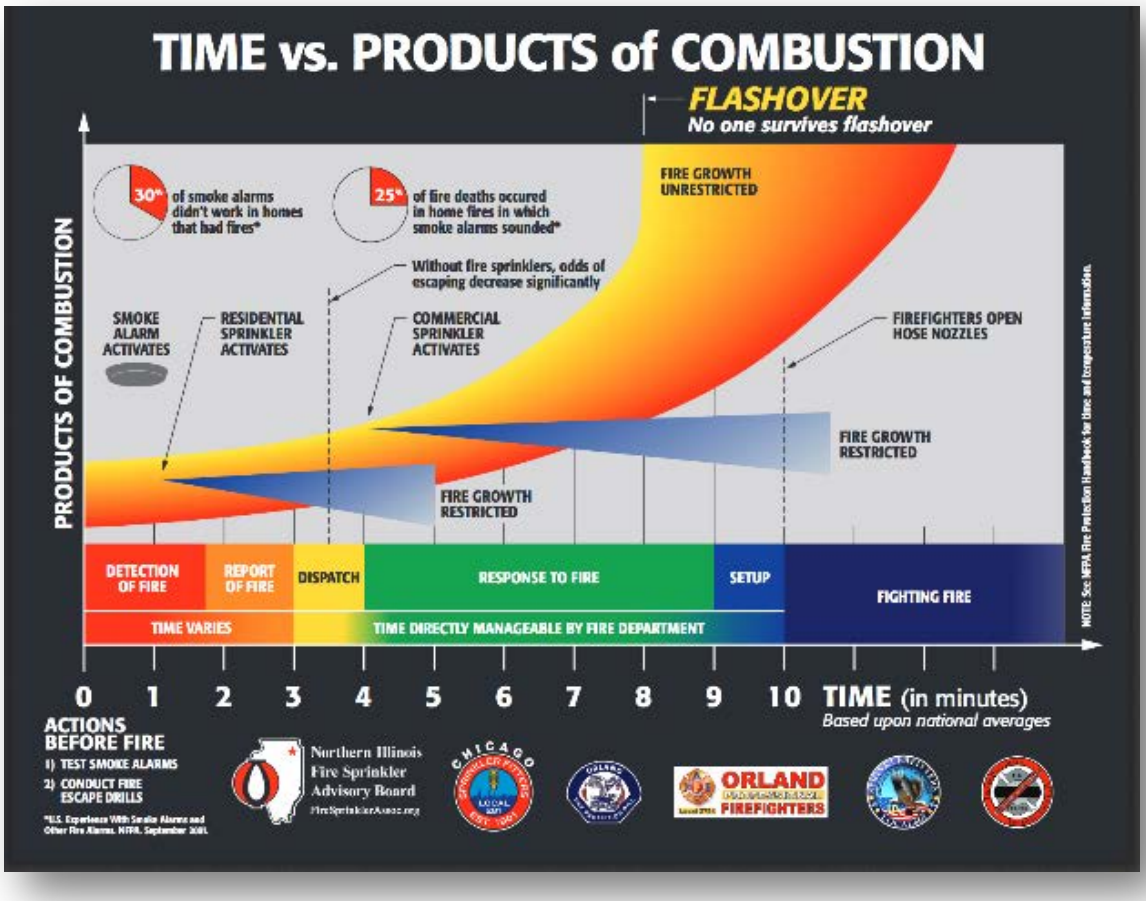
Fire

The number one priority with structural fire incidents is to save lives followed by the minimization of property damage. A direct relationship exists between the timeliness of the response and the survivability of unprotected occupants and property damage. The most identifiable point of fire behavior is flashover.

Flashover is the point in fire growth where the contents of an entire area, including the smoke, reach their ignition temperature, resulting in a rapid-fire growth rendering the area un-survivable by civilians and untenable for firefighters. Best practices would result in the fire department arriving and attacking the fire prior to the point of flashover. A representation of the traditional time temperature curve and the cascade of events is provided on the next page.[25]

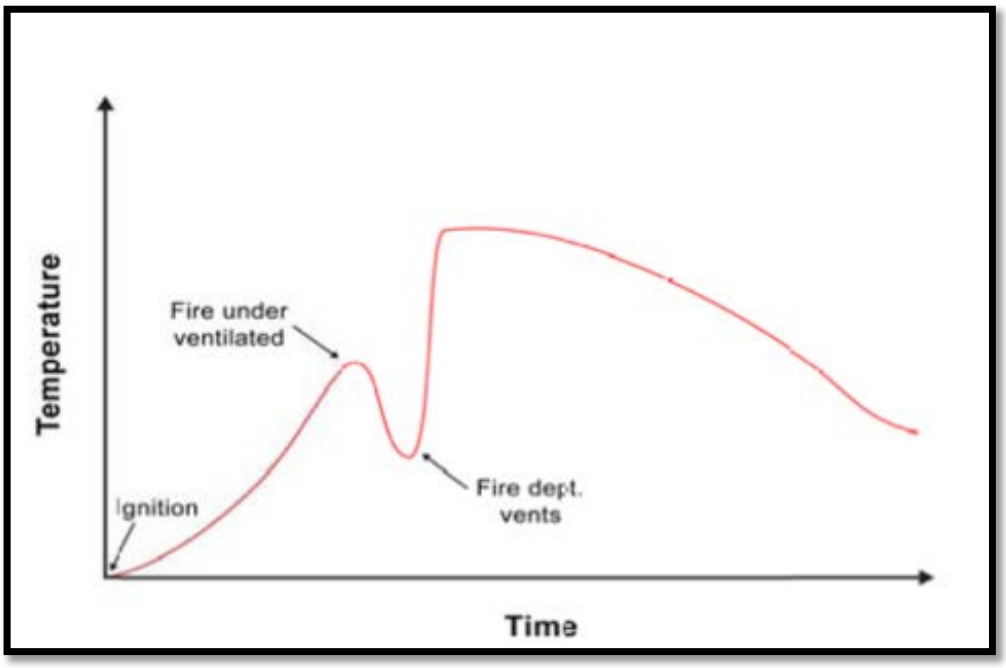
[25] Example of Traditional Time Temperature Curve. Retrieved at http://www.usfa.fema.gov/downloads/pdf/coffee-break/time-vs-products-of-combustion.pdf

Figure 46: Example of Traditional Time Temperature Curve



Recent studies by Underwriter's Laboratories (UL) have found that in compartment fires such as structure fires, flashover occurs within 4 minutes in modern fire environment. Modern home environments differ from traditional home environments with the addition of consumer furnishings made from petroleum-based products such as foam cushions and plastics. A compounding effect is also due to the advances in energy efficiency such as found in modern windows, insulation, etc. In addition, the UL research has identified an updated time temperature curve due to fires being ventilation controlled rather than fuel controlled as represented in the traditional time temperature curve. While this ventilation-controlled environment continues to provide a high risk to unprotected occupants to smoke and high heat, it does provide some advantage to property conservation efforts as water may be applied to the fire prior to ventilation and the subsequent flashover. An example of UL's ventilation-controlled time temperature curve is provided below.[26]

Figure 47: Ventilation Controlled Time Temperature Curve



EMS

The effective response to EMS incidents also has a direct correlation with the ability to respond within a specified period. However, unlike structure fires, responding to EMS incidents introduces considerable variability in the level of clinical acuity. From this perspective, the association of response time and clinical outcome varies depending on the severity of the injury or the illness. Research has demonstrated that the overwhelming majority of requests for EMS services are not time sensitive between 5 minutes and 11 minutes for emergency and 13 minutes for non-emergency responses.[27] The 12-minute upper threshold is only the upper limit of the available research and is not a clinically significant time measure, as patients

[26] UL/NIST Ventilation Controlled Time Temperature Curve. Retrieved from http://www.nist.gov/fire/fire_behavior.cfm

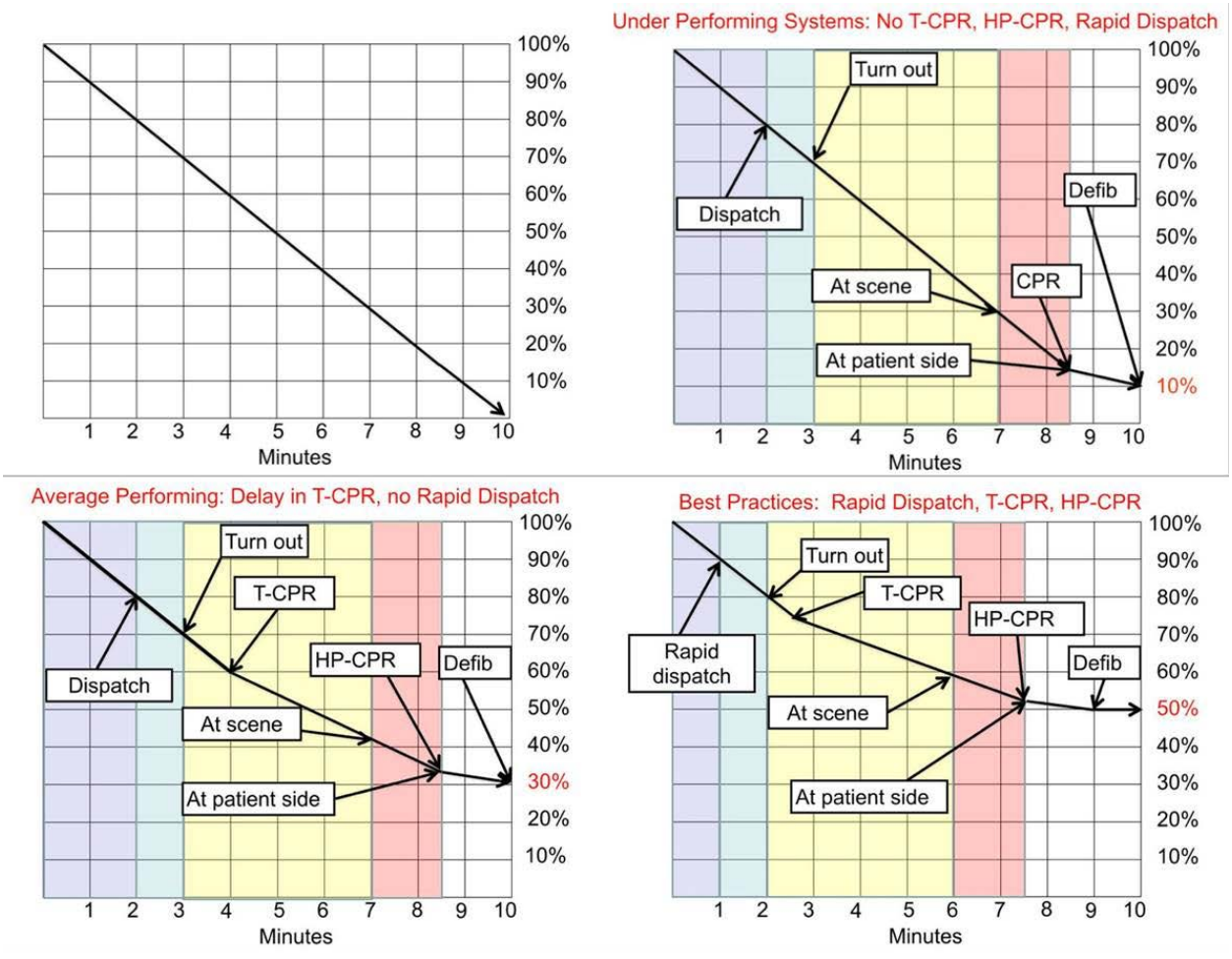
[27] Blackwell, T.H., & Kaufman, J.S. (April 2002). Response time effectiveness: Comparison of response time and survival in an urban emergency medical services system. *Academic Emergency Medicine,* 9(4): 289-295.

were not found to have a significantly different clinical outcome when the 12-minute threshold was exceeded.[28]

Out-of-hospital sudden cardiac arrest is the most identifiable and measured incident type for EMS. To demonstrate the relationship between response time and clinical outcome, a representation of the cascade of events and the time to defibrillation (shock) is presented below. The American Heart Association (AHA) has determined that brain damage will begin to occur between four and six minutes and become irreversible after 10 minutes without intervention.

Modern sudden cardiac arrest protocols recognize that high quality CPR at the BLS level is a quality intervention until defibrillation can be delivered in shockable rhythms. The figure below is representative of a sudden cardiac arrest that is presenting in a shockable heart rhythm such as Ventricular Fibrillation (V-Fib) or Ventricular Tachycardia (V-Tach). The right axis is reflective of the survivability to discharge.

Figure 48: CPR Performance Analysis[29]



[28] Blackwell, T.H., et al. (Oct-Dec 2009). Lack of association between prehospital response times and patient outcomes. *Prehospital Emergency Care,* 13(4): 444-450.

[29] Eisenberg, M., MD, PhD. *Who shall live? Who shall die?* Presentation from Seattle / King County Resuscitation Academy.

It is important to note that many confounding variables are present in any of the broad response time-to-outcome relationships. For example, the recognition and detection phase previously discussed could have the greatest impact on the efficacy of the response system.

Distribution Factors

Comparison of Demand Zones

Geospatial analyses were completed regarding drive times that incorporated RFD's current performance and nationally recommended best practices. Drive times from each of the current fixed-facility fire stations were created utilizing existing road miles and impedance for a 5-minute drive time that most closely represents current performance. This analysis suggests that about 70% the jurisdiction should be able to be responded to within 5 minutes travel time for where the majority of the risk is located. This coverage will likely diminish over time more intense development occurs in the areas within the city limits but in the non-shaded areas (example, Whitney Ranch development). The green shading indicates the estimated travel time capabilities from the existing road networks. The darker the green shading, the more overlap that exists between response capabilities within the current configuration. Finally, the number in parentheses, for example "(1)," indicates the order of contribution to system performance at the specific travel time goal.

5-Minute Travel Time

A 5-minute travel time analysis was created to evaluate RFD's capabilities with the current station configuration. Results suggest that with all three fire stations, 70.38% of the incidents could be responded to within 5 minutes or less travel time, without consideration of the unit capabilities. For example, Table 64 and Figure 49 reflect the travel time performance for any type of unit (engine, truck, battalion chief, etc.), even if the unit might not be the appropriate unit for the call type. As such, Station 24 contributes the most to the overall success of the system and Station 25 contributes the least. The contribution is cumulative, as Station 23 and Station 24 combined can cover 62% of the incidents in 5 minutes or less. However, figure 50 reflect the gap in suppression capabilities for Station 24 which is consideration for further analysis.

Table 64: Marginal Fire Station Contribution for 6-Minute Travel Time

Rank	Station	Station Capture	Total Capture	Percent Capture
1	24	1,613	1,613	31.94%
2	23	1,518	3,131	62.00%
3	25	423	3,554	70.38%

Figure 49: Current Fire Station Bleed Maps for 5-Minute Travel Time

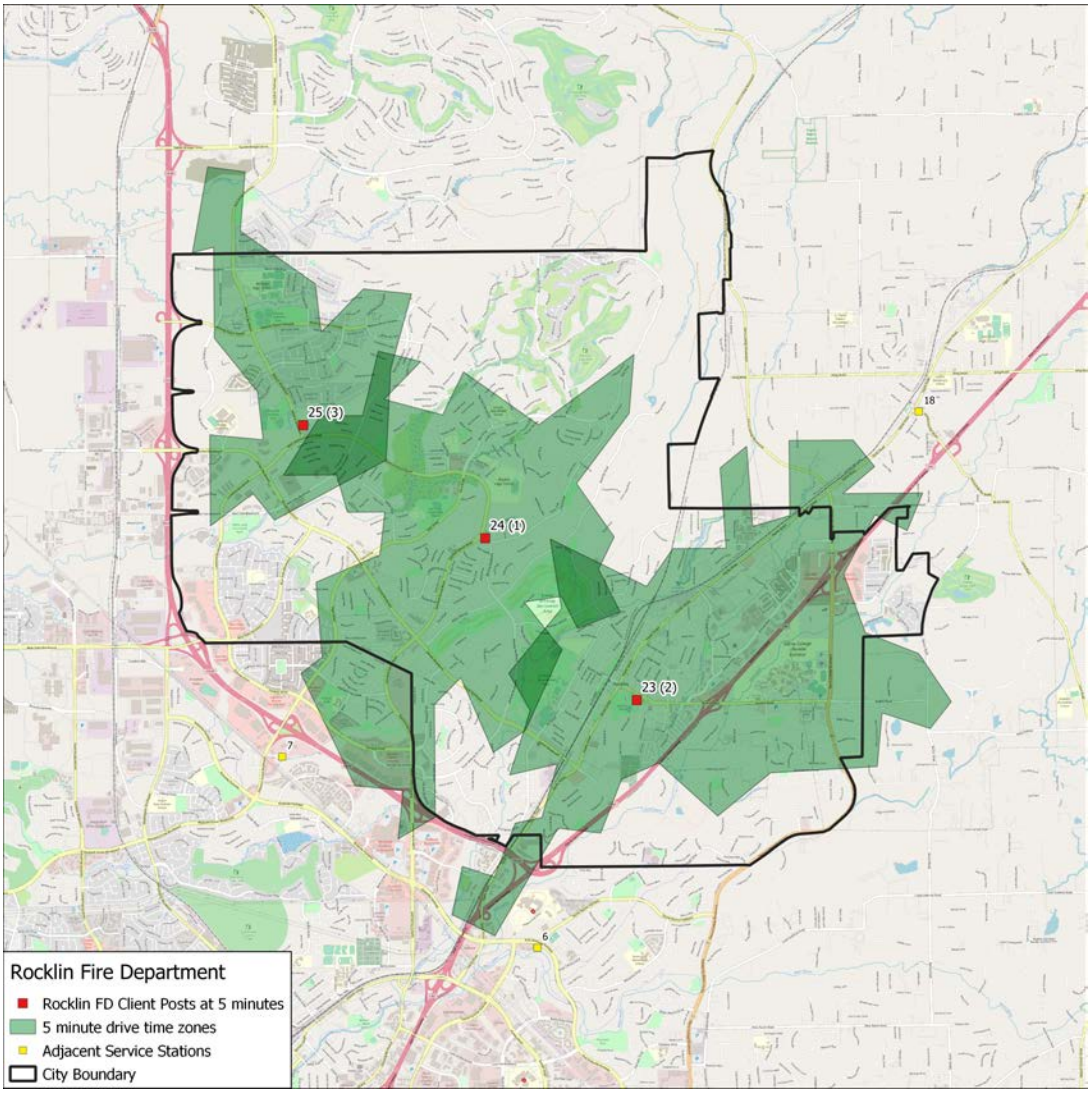
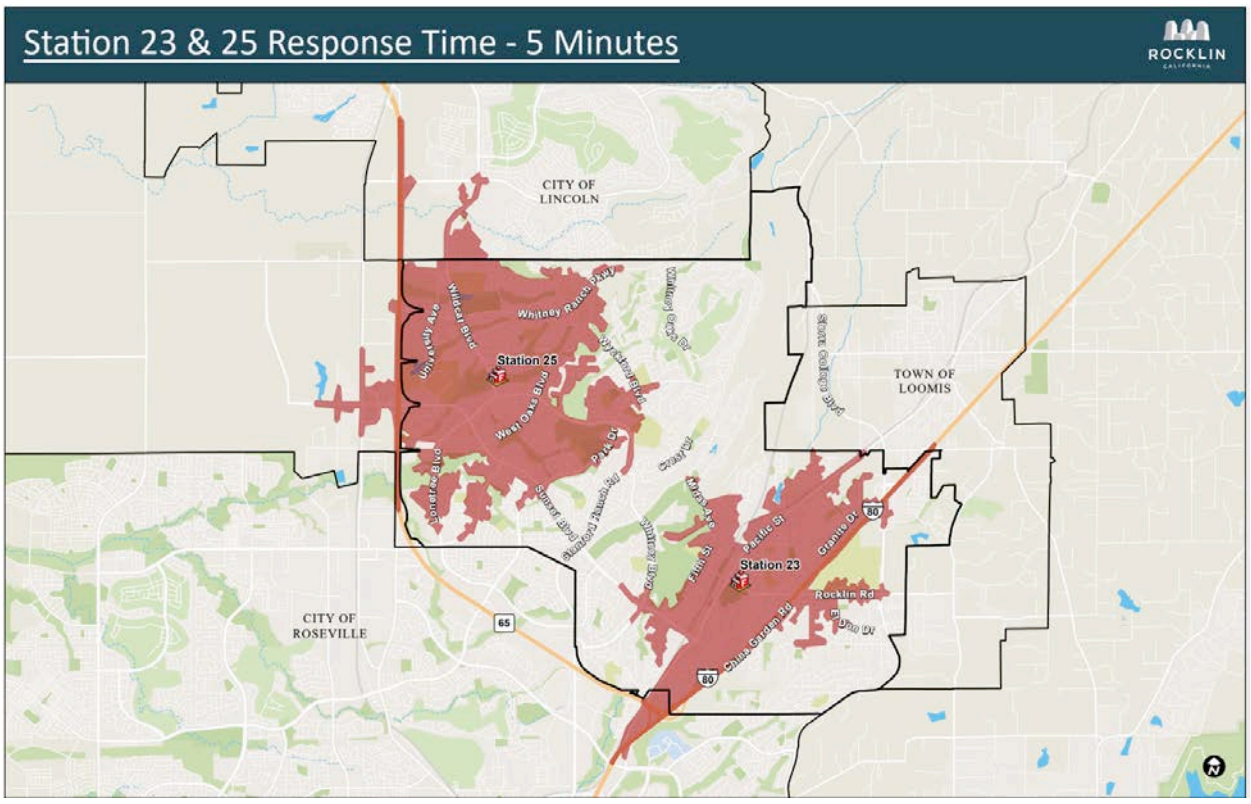


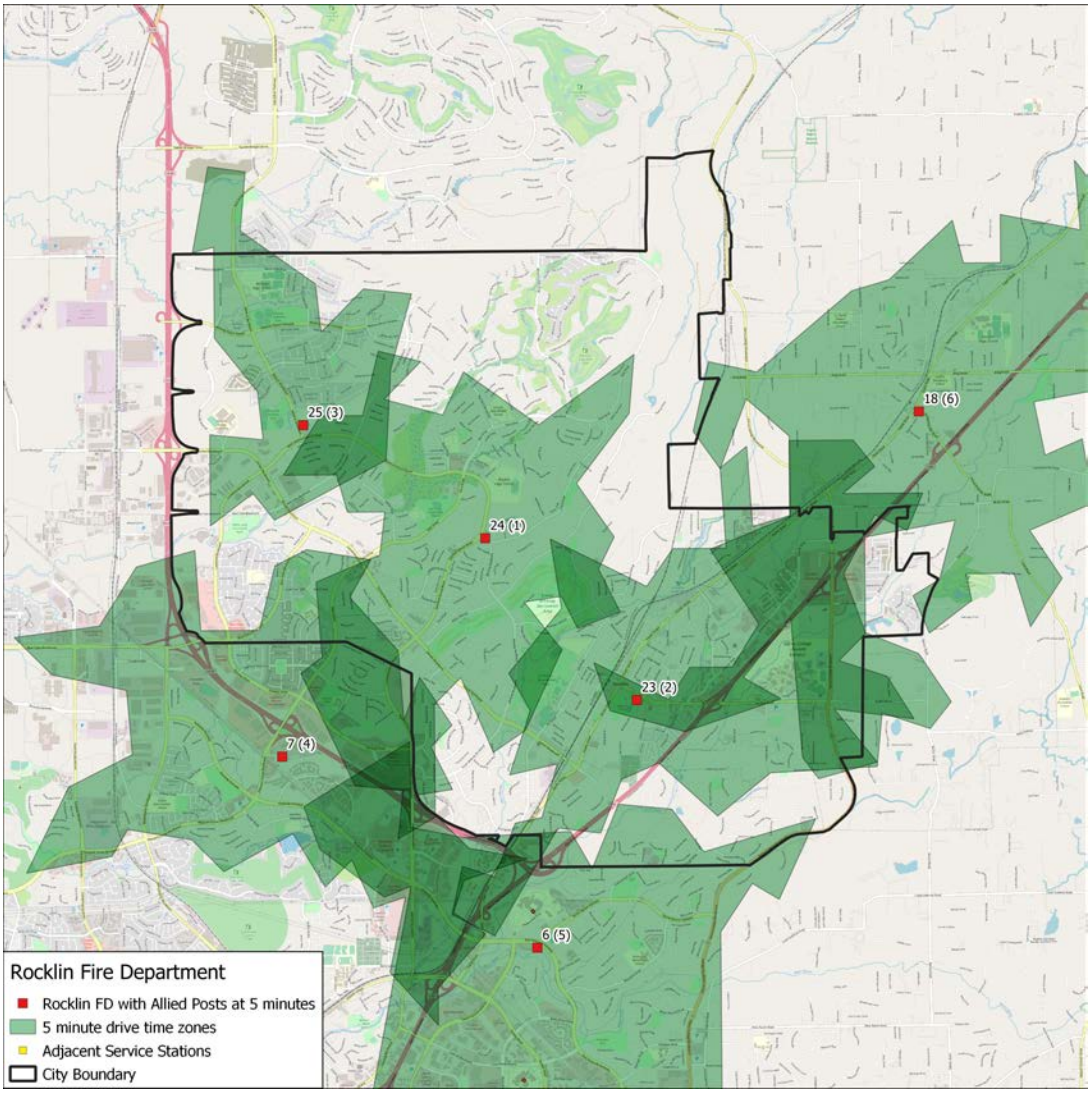
Figure 50: Current Fire Station Bleed Maps for 5-Minute Travel Time with 1st Unit Suppression Capabilities



5-Minute Travel Time – With Automatic Aid

A 5-minute travel time analysis was created was also evaluated with consideration of the adjacent stations that are available (based on location and minimum staffing levels) to provide automatic aid (Figure 51). Results suggest that with all three RFD fire stations and three stations from adjacent agencies (Roseville and Placer County), 75.82% of the incidents could be responded to within 5 minutes or less travel time.

Figure 51: Current Fire Station Bleed Maps for 5-Minute Travel Time with Automatic Aid



Utilizing a 5-minute travel time benchmark is common among California fire agencies, and the provision of automatic aid has helped the RFD with response time performance to date, however, there are a few considerations if the agency determines to maintain this benchmark performance over time. 1. The lack of automatic aid from the north and northeast (Lincoln Fire Department) will become more evident in outcome measurements over time due to the gap in first unit response coverage (distribution). 2. This map (Figure 51) assumes all units coming from adjacent agencies are available, which they will not. 3. This map shows coverage from Station 24 that is primarily covered by Truck 24, which has minimal suppression capabilities. Therefore, a large gap in fire suppression capabilities exist in all the areas shown outside the green coverage areas, as well as all the Station 24 coverage area (Figure 50).

In order to close this gap in service, the agency should consider the following strategies: 1. Locate a new fire station in the northeast quadrant of the City. 2. Move Fire Station 24 to a more optimal location (likely closer to Sunrise Blvd) and then staff the new Fire Station 24 with a fire engine. 3. Truck 24 could then be

relocated to any of the available stations based on a new risk assessment methodology as recommended in this report (See: Occupancy Level Risk section).

Recommendation:
It is recommended the Department review travel time performance again once the streets are fully built out in the northeast section of the City (Whitney Ranch area) and consider a future analysis for future fire station locations to maintain first suppression unit response performance (distribution) over time.

Unit Hour Utilization

Another measure, time on task, is necessary to evaluate best practices in efficient system delivery and consider the impact workload has on personnel. Unit Hour Utilization (UHU) values represent the proportion of the work period (e.g., 24 hours) that is utilized responding to requests for service.

Historically, the International Association of Fire Fighters (IAFF) has recommended that 24-hour units utilize 0.30, or 30% workload as an upper threshold.[30] In other words, this recommendation would have personnel spend no more than 7.2 hours per day on emergency incidents. These thresholds take into consideration the necessity to accomplish non-emergency activities such as training, health and wellness, public education, and fire inspections. The 4th edition of the IAFF EMS Guidebook no longer specifically identifies an upper threshold. However, *FITCH* recommends that an upper unit utilization threshold of approximately 0.30, 0r 30%, would be considered best practice. In other words, units and personnel should not exceed 30%, or 7.2 hours, of their workday responding to calls. These recommendations are also validated in the literature. For example, in their review of the city of Rolling Meadows, the Illinois Fire Chiefs Association utilized a UHU threshold of 0.30 as an indication to add additional resources.[31] Similarly, in a standards of cover study facilitated by the Center for Public Safety Excellence, the Castle Rock Fire and Rescue Department utilizes a UHU of 0.30 as the upper limit in their standards of cover due to the necessity to accomplish other non-emergency activities.[32]

UHU analyses included units designated by the RFD leadership team as 24-hour per day units (Table 65; Figure 52). Select 24-hour per day units were cross-staffed (i.e., had their busy time combined), as follows:

- E23/BR23/BSU23;
- E24/BR24; and
- E25/BR25.

Units that were not considered to be 24-hour per day units are still presented in the table to reflect busy hours.

---

[30] International Association of Firefighters. (1995). Emergency *Medical Services: A Guidebook for Fire-Based Systems.* Washington, DC: Author. (p. 11)

[31] Illinois Fire Chiefs Association. (2012). An *Assessment of Deployment and Station Location: Rolling Meadows Fire Department.* Rolling Meadows, Illinois: Author. (pp. 54-55)

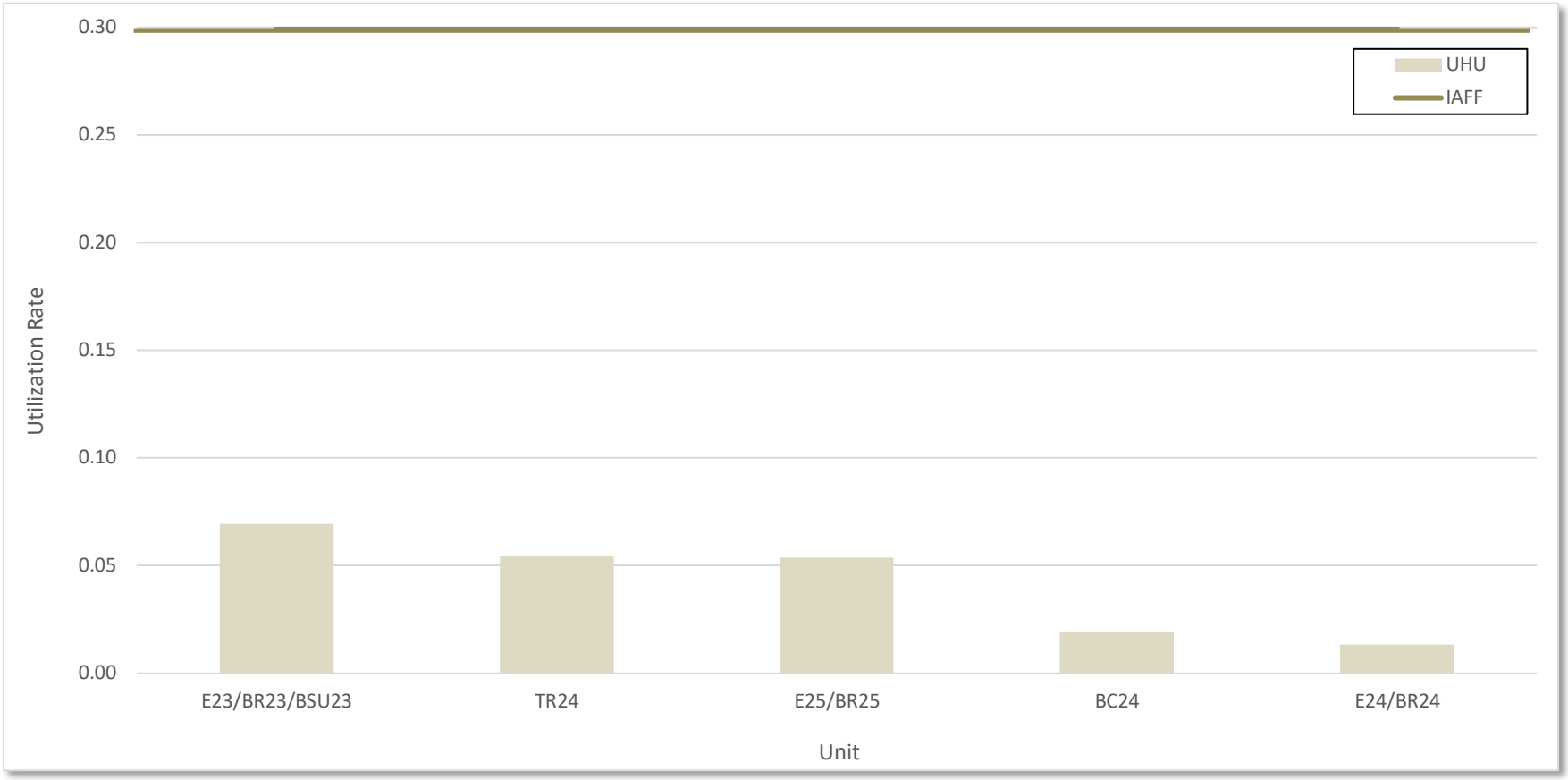
[32] Castle Rock Fire and Rescue Department. (2011). Community *Risk Analysis and Standards of Cover.* Castle Rock, Colorado: Author. (p. 58)

All units had UHU values < 0.30.

Table 65: Unit Hour Utilization by Station and Reporting District – RFD Units

Reporting District	Station	Unit ID	UHU Value	Total Busy Hours
RFD	23	E23/BR23/BSU23	0.07	604.4
		Total	**--**	**604.4**
	24	2412	--	0.0
		BC24	0.02	165.0
		BC2412	--	< 0.1
		E24/BR24	0.01	112.9
		TR24	0.05	469.8
		Total	**--**	**747.7**
	25	E25/BR25	0.05	465.8
		Total	**--**	**465.8**
Outside or Unknown	23	E23/BR23/BSU23	0.01	102.2
		Total	**--**	**102.2**
	24	2412	--	0.5
		BC24	0.01	105.4
		BC2412	--	< 0.1
		E24/BR24	< 0.01	2.1
		TR24	< 0.01	32.1
		Total	**--**	**140.2**
	25	E25/BR25	0.01	52.1
		Total	**--**	**52.1**
All	23	E23/BR23/BSU23	0.08	706.5
		Total	**--**	**706.5**
	24	2412	--	0.5
		BC24	0.03	270.4
		BC2412	--	< 0.1
		E24/BR24	0.01	115.0
		TR24	0.06	501.9
		Total	**--**	**887.8**
	25	E25/BR25	0.06	517.9
		Total	**--**	**517.9**

Figure 52: Unit Hour Utilization in RFD Reporting Districts – 24-Hour Per Day RFD Units



Workload by Fire Zone

Another method for assessing the effectiveness of the distribution model is to analyze the demand for services across the department, wherein workload is assessed at the fire zone level. The highest volume of calls responded to by RFD units occurred in fire zone 23 (2,117 calls). Fire zone 23 also had the highest volume of responses made by departmental units to the area (2,488 responses), requiring 37.7% of RFD's total responses (Table 66; Figure 53).

Table 66: Department Workload by Fire Zone – RFD Units

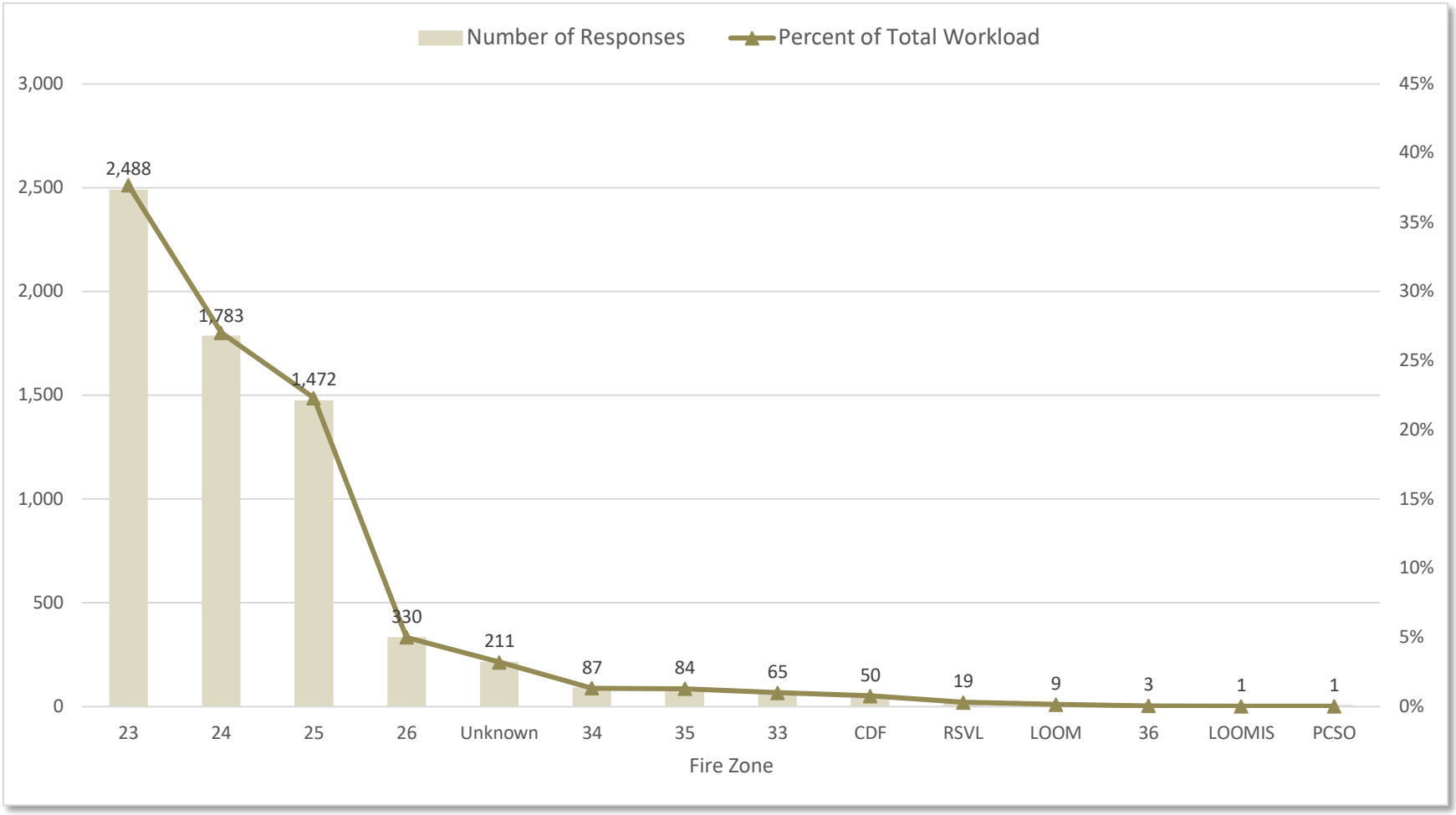
Fire Zone	Number of Calls in Fire Zone[1]	Number of Responses Made by Department in Fire Zone[2]	Percent of Department Workload[3]
23	2,117	2,488	37.7
24	1,479	1,783	27.0
25	1,284	1,472	22.3
26	284	330	5.0
33	49	65	1.0
34	62	87	1.3
35	74	84	1.3
36	2	3	< 0.1
CDF	42	50	0.8
LOOM	6	9	0.1
LOOMIS	1	1	< 0.1
PCSO	1	1	< 0.1
RSVL	16	19	0.3
Unknown	175	211	3.2
Total	**5,592**	**6,603**	**100.0**

[1]"Number of Calls" reflects an adjusted number of calls following any exclusion activity to align with responses made by valid units assigned to RFD (see Appendix).

[2]"Number of Responses" reflects the total number of records in the data file associated with responses made by valid units assigned to RFD, regardless of calculated busy time.

[3]"Percent of Department Workload" is based on "Number of Responses Made by Department in Fire Zone."

Figure 53: Department Workload by Fire Zone – RFD Units



Finally, workload was analyzed by fire zone and program (Table 67). The highest number of responses for EMS, fire, hazmat, and rescue related calls were made by the department to fire zone 23.

Table 67: Number of Responses by Fire Zone and Program – RFD Units

Fire Zone	Program					Total
	EMS	Fire	Hazmat	Rescue	Unknown	
23	1,579	865	37	7	0	2,488
24	1,233	516	34	0	0	1,783
25	1,073	376	17	6	0	1,472
26	251	73	6	0	0	330
33	27	36	1	1	0	65
34	31	50	6	0	0	87
35	46	35	3	0	0	84
36	0	3	0	0	0	3
CDF	0	50	0	0	0	50
LOOM	0	9	0	0	0	9
LOOMIS	0	1	0	0	0	1
PCSO	0	1	0	0	0	1
RSVL	0	19	0	0	0	19
Unknown	1	152	0	0	58	211
Total	**4,241**	**2,186**	**104**	**14**	**58**	**6,603**

Description of First Arriving Unit Performance

The analyses in this section focus on performance times related to dispatch (or alarm processing), turnout, travel, and response times, as follows:

"Dispatch Time" was calculated as Unit Dispatch Date and Time minus Call Received Date and Time. "Turnout Time" was calculated as Unit Enroute Date and Time minus Unit Dispatch Date and Time. "Travel Time" was calculated as Unit Arrival Date and Time minus Unit Enroute Date and Time. "Response Time" was calculated as Unit Arrival Date and Time minus Call Received Date and Time.

"Response Time" may also be calculated by summing relevant dispatch, turnout, and travel times, and "Average Response Time" may be derived by summing relevant average dispatch, turnout, and travel times, but only when the sample data used during calculation of the outcomes are identical for all three outcomes.

Average performance times and performance times at the 90th percentile are reported in this section. The 90th percentile is presented as a more conservative and reliable measure of performance, as this measure is often more robust, or less influenced by outliers, than measures of central tendency such as the average. Best practice is to measure at the 90th percentile. In other words, 90% of all performance is

captured, expecting that 10% of the time the department may experience abnormal conditions that would typically be considered outliers. For example, if the department were to report an *average* response time of six minutes, then in a normally distributed set of data, half of the responses would be longer than six minutes and half of the responses would be shorter than six minutes. Utilizing six minutes as an example again, a *90th percentile value* of six minutes communicates that 9 out of 10 times, the department performance is six minutes or better (faster) and is therefore more predictable and more clearly articulated to policy makers and the community. Note, however, that the sum of the 90th percentile values for dispatch, turnout, and travel times is not equivalent to the 90th percentile response time.

Analyses of performance times focused on emergency (lights and sirens) responses from RFD's first arriving primary front-line units for all unique incidents. Records with a "Call Priority" value of 1 were considered to be emergency (lights and sirens) responses throughout this report. RFD units considered by department leadership to be primary front-line units appropriate for inclusion in performance time analyses included select battalion chiefs, type 3 brush trucks, breathing support unit, engines, foam tender, and trucks.

During the audit and exclusion process, calculated times with negative or zero values were excluded from all related analyses, and calculated times considered to be outliers were also excluded from all related analyses.

Average and 90th percentile dispatch, turnout, travel, and response times are presented in Tables 68 and 69, respectively. Average dispatch, turnout, travel, and response times are additionally depicted in Figure 54.

Typically, performance varies across call types or categories for a variety of reasons. For example, turnout time may be longer for fire related calls because the crews must dress in their personal protective ensemble (bunker gear) prior to leaving the station, whereas on an EMS incident, they do not. Similarly, the larger fire apparatus may require longer travel and overall response times due to its size and lack of maneuverability.

Table 68: Average Dispatch, Turnout, Travel, and Response Times by Program and Reporting District– First Arriving RFD Units

Reporting District	Program	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)	Sample Size[1]
RFD	EMS	2.0	1.5	3.7	7.1	3,507
	Fire	2.1	1.9	3.9	7.8	708
	Hazmat	1.9	1.8	4.6	8.3	56
	Rescue	1.3	1.5	3.6	6.4	3
	Total	**2.0**	**1.5**	**3.8**	**7.3**	**4,274**
Outside or Unknown	EMS	3.7	1.8	7.9	13.3	59
	Fire	2.5	2.0	7.4	11.1	117
	Hazmat	2.3	1.4	6.9	10.6	6

Reporting District	Program	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)	Sample Size[1]
	Rescue	--	--	--	--	1
	Total	**3.0**	**1.9**	**7.6**	**12.0**	**183**
All	EMS	2.0	1.5	3.8	7.2	3,566
	Fire	2.2	1.9	4.4	8.2	825
	Hazmat	1.9	1.7	4.8	8.5	62
	Rescue	7.3	2.0	6.1	15.4	4
	Total	**2.0**	**1.6**	**3.9**	**7.5**	**4,457**

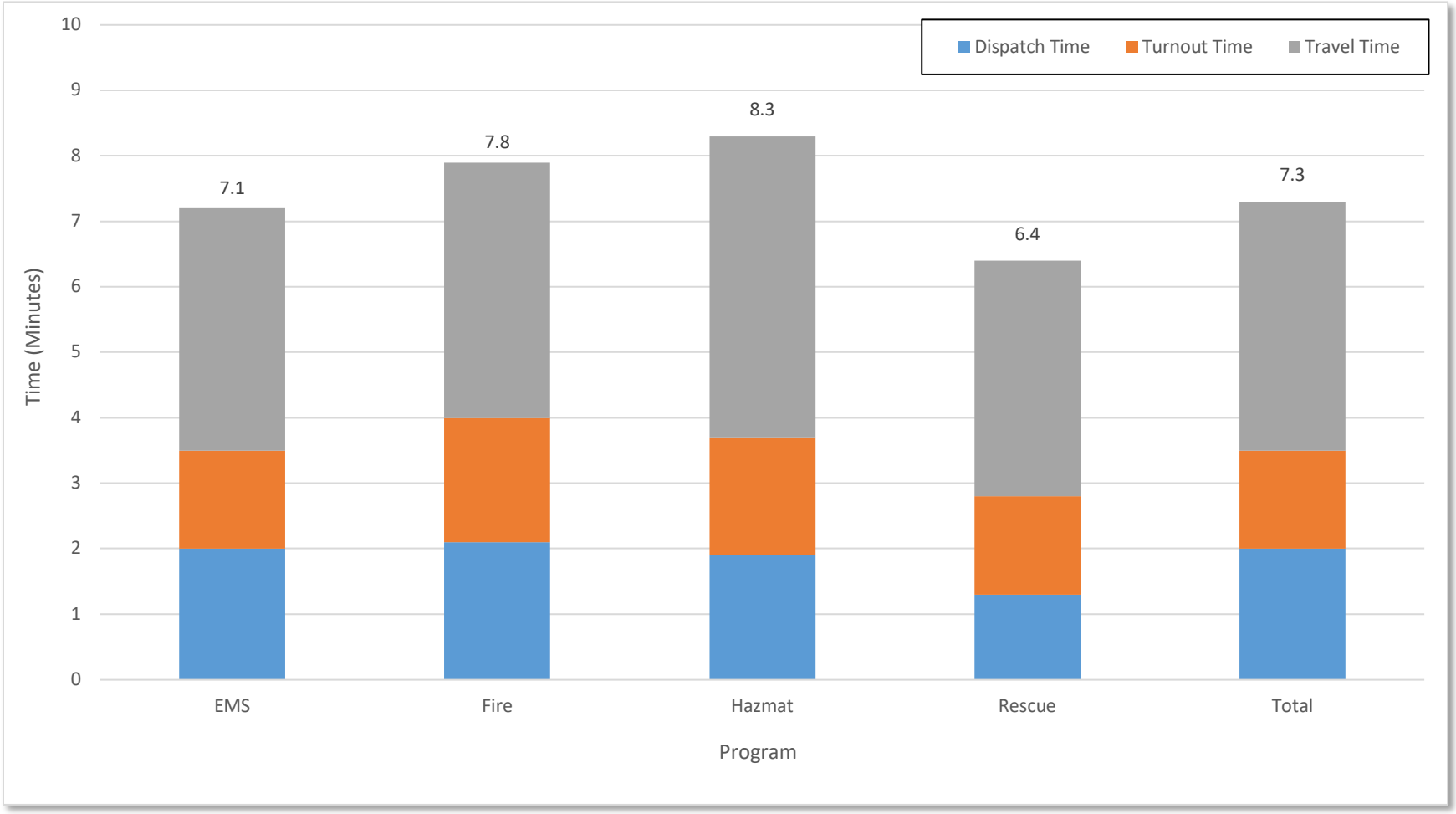
[1]Sample sizes reflect the number of responses made to emergency (lights and sirens) calls by first arriving primary front-line units assigned to RFD; due to missing or excluded time data, sample sizes corresponding to individual table metrics may be smaller.

Table 69: 90th Percentile Dispatch, Turnout, Travel, and Response Times by Program and Reporting District – First Arriving RFD Units

Reporting District	Program	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)	Sample Size[1]
RFD	EMS	2.9	2.5	5.5	9.5	3,507
	Fire	3.9	2.9	6.3	10.7	708
	Hazmat	3.2	2.8	6.9	12.5	56
	Rescue	--	--	--	--	3
	Total	**3.1**	**2.6**	**5.7**	**9.8**	**4,274**
Outside or Unknown	EMS	10.4	3.2	13.0	19.8	59
	Fire	6.2	3.1	12.3	19.2	117
	Hazmat	--	--	--	--	6
	Rescue	--	--	--	--	1
	Total	**7.1**	**3.1**	**12.8**	**19.5**	**183**
All	EMS	3.0	2.5	5.7	9.7	3,566
	Fire	4.3	2.9	7.3	11.9	825
	Hazmat	3.4	2.7	8.2	12.6	62
	Rescue	--	--	--	--	4
	Total	**3.2**	**2.6**	**6.1**	**10.3**	**4,457**

[1]Sample sizes reflect the number of responses made to emergency (lights and sirens) calls by first arriving primary front-line units assigned to RFD; due to missing or excluded time data, sample sizes corresponding to individual table metrics may be smaller.

Figure 54: Average Dispatch, Turnout, Travel, and Response Times by Program in RFD Reporting Districts – First Arriving RFD Units



Lastly, 90th percentile travel times are presented by reporting district and unit type in Table 70. However, due to the way unit-level responses are recorded in the CAD data file for cross-staffed units (e.g., brush truck responses often simply have a record, but no associated date and time stamps, as the date and time stamps appear to be accounted for by a record related to its corresponding engine instead), the majority of times ended up being reported for engines. It is assumed that brush trucks made several more responses and first arrivals than what can be accounted for by the data set, but that several of these events are recorded as engine responses instead.

Table 70: 90th Percentile Travel Times by Unit Type and Reporting District – First Arriving RFD Units

Reporting District	Unit Type	Travel Time (Minutes)	Number of First Arrivals	Number of First Arrivals with Travel Times
RFD	Battalion Chief	7.2	46	41
	Engine	5.5	3,067	3,009
	Truck	6.3	1,144	1,120
	Type 3 Brush	4.3	17	13
Outside or Unknown	Battalion Chief	13.9	57	55
	Engine	8.6	107	102
	Truck	24.3	12	10
	Type 3 Brush	--	7	4
All	Battalion Chief	13.0	103	96
	Engine	5.7	3,174	3,111
	Truck	6.4	1,156	1,130
	Type 3 Brush	9.3	24	17

Turnout and Travel Time Distributions

Additional analyses related to the response characteristics of first arriving RFD units to calls within the RFD reporting districts were conducted. The analyses in this section also focused on emergency (lights and sirens) responses from primary front-line units arriving first on scene for all distinct incidents within the RFD reporting districts.

To first recap data presented previously in Table 69 and Table 70, first arriving primary front-line RFD units had an overall average turnout time of 1.5 minutes, and a turnout time of 2.6 minutes at the 90th percentile. A total of 947 of 4,185 calls with turnout times (22.6%) experienced turnout times of one minute or less, and 75.0% of calls (3,138/4,185) experienced turnout times of two minutes or less (Figure 55). The overall average travel time was 3.8 minutes; performance at the 90th percentile for travel time was 5.7 minutes. A total of 1,363 of 4,183 calls with travel times (32.6%) experienced travel times of three minutes or less, and 62.4% of calls (2,611/4,183) experienced travel times of four minutes or less (Figure 56). The average response time was 7.3 minutes; performance at the 90th percentile for response time was 9.8 minutes.

Table 71: Average and 90th Percentile Dispatch, Turnout, Travel, and Response Times in RFD Reporting Districts – First Arriving RFD Units

Measure	Average (Minutes)	90th Percentile (Minutes)
Dispatch Time	2.0	3.1
Turnout Time	1.5	2.6
Travel Time	3.8	5.7
Response Time	7.3	9.8

Figure 55: Distribution of Turnout Time of First Arriving RFD Units – All Emergency Calls in RFD Reporting Districts

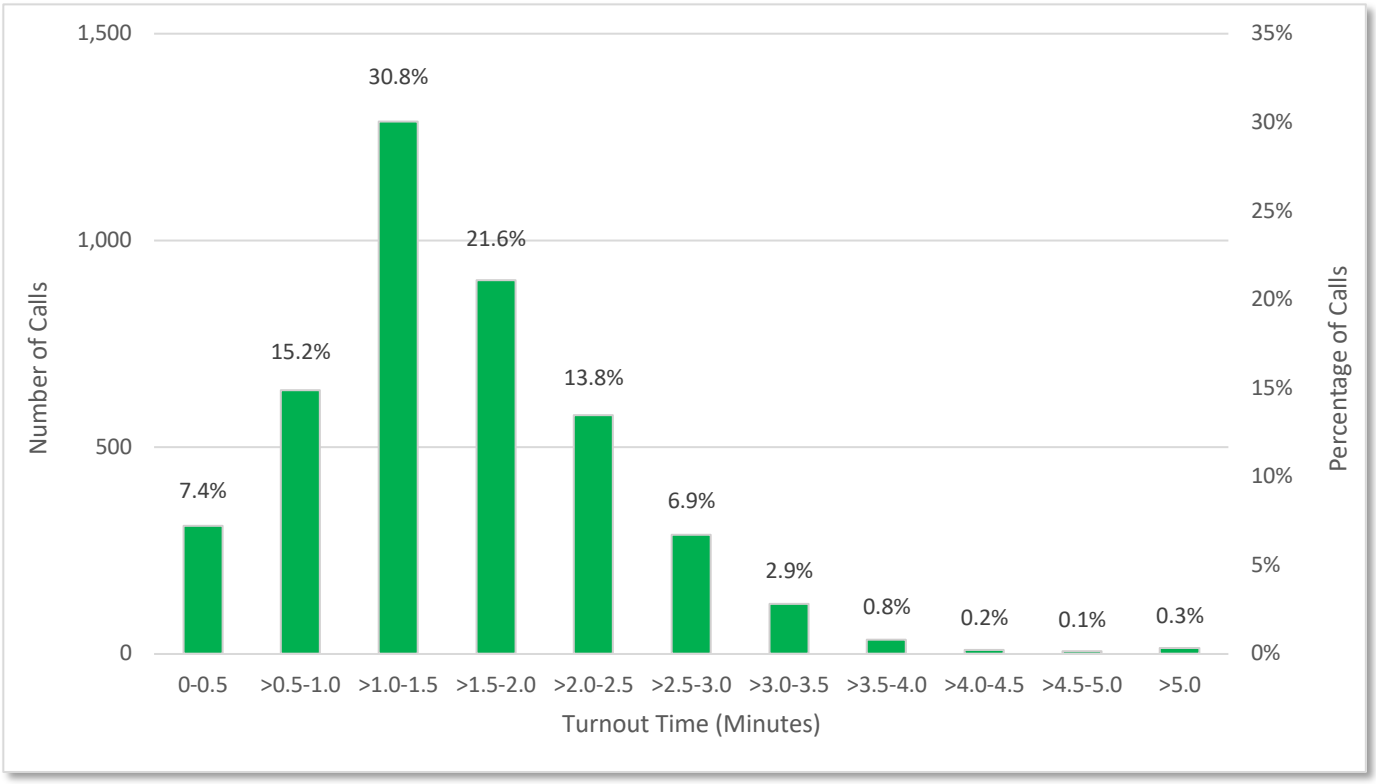
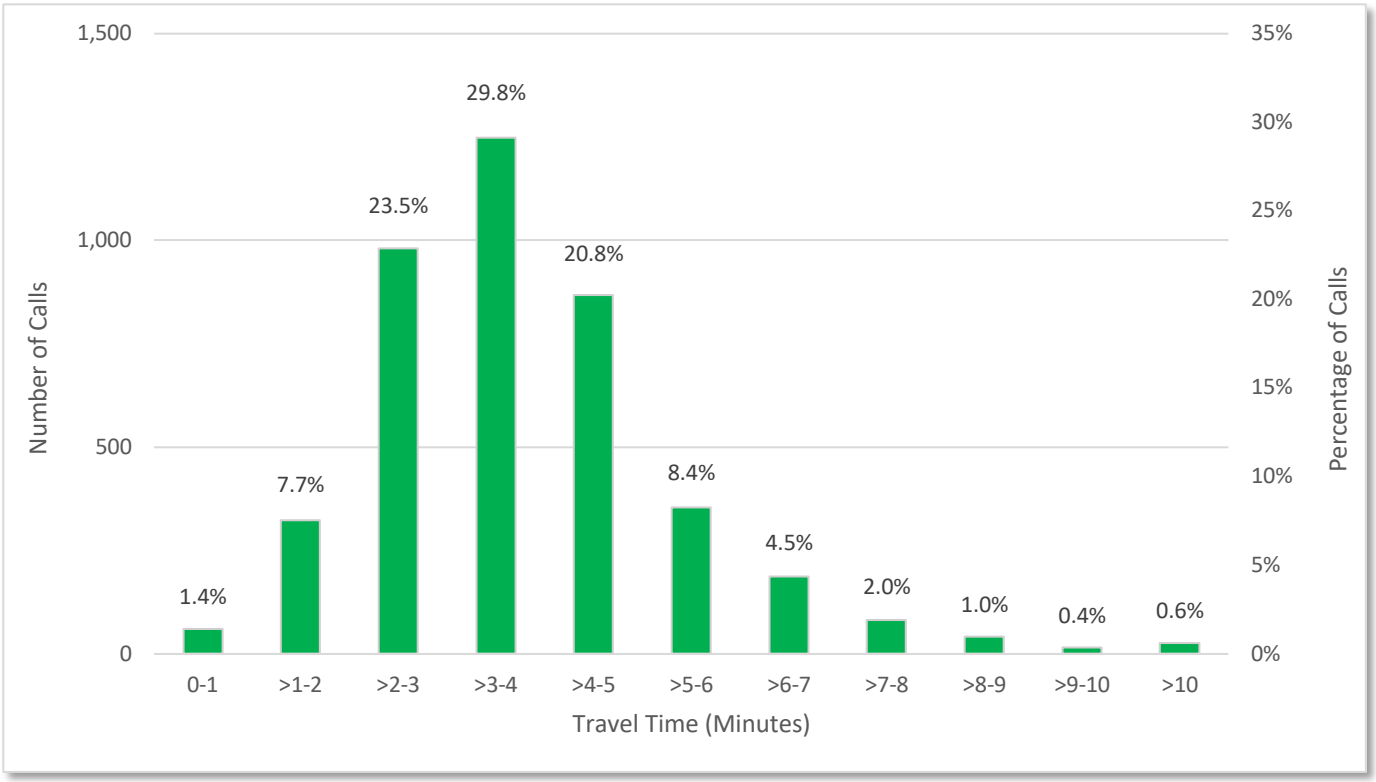


Figure 56: Distribution of Travel Time of First Arriving RFD Units – All Emergency Calls in RFD Reporting Districts



National recommendations provide differentiation between EMS and fire/special operations incidents. For example, the best practice for an EMS incident is a turnout time of 60 seconds or less 90% of the time. Due to the necessity to don personal protective equipment prior to responding to fire related incidents, best practices provide either 80 seconds (NFPA) or 90 seconds (CFAI) or less at the 90th percentile for turnout times associated with fire calls. Therefore, turnout and travel times are also reported by the major program areas of EMS and fire.

For EMS incidents, first arriving primary front-line RFD units had an average turnout time of 1.5 minutes (Table 68), and a turnout time of 2.5 minutes at the 90th percentile (Table 69). A total of 822 of 3,441 calls with turnout times (23.9%) experienced turnout times of one minute or less, and 79.0% of calls (2,718/3,441) experienced turnout times of two minutes or less (Figure 55). The average travel time for EMS incidents was 3.7 minutes; performance at the 90th percentile for travel time was 5.5 minutes. A total of 1,119 of 3,441 calls with travel times (32.5%) experienced travel times of three minutes or less, and 63.8% of calls (2,195/3,441) experienced travel times of four minutes or less. The average response time for EMS calls was 7.1 minutes; performance at the 90th percentile for response time was 9.5 minutes.

For fire related incidents, first arriving primary front-line RFD units had an average turnout time of 1.9 minutes (Table 68), and a turnout time of 2.9 minutes at the 90th percentile (Table 69). A total of 114 of 685 calls with turnout times (16.6%) experienced turnout times of one minute or less, and 55.5% of calls (380/685) experienced turnout times of two minutes or less (Figure 55). The average travel time for fire related incidents was 3.9 minutes; performance at the 90th percentile for travel time was 6.3 minutes. A total of 234 of 683 calls with travel times (34.3%) experienced travel times of three minutes or less, and 57.7% of calls (394/683) experienced travel times of four minutes or less. The average response time for fire related calls was 7.8 minutes; performance at the 90th percentile for response time was 10.7 minutes.

Figure 57: Distribution of Turnout Time of First Arriving RFD Units – Emergency EMS Related Calls in RFD Reporting Districts

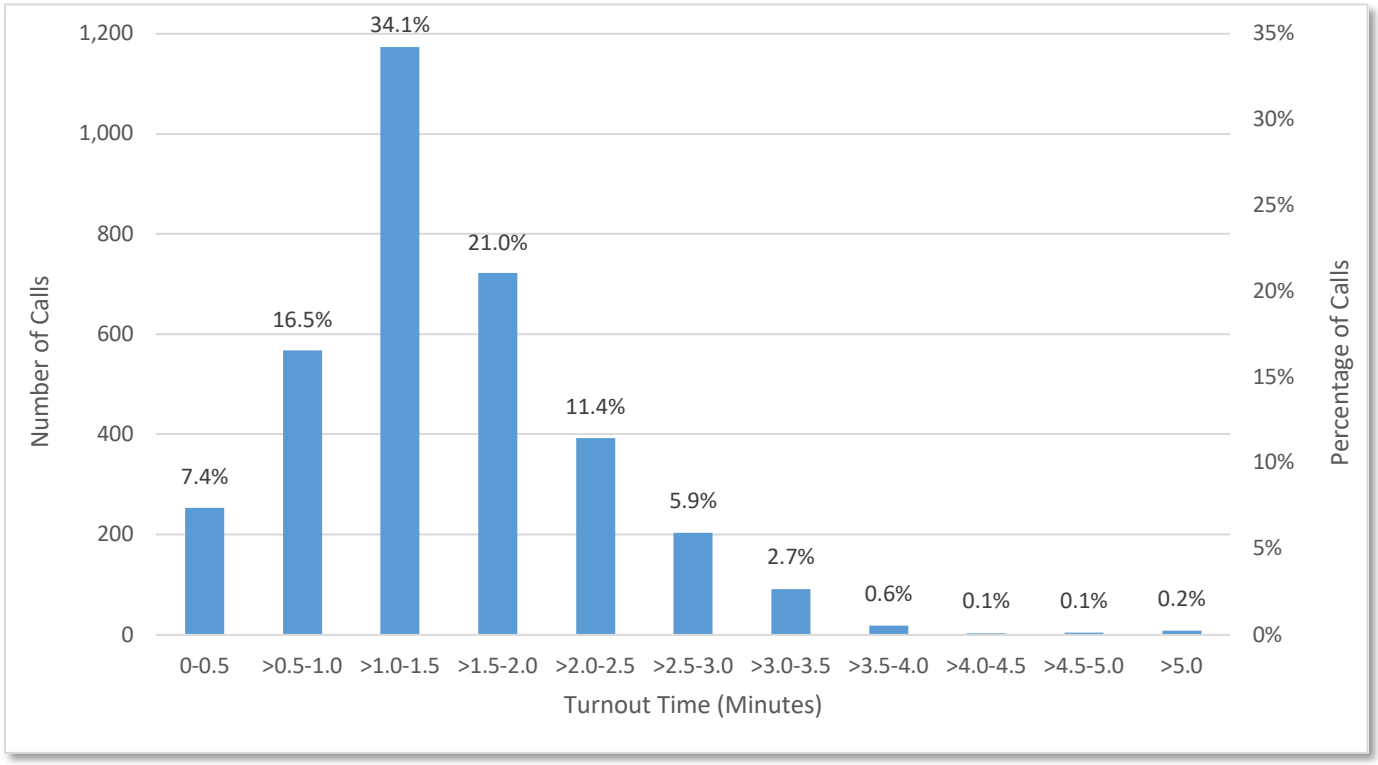


Figure 58: Distribution of Travel Time of First Arriving RFD Units – Emergency EMS Related Calls in RFD Reporting Districts

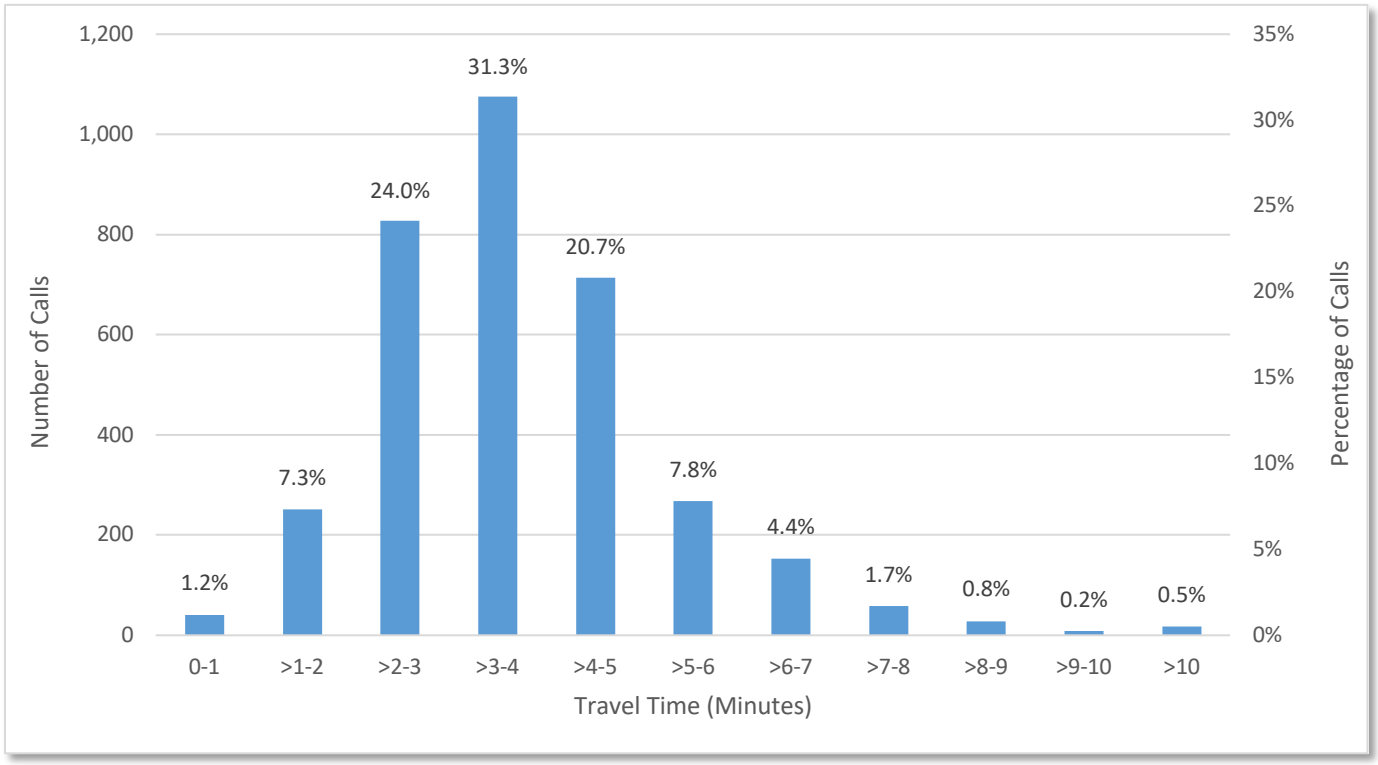


Figure 59: Distribution of Turnout Time of First Arriving RFD Units – Emergency Fire Related Calls in RFD Reporting Districts

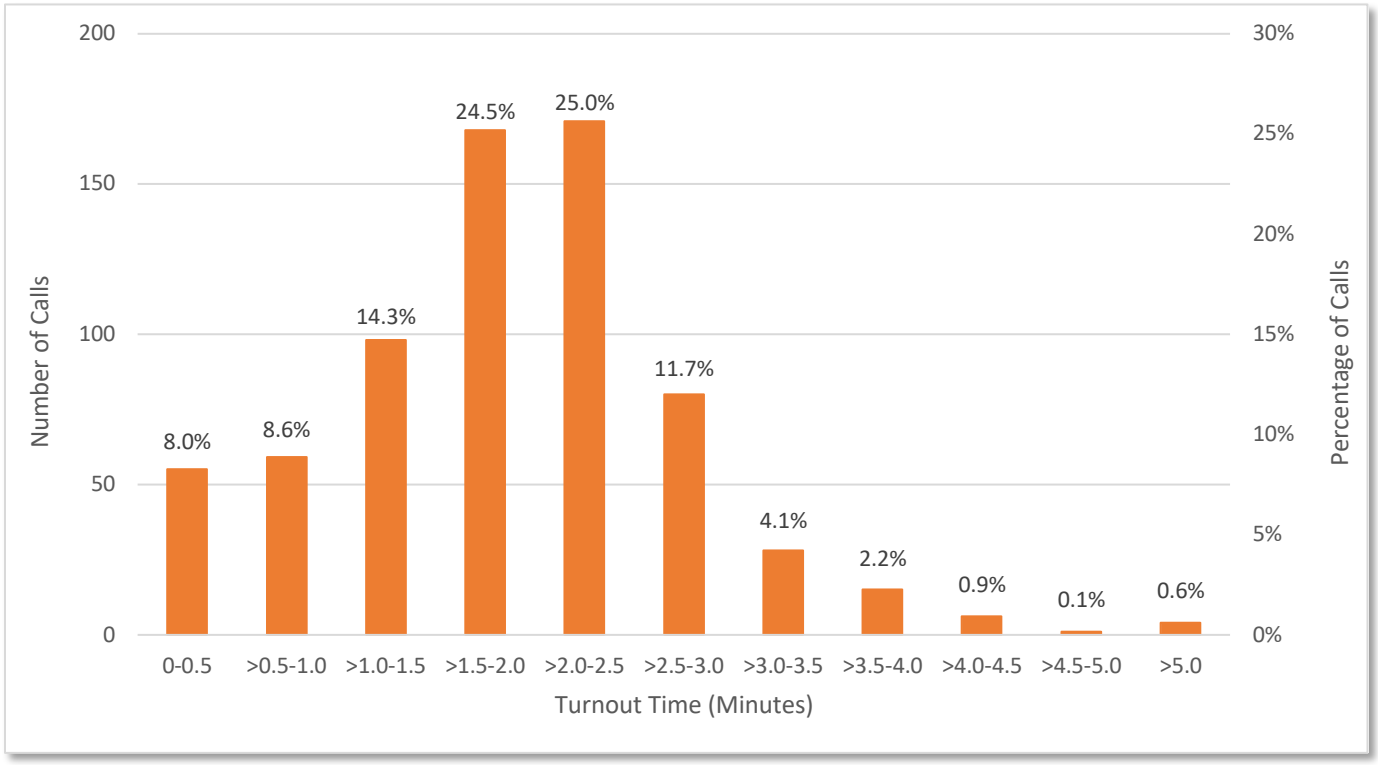
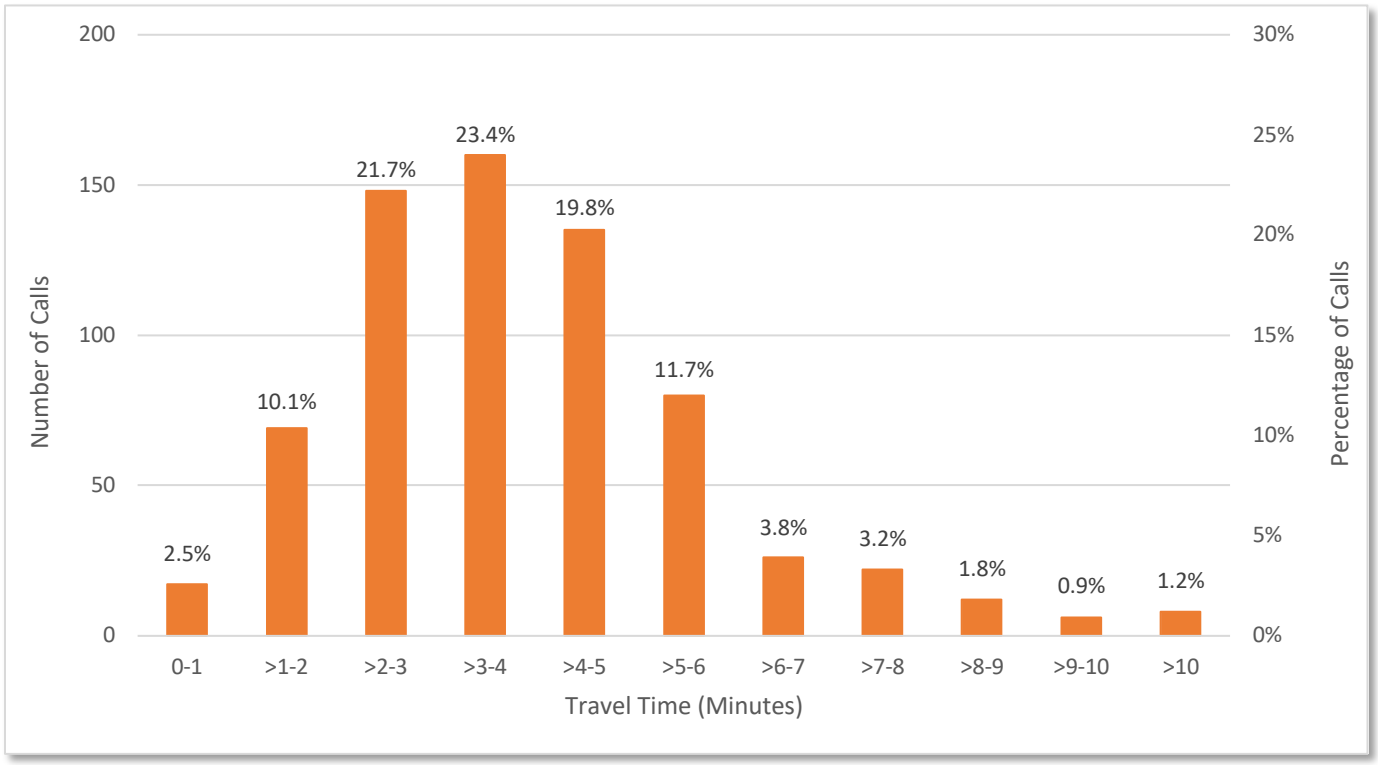


Figure 60: Distribution of Travel Time of First Arriving RFD Unit – Emergency Fire Related Calls in RFD Reporting Districts



First Arriving Unit Performance by Fire Zone

Further analyses were conducted by fire zone to measure the performance of the first arriving primary front-line RFD units to emergency calls in each fire zone (i.e., also covers all reporting districts to which RFD units responded). Performance times are reported at the average (Table 72; Figure 61) and 90th percentile (Table 73; Figure 62) values. Sample sizes are provided in Table 74. Figures depict values for RFD fire zones only.

Table 72: Average Dispatch, Turnout, Travel, and Response Times by Fire Zone – First Arriving RFD Units

Fire Zone	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)
23	2.1	1.4	3.9	7.4
24	1.8	1.7	3.6	7.0
25	2.0	1.6	3.5	7.0
26	1.9	1.6	5.5	8.9
33	5.3	2.0	10.6	18.1
34	4.4	1.6	9.1	14.4
35	4.3	2.4	8.3	15.0
CDF	1.7	1.2	24.8	21.6
LOOM	--	--	--	--
RSVL	2.5	1.7	6.8	11.0
Unknown	2.4	2.9	9.2	11.5
Total	**2.0**	**1.6**	**3.9**	**7.5**

Table 73: 90th Percentile Dispatch, Turnout, Travel, and Response Times by Fire Zone – First Arriving RFD Units

Fire Zone	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)
23	3.3	2.5	6.0	10.4
24	2.9	2.7	5.2	9.2
25	3.0	2.5	5.2	9.1
26	2.9	2.7	7.6	11.3
33	25.5	4.0	17.2	42.2
34	13.1	3.6	12.7	21.4
35	17.8	4.5	13.4	29.8
CDF	--	--	--	--
LOOM	--	--	--	--
RSVL	--	--	--	--
Unknown	7.1	7.7	22.2	24.1
Total	**3.2**	**2.6**	**6.1**	**10.3**

Table 74: Sample Sizes for Dispatch, Turnout, Travel, and Response Times by Fire Zone – First Arriving RFD Units

Fire Zone	Dispatch Time (*N*)	Turnout Time (*N*)	Travel Time (*N*)	Response Time (*N*)
23	1,717	1,715	1,715	1,718
24	1,222	1,209	1,209	1,224
25	1,112	1,101	1,100	1,112
26	239	236	236	239
33	19	21	21	19
34	25	23	24	24
35	28	27	27	28
CDF	4	3	3	4
LOOM	1	1	1	1
RSVL	3	3	3	3
Unknown	18	17	15	16
Total	**4,388**	**4,356**	**4,354**	**4,388**

Figure 61: Average Dispatch, Turnout, Travel, and Response Times by RFD Fire Zone – First Arriving RFD Units

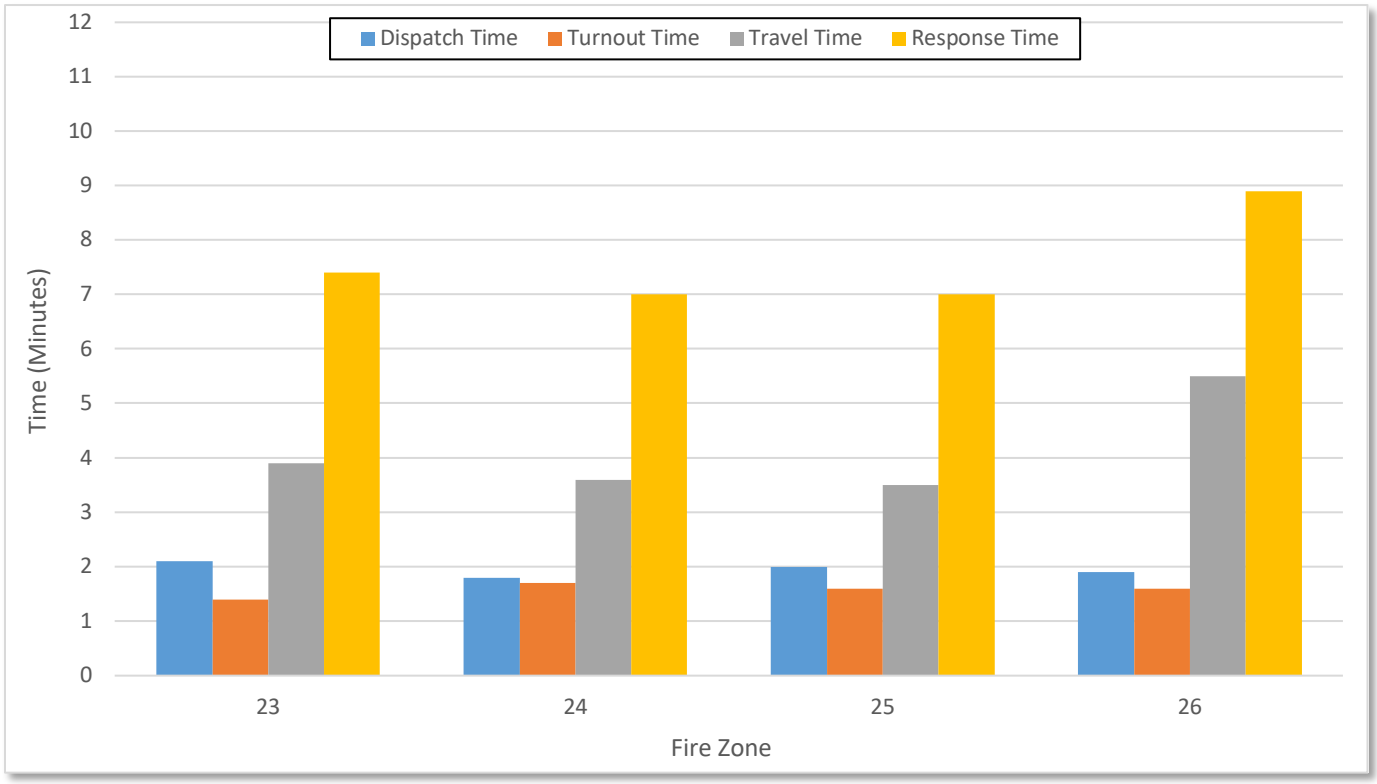
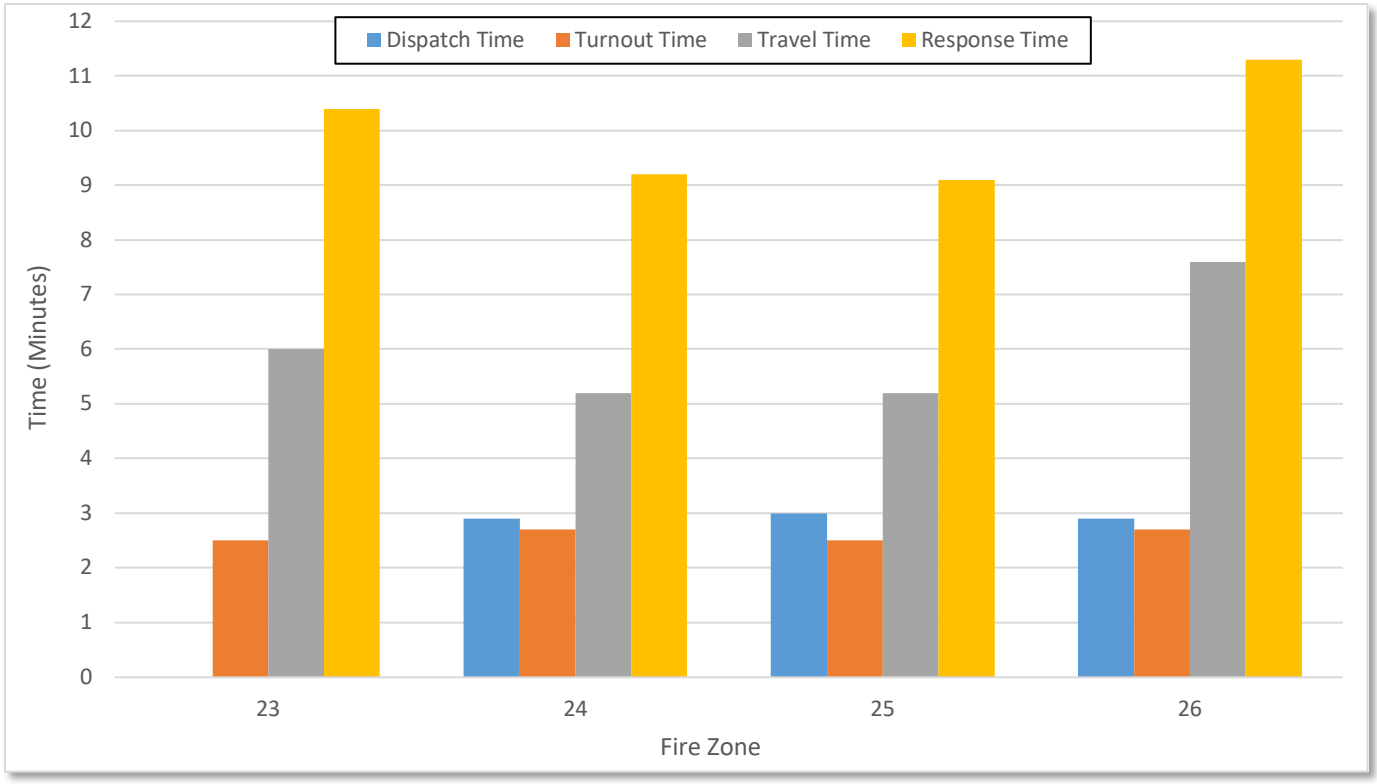


Figure 62: 90th Percentile Dispatch, Turnout, Travel, and Response Times by RFD Fire Zone – First Arriving RFD Units



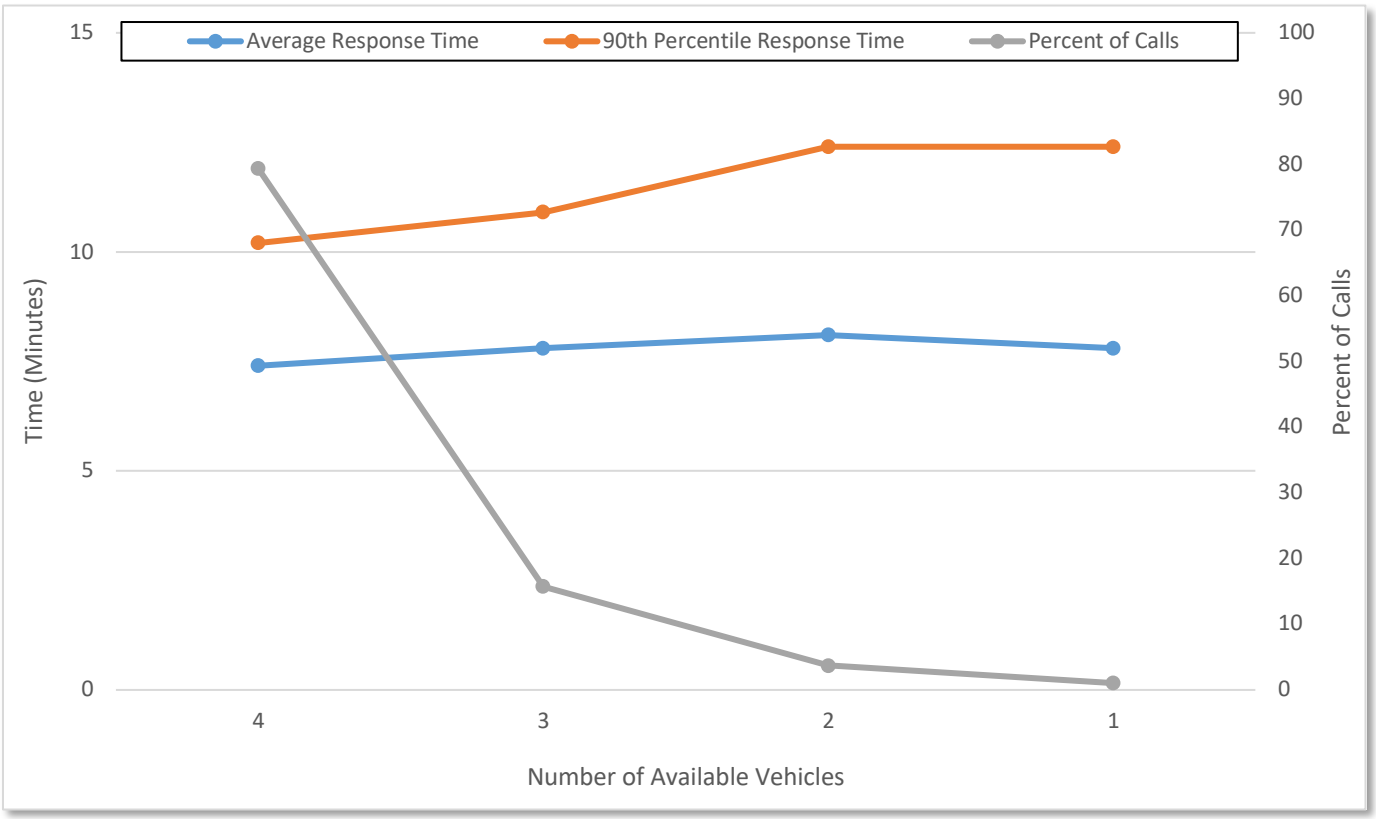
Response Time Performance by Available Vehicles

We investigated whether response time performance for emergency (lights and sirens) calls deteriorated when there were fewer RFD 24-hour per day primary front-line vehicles available (Table 74; Figure 63). Units considered to be 24-hour per day primary front-line units for the purposes of available vehicles analyses included engines and TR24, and the engines' cross-staffed 24-hour per day primary front-line vehicles. Due to multiple cross-staffed units, a maximum of four manpower teams (units) were considered to be available across the department (i.e., E23/BR23/BSU23, E24/BR24, TR24, and E25/BR25). Caution when interpreting metrics associated with small sample sizes. Limited figure data are presented for this reason.

Table 75: Average and 90th Percentile Response Times by Number of Available Vehicles – RFD Units

Number of Available Vehicles	Average (Minutes)	90th Percentile (Minutes)	Sample Size Calls (*N*)	Call Percentage (%)
4	7.4	10.2	3,967	79.3
3	7.8	10.9	784	15.7
2	8.1	12.4	187	3.7
1	7.8	12.4	52	1.0
0	8.1	14.0	13	0.3
Total	**7.5**	**10.4**	**5,003**	**100.0**

Figure 63: Average and 90th Percentile Response Times by Number of Available Vehicles – RFD Units



System Reliability

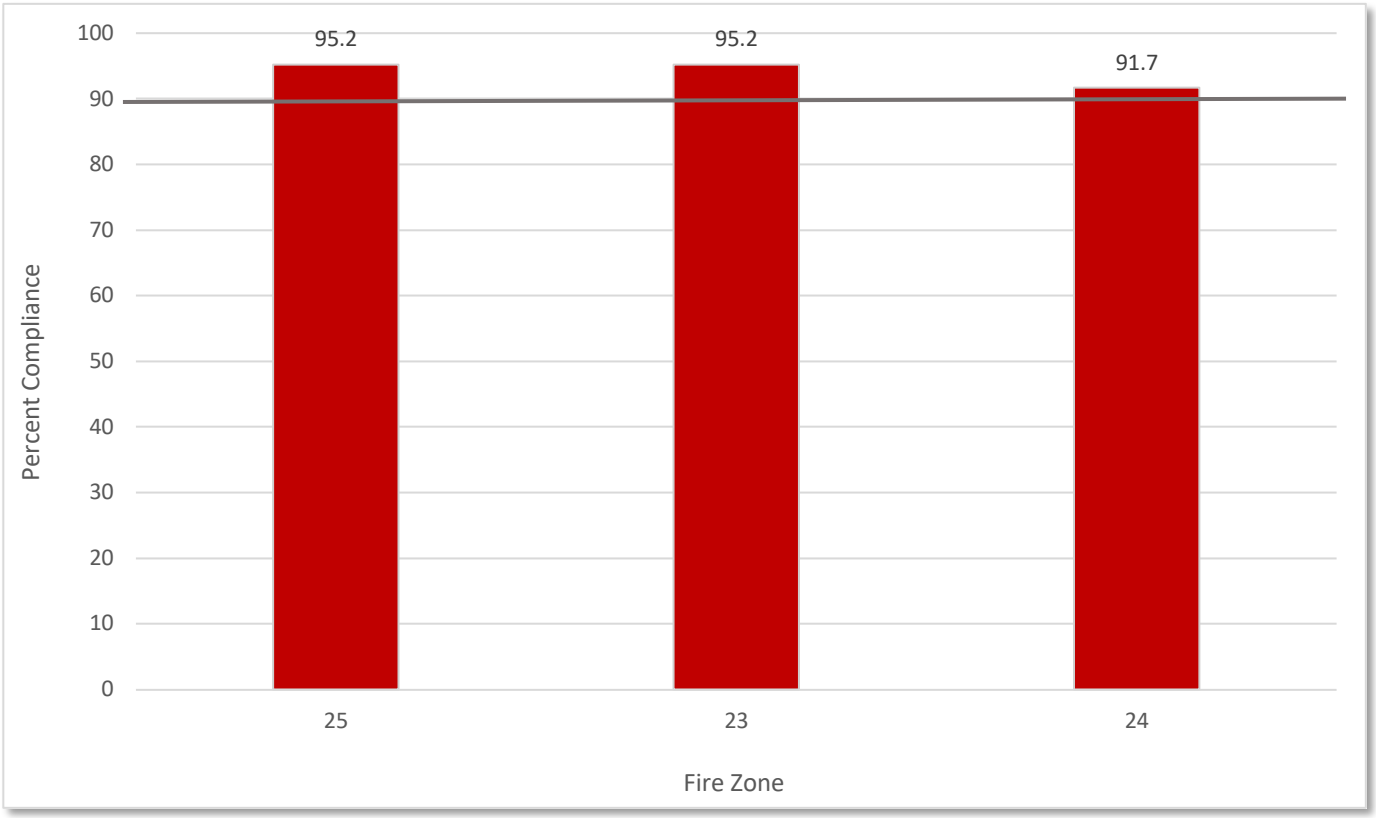
The reliability of the distribution model is a factor of how often the response model is available and able to respond to a call within the assigned fire zone. Only RFD fire zones 23-26 and units assigned to RFD stations 23-25 are included in these analyses. Units assigned to all stations responded to calls within their respective fire zones > 90% of the time (Table 76; Figure 64).

Table 76: First Due Compliance by RFD Fire Zone – Number of Calls and Percent Compliance

	Responding Unit's Assigned Station				
Fire Zone	23	24	25	Total[1]	% Compliance
23	**2,016**	293	51	2,117	**95.2**
24	136	**1,356**	169	1,479	**91.7**
25	38	153	**1,223**	1,284	**95.2**
26	14	255	48	284	--

[1]"Total" values will not equal the sum of the cell values across columns per row because units from multiple stations may have responded to a call within the given fire zone.

Figure 64: Percentage of First Due Compliance by RFD Fire Zone



Overlapped Call Analysis

Overlapped or simultaneous calls are defined as another call being received in a demand zone (or first due station's area) while one or more calls are already ongoing for the same demand zone (or first due station's area). For example, if there is an ongoing call in Station 1's demand zone wherein all departmental units have not yet been cleared, and another request for service occurs in Station 1's demand zone, those two calls would be captured as overlapped calls. Understanding the percentage of overlapped calls may help to determine the number of units to staff for each station. In general, the larger the call volume for a demand zone, the greater the likelihood of overlapped calls occurring. The distribution of the demand throughout the day will impact the chance of having overlapped calls. Additionally, the duration of a call plays a significant role; the longer it takes to clear a request, the greater the likelihood of having an overlapping request.

Results for these analyses are reported for all calls and by EMS and fire calls. Note that for EMS and fire calls, overlapped calls represent any call classified in its respective program area, but that overlapped with one or more calls from *any* program area. For example, fire zone 23 observed 137 calls during 2019 that overlapped with one or more calls within the area—91 were classified as EMS calls, 43 were classified as fire calls, and three were classified as hazmat calls. The 91 calls that were classified as EMS calls could have overlapped with one or more calls from EMS, fire, or other program areas.

Fire zone 23 had the highest percentage of overlapped calls during 2019 for overall calls (7.3%; Table 77; Figure 65), for EMS calls (4.8%; Table 78; Figure 66), and for fire calls (2.3%; Table 79).

Table 77: Overlapped Calls by Fire Zone

Fire Zone	Overlapped Calls	Total Calls	Percentage of Overlapped Calls
23	137	1,884	7.3
24	53	1,339	4.0
25	47	1,156	4.1
26	2	257	0.8

Figure 65: Percentage of Overlapped Calls by Fire Zone

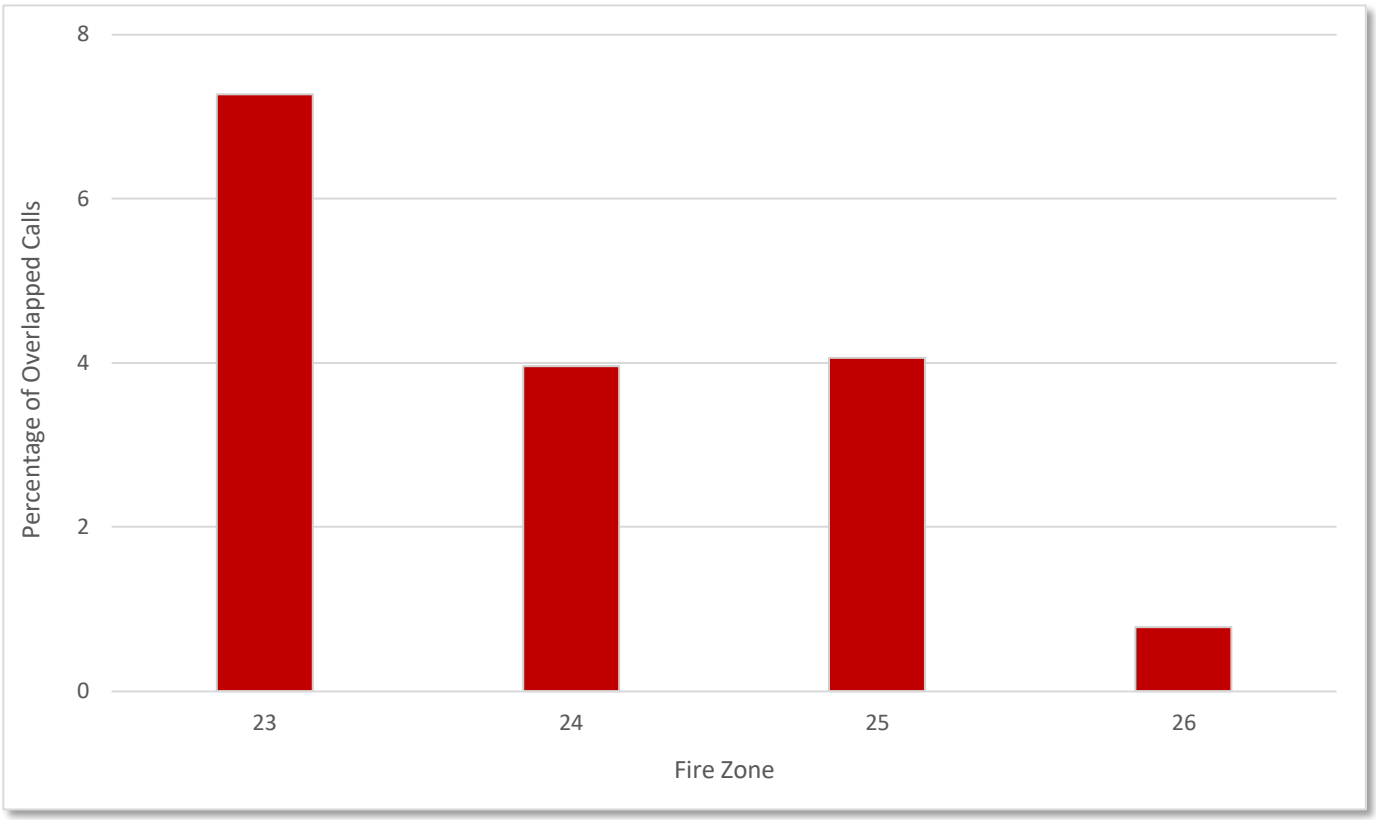


Table 78: Overlapped EMS Calls by Fire Zone

Fire Zone	Overlapped Calls	Total Calls	Percentage of Overlapped Calls
23	91	1,884	4.8
24	43	1,339	3.2
25	36	1,156	3.1
26	1	257	0.4

Figure 66: Percentage of Overlapped EMS Calls by Fire Zone

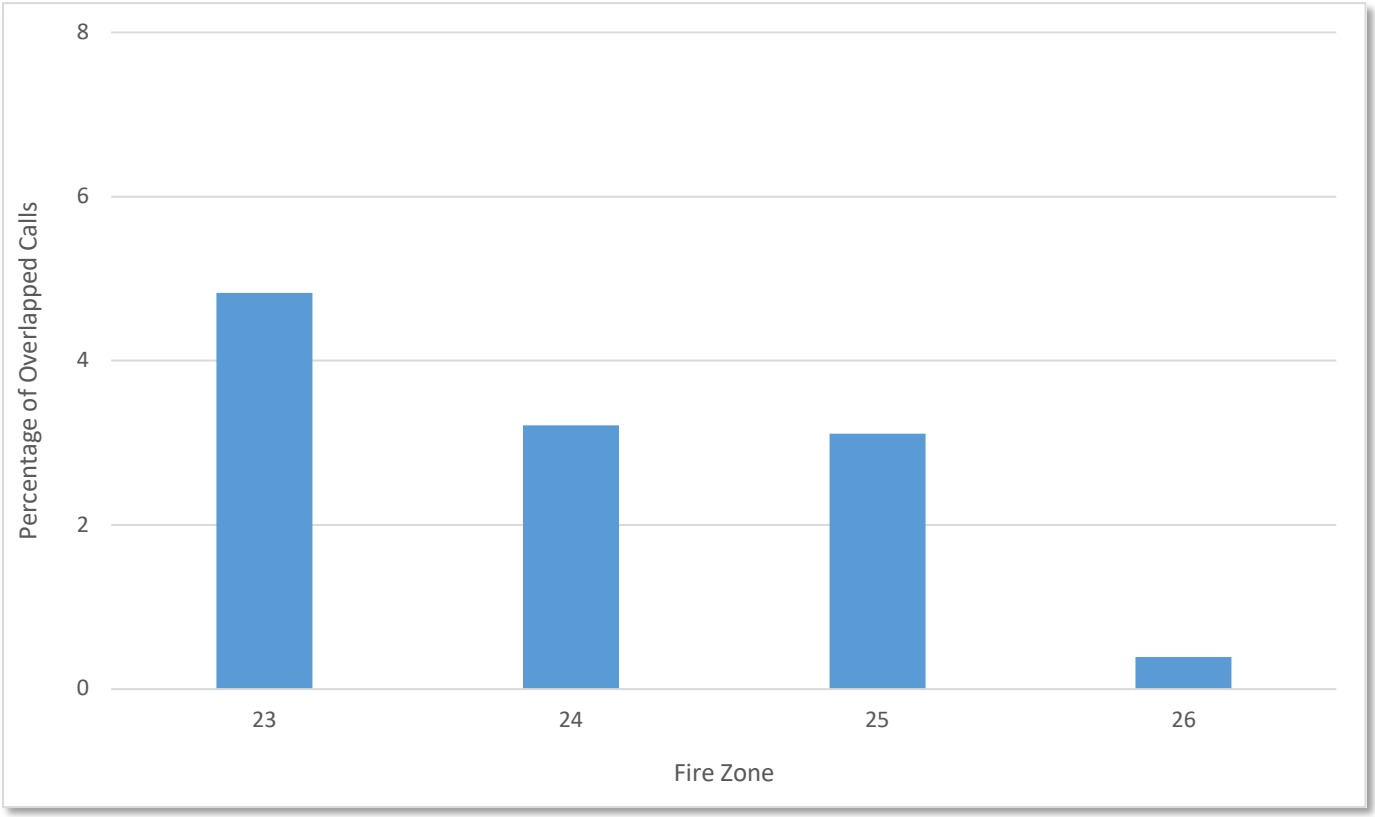


Table 79: Overlapped Fire Calls by Fire Zone

Fire Zone	Overlapped Calls	Total Calls	Percentage of Overlapped Calls
23	43	1,884	2.3
24	10	1,339	0.7
25	9	1,156	0.8
26	1	257	0.4

Effective Response Force Capabilities

The capability of an ERF to assemble in a timely manner with the appropriate personnel, apparatus, and equipment is important to the success of a significant structure fire event. Therefore, it is important to measure the capabilities of assembling an ERF. In most fire departments, the distribution model performs satisfactorily, but it is not uncommon to be challenged to assemble an ERF in the recommended time frames. Several factors affect the capabilities to assemble an ERF, such as the number of fire stations, number of units, and number of personnel on each unit. Each of these policy decisions should be made in relation to the community's specific risks and the willingness to assume risk.

Similar to previous discussion, there are two prevailing recommendations for the time to assemble an ERF for structure fires. First, NFPA 1710 suggests that the ERF should arrive in eight minutes travel time or less. Second, the CFAI provides a baseline travel time performance objective of 10 minutes and 24 seconds 90% of the time or less as well as a 13-minute travel time ERF for suburban areas. Therefore, 8-, 10-, 12-, and 15-minute travel times were created to demonstrate the relative coverage throughout the jurisdiction.

Under the current configuration (three stations), approximately 39% of the community geography can be served with a 10-person ERF with the current staffing strategy.

Table 80: Comparisons of Effective Response Force Configurations

Travel Time Objective	Current
8-Minute	0.72%
10-Minute	17.30%
12-Minute	39.56%
15-Minute	76.45%

Overall, the ERF coverage is more robust in the center and to the west of the jurisdiction where the greatest historical demand exists. The areas in the north are challenged since they do not benefit from concentric response zones, nor a reliable automatic aid.

Figure 67: 8-Minute ERF

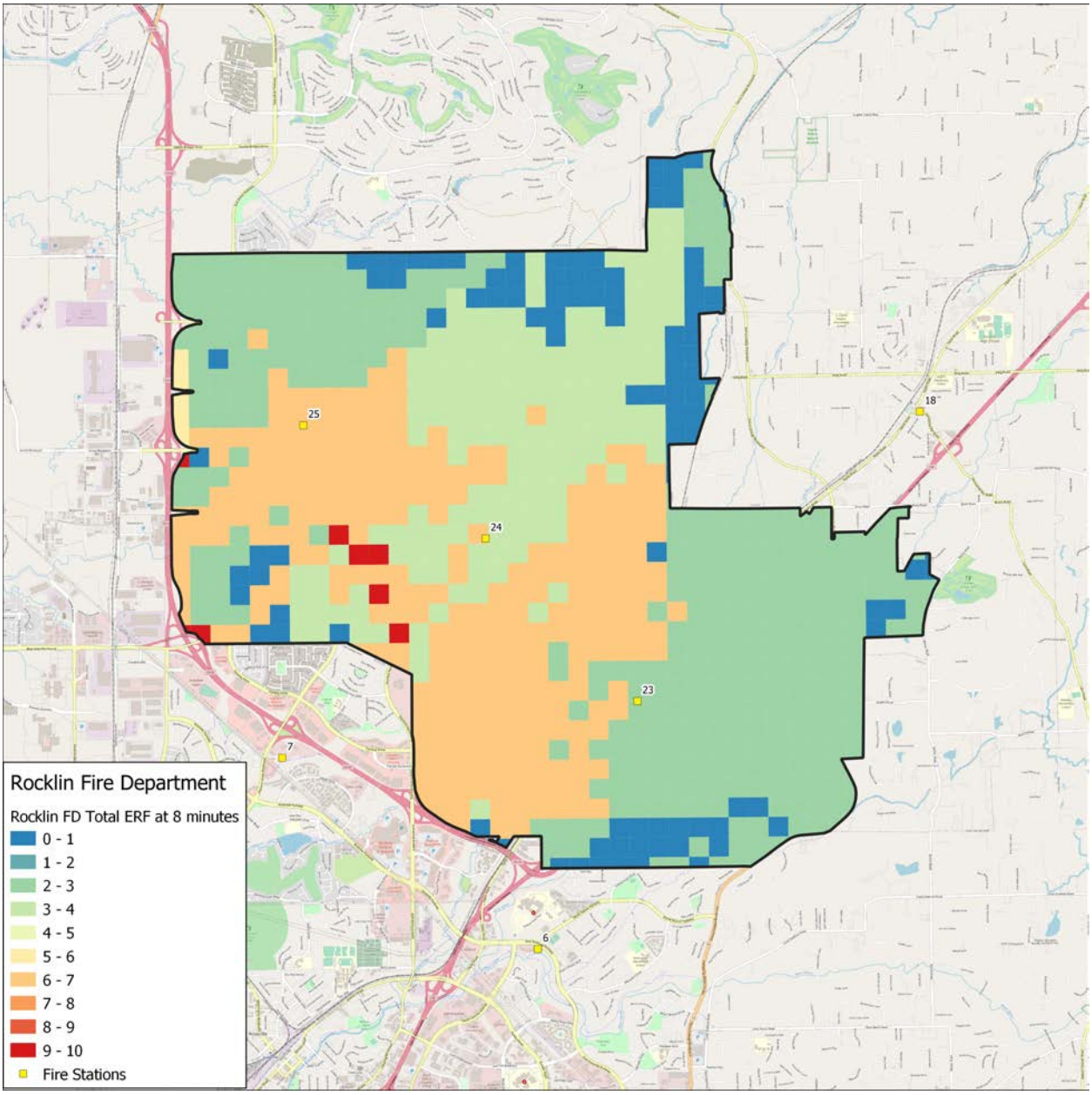


Figure 68: 10 Minute ERF

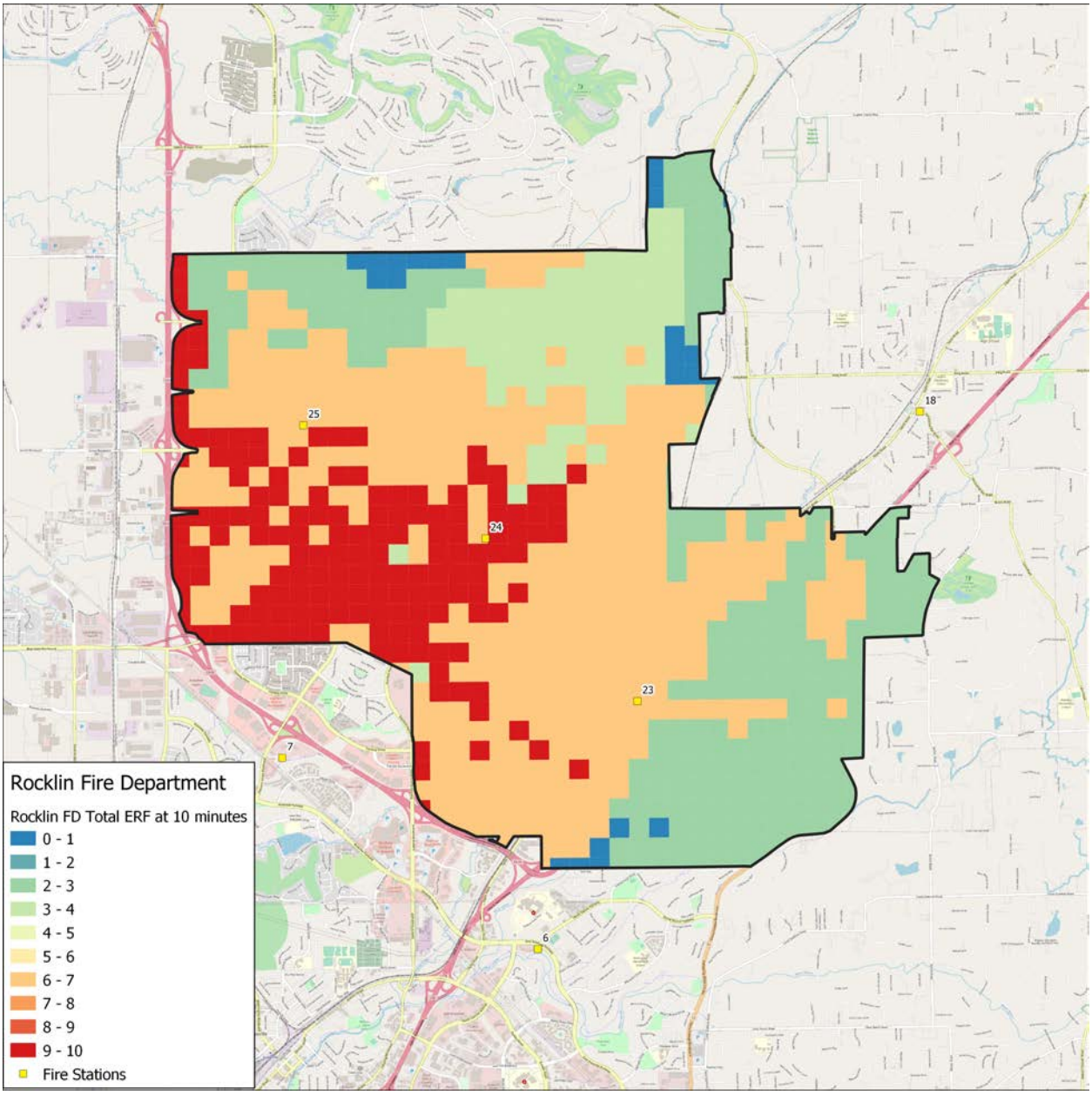


Figure 69: 12-Minute ERF

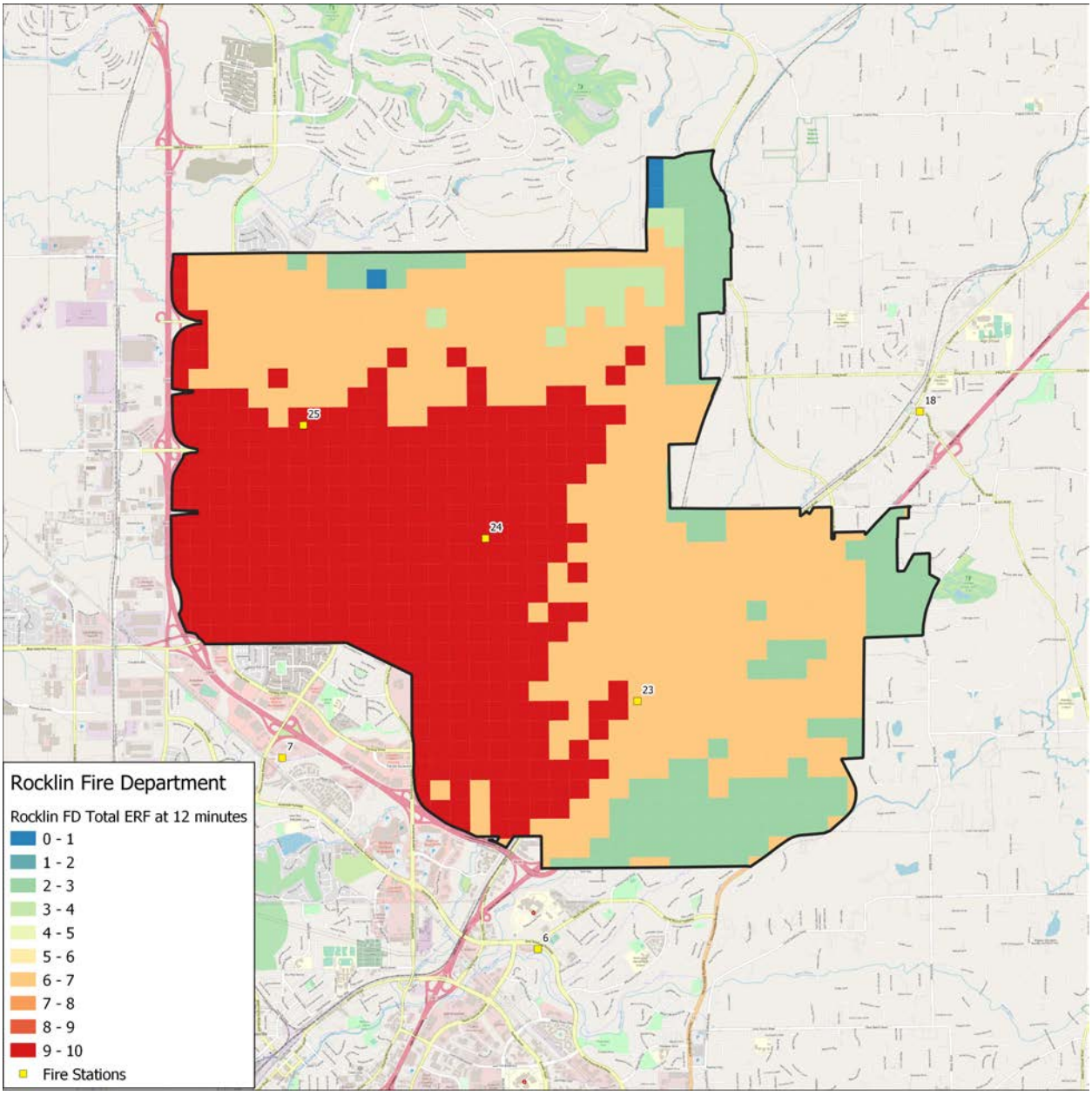
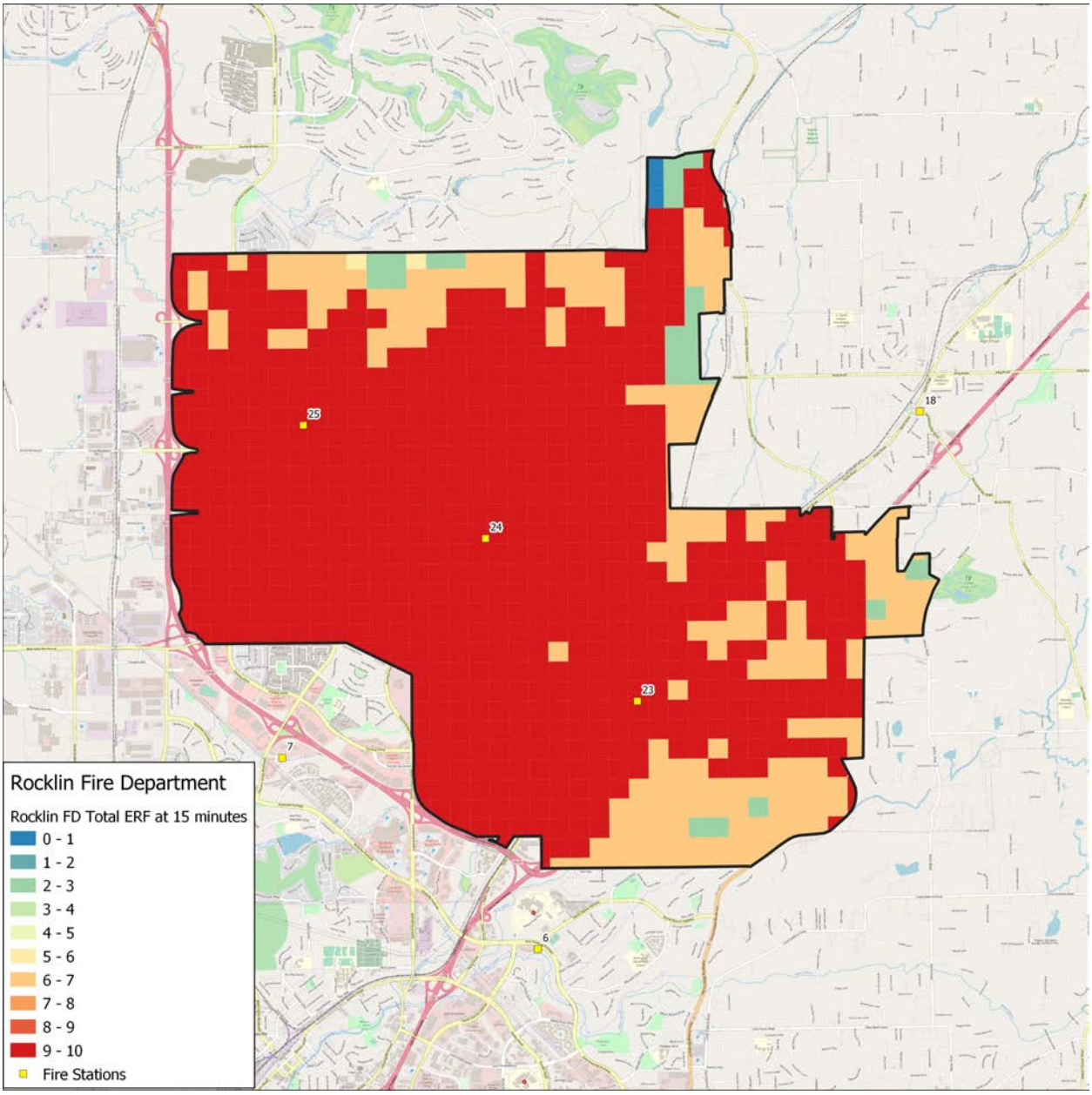


Figure 70: 15-Minute ERF



PERFORMANCE OBJECTIVES AND MEASUREMENT

Performance Objectives – Benchmarks

Benchmark:

Benchmark statements describe the preferred level of performance that the agency is striving to attain. It is not expected that the agency meets this goal as much as they are using the goal in relation to actual performance, year over year, to show progress or continuous improvement. In other words, over time, the agency should be moving closer and closer to the benchmark performance goal.

Baseline:

Baseline statements describe the agency's actual (current) performance. Best practice in the industry is to maintain a baseline within 70% to 80% of the benchmark so as not to fall into a state of gross deviation from the benchmark.

Performance Objectives – Benchmarks

Fire Suppression Services Program

For 90% of all priority structure fire incidents, the first-due unit shall arrive, with a minimum of three personnel, within 9 minutes total response time. The first-due unit shall be capable of providing 500 gallons of water and 1,500 gallons per minute pumping capacity; initiating command; establishing and advancing an attack line flowing a minimum of 150 gpm; containing the fire; and/or rescuing at-risk victims; and requesting additional resources if needed.

For 90% of all priority moderate risk structure fire incidents, the Initial ERF, with a minimum of 15 personnel, shall arrive within 13 minutes total response time. The Initial ERF shall be capable of establishing an uninterrupted water supply; advancing a back-up line; complying with the Occupational Safety and Health Administration (OSHA) requirements for 2-In/2-Out; completing forceable entry; searching and rescuing at-risk victims; ventilating the structure; controlling utilities; and protecting exposures. The full ERF, with a minimum of 18 personnel, shall arrive within 15 minutes total response time, and shall be capable of providing a medical/rehab and a Safety Officer.

For 90% of all priority high-risk structure fire incidents, the Initial ERF, with a minimum of 19 personnel, shall arrive within 15 minutes total response time. The Initial ERF shall be capable of establishing an uninterrupted water supply; advancing multiple hose lines; complying with the Occupational Safety and Health Administration (OSHA) requirements for 2-In/2-Out; completing forceable entry; searching and rescuing at-risk victims; ventilating the structure; controlling utilities; and protecting exposures. The full ERF, with a minimum of 22 personnel, shall arrive within 18 minutes total response time, and shall be capable of providing a medical/rehab and a Safety Officer.

Wildland

For 90% of all priority wildland fire incidents, the first-due unit shall arrive, with a minimum of three personnel, within 9 minutes total response time. The first-due unit shall be capable of initiating fire attack, protect structures or other exposures, assume command, and call for additional resources if needed.

For 90% of all priority high-risk wildland fire incidents, the ERF, with a minimum of 10 personnel, shall arrive within 12 minutes total response time. The ERF shall be capable of preventing further escalation of the fire incident.

Emergency Medical Services Program

For 90% of all priority ALS emergency medical incidents, the first due ALS unit, with a minimum of two personnel, shall arrive within 8 minutes total response time. The ALS unit shall be capable of providing advanced life support (unit might be an AMR ambulance alone).

For 90% of all priority moderate-risk incidents, the ERF, consisting of 5 personnel, shall arrive within 10 minutes total response time. The ERF should be capable of patient care and transport support.

For 90% of all priority high-risk incidents, the ERF of 9 personnel, shall arrive within 12 minutes total response time.

Hazardous Materials Services Program

For 90% of all priority hazardous materials incidents, the first-due unit shall arrive with a minimum of three personnel, within 9 minutes total response time. The unit shall be capable of assessing scene safety, isolating the area, provide emergency medical care to any patients, provide initial identification of the material released, establish command, and call for additional resources if needed.

For 90% of all priority moderate-risk and high-risk* hazardous materials incidents, the Initial ERF, consisting of a minimum of 11 personnel, shall arrive within 12 minutes total response time. The full ERF, with a minimum of 20 personnel, shall arrive within 30 minutes total response time, and shall be capable of providing a medical/rehab and a Safety Officer.

The ERF shall be capable of mitigation of a hazardous materials incidence that may include entry, identification, recon, decontamination, and rehabilitation. *A response from the Operational Area is available for major incidents.

Rescue Services Program

For 90% of all priority technical rescue incidents, the first-due unit shall arrive, with a minimum of three personnel, within 9 minutes total response time. This unit shall be capable of assessing scene safety, provide emergency medical care to any patients, establish command, and call for additional resources if needed.

For 90% of all priority low-risk technical rescue incidents, the ERF, with a minimum of 5 personnel, shall arrive within 10 minutes total response time.

For 90% of all priority moderate-risk technical rescue incidents, the ERF, with a minimum of 9 personnel, shall arrive within 11 minutes total response time. The ERF shall be capable of extricating patient from vehicle or machinery and provide advanced life support

For 90% of all priority high-risk technical rescue incidents, the Initial ERF, with a minimum of 12 personnel, shall within 12 minutes total response time. The full ERF, with a minimum of 20 personnel, shall arrive within 30 minutes total response time, and shall be capable of mitigation of a technical rescue incident that may include shoring, extrication, below-grade rescue, and high-angle rescue. A response from the Operational Area is available for major incidents. The extremely limited sample size requires some assumptions based on the cumulative distribution of other more robust program areas.

Performance Objectives – Baselines

Fire Suppression Services Program

For 90% of all priority structure fire incidents, the first-due unit arrived, with a minimum of three personnel, within 10 minutes and 48 seconds total response time.

For 90% of all priority moderate-risk structure fire incidents, the ERF, with a minimum of 15 personnel, arrived within 13 minutes and 20 seconds total response time.

For 90% of all priority high-risk structure fire incidents, the ERF, with a minimum of 19 personnel, arrived within 15 minutes and 36 seconds total response time.

Emergency Medical Services Program

For 90% of all priority ALS emergency medical incidents, the first due ALS unit, with a minimum of two personnel, arrived within 9 minutes and 36 minutes total response time.

For 90% of all priority moderate-risk incidents, the ERF, consisting of 5 personnel, arrived within 10 minutes total response time.

For 90% of all priority high-risk incidents, the ERF of 9 personnel, arrived within 14 minutes and 24 seconds total response time.

Hazardous Materials Services Program

For 90% of all priority hazardous materials incidents, the first-due unit, with a minimum of three personnel, arrived within 12 minutes total response time.

For 90% of all priority moderate-risk hazardous materials incidents, the ERF, consisting of a minimum of 11 personnel, arrived within 14 minutes and 24 seconds total response time.

*The extremely limited sample size makes any assumptions based on the cumulative distribution very unreliable. Therefore, no baseline ERF is provided for high-risk.

Rescue Services Program

For 90% of all priority technical rescue incidents, the first-due unit, with a minimum of three personnel, arrived within 10 minutes and 48 seconds total response time.

For 90% of all priority moderate-risk technical rescue incidents, the ERF, with a minimum of 9 personnel, arrived within 13 minutes and 12 seconds total response time.

*The extremely limited sample size makes any assumptions based on the cumulative distribution very unreliable. Therefore, no baseline ERF is provided for high risk.

Future Fire Station Opening Criteria

As development within the City continues to expand, demand for service in the new areas will eventually grow to the level that a new fire station will be needed. It is important to develop a set of objective criteria in advance of the need for the station so that expectations of the fire department, city council, the community, and other stakeholders, are all aligned and pre-established. In the absence of consensus on a plan, one high profile fire or medical emergency could create political strife which may cause the stakeholders to make decisions based on emotions and not an objective risk management model.

The following matrix outlines the measurable benchmarks that will drive the decision-making process for future fire stations.

Step 1: New Fire Station Location Identification
The location (or possible locations) for the proposed station will be made after each update to the General Plan and an analysis of the demand for services in the proposed area(s).

Step 2: Acquisition of Land for New Fire Station
When the area that will be serviced by the proposed fire station reaches 100 calls for service, the City will begin the land acquisition process.

Step 3: Design New Fire Station
When two or more of the following benchmarks are reached, the design phase for the new fire station will begin.

- Area served by the proposed fire station receives 300 or more calls for service per year (rolling 365).

- The First-In performance of adjacent existing fire stations drop below 80%.
- Development with the proposed service area exceeds 50%.

Step 4: Build and Staff New Fire Station

When two or more of the following benchmarks are reached, the build and staff phase for the new fire station will begin.

- Area served by the proposed fire station receives 500 or more calls for service per year (rolling 365).
- The First-In performance of adjacent existing fire stations drop below 75%.
- Development with the proposed service area exceeds 70%.

COMPLIANCE METHODOLOGY

This SOC document is designed to guide the Department to continuously monitor performance, seek areas for improvement, and to clearly articulate service levels and performance to the community we have the privilege of serving. Therefore, the Fire Chief has established a compliance team consisting of the Department's Chief Officer Group to continuously monitor elements of this SOC and make recommendations for system adjustments or improvement quarterly.

Compliance Team / Responsibility

The Compliance Team will consist of the following department members (TBD) and will have the responsibility of continuously monitoring changes in risk, community service demands, and department performance in each program area, fire department demand zone, and/or risk category.

- Chair – Fire Chief
- Member – Deputy Fire Chiefs
- Member – Shift Battalion Chiefs
- Member – Representatives from Rocklin Firefighters Association - Local 3847

Performance Evaluation and Compliance Strategy

The RFD will evaluate system performance by measuring first due unit performance at the 90th percentile quarterly and annually. In addition, the Department will evaluate first due performance by each individual fire station demand zone and by program area. Measures for the ERF by each program area, fire station demand zone, and risk category will be evaluated annually. Annual reviews will be conducted in January/February of each year regarding the previous year. All response performance monitoring will exclusively evaluate emergency responses.

The Compliance Team will determine the strengths, weaknesses, opportunities, and threats of the system performance annually and make recommendations for system adjustments to the Fire Chief. Finally, the Department will annually update and evaluate the risk assessment matrices for relevancy and changes in community risk.

Recommendation:
It is recommended that outcome measures are adopted and serve as the primary evaluation tool and that the traditional performance objectives and measures presented previously are utilized primarily as a management tool. In this manner, the Department will not be overly sensitized to incremental changes in performance criteria if the outcomes continue to be met

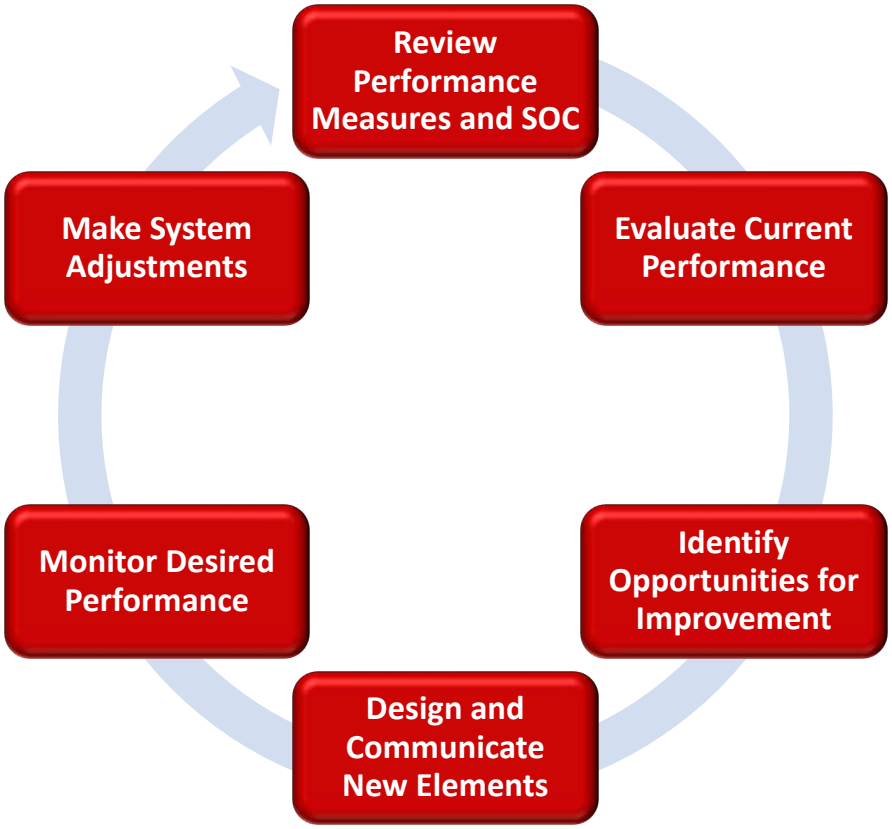
Compliance Verification Reporting

The Compliance Team will communicate results of the period evaluations to the Fire Chief. The Fire Chief will disseminate the quarterly and annual results and any system adjustments in a timely manner so that both performance measurement and continuous improvement becomes part of the organization's culture. All performance and risk measures will be reported through the Fire Chief to the City Manager and the City Council and made available to the community annually.

Constant Improvement Strategy

The Department utilizes the following conceptual model to facilitate both compliance and continuous improvement.

Figure 71: Continuous Improvement and Compliance Model



OVERALL EVALUATION, CONCLUSIONS, AND RECOMMENDATIONS

Overall Evaluation

The overall evaluation is the final component of the SOC process. As a risk-based process that incorporates risk, mitigation, and outcomes measures, the fire department and city leadership can more easily discuss service levels, outcomes, and the associated cost allocations based on community risk.

Overall, the RFD is performing well within the current system. The community enjoys high-quality services from a professional and well-trained department. Predominantly, the Department's distribution has been sufficient to address community risk, however the Department will need to plan for continued development and a growth in demand for service. The following is a summary of all recommendations made throughout the report.

Recommendation:
It is recommended the Department consider classifying motor vehicle accidents as rescue calls within their records management system for future analysis and annual reporting.

Recommendation:
It is recommended the Department consider interconnecting the AVL systems between the Rocklin Fire units and the units most likely to mutually respond on incidents in the region.

Recommendation:
It is recommended the Department consider specifically re-evaluating workload and performance indicators for every 1,000-call increase, or every five-years, to ensure system stability.

Recommendation:
The utilization of the Occupancy Classification is an effective and accepted practice; however, it is likely overstating community fire occupancy-related risk. Therefore, it is recommended that the Department design and develop the desired occupancy-level variables such as square footage, building height, building construction, combustion rates, and human occupancy to complement the passive mitigation data currently available.

Recommendation:
It is recommended the Department review travel time performance again once the streets are fully built out in the northeast section of the City (Whitney Ranch area) and consider a future analysis for future fire station locations to maintain first suppression unit response performance (distribution) over time.

Recommendation:
It is recommended the Department consider implementing a CAD-to-CAD between the dispatch centers of all high-frequency mutual aid providers, to include the ambulance dispatch center.

Recommendation:
It is recommended that outcome measures are adopted and serve as the primary evaluation tool and that the traditional performance objectives and measures presented previously are utilized primarily as a management tool. In this manner, the Department will not be overly sensitized to incremental changes in performance criteria if the outcomes continue to be met

Attachment A

Assorted Risk Classification Tables

FITCH
& ASSOCIATES

ANALYSIS OF CAD DATA

Risk classifications for the program areas of fire, hazmat, and rescue were based on "AgencyEventTypeCodeDesc" entries from the CAD data file, and risk classifications for EMS calls were based on "AgencyEventTypeCode" entries from the CAD data file. Additional information regarding audit, exclusion and classification activities are available in the "Rocklin Data Report, April 2020" provided to the agency in April 2020.

Table 81: Risk Classifications Based on CAD Data

Program	Call Category	Definition for "TYPE" Entry from Data File[1]
EMS	CPR	CPR
EMS	Death Investigation	DEATH INVESTIGATION AND CORONERS CASES
EMS	Man Down	MAN DOWN (SEND POLICE/FIRE)
EMS	Medical Aid	MEDICAL AID
EXCLUDE	EXCLUDE	BATTERY/ASSAULT IN PROGRESS
EXCLUDE	EXCLUDE	BE ON THE LOOKOUT
EXCLUDE	EXCLUDE	BURGLAR ALARM
EXCLUDE	EXCLUDE	DRUNK IN PUBLIC
EXCLUDE	EXCLUDE	FIRE TEST INCIDENT
EXCLUDE	EXCLUDE	HIT & RUN
EXCLUDE	EXCLUDE	HIT & RUN RPT
EXCLUDE	EXCLUDE	IN PROGRESS TRAFFIC EVENT
EXCLUDE	EXCLUDE	LIVE SCAN FRONT COUNTER
EXCLUDE	EXCLUDE	LOG INFORMATION
EXCLUDE	EXCLUDE	MENTAL CASE
EXCLUDE	EXCLUDE	MISSING ADULT REPORT
EXCLUDE	EXCLUDE	PHYSICAL DISTURBANCE
EXCLUDE	EXCLUDE	RECKLESS DRIVING
EXCLUDE	EXCLUDE	REPOSSESSED VEHICLE
EXCLUDE	EXCLUDE	SCHOOL SECURITY CHECK
EXCLUDE	EXCLUDE	SPECIAL ASSIGNMENT
EXCLUDE	EXCLUDE	SUPPLEMENT REPORT
EXCLUDE	EXCLUDE	TEST INCIDENT
EXCLUDE	EXCLUDE	TOW RELEASE
EXCLUDE	EXCLUDE	TRAFFIC STOP
EXCLUDE	EXCLUDE	UNCLASSIFIED
EXCLUDE	EXCLUDE	UNK TYPE DISTURBANCE
EXCLUDE	EXCLUDE	VACATION CHECK
EXCLUDE	EXCLUDE	VERBAL DISTURBANCE
EXCLUDE	EXCLUDE	SECURITY
EXCLUDE	EXCLUDE	SERVICES
EXCLUDE	EXCLUDE	LOGNOTE

Program	Call Category	Definition for "TYPE" Entry from Data File[1]
Fire	Agency Assist	ASSIST OUTSIDE AGENCY
Fire	CO Alarm	CARBON MONOXIDE ALARM
Fire	Fire Aid	Police Assist Fire Dept.
Fire	Fire Alarm	COMMERCIAL FIRE ALARM
Fire	Fire Alarm	RESIDENTIAL FIRE ALARM
Fire	Fire Investigation	FIRE INVESTIGATION (SMOKE IN AREA)
Fire	Fire Other	911 DUPLICATE CALL
Fire	Fire Other	911 HANG UP
Fire	Fire Other	CELLULAR 911 CALL
Fire	Fire Other	FIRE INSPECTION
Fire	Fire Other	FIREWORKS COMPLAINT
Fire	Fire Other	HAZARD
Fire	Fire Other	HAZARDOUS WIRES
Fire	Fire Other	PLANE DOWN
Fire	Fire Other	REPORT OF A BOMB THREAT (FIRE)
Fire	Flooding Condition	FLOODING CONDITION
Fire	Mutual Aid	MUTUAL AID
Fire	MVA	VEHICLE ACCIDENT - MAJOR INJURY
Fire	MVA	VEHICLE ACCIDENT - MINOR INJURY
Fire	MVA	VEHICLE ACCIDENT (HIGH)
Fire	MVA	VEHICLE ACCIDENT (LOW)
Fire	MVA	VEHICLE ACCIDENT- NON INJURY
Fire	MVA	VEHICLE ACCIDENT- UNKNOWN INJURY
Fire	MVA	VEHICLE ACCIDENT W/FIRE
Fire	Outside Fire	TRASH/DUMPSTER FIRE
Fire	Outside Fire	VEGETATION FIRE SUMMER
Fire	Outside Fire	VEGETATION FIRE WINTER
Fire	Outside Fire	VEGETATION HIGH (RED FLAG CONDITIONS)
Fire	Police Assist	CITIZEN ASSIST (POLICE)
Fire	Police Assist	DISABLED VEHICLE
Fire	Police Assist	EXTRA PATROL REQUEST
Fire	Police Assist	POLICE ASSIST
Fire	Police Assist	SUSPICIOUS CIRCUMSTANCES
Fire	Public Assist	ANIMAL CALL
Fire	Public Assist	LOW PRIORITY ANIMAL CALL
Fire	Public Assist	PUBLIC/INVALID ASSIST
Fire	Public Assist	WELFARE CHECK
Fire	Strike Team	STRIKE TEAM REQUEST
Fire	Structure Fire	COMMERCIAL STRUCTURE FIRE (HIGH)
Fire	Structure Fire	COMMERCIAL STRUCTURE FIRE (LOW)
Fire	Structure Fire	COMMERCIAL STRUCTURE FIRE (LOW)

Program	Call Category	Definition for "TYPE" Entry from Data File[1]
Fire	Structure Fire	RESIDENTIAL STRUCTURE FIRE (HIGH)
Fire	Structure Fire	RESIDENTIAL STRUCTURE FIRE (LOW)
Fire	Structure Fire	RESIDENTIAL STRUCTURE FIRE (LOW)
Fire	Vehicle Fire	VEHICLE FIRE
Hazmat	Hazmat	COMMERCIAL GAS LEAK
Hazmat	Hazmat	LEAKING HAZAMAT (LOW)
Hazmat	Hazmat	LEAKING HAZMAT (HIGH)
Hazmat	Hazmat	RESIDENTIAL GAS LEAK
Rescue	Rescue	RESCUE (TECHNICAL)
Rescue	Rescue	WATER RESCUE

Entries are presented verbatim from the data file

Table 82: Risk Classifications Based on CAD Data - EMS Calls

"AgencyEventTypeCode" Entries from CAD	Risk Classification
A	Low
B	Moderate
C	Moderate
D	High
E	High
O	Low

Entries derived as determinant.

www.fitchassoc.com