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Final Standards of Cover

Roseville Fire Department
Roseville, California

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CONSULTANT REPORT

ROSEVILLE FIRE DEPARTMENT
STANDARDS OF COVER

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EXECUTIVE SUMMARY

As part of the ongoing accreditation process and to ensure compliance with adopted standards, the City of Roseville has actively worked to evaluate the fire department's operations, deployment, and staffing. The Roseville Fire Department (RFD) uses risk-based data-driven staffing and deployment plans based upon the specific and unique profile in the City of Roseville. These analyses culminated in a comprehensive deployment and staffing plan referred to as a Standards of Response Coverage.

RFD's ***Standards of Cover*** is a comprehensive report that highlights community demographics, risk, resource deployment, concentration of personnel, and response reliability. It is the result of a review process known as deployment analysis. This is a process where guidelines and standards from the National Fire Protection Association (NFPA), the Commission on Fire Accreditation International (CFAI) – 9th *Edition Fire and Emergency Services Self-Assessment Manual*, the American Heart Association, and the Insurance Services Office – *Fire Suppression Rating Schedule* are used to determine the distribution and concentration of fixed and mobile resources along with an intensive risk analysis of hazards within the City of Roseville. This report provides a valuable review of past performance and offers strategic recommendations aimed at ensuring safe and effective emergency response.

RFD is a paid, career fire department that serves the community of Roseville with various core emergency response services, such as fire suppression, emergency medical services (EMS), hazardous materials mitigation, and technical rescue. In addition to these core services, the Department also provides several other community supportive functions, such as fire prevention and emergency preparedness services. Twenty-four hours a day, 365 days a year, thirty-three personnel are on duty serving the community from eight fire stations. These trained professional firefighters operate eight engine companies staffed with three personnel each; two truck companies staffed with four personnel; and one battalion chief command vehicle. In total, the Department employs 119 dedicated employees.

This Standards of Cover (SOC) report aims to provide elected officials, citizens, customers, cooperating agencies, and department members an overview of the assets at risk (e.g., people, possessions, homes, businesses, cultural assets, environment) and the methods that RFD will employ to assess those fire and non-fire risks. The SOC defines the target baseline emergency response and identifies service delivery performance. It is to be used in conjunction with the RFD Strategic Plan. Developing this report required research, study, and evaluation in a number of key areas including risk, critical tasks, service level objectives, deployment plans, reliability measures, and historical performance.

Like other business units of a municipality, the fire service must adequately define the levels of service for the community it protects based on the unique characteristics of the community and availability of fiscal resources. As part of CFAI's process, an SOC document adopted by the agency having jurisdiction sets the foundation for service level goals. In establishing those goals, RFD used

nationally recognized standards and best practices such as those outlined in NFPA Standards, CFAI – 9th Edition Fire and Emergency Services Self-Assessment Manual, the Utstein Reporting Criteria, American Heart Association guidelines, and the Insurance Services Office – Fire Suppression Rating Schedule. It also included input from a representative group of stakeholders from the community on the levels of service they want as residents.

A Community Risk Assessment involves the analysis of risk for fire and non-fire emergencies (i.e., emergency medical services, hazardous materials, and technical rescue); impacts to life safety, assets, and the environment are measured along with an incident's relative probability. In summary, low risk is defined as incidents having low probability and low consequences; moderate risk is composed of incidents having high probability with low consequences; high risk is defined as incidents having high probability and high consequences.

Within the categories of fire suppression, emergency medical services, hazardous materials, and technical rescue, the Department has established specific risk classifications and has conducted critical task analyses to determine appropriate response levels. Critical tasking analysis determines how many personnel and what apparatus/equipment are necessary to mitigate a variety of emergency situations.

The Department has established both baseline and benchmark performance measures. Baseline measures reflect historical performance and benchmarks are Total Response Time (TRT) goals. TRT is measured in two ways: first-arriving unit and effective response force (ERF; i.e., total number of personnel necessary to address the emergency situation). TRT is composed of call processing time, turnout time, and travel time. The Department observes the 90th percentile of performance as opposed to the average response time (i.e., 50th percentile in a normally distributed set of data). This depicts more efficiently what is done the majority of the time as opposed to what is done approximately half the time.

Based on the City of Roseville's adopted General Plan, comprehensive risk assessment that included historical data sets, fiscal resources, and input from community stakeholders, the SOC document establishes the following three primary benchmark performance measures in terms of deployment and emergency response:

Fire Department Response Goal:
First Unit –Total Response Time – EMS Calls for Service
= **7 Minutes at 90th Percentile**

Fire Department Response Goal:
First Unit –Total Response Time – Fire, Hazardous Material and Technical Rescue Calls for Service
= **8 Minutes at 90th Percentile**

Fire Department Response Goal:
Effective Response Force – Fire Calls for Service
= **11 Minutes & 30 Seconds at 90th Percentile**

EMS 90th percentile performance benchmarks are 7 minutes for the first-arriving unit and 10 minutes and 30 seconds for the ERF. Fire suppression, hazardous materials, and technical rescue benchmarks have been set at 8 minutes for the first-arriving unit and 11 minutes and 30 seconds for the ERF. Baseline performance measures for EMS are 8 minutes and 12 seconds for the first-arriving unit and there were not enough ERF incidents requiring a complete ERF to determine an accurate total response time. Baseline performance measures for Fire suppression are 9 minutes and 36 seconds for the first-arriving unit, 14 minutes and 6 seconds for an initial moderate fire ERF, and 22 minutes and 30 seconds for a high ERF. Baseline performance measures for hazardous materials first-arriving unit are 9 minutes and 30 seconds and ERF is 16 minutes and 48 seconds. Baseline performance measures for technical rescue are 9 minutes and 48 seconds for the first-arriving unit and ERF is 19 minutes and 30 seconds.

Standards of Cover Team

Fire Chief Rick Bartee
Assistant Chief Brian Diemer
Assistant Chief Greg James
Division Chief Jason Rizzi
Division Chief David Dolson
GIS Specialists Dan Funderburg
Administrative Analyst Katrina Rostam

Overall Evaluation and Recommendations

Evaluation

Overall, RFD is performing slightly below proposed baseline performance objectives, which is to be expected. There are some opportunities for performance improvement with modest, yet strategic investments.

The community enjoys high-quality services from a professional and well-trained Department. The Department's current distribution and concentration delivery models are appropriately aligned with their unique risks. However, there are areas that can be improved upon by making incremental system adjustments.

Recommendations

Monitor Call Processing Time Performance Goals

Roseville Police Department Dispatch Center is the primary public safety answering point (PSAP) for all 9-1-1 calls. NFPA Standard 1221 recommends that a call be answered at the PSAP within 15 seconds, 90% of the time. This standard also recommends that a call be processed by the dispatch center, and responders notified within 90 seconds from the time at which the call is received, 90% of the time. RFD has established a benchmark of 60 seconds or 1 minute for call processing time.

Call processing is an area over which management has a great deal of control to achieve improvement through policies, procedures, and management practices. It is recommended that the dispatch process be reviewed and areas for improvement be identified. It is also important that personnel are trained on the performance standards and held accountable for meeting the standards.

Reducing the call processing time component reduces total response time. Call processing data show that the Department is currently performing above the benchmark goal of 1 minute.

Monitor Turnout Time Performance Goals

Turnout time, or the time between when the call is received by the response units (dispatched) and when the unit is en route to the scene (responding), affects overall response times. NFPA Standard 1710 recommends turnout time performance objectives of 80 seconds or less for fire and special operations response, and 60 seconds or less for all other priority responses including EMS. The Department does not meet the nationally recommended benchmarks for turnout time and is currently almost double the national benchmark. It is recommended that this benchmark be reviewed as many accredited fire agencies are unable to meet this benchmark.

Turnout time is an area over which RFD has complete managerial and accountability control, and turnout time is not impacted by outside influences. Like call processing, management can achieve improvement through policies, procedures, and management accountability practices. It is recommended that the Command Staff and Battalion Chiefs monitor turnout time monthly. This includes sharing monthly data with company officers and holding them accountable for meeting performance standards.

Reducing the turnout time component will lead to an overall reduction in total response time.

Create a Target Hazard Dispatch for Structure Fire Incidents

RFD should develop a target hazard dispatch that would send additional fire apparatus and personnel to only high-risk occupancies on initial first alarm structure fire calls. Extra resources would include the second ladder truck and one additional engine company.

The community risk analysis identified occupancies that were classified as high-risk due to needed fire flow, number of stories, and size of the buildings. The goal of the target hazard dispatch is to allocate more personnel to fill the critical tasks on the first alarm dispatch. Additional personnel would limit loss by placing more personnel and apparatus on scene sooner.

Add Fire Station 8 and Relocate Fire Station 5 to Optimize System Performance

After evaluating four different alternatives for fire station configuration, the most improvement for all existing fire stations would occur with the addition of Station 8 and the relocation of Station 5. The results suggest that with all nine RFD fire stations, 92.56% of the incidents could be responded to within 5 minutes or less travel time. This is approximately an 11% improvement over the current configuration prior to the addition of Station 8 or relocation of Station 5.

Table 1: Marginal Fire Station Contribution for 5-Minute Travel Time

Rank	Station	Station Capture	Total Capture	Percent Capture
1	S3	5,054	5,054	29.96%
2	S6	2,952	8,006	47.45%
3	S2	2,281	10,287	60.97%
4	S7	1,354	11,641	69.00%
5	S1	944	12,585	74.60%
6	S5	488	13,073	77.49%
7	S9	438	13,511	80.08%
8	S4	106	13,617	80.71%

Evaluate the Use of Medical Priority Dispatch System

RFD should evaluate the Medical Priority Dispatch System (MPDS). Approximately 60.5% of the Department's response history is associated with providing emergency medical services via Advanced Life Support (ALS) capabilities. Data have shown that approximately 70% to 80% of these calls do not require ALS treatment and time is not a factor in patient outcomes. The County ambulance service provider is also trained to ALS and provides ambulance transport services for the City.

MPDS provides for consideration of possibly implementing a tiered EMS response to lower-acuity medical incidents that are less time-sensitive. This could mean no Department response to very low-acuity calls, responding only with Basic Life Support units, or alternate deployment to these types of calls. MPDS could focus the Department's efforts on making sure units are available for responding to higher-acuity or life-threatening emergencies, where time has a greater impact on the clinical

outcome as well as the need for additional personnel such as with a cardiac arrest, penetrating chest wound, or major trauma injury.

An integral component to MPDS is having a reliable and well-designed medical priority call triage system that is utilized to correctly and accurately prioritize emergency medical service calls at the dispatch center. It would need to be evaluated if the Roseville Dispatch Center is capable of providing this level of service. Currently, the dispatchers are performing ProQA, so determining the priority of a medical emergency incident should be part of this process. If this recommendation is pursued, a nationally recognized MPDS should be utilized.

The adoption of this alternative would create considerable capacity to cost savings on additional resources in the future, as the fastest growing call type is for EMS incidents, as well as provide for a more efficient and effective response to seriously sick and injured patients. Another benefit is the introduction of additional capacity into the system to maintain a high degree of readiness and available concentration of resources for fire prevention, community risk reduction, and fire suppression activities.

SECTION 1: THE CITY OF ROSEVILLE

Description of Community Served

Location

The City of Roseville is located in California on the southwest edge of Placer County, bordering Sacramento County. The City is located 405 miles north of Los Angeles, 102 miles northeast of San Francisco, and 16 miles north of Sacramento, the State capital. The City of Roseville (the City) began as a railroad junction in 1864 and was called Roseville Junction. Renamed Roseville City and incorporated in 1909, it officially became a chartered city in California in 1955.

Geography/Climate

The original City had fewer than 2,500 residents and has grown to over 139,643 (as of 1/1/2019, CA Department of Finance) and covers 44.32 square miles. Roseville experiences annual average temperatures of 61.6 degrees Fahrenheit and 21.2 inches of rain. While the average is relatively temperate, summer and winter months can bring extreme weather patterns to the region. During the winter, the high temperatures hover around 53 degrees Fahrenheit. During the summer months, the region receives extended periods of 95+ degrees Fahrenheit days, well above the national average. While the average summer temperature is 94 degrees Fahrenheit, these extended heat waves affect the medically fragile, elderly, and animal populations.

Transportation

Two highways run through the City: Interstate 80 and State Route 65 (the southern terminus of which connects to I-80). Amtrak, the national passenger rail system, provides service to Roseville at the Roseville Amtrak Station and is part of the Capitol Corridor. Roseville Transit is a public transit service overseen by the City of Roseville and operated by MV Transportation. The system provides a total of 11 regular local routes, as well as the Roseville Transit Dial-A-Ride (DAR) and Roseville Transit Commuter service.

Governance

In 1907, a fire protection committee was established and thus RFD was born. RFD is legally established as a department in the City of Roseville, which is the largest city in Placer County. The City of Roseville has adopted a "council-manager" form of government. The governing board of RFD is made up of the five-member Roseville City Council (Council) that is responsible for the appointment of the City Manager based on an individual's executive and administrative qualifications. The City Manager is the administrative head of the City government under the direction and control of the City Council. Council ensures compliance with the basic agency policies

through the annual budget review and approval process that includes program performance reviews.

Legal Basis

The City of Roseville was legally chartered by the State of California on January 5, 1955 as a local municipality. As a Charter City under the State of California Government Code Section 34101, the voters in the City are given broad local control to determine how their City Government is organized, the authority to establish services to benefit the community and, with respect to municipal affairs, enact legislation different than that adopted by the State. The charter establishes the roles, responsibilities, and powers of the City Council. It also establishes the position of City Manager. RFD is in compliance with the State of California Government Code Section 38600-38611 which outlines the regulations applicable to city fire departments, their formation, powers, and authority. Specifically, California Government Code Section 38611 requires that general law cities provide a fire department. City Charter Section 2.11 enables the City Manager to appoint department directors via administrative policies. Thus, through Administrative Regulation 1.10.1, the City Manager establishes the various departments of the city and duties of department directors. The position of Fire Chief is established, along with his/her responsibilities. The City Charter is reviewed and amended, as needed, every ten years. RFD is also allowed to provide EMS under the California Health and Safety Code 1797.201-1797.227 under the authority of the Local Emergency Medical Services Agency (LEMSA).

Financial Basis

Roseville receives the majority of its general fund revenue from two primary sources: sales tax and property taxes. Roseville's fiscal outlook will see a significant improvement in Fiscal Year (FY) 2019-20 due to a half-cent sales tax increase (Measure B) approved by voters in November 2018. This increase became effective on April 1, 2019. The City will begin receiving the estimated $16 million to $19 million annually in new sales tax revenue. Of the $158 million General Fund budget, $34 million of expenditures are offset by restricted revenue, coming from grants, specific fees, and taxes tied to specific programs. Nondiscretionary expenditures and transfers totaling $23 million are required by Council-approved policies and agreements. Council has discretion over $102 million that is unrestricted. Over half of this unrestricted funding, approximately $64 million, will go towards public safety, the City Council's top priority.

During FY2019-20, the City is expected to receive $72.3 million in sales tax revenues, including a conservative estimate of $16 million for the new Measure B local sales tax, and $48.9 million in property tax revenues. Sales and property tax revenues will account for 76%of the City's FY2019-20 General Fund revenues. Sales tax revenue in FY2019-20, other than the new Measure B local sales tax, is forecasted to remain flat compared to the FY2018-19 projections. Sales tax growth in future years is projected to grow at a reduced rate compared to the past several years. This slowing growth rate is primarily due to the transition to a service economy.

The City, by City Charter and State law, may not spend public funds without the legal authorization to do so. Among other things, a budget appropriates public funds, thereby providing the legal authorization from the governing body to expend these funds. The City shall adopt by resolution a final budget for that fiscal year at or before its first regular meeting held in such fiscal year. In addition, the City shall annually establish its appropriations limit related to the proceeds from taxes in compliance with Article XIIIB of the California Constitution and Government Code Sec 7910. The appropriations limit is established as part of an annual budget and must be reviewed as part of an annual financial audit.

Department Budget

The City Manager and the City Council approve the administrative structure of the fire department through its annual budget process. The City uses a one-year budget cycle to prepare the annual operating budget and capital improvement plan based on a July through June fiscal year. Quarterly program performance reports are prepared for each program within the Department. The department is funded through the City general fund. Revenue for fire is received through the general revenue of the City primarily from property tax. Additionally, revenue from fees-for-service activities such as plan checking and fire inspections, as well as hazardous materials and driving under-the-influence (DUI) cost recovery reimbursement programs, also contribute to Department revenue.

Table 2: Council-Approved Budget Breakdown by Fiscal Year

Year	Salaries & Benefits	Materials & Supplies	Capital Outlay	Reimbursed Expenditures	Total
FY 19/20	29,069,066	5,129,870	0	(13,203)[1] projected	34,185,733
FY 18/19	27,199,445	5,263,323	0	(75,552)	32,387,216
FY 17/18	27,889,937	4,853,307	56,682	(82,213)	32,717,713
FY 16/17	25,361,094	3,254,328	0	(5,000)	28,610,422
FY 15/16	25,027,204	2,887,004	12,564	(0)	27,926,772
FY 14/15	24,780,550	2,548,459	60,834	(9,593)	27,380,250

[1]City web page showing last five years budget.

Table 3: Staffing Totals by Type and Fiscal Year

Year	Admin Personnel	Operations BC's	Prevention Personnel	Operations Personnel	Total Personnel
FY 19/20	11	3	9	96	119
FY 18/19	11	3	9	96	119
FY 17/18	11	3	9	96	119
FY 16/17	12	3	8	96	119
FY 15/16	12.5	3	8	96	119.5
FY 14/15	11	3	10	96	120

Population and Demographic Features

RFD serves a total population of approximately 139,643 within a geographic area of approximately 44.32 square miles.

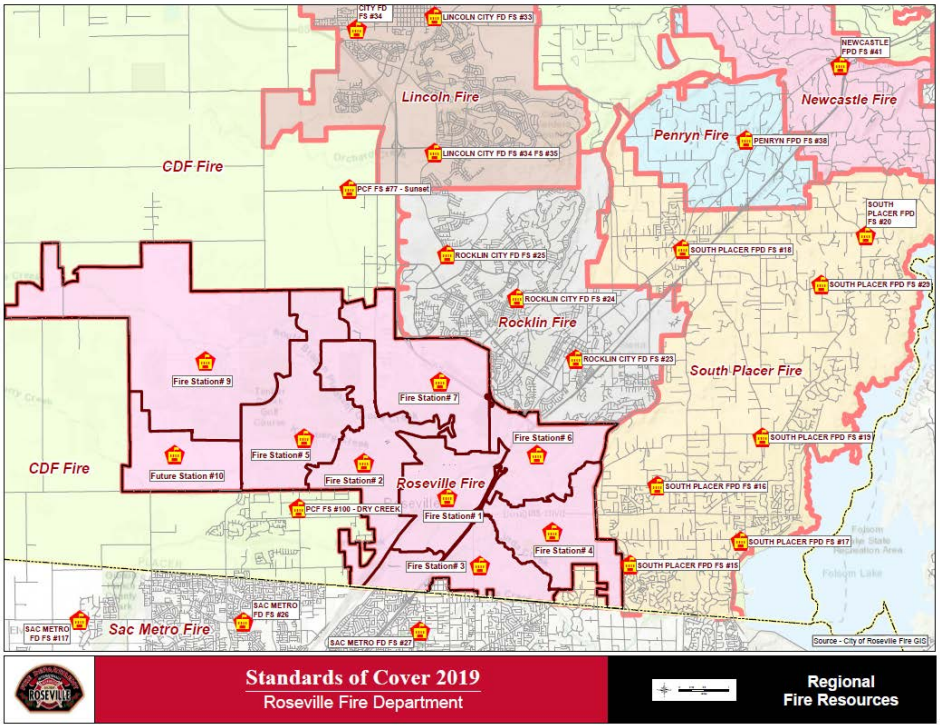
Table 4 below provides various metrics of census data for Roseville and the State of California.

Table 4: Census Data for City of Roseville and State of California

People Quick Facts	Roseville	California
Population estimates, July 1, 2018, (V2018)	139,643	39,557,045
Population estimates base, April 1, 2010, (V2018)	119,156	37,254,523
Population, percent change - April 1, 2010 (estimates base) to July 1, 2018, (V2018)	17.2%	6.2%
Population, Census, April 1, 2010	118,788	37,253,956
Persons under 5 years, percent, April 1, 2010	6.3%	6.2%
Persons under 18 years, percent, April 1, 2010	24.3%	22.7%
Persons 65 years and over, percent, April 1, 2010	15.7%	14.3%
Female persons, percent, April 1, 2010	52.0%	50.3%
White alone, percent, April 1, 2010	78.2%	57.6%
Black or African American alone, percent, April 1, 2010	1.8%	6.5%
American Indian and Alaska Native alone, percent, April 1, 2010	0.6%	1.6%
Asian alone, percent, April 1, 2010	10.0%	15.3%
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010	0.4%	0.5%
Two or More Races, percent, April 1, 2010	5.3%	3.9%
Hispanic or Latino, percent, April 1, 2010	15.1%	39.3%
White alone, not Hispanic or Latino, percent, April 1, 2010	73.7%	36.8%
Living in same house 1 year ago, percent of persons age 1 year+, 2010-2014	69.2%	84.6%
Population per square mile, 2010	3,279.4	239.1
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	17.1%	44%
High school graduate or higher, percent of persons age 25 years+, 2013-2017	93.3%	82.5%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	38.8%	32.6%
Veterans, 2013-2017	8,624	1,661,433
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	25.8	28.8
Owner-occupied housing unit rate, 2010-2014	64.7%	54.5%
Median value of owner-occupied housing units, 2010-2014	$386,300	$443,400
Households, 2013-2017	47,851	14,277,157
Persons per household, 2013-2017	2.71	2.96
Per capita income in past 12 months (in 2017 dollars), 2013-2017	$37,623	$33,128
Median household income (in 2017 dollars), 2013-2017	$81,119	$67,169
Persons in poverty, percent	8.9%	13.3%

Community Boundaries/Auto Aid

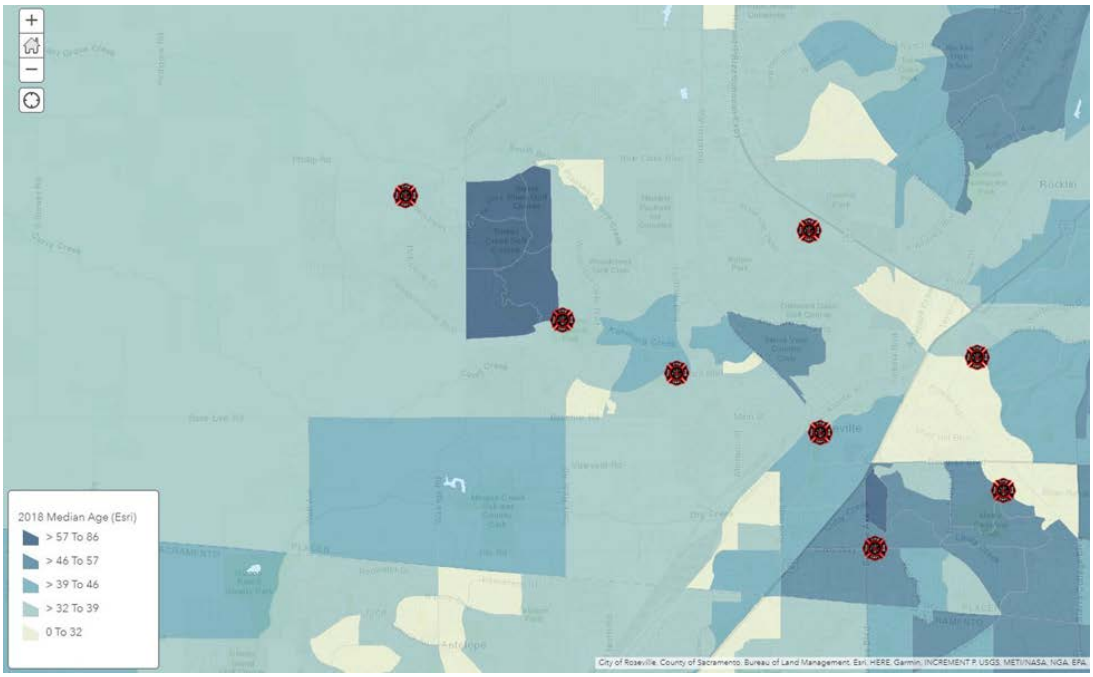
Figure 1: Regional Boundaries



Population Characteristics

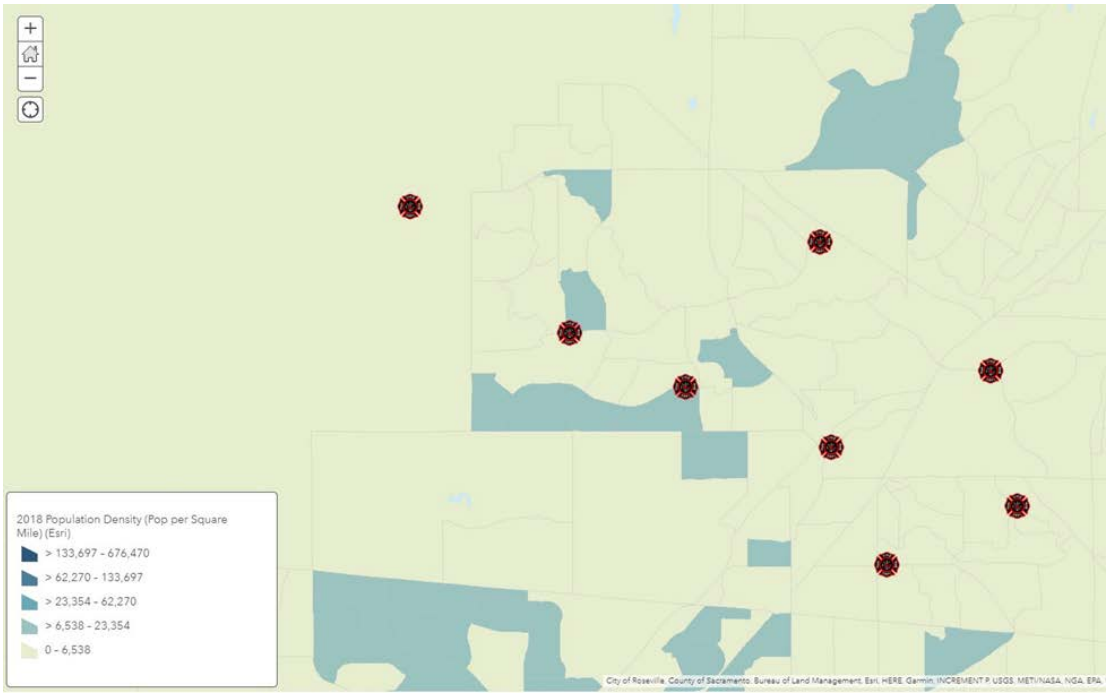
Generally, older populations and very young populations are considered to be most vulnerable to the frequency and incidents of fire. In addition, older populations historically utilize EMS services with greater frequency. It is important to understand, what field crews often recognize intuitively, that the distribution of population risks is not uniform across the jurisdiction. According to census data, the majority of the jurisdiction is less than 57 years of age. Median age for the areas shaded in the darkest blue west and northwest of Station 5 ranges from 73.2 to 79.6 years, and median age for the area shaded in the darkest blue north of Station 3 is 61.1 years (Figure 2).

Figure 2: Median Age – 2018



The majority of the census block areas have densities of 0 to 6,538 people per square mile, with some clusters of > 6,538 to 23,354 people per square mile in portions of the jurisdiction (Figure 3).

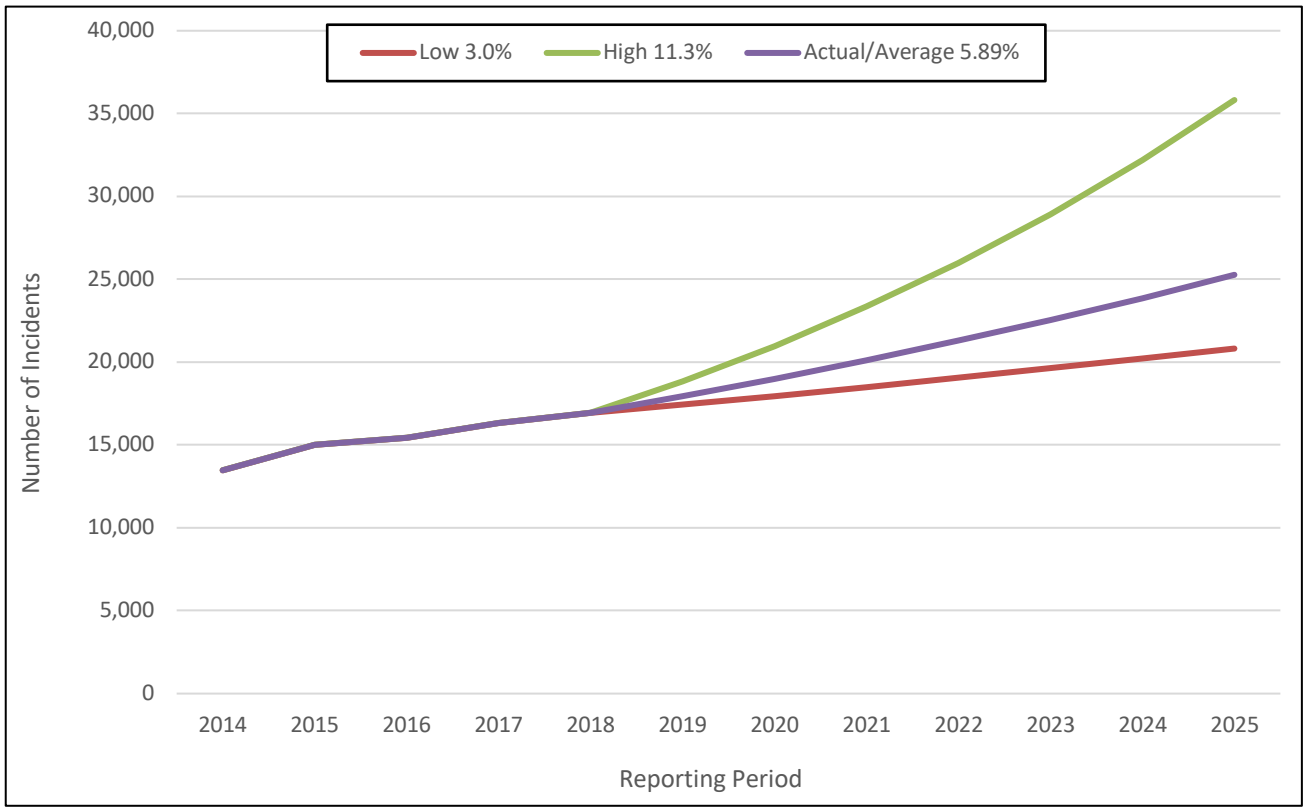
Figure 3: Population Density by Census Block – 2018



Future Population

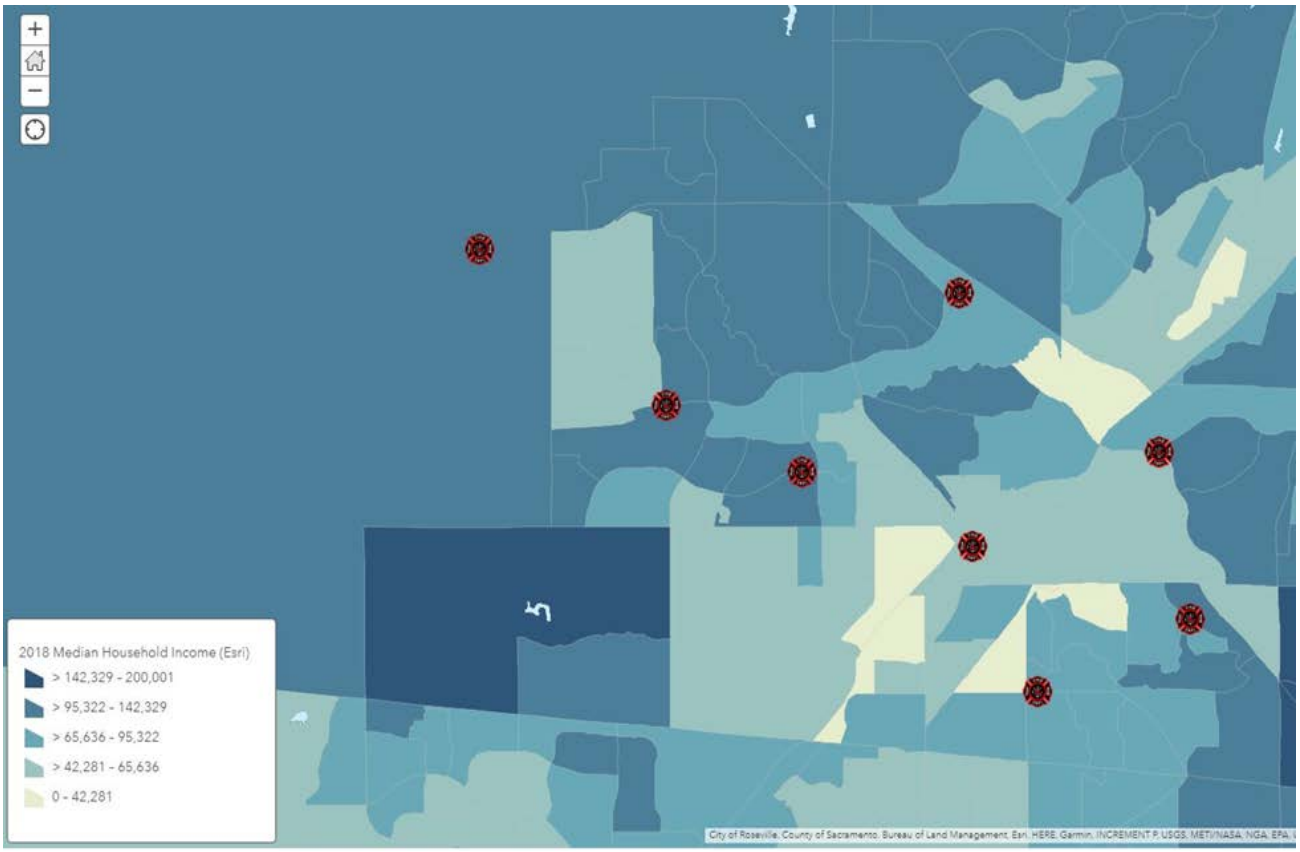
Roseville's current growth rate is approximately 2.5%, which is much higher than California's current rate of 0.60% or the national rate of 0.71%. Placer County continues to be recognized by the Department of Finance as one of the State's fastest growing counties. Current estimates indicate the population of Roseville will surpass 140,000 by the end of 2020.

Figure 4: Calls for Service by Year



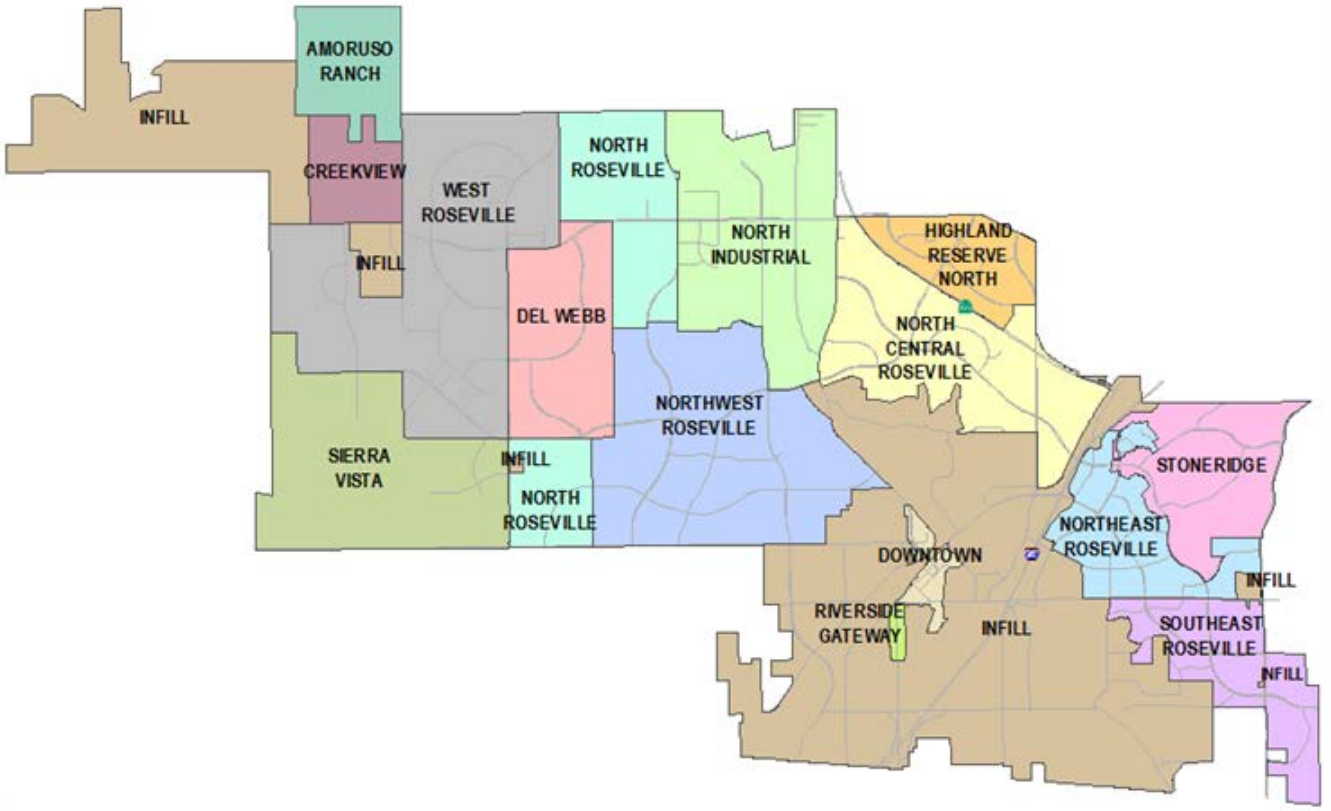
Finally, population alone is not the sole variable that influences demand for services, as socioeconomic and demographic factors have greater influence over demand. Median household income was evaluated to determine the degree to which the community had underprivileged populations. According to the US Census Bureau, the 2017 national median household income is reported at $61,372. Median household income values for the off-white shaded areas are as follows: northeast of Station 6, $35,433; northwest of Station 6, $40,557; west of Station 1, $35,695; southwest of Station 1, $29,806; west-northwest of Station 3, $32,255; and north-northeast of Station 3, $42,009.

Figure 5: Median Household Income – 2018



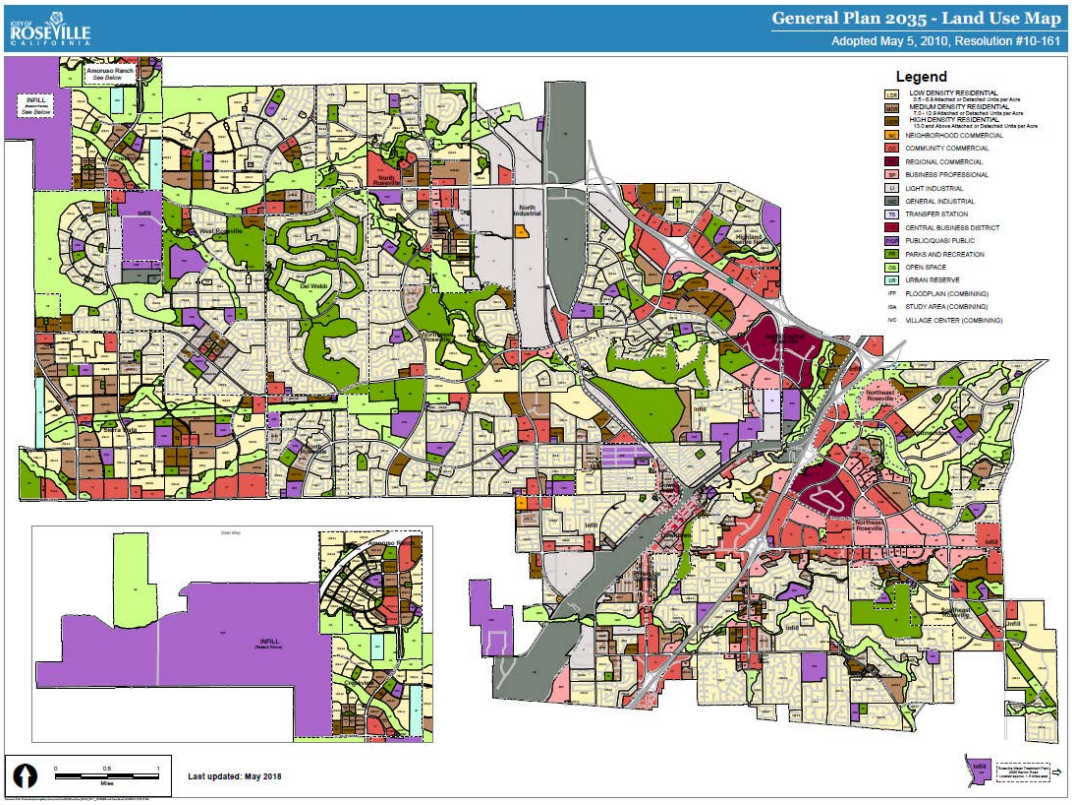
Specific Plans

Figure 6: City of Roseville Specific Plan Map



Land Use Map

Figure 7: General Plan – Land Use Map Adopted May 5, 2010

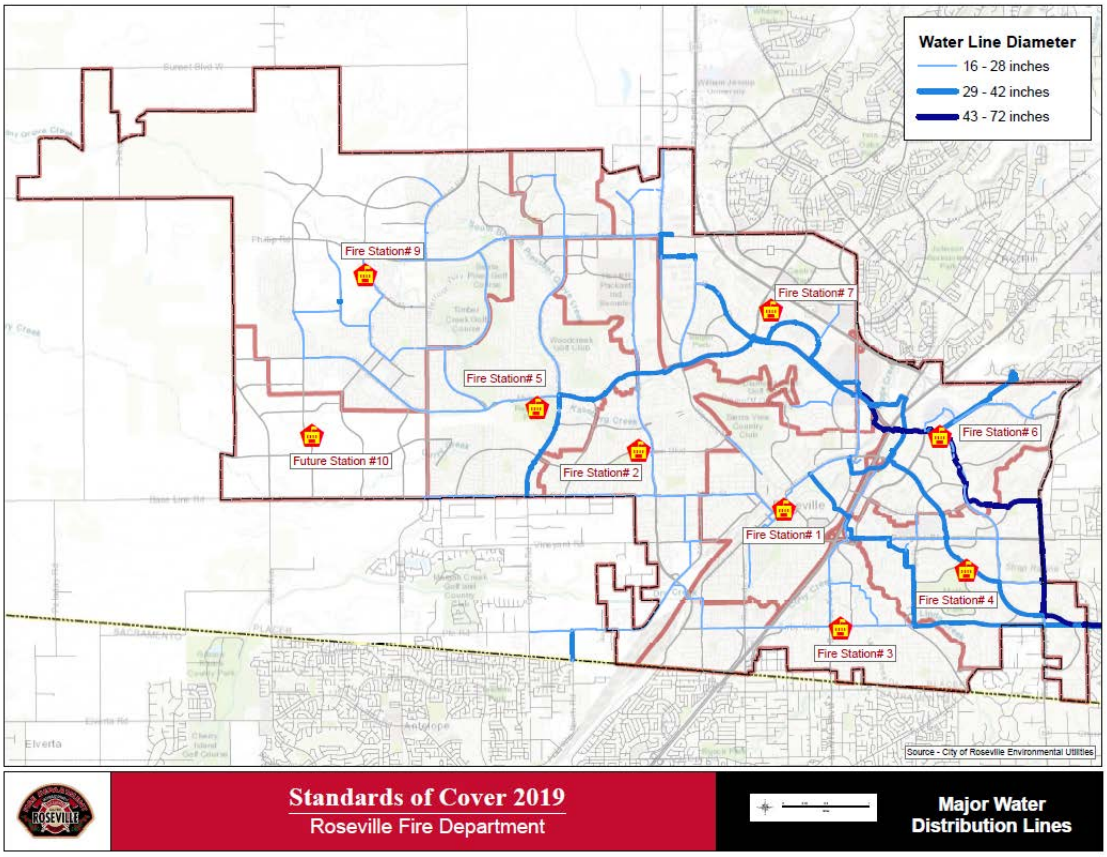


City Water Supply

The City of Roseville's municipal water system is operated by the Environmental Utilities Department. They are responsible for the operation and maintenance of the City's water transmission and distribution facilities through the groups of construction, meter/backflow, meter retrofit, preventative maintenance, and field service. These facilities include water mains, water storage tanks, pump stations, water wells, pressure-reducing stations, and interties. The water system consists of approximately 600 miles of water mains ranging in size from 4 to 66 inches in diameter. There are over 4,500 fire hydrants, 10,000 valves, 4,000 backflow devices, and 35,000 services within the system. Roseville's water supply comes from multiple sources, the primary is Folsom Lake, and is treated by a City-operated treatment plant. In order to provide reliability in time of water shortage or emergency outages, the City also maintains five groundwater wells and several interties with surrounding water agencies.

Water Supply Map

Figure 8: Water Supply by Line Diameter



SECTION 2: SERVICES PROVIDED BY RFD

Roseville Fire Department

RFD is a full- service, all-hazards department, capable of responding to any type of fire, EMS, rescue, or hazardous materials call. The Department maintains a modern fleet of well-equipped apparatus that are distributed throughout the service area and are staffed with highly-trained, motivated employees. Paramedics are staffed on every apparatus. RFD utilizes a variety of resources to deliver a full range of services including:

- Fire suppression, including wildfire response
- Emergency medical services (Advanced Life Support - ALS)
- Hazardous materials emergency response
- Technical rescue (high-angle, confined space, trench, vehicle extrication, and water rescue)
- Public assistance and education
- Community Risk Reduction (Fire & Life Safety Division)
- Tactical EMS paramedics supporting Roseville PD SWAT Team
- Paramedic Bike Team

The Department operates from eight stations and currently staffs eight engine companies, two ladder companies, and one Battalion Chief. These personnel cross staff three brush engines, two grass engines, one hazmat company, and one rescue company. There are three platoons, working 48 hours on, followed by 96 hours off. The staffing matrix is done via a constant staffing framework (meaning no extra bodies are hired to float out to open positions). Long-term vacancies, training, vacation, and other open positions are filled using scheduled overtime via our TeleStaff™ system. Minimum daily staffing for eight stations, including one 24-hour Battalion Chief, is 33 persons per day.

Fire Service Response

RFD is appropriately staffed and equipped to respond to fire incidents in the City as well as providing automatic and mutual aid to neighboring agencies throughout the State of California. The **Low-Level** fire response for a reported vehicle fire, small grass fire, and dumpster fire consists of one engine. A **Moderate-Level** response to an unconfirmed or possible structure fire consists of two engines, one truck, and one Battalion Chief, providing a total of 11 firefighters. A working fire incident, either residential or commercial, sends a **High-Level** response for all working structure fires consisting of four engines, two trucks, two Battalion Chiefs, and one ambulance, providing 21 firefighters. All Roseville Firefighters are certified by the State of California to the "Firefighter II" level and each holds current Emergency Medical Technician I certification or Paramedic licensure.

Every Type I fire engine carries three firefighters (Captain, Engineer, and a Firefighter/Paramedic (FF/P)), is a 1,500 gallons per minute (gpm) rated pumper with foam capability, holds 500 gallons of water, carries 1,000 feet of supply hose and 1,950 feet of attack hose (in varying diameters), has scene lighting, and a full assortment of basic and advanced life support equipment. Fire engines are operated out of Stations 1 through 9.

The typical fire truck carries four firefighters (Captain, Engineer, and two FF/Ps), a hydraulically-powered 100-foot aerial ladder, and hydraulic, pneumatic, and electric heavy rescue tools. Fire trucks carry no water and have no fire pump. Fire trucks are currently operated out of Stations 1 and 7 and they cross staff either a rescue or hazardous materials unit.

Wildfire / Vegetation Fire Service

The Department operates three Type III Brush Engines and two Type VI Grass Engines in the areas that are prone to wildland fires. In addition, RFD has a Type I engine from the California Office of Emergency Services for use through the California Master Mutual Aid system. All firefighters are trained to fight wildland and urban interface fires and complete annual RT-130 training. The Type III and Type VI apparatus are capable of getting in tight areas along our bike trails and ravines that Type I structure apparatus cannot access. Type III Brush rigs are heavily utilized during Statewide Mutual Aid fires throughout California. The Department participates fully with the California Master Mutual Aid System by sending any of our capabilities to those in need. All apparatus are typed and registered with the California Office of Emergency Services (OES) and subject to deployment when requested.

Emergency Medical Service

In 2018, RFD responded to approximately 10,247 EMS calls. RFD operates one of the most progressive EMS systems in the United States, utilizing cutting edge technology and current treatment protocols and procedures, including Advanced Cardiac Life Support and medication administration for the heart attack victim, various advanced airways tools, and intraosseous insertion for fluid and medications. Electronic patient care reporting (ePCR) and transmission of EKGs directly to the hospital during patient treatment are just two examples of the progressive and innovative approaches to patient care. In addition, RFD participates in the STEMI (ST Elevation Myocardial Infarction) Critical Trauma and Stroke programs supported by local hospitals.

All apparatus in RFD are staffed 24/7 with California State Certified Paramedics (EMT-P) capable of providing care to critical patients requiring invasive procedures such as IVs, 12 lead EKGs, medication administration, and airway intubations. In addition to the ALS equipment carried on the engines and trucks, limited ALS equipment is also carried on three brush units located at Stations 5, 6, and 9. The Division Chief of EMS oversees all areas of EMS while the EMS Quality Assurance Coordinator delivers EMS training to the Department's Paramedics and Emergency Medical Technicians. The EMS Division not only encompasses a field operations component, but incorporates an extensive EMS Education and Quality

Assurance Program. Training includes a variety of disciplines including EMT, American Heart Advanced Cardiac Life Support, Pediatric Advanced Life Support, and current standards of practice for emergency medicine. The EMS Division also partners with the Training Division to offer EMS learning opportunities throughout the year during company evolutions and the new hire fire academy.

Technical Rescue Service

Rescue 7 is the Department's Type II-Medium rescue vehicle. The vehicle carries equipment capable of providing the means to perform high angle (above ground), trench (below ground), confined space, collapse, and swift water rescues. All personnel assigned to Station 7 are State Fire Marshal certified in Confined Space Rescue, Trench Rescue, and Rescue Systems I and II. Numerous members at outlying stations are also trained in these rescue disciplines and they attend required trainings to keep their skill levels proficient. For a large or complex event, these additional rescue technicians may be pulled from other fire apparatus to supplement those already assigned to Station 7.

Hazardous Materials Service

RFD operates one of three Type I Hazardous Materials Teams located in the Sacramento Region. Task Force 1 personnel are trained to the Hazmat Specialist level of capability. In addition to the seven hazmat specialists assigned to Task Force 1, many other hazmat specialists are assigned around the City and may be mobilized to assist Task Force 1 if the need arises. All operational personnel are trained to the First Response Operations (FRO) level, and may assist with certain hazardous materials incident tasks, such as decontamination.

The Department also staffs a mass decontamination trailer that was provided from regional grants. The equipment/personnel provide the capability to decontaminate large numbers of contaminated people while providing for their modesty. The trailer is one of seven similar resources located throughout the Sacramento region. Personnel assigned to Station 2 are responsible for this resource and deployment when needed.

Tactical EMS

To assist with immediate care and increase survivability on critical incidents such as an active shooter scenario, one Roseville Fire Engineer/Paramedic and two Firefighter/Paramedics participate on the Roseville Police Special Weapons and Tactics (SWAT) Team providing immediate medical attention for officers, citizens, and suspects that might be injured in a tactical environment. Tactical medics train ten hours every month with the Police SWAT Team and meet annual certification and qualifications.

Paramedic Bike Team

For special events that involve large crowds or difficult access, RFD deploys two paramedics on bicycles. This crew carries advanced life support (ALS) equipment so paramedic-level care can be provided instantly while waiting for additional responders to arrive.

Fire Investigation Team

RFD has a six-person investigation team. The team operates under the Fire Life Safety Division. Staffing includes four shift personnel and two 40-hour personnel, which are at the battalion chief and fire inspector rank. The Division Chief manages and coordinates the program and provides 24/7 fire investigation for cause and origin.

RFD investigates all fires occurring within City limits and assists neighboring jurisdictions when requested. Roseville Police Department assists when a fire is determined "criminal" in nature after a cause and origin investigation is conducted. Arrests are made by Roseville Police and they also book and hold evidence. To help facilitate training and knowledge sharing within the investigation community, all Roseville Fire Investigators are members of the Sacramento/Sierra Arson Taskforce, California Conference of Arson Investigators, and the International Association of Arson Investigators.

Fire Administration

Fire Administration is overseen by the Fire Chief and includes an Administrative Analyst and Administrative Assistant who directly report to the Fire Chief. There are two Assistant Chiefs, one for Support Services and one for Operations. There is a Division Chief of Life Safety, a Battalion Chief for Safety, a Battalion Chief for Training/EMS, GIS Analyst, Fire Inspection Supervisors, Fire inspectors, PIO, and Office Assistant positions.

Roseville Fire Battalion Chiefs operate out of Station 1 in the Battalion 1 command vehicle. One Battalion Chief covers eight stations and ten companies on the same 48 hours on-duty followed by 96 hours off-duty for each A, B, and C shift.

Fire & Life Safety Division

The Fire & Life Safety Division is composed of eleven full-time staff members and two part-time staff member. The Division oversees a wide variety of programs and services which include the inspection and plan review of commercial construction projects, annual fire inspections on occupancies requiring State-Mandated inspections, and administration of the Certified Unified Program Agency (CUPA), or hazardous materials program. Additionally, the Division provides public education and outreach services to the community through its public education program, and oversees the Department's Public Information Officer.

RFD's Fire & Life Safety Division contracts with South Placer Fire District for plan check and other various prevention duties. The contract is renewable on a semi-annual basis.

This Division also coordinates the City's emergency preparedness program which oversees city-wide preparedness planning in the areas of prevention, preparedness, response, recovery, and mitigation. The Division plans and leads City- and County-wide disaster drills, trains City personnel on Emergency Operations Center (EOC) operations, and handles emergency notification delivery systems to warn citizens of impending emergencies. The City's Emergency Operations Plan and Multi-Hazard Mitigation Plan are reviewed and updated annually.

Public Safety Outreach and Public Education

RFD actively participates to spread its mission throughout the community. Using news releases, public service announcements, and direct contact, the Department assures public education reaches its intended audience. Administrative personnel, suppression personnel, and volunteers are all used in a continuing program to educate and train the public in essential lifesaving skills. Other programs include smoke detector checks and installation for those in need. RFD also hosts car seat inspections.

Quarterly, RFD opens up one fire station to meet the community and show them the Department's capabilities. Each event has a different safety theme and allied public safety educators are encouraged to participate.

Roseville Firefighters host an annual week-long Kids Fire Camp where children between 12 and 14 years of age have the opportunity to spend six days immersed in learning lifesaving skills and fire service careers. At the conclusion of the camp week, participants show their parents the skills they learned during a graduation ceremony.

Training Division

Training is the keystone to effective emergency response. During emergency operations, time is always of the essence and an effective training program can mean the difference between a fire contained to the area of origin and one that causes great damage.

Training in the fire service has two parts: (1) vocational training, which teaches the skill sets necessary to do the "hands-on" type of work that firefighters do; and (2) education, which teaches the knowledge necessary to do the mental work. The Training Division maintains Standard Operating Evolutions, thus ensuring a well-trained, effective, and aggressive response capability.

NFPA has several recommended standards that apply to fire service training. RFD has adopted the following standards by reference, as they represent best practices for the fire service.

- **NFPA 1403** - *Standard on Live Fire Training Evolutions*. This standard outlines the procedures required for safe live-fire training. This is a particularly important standard as live-fire training is demonstrably the most dangerous training activity undertaken by the fire service. RFD conducts live-fire training at its training facility in specially designed burn rooms.

- **NFPA 1410** - *Standard for Initial Emergency Scene Operations*. Standard Company Evolutions are the minimum acceptable standards for the performance of critical firefighting tasks. These NFPA Standards have been incorporated into the RFD Standard Operating Evolutions Manual. All line personnel (firefighter through captain) train regularly on these evolutions so they can effectively, efficiently, and safely operate as part of an emergency response company.

RFD utilizes the State Fire Training - Office of State Fire Marshal (OSFM) certification standards for its entry and promotional training requirements. Positions which meet or exceed State Fire certification and training standards include Firefighter, Apparatus / Operator, and Fire Officer. There is a consistent sanctioned career development program through all levels in the OSFM certification program and the California State Fire Training - OSFM training certification program is compliant with national standards.

RFD participates in the "Red Card" system through the California Incident Command Certification System (CICCS). This program ensures that Incident Command and wildland fire training requirements are met. Training is under the auspices of the OSFM's Fire Service Training and Education Program. All RFD instructors are certified Fire Instructors through State Fire Training – OSFM and/or are qualified subject matter experts with extensive training in instructional methodology. The Training Division is staffed with a Division Chief of Training and supplemented with designated Department instructors used as needed for specialized training in Hazmat, Technical Rescue, Wildland Firefighting, Pump Operations, Emergency Vehicle Driving, and Fire Officer Development. Didactic training can often be delivered directly

to fire stations via online learning tools such as Target Solutions and GoTo Meeting. The fire stations also have a standard International Fire Service Training Association (IFSTA) training library.

Manipulative training is conducted at the Roseville Fire Training Center, a state-of-the-art training facility that includes a six-story training tower with computerized burn rooms, classrooms, drafting pit, above/below grade technical rescue props, and fully functional hazardous materials props.

The RFD Training Division manages the following required training and associated activities:

- Insurance Services Office required drills – live-fire drills, multi-company drills, regional drills, driver / pump operator, emergency vehicle operator, and new hire firefighter academy training.

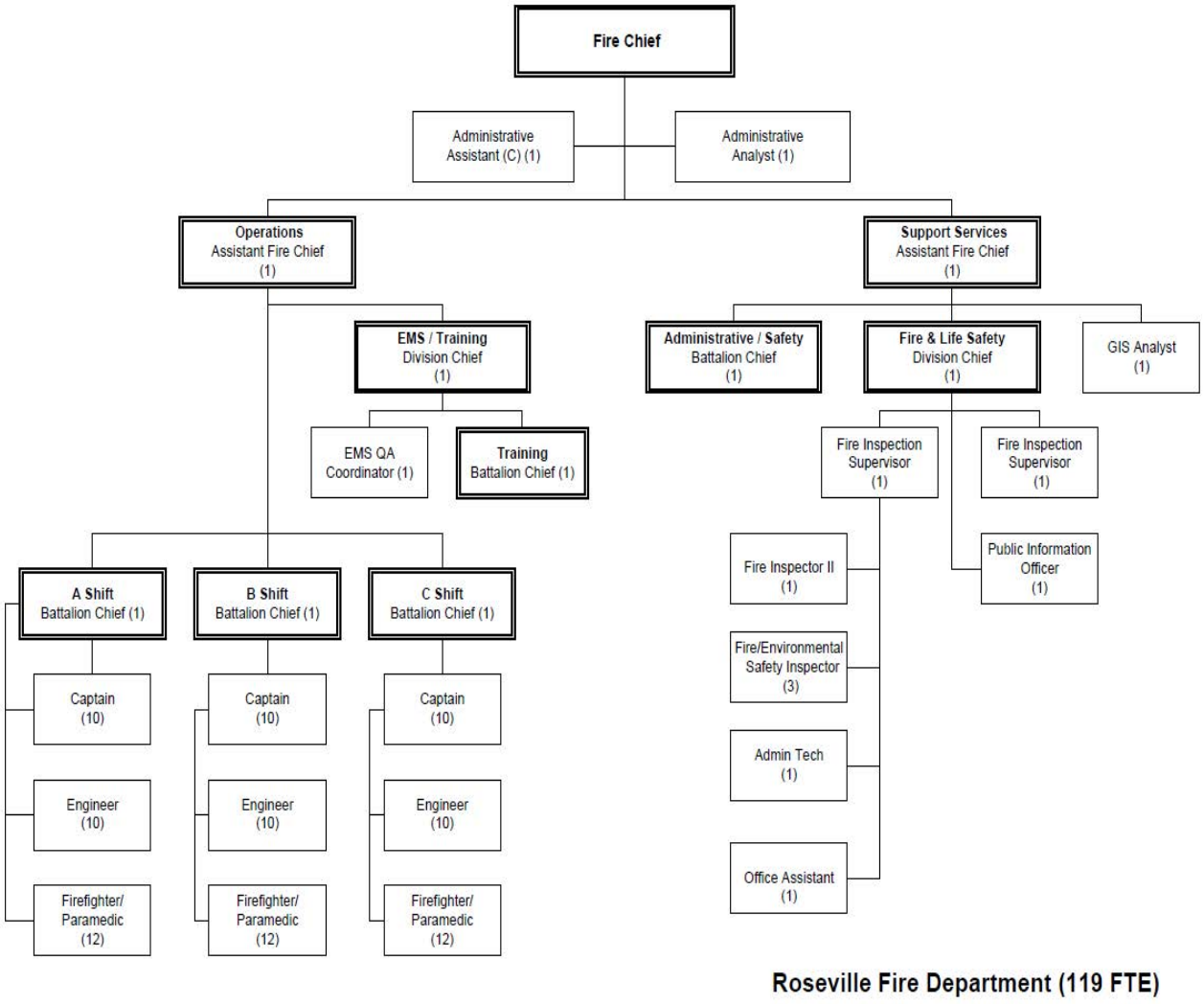
- Interagency mutual aid drills.

- California Code of Regulations required training – Hazardous Materials, Technical Rescue, annual wildland fire refresher, Blood-Borne Pathogen, and SCBA.

- Code of Federal Regulations – Confined Space and Trench Rescue training. The Fire Training Center (FTC) provides facilities for effective drills and classroom presentations which are essential to the development of skills.

A Training Advisory Committee meets monthly to help identify and guide training priorities in the Department's two-year training plan. This committee comprises lead instructors, program managers, and members-at-large.

Figure 9: Fire Department Organizational Chart



Population History and Calls for Service

Table 5: Staffing and Population by Year

Year	Population	Total Calls	Operations Response Personnel	FF's Per 1,000 Population	Shift Staffing
2014	127,153	13,113	99	.78	23
2015	131,433	14,655	99	.75	33
2016	134,073	15,071	99	.74	33
2017	135,868	15,939	99	.73	33
2018	137,213	16,582	99	.72	33

*Budget and staffing numbers from FY 2019 Budget.

Fire Department Staffing

Table 6: Administrative Positions

Positions	Number
Fire Chief*	1
Assistant Fire Chief*	2
Division Chief*	2
Battalion Chief*	5
EMS QA Coordinator	1
Administrative Analyst	1
Administrative Assistant	1
Office Assistant	1
GIS Analyst	1
Pub Ed Coordinator	.5
Fire Inspector Supervisor	2
Fire Inspectors*	4
Fire Technician	1
Fire PIO	1
Office Assistant	1
Total	23.5
*Sworn positions	12

Table 7: Emergency Response Personnel 2018

Positions	Number
Fire Chief	1
Assistant Fire Chief	2
Division Chief	2
Battalion Chief	5
Fire Captain	30
Fire Engineer	30
Firefighter Paramedics	36
TOTAL	106

Table 8: Minimum Daily Staffing

Positions	Number
8 Engines @ 3 FF's per Day	24
2 Trucks @ 4 FF's per Day	8
1 Battalion Chief	1
TOTAL	33

Unit Staffing

Each unit is staffed by career personnel, with wildland units (Grass and Brush), HazMat, and Rescue cross staffed by the same personnel from that station. If a wildland fire is dispatched, the crew will respond in the wildland unit and place the engine out of service.

Table 9: Unit Identifications with Type and Staffing

Unit	ID	UNIT TYPE	BC	Captain	Engineer	FF Medic	FF or FF Medic	TOTAL
Battalion 1	B1		1					1
Engine 1	E1	I		1	1	1		3
Truck 1	T1			1	1	1	1	4
Hazmat 1	HM1	II	Cross Staffed by E1 / T1					
Engine 2	E2	I		1	1	1		3
Grass 2	G2	VI	Cross Staffed by E2					
Engine 3	E3	I		1	1	1		3
Engine 4	E4	I		1	1	1		3
Grass 4	G4	VI	Cross Staffed by E4					
Engine 5	E5	I		1	1	1		3
Brush 5	BR5	III	Cross Staffed by E5					
Engine 6	E6	I		1	1	1		3
Brush 6	BR6	III	Cross Staffed by E6					
Engine 7	E7	I		1	1	1		3
Truck 7	T7			1	1	1	1	4
Rescue 7	R7	MED	Cross Staffed by E7 / T7					
Engine 9	E9	I		1	1	1		3
Brush 9	BR9	III	Cross Staffed by E9					

Community Response History

Methodology

Data were collected and reviewed from both call data-processing applications utilized by the Department spanning January 1, 2016 to December 31, 2018 for CAD and January 1, 2014 to December 31, 2018 for RMS. All reporting periods were based on the calendar year from January 1 to December 31. As such, this report presents five full reporting periods of RFD baseline workload and response time performance data, where available and applicable.

In this report, the Department utilizes two distinct measures: call volume and workload. Call volume is the number of requests for service that are defined as either "dispatches" or "calls." Dispatches/calls are the number of times a distinct incident was created involving RFD units or calls in RFD's jurisdiction. Workload is the number of times that an individual unit (or units) responded to a call. Responses will be utilized on all unit- and station-level analyses, which account for all elements of workload and performance. Responses were classified based on call status and the role of the responding unit. Call status as emergency (lights and sirens) was obtained from the RMS call-level data file.

The following chart demonstrates workload by call type. During the 2018 reporting period (i.e., January 1, 2018 to December 31, 2018; hereinafter referred to as 2018), RFD received a total of 16,930 unique requests for service (Figure 9; Table 6). Incidents reflect requests for service within RFD's demand zones, as well as from other agencies outside of the demand zones through automatic and mutual aid. EMS related requests totaled 10,247, accounting for 60.5% of the total call volume, and fire related requests totaled 325, accounting for 1.9% of the total call volume.

Figure 10: Percentage of Total Incidents by Program

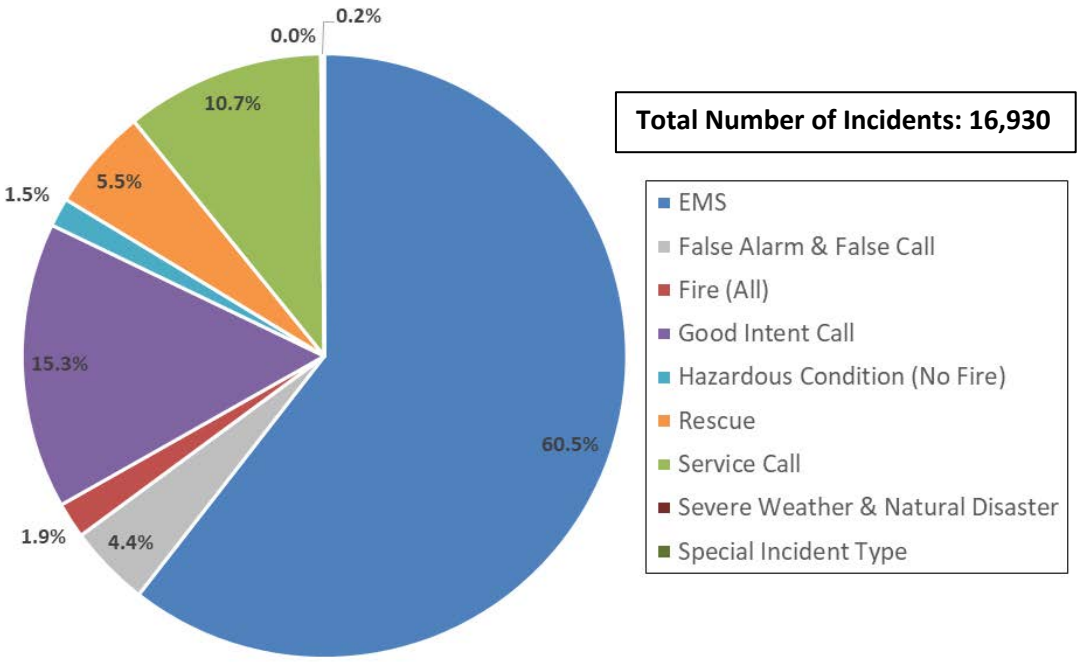


Table 10: Number of Incidents by Call Category

Call Category[1]	Number of Calls	Average Calls per Day	Call Percentage
EMS	**10,247**	**28.1**	**60.5**
False Alarm & False Call	**739**	**2.0**	**4.4**
Fire (Not Building or Wildland)	92	0.3	0.5
Building Fire	130	0.4	0.8
Wildland Fire	103	0.3	0.6
Fire (All)	**325**	**0.9**	**1.9**
Good Intent Call	**2,594**	**7.1**	**15.3**
Hazardous Conditions (No Fire)	**261**	**0.7**	**1.5**
Rescue	**928**	**2.5**	**5.5**
Service Call	**1,804**	**4.9**	**10.7**
Severe Weather & Natural Disaster	**3**	**0.0**	**0.0**
Special Incident Type	**29**	**0.1**	**0.2**
Total	**16,930**	**46.4**	**100.0**

[1]Classifications of incident types from the data file into call category are presented in the Appendix of the data report.

Table 11: Number of Calls, Number of Responses, and Total Busy Time by Reporting Period

Reporting Period[1]	Number of Calls[2]	Number of Responses[3]	Average Responses per Call	Total Busy Hours	Responses with Time Data[4]	Average Busy Minutes per Response	Average Calls per Day[5]	Average Responses per Day[5]
2014	13,466	16,487	1.2	5,672.4	16,413	20.7	36.9	45.2
2015	14,969	18,123	1.2	6,173.6	17,431	21.3	41.0	49.7
2016	15,402	17,942	1.2	6,190.4	17,105	21.7	42.1	49.0
2017	16,277	19,839	1.2	6,236.6	19,444	19.2	44.6	54.4
2018	16,908	20,847	1.2	6,624.4	20,546	19.3	46.3	57.1

[1]Reporting periods reflect full calendar years, from January 1 to December 31 of each respective year.
[2]"Number of Calls" reflects an adjusted number of unique incidents to correspond with responses made by RFD units as available in the unit-level data file. For example, for 2018, 11 unique incident keys appeared in the call-level data file, but not in the unit-level data file, and within the unit-level data file, 11 additional unique calls reported only AMR unit responses.
[3]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[4]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix of data report).
[5]Reporting period 2016 contained 366 days due to inclusion of leap year date February 29, 2016; all other reporting periods contained 365 days.

Table 12: Number of Incidents Dispatched by Category, Reporting Period, and Demand Zone (Roseville Only)

Demand Zone	Call Category	Reporting Period[1]				
		2014	2015	2016	2017	2018
Roseville	**EMS**	**8,618**	**9,614**	**9,561**	**9,769**	**10,190**
	False Alarm & False Call	**474**	**576**	**675**	**685**	**734**
	Fire (Not Building or Wildland)	133	121	121	123	89
	Building Fire	109	112	109	101	120
	Wildland Fire	66	54	62	64	91
	Fire (All)	**308**	**287**	**292**	**288**	**300**
	Good Intent Call	**1,345**	**1,582**	**1,833**	**2,336**	**2,447**
	Hazardous Conditions (No Fire)	**201**	**215**	**220**	**237**	**258**
	Rescue	**772**	**806**	**922**	**876**	**918**
	Service Call	**1,386**	**1,567**	**1,563**	**1,731**	**1,703**
	Severe Weather & Natural Disaster	**6**	**2**	**1**	**2**	**3**
	Special Incident Type	**3**	**1**	**4**	**14**	**29**
	Unknown	**0**	**5**	**0**	**1**	**0**
	Total[2]	**13,113**	**14,655**	**15,071**	**15,939**	**16,582**
	Average Calls per Day[2]	**35.9**	**40.2**	**41.2**	**43.7**	**45.4**
	YoY Growth	**N/A**	**11.8%**	**2.8%**	**5.8%**	**4.0%**

[1]Reporting periods reflect full calendar years, from January 1 to December 31 of each respective year.
[2]Reporting period 2016 contained 366 days due to inclusion of leap year date February 29, 2016; all other reporting periods contained 365 days.

Table 13: Overall Workload by Station

Station	Number of Calls Responded to by Units Assigned to 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
Station 1	3,446	4,544	4,452	1,370.0	18.5	20.7
Station 2	2,054	2,057	2,035	674.9	19.9	10.2
Station 3	2,989	2,989	2,963	928.1	18.8	14.0
Station 4	2,100	2,100	2,078	635.4	18.3	9.6
Station 5	2,220	2,225	2,198	766.0	20.9	11.6
Station 6	2,096	2,108	2,078	593.0	17.1	9.0
Station 7	2,523	2,950	2,906	940.0	19.4	14.2
Station 9	1,825	1,831	1,810	685.7	22.7	10.4
RFD Admin	35	38	24	30.5	76.1	0.5
RFD Other[3]	5	5	2	0.8	23.9	0.0
Total	--	**20,847**	**20,546**	**6,624.4**	**19.3**	**100.0**

[1]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[2]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix of data report).
[3]Reflects only the unit OES364, a state resource staffed by RFD for state or federal incidents; not otherwise typically staffed.

Figure 11: Heat Map for All Incidents

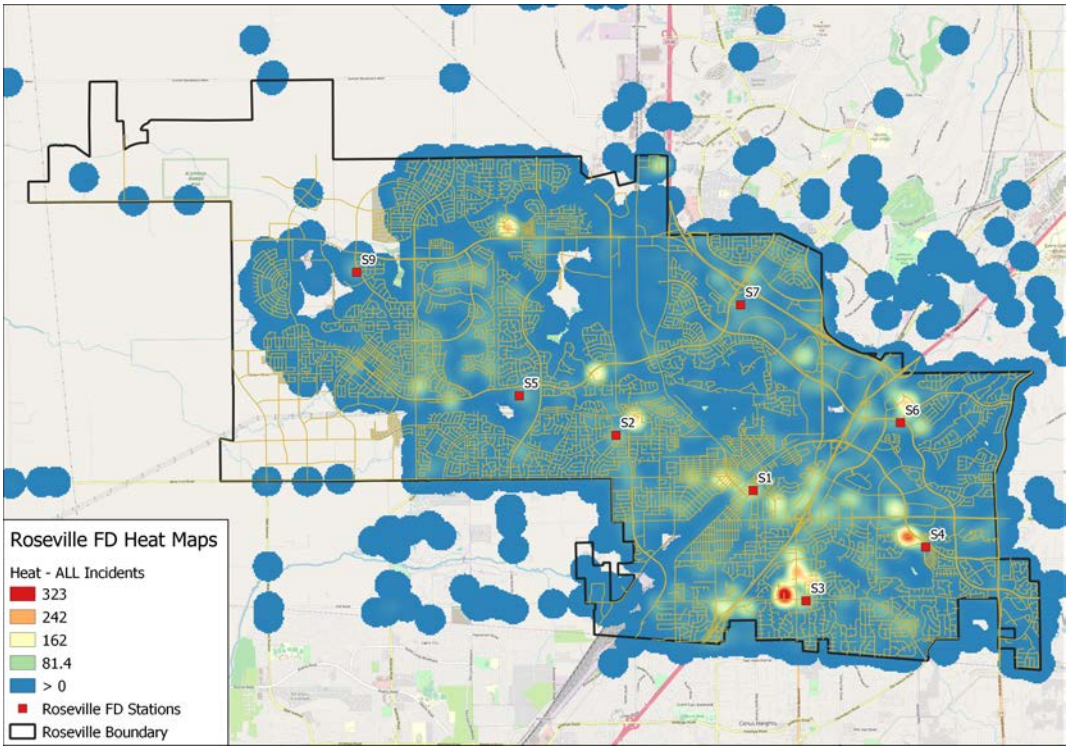
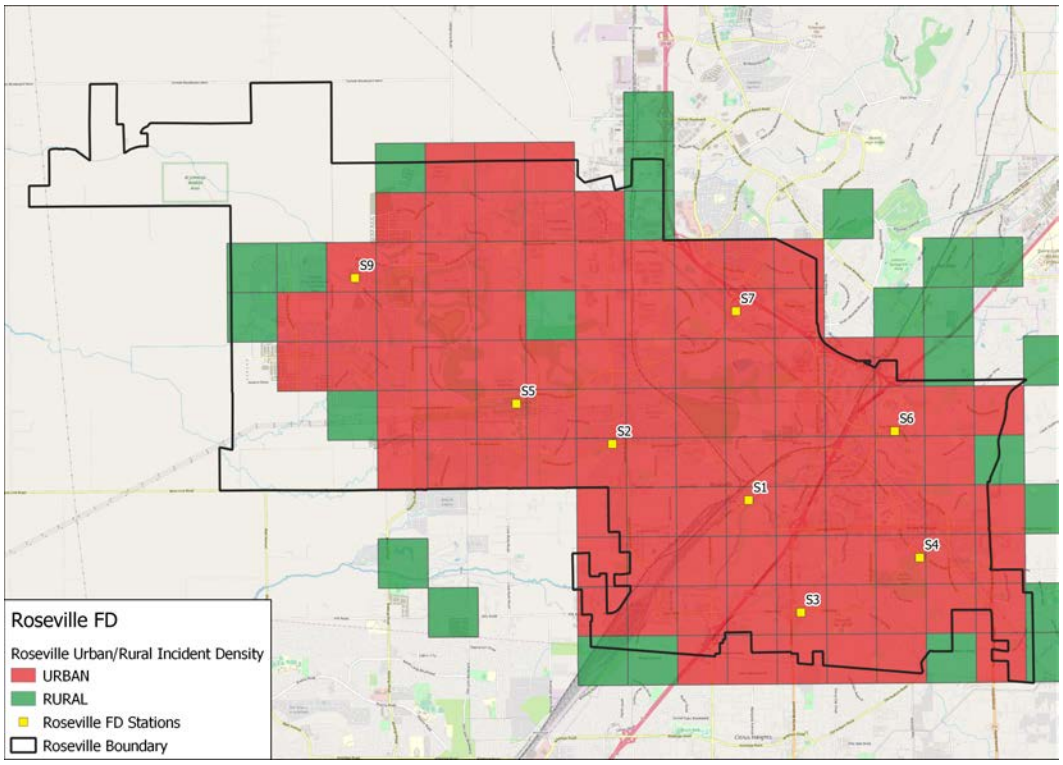


Figure 12: Urban and Rural Call Density Map with Current Stations



Distribution of Resources

The term distribution describes resource locations needed to ensure a rapid initial response to emergencies. Distribution is measured by the percentage of the jurisdiction covered by the first-in response company within adopted response time goals.

This view of the response system analyzes fire and EMS resource deployment in terms of a static placement of resources and their theoretical response potential. By taking this theoretical view of the system, it is possible to determine whether or not response standards can be met from existing infrastructure with current staffing levels when all companies and units are in quarters and available for emergency response.

The Department uses a variety of factors to determine optimal locations for fire stations from pertinent national standards, including NFPA (NFPA 1710 –*Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2010 Edition*), the Insurance Services Office (ISO), and the American Heart Association, covering both response time and deployment standards (including number and type of resources needed on scene). In addition, GIS mapping uses time and distance studies that are performed to measure actual distances and travel times across the service area. The results help determine response areas and response order for RFD.

The Department's current fire station positioning provides for an efficient distribution of the available emergency response resources. In developing this infrastructure, the goal was to balance elements that include a favorable fire station site configuration and three additional areas of consideration, as follows:

- Placement - Geographic spacing between fire stations taking into consideration natural and human-made obstacles or barriers, and provides for coverage efficiency balanced with depth of coverage through limited response zone overlap.

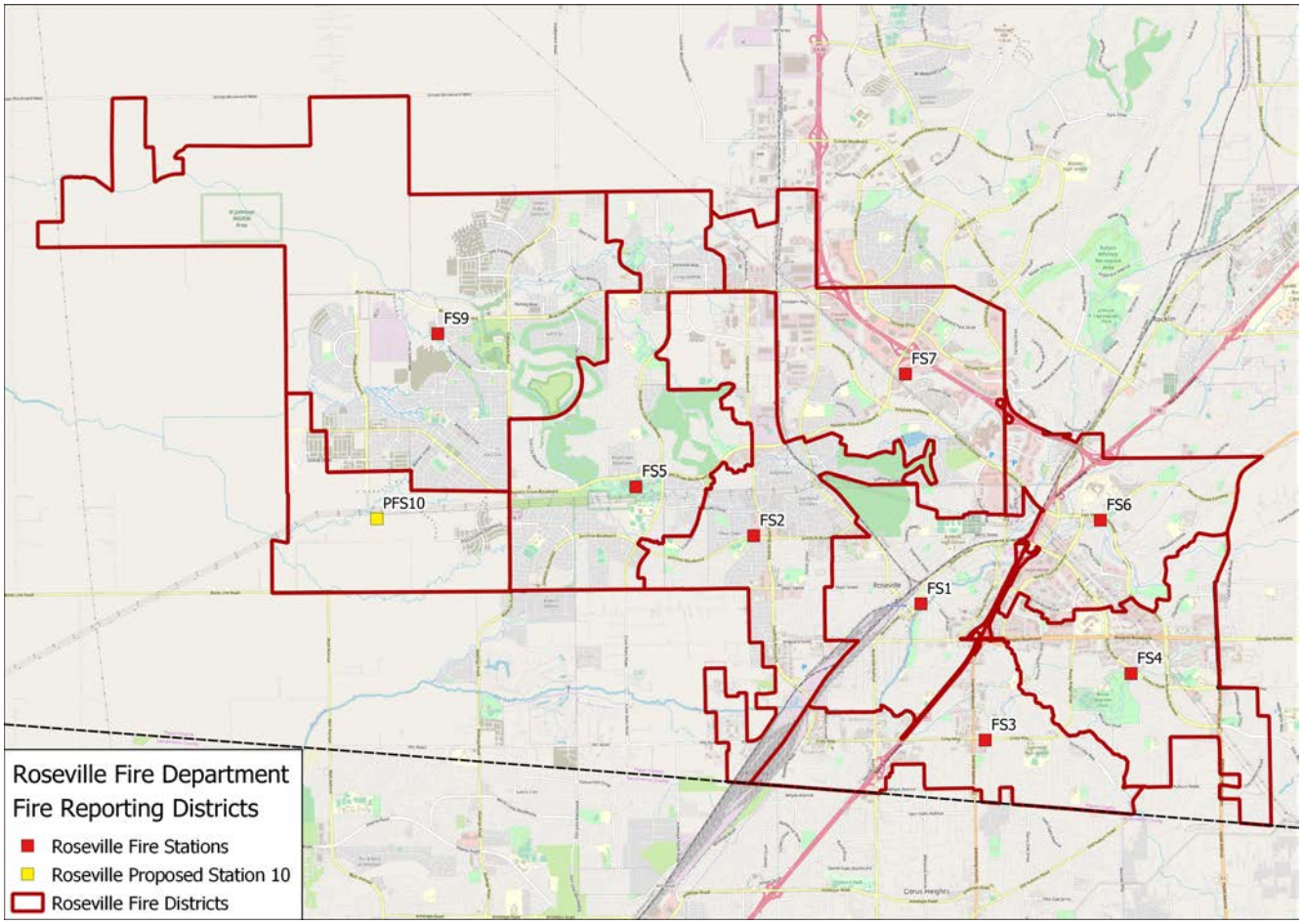
- Response Routes - Proximity and access to multi-directional transportation corridors sized appropriately for fire apparatus and referred to as run streets.

- Property Acquisition - Availability, lot size, and the cost of suitable sites within the parameters of factors noted above.

Currently, RFD operates out of eight fire stations divided into one geographically defined battalion, composed of nine first due response districts containing a total of 210 fire-reporting districts. All CAD data are reviewed from the response district perspective. However, the Department can focus on the smaller fire reporting district if needed to make smaller adjustments to response districts.

Fire Response First Due Districts and Fire Reporting Districts

Figure 13: City of Roseville Response Districts by First Due



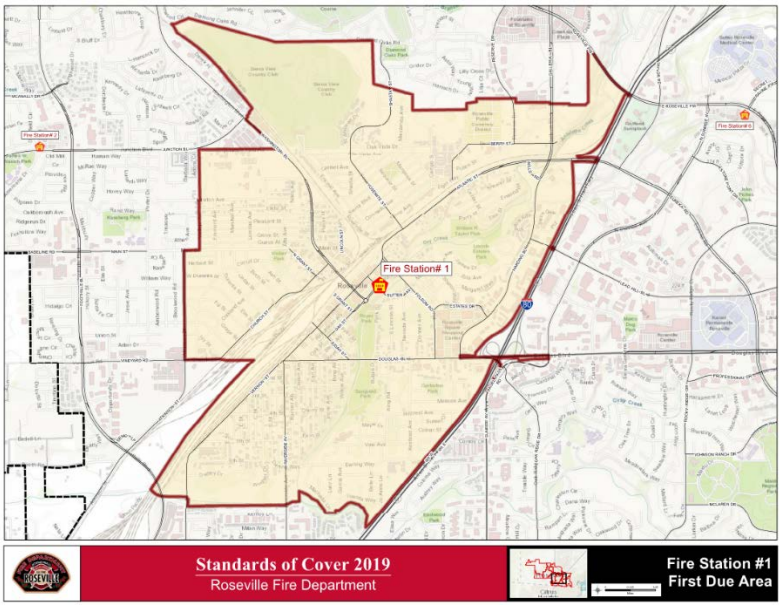
Staffing, Station Location, and Equipment Analysis

A critical factor in developing this SOC is review of the overall system to see if it is meeting the established service-level objectives. It is common for fire and EMS response that distinctive geographic areas are built upon the first due response areas of the fire stations located throughout the City. This approach allows the fire department to analyze the workload and measure the performance of those stations based upon the identified service-level objectives. By doing so, it assists in identifying areas of weakness, where additional stations may be warranted, and/or where additional companies should be placed in service based upon the workload.

Fire Station 1 & Administration Headquarters

800 Lincoln Street
Roseville, CA 95678

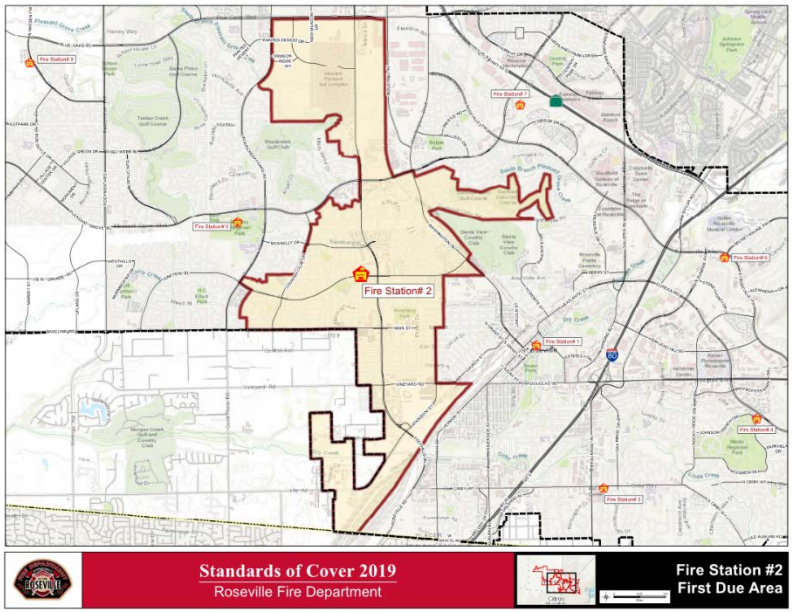
Apparatus	Apparatus Type	Number of Personnel Assigned
Engine 1	Engine	3
Truck 1	Truck	4
Battalion 1	SUV	1
Hazmat 1	Specialty	Cross-staffed



Fire Station 2

1398 Junction Blvd
Roseville, CA 95747

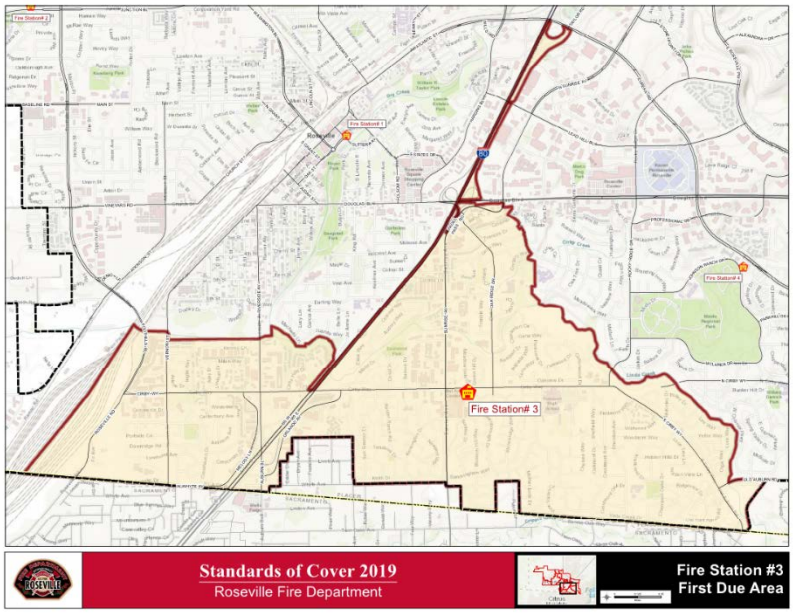
Apparatus	Apparatus Type	Number of Personnel Assigned
Engine 2	Engine	3
Grass 2	Specialty	Cross-staffed



Fire Station 3

1300 Cirby Way
Roseville, CA 95661

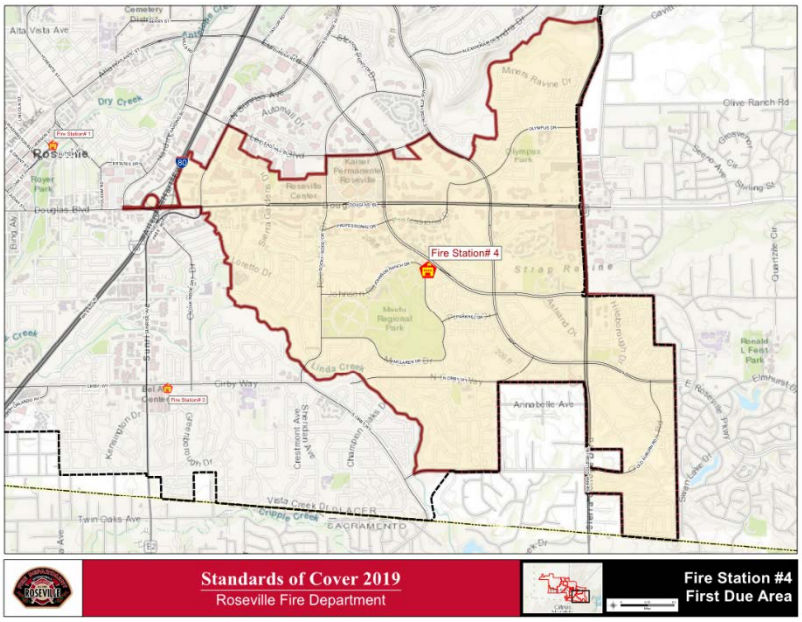
Apparatus	Apparatus Type	Number of Personnel Assigned
Engine 3	Engine	3
Reserve Engine 3B	Engine	Reserve



Fire Station 4

1900 Eureka Rd
Roseville, CA 95661

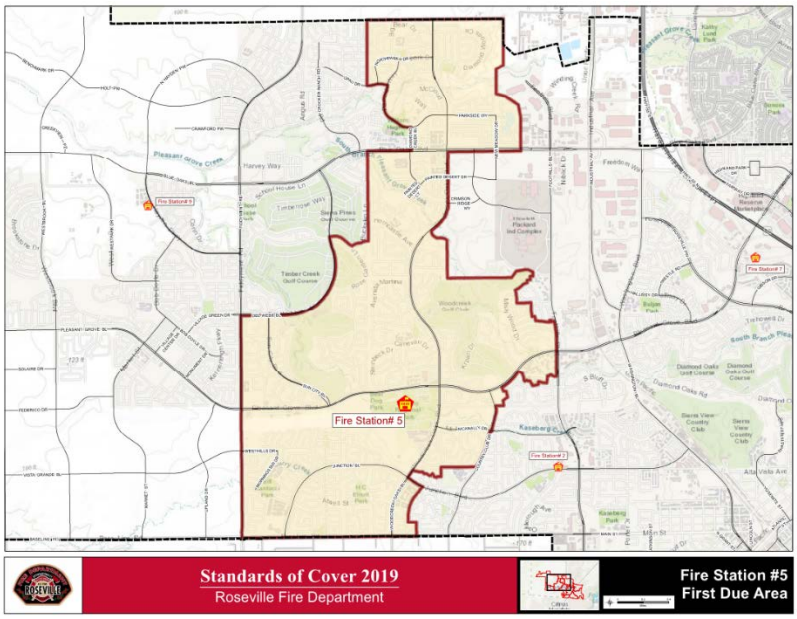
Apparatus	Apparatus Type	Number of Personnel Assigned
Engine 4	Engine	3
Grass 4	Specialty	Cross-staffed



Fire Station 5

1565 Pleasant Grove Blvd.
Roseville, CA 95747

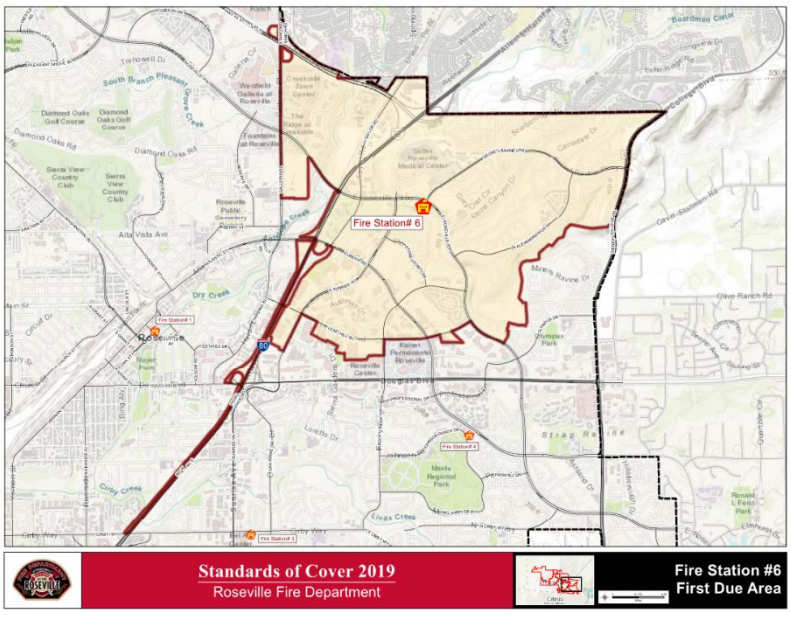
Apparatus	Apparatus Type	Number of Personnel Assigned
Engine 5	Engine	3
Reserve Engine 5B	Engine	Reserve
Brush 5	Wildland	Cross-staffed



Fire Station 6

1430 East Roseville Pkwy
Roseville, CA 95661

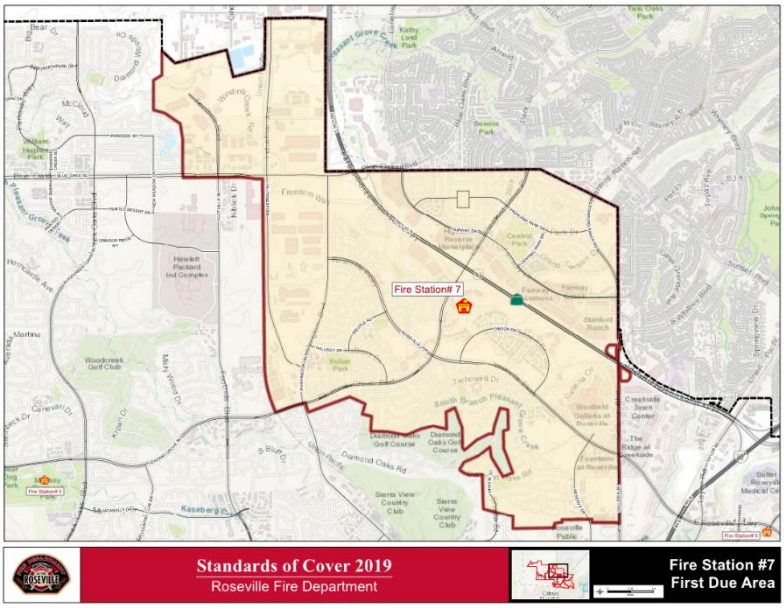
Apparatus	Apparatus Type	Number of Personnel Assigned
Engine 6	Engine	3
Reserve Engine 6B	Engine	Reserve
Brush 6 *2004 International	Wildland	Cross-Staffed
Paramedic Bike 1	Bicycle	1



Fire Station 7

911 Highland Pointe Dr.
Roseville, CA 95661

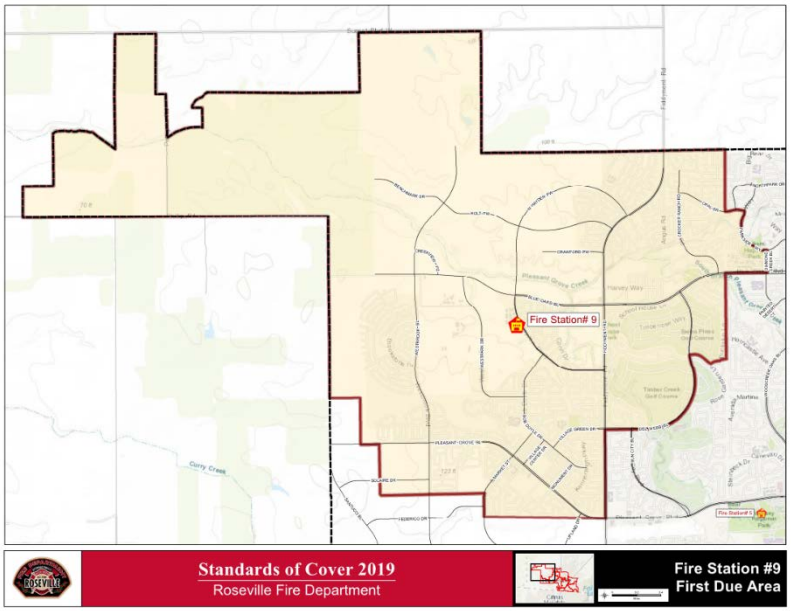
Apparatus	Apparatus Type	Number of Personnel Assigned
Truck 7	Truck	4
Reserve Truck 7	Truck	Reserve
Engine 7	Engine	3
Rescue 7	Specialty	Cross-staffed



Fire Station 9

2451 Hayden Parkway
Roseville, CA 95747

Apparatus	Apparatus Type	Number of Personnel Assigned
Engine 9	Engine	3
Brush 9	Wildland	Cross-staffed



Fire Training Center

2030 Hilltop Circle
Roseville, CC 95678

Apparatus	Apparatus Type	Number of Personnel Assigned
Bauer Air Trailer	Trailer	-
Training 1 *97.425 Spartan	Engine	-
MCI Decontamination Trailer	Trailer	-

The Fire Training Center sits on five acres and serves as a regional training hub providing state certified technical rescue, hazardous materials, and command training programs for Roseville and other public safety agencies. Twice a year, the Roseville Fire Training Center hosts a pre-service Firefighter I Academy in partnership with Sierra College.

The six-story tower contains Class A burn rooms, anchors for high-angle rappelling, forcible entry props, an elevator shaft, SCBA confidence course, simulated building fronts (retail and center hallway), and various search and rescue rooms. Other on-site props include a train derailment prop, multiple hazmat props for rail, transport, and fixed facility simulations, and a roof ventilation prop. The site also houses two multi-use classrooms with office space and a large apparatus building with two bays that house the training engine and the air trailer.

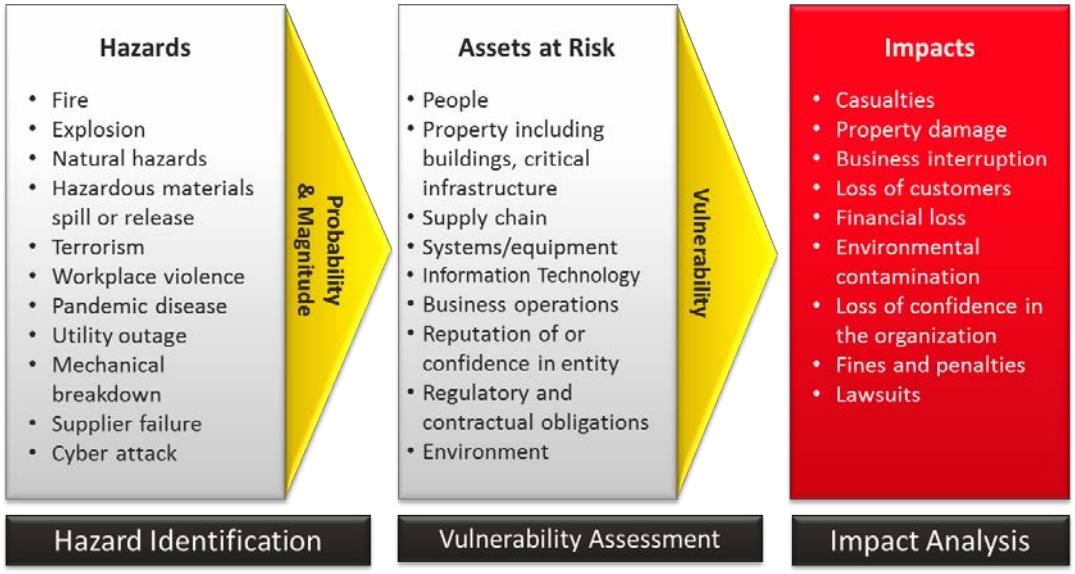
SECTION 3: COMMUNITY RISK ASSESSMENT METHODOLOGY

Risk Assessment Methodology

The City must assess risks based upon the potential frequency (probability of an incident occurring) and consequence (potential damage should an event occur). For example, a dike breach at Folsom Lake has a low probability; however, if a dike breach occurs, it is estimated that numerous areas of Roseville, south of Douglas Boulevard and east of Sunrise, could be 10+ feet under water. The damage and the economic impact are potentially very high. The overall potential damage from routine medical emergencies to the community as a whole is not nearly as significant as that from an earthquake or other natural disaster, although these individual incidents greatly affect those requiring our service. To design future deployment strategies, the Department must be able to compare the potential frequency and damage of events that may affect the community and service area.

Risk assessment is the analysis of the chance of an event occurring and the resulting damage that could occur as a result of the event. Risk management is the practice of committing sufficient resources to address the hazards in the most effective and efficient manner available.

Figure 14: Hazard Identification, Vulnerability Assessment, and Impact Analysis



The relationships between probability and consequence, and the community's adopted service-level goals determine the needed concentration and distribution of resources.

Distribution is the number of resources placed throughout the City. Currently, this can be best described as deploying sufficient resources to provide a 5:00 (300 seconds) travel time 90% of the time

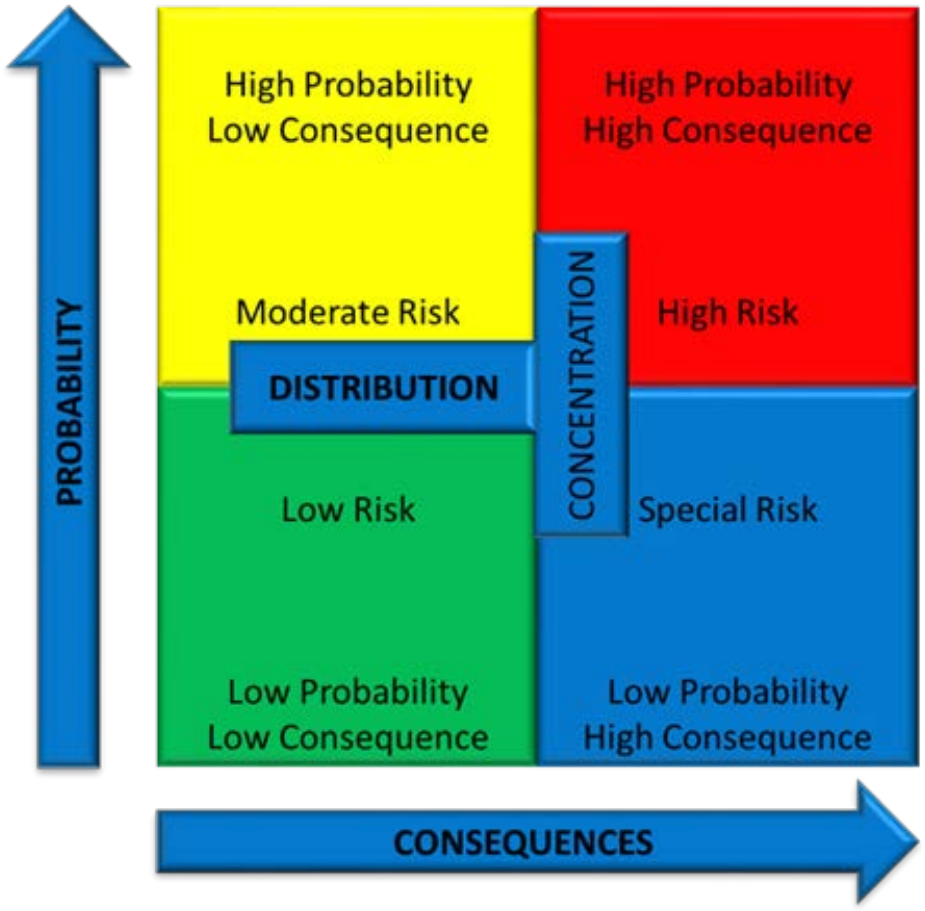
to all residents. Concentration is the number of resources needed in a given area within the City depending on many factors, including the number of calls for service, the risk factors of the area, the availability, reliability, and time of arrival of secondary responding units.

The risk assessment process utilizes a systematic methodology to evaluate the unique risks that are specific to RFD. This process evaluates 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 allow sufficient distribution and concentration of resources to mitigate those risks. This methodology also provides information for the Department to consider alternative solutions to assist in the mitigation of risks.

The overall community risk assessment process and methods utilized by RFD is outlined below.

Figure 15: Community Risk Assessment Process

Figure 16: Probability and Consequence Matrix



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 evaluated by station demand zone and the frequency of incidents. Community risks were evaluated by each program area and risks were 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. The combined results of this process were utilized to classify risk by severity utilizing a probability and consequence matrix for each program/risk area. Finally, the critical tasks required for each level of risk were identified. An example of the overall probability and consequence matrix is provided above (Figure 16).

Resource Management

A critical element in the assessment of any emergency service delivery system is the ability to provide adequate resources for anticipated fire combat situations, medical emergencies, and other anticipated events. Each emergency requires a variable amount of staffing and resources to be effective. Properly trained and equipped fire companies must be notified, respond, arrive, and deploy at the event within specific timeframes and in proper numbers to mitigate the event.

The objective is to have a distribution of resources that is able to reach a majority of events in the timeframe as stated in the service-level goals. There are many factors that make up the risk level, which would indicate the need for a higher concentration of resources.

Risk Factors:

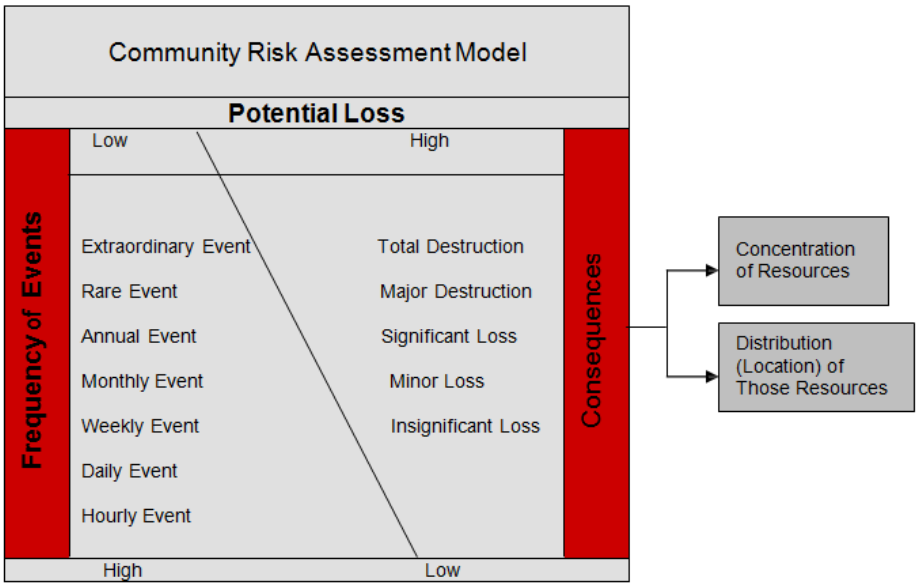
- Inability of occupants to take self-preserving actions
- Construction features
- Lack of built-in fire protection
- Hazardous structures
- Lack of needed fire flow
- Nature of the occupancy or its contents

Evaluation of such factors leads to the number of personnel needed to conduct the critical tasks necessary to contain the event in an acceptable timeframe. The level of service provided by an agency should be based on the agency's ability to cope with various types and sizes of emergencies that the agency can reasonably expect after conducting a risk assessment.

This process starts with examining the most common community risk, the potential fire problem, target hazards, critical infrastructure, and an analysis of historic call data.

Community risk assessment incorporates the various elements of risk among the community as a whole, the frequency of events that occur, the severity of potential losses, and the distribution of those risks. Overall, Roseville and its service areas are likely to have a wide range of potential risks, and there will be an inverse relationship between risk and frequency. The daily event is usually the routine calls that result in minimal losses, while significant events are less frequent. Toward the highest risk levels on the chart, the events are less frequent. If the risk management system is working in the community, a catastrophic loss should be an extraordinary event. The objective of a risk assessment is to reduce the truly serious loss to a very unusual event for the area served and involves trying to keep routine emergencies from becoming serious loss situations.

Figure 17: Community Risk Assessment Model



The purpose of risk assessment is not only to evaluate risks and hazards in the fire department's response area but also to provide a basic methodology to evaluate existing response coverage. The process begins with the identification of community hazards and risks.

- **Hazard** - a source of potential danger or an adverse condition
- **Risk** - the possibility of loss or injury
- The probability of an event multiplied by the significance of the consequence (impact) of the event = Risk.
- Risk = Probability x Impact

To determine the overall community risk and vulnerability, several areas must be assessed.

Evaluating Community Risk

The City of Roseville routinely responds to a variety of risks. Roseville is the economic hub of the region with areas of greatest concentration of retail in the County, the largest railway marshaling yard west of the Mississippi, and two large hospital campuses. The service area encompasses over 44 square miles, not including areas served through automatic and mutual aid. These areas include both a structural and non-structural risk. Non-structural risks include emergency medical, hazardous materials, technical rescue, water rescue, wildland/urban interface, and disasters. Structural risks evaluated included all structures within the service area, major highways, railways and roadways that transverse the area, water, power, communications and other critical infrastructure, as well as items of historical and cultural significance. In order to determine the extent of various risk factors, the Department analyzed the

demographics in the area protected, the building stock, historical call volume, and the existing deployment of resources.

Evaluating Fire Suppression Capabilities

Firefighters encounter a wide variety of conditions at each fire. Some fires will be at an early stage and others may have already spread throughout the structure. This variation in conditions complicates attempts to compare fire department capability. A common reference point must be used so that the comparisons are made under equal conditions. In the area of fire suppression, service-level objectives are intended to prevent the occurrence of flashover, a particular point of a fire's growth that makes a significant shift in its threat to life and property. Fire suppression tasks required at a typical fire scene can vary a great deal. What fire companies must do, simultaneously and quickly if they are to save lives and limit property damage, is to arrive within a short period of time with adequate resources (ERF) to do the critical tasks required. Matching the arrival of resources within a specific time period is the objective of developing a comprehensive SOC.

The Stages of Fire Growth

Virtually all structure fires progress through a series of identifiable stages.

- **Ignition** - the inflammation of a fuel source takes place. Ignition may be caused by any number of factors–from natural occurrences, such as lightning, to premeditated arson.

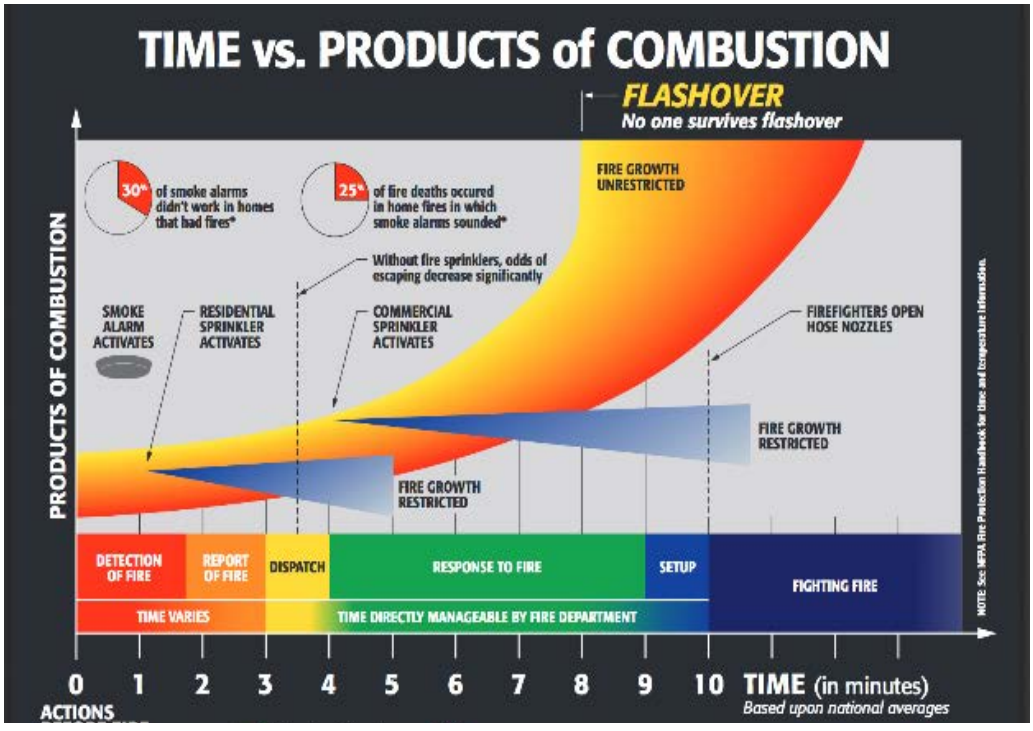
- **Growth Stage** - during this stage of a fire, heat breaks down the fuel source so that it turns into a gas which is capable of combustion. A fire in this stage is typically considered to be fuel-limited meaning that there is less fuel available for consumption than there is oxygen. The primary method of heat transfer during this stage is through convection. Inhaling the products of combustion is the primary life hazard during this stage.

- **Flashover Stage** - as a fire continues to grow and produce more fuel, it begins to pre-heat all of the material in the room--furniture, wall coverings, floor coverings, window coverings, all begin to off-gas and produce pre-heated fuel. Once all of the fuel, or smoke, in the room reaches its ignition temperature (which varies depending upon the material, anywhere from 400-900 degrees Fahrenheit), it will all simultaneously ignite. Temperatures during flashover can range from 800-1,700 degrees Fahrenheit. Both scientific tests and field observations have shown that when flashover is experienced, fire growth is exponential and can quickly overwhelm firefighting resources. Human survival after this point is highly improbable without specialized protective equipment. Flashover can occur multiple times during a structure fire.

- **Fully Developed Stage** – all of the available fuel is involved in combustion. A fire in this stage can free-burn until it becomes fuel-limited or ventilation-limited. One breath of the superheated air can sear the lungs.

- **Decay Stage** - A fire in this stage may be either fuel-limited or ventilation-limited. In a fuel- limited fire, the fire has either burned all of the available fuel or it is no longer producing enough fuel to support combustion. In ventilation- limited fires, the fuel no longer has enough oxygen available to support combustion. Understanding fuel- limited and ventilation- limited fires allows firefighters to use tactics to extinguish fires. For example, by applying water to a fire, one is able to cool the fuel which decreases the amount of fuel being produced to the point where combustion is no longer supported. This would be an offensive tactic based on the premise of a fuel-limited fire. During the decay stage, large volumes of smoke and toxic gases are produced. Most fire deaths occur as a result of inhaling these gases. Temperatures rise throughout this stage to over 1,000 degrees Fahrenheit in compartmentalized spaces, creating the hazard of "backdraft" or smoke explosion. This stage can vary in time from a few minutes to several hours. When sufficient oxygen is present, the fire will progress to the free-burning phase.

Figure 18: Example of Traditional Time Temperature Curve



Dynamics of Fire in Buildings

Most fires within buildings develop in a predictable fashion unless influenced by highly flammable material. Ignition, or the beginning of a fire, starts the sequence of events. It may take several minutes or even hours from the time of ignition until a flame is visible. This smoldering stage is very dangerous, especially during times when people are sleeping, since large amounts of highly toxic smoke may be generated during this phase; hence the importance of smoke alarms to provide early notification to the occupants.

Once flames do appear, the sequence continues rapidly. Combustible material adjacent to the flame heat and ignite which in turn heats and ignites other adjacent materials if sufficient oxygen is present. As the objects burn, heated gases accumulate at the ceiling of the room. Some of the gases are flammable and highly toxic.

Soon the flammable gases at the ceiling, as well as other combustible material in the room of origin, reach ignition temperature. At that point, an event termed "rollover" occurs; the gases near the ceiling level ignite and cause increased pre-heating of materials and gases. Once pre-heated gases have been produced, an event termed "flashover" occurs; the gases from ceiling to floor ignite, which in turn ignites everything in the room. Once flashover occurs, damage caused by the fire is significant and the environment within the room can no longer support human life.

Due to the high heat release rates of modern furnishings and building materials, flashover may occur in as little as two to three minutes from ignition. Since flashover has such a dramatic influence on the outcome of a fire event, the goal of any fire agency is to apply water to a fire before flashover occurs. This is where quick response times are pivotal.

Although modern building codes tend to make fires in newer structures more infrequent, today's energy-efficient construction, specifically designed to hold heat during the winter, also tends to confine the heat of a hostile fire. In addition, research has shown that due to the use of synthetics, modern furnishings generally burn hotter.

In the 1970s, scientists at the National Institute of Standards and Technology (NIST) found that after a fire broke out, building occupants had about 17 minutes to escape before being overcome by heat and smoke. Today, that estimate is as short as three minutes. The necessity of effective early warning from smoke alarms, early suppression from fire sprinklers, and the proper number of firefighters arriving on the scene of a fire in the shortest span of time is more critical now than ever.

Perhaps as important as preventing flashover is the need to control a fire before it does damage to the structural framing of a building. Materials used to construct buildings today are often less fire resistive than the heavy structural skeletons of older frame buildings. Roof trusses and floor joists are commonly made with lighter materials that are more easily weakened by the effects of fire. Light weight roof

trusses fail after five to seven minutes of direct flame impingement. Plywood I-beam joists can fail after as little as three minutes of flame contact. This creates a dangerous environment for firefighters.

In addition, the contents of buildings today have a much greater potential for heat production than in the past. The widespread use of plastics in furnishings and other building contents rapidly accelerate fire spread and increase the amount of water needed to effectively control a fire. All of these factors make the need for early application of water essential to a successful fire outcome. A number of events must take place quickly to make it possible to achieve fire suppression prior to flashover. The following table illustrates the sequence of events.

Table 14: Sequence of Events Pre-Flashover to Post-Flashover

Pre-Flashover = 0 to 6 minutes	**Post-Flashover = 6 to 10 minutes**
Limited to one room	May spread beyond one room
Requires smaller attack line	Requires larger, more attack lines
Rescue of trapped occupants more likely	Trapped occupants not likely to survive
Less firefighters are needed	More firefighters are needed
Structure and possessions more likely to be salvaged	Structure and possessions damaged beyond repair

Impact of Residential Fire Sprinklers

In January 2010, California adopted the 2009 International Residential Code, including its requirements for automatic fire sprinkler systems in new one- and two-family dwellings. The sprinkler requirement became effective statewide on January 1, 2011.

The complete impact of residential sprinklers on deployment models may take years to fully realize, but reasonable assumptions can be made with regard to the deployment of future Department resources. NFPA data on reported fires in the U.S. from 2007 – 2011 show that for fires reported in single-family homes, the risk of death decreases by about 80% and direct property damage is reduced by about 70% when sprinklers are present.

With increasing numbers of new homes being built in Roseville, all of which are equipped with automatic fire sprinkler systems, the Department needs to continue its fire safety education and outreach.

Facts that should be communicated include:

- Sprinkler systems are designed to keep fire contained long enough to allow occupants to exit, not to fully extinguish the fire. A fire department response is still necessary.
- Sprinkler systems do not control fires outside the home.
- Sprinkler systems do not lessen the need for fire stations, but will lessen the need for multiple units responding.

Evaluation of EMS Capabilities

The morbidity and mortality rates of critically ill or injured patients in an emergency system is directly proportional to the time of rapid access to the 9-1-1 system, accurate assessment of needs, and timely intervention with ALS skills.

Human body systems cannot survive without adequate oxygen being delivered to each body cell by a heart that is functioning properly and blood vessels that are supporting the transfer of oxygenated blood. Those organs most readily affected are the brain, heart, and kidneys. Timely emergency response is key to keeping those organs alive and oxygenated to prevent further destruction and ultimate death.

Cardiac arrest, stroke, critical trauma, and shock are all known as "time-sensitive" diseases that, without rapid response and intervention, will result in severe disability or death. Fire department rapid response is crucial in an EMS system aimed at serving the community to promote a safe and healthy environment.

Cardiac arrest is the leading cause of death in the United States with 424,000 deaths annually. Early CPR and early defibrillation are often called the critical links in the chain of survival because they are the only way to successfully treat most incidents of sudden cardiac arrests. When cardiac arrest occurs, the heart starts to beat chaotically (fibrillation) and cannot pump blood efficiently. Time is critical. If a normal heart rhythm is not restored within minutes, the person will die. In fact, for every minute without defibrillation, the odds of survival drop 7%-10%.

Figure 19: Survival Rate by Time to Defibrillation

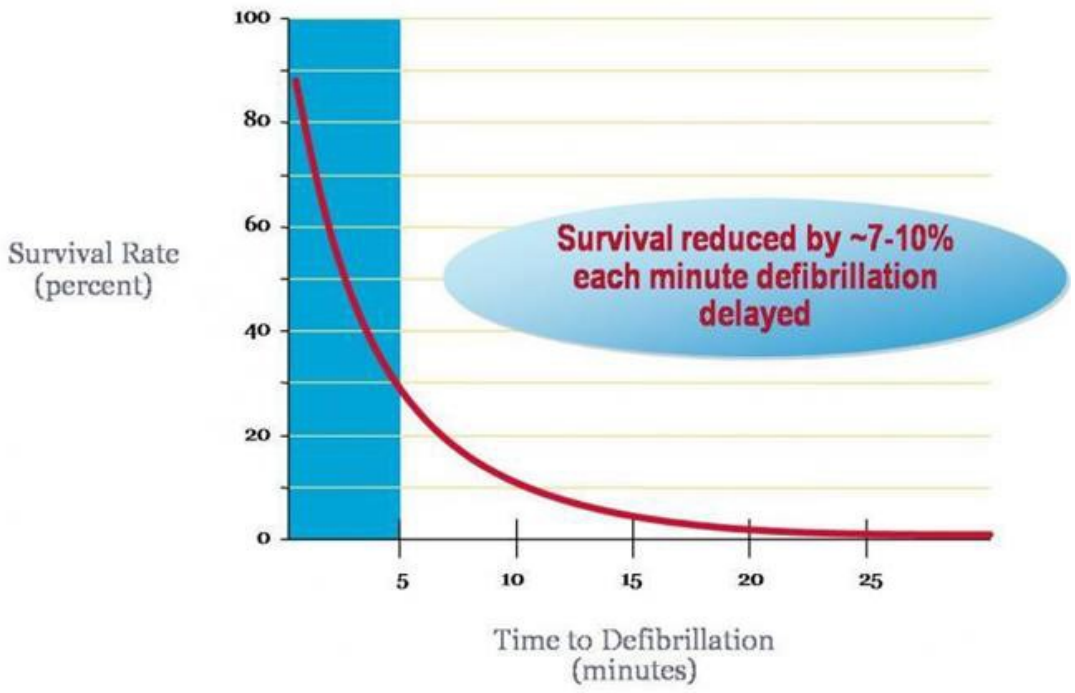
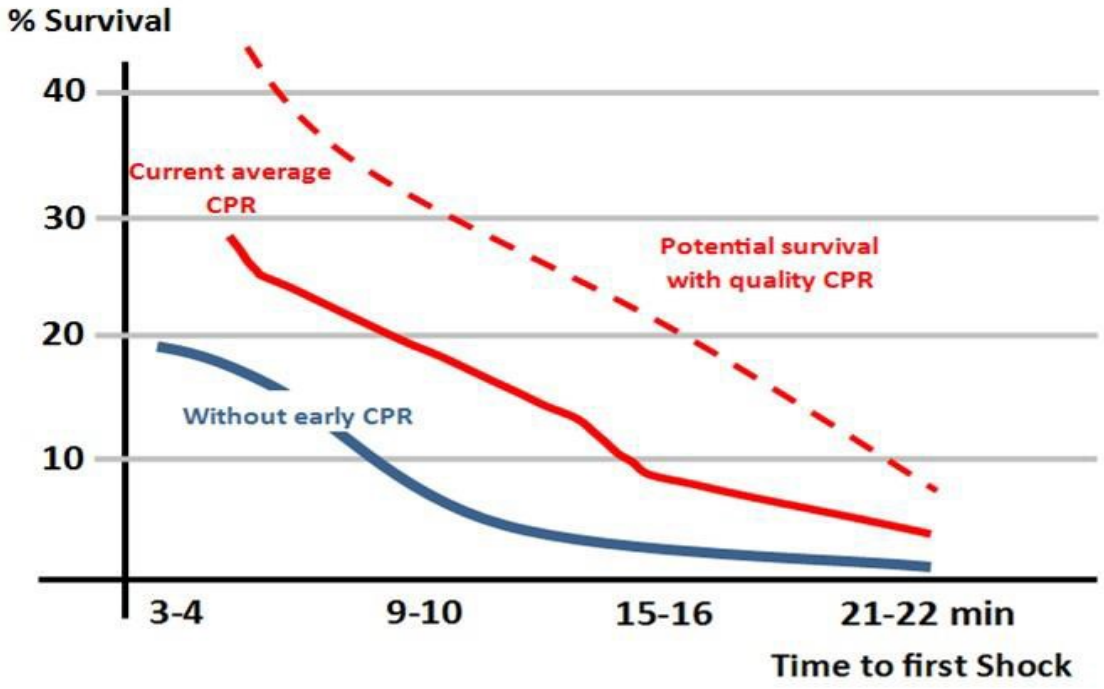


Figure 20: Survival Rate by Time to First Shock

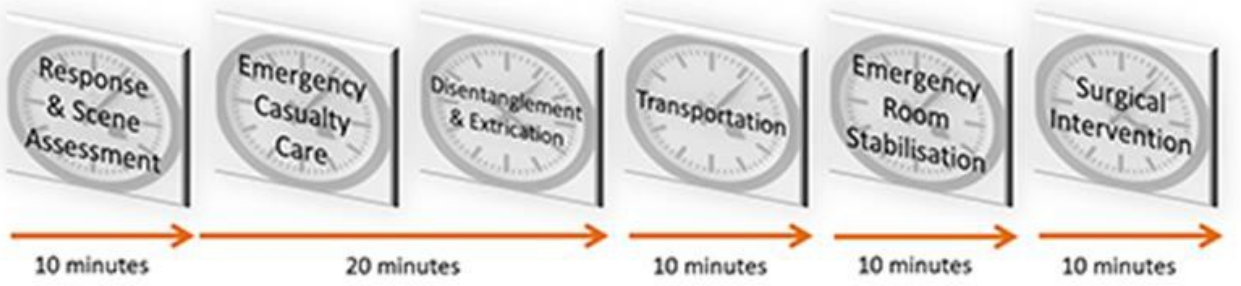


The shortest possible response times create the highest probabilities of resuscitation. An important evaluation point lost on most agencies is the amount of time it takes a crew to reach the patient's side. Often the clock stops when the vehicle arrives or stops at the address. The key to a successful outcome is the point the patient is actually contacted. Consideration of actual patient contact must be made when evaluating total response time for EMS calls. This time period can be substantial and can most certainly affect patient outcome due to delayed intervention.

Critical Trauma

Critical trauma is the fourth leading cause of death in the United States, and requires prompt treatment on scene and rapid transport to a trauma center for best patient outcome.

Figure 21: Critical Trauma Timeline



Response Time Importance

Timely arrival of appropriately equipped firefighters and paramedics is essential to saving lives and controlling fires before they escalate. The importance of processing 9-1-1 calls, alerting the appropriate personnel, and sending the closest, most appropriate resource cannot be over emphasized. Timely arrival of well-trained and equipped personnel can make a big difference in the outcome.

Two commonly referred to criteria used to quantify the importance of a timely fire department response include:

- The time of flashover in a structure fire where a fire goes beyond control capability of a single alarm.

- The time on an EMS call where irreversible brain damage and chances for successful resuscitation are greatly reduced for patients who are pulseless and non-breathing.

SECTION 4: ROSEVILLE RISK ASSESSMENT

Risk Assessment

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, or property damage resulting from hazards. The SOC document reviews the hazards identified in the 2011 Roseville Multi-Hazard Mitigation Plan (RMHMP), which have been identified as likely to occur in Roseville. It meets the requirements of Title 44 of the CFR (Section 201.6.c.2) for risk assessment of hazards, and it also looks at the possible impacts of human-caused and human-health hazards.

Chapters 10 through 18 of the RMHMP describe the risks associated with the identified hazards of concern for the City of Roseville. Each chapter elaborates on one hazard, the City's vulnerability to that hazard, and probable event scenarios. The 2016 Progress Report to the RMHMP assesses the progress made since the plan was approved by FEMA on March 28, 2011. As of the most recent reporting period, 63 hazard mitigation initiatives were pursued during this five-year performance period.

The RMHMP addresses the probable impact of the following natural hazard events in the City of Roseville along with in-depth reports on loss estimates, impacts, and secondary hazards. Appendix B has maps of various risks identified in the RMHMP.

1. Dam Failure
2. Drought
3. Earthquake
4. Flood
5. Human-Caused Hazards
   - Terrorism and Weapons of Mass Destruction
   - Technological Hazards
   - Hazardous Materials
   - Industrial Fixed-Facility Hazardous Materials
   - Hazardous Materials Transportation
   - Pipeline Facilities
   - Agricultural
   - Radioactive
   - Utility Losses
   - Data and Telecommunications
   - Water/Wastewater Disruption
   - Air and Transportation Accidents Facilities
   - Infrastructure Threats
   - Business and Industrial Areas
6. Human-Health Hazards
7. Influenza, H1N1, H5N1, Small Pox, Vital Hemorrhagic Fever, Plague, Tularemia, Encephalitis, Malaria, West Nile, Lyme Disease, Anthrax, Severe Acute Respiratory Syndrome
8. Severe Weather
9. Structure/Wildland Fires
10. Landslides

Roseville Emergency Operations Plan

The City of Roseville Emergency Operations Plan (EOP), directs the City of Roseville Emergency Management Organization, coordinates the actions of the Emergency Operations Center (EOC) staff, establishes operational priorities, ensures development and implementation of strategies to meet the needs of the emergency, works with local elected officials on issues related to emergency response and recovery, identifies procedures for evacuation, communicates with the media, coordinates response with outside agencies, and ensures the safety of the responders. The EOP follows the Standardized Emergency Management System (SEMS) format required under Government Code § 8607. SEMS is a standardized system that enhances the ability of local jurisdictions to coordinate emergency response activities. City and special district EOCs are required to use the same SEMS management functions (management, operations, planning, logistics, and finance) in order to facilitate interagency communication and coordination.

Management staff from all departments within the City of Roseville participate in EOC drills twice annually. A County-wide Web EOC platform is utilized during EOC activations and practiced with during each EOC drill. In addition, every two years the City of Roseville participates in a regional, large-scale training that challenges various components of emergency response.

Roseville Property Types and Risk Breakdown

Fire Risk Assessment

The Department has identified risk hazards for each type of occupancy within the City based upon NFPA business occupancy codes. Premise information and pre-fire plans are established for risks that pose a high life hazard, high property loss, conflagration hazard, or contain hazardous materials. The assessment of each commercial building is completed during annual inspections by Fire & Life Safety personnel.

Many factors were considered when defining the types of fires that fall into the risk categories of low, moderate, high, and maximum, including:

- Hazards – Hazards pose or create a threat to life, health, property, or environment. The known presence of hazards may increase risk. This includes the potential for high-risk activities or human behavior.
- Mitigating factors – There are factors that can affect the probability and consequences of an incident. Positive factors include engineered systems, regular fire inspections, proper maintenance, proper storage, and awareness by occupants (fire drills, evacuation plans). Negative factors are the absence of any of these.

- Population – The time of day when structures are primarily occupied can influence an effective response, as well as whether or not the occupants are ambulatory.
- Potential loss – Loss can include the value of the structure and contents damaged or destroyed (direct loss), as well as loss of revenue, employment, historical significance, infrastructure, or government continuity (indirect loss).
- Occupancy type – Certain occupancy classes are inherently high risk. Considering the other factors above, RFD placed occupancy classes in each risk category.

Table 15: Descriptions of Fire Risk Categories

Fire Risk Category	*General Description of Associated Risk*
Low	Car fires, dumpster fires, small outside structure fires, and other small fires that do not endanger occupied structures.
Moderate	Small to medium commercial occupancies with fire suppression systems, multi-family residence or hotels with fire suppression systems, single family residence, business and assembly with fire suppression systems, and large businesses with fire suppression systems. *CFC Occupancy classes: A-4, A-5, B (with fire suppression systems), E, H-4, I-3, I-4, F-2, R-2 (with fire suppression systems), R-4, S-2, M (with fire suppression systems), & U occupancies.*
High	Assisted living facilities, large industrial/manufacturing, assemblies without fire suppression systems, large commercial/big box, and small to medium commercial without fire suppression systems. *CFC Occupancy classes: A-1, A-3, B (without fire suppression systems), F-1, H-1, H-2, H-3, H-5, I-1, I-2, M (without fire suppression systems), and S-1 occupancies.*

Table 16: California Fire Code Occupancy Classifications

California Fire Code Occupancy Classifications	
A-1, A-2, A-3, A-4, A-5	Assembly
B	Business
E	Educational
F-1, F-2	Factory and Industrial
H-1, H-2, H-3, H-4, H-5	High Hazard
I-1, I-2, I-3, I-4	Institutional
M	Mercantile
R-1, R-2, R-3, R-4	Residential
S-1, S-2	Storage

Occupancy Level Risk

Occupancy risk was evaluated across the jurisdiction utilizing data provided by ISO that independently rates buildings within a community.

The occupancy level risk assessment process utilized the following variables:

- Needed fire flow
- Presence of a sprinkler system
- Construction classification type
- Building combustion classification
- Number of stories
- Total square footage

The risk ratings were adjusted if the building had an automatic sprinkler system. Ultimately, a risk-rating matrix was developed that categorized 1,060 occupancies within the jurisdiction into high, moderate, and low risks.

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 in the matrix for a more realistic risk factor rating. The results of the risk assessment process categorized the 1,060 occupancies into 23 high-risk structures, 869 moderate-risk structures, and 168 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 high-, moderate-, and low-risk structures are presented on the following pages. From a broad perspective, this provides validation to the risk assessment process developed within the Department as well as the necessary deployment strategy to cover the historical demand for services.

Table 17: Occupancy Level Risk Matrix

Risk Class	Fire Flow		Number of Stories		Square Footage		Construction Class		Building Combustion Class		Full Credit Sprinkler System (Yes/No)	Total Risk Score
	Value	Scale	Value	Scale	Value	Scale	Value	Scale	Value	Scale	Value	Scale
High	3	≥ 1500 gpm	5	≥ 4	5	>=100k GPM	5	Combustible or Frame	5	Quick Free and Rapid Burning	-10/0	≥ 16
Moderate	2	> 499 and < 1500 gpm	3	> 1 and < 4	3	> 10k gpm < 100k GPM	3	Joisted Masonry	3	Combustible	-10/0	>6 and <16
Low	1	≤ 499 gpm	1	1	1	< 10k GPM	1	Non-Combustible Masonry Non-Combustible Fire Resistive	1	Slow Non/Limited Combustible	-10/0	≤ 6

Figure 22: High-Risk Occupancies by Station Demand Zone

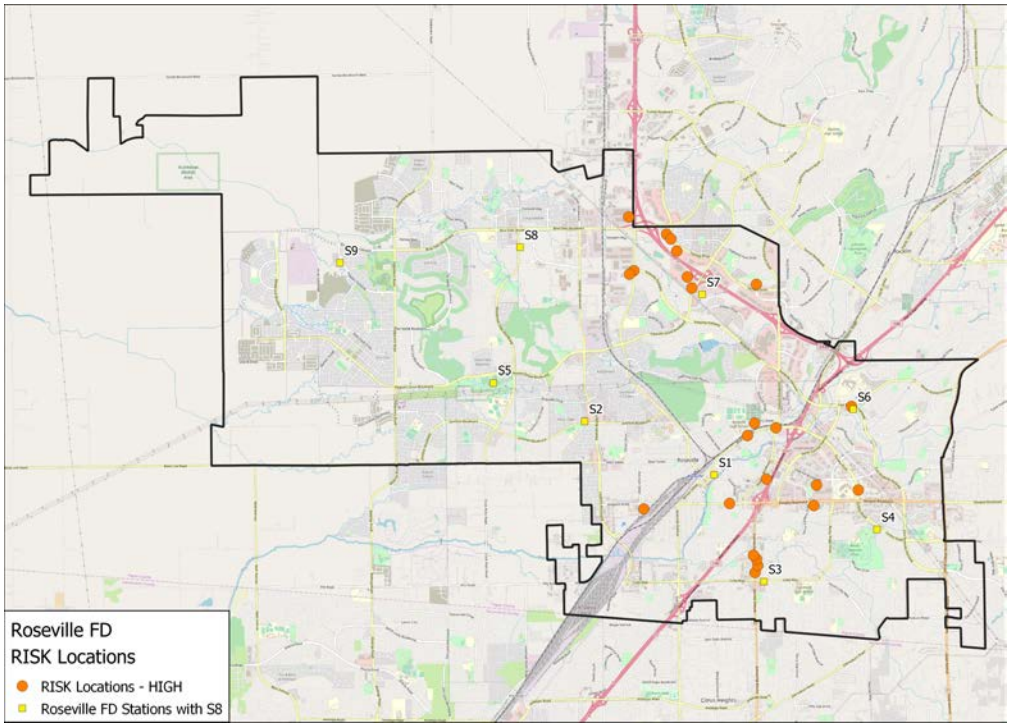


Figure 23: Moderate-Risk Occupancies by Station Demand Zone

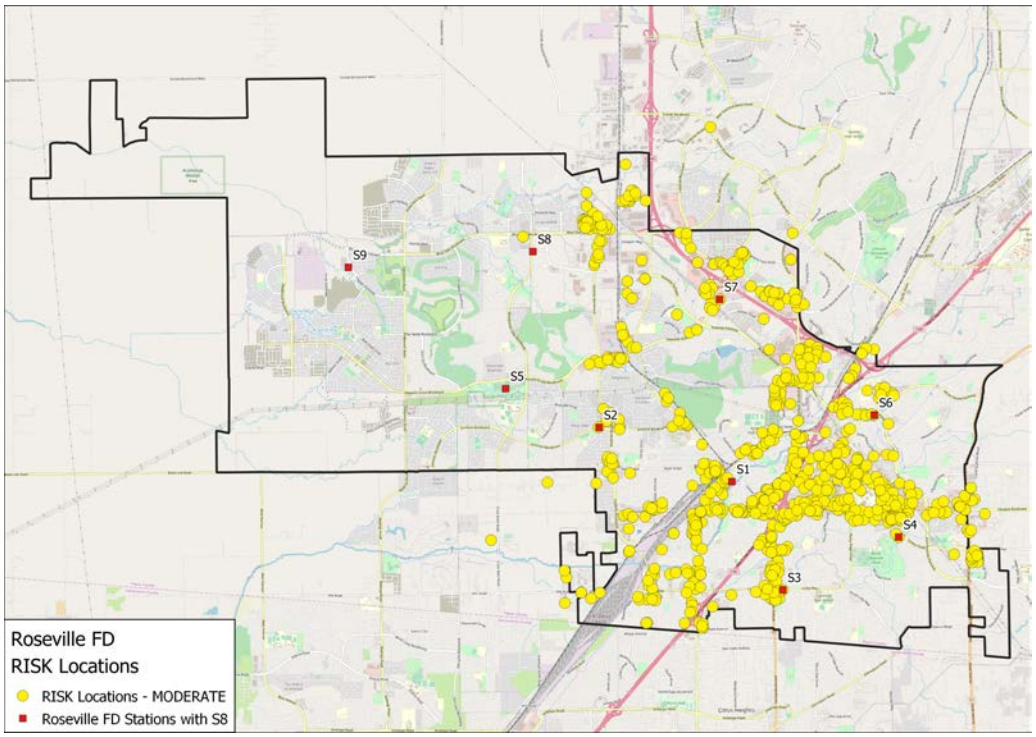
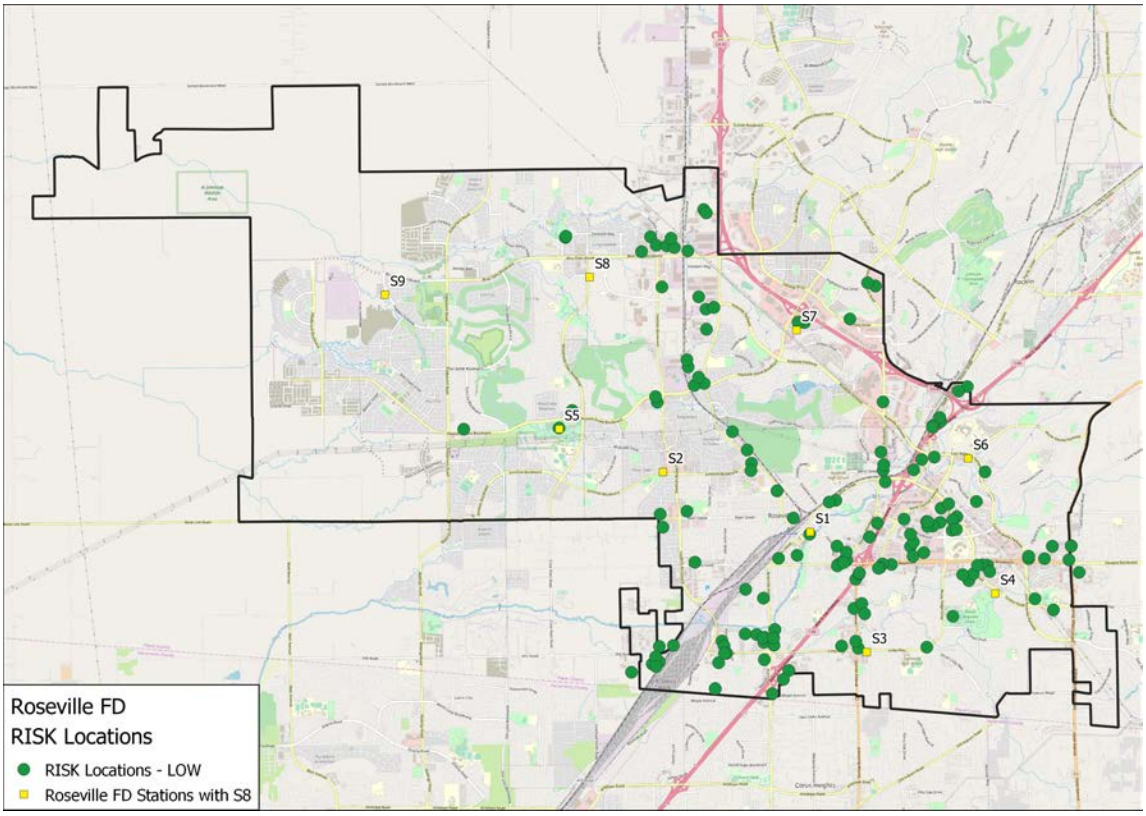


Figure 24: Low-Risk Occupancies by Station Demand Zone



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 with the necessity of higher concentrations of resources. In addition, several measures were used that both serve the distribution aspect of the risk evaluation, and contribute to the need for higher concentrations of resources. For example, a higher call volume may 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 18: Station Demand Zone Risk Concentration Matrix

Station Demand Zone	Community Demand	Call Concurrency	High/Moderate Risk Occupancies	Total risk Score	Risk Rating
1	6	3	5	26.92	Moderate
2	4	2	1	6.48	Low
3	5	4	4	22.98	Moderate
4	4	3	2	11.05	Low
5	4	3	1	9.19	Low
6	4	2	4	13.86	Low
7	5	3	4	19.61	Moderate
9	4	2	1	6.48	Low

Overall, the risk assessment identified that the majority of station demand zones are of low risk (Stations 2, 4, 5, 6, and 9) and that there are three moderate-risk stations (Stations 1, 3, and 7).

Emergency Medical Services Risk Assessment

Requests for EMS are the most frequent type of service provided by RFD. EMS incidents account for approximately 65% of emergency activities and correspondingly have the greatest impact on the

Department's resources. The residential and daytime population is a significant factor in assessing the probability of EMS incidents. There is a range of EMS incident types from single-patient single-unit response to multi-casualty incidents with six or more patients. Residences and specialized buildings house at-risk populations that require a greater response both under fire and EMS conditions. Less than 1% of EMS responses require additional personnel; the majority are handled by a single engine and ambulance.

Certain building types have inherent risks to life due to the age of occupants, such as care homes, or patient mobility issues, such as in hospitals, where self-evacuation would not be possible. Emergencies within these buildings would require numerous additional resources. Risk assessments are conducted to identify these buildings that pose response challenges and provide for response augmentation.

Table 19: EMS Building Risk Classifications and Examples

Risk	Building Classification	Example
Low	R-1 /R-3.1	Best Western/ Holiday Inn / Bonita Home Care / Estera's Home Care (RCFE's)
Medium	R-2 (Large Apartments & Senior Living)	Mistywood Living / Roseville Commons / Autumn Oaks Apts./ Cirby Oaks Apts./ Vintage Square Sr. Apts.
High	I-2 / I-2.1/ I-3 /I-4	Sutter Hospital /Terraces of Rsvl / Emeritus Sr. Living / PC Jail / Aim Higher

Table 20: EMS Building Risk Count

Structure Count				
Station	**HIGH**	**MODERATE**	**LOW**	**Grand Total**
1	3	83	10	96
2	2	14	17	33
3	10	46	17	73
4	4	11	5	20
5		5	16	21
6	3	6	15	24
7	2	7	21	30
9	1	3	6	10
Grand Total	**25**	**175**	**107**	**307**

Hazardous Materials Risk Assessment

The City contains several large industrial firms, three of which are classified as high-risk based on the risk assessment model and are required to complete release plans based on the California Accidental Release Prevention (CalARP) program. CalARP facilities are those that require that an owner or operator of a business handling more than the threshold quantity of a regulated substance, evaluate the use of the substance to determine the potential for, and impacts of, an accidental release. Under the CalARP regulations, these facilities must submit a Risk Management Plan (RMP). The RMP is used to determine potential accident factors and to implement measures to reduce the accident potential. Information contained within an RMP includes the following: safety information, process hazard analysis/hazard review, operating procedures, training, maintenance, compliance audits and incident investigations. Documents and records showing that the facility is implementing the program are also required to be regularly provided.

Eleven industrial fixed-facilities categorized as high risk based on the risk assessment model are included in the map section of Appendix B. There are approximately 667 Certified Unified Program Agency (CUPA)

sites within the City. The Union Pacific switchyard in Roseville, the largest rail marshaling yard west of the Mississippi, presents many serious hazards. The site encompasses 106 miles of track and 60 miles of main line. Not only does it split the City, it is very close in proximity to the heavily populated retail and residential districts. Additionally, one million shipments of hazardous materials are transported in bulk through the City of Roseville annually.

Occupancy level data for hazardous materials sites were geocoded by station response area. Overall, the highest number of hazardous materials occupancies were located in the response area of Station 7 at 186, followed by Station 3 at 135, and Station 1 at 109.

Table 21: Hazardous Materials Building Risk Classifications and Examples

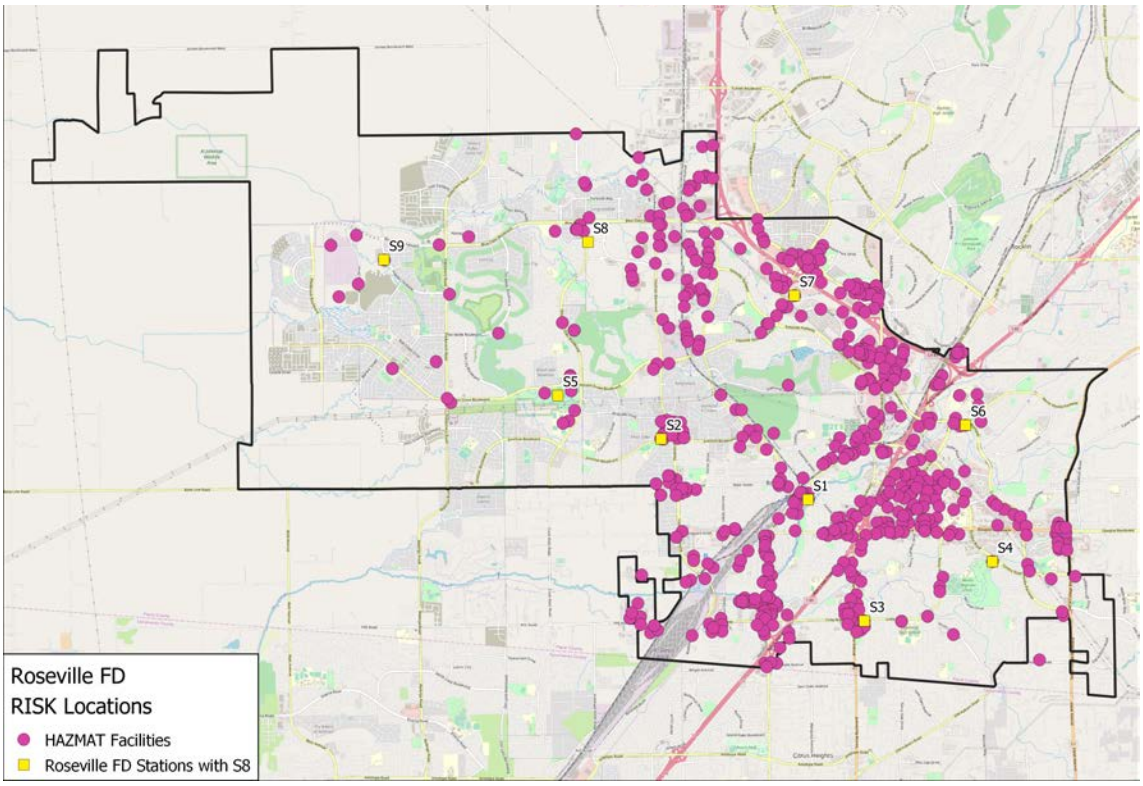
Risk	Building Classification	Example
Low	B / S / M	Cell Site / Cleaners
Medium	H-1 / H-2 / H-3	Metal Finishing
High	H-4 / H-5	Union Pacific Rail Yard / CalARP Sites (TSI, SaveMart Distribution, HB Fuller)

Table 22: Summary Count of Hazardous Materials Sites by Station Area

Current Stations	Stations								
Type	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S9**	**Grand Total**
HAZMAT	109	68	135	31	14	115	186	19	677
Grand Total	**109**	**68**	**135**	**31**	**14**	**115**	**186**	**19**	**677**

In addition, all hazardous materials locations were plotted on a map that includes all station locations plus Station 8. If Station 8 is included, Stations 2, 5, 7, and 9 reduce their respective number of hazmat sites and Station 8 would have 69 locations within its jurisdiction.

Figure 25: Hazardous Materials Sites by Station Area



Critical Facilities and Infrastructure

Critical and essential facilities and infrastructure are those that are critical to the health and welfare of the population. These become especially important after a hazard event. For the purpose of this document, a definition specific to Roseville considers the following criteria:

Facilities which are vital for the City's ability to provide essential services and protect life and property. Facilities whose loss would have a severe economic or catastrophic impact.

A database of critical facilities in Roseville was created to identify vulnerabilities to each hazard addressed in this plan. The Department has created a database of senior and childcare facilities so responders are aware of the special fire hazard that might require additional assistance in the event of a fire or mass-casualty incident. These special populations typically cannot self-extricate and require additional assistance.

Maps of critical infrastructure are provided in Appendix B.

SECTION 5: CRITICAL TASK ANALYSIS

On-scene operations, identification of critical tasks, and an effective emergency response force are the key elements in determining appropriate staffing levels, the number of companies needed, optimal deployment strategies, and the priority duties to be performed on the fire ground or emergency incident scene. Effective all-hazards fire departments must be able to determine what tasks need to be completed and in what order, the number of personnel needed, and the type of apparatus required to complete the identified tasks to have a positive influence on the outcome of the situation.

On-Scene Operations

The variables of fire growth dynamics along with property and life risks combine to determine the fire ground tasks that must be accomplished, and to a certain extent, the order in which they must be accomplished, to preserve life and mitigate loss. Critical tasks are interrelated, but can be separated into two basic types: 1) fire control and property conservation and 2) life safety.

Fire control tasks are those related to applying a fire suppression agent, generally water, on the fire and removing the products of combustion from an enclosed environment. Life safety tasks are those related to finding trapped, disoriented, or incapacitated victims, and safely removing them from the structure or shielding them from the hazard.

Fire control tasks are generally accomplished by using one of two methods: hand-held hose lines or master streams. Handheld hose lines are mobile and produce water flows up to 250 gpm. These are generally used during interior, offensive firefighting activities. Master streams are generally used from stationary positions, and produce flows up to 1,000 gpm. They are primarily used during exterior, defensive firefighting activities.

The decision to use either hand-held lines or master streams depends upon the stage of the fire, the identified threat to life safety and adjoining property, and the specific strategy and tactics employed by the fire incident commander when sufficient firefighting resources have reached the scene. If the fire is in a pre-flashover stage, firefighters can make an offensive fire attack into a building by using hand lines to attack the fire and shield trapped victims until they can be safely removed from the structure.

If a fire is in a post-flashover stage and has extended beyond the capacity or mobility of hand-held hoses, or if the structural damage and the threat of building collapse present a significant risk to the safety of firefighters on scene, the structure may be declared a loss. In this situation, master streams are positioned to extinguish the fire and keep it from advancing to surrounding exposures.

Life safety tasks assigned are based upon the number of occupants, their location, their status (e.g., awake, unconscious), and their ability to take effective self-preserving action. For example, ambulatory

adults need less assistance than non-ambulatory adults or children. The very young and old generally require more assistance, which requires greater resource utilization.

The key to any fire department's success at a fire incident always includes a rapid response and efficient fire scene deployment, as well as adequate staffing and coordinated teamwork. These key elements are relevant regardless of whether the fire ground tasks are all fire flow related or a combination of fire flow and life safety.

Critical Tasks and On-Scene Performance for Fires

Fires

Critical tasks are those that must be conducted in a timely manner by firefighters at structure fires in order to control the fire prior to flashover, or to extinguish the fire in a timely manner. Fire departments are responsible for ensuring that responding companies are capable of performing all of the required tasks in a prompt and proficient manner.

The rapid and effective performance of highly coordinated assigned tasks is the hallmark of a successful ERF. Time and on-scene performance expectations are the target indicators established for measuring the operational elements including individuals, crews, and work units that make up the Department's response-ready resources. RFD has developed Standard Operating Evolutions that are sub-categorized into: Individual, Engine, Truck, RIC, Pumping, NFPA, and Medical Evolutions. All companies train regularly on these Standard Operating Evolutions to develop proficiency as well as a means to time and evaluate company performance for critical fire ground tasks. Cumulative data collection from Standard Operating Evolutions also allows for the development of standard expected times to complete a task, based on the average time of completion.

SOG 1.08.0050 - *Standard Company Evolutions*, outlines the importance of doing critical tasks on fire emergencies in a timely manner.

The initial fire ground actions begin with the arrival of the first company and continue, sequentially or in parallel, as tasks are completed and additional resources arrive. Initial deployment tasks are fairly standard, but are based on the difficulty of the situation faced. The table below outlines the minimum number of personnel to begin basic deployment tasks on a typical residential structure fire within the first 5 to 15 minutes after arriving.

Table 23: Critical Tasks for a Low-Risk Fire

Task	Personnel	Units
Size-Up/Command	1	1st Engine
Attack Line	1	1st Engine
Pump Operator	1	1st Engine
Initial Attack Personnel	3	1 Fire Apparatus

Table 24: Critical Tasks for a Moderate-Risk Unconfirmed Working Structure Fire

Task	Personnel	Units
Size-Up and Command	1	Battalion Chief
Attack Line	2	1st Engine
Pump Operator	1	1st Engine
Rescue or Primary Search	2	2nd Engine
Water Supply or FDC	1	2nd Engine
Two Out /Back Up Line	2	1st Truck
RIC/Utilities & Safety	2	1st Truck
Initial Attack Personnel	11	3 Fire Apparatus + BC

If the fire continues beyond initial attack, then the scope of personnel necessary to provide immediate task-level duties escalates rapidly and can quickly overwhelm any department. The high-risk response for a working structure fire in Roseville sends 21 firefighters on four engines, two trucks, and one Battalion Chief. The table below reflects a high-risk large residential structure fire or a basic commercial fire. Eleven personnel are the minimum needed to complete the basic initial critical tasks for a working fire; however, it is RFD's policy that more than 11 personnel respond to all confirmed working fires.

Table 25: Critical Tasks for a Confirmed Working or High-/Special-Risk Structure Fire

Task	Personnel	Units
Size-Up/Command	1	Battalion Chief
Attack Line	2	1st Engine
Pump Operator	1	1st Engine
Back Up Line	2	4th Engine
Rescue/Primary Search	2	2nd Engine
Water Supply/FDC	1	2nd Engine
Two Out / Utilities & Safety	3	3rd Engine
Forcible Entry / Ventilation	4	1st Truck
Rapid Intervention Team	4	2nd Truck
Air/Lights/Rehab	1	4th Engine
Initial Attack Personnel	21	6 Fire Apparatus + BC

EMS

The following hazard levels have been established for EMS risk:

- **Low-Risk:** Injured and ill persons, without airway, breathing, or circulatory problems.
- **Moderate-Risk:** Pin-in, multiple vehicles, patients meeting trauma center criteria, or other specialty center criteria.
- **High-Risk:** Multi-victim incidents with five or more patients.

Table 26: Critical Tasks for Low-Risk EMS

Task	Personnel	Units
Number of Staff Command / Safety	1	1st Engine
Patient Assessment / Patient Interview	1	1st Engine
Documentation / Medical Control	1	1st Engine
Patient Care / Handling / Equipment	2	Ambulance
Total ERF Low EMS	5	1 Fire Apparatus

Table 27: Critical Tasks for Moderate- and High-Risk EMS

Tasks	Personnel	Units
Number of Staff Command / Safety	1	Battalion Chief
Scene Safety	1	1st Engine
Patient Assessment / Patient Interview	2	1st Engine
Extrication	2	1st Truck
Hose Line	2	2nd Engine
Patient Care / Handling / Equipment	2	1st Truck & Amb.
Total ERF Moderate EMS	11	3 Fire Apparatus + BC

For high-risk EMS incidents, the incident commander will call for specific types and numbers of response personnel based upon the number of patients and/or special needs.

Hazardous Materials

The following hazard levels have been established for Hazardous Materials incidents:

- **Low-Risk:** Odor check without patients, small fuel or oil spill, and CO detector.
- **Moderate-Risk:** Incidents requiring Level C entry to for identification or mitigation.
- **High-Risk:** Incidents requiring a Level A or B entry to mitigate or determine the source.

Table 28: Critical Tasks for Low-Risk Hazardous Materials

Tasks	Personnel	Units
Command/Control	1	1st Engine
Investigate & deny Entry	2	1st Engine
Total ERF Low Hazardous Material	3	1 Fire Apparatus

Table 29: Critical Tasks for Moderate- and High-Risk Hazardous Materials

Tasks	Personnel	Units
Command / Control	1	Battalion Chief
Assistant Safety Officer	1	1st Engine
Entry Team	2	2nd Engine
Back Up Team	2	1st Truck
Decon	2	1st Truck
Isolate and Deny Entry / Evacuation	2	1st Engine
Medical (Private Ambulance)	2	Ambulance
Total ERF Moderate Hazardous Material	13	3 Fire Apparatus + BC

Technical Rescue

The following hazard levels have been established for Technical Rescue risk:

- **Low-Risk:** Child locked in a vehicle or person stuck in an elevator.
- **Moderate or High-Risk:** Swift water rescue, high angle, or trench rescue.

Table 30: Critical Tasks for Low-Risk Technical Rescue

Task	Firefighters	Company
Size-Up/Command	1	1st Engine
Locate/Access	1	1st Engine
Stabilize, Lock Out, Patient Care	1	1st Engine
Personnel	3	1 Fire Apparatus

Table 31: Critical Tasks for Moderate- and High-Risk Technical Rescue

Task	Firefighters	Company
Size-Up/Command	1	Battalion Chief
Safety	1	1st Engine
Locate/Access	2	1st Engine
Stabilize/Extricate/Rescue	4	1st Truck
Transport	3	2nd Engine
Patient Care	2	Ambulance
Personnel	13	3 Fire Apparatus + BC

Wildland/Vegetation Fire

The following hazard levels have been established for Wildland/Vegetation Fire risk:

- **Low-Risk:** Small grass fire in a contained area.
- **Moderate or High-Risk:** Vegetation fire in an open area.

Table 32: Critical Tasks for Low-Risk Wildland/Vegetation Fire

Task	Firefighters	Company
Size-Up/Command	1	1st Engine
Hose Line	2	1st Engine
Personnel	3	1 Fire Apparatus

Table 33: Critical Tasks for Moderate- and High-Risk Wildland/Vegetation Fire

Task	Firefighters	Company
Size-Up/Command	1	Battalion Chief
Safety	1	1st Engine
Water Supply	2	1st Engine
Hose Line Left Flank	3	2nd Engine
Hose Line Right Flank	3	3rd Engine
Personnel	10	3 Fire Apparatus + BC

SECTION 6: PERFORMANCE MEASURES

Time Points and Intervals – The Cascade of Events

Over the years, response time data have been analyzed by the fire service industry using a variety of methods. In order to standardize the terminology used by departments around the United States and Canada, CFAI has developed the following set of definitions to be used for describing the individually recognized components of response time. These elements can be appropriately viewed as an interrelated cascading sequence of events consisting of a series of points in time separated by intervals. RFD has adopted the following definitions which are consistent with those given by CFAI.

- **Event Initiation** – the point at which events occur that may ultimately result in an activation of the emergency response system. Precipitating events can occur seconds, minutes, hours, or even days before a point of awareness is reached. It is rarely possible to pinpoint the time at which event initiation occurs.

- **Emergency Event Awareness** – the point at which an individual or technological sentinel (e.g., smoke or heat detector) becomes aware that conditions exist which require an activation of the emergency response system.

- **Alarm** – the point at which awareness triggers an effort to notify the emergency response system. An example of this is the transmittal of a local or central alarm to a designated PSAP.

- **Notification** – the point at which an alarm or call for assistance is received by the PSAP. This transmittal may take the form of an electronic or mechanical notification process to the point at which a call is received and answered within the jurisdictional PSAP.

- **Call Processing Time** – the interval between the first ring of the 9-1-1 telephone at the PSAP and the time the dispatcher activates station, crew, and/or individual alerting devices. This interval can also be further divided into two additional sub-intervals: 1) ***call-taker interval,*** which is the time from the first ring of the 911 telephone until the call-taker subsequently transfers the call information to the dispatcher; and 2) ***dispatcher interval,*** which is the interval from the time when the call-taker transfers the call to the dispatcher until the dispatcher activates all applicable alerting devices for emergency responders.

- **Turnout Time** – the interval between the activation of station and/or crew alerting devices with the delivery of specific dispatch information to emergency personnel and the time when the responding crew notifies the dispatcher that the company is enroute. During the turnout interval, crews immediately cease all other activities, don appropriate protective clothing, determine the

location of the call, board and start the appropriate response vehicle. The enroute notification to dispatch is made when all personnel are aboard the apparatus, and the vehicle begins traveling toward the call location.

- **Enroute Time** – the point at which the responding unit signals the dispatcher that they are responding to the call for service or traveling toward the hospital or other appropriate receiving facility. On calls in which a patient is transported, there are two enroute times: enroute to the call and enroute to the medical receiving facility.

- **Travel Time** – the interval that begins at the time of the enroute notification and ends when the responding unit notifies the dispatcher that it has arrived on scene.

- **Arrival (On-Scene) Time** – the point at which the first responding unit arrives on scene or the transport unit arrives at the receiving facility. Arrival is determined by actual physical arrival at the address or location of the emergency. Arrival time also includes stage time, which is when an apparatus is staged or standing by near the incident location.

- **On-Scene Interval** – the interval which begins at the arrival time on scene and ends with one of the following situations: 1) the official termination of the incident; 2) the point at which an ambulance is enroute transporting the patient to a receiving facility; or 3) when one or more units have completed the response assignment and are made available to respond to other requests for service. This time interval can be lengthy and may include a variety of fire ground and emergency incident activities. Other factors to consider are access problems associated with campuses, malls, complexes, high-rise buildings, or rural locations, and other incidents where a significant amount of area or terrain must be traversed in order to reach the patient or specific location of the incident.

- **Transport Time** – the second travel time interval for a medical transport call, which begins at the termination of on-scene time and ends upon arrival at the hospital or other designated medical receiving facility.

- **Termination of Incident (Shut Off)** – the point at which the designated incident commander notifies the dispatcher that the assignment has been completed and the units assigned are available to respond or otherwise commit.

- **Task Time** – the total time interval from dispatch through termination of the incident. It reflects the period of time response resources are committed and unavailable for other service requests.

- **Response Time** – includes the elements of responding to an incident that are directly under the control of the responding agency (i.e., turnout time plus travel time).

The ultimate goal of any emergency service delivery system is to provide sufficient resources (personnel, apparatus, and equipment) to the scene of an emergency in time to take effective action to minimize the impacts of the emergency. This need applies to fires, medical emergencies, and any other emergency situations to which the fire department responds. RFD has established response performance measures based on its current capabilities and resources.

Table 34: Benchmark Response Goals

First 5 RFD Units or min. 14 FF					
Minutes	**Fire**	**Building Fire ERF**	**EMS**	**Hazmat**	**Tech Rescue**
Call Process	0:01:00	0:01:00	0:01:00	0:01:00	0:01:00
Turnout	0:02:00	0:02:00	0:01:00	0:02:00	0:02:00
Travel	0:05:00	08:30	0:05:00	0:05:00	0:05:00
Dispatch-Arrival	0:07:00	10:30	0:06:00	0:07:00	0:07:00
Total Response Time	0:08:00	11:30	0:07:00	0:08:00	0:08:00

The following six benchmark response goal statements provide the specific areas where annual analysis is conducted to measure how well our organization is performing in relation to these response time goals. This helps determine if the Department has sufficient resources to meet the demands of a growing community. These performance measures are reported on the program quarterly budget reports sent to the City Council and City Administration.

Response Goal Statement #1: First Due Fire

For 90% of all **low-risk** structure fires, the goal for total response time for arrival of the first due unit, staffed with three personnel (one Captain, one Engineer, and one FF/P) shall be: **8 minutes**. The first due unit shall be able to: provide 500 gallons of water and 1,500 gallons per minute (gpm) pumping capacity, provide a size-up, conduct a 360° evaluation, initiate command, request additional resources, establish an uninterrupted water supply, establish and advance an attack line flowing a minimum of 150 gpm in a defensive or transitional capacity, contain the fire, and rescue immediately at-risk victims. These operations shall be done in accordance with Departmental standard operating procedures.

Response Goal Statement #2: Effective Response Force of 21 Personnel for Moderate and High Working Fires

For 90% of all **moderate- and high-risk** structure fires, the goal for total response time for arrival of the ERF, staffed with 21 firefighters and officers, shall be **11 minutes and 30 seconds**. The ERF shall be able to: establish command, appoint a site safety officer, provide an uninterrupted water supply, advance an attack line and backup line for fire control, comply with the Occupational Safety and Health Administration (OSHA) requirements for two-in and two-out, complete forcible entry, search and rescue at-risk victims, ventilate the structure, control utilities, and perform salvage and overhaul.

The ERF for **high- and special-risk** structure fires shall also be capable of placing elevated streams into service from aerial ladders. These operations shall be done in accordance with Department standard operating procedures while providing for the safety of responders and the general public. There is not a calculated response time for high- and special-risk structure fires due to infrequent calls of this severity.

Response Goal Statement #3: EMS

To treat **low- and moderate-risk** medical patients, the goal for total response time for arrival of the first due unit, staffed with three personnel (including a minimum of one Paramedic) shall be **7 minutes**, 90% of the time from receipt of the 9-1-1 call. The first due unit shall be able to: assess a patient, administer basic and advanced life support including oxygen, IVs, and medication, stop bleeding, splint and bandage wounds, and prepare the patient for transportation to a hospital.

Response Goal Statement #4: Special Operations Hazardous Materials

For 90% of all **low-risk** Hazardous Materials responses, the goal for total response time for arrival of the first due unit, staffed with three personnel (one Captain, one Engineer, and one Firefighter) shall be **8 minutes**. The first due unit shall be able to: establish command, complete a size-up and assess the situation to determine the presence of a potential hazardous material or explosive device, determine the need for additional resources, provide 500 gallons of water and 1,500 gallons per minute (gpm) pumping capacity for emergency decontamination, rescue victims that are down in the line of sight, conduct a 360° evaluation, initiate command, request additional resources, isolate the area, establish perimeters, and rescue at-risk victims. These operations shall be done in accordance with Departmental standard operating procedures.

For 90% of all **moderate- and high-risk** hazardous materials response incidents, the goal for total response time for the arrival of the ERF including the hazardous materials response team, staffed with 14 firefighters and officers, shall be **20 minutes** in all areas. The ERF shall be able to: appoint an incident safety officer and provide the equipment, technical expertise, knowledge, skills, and abilities to mitigate a hazardous materials incident in accordance with Departmental standard operating procedures.

Response Goal Statement #5: Technical Rescue

For 90% of all **low-risk** rescue responses, the goal for total response time for arrival of the first due unit, staffed with three personnel (one Captain, one Engineer, and one Firefighter) shall be **8 minutes**. The first due unit for all risk levels shall be able to: provide a 360° evaluation and scene size-up, incident stabilization, secure utilities, establish command, rescue at-risk victims that might be trapped, utilize special extrication tools carried on apparatus, request additional resources, isolate the area, and establish perimeters. These operations shall be done in accordance with Departmental standard operating procedures.

The ERF for **moderate- and high-risk** special operations requiring a rescue response shall be able to: provide additional equipment including rescue apparatus and additional task force members in accordance with Departmental policy. There is not a calculated response time for high-risk hazmat or rescue operations due to infrequent calls of this severity.

Response Goal Statement #6: Response Reliability

Maintain a Response Reliability greater than 80% for each district.

Current Baseline Performance Measures

The data from the previous five years of response times are broken out by call processing, turnout, travel, and call to arrival. Evaluation is done at every step in the process so deficient areas can be analyzed individually and improvements implemented. All response times are for priority responses only. The chart below shows **overall baseline response times** for each response component for priority incidents.

Table 35: Overall Baseline Response Times for All Emergency Calls

Measure	Average	Median	90th Percentile
Dispatch Time	1.5	1.0	2.4
Turnout Time	1.4	1.3	2.2
Travel Time	3.4	3.2	5.5
Response Time	6.2	5.7	8.6

Figure 26: Distribution of Turnout Time of First Arriving Unit – All Emergency Calls

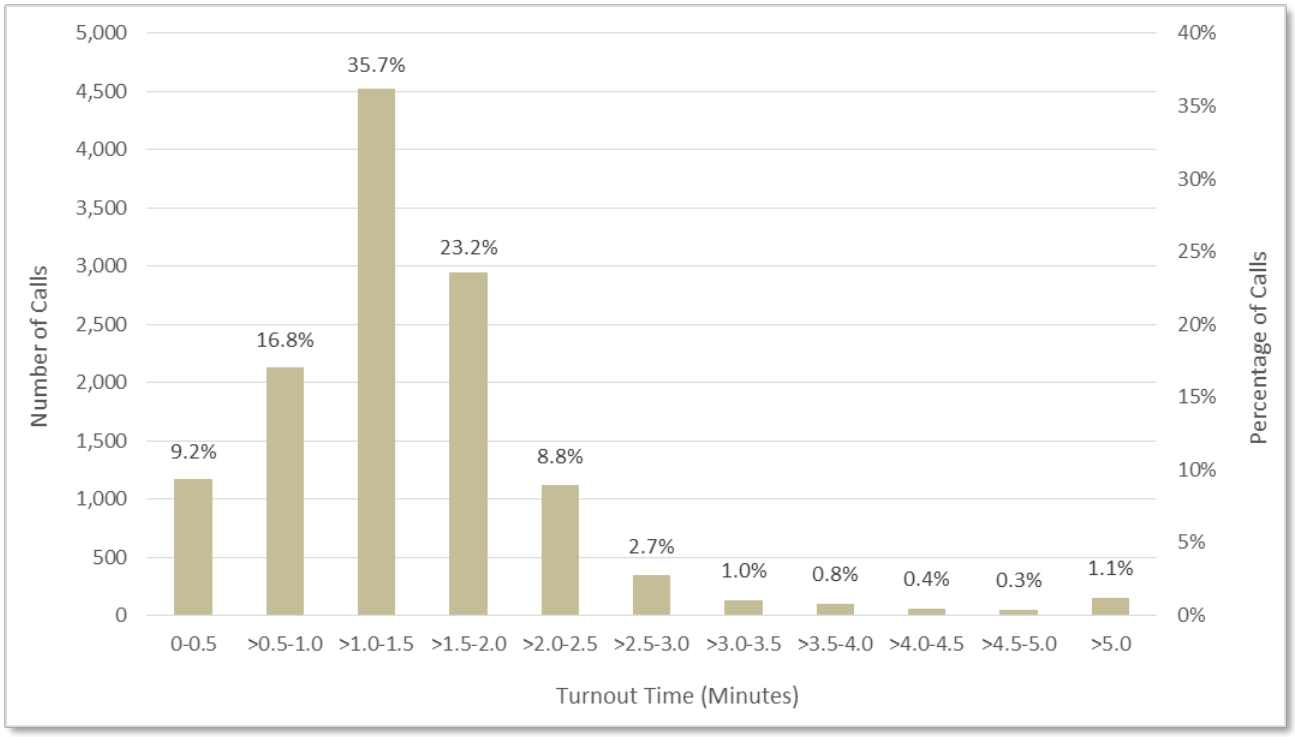
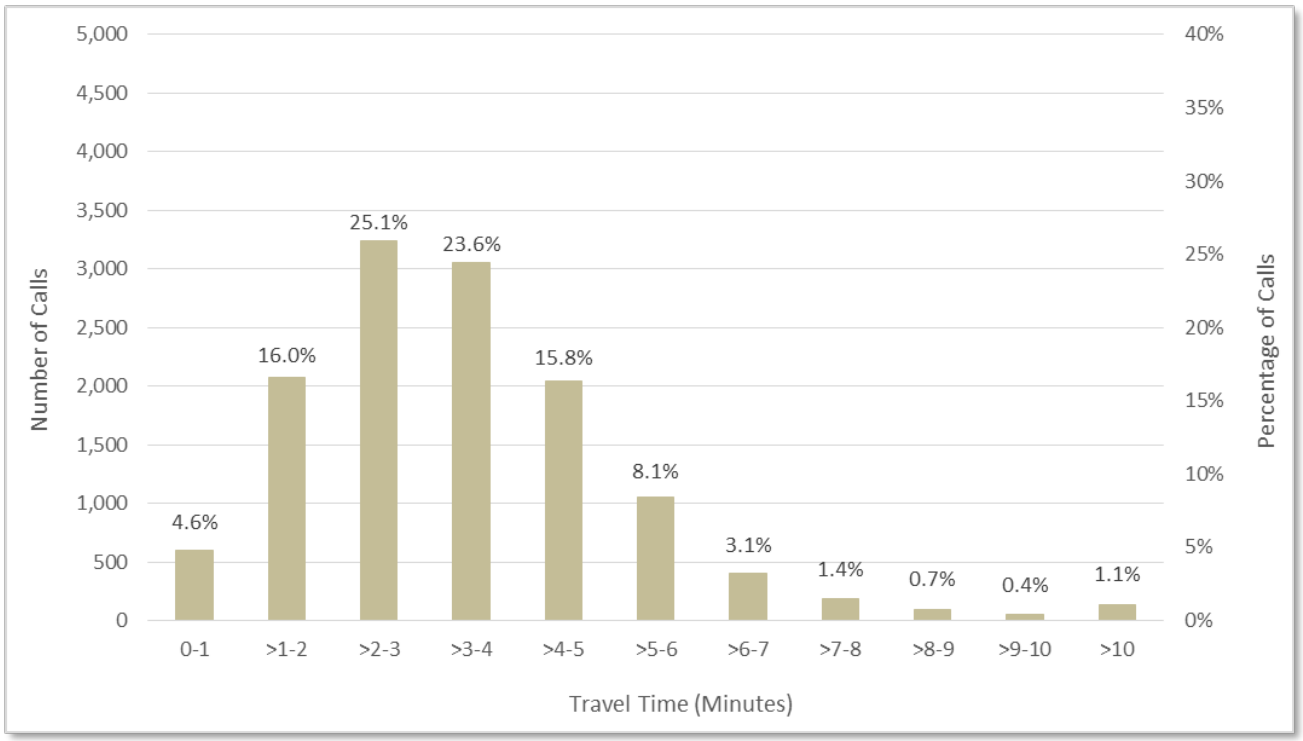


Figure 27: Distribution of Travel Time of First Arriving Unit – All Emergency Calls



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.

Table 36: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for Low-Risk EMS Incidents by Reporting Period

90th Percentile Time (Minutes) Performance Metric	Arriving Unit	2015-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	1.9	1.6	1.8	1.8	2.0	2.1
Turnout Time	1st	2.0	1.9	2.0	2.1	2.1	2.2
Travel Time	1st	5.4	5.2	5.3	5.4	5.5	5.4
Response Time	1st	8.0	7.5	7.8	8.1	8.3	8.2
Sample Size[1]	1st	46,503	8,407	9,340	9,285	9,553	9,918

For EMS incidents, RFD had an average turnout time of 1:24 minutes, a median turnout time of 1:18 minutes, and a turnout time of 2:12 minutes at the 90th percentile during 2018. A total of 2,550 of 9,550 (26.7%) calls reported turnout times of one minute or less, and 86.2% of calls (8,231/9,550) experienced turnout times of two minutes or less. The average travel time for EMS incidents was 3:24 minutes (median = 3:12 minutes) and performance at the 90th percentile for travel time was 5:24 minutes. A total of 4,474 of 9,765 (45.8%) experienced travel times of three minutes or less, and 70% of calls (6,838/9,765) experienced travel times of four minutes or less. The average response time for EMS calls was 6 minutes (median = 5:36 minutes) and performance at the 90th percentile for response time was 8:12 minutes.

Table 37: Baseline 90th Percentile Performance of Primary Front-line Arriving Units for Low-Risk Fire Incidents by Reporting Period

90th Percentile Time (Minutes) Performance Metric	Arriving Unit	2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	2.7	3.1	2.5	2.1	2.9	2.5
Turnout Time	1st	2.6	2.4	2.5	2.7	2.6	2.4
Travel Time	1st	6.7	7.2	5.8	7.8	6.5	6.0
Response Time	1st	9.9	10.5	9.1	10.7	10.0	9.7
Sample Size[1]	1st	1,323	276	262	261	250	274

For fire related incidents, RFD had an average turnout time of 1:42 minutes, a median turnout time of 1:42 minutes, and a turnout time of 2:24 minutes at the 90th percentile during 2018. A total of 46 of 285 (16.1%)

experienced turnout times of one minute or less, and 71.6% of calls (204/285) experienced turnout times of two minutes or less. The average travel time for fire related incidents was 3:36 minutes (median = 2:54 minutes) and performance at the 90th percentile for travel time was 6 minutes. A total of 158 of 293 (53.9%) experienced travel times of three minutes or less, and 72.4% of calls (212/293) experienced travel times of four minutes or less. The average response time for fire related calls was 6:36 minutes (median = 5:48 minutes) and performance at the 90th percentile for response time was 9:36 minutes.

Figure 28: Distribution of Turnout Time of First Arriving Unit – Emergency EMS Related Calls

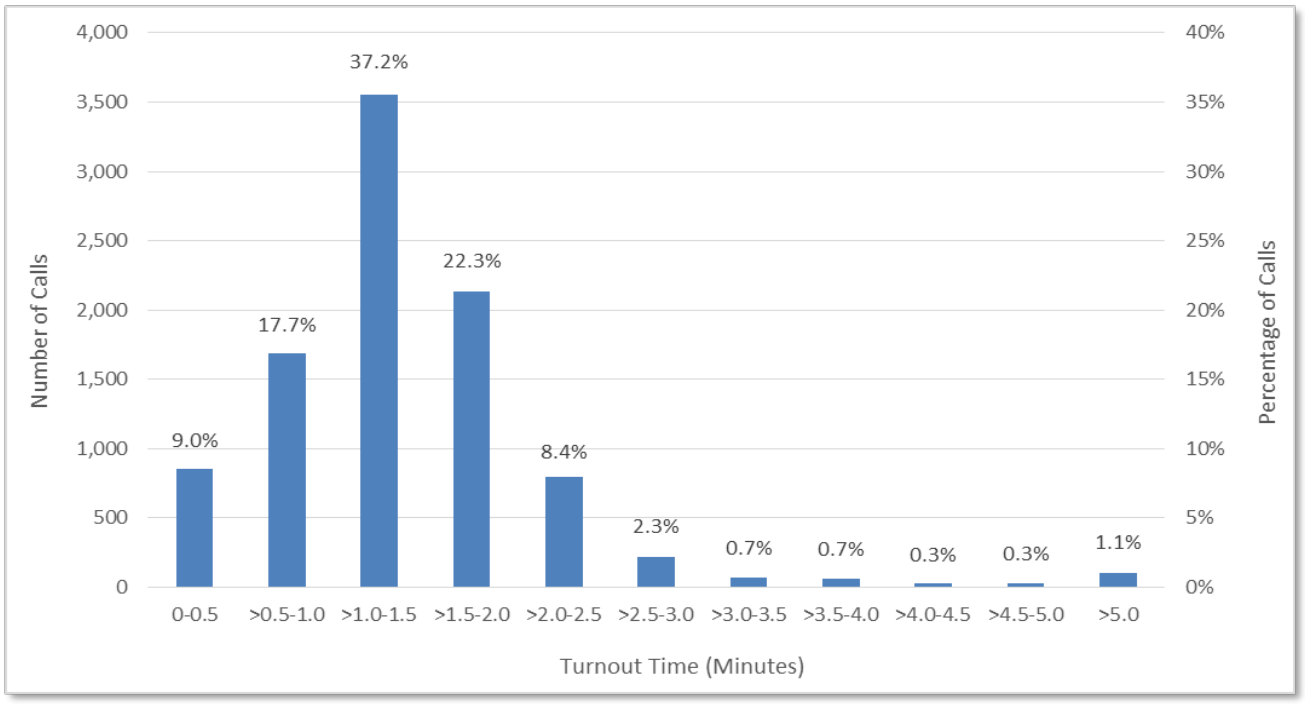


Figure 29: Distribution of Travel time for First Arriving Unit – Emergency EMS Related Calls

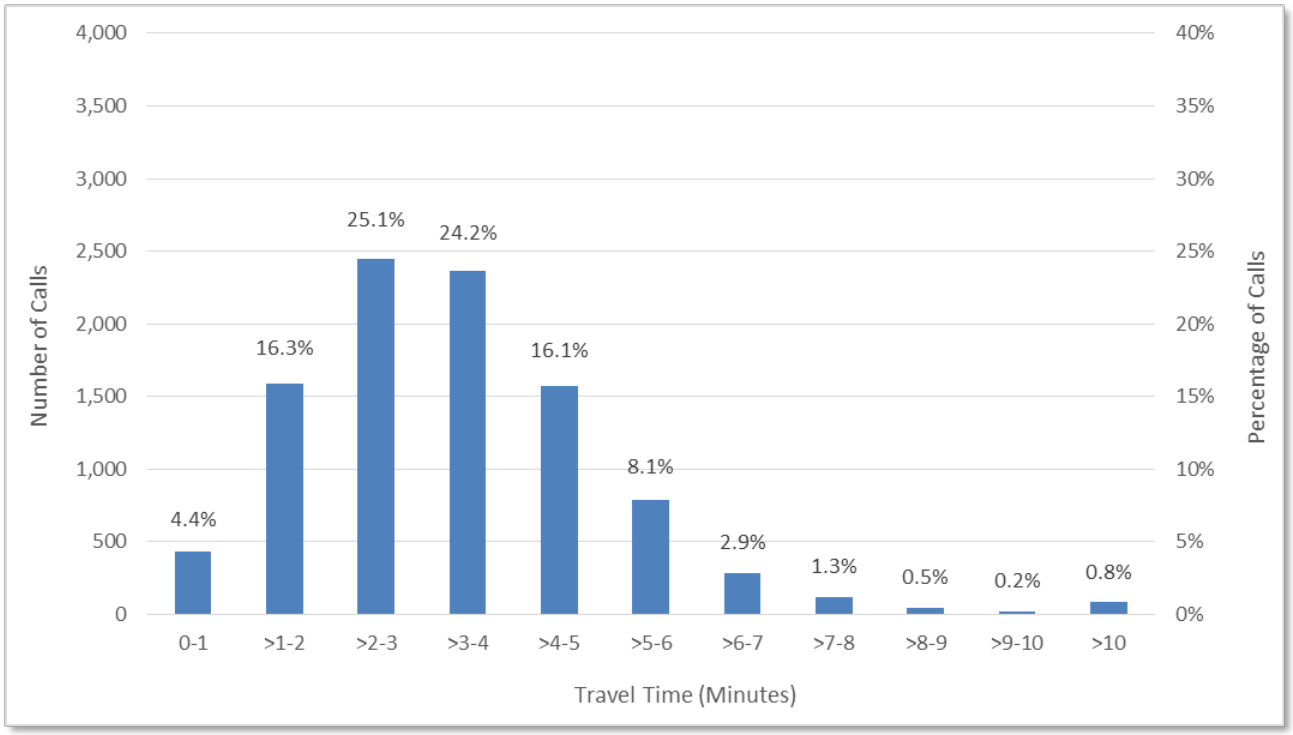


Figure 30: Distribution of Turnout Time of First Arriving Unit – Emergency Fire Related Calls

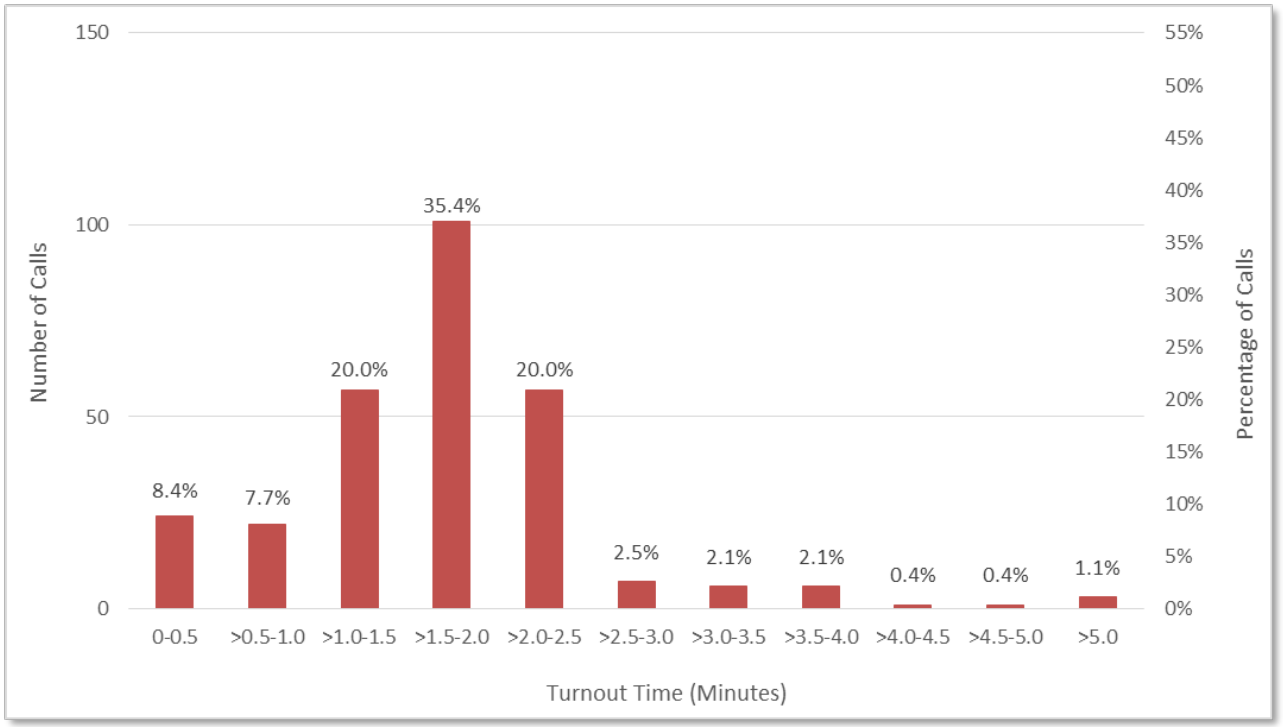


Figure 31: Distribution of Travel time for First Arriving Unit – Emergency Fire Related Calls

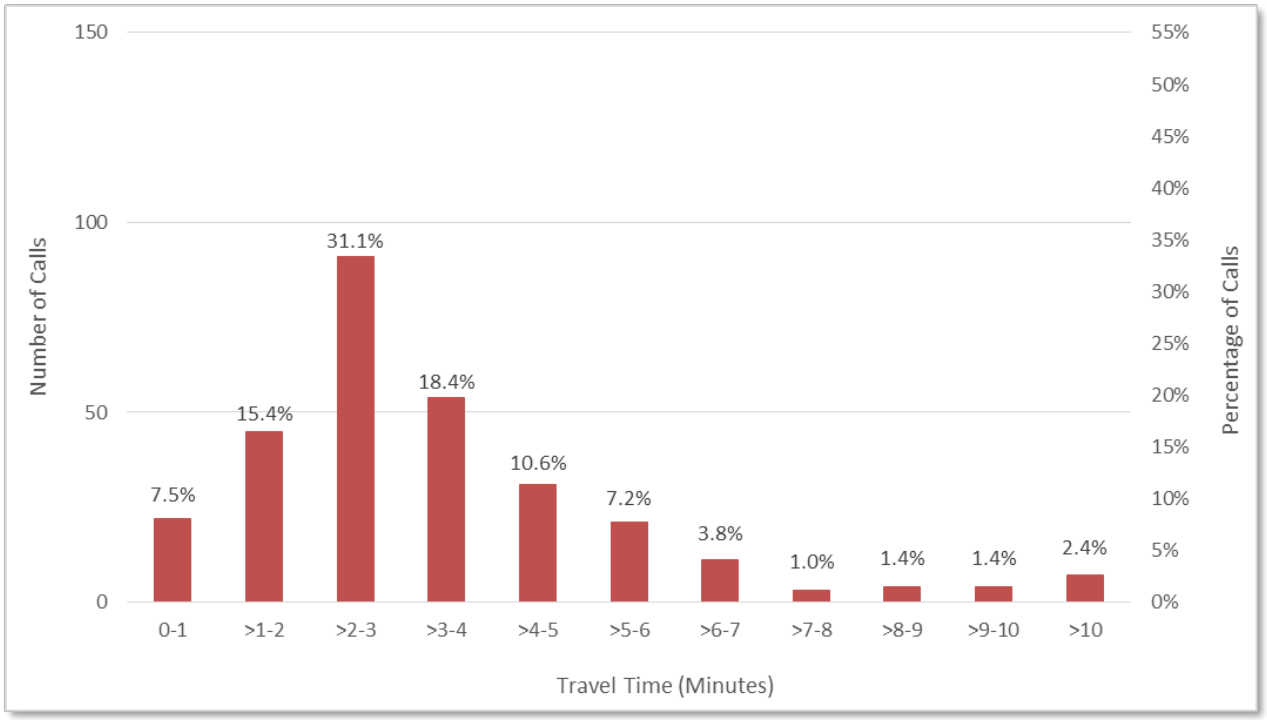


Table 38: Call Totals by Type and Reporting Period

Demand Zone	Call Category	Reporting Period[1]				
		2014	2015	2016	2017	2018
Roseville	**EMS**	**8,618**	**9,614**	**9,561**	**9,769**	**10,190**
	False Alarm & False Call	**474**	**576**	**675**	**685**	**734**
	Fire (Not Building or Wildland)	133	121	121	123	89
	Building Fire	109	112	109	101	120
	Wildland Fire	66	54	62	64	91
	Fire (All)	**308**	**287**	**292**	**288**	**300**
	Good Intent Call	**1,345**	**1,582**	**1,833**	**2,336**	**2,447**
	Hazardous Conditions (No Fire)	**201**	**215**	**220**	**237**	**258**
	Rescue	**772**	**806**	**922**	**876**	**918**
	Service Call	**1,386**	**1,567**	**1,563**	**1,731**	**1,703**
	Severe Weather & Natural Disaster	**6**	**2**	**1**	**2**	**3**
	Special Incident Type	**3**	**1**	**4**	**14**	**29**
	Unknown	**0**	**5**	**0**	**1**	**0**
	Total[2]	**13,113**	**14,655**	**15,071**	**15,939**	**16,582**
	Average Calls per Day[2]	**35.9**	**40.2**	**41.2**	**43.7**	**45.4**
	YoY Growth	**N/A**	**11.8%**	**2.8%**	**5.8%**	**4.0%**

[1]Reporting periods reflect full calendar years, from January 1 to December 31 of each respective year.
[2]Reporting period 2016 contained 366 days due to inclusion of leap year date February 29, 2016; all other reporting periods contained 365 days.

The incident count shows how many specific calls were generated per year by call type. This does not reflect the multiple company responses, meaning a structure fire will typically have four engines, two trucks, and a Battalion Chief respond, yet it still counts as one incident. The annual unit count will reflect how many times each unit (apparatus) responded to calls.

Table 39: 90th Percentile First Arrival Performance in Minutes by Demand Zone

Demand Zone	Dispatch Time	Turnout Time	Travel Time	Response Time
Station 1	3.2	2.3	4.3	7.6
Station 2	2.2	2.3	5.1	8.2
Station 3	2.2	2.0	5.0	7.8
Station 4	2.2	2.2	4.9	7.8
Station 5	2.0	2.3	5.8	8.7
Station 6	2.4	2.1	5.5	8.8
Station 7	2.7	2.4	6.0	9.3
Station 9	1.9	2.3	6.3	9.3
Total[1]	**2.4**	**2.2**	**5.5**	**8.6**

[1]Metrics associated with unknown first due stations (demand zones) are included in the total values, but are not presented separately in the table.

Table 40: Sample Sizes for First Arrival Performance by Demand Zone

Demand Zone	Dispatch Time	Turnout Time	Travel Time	Response Time
Station 1	1,803	1,708	1,755	1,631
Station 2	1,373	1,341	1,368	1,318
Station 3	2,459	2,362	2,447	2,332
Station 4	1,550	1,514	1,552	1,492
Station 5	1,694	1,659	1,687	1,640
Station 6	1,196	1,162	1,185	1,138
Station 7	1,546	1,492	1,522	1,459
Station 9	1,262	1,244	1,260	1,233
Total[1]	**13,050**	**12,643**	**12,939**	**12,399**

[1]Metrics associated with unknown first due stations (demand zones) are included in the total values, but are not presented separately in the table.

Travel Time

There are two notable references for travel time available to the fire service: National Fire Protection Association (NFPA) 17100F and the Commission on Fire Accreditation International (CFAI). NFPA 1710 suggests a 4-minute travel time at the 90th percentile for first due arrival of BLS and fire incidents, and a significant amount of CFAI accredited agencies are using a 5-minute travel time for first due arrival in an urban/suburban population density. The arrival of an ALS unit is recommended at 8 minutes travel time by NFPA 1710.

Considering the overall 90th percentile travel time goal of 5 minutes and 30 seconds and a 6-minute travel time at the 90th percentile for fire related incidents, a 5-minute travel time was used as a surrogate measure for the more restrictive 4-minute or 5:12 thresholds identified. When referring to the marginal utility analysis provided in the tables on the following pages, the ascending rank order is the station's capability to cover risk (incidents) in relation to the total historical call volume of the sample period (2018).

5-Minute Travel Time

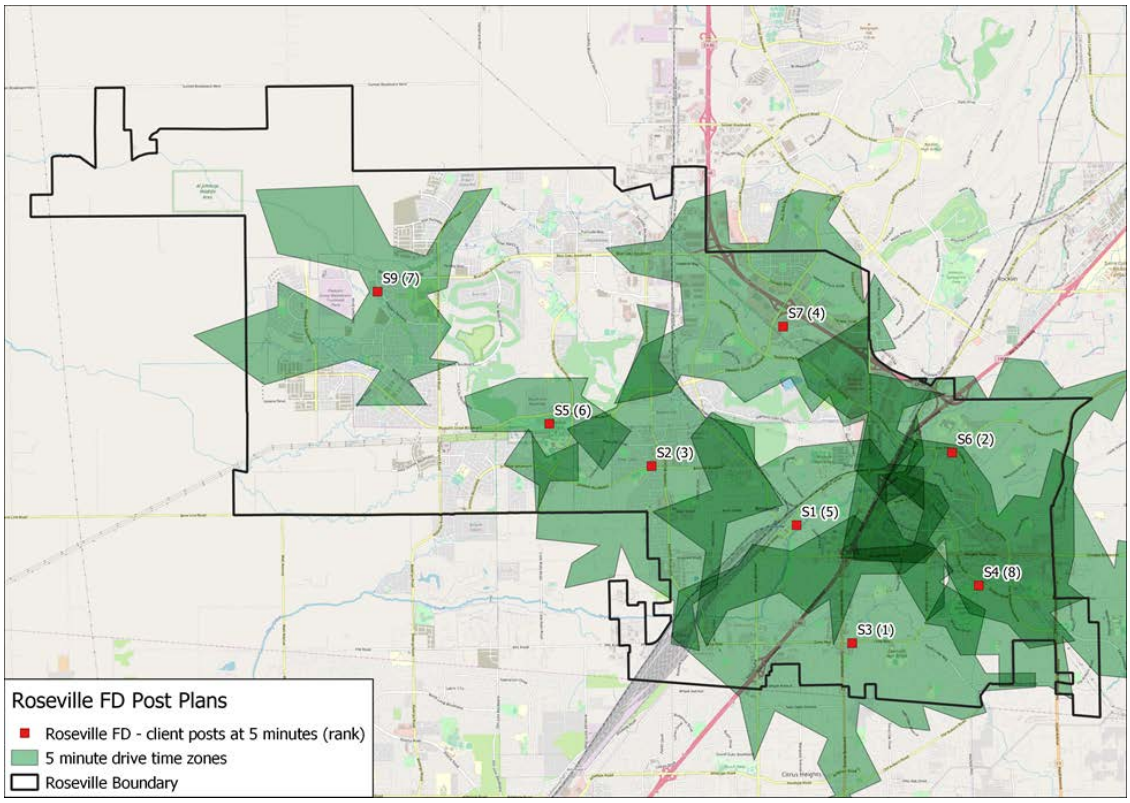
Results suggest that with all eight RFD fire stations active, 80.71% of the incidents could be responded to within 5 minutes or less travel time. The station that could contribute the most to the overall system's performance is Station 3 in the first row that could capture 29.96% of the risks within 5 minutes. Station 6 could cover an additional 17.49% of the risk, bringing the cumulative total to 47.45% between Stations 3 and 6.

In the table below, station is the current RFD station identifier; station capture is the number of calls the station would capture within a 5-minute travel time; total capture is the cumulative number of calls captured with the addition of each fire station; and percent capture is the total cumulative percentage of risk covered by each station. The goal would be to achieve at least 90% capture. Figures depict drive time mapping.

Table 41: Marginal Fire Station Contribution for 5-Minute Travel Time

Rank	Station	Station Capture	Total Capture	Percent Capture
1	Station 3	5,054	5,054	29.96%
2	Station 6	2,952	8,006	47.45%
3	Station 2	2,281	10,287	60.97%
4	Station 7	1,354	11,641	69.00%
5	Station 1	944	12,585	74.60%
6	Station 5	488	13,073	77.49%
7	Station 9	438	13,511	80.08%
8	Station 4	106	13,617	80.71%

Figure 32: Current Fire Station Bleed Maps for 5-Minute Travel Time



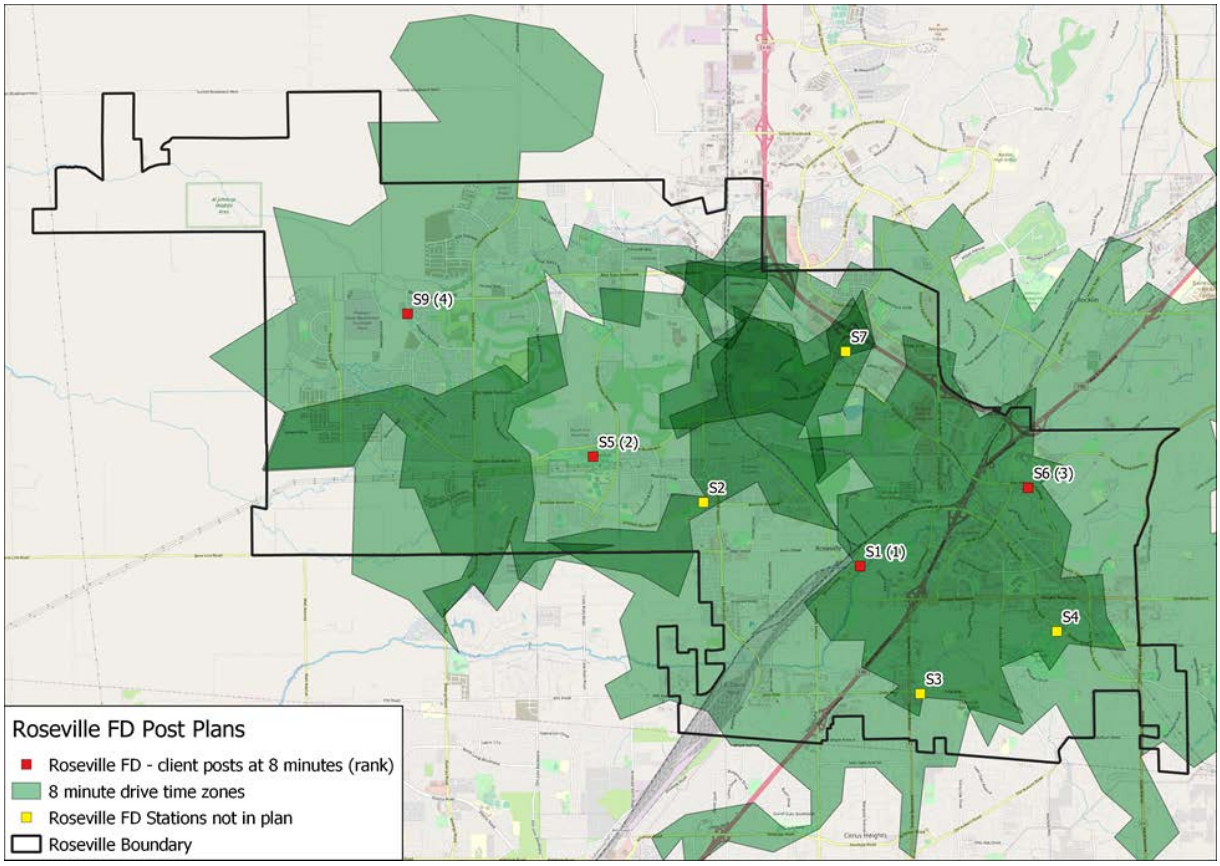
8-Minute Travel Time for ERF

Results suggest that with four RFD fire stations active, 95.70% of the incidents could be responded to within 8 minutes or less travel time. All eight RFD fire stations could cover 97.88% of the risk within 8 minutes or less travel time.

Table 42: Marginal Fire Station Contribution for 8-Minute Travel Time

Rank	Station	Station Capture	Total Capture	Percent Capture
1	Station 1	10,505	10,505	62.27%
2	Station 5	2,711	13,216	78.34%
3	Station 6	1,618	14,834	87.93%
4	Station 9	1,311	16,145	95.70%
5	Station 7	179	16,324	96.76%
6	Station 3	158	16,482	97.69%
7	Station 4	26	16,508	97.85%
8	Station 2	5	16,513	97.88%

Figure 33: Current Fire Station Bleed Maps for 8-Minute Travel Time



Alternative Station Configurations

RFD has proposed possible locations and construction for future fire Station 8 and Station 10, respectively. The following scenarios were created to validate and analyze the potential alternative configurations.

- Scenario 1: All existing stations with the addition of Station 8.
- Scenario 2: All existing stations with the addition of Station 8 and relocated Station 5.
- Scenario 3: All existing stations with the addition of Stations 8 and 10.

Scenario 1

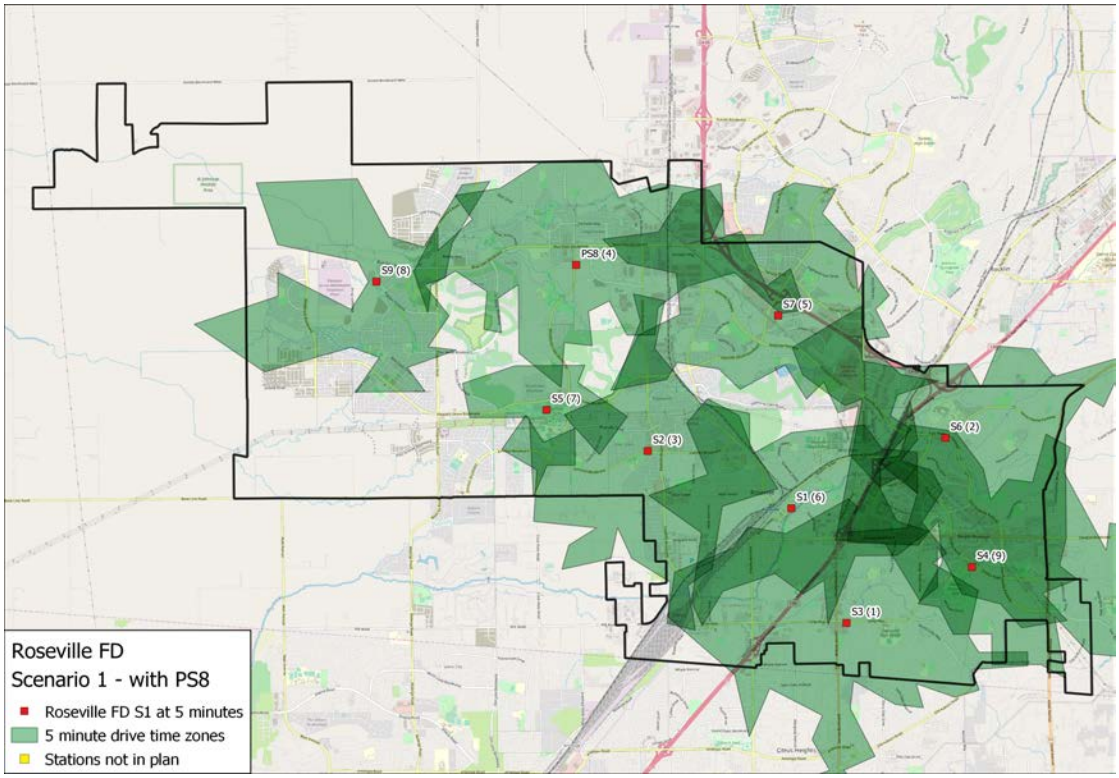
5-Minute Travel Time

Results suggest that with all nine RFD fire stations active, 87.85% of the incidents could be responded to within 5 minutes or less travel time. This is approximately a 7% improvement over the current configuration prior to the addition of Station 8.

Table 43: Marginal Fire Station Contribution for 5-Minute Travel Time

Rank	Station	Station Capture	Total Capture	Percent Capture
1	S3	5,054	5,054	29.96%
2	S6	2,952	8,006	47.45%
3	S2	2,281	10,287	60.97%
4	S8	1,641	11,928	70.70%
5	S7	967	12,895	76.43%
6	S1	944	13,839	82.03%
7	S5	474	14,313	84.84%
8	S9	403	14,716	87.23%
9	S4	106	14,822	87.85%

Figure 34: Current Fire Stations and Station 8 Bleed Maps for 5-Minute Travel Time



Scenario 2

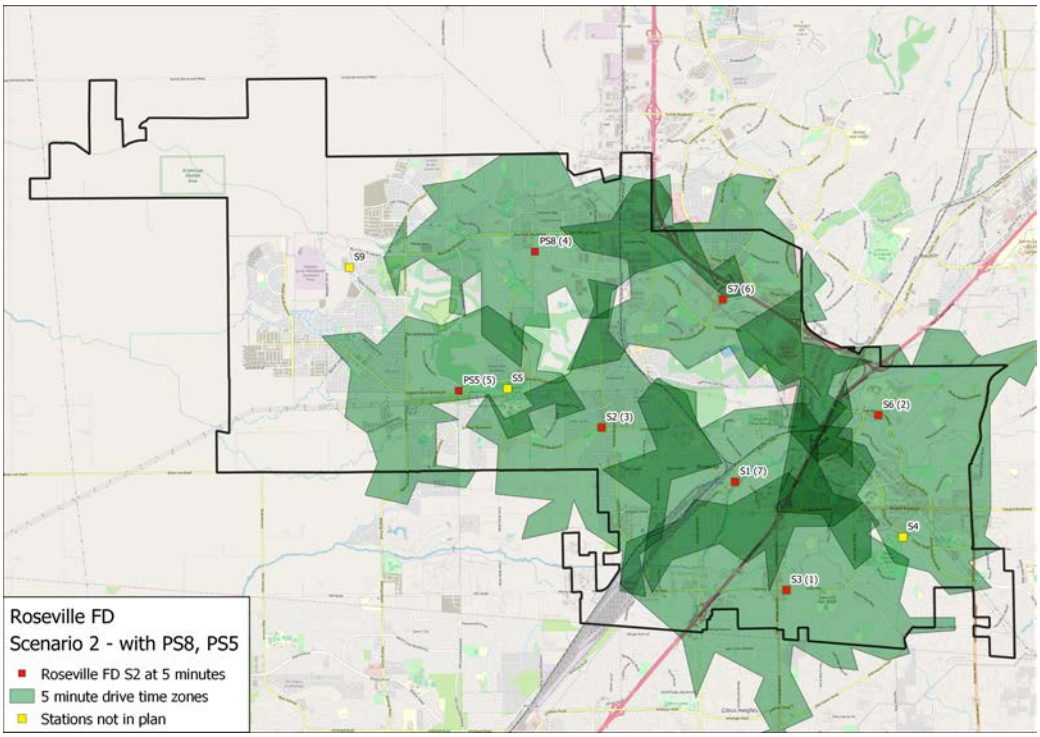
5-Minute Travel Time

Results suggest that with all nine RFD fire stations active, 92.56% of the incidents could be responded to within 4 minutes or less travel time. This is approximately a 9% improvement over the current configuration prior to the addition of Station 8 or relocation of Station 5.

Table 44: Marginal Fire Station Contribution for 5-Minute Travel Time

Rank	Station	Station Capture	Total Capture	Percent Capture
1	S3	5,054	5,054	29.96%
2	S6	2,952	8,006	47.45%
3	S2	2,281	10,287	60.97%
4	S8	1,641	11,928	70.70%
5	S5N	1,397	13,325	78.98%
6	S7	967	14,292	84.71%
7	S1	944	15,236	90.31%
8	S9	274	15,510	91.93%
9	S4	106	15,616	92.56%

Figure 35: Current Fire Stations, Station 8, and Relocation of Station 5 Bleed Maps for 5-Minute Travel Time



Scenario 3

5-Minute Travel Time

Results suggest that with all 10 RFD fire stations active, 88.64% of the incidents could be responded to within 4 minutes or less travel time. This is approximately a 7% improvement over the current configuration, but 4% less than the configuration of Station 8 and relocation of Station 5.

Table 45: Marginal Fire Station Contribution for 5-Minute Travel Time

Rank	Station	Station Capture	Total Capture	Percent Capture
1	S3	5,054	5,054	29.96%
2	S6	2,952	8,006	47.45%
3	S2	2,281	10,287	60.97%
4	S8	1,641	11,928	70.70%
5	S7	967	12,895	76.43%
6	S1	944	13,839	82.03%
7	S5	474	14,313	84.84%
8	S9	403	14,716	87.23%
9	S10	133	14,849	88.01%
10	S4	106	14,955	88.64%

Figure 36: Current Fire Stations with Stations 8 and 10 Bleed Maps for 5-Minute Travel Time

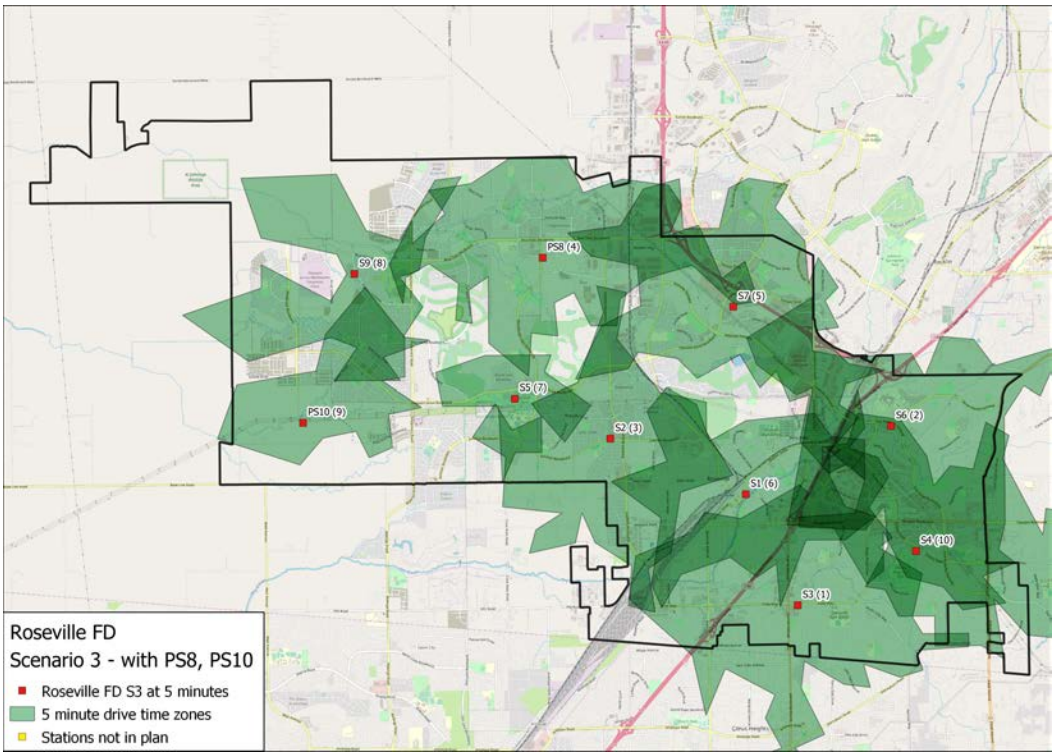


Table 46: Summary of Alternative Station Configurations

Performance (Minutes)	Current Configuration	Scenario 1	Scenario 2	Scenario 3
4	64.87%	70.20%	74.04%	71.26%
5	80.71%	87.85%	92.56%	88.64%
6	87.57%	95.09%	97.09%	95.64%
7	95.44%	98.75%	98.98%	98.77%
8	97.88%	99.05%	99.24%	99.05%

The analyses of several possible alternatives reveal that Scenario 2 (addition of Station 8 and relocation Station 5) has the greatest return on investment. With very little variability, it requires only one additional station and the relocation of one station rather than two additional stations.

Overall Response Analysis All Calls

Overall Workload by Station

In 2018, RFD responded to 20,847 calls for service with a total of 6,624.4 on-task hours. The station-level demand is a more useful measure 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 1 was the busiest station based on number of calls responded to by units assigned to the station at 3,446 calls. Units assigned to Station 1 also made the greatest number of responses to calls across the Department (4,544 responses) and had the greatest number of total busy hours during 2018 (1,370 hours).

E3, E5, and E1 were the busiest RFD units based on total busy hours (928.1 hours, 718.4 hours, and 655 hours, respectively).

Table 47: Overall Workload by Station

Station	Number of Calls Responded to by Units Assigned to 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
Station 1	3,446	4,544	4,452	1,370.0	18.5	20.7
Station 2	2,054	2,057	2,035	674.9	19.9	10.2
Station 3	2,989	2,989	2,963	928.1	18.8	14.0
Station 4	2,100	2,100	2,078	635.4	18.3	9.6
Station 5	2,220	2,225	2,198	766.0	20.9	11.6
Station 6	2,096	2,108	2,078	593.0	17.1	9.0
Station 7	2,523	2,950	2,906	940.0	19.4	14.2
Station 9	1,825	1,831	1,810	685.7	22.7	10.4
RFD Admin	35	38	24	30.5	76.1	0.5
RFD Other[3]	5	5	2	0.8	23.9	0.0
Total	--	**20,847**	**20,546**	**6,624.4**	**19.3**	**100.0**

[1]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[2]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix of data report).
[3]Reflects only the unit OES364, a state resource staffed by RFD for state or federal incidents; not otherwise typically staffed.

Overall Workload by Unit

Table 48: Overall Workload by Unit

Station	Unit	Unit Type	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
Station 1	B1	Battalion Chief	634	628	272.4	26.0
	E1	Engine	2,550	2,497	655.0	15.7
	HZ1	Hazmat	12	0	--	--
	T1	Truck	1,348	1,327	442.6	20.0
	Station Total		**4,544**	**4,452**	**1,370.0**	**18.5**
Station 2	E2	Engine	2,021	1,999	636.1	19.1
	G2	Grass	36	36	38.8	64.7
	Station Total		**2,057**	**2,035**	**674.9**	**19.9**
Station 3	E3	Engine	2,989	2,963	928.1	18.8
	Station Total		**2,989**	**2,963**	**928.1**	**18.8**
Station 4	E4	Engine	2,069	2,049	613.8	18.0
	G4	Grass	31	29	21.5	44.6
	Station Total		**2,100**	**2,078**	**635.4**	**18.3**
Station 5	BR5	Brush Truck	34	33	43.9	79.8
	E5	Engine	2,172	2,146	718.4	20.1
	E5B	Engine	3	3	0.0	0.4
	E8	Engine	16	16	3.7	13.9
	Station Total		**2,225**	**2,198**	**766.0**	**20.9**
Station 6	BR6	Brush Truck	45	43	42.2	58.9
	E6	Engine	2,062	2,035	550.8	16.2
	E6B	Engine	1	0	--	--
	Station Total		**2,108**	**2,078**	**593.0**	**17.1**
Station 7	E7	Engine	1,916	1,897	618.4	19.6
	R7	Rescue	16	15	13.9	55.7
	T7	Truck	1,017	994	307.7	18.6
	T7B	Truck	1	0	--	--
	Station Total		**2,950**	**2,906**	**940.0**	**19.4**
Station 9	BR9	Brush Truck	39	35	42.3	72.6
	E9	Engine	1,792	1,775	643.4	21.7
	Station Total		**1,831**	**1,810**	**685.7**	**22.7**
RFD Admin	1401	Chief Officer	2	0	--	--
	1404	Chief Officer	1	0	--	--
	1405	Chief Officer	1	1	0.5	28.3
	1410	Chief Officer	5	2	6.0	179.6
	1411	Chief Officer	1	0	--	--
	1413	Chief Officer	1	0	--	--

Station	Unit	Unit Type	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
RFD Admin	1414	Chief Officer	5	0	--	--
	FPB	Fire Prevention	1	0	--	--
	P2	Fire Prevention	2	2	0.7	20.5
	P3	Fire Prevention	4	4	10.7	160.6
	P4	Fire Prevention	6	6	4.1	40.8
	P5	Fire Prevention	3	3	2.0	40.2
	P6	Fire Prevention	6	6	6.5	65.1
	Station Total		**38**	**24**	**30.5**	**76.1**
RFD Other	OES364	OES Engine	5	2	0.8	23.9
	Station Total		**5**	**2**	**0.8**	**23.9**
Department Total			**20,847**	**20,546**	**6,624.4**	**19.3**

[1]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[2]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix of data report).

To provide a more global 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 28 below, the busiest hour is at 1300 with 1,065 calls occurring during that hour in 2018. The average number of calls per hour is a daily average for those 1,065 calls if they were distributed equally across the year (i.e., 1,065/365 = 2.9). Therefore, the busiest hour per day would be at 1300 with an average hourly call volume of 2.9 calls per day. The second busiest hour occurred at 1000 with 1,047 calls during that hour in 2018, with an average hourly call volume of 2.9 calls per day.

Figure 37: Overall: Average Calls per Day by Hour of Day

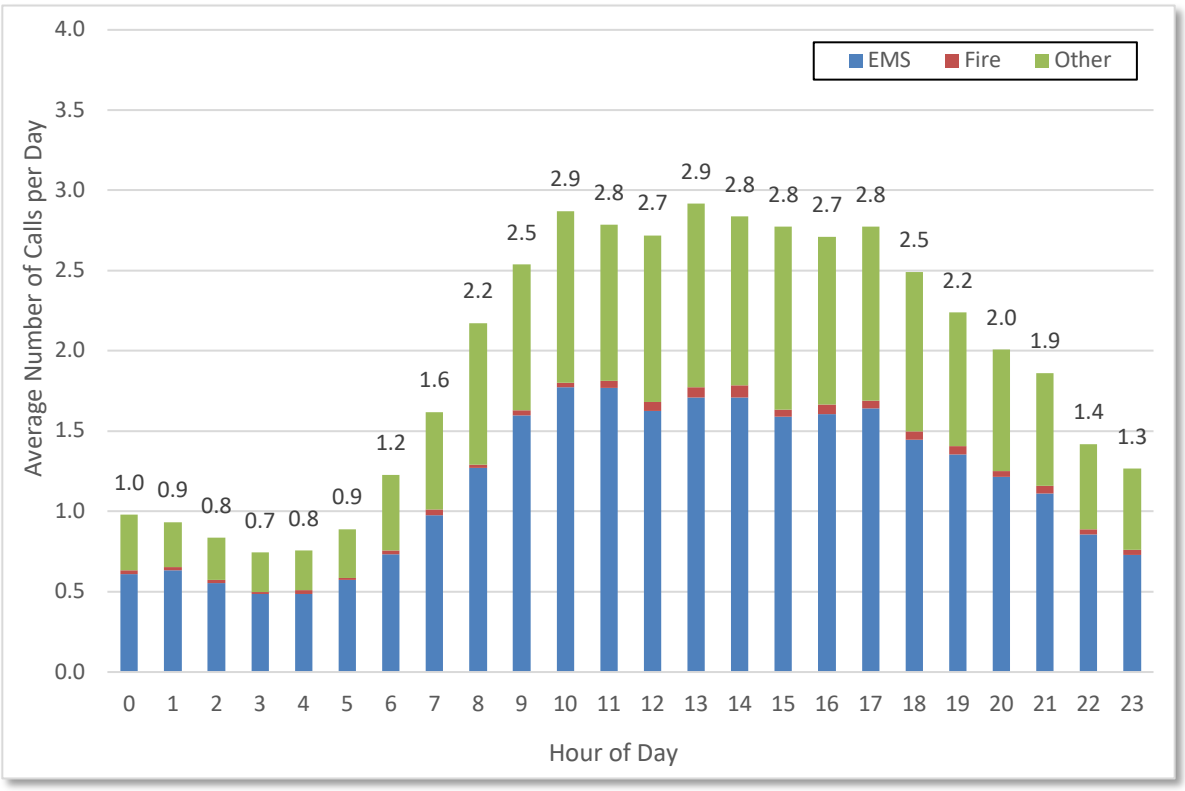


Figure 38: Overall: Average Calls per Day by Day of Week

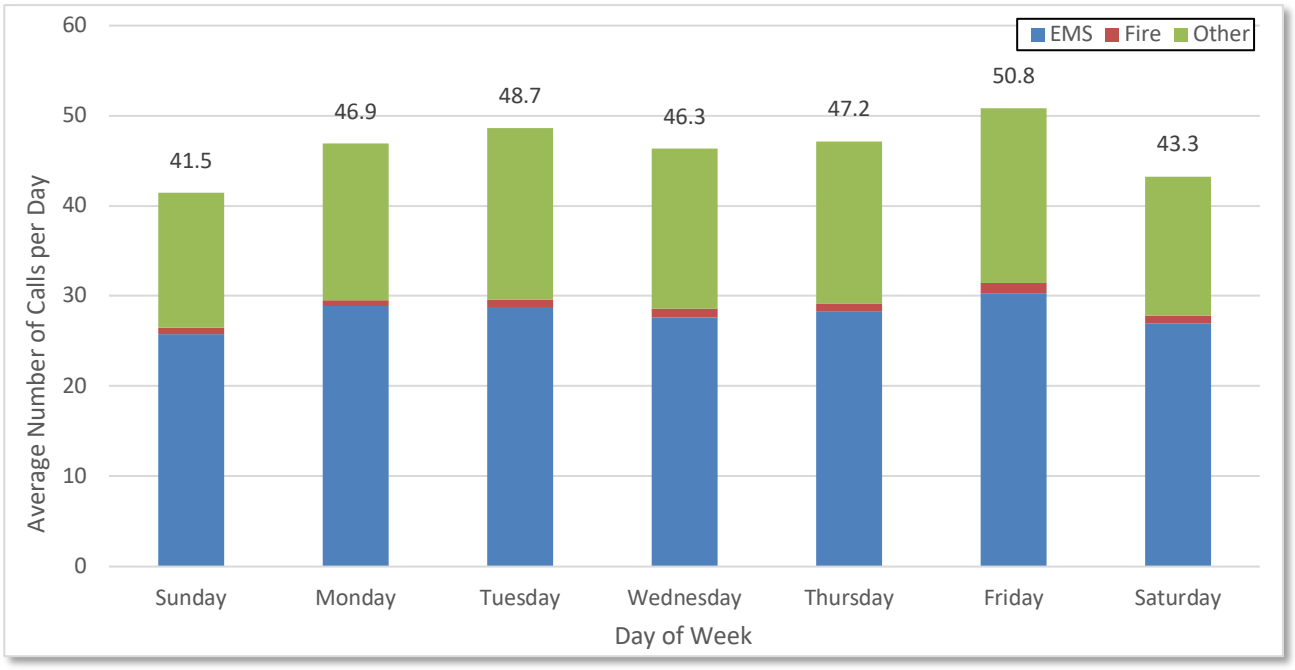
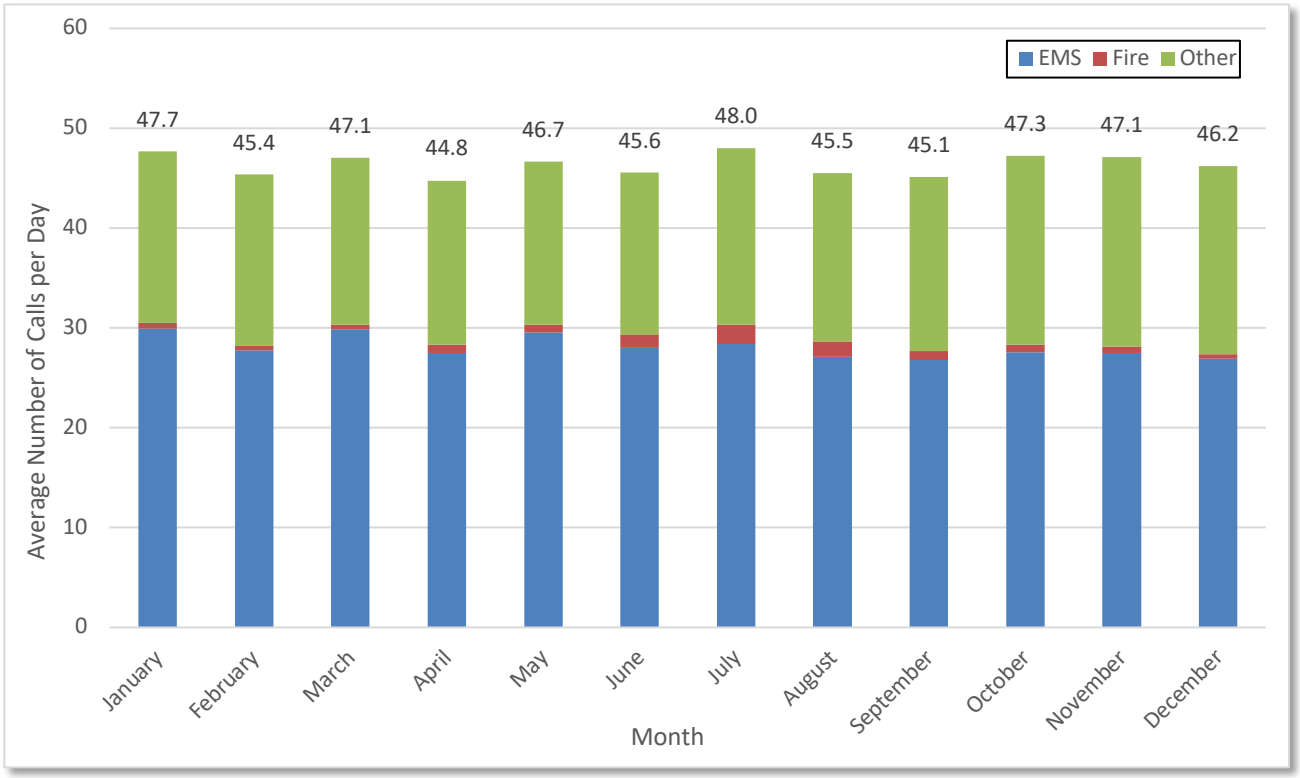


Figure 39: Overall: Average Calls per Day by Month



Fire Response Analysis

Table 49: Total Fire Related Calls by Nature of Call

Nature of Call[1]	Number of Calls	Percentage of Total Fire Service Demands
Brush, or brush and grass mixture fire	65	20.0
Building fire	46	14.2
Passenger vehicle fire	40	12.3
Trash or rubbish fire, contained	36	11.1
Cooking fire, confined to container	29	8.9
Grass fire	24	7.4
Outside rubbish, trash or waste fire	17	5.2
Outside rubbish fire, other	13	4.0
Natural vegetation fire, other	12	3.7
Fire, other	9	2.8
Special outside fire, other	7	2.2
Dumpster or other outside trash receptacle fire	6	1.8
Fires in structures other than in a building	4	1.2
Fire in portable building, fixed location	3	0.9
Outside equipment fire	3	0.9
Cultivated vegetation, crop fire, other	2	0.6
Fuel burner/boiler malfunction, fire confined	2	0.6
Outside storage fire	2	0.6
Road freight or transport vehicle fire	2	0.6
Chimney or flue fire, confined to chimney or flue	1	0.3
Mobile property (vehicle) fire, other	1	0.3
Off-road vehicle or heavy equipment fire	1	0.3
Total	**325**	**100.0**

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

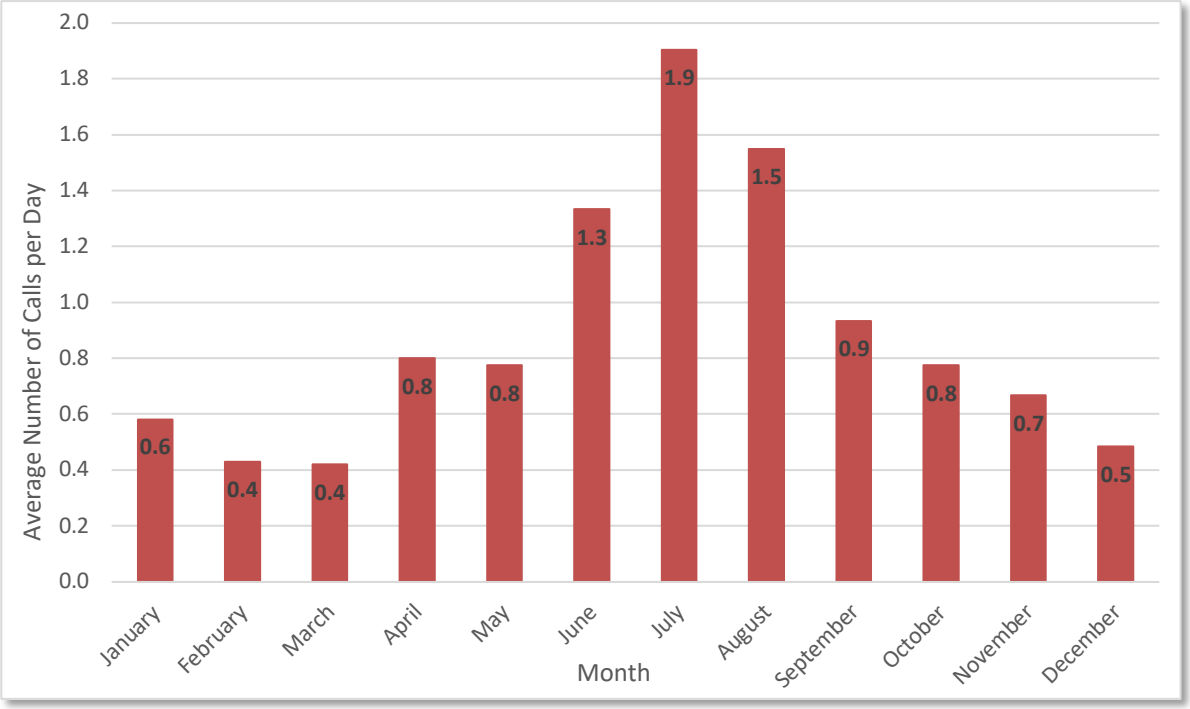
Fire related requests accounted for 1.9% of the total requests for service during 2018 and averaged 0.9 requests per day.

Temporal analyses were conducted to evaluate patterns in community demands for fire related services. These analyses examined the frequency of requests for service in 2018 by month, day of week, and hour of day. Results found that there was variability by month. The three months with the most fire related calls in descending order were: July (1.9 per day), August (1.5 per day), and June (1.3 per day). The three months with the fewest fire related calls in ascending order were: March (0.4 per day), February (0.4 per day), and December (0.5 per day).

Table 50: Total Fire Related Calls and Average Calls per Day by Month

Month	Number of Calls	Average Calls per Day	Call Percentage
January	18	0.6	5.5
February	12	0.4	3.7
March	13	0.4	4.0
April	24	0.8	7.4
May	24	0.8	7.4
June	40	1.3	12.3
July	59	1.9	18.2
August	48	1.5	14.8
September	28	0.9	8.6
October	24	0.8	7.4
November	20	0.7	6.2
December	15	0.5	4.6
Total	**325**	**0.9**	**100.0**

Figure 40: Average Fire Related Calls per Day by Month



Similar analyses were conducted for fire related calls by day of week. The data revealed that there is only slight variability in the demand for services by day of week. The three days with the most fire related calls in descending order were: Friday (1.1 per day), Wednesday (1.0 per day), and Tuesday (1.0 per day). The three days with the fewest fire related calls in ascending order were: Monday (0.7 per day), Sunday (0.7 per day), and Saturday (0.8 per day).

Table 51: 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	37	0.7	11.4
Monday	35	0.7	10.8
Tuesday	50	1.0	15.4
Wednesday	51	1.0	15.7
Thursday	50	1.0	15.4
Friday	58	1.1	17.8
Saturday	44	0.8	13.5
Total	**325**	**0.9**	**100.0**

Figure 41: Average Fire Related Calls per Day by Day of Week

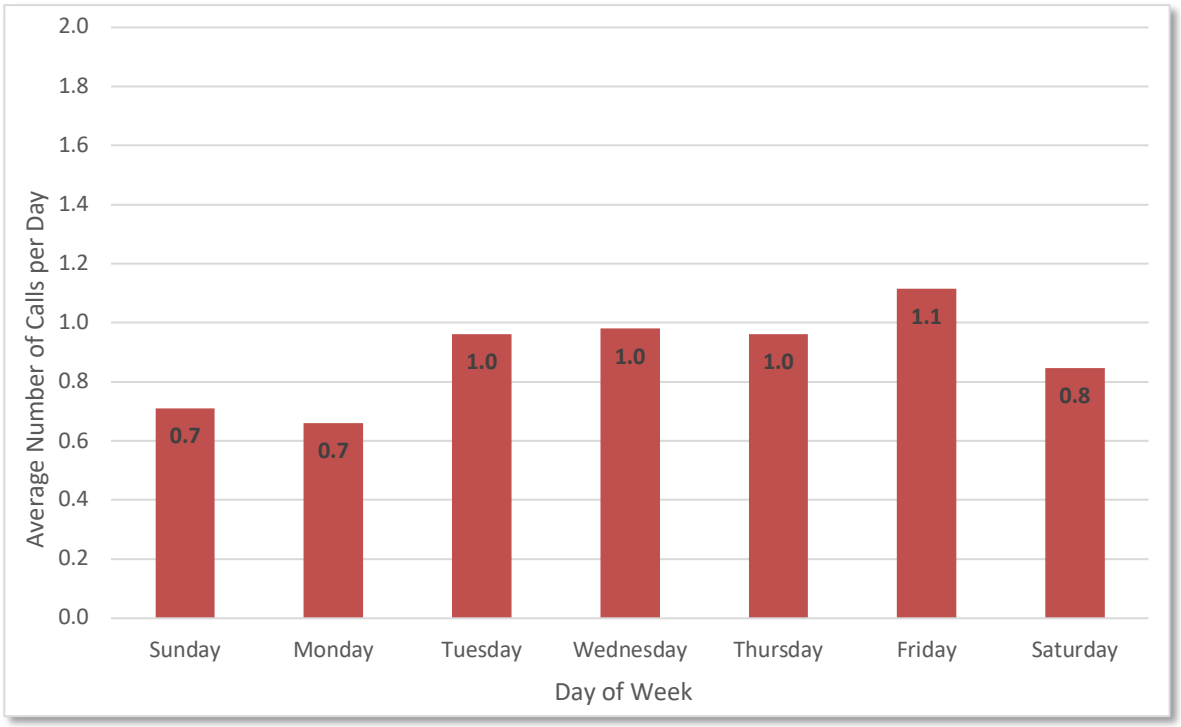


Figure 42: Average Fire Related Calls per Day by Hour of Day

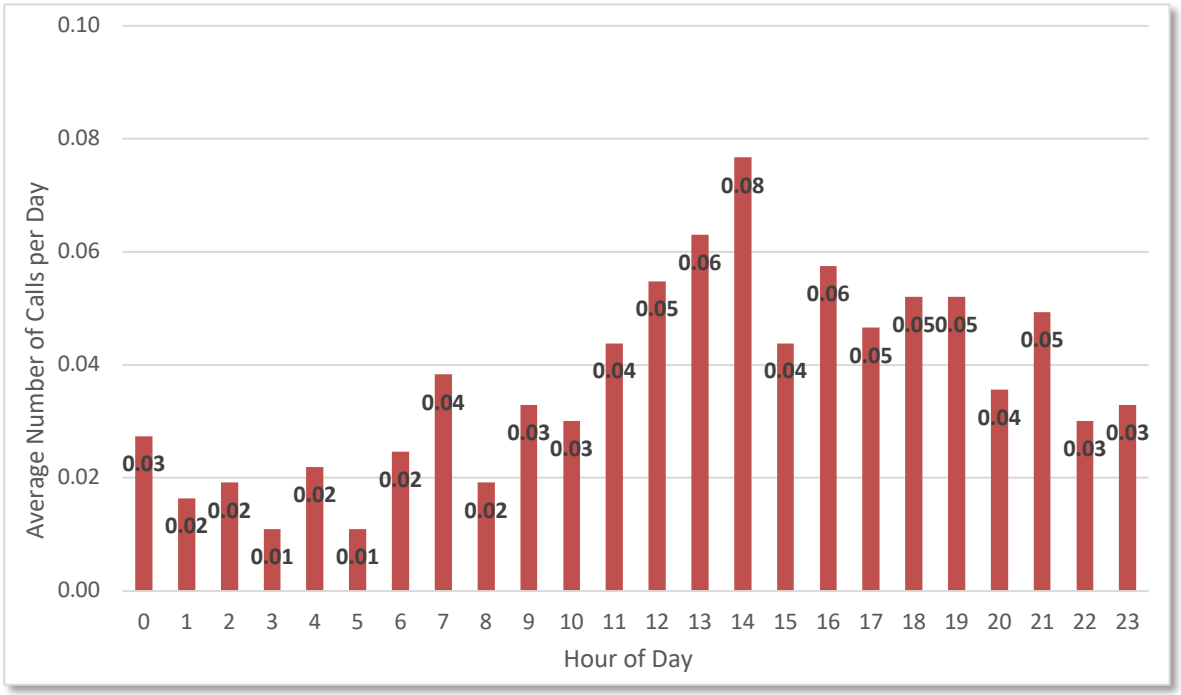


Table 52: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for Moderate-Risk Fire Incidents

90th Percentile Time (Minutes) Performance Metric	Arriving Unit	2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	2.7	3.1	2.5	2.1	2.9	2.5
	3rd (ERF)	5.5	6.9	6.0	6.7	2.7	4.1
Turnout Time	1st	2.6	2.4	2.5	2.7	2.6	2.4
	3rd (ERF)	3.5	3.3	3.6	3.3	3.7	4.6
Travel Time	1st	6.7	7.2	5.8	7.8	6.5	6.0
	3rd (ERF)	9.9	13.1	10.5	12.1	8.4	9.3
Response Time	1st	9.9	10.5	9.1	10.7	10.0	9.7
	3rd (ERF)	14.1	20.8	14.5	15.5	13.1	12.6
Sample Size	1st	1,323	276	262	261	250	274
	3rd (ERF)	309	51	66	69	52	71

Table 53: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for High-Risk Fire Incidents

90th Percentile Time (Minutes) Performance Metric	Arriving Unit	2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	2.7	3.1	2.5	2.1	2.9	2.5
	6th (ERF)	9.1	7.8	9.6	11.3	11.0	9.7
Turnout Time	1st	2.6	2.4	2.5	2.7	2.6	2.4
	6th (ERF)	5.5	4.9	7.5	8.9	4.0	8.7
Travel Time	1st	6.7	7.2	5.8	7.8	6.5	6.0
	6th (ERF)	15.7	17.4	23.2	15.9	15.3	17.3
Response Time	1st	9.9	10.5	9.1	10.7	10.0	9.7
	6th (ERF)	22.5	20.3	31.4	18.6	20.4	24.8
Sample Size[1]	1st	1,323	276	262	261	250	274
	6th (ERF)	117	18	28	17	20	34

RFD made a total of 1,111 responses to fire related calls in 2018. Total task time was 709.5 hours and the average busy minutes per response was 38.8 minutes. The three most utilized units based on busy hours were B1 (123.7 hours), E1 (71.9 hours), and T1 (69.1 hours).

Table 54: Workload by Unit for Fire Related Calls

Station	Unit	Unit Type	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
Station 1	B1	Battalion Chief	174	174	123.7	42.6
	E1	Engine	124	124	71.9	34.8
	HZ1	Hazmat	0	--	--	--
	T1	Truck	80	80	69.1	51.9
	Station Total		**378**	**378**	**264.7**	**42.0**
Station 2	E2	Engine	92	91	45.5	30.0
	G2	Grass	25	25	27.0	64.9
	Station Total		**117**	**116**	**72.5**	**37.5**
Station 3	E3	Engine	89	87	47.6	32.8
	Station Total		**89**	**87**	**47.6**	**32.8**
Station 4	E4	Engine	59	58	29.1	30.1
	G4	Grass	25	24	19.7	49.3
	Station Total		**84**	**82**	**48.9**	**35.8**
Station 5	BR5	Brush Truck	20	20	27.6	82.8
	E5	Engine	63	61	28.8	28.4
	E5B	Engine	0	--	--	--
	E8	Engine	0	--	--	--
	Station Total		**83**	**81**	**56.4**	**41.8**
Station 6	BR6	Brush Truck	29	29	27.7	57.3
	E6	Engine	87	87	37.6	26.0
	E6B	Engine	0	--	--	--
	Station Total		**116**	**116**	**65.3**	**33.8**
Station 7	E7	Engine	96	96	46.7	29.2
	R7	Rescue	1	1	1.3	80.0
	T7	Truck	83	82	46.9	34.3
	T7B	Truck	0	--	--	--
	Station Total		**180**	**179**	**95.0**	**31.8**
Station 9	BR9	Brush Truck	17	16	18.1	67.8
	E9	Engine	38	38	25.1	39.6
	Station Total		**55**	**54**	**43.2**	**48.0**
RFD Admin	1401	Chief Officer	0	--	--	--
	1404	Chief Officer	0	--	--	--
	1405	Chief Officer	1	1	0.5	28.3
	1410	Chief Officer	4	1	5.8	345.4
	1411	Chief Officer	0	--	--	--
	1413	Chief Officer	0	--	--	--

Station	Unit	Unit Type	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
RFD Admin	1414	Chief Officer	1	0	--	--
	FPB	Fire Prevention	0	--	--	--
	P2	Fire Prevention	0	--	--	--
	P3	Fire Prevention	2	2	9.2	276.5
	P4	Fire Prevention	0	--	--	--
	P5	Fire Prevention	0	--	--	--
	P6	Fire Prevention	0	--	--	--
	Station Total		**8**	**4**	**15.4**	**231.6**
RFD Other	OES364	OES Engine	1	1	0.5	28.4
	Station Total		**1**	**1**	**0.5**	**28.4**
Department Total			**1,111**	**1,098**	**709.5**	**38.8**

[1]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[2]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix of data report).

An analysis of RFD'S 2018 response by unit to fire related calls was also conducted. Overall, 28.9% of fire related calls were responded to by one unit, and 16.0% were responded to by two units. However, for building fire calls, 61.5% of calls (80/130) were responded to by three or more units. The maximum number of units responding to a building fire call was 10. RFD was busy on building fire calls for 357.7 hours during 2018, making 511 responses to 130 building fire calls and averaging 3.9 responses per call. Average busy minutes per response was 42.4 minutes.

Wildland fire calls had three or more RFD units responding 68.9% of the time (71/103).

Table 55: Number of Responding Units by Fire Related Call Type

Call Category	Number of Responding Units							Total
	1	2	3	4	5	6	7 or more	
Fire (Not Building or Wildland)	29	35	4	11	6	0	7	92
Building Fire	42	8	7	25	8	5	35	130
Wildland Fire	23	9	22	23	8	8	10	103
Total	**94**	**52**	**33**	**59**	**22**	**13**	**52**	**325**
Percentage	**28.9**	**16.0**	**10.2**	**18.2**	**6.8**	**4.0**	**16.0**	**100.0**

Figure 43" Percentage of Building Fire Calls by Number of Responding Units

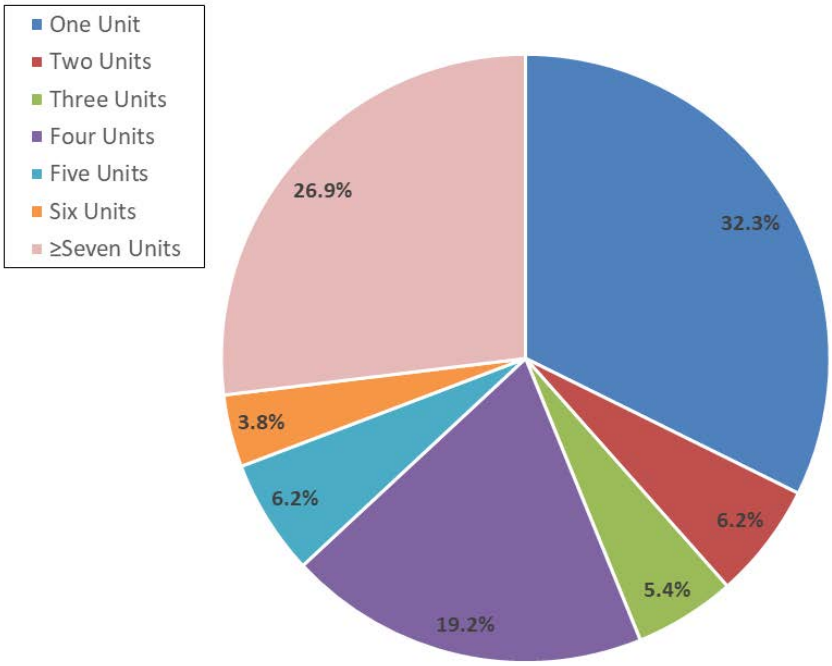
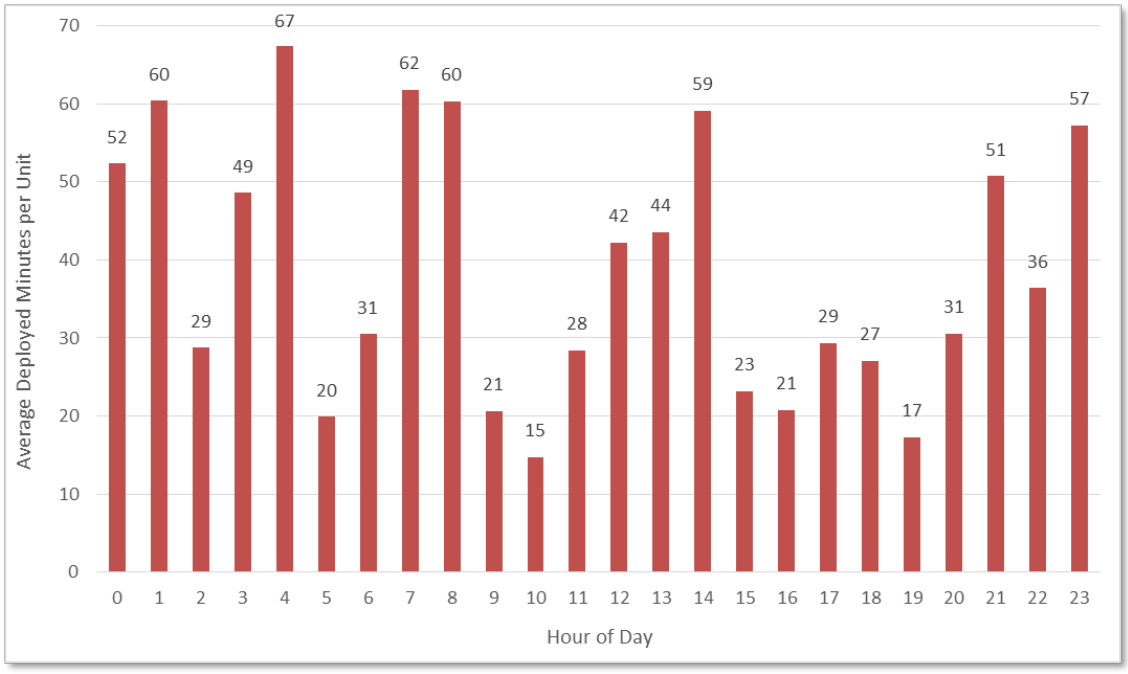


Table 56: Number of Responding Units for Building Fire Calls

Number of Responding Units	Number of Calls
1	42
2	8
3	7
4	25
5	8
6	5
7	23
8	8
9	3
10	1
Total	**130**

Figure 44: Average Deployed Minutes per Unit by Hour of Day for Fire Related Responses



Heat maps were created to identify the concentration of the historic demand for services for fire. The blue areas have the lowest concentration of demand and the dark red areas have the highest concentration of demand.

Figure 45: Heat Map for Fire Related Incidents

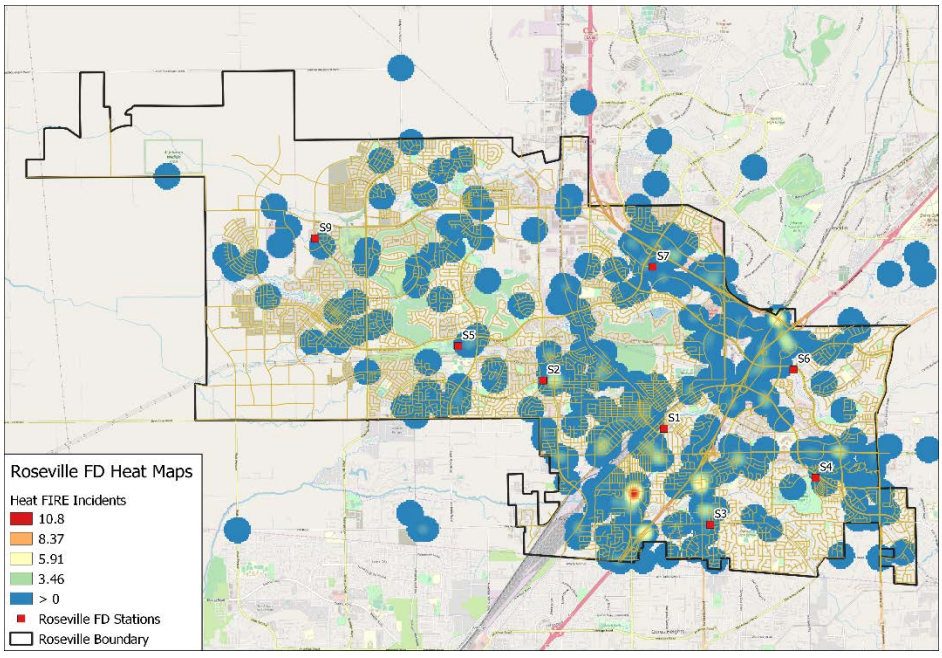


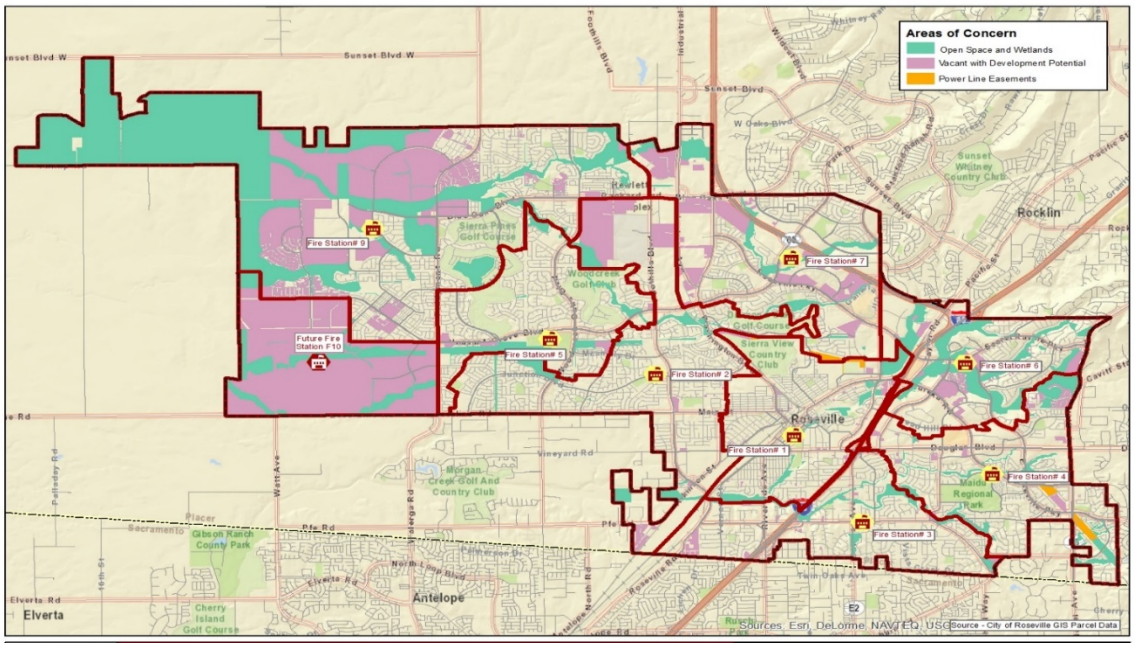
Table 57: Wildland Incident Responses by Unit and Reporting Year

Reporting Year	Unit							Total
	BR2	BR5	BR6	BR9	G2	G4	G8	
2014	0	26	21	15	19	10	0	**91**
2015	0	12	11	7	11	7	0	**48**
2016	0	26	13	15	19	11	0	**84**
2017	0	11	12	8	12	4	0	**47**
2018	0	18	27	16	24	22	0	**107**
Total	**0**	**93**	**84**	**61**	**85**	**54**	**0**	**377**

Table 58: Wildland Incident Arrivals by Unit and Reporting Year

Reporting Year	Unit							Total
	BR2	BR5	BR6	BR9	G2	G4	G8	
2014	0	17	16	10	15	9	0	**67**
2015	0	10	6	5	8	6	0	**35**
2016	0	22	10	14	17	10	0	**73**
2017	0	11	7	8	10	4	0	**40**
2018	0	17	20	9	14	9	0	**69**
Total	**0**	**77**	**59**	**46**	**64**	**38**	**0**	**284**

Figure 46: Wildland Fires Areas of Concern



EMS Response Analysis

EMS Benchmark

To treat **low- and moderate-risk** medical patients, the goal for total response time for arrival of the first due unit, staffed with three personnel (including a minimum of one Paramedic) shall be **7 minutes**, 90% of the time from receipt of the 9-1-1 call.

EMS Calls Percentage of Total Call Volume

EMS related requests accounted for 60.5% of the total requests for service during 2018 and averaged 28.1 requests per day. EMS related incidents are an aggregated category of the various final incident types available in the data file. The table provides details for these EMS related incidents by nature of the call; nature of the call was obtained using a data dictionary provided by RFD that permitted the mapping of text definitions to the numeric NFIRS codes (i.e., variable "INCIDENTTYPE") presented in the RMS data file.

Table 59: Total EMS Related Calls by Nature of Call

Nature of Call[1]	Number of Calls	Percentage of Total EMS Demands
EMS call, excluding vehicle accident with injury	10,065	98.2
Medical assist, assist EMS crew	180	1.8
Emergency medical service, other	2	0.0
Total	**10,247**	**100.0**

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

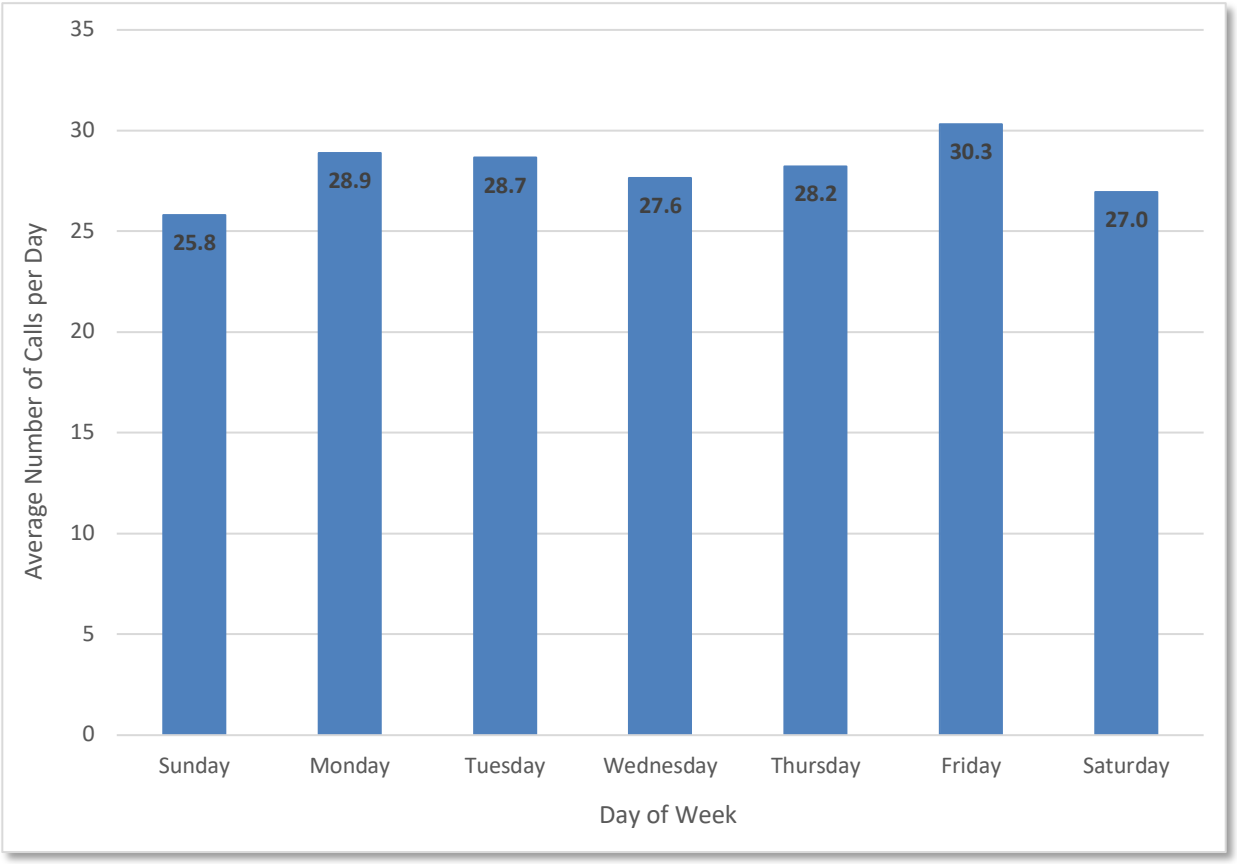
Temporal analyses were conducted to evaluate patterns in community demands for EMS related services. These analyses examined the frequency of requests for service in 2018 by month, day of week, and hour of day. Results found that there was some variability by month. The three months with the most EMS related calls in descending order were: January (29.9 per day), March (29.9 per day), and May (29.5 per day). The three months with the fewest EMS related calls in ascending order were: September (26.8 per day), December (26.9 per day), and August (27.1 per day).

Similar analyses were conducted for EMS related calls by day of week. 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 30.3 calls per day and accounting for 15.4% of all EMS related calls. Sunday had the lowest frequency of requests for EMS related services, averaging 25.8 calls per day and accounting for 13.1% of all EMS related calls.

Table 60: 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	1,342	25.8	13.1
Monday	1,531	28.9	14.9
Tuesday	1,490	28.7	14.5
Wednesday	1,437	27.6	14.0
Thursday	1,468	28.2	14.3
Friday	1,577	30.3	15.4
Saturday	1,402	27.0	13.7
Total	**10,247**	**28.1**	**100.0**

Figure 47: Average EMS Related Calls per Day by Day of Week



RFD made a total of 11,247 responses to EMS related calls in 2018. Total busy time was 3,671.3 hours, and the average busy minutes per response was 20.1 minutes. The three most utilized units based on total busy hours were E3 (664 hours), E5 (486 hours), and E9 (441 hours).

Figure 48: Average EMS Related Calls per Day by Hour of Day

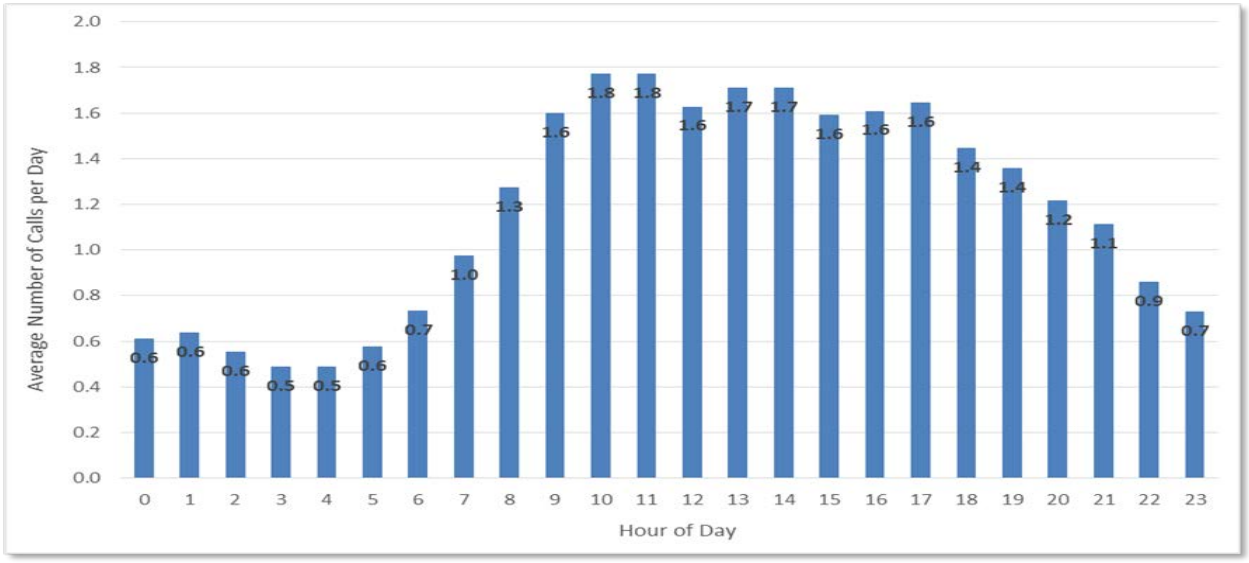


Figure 49: Heat Map for EMS Related Incidents

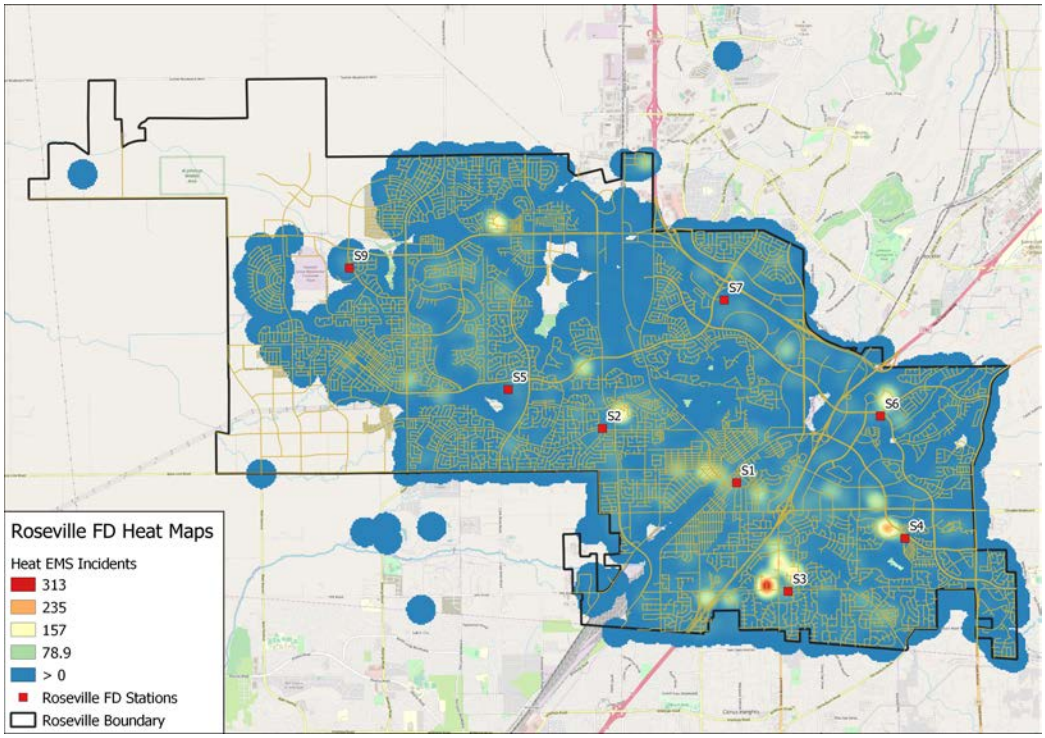


Table 61: Workload by Unit for EMS Related Calls

Station	Unit	Unit Type	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
Station 1	B1	Battalion Chief	21	19	7.8	24.6
	E1	Engine	1,496	1,460	381.4	15.7
	HZ1	Hazmat	0	--	--	--
	T1	Truck	572	561	147.3	15.8
	Station Total		**2,089**	**2,040**	**536.5**	**15.8**
Station 2	E2	Engine	1,243	1,234	427.4	20.8
	G2	Grass	2	2	1.4	42.1
	Station Total		**1,245**	**1,236**	**428.8**	**20.8**
Station 3	E3	Engine	1,925	1,918	664.0	20.8
	Station Total		**1,925**	**1,918**	**664.0**	**20.8**
Station 4	E4	Engine	1,207	1,199	392.2	19.6
	G4	Grass	0	--	--	--
	Station Total		**1,207**	**1,199**	**392.2**	**19.6**
Station 5	BR5	Brush Truck	0	--	--	--
	E5	Engine	1,317	1,304	486.0	22.4
	E5B	Engine	0	--	--	--
	E8	Engine	10	10	2.8	17.1
	Station Total		**1,327**	**1,314**	**488.9**	**22.3**
Station 6	BR6	Brush Truck	1	1	0.4	25.3
	E6	Engine	914	900	281.6	18.8
	E6B	Engine	0	--	--	--
	Station Total		**915**	**901**	**282.1**	**18.8**
Station 7	E7	Engine	980	970	354.9	22.0
	R7	Rescue	0	--	--	--
	T7	Truck	305	296	82.7	16.8
	T7B	Truck	0	--	--	--
	Station Total		**1,285**	**1,266**	**437.6**	**20.7**
Station 9	BR9	Brush Truck	0	--	--	--
	E9	Engine	1,107	1,101	441.1	24.0
	Station Total		**1,107**	**1,101**	**441.1**	**24.0**
RFD Admin	1401	Chief Officer	0	--	--	--
	1404	Chief Officer	0	--	--	--
	1405	Chief Officer	0	--	--	--
	1410	Chief Officer	0	--	--	--
	1411	Chief Officer	0	--	--	--
	1413	Chief Officer	0	--	--	--

Station	Unit	Unit Type	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
RFD Admin	1414	Chief Officer	0	--	--	--
	FPB	Fire Prevention	0	--	--	--
	P2	Fire Prevention	0	--	--	--
	P3	Fire Prevention	0	--	--	--
	P4	Fire Prevention	0	--	--	--
	P5	Fire Prevention	0	--	--	--
	P6	Fire Prevention	0	--	--	--
	Station Total		**0**	**--**	**--**	**--**
RFD Other	OES364	OES Engine	1	1	0.3	19.5
	Station Total		**1**	**1**	**0.3**	**19.5**
Department Total			**11,101**	**10,976**	**3,671.3**	**20.1**

[1]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[2]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix).

RFD dispatched multiple units to 8.1% of EMS related calls (833/10,244). On average, 1.1 units were dispatched per EMS related call (11,101/10,244).

Table 62: Number of Responding Units by EMS Related Call Type

Call Category	Number of Responding Units				Total
	1	2	3	4	
EMS	9,411	810	22	1	10,244
Total	9,411	810	22	1	10,244
Percentage	**91.9**	**7.9**	**0.2**	**0.0**	**100.0**

Hazardous Materials Call Analysis

Hazardous Materials Benchmark

For 90% of all **low-risk** Hazardous Materials responses, the total response time for arrival of the first due unit, staffed with three personnel (one Captain, one Engineer, and one FF/P) shall be **8 minutes**.

Hazardous Materials Baseline Performance Measure

Table 63: Baseline Average Performance of Primary Front-Line Arriving Units for Hazardous Conditions (No Fire) Incidents – Low Risk

		Average Time (Minutes)					
Performance Metric	**Arriving Unit**	**2014-2018**	**2014**	**2015**	**2016**	**2017**	**2018**
Dispatch Time	1st	1.9	1.5	1.7	2.1	1.8	2.2
Turnout Time	1st	1.6	1.4	1.5	1.6	1.6	1.7
Travel Time	1st	3.8	3.9	4.0	3.9	3.8	3.6
Response Time	1st	7.0	6.6	7.1	7.5	7.0	7.0
Sample Size[1]	1st	691	119	122	126	162	162

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

Table 64: Baseline Average Performance of Primary Front-Line Arriving Units for Hazardous Conditions (No Fire) Incidents – Moderate and High Risk

		Average Time (Minutes)					
Performance Metric	**Arriving Unit**	**2014-2018**	**2014**	**2015**	**2016**	**2017**	**2018**
Dispatch Time	1st	1.9	1.5	1.7	2.1	1.8	2.2
	3rd (ERF)	2.3	2.2	2.0	2.3	2.6	2.3
Turnout Time	1st	1.6	1.4	1.5	1.6	1.6	1.7
	3rd (ERF)	2.2	2.7	2.3	2.8	2.1	1.7
Travel Time	1st	3.8	3.9	4.0	3.9	3.8	3.6
	3rd (ERF)	6.2	5.6	6.8	5.5	5.7	7.0
Response Time	1st	7.0	6.6	7.1	7.5	7.0	7.0
	3rd (ERF)	10.0	9.1	11.1	10.2	9.9	9.6
Sample Size[1]	1st	691	119	122	126	162	162
	3rd (ERF)	152	24	29	19	45	35

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

The response goal for hazardous material incidents is recorded as the first arriving engine or truck on these specific call types. The vast majority of hazardous material calls are handled with a single company. If a medium- or high-level incident occurs, additional personnel and apparatus are requested. Hazardous Material 1 is cross staffed with Engine 1 and Truck 1, so the arrival of Hazardous Material 1 may be delayed, if one or both of the crews are out of the station at the time of dispatch.

Technical Rescue Call Analysis

Technical Rescue Benchmark

For 90% of all **low-risk** Rescue responses, the total response time for arrival of the first due unit, staffed with three personnel (one Captain, one Engineer, and one FF/P) shall be **8 minutes**.

Technical Rescue Baseline Performance

Table 65: Baseline Average Performance of Primary Front-Line Arriving Units for Rescue Incidents – Low Risk

Average Time (Minutes)							
Performance Metric	**Arriving Unit**	**2014-2018**	**2014**	**2015**	**2016**	**2017**	**2018**
Dispatch Time	1st	1.8	1.2	1.8	2.0	2.3	1.9
Turnout Time	1st	1.4	1.3	1.3	1.5	1.5	1.5
Travel Time	1st	3.4	3.4	3.4	3.4	3.5	3.4
Response Time	1st	6.5	5.7	6.3	6.7	7.2	6.7
Sample Size[1]	1st	4,057	734	765	865	830	863

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

Table 66: Baseline Average Performance of Primary Front-Line Arriving Units for Rescue Incidents – Moderate and High Risk

Average Time (Minutes)							
Performance Metric	**Arriving Unit**	**2014-2018**	**2014**	**2015**	**2016**	**2017**	**2018**
Dispatch Time	1st	1.8	1.2	1.8	2.0	2.3	1.9
	3rd (ERF)	2.0	1.1	2.8	1.5	2.1	2.2
Turnout Time	1st	1.4	1.3	1.3	1.5	1.5	1.5
	3rd (ERF)	1.8	1.9	1.6	1.9	2.0	1.9
Travel Time	1st	3.4	3.4	3.4	3.4	3.5	3.4
	3rd (ERF)	6.9	5.2	6.1	7.9	6.1	9.2
Response Time	1st	6.5	5.7	6.3	6.7	7.2	6.7
	3rd (ERF)	10.9	7.7	12.1	11.5	9.9	13.1
Sample Size[1]	1st	4,057	734	765	865	830	863
	3rd (ERF)	136	23	34	21	32	26

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

SECTION 7: CONCENTRATION OF RESOURCES – ERF

Effective Response Force

The capability of an ERF to assemble in a timely manner with the appropriate personnel, apparatus, and equipment is vital to the success of a significant building 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 timeframes. Several factors affect the capabilities to assemble an ERF including 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 a community's specific risks and the willingness to assume risk.

Concentration refers to the spacing of multiple resources in close proximity in order to assemble an initial ERF, sometimes referred to as first alarm assignment within prescribed timeframes. An initial ERF is one that has been deemed capable of stopping the escalation of a fire emergency, stabilizing a medical scene, affecting a rescue, and successfully mitigating an incident. Analysis of unit concentration must take into account the substantial reliance of all of the region's fire and medical service organizations on mutual and automatic aid. RFD has determined that 11 firefighters are sufficient to make our ERF for moderate-risk fires unless it is a confirmed working structure fire. On any working building fire, the Department response is four fire engines, two ladder trucks, and one Battalion Chief for a total of 21 personnel.

Response Goal Statement #2: Effective Response Force of 11 Personnel for Moderate-Risk Fires

For 90% of all **moderate-risk** structure fires, the total response time for arrival of the ERF staffed with 14 firefighters and officers, shall be **11 minutes and 30 seconds**. The ERF shall be able to: establish command, appoint a site safety officer, provide an uninterrupted water supply, advance an attack line and backup line for fire control, comply with the Occupational Safety and Health Administration (OSHA) requirements for two-in and two-out, complete forcible entry, search and rescue at-risk victims, ventilate the structure, control utilities, and perform salvage and overhaul.

The ERF for **high- and special-risk** structure fires shall be capable of placing elevated streams into service from aerial ladders. These operations shall be done in accordance with Department policy while providing for the safety of responders and the general public. There is not a calculated response time for high- and special-risk structure fires due to infrequent calls of this severity.

Effective Response Force Mapping

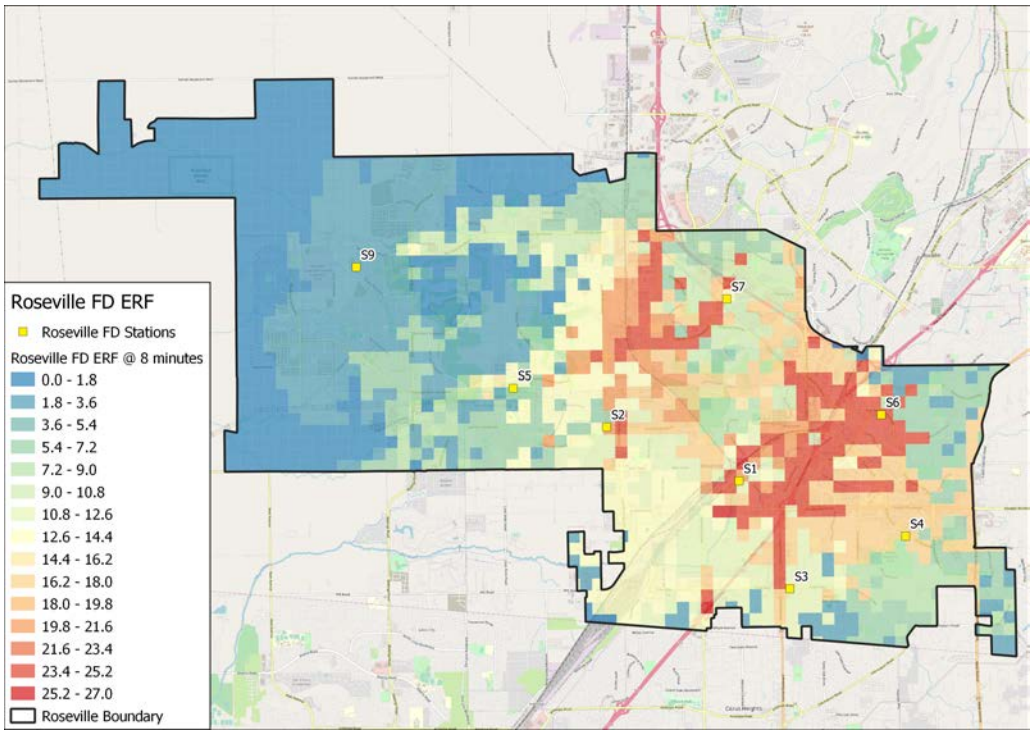
The following analyses evaluated an ERF of 16 personnel. Under the current configuration of eight stations, the Department can cover nearly 22% of the jurisdiction and assemble 16 personnel within 8 minutes. Approximately, 50% of the community can be covered within 10 minutes with 16 personnel, and 75% of the community can be covered within 13 minutes with 16 personnel.

Table 67: Comparisons of ERF Configurations

Travel Time Objective	Current
8-Minute	21.88%
10-Minute	49.03%
13-Minute	74.81%
17-Minute	86.72%

Overall, the ERF coverage is more robust in the center of the jurisdiction where the greatest historical demand exists. The areas in the east and west of the City are challenged since they do not benefit from concentric response zones.

Figure 50: 8-Minute ERF – All Current Stations



Baseline Performance Measures ERF

Table 68: Baseline Average Performance of Primary Front-Line Arriving Units for Fire Incidents – Low Risk

Performance Metric	Arriving Unit	Average Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	1.5	1.6	1.4	1.5	1.5	1.4
Turnout Time	1st	1.7	1.5	1.6	1.7	1.8	1.7
Travel Time	1st	4.0	4.3	3.7	4.3	4.0	3.6
Response Time	1st	6.9	7.1	6.4	7.2	7.2	6.6
Sample Size[1]	1st	1,323	276	262	261	250	274

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

Table 69: Baseline Average Performance of Primary Front-Line Arriving Units for Fire Incidents – Moderate Risk

Performance Metric	Arriving Unit	Average Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	1.5	1.6	1.4	1.5	1.5	1.4
	3rd (ERF)	2.2	3.1	2.3	2.3	1.4	1.8
Turnout Time	1st	1.7	1.5	1.6	1.7	1.8	1.7
	3rd (ERF)	2.3	2.1	2.3	2.1	2.5	2.3
Travel Time	1st	4.0	4.3	3.7	4.3	4.0	3.6
	3rd (ERF)	5.7	6.0	5.6	6.5	5.2	5.0
Response Time	1st	6.9	7.1	6.4	7.2	7.2	6.6
	3rd (ERF)	9.5	10.5	9.4	10.0	8.8	8.8
Sample Size[1]	1st	1,323	276	262	261	250	274
	3rd (ERF)	309	51	66	69	52	71

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

Table 70: Baseline Average Performance of Primary Front-Line Arriving Units for Fire Incidents – High Risk

Performance Metric	Arriving Unit	Average Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	1.5	1.6	1.4	1.5	1.5	1.4
	6th (ERF)	3.3	2.1	3.1	3.6	3.7	3.8
Turnout Time	1st	1.7	1.5	1.6	1.7	1.8	1.7
	6th (ERF)	2.7	2.4	3.1	3.1	2.2	2.8
Travel Time	1st	4.0	4.3	3.7	4.3	4.0	3.6
	6th (ERF)	8.1	7.6	8.6	6.8	8.0	8.6
Response Time	1st	6.9	7.1	6.4	7.2	7.2	6.6
	6th (ERF)	13.8	11.6	15.0	12.6	13.7	14.7
Sample Size[1]	1st	1,323	276	262	261	250	274
	6th (ERF)	117	18	28	17	20	34

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

Table 71: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for Building Fire Incidents – Low Risk

Performance Metric	Arriving Unit	90th Percentile Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	2.2	2.2	2.4	1.9	2.7	2.3
Turnout Time	1st	2.5	2.4	2.6	2.7	2.6	2.4
Travel Time	1st	6.2	7.4	5.7	7.4	7.1	5.6
Response Time	1st	9.4	9.3	9.0	10.9	11.3	8.7
Sample Size[1]	1st	497	96	105	97	90	109

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

Table 72: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for Building Fire Incidents – Moderate Risk

Performance Metric	Arriving Unit	90th Percentile Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	2.2	2.2	2.4	1.9	2.7	2.3
	3rd (ERF)	3.3	3.9	5.5	4.3	2.1	3.1
Turnout Time	1st	2.5	2.4	2.6	2.7	2.6	2.4
	3rd (ERF)	3.7	2.6	3.8	5.1	5.0	4.9
Travel Time	1st	6.2	7.4	5.7	7.4	7.1	5.6
	3rd (ERF)	7.8	8.5	8.3	8.6	7.3	9.2
Response Time	1st	9.4	9.3	9.0	10.9	11.3	8.7
	3rd (ERF)	11.5	10.2	13.8	11.1	11.2	12.3
Sample Size[1]	1st	497	96	105	97	90	109
	3rd (ERF)	179	28	47	34	33	37

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

Table 73: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for Building Fire Incidents – High Risk

Performance Metric	Arriving Unit	90th Percentile Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	2.2	2.2	2.4	1.9	2.7	2.3
	6th (ERF)	8.9	7.9	8.4	10.3	11.7	7.8
Turnout Time	1st	2.5	2.4	2.6	2.7	2.6	2.4
	6th (ERF)	6.2	4.9	8.3	6.4	4.6	10.2
Travel Time	1st	6.2	7.4	5.7	7.4	7.1	5.6
	6th (ERF)	10.0	13.3	12.7	9.8	12.7	9.1
Response Time	1st	9.4	9.3	9.0	10.9	11.3	8.7
	6th (ERF)	17.6	16.6	21.4	17.1	22.3	19.3
Sample Size[1]	1st	497	96	105	97	90	109
	6th (ERF)	92	15	26	11	16	24

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

Table 74: Building Fire: 90th Percentile Travel Time in Minutes for ERF by Demand Zone

Demand Zone	Order of Arrival						
	1	2	3	4	5	6	7
Station 1	3.2	4.3	9.3	9.6	--	--	--
Station 2	5.8	4.3	5.7	4.8	--	--	--
Station 3	4.1	--	--	--	--	--	--
Station 4	4.0	--	--	--	--	--	--
Station 5	6.0	7.9	--	--	--	--	--
Station 6	--	--	--	--	--	--	--
Station 7	4.9	--	--	--	--	--	--
Station 9	5.3	--	--	--	--	--	--
Total	**5.5**	**7.7**	**8.6**	**8.8**	**9.3**	**9.4**	**10.3**

Table 75: Building Fire: Sample Size for ERF Analysis by Demand Zone

Demand Zone	Order of Arrival						
	1	2	3	4	5	6	7
Station 1	16	12	11	10	6	4	2
Station 2	15	10	10	10	7	6	6
Station 3	18	8	5	4	4	4	2
Station 4	14	8	8	6	3	6	1
Station 5	13	10	4	3	3	6	2
Station 6	5	1	1	1	0	0	0
Station 7	11	5	4	3	1	2	2
Station 9	12	6	4	3	3	2	2
Total	**112**	**66**	**49**	**40**	**27**	**24**	**17**

Figure 51: 90th Percentile ERF Travel Time Performance for Building Fires Overall

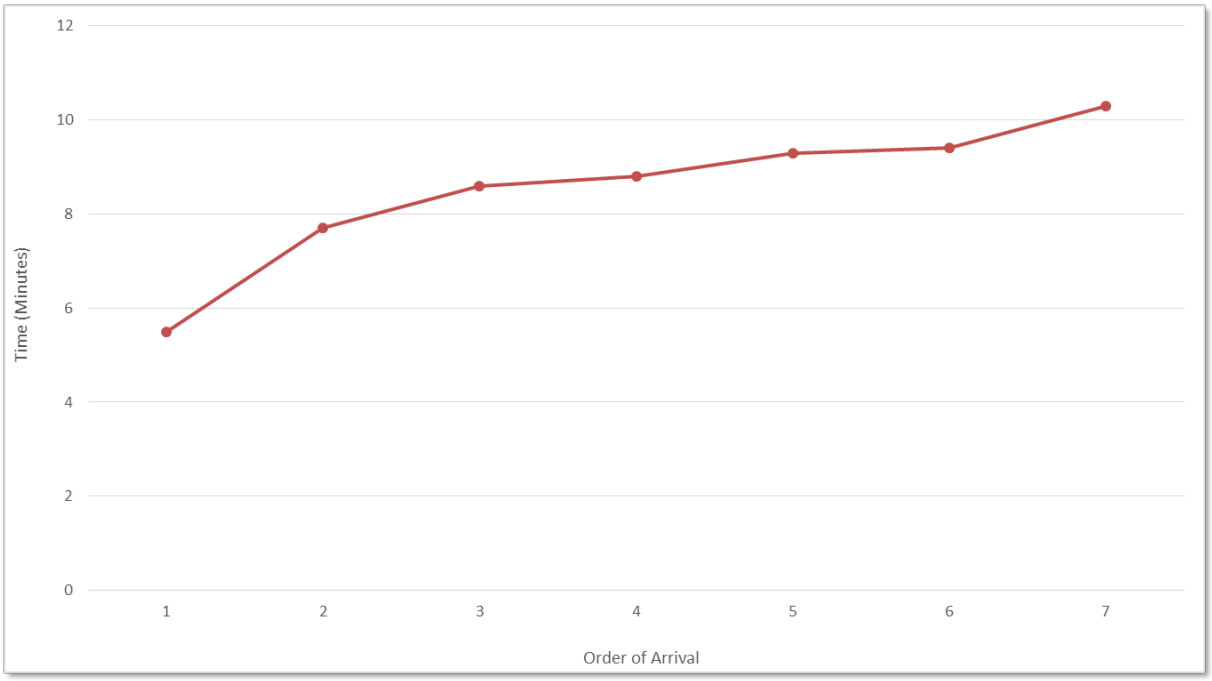


Table 76: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for Wildland Fire Incidents – Low Risk

Performance Metric	Arriving Unit	90th Percentile Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	3.3	4.6	2.8	3.3	3.6	2.6
Turnout Time	1st	3.2	3.0	2.3	3.3	3.5	3.5
Travel Time	1st	10.1	11.5	9.7	11.8	7.8	8.5
Response Time	1st	12.9	17.4	10.4	12.9	10.7	13.1
Sample Size[1]	1st	315	62	52	63	57	81

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

Table 77: Baseline 90th Percentile Performance of Primary Front-Line Arriving Units for Wildland Fire Incidents – Moderate and High Risk

Performance Metric	Arriving Unit	90th Percentile Time (Minutes) 2014-2018	2014	2015	2016	2017	2018
Dispatch Time	1st	3.3	4.6	2.8	3.3	3.6	2.6
	3rd (ERF)	7.0	11.6	12.8	7.2	5.5	7.3
Turnout Time	1st	3.2	3.0	2.3	3.3	3.5	3.5
	3rd (ERF)	3.5	7.0	N/A	3.4	N/A	6.4
Travel Time	1st	10.1	11.5	9.7	11.8	7.8	8.5
	3rd (ERF)	13.1	15.1	12.5	20.8	23.0	12.0
Response Time	1st	12.9	17.4	10.4	12.9	10.7	13.1
	3rd (ERF)	21.3	27.9	N/A	23.4	N/A	14.7
Sample Size[1]	1st	315	62	52	63	57	81
	3rd (ERF)	91	14	12	26	10	29

[1]Sample sizes reflect the number of responses made by arriving primary front-line units to emergency calls; due to missing or excluded time data, sample sizes corresponding to individual table metrics may be smaller.
N/A = Small or zero sample size precluded the calculation of metric.

Mutual and Automatic Aid Analysis

RFD maintains a broad network of mutual and automatic aid agreements with surrounding jurisdictions. Mutual aid defines services provided to another area at the specific request of the jurisdiction having authority, and is granted whenever doing so will not leave areas of primary responsibility with an inadequate level of protection. Mutual aid can be provided within our County for a large-scale incident, and no reimbursement occurs for the first 12 hours of commitment to the incident. Other times, when large fires overwhelm the response capabilities of local resources, resources are requested through the State of California Master Mutual Aid system. Examples would be deployment of a Roseville Type III Brush Engine to Southern California for a large fire incident.

Automatic aid refers to agreements that provide a pre-determined level of cross-jurisdictional response support, usually in boundary areas, without the need for a specific request. Currently, Roseville has automatic aid agreements with CalFire, Sacramento Metropolitan Fire District, South Placer Fire District, and Rocklin Fire--all agencies that share borders with the Department.

Table 78: Mutual Aid and Automatic Aid Received and Given – Calls, Responses, and Busy Time

Mutual Aid Code	Number of Calls	Agency or Station	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
Mutual Aid Received	10	AMR	6	6	2.5	25.2
		Other Outside	10	10	7.0	42.0
		Total	**16**	**16**	**9.5**	**35.7**
Automatic Aid Received	15	AMR	11	10	5.3	32.1
		Other Outside	18	18	7.3	24.4
		Total	**29**	**28**	**12.7**	**27.2**
Mutual Aid Given	127	Station 1	37	37	32.8	53.2
		Station 2	20	20	14.8	44.4
		Station 3	1	1	0.1	7.6
		Station 4	10	10	7.6	45.9
		Station 5	29	29	19.0	39.2
		Station 6	13	12	13.2	66.0
		Station 7	48	48	33.6	42.0
		Station 9	20	19	25.8	81.4
		RFD Admin	3	0	--	--
		RFD Other	2	0	--	--
		Total	**183**	**176**	**146.9**	**50.1**
Automatic Aid Given	65	Station 1	29	29	29.5	61.0
		Station 2	7	7	3.2	27.8
		Station 3	13	13	5.2	24.0
		Station 4	11	10	7.1	42.8
		Station 5	6	6	5.6	55.8
		Station 6	11	11	1.9	10.6
		Station 7	17	17	9.0	31.6
		Station 9	9	8	9.6	71.6
		RFD Admin	1	0	--	--
		RFD Other	0	--	--	--
		Total	**104**	**101**	**71.1**	**42.2**
Other Aid Given	1	Station 9	1	1	0.4	21.9
		Total	**1**	**1**	**0.4**	**21.9**
None	16,505	All	32,959	31,777	8,227.4	15.5
Y[3]	196	All	805	781	250.3	19.2
Total	**16,919**	**All**	**34,273**	**33,041**	**8,865.5**	**16.1**

[1]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[2]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix).
[3]Code appeared as "Y," not otherwise specified.

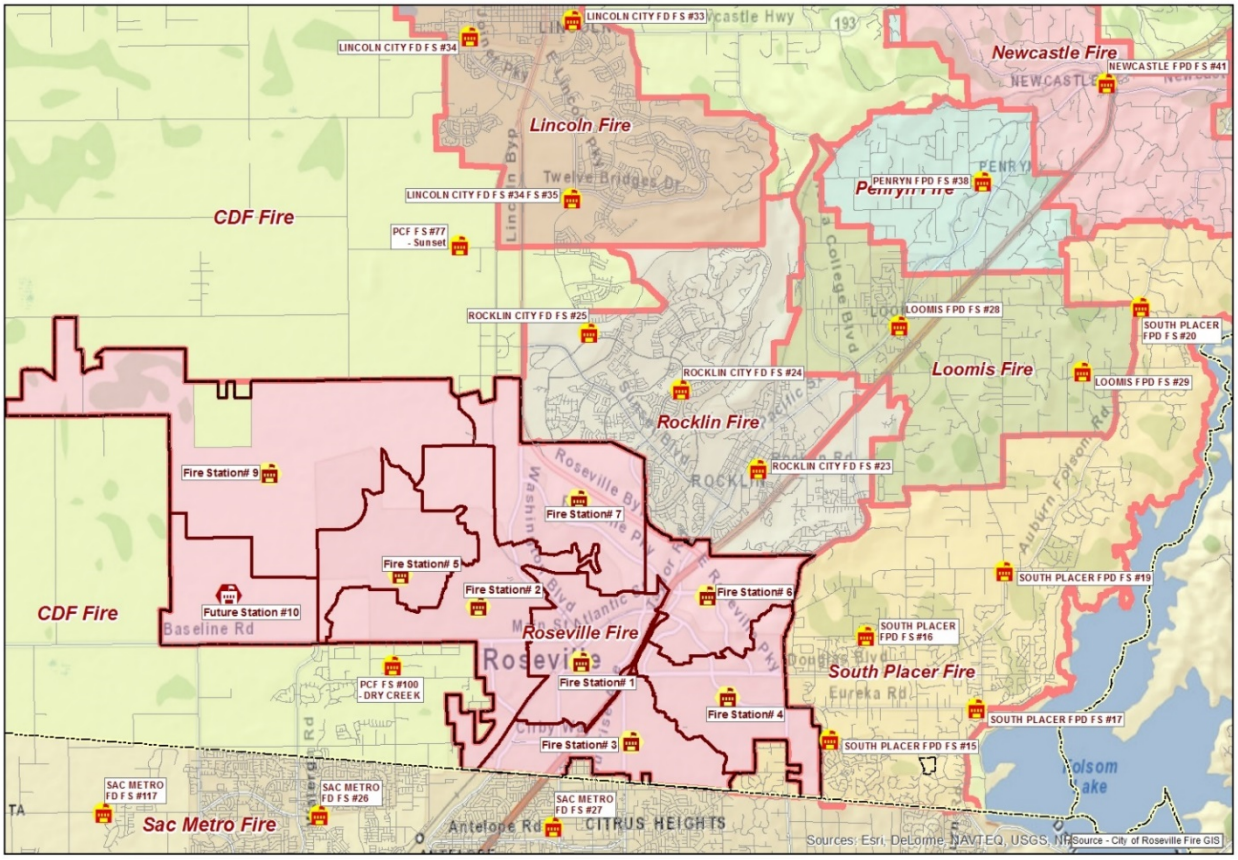
Table 79: Overall Workload by Unit – Outside Agencies

Agency	Unit	Unit Type	Number of Responses[1]	Responses with Time Data[2]	Total Busy Hours	Average Busy Minutes per Response
AMR	All	ALS Unit	13,170	12,252	2,194.4	10.7
	Station Total		**13,170**	**12,252**	**2,194.4**	**10.7**
Placer County	E77	Engine	4	3	0.4	7.8
	E100	Engine	20	16	9.1	34.0
	Station Total		**24**	**19**	**9.5**	**29.9**
Rocklin	B24	Battalion Chief	68	65	9.2	8.5
	E23	Engine	85	84	18.3	13.1
	E24	Engine	6	6	0.4	4.0
	E25	Engine	2	2	0.2	6.0
	T24	Truck	26	25	3.1	7.6
	Station Total		**187**	**182**	**31.3**	**10.3**
South Placer	B19	Battalion Chief	19	18	2.7	8.8
	E15	Engine	26	24	3.3	8.3
	Station Total		**45**	**42**	**6.0**	**8.6**
Outside Agency Total			**13,426**	**12,495**	**2,241.2**	**10.8**

[1]"Number of Responses" reflects the total number of entries in the unit-level data file, regardless of calculated busy time.
[2]"Responses with Time Data" reflects the number of responses in the unit-level data file with calculated busy time not otherwise missing or excluded (see Appendix of data report).

Regional Resources

Figure 52: Regional Departments and Available Resources



Regional Incident Management Team

RFD is an integral part of Placer County's Incident Support Team. Approximately eight RFD personnel participate in the 50-member team composed of peers from regional fire, law, and PSAP agencies. The team is activated through emergency notification to support incident management that extends beyond a single operational period, or when requested by the Incident Commander. The team trains regularly and is able to respond to multiple hazards including wildland fires, floods, earthquakes, tornadoes, large fires, hazardous materials incidents, and other natural or human-caused incidents.

Response Reliability Analysis

Maintain Response Reliability greater than 80% for each Fire Response District Benchmark

Response reliability is the probability that the resources assigned to an area will be available to respond from within the area when an emergency occurs. The benchmark for RFD is to maintain 80% or greater response reliability for each response district. Response reliability would be 100% if every company were available in their designated area when a fire or emergency call is received. However, in reality, there are times when the first due unit is committed, out of area, or otherwise unavailable. This requires that a later due unit, in the predetermined response order, be assigned. If the later due unit is too far away, the call cannot be handled within the desired response time. When a district's response reliability falls below 80%, it is time to begin looking at ways to keep that assigned apparatus in that district available more often. If those efforts fail, then other measures should be taken, such as implementation of a peak activity unit, cover unit from another district, additional staffing, and/or an additional company.

As the number of emergency calls per day, training demands, and other activities increase, so does the probability that the first due unit will be out of area or unavailable when a call is received, resulting in decreased reliability.

Percentage of First Due Compliance

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 demand zone. This analysis utilized all dispatched calls within RFD's demand zones and performance included responses from any unit in RFD's department. Units assigned to Station 1 responded to calls within their respective demand zone >90% of the time. Units from all other stations responded to calls within their respective demand zones <90% of the time.

Response Reliability by Demand Zone

Table 80: Number of Responses by Demand Zone and Program

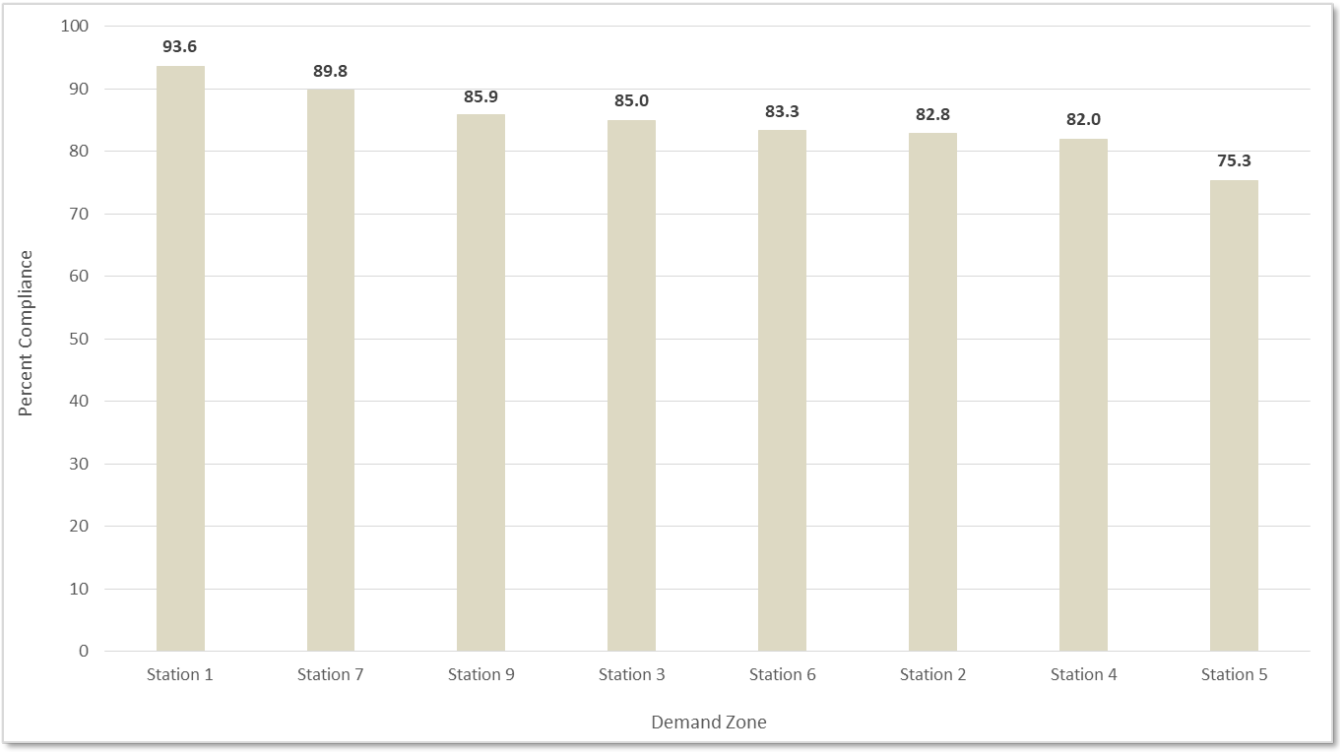
Demand Zone	Program			Total
	EMS	Fire	Other	
Station 1	1,668	227	1,270	3,165
Station 2	1,235	124	736	2,095
Station 3	2,196	141	1,184	3,521
Station 4	1,270	106	966	2,342
Station 5	1,524	118	980	2,622
Station 6	828	114	1,153	2,095
Station 7	1,193	136	1,266	2,595
Station 9	1,124	97	701	1,922
Unknown	63	48	379	490
Total	**11,101**	**1,111**	**8,635**	**20,847**

Table 81: First Due Compliance by Demand Zone – Number of Calls

Demand Zone	Responding Unit's Assigned Station										
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 9	RFD Admin	RFD Other	Total[1]
Station 1	**2,149**	74	91	28	16	121	72	7	5	0	2,295
Station 2	214	**1,432**	11	5	120	10	143	10	4	0	1,729
Station 3	440	37	**2,537**	202	8	99	39	0	5	0	2,985
Station 4	122	5	223	**1,608**	5	250	29	2	4	0	1,962
Station 5	77	337	2	1	**1,710**	4	117	314	3	1	2,270
Station 6	168	7	56	200	5	**1,375**	164	3	6	0	1,651
Station 7	133	83	4	10	31	203	**1,778**	21	5	0	1,981
Station 9	58	39	2	1	270	3	82	**1,427**	0	0	1,662
Unknown	85	40	63	45	55	31	99	41	3	4	373
Total	**3,446**	**2,054**	**2,989**	**2,100**	**2,220**	**2,096**	**2,523**	**1,825**	**35**	**5**	**16,908**

[1]"Total" values may 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 demand zone.

Figure 53: Percentage of First Due Compliance by Demand Zone



Overlapped or Simultaneous Call Analysis

Overlapped or simultaneous calls are defined as another call being received in a demand zone or for a first due station while one or more calls are already ongoing for the same demand zone or first due station. For example, if there is an ongoing call in Station 1's zone wherein all units have not yet been cleared, and another request for service occurs in Station 1's zone, those two calls would be captured as overlapped calls. Understanding the percentage of overlapped calls will help to determine the number of units to staff for each station. In general, the larger the call volume for a demand zone or first due station, 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 then broken down 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, Station 1 observed 187 calls during 2018 that overlapped with one or more calls within its demand zone—113 were classified as EMS calls, 16 were classified as fire calls, and 58 were classified into one of the other call categories. The 113 calls that were classified as EMS calls could have overlapped with one or more calls from EMS, fire, or other program areas. Calls with an unknown demand zone were not included in these analyses.

Station 3's demand zone had the highest percentage of overlapped calls during 2018 for overall calls at 11.8% and for EMS calls at 8.6%. Station 1's demand zone had the highest percentage of overlapped calls during 2018 classified as fire calls at 0.7%.

Table 82: Overlapped Calls by Demand Zone

Demand Zone	Overlapped Calls	Total Calls	Percentage of Overlapped Calls
Station 1	187	2,291	8.2
Station 2	106	1,726	6.1
Station 3	353	2,980	11.8
Station 4	154	1,960	7.9
Station 5	196	2,265	8.7
Station 6	99	1,645	6.0
Station 7	197	1,978	10.0
Station 9	114	1,662	6.9

Figure 54: Percentage of Overlapped Calls by Demand Zone

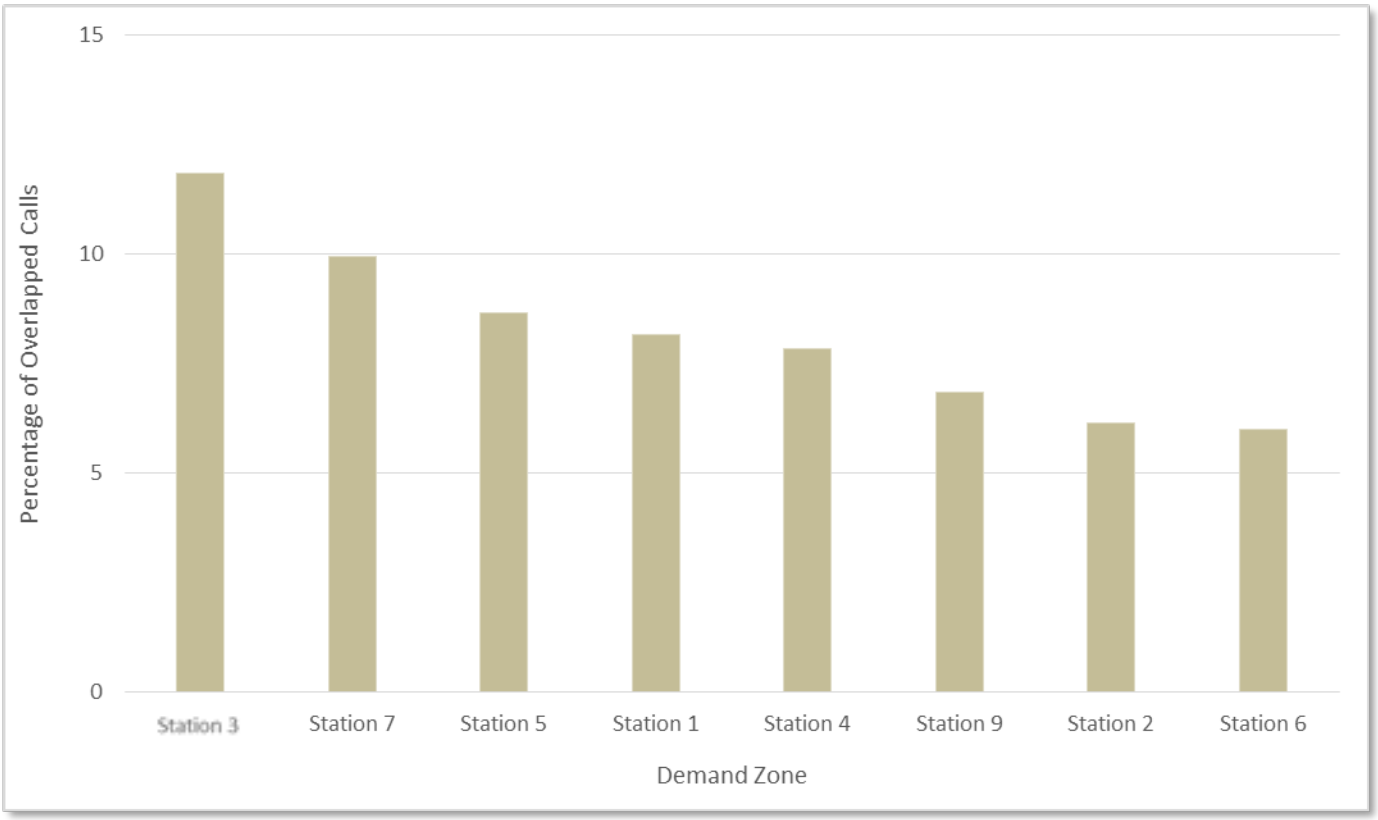


Table 83: Overlapped EMS Calls by Demand Zone

Demand Zone	Overlapped Calls	Total Calls	Percentage of Overlapped Calls
Station 1	113	2,291	4.9
Station 2	74	1,726	4.3
Station 3	257	2,980	8.6
Station 4	96	1,960	4.9
Station 5	131	2,265	5.8
Station 6	56	1,645	3.4
Station 7	128	1,978	6.5
Station 9	83	1,662	5.0

Figure 55: Percentage of Overlapped EMS Calls by Demand Zone

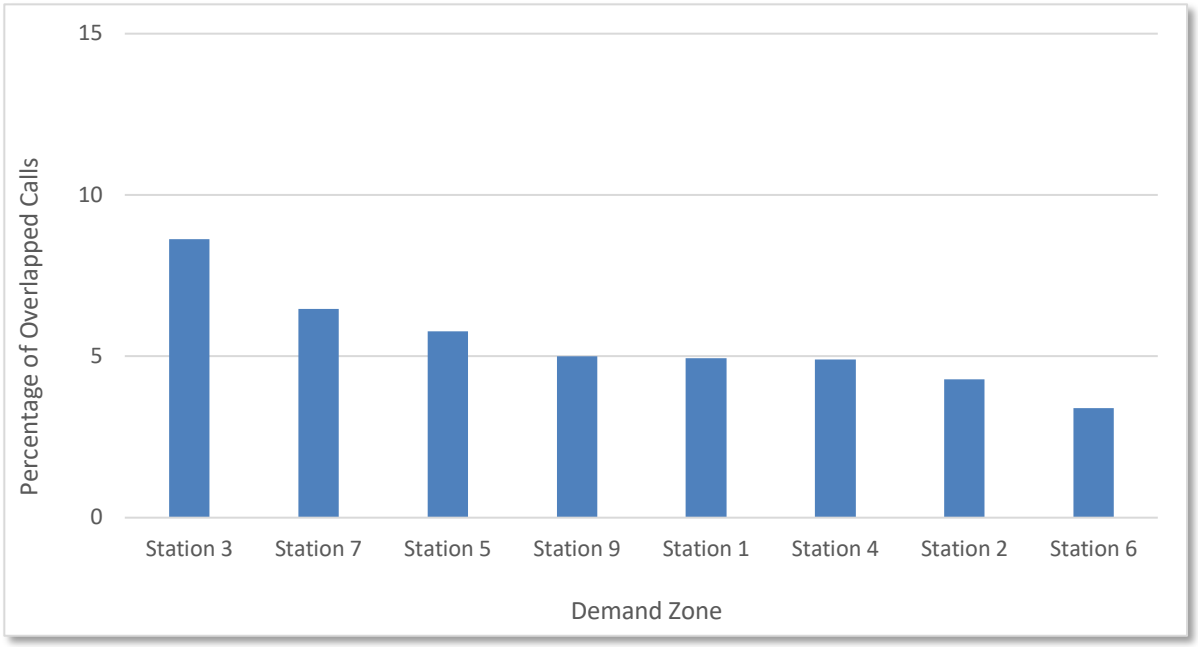
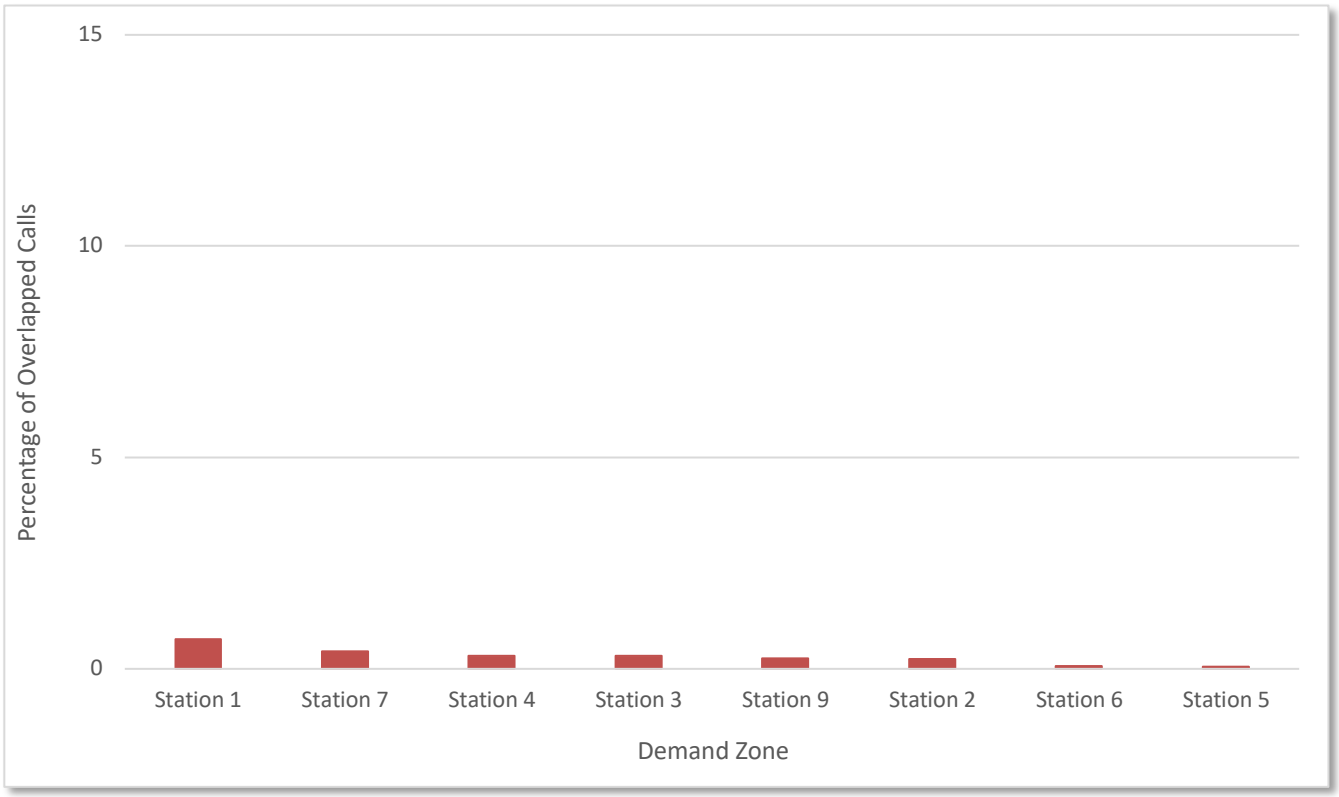


Table 84: Overlapped Fire Calls by Demand Zone

Demand Zone	Overlapped Calls	Total Calls	Percentage of Overlapped Calls
Station 1	16	2,291	0.7
Station 2	4	1,726	0.2
Station 3	9	2,980	0.3
Station 4	6	1,960	0.3
Station 5	1	2,265	0.0
Station 6	1	1,645	0.1
Station 7	8	1,978	0.4
Station 9	4	1,662	0.2

Figure 56: Percentage of Overlapped Fire Calls by Demand Zone



SECTION 8: ISO RATING & COMMUNITY EXPECTATIONS

Current ISO Rating

In July 2015, RFD received an ISO Public Protection Classification grading of **02.** An ISO rating is expressed as a number between 1 and 10, with 1 being the highest level of protection and 10 being unprotected or nearly so. This is an important rating as insurance rates for businesses within our City are based upon this rating.

Figure 57: 2015 ISO Summary Evaluation

FSRS Item	Earned Credit	Credit Available
Emergency Communications		
414. Credit for Emergency Reporting	3.00	3
422. Credit for Telecommunicators	4.00	4
432. Credit for Dispatch Circuits	1.50	3
440. Credit for Emergency Communications	8.50	10
Fire Department		
513. Credit for Engine Companies	5.88	6
523. Credit for Reserve Pumpers	0.49	0.5
532. Credit for Pumper Capacity	3.00	3
549. Credit for Ladder Service	1.98	4
553. Credit for Reserve Ladder and Service Trucks	0.50	0.5
561. Credit for Deployment Analysis	6.93	10
571. Credit for Company Personnel	8.81	15
581. Credit for Training	8.39	9
730. Credit for Operational Considerations	2.00	2
590. Credit for Fire Department	37.98	50
Water Supply		
616. Credit for Supply System	30.00	30
621. Credit for Hydrants	2.87	3
631. Credit for Inspection and Flow Testing	3.59	7
640. Credit for Water Supply	36.46	40
Divergence	-3.04	--
1050. Community Risk Reduction	4.83	5.50
Total Credit	84.73	105.5

Final Community Classification = 02

SECTION 9: ROSEVILLE POLICE & FIRE PSAP

Public Safety Answering Point and Dispatch

The City of Roseville PSAP is housed within the Roseville Police Department and employs 21 full-time dispatchers, three Communication Supervisors, and one Administrator. In 2018, the center processed 163,507 telephone calls and 139,817 Computer Aided Dispatch incidents. In 2018, the PSAP's average answer time for 911 calls was 10.59 seconds.

Table 85: PSAP Call Data by Year

2018 Statistics	911	7-Digit Emergency	Administrative Lines
Total Number 2018	60,575	15,069	87,863
Total Number 2017	82,338	16,535	89,574
% of Total Calls Processed 2018	37.04%	9.21%	53.73%
% of Total Calls Processed 2017	33.03%	10.43%	53.53%

All Roseville Police and Fire Dispatchers are cross-trained to perform call-taking duties and handle both law and fire radio dispatch. Dispatchers are required to pass an extensive background check prior to appointment with the City of Roseville, and, on average, spend ten months in on-the-job training working directly with a training officer before being allowed to work in a solo capacity. Additionally, dispatchers receive over 140 hours of classroom instruction and receive a minimum of two dispatch certifications.

Roseville Police and Fire Public Safety Dispatchers maintain Emergency Medical Dispatch (EMD) certification through the International Association of Emergency Dispatch (IAED). EMD certification requires that dispatchers receive 24 hours of classroom instruction, pass a written exam with a score of at least 80%, and obtain CPR certification. Dispatchers are also required to re-test and pass the written exam and receive an additional 24 hours of Continuing Dispatch Education every two years.

City of Roseville Public Safety Dispatchers processed approximately 12,767 emergency medical calls in 2014. A random percentage of these calls are reviewed through monthly quality assurance checks conducted by a quality assurance committee. The committee is composed of a Registered Nurse, an EMD certified dispatcher, and an EMD certified Communications Supervisor. During the review, committee members evaluate a random selection of the emergency medical calls received in that month and compare them against a standardized EMD rubric and provide feedback regarding call handling. On average, Roseville Police and Fire Dispatchers receive EMD scores of 90.85%. The PSAP is currently striving to certify all

supervisors and the members of the EMD review committee through the IAED's EMD-Q quality assurance program.

Roseville's public safety dispatchers are also certified as Public Safety Dispatchers through the California Commission on Peace Officer Standard and Training (POST). POST requires that all dispatchers complete a 120-hour basic dispatcher course, receive adequate on-the-job training, and pass a probationary period of at least 12 months.

Roseville's PSAP offers enhanced 9-1-1 services that allow dispatchers to pinpoint most callers' locations, and even maps cellular callers' locations using latitude and longitude coordinates. The telephone system links directly to the current Computer Aided Dispatch (CAD) system and provides emergency telecommunications for the deaf (TDD) access as well as language translation services to the Roseville community.

In 2018, the dispatch center installed a new regional phone system with their county partners. With this new system, they are able to answer their 9-1-1 calls from any of the partner centers shall they need to evacuate. The CAD vendor, New World Systems™, brings a variety of new capabilities to the center that will facilitate more efficient and timely dispatching of emergency resources. New World System capabilities include highly accurate mapping capabilities, unit recommendations, proximity dispatching, and interactive messaging with field units.

Dispatchers are also trained to operate and monitor both 800 MHz and VHF radio systems, and the radio system has been updated to meet all the P25 state requirements. The Roseville Police Department operates primarily on the 800 MHz system, but most regional fire and law enforcement partners operate on VHF systems. Roseville Public Safety Dispatchers are trained to react quickly to emergency radio traffic and they have a variety of tools available to provide immediate interoperability capabilities, as necessary.

Since the Roseville PSAP is both an alternate 9-1-1 answer site and a back-up dispatch center for two other PSAPs in the region, the center's radio consoles are designed to allow dispatchers from any of the participating agencies to easily dispatch law and fire resources with no noticeable delays in service or impact to field units. The PSAP recently participated in, and successfully completed, two regional 9-1-1 and radio dispatch failover events that tested the emergency backup plans and validated current emergency plans.

Roseville's PSAP is highly functional, staffed with highly-trained and certified dispatch personnel, and is prepared to transition to a more technical, next generation 9-1-1-compliant facility to better serve the community and the Roseville Police and Fire Departments.

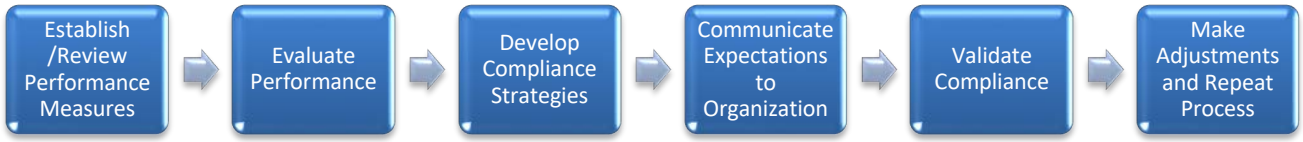
SECTION 10: COMPLIANCE METHODOLOGY

Compliance Methodology

In order to ensure that service-level objectives and performance measures are evaluated and that efforts are made to reach or maintain the established levels, a compliance strategy must be implemented. Maintenance of effort refers to the resources and energy put forth by the organization to maintain and improve the services provided by the organization and identified in this document.

To measure and achieve compliance with the objectives set forth in this *SOC*, RFD will utilize the following six-step compliance model.

Figure 58: Six-Step Compliance Model



Phase 1 - Establish/Review Performance Measures

This phase includes the research for, and completion of the initial *SOC* process. Upon adoption of the SOC, RFD will conduct a full review of the performance measures annually. Review will include the following items:

- Service provided identified
- Levels of service defined
- Levels of risk categorized
- Performance objectives and measures developed
    - Distribution performance measures adopted
    - Concentration measures adopted

Phase 2 - Evaluate Performance

Actual service performance is evaluated against adopted performance measures and benchmarks. Service will be evaluated at multiple levels.

- System level
- Regional level
- First-due area level
- Unit level
- ERF Level

Phase 3 - Develop Compliance Strategies

RFD will utilize SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis along with the data collected in the evaluation phase to identify compliance issues. RFD will use this information to develop solutions to performance issues.

Phase 4 - Communicate Expectations to the Department

Any expectation of success is dependent upon the personnel involved being aware of the expectations being placed on them. It is important for the Department to clearly communicate the expectations for service improvement to the entire staff and to the public as well. The following tasks are needed:

- Explain the method of measuring compliance to personnel who are expected to perform the services
- Provide feedback mechanisms
- Define consequences for non-compliance

Any changes to policy or procedures should be accompanied by training of personnel in the changes. Provide appropriate levels of training/direction for all affected personnel and communicate consequences of non-compliance. Empower personnel within the Department to identify the need to modify processes, application systems, and technical infrastructure as necessary to comply, should there be a conflict with the new methods.

Phase 5 - Validate Compliance

RFD will develop and deploy verification tools and techniques that can be used by each division of the Department to verify compliance with the adopted requirements. These tools may include:

- Monthly Evaluations
    - Performance by unit
    - Overall system performance
    - Review of performance by division/section management
- Quarterly Evaluations
    - Performance by unit
    - Performance by first due
    - Overall system performance

Phase 6 - Make Adjustments and Repeat Process

RFD will develop and implement a review program to ensure service levels are maintained, and where possible, are constantly improving. In addition to the validation completed in Phase 5, it is necessary to view the results on a more universal level. Evaluation at this level would focus more on trending and projections. Evaluations at this level may include:

- Annual Review and Evaluation
    - Performance by unit, first-due unit, and overall performance
    - Compliance by time of day, day of week, and month of year for each type of service
    - Indication of workload may show future trends and past performances
    - Review of performance by Command Staff
    - Adjustment of service-level objectives as necessary

APPENDIX A: TERMINOLOGY GLOSSARY AND ACRONYMS

These industry standard terms come from CFAI and they may or may not have been used in this document.

Acceptable Level of Risk: The amount or level of risk set through adoption of public policy through law, regulation, or level of service. To deem acceptable, risk is gauged against a benchmark or standard that has been deemed adequate for the jurisdiction.

Accepted Risk: The portion of a problem that is beyond the agency's ability to cope with the consequences and are accepted within the community as a potential loss.

Accreditation: A process by which an association or agency evaluates and recognizes a program of study or an institution as meeting certain predetermined standards or qualifications.

Adequate: Providing what is needed to meet a given objective without being in excess.

Advanced Life Support (ALS): A sophisticated level of pre-hospital care that builds upon basic life support procedures, and includes the use of invasive techniques such as advanced airway management, cardiac monitoring and defibrillation, intravenous therapy and the administration of specified medications, to save a patient's life.

AHJ: Authority Having Jurisdiction

Alarm Processing Time: The elapsed time from the receipt of an alarm by the 9-1-1 communications center and the notification of specific fire companies that are to respond.

Apparatus: Fire suppression or medical vehicle such as engine, ladder, truck, or medic unit.

Assumption: A situation or condition, which must be considered as existing if the organization, is forced to operate in a specific manner and over which the organization does not exercise any control.

Baseline: The current measurement of performance in an organizational context; a usually initial set of critical observations of data used for comparison or a control. The activities that are currently in place to achieve the organization's goals and objectives.

Basic Life Support (BLS): A primary level of pre-hospital care, which includes the recognition of life-threatening conditions and the application of simple emergency lifesaving procedures, including the use of adjunctive equipment, aimed at supporting life.

Benchmark: A benchmark is defined as a standard from which something can be judged. Searching for the best practice will help define superior performance of a product, service, or process.

Community Risk Assessment: The evaluation of fire and other risks taking into account all pertinent facts that increase or decrease hazard in order to define standards of coverage. (See Occupancy Risk Assessment)

Concentration: Spacing of multiple resources arranged so that an initial effective response force can arrive on scene within the time frames outlined in the on-scene performance expectations.

Confined Space/Trench Rescue: All rescues that meet OSHA's definition of confined space, in which special breathing apparatus, shoring, explosion-proof lighting, and atmospheric monitoring are necessary.

Cost Benefit: Term used to express the value of a component of a system. It is expressed usually as a ratio of cost, expenditure, or to a benefit, a saving of some type. Cost benefit can be measured in either soft or hard currency descriptions.

CCR: Cardio-Cerebral Resuscitation

Critical Incidents: A method of evaluation based on specific examples of above or below average performance.

Deployment: The strategic assignment and placement of fire agency resources such as fire companies, fire stations, and specific staffing levels for those companies.

Dispatch Time: The portion of a F ire Department's response time that begins when the dispatcher receives an alarm and ends when the dispatcher assigns the proper companies to respond to the emergency.

Dollar Value of Total Fire Loss: The assessed value of improvements lost as a result of fire. This is not the replacement value.

Effective Response Force (ERF): The minimum amount of staffing and equipment that must reach a specific emergency zone location within a maximum prescribed travel or driving time and is capable of initial fire suppression, emergency medical services, and/or mitigation.

Emergency Operations Center (EOC): A central location where those in authority congregate to allow for exchange of information and conduct face-to-face coordination in the making of decisions. The center, often referred to as the EOC, provides for centralized emergency management in major natural disaster and other emergencies.

EMS: Emergency Medical Services.

Engines: Basic firefighting vehicle equipped with a pump capable of supplying a minimum of 500 gallons per minute, fire hose, and a water tank.

Evaluation: Analysis and comparison of actual performance versus prior plan and stated goals and objectives. The systematic and thoughtful collection of information and decision making. Evaluation consists of having criteria, collecting evidence, and making judgments.

Fire Company: Assigned personnel, apparatus, and equipment.

Fire Confined to Structure: Responses to fire calls where the fire is contained to the structure or structures that were involved when the responding unit first arrived at the scene.

Fire Crew: Personnel assigned to an apparatus.
Fire Out on Arrival: Fire calls in which the fire that initiated the call is extinguished when the responding unit arrives at the scene.

Fire Spread Beyond Structure: Fire calls where the fire first spreads beyond the structure or structures that were involved when the responding unit arrived at the scene.

Fire Pre-Plan: Plan developed to identify hazardous building information and owner information, used during emergency incidents to determine the best course of mitigating an emergency.

Fire Flow Available: The amount of water available for firefighting on a continuous basis. The highest demand upon the water distribution system.

Fire Flow Delivered: The amount of water that can be delivered at the scene of an emergency. It is a combination of three factors: pump capacity available, hose and nozzle configurations, and staffing levels.

Fire Flow Required or Estimated: The quantity of water that should be available for a period of two to three hours at a minimum pressure of 20 psi in a water distribution system.

Fire Protection Environment: The conditions, circumstances, and influences under which a fire protection system must operate. It includes the population, the geographical area, land use, occupancy factors, weather conditions, structural and nonstructural physical situations, financial, political, legislative, and regulatory criteria.

First Due Area: The portion of a jurisdiction that each response company has been assigned to be the first unit to arrive at the scene of an emergency. Usually the first-in company is responsible for most activities in that area.

First Responder: A term used for the person who is trained and/or certified to be the first to arrive at a scene of a specific type of emergency, i.e. EMS or hazardous materials.

Heavy Extrication: Rescues of persons trapped in road, rail, air, and water vehicles, which require specialized tools and training.

Insurance Services Offices (ISO): A for-profit national organization that evaluates public fire protection and provides rating and classification information to insurance companies for a fee. Some insurers use this rating to set basic premiums for fire insurance.

IAFC: International Association of Fire Chiefs.

IAFF: International Association of Fire Fighters.

IFSTA: International Fire Service Training Association.

ISFSI: International Society of Fire Service Instructors.

Jurisdiction: A population area wherein there is clearly defined responsibility, based on statutory authority, to provide fire and/or emergency medical services.

Ladder Truck: Vehicles that carry a variety of equipment such as ladders, forcible entry tools and rescue equipment.

Level of Service: The resources needed to meet the stated service level objective(s). Level of service is defined only in terms of what is provided and not in terms of effectiveness or of quality.

Median Age of Population: The median age of the population as reported in the most recent census.

Median Age of Residential Structures: The median age of residential structures as reported in the most recent census.

Median Household Income: The median household income as reported by the U.S. Bureau of Labor Statistics for the most recent period reported.

Minimum Staffing per Unit: The minimum number of personnel assigned to staff each type of apparatus.

NFPA: National Fire Protection Association.

NFPA Standards: Standards published by the NFPA through the consensus process setting a recognized level of standard for fire service-related dimensions, services, installations, vehicles, or equipment specification.

Non-Transport: Responses in which no individuals are transported to a medical facility.

Number of Population by Age: The number of persons in each category within the service area as reported in the most recent census.

Occupancy: The classification given to a building in accordance with a specific building code.

Occupancy Risk Assessment: An assessment of the potential severity of a specific structure in relation to the fire agency's ability to handle the types and severity of emergencies within that structure. Occupancy risk assessment often includes classifying these risks into categories (See Risk Categories).

Performance Indicator: The desired level of achievement toward a given objective and the ability to demonstrate doing a particular task as specified in the Accreditation process.

PSAP: Public Safety Answering Point.

Resource Exhaustion: Resource exhaustion occurs when a system is out of resources for both initial response and to maintain an area-wide effective response force.

Response: A response to an incident regardless of the number of units or personnel required to respond.

Response Reliability: The probability that the required amount of staffing and apparatus that is regularly assigned will be available when a fire or emergency call is received, i.e. the percentage of time that all response units are available for a dispatch. When a response unit is unavailable, the response time to an emergency in their first due area will be longer, because a more distant unit will have to respond to the call. Response reliability is a statement of the probability that an effective response force may not be provided when a call is received.

Response Time: The total amount of time that elapses from the time that call is dispatched until the responding unit is on the scene of the emergency and prepared to control the situation. Response time is composed of several elements.

Risk: Exposure to a hazard based on the probability of an outcome when combined with a given situation with a specific vulnerability. The level of risk can be described as the probability of a specified loss over a given period of time. All structures, for example, are subject to destruction by fire; however, individual structures vary considerably as to the possibility of loss as a result of their construction, contents, and built-in protection.

Risk Categories:

Maximum/Worst Risk - Occupancies classified as maximum risk will be of substantial size and contain a concentration of properties that present a very high risk of life loss, loss of economic value to the community or large loss damage to property in the event of fire. These risks frequently affect the need for the Fire Department to have multiple alarm capability and have an adequate assessment of their ability to concentrate resources.

High Hazard Risks - Built-up areas of substantial size with a concentration of property presenting a substantial risk of life loss, a severe financial impact on the community, or unusual potential damage to property in the event of fire.
Special Risks - These are areas that require a first due response over and above that appropriate to the risk. These areas should be treated as special risks, and given an appropriate predetermined response.

Moderate Risk - Built-up areas of average size, where the risk of life loss or damage to the property in the event of a fire in a single occupancy is usually limited to that occupancy. In certain areas, such as small apartment complexes, the risk of death or injury may be relatively high. The moderate/typical risks are often the greatest factor in determining fire station locations and staffing due to the frequency of emergencies in this category. To assure an equitable response and to provide adequate initial attack/rescue capability to the majority of incidents, the typical risk is often used in determining needed resources.

Low Risk - Small commercial structures that are remote from other buildings, detached residential garages and outbuildings.

Remote and Isolated Rural Risks - Areas may be classified as remote/isolated rural risks if they are isolated from any centers of population and contain few buildings; for example, rural land with no occupied structures or recreational areas.

Residential Single-Family Dwelling Unit: One family unit - house.

Square Miles Served: Number of square miles contained within the boundaries of the service area.

Staffing: The level of personnel assigned to perform the anticipated emergency tasks of a specific fire company for the risk identified in a given district or community. The number of personnel required to perform multiple emergency operations functions such as fire suppression versus EMS or hazardous materials operations.

Standardization: Standardization is a process by which a product or service is assessed against some standard, performance, or quality.

Standard Operating Guideline (SOG): A term used to describe written direction provided to personnel in a manual format.

Transport: Responses that result in one or more persons being transported to a medical facility.

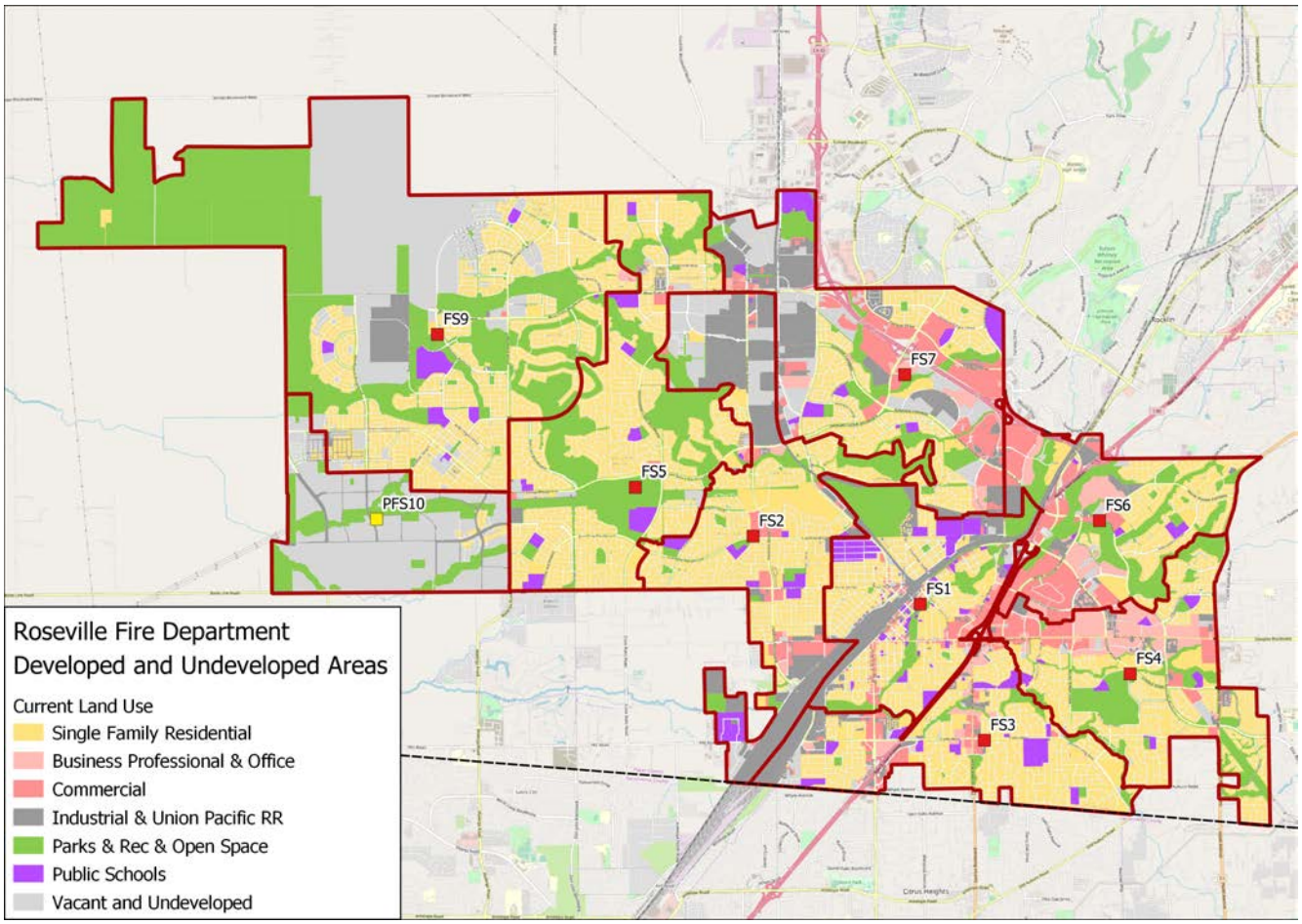
Travel Time: The portion of response time that is utilized by responding units to drive to the scene of the emergency. Travel time begins when assigned fire companies begin to actually drive to the emergency.

Turnout Time: The portion of response time when fire units are donning personal protective clothing and boarding their apparatus. The time begins once the units have been given their assignments and ends when they begin travel time.

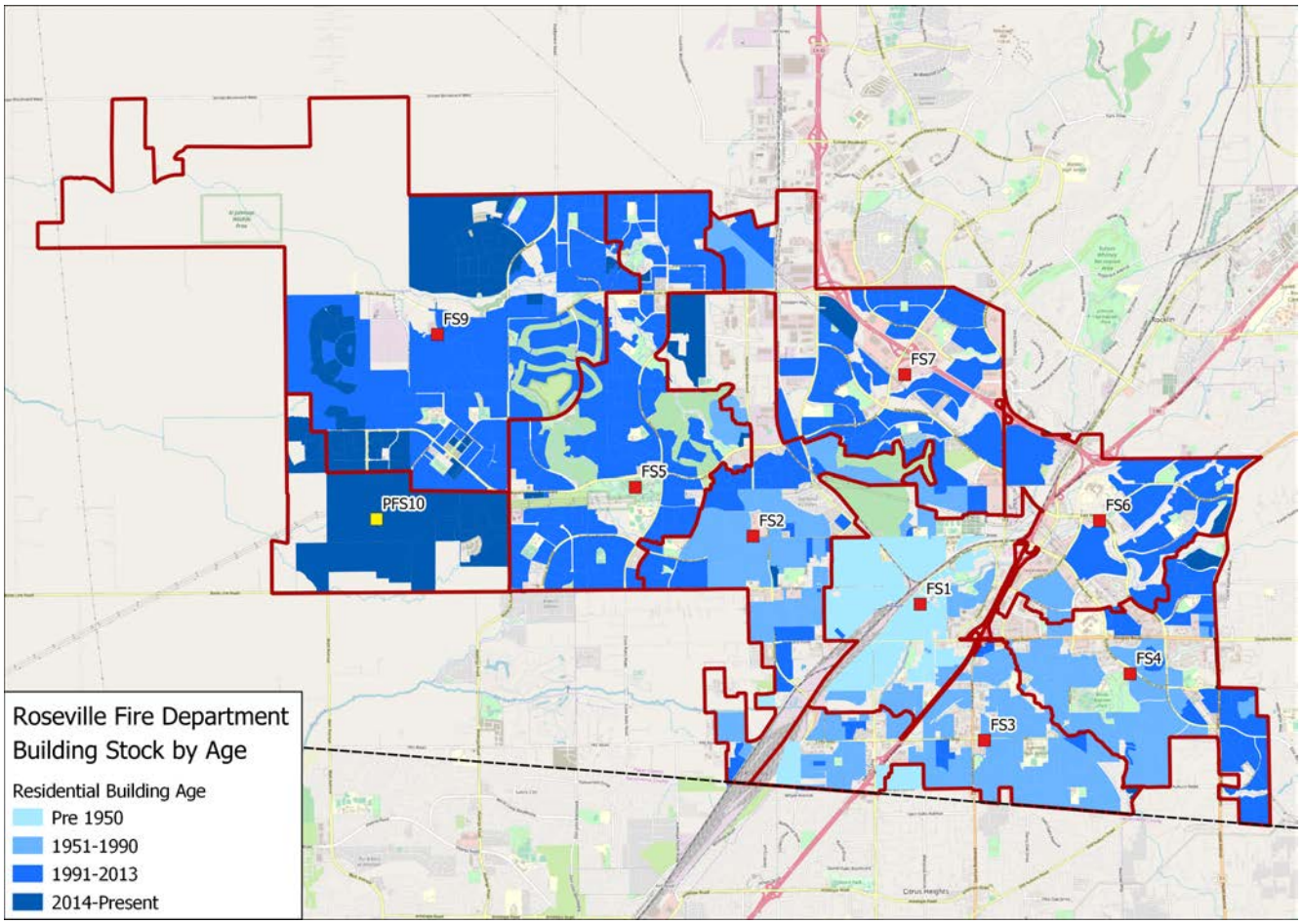
Water Rescue: The rescue of persons trapped in rivers, lakes, pools, or flood-control waterway.

APPENDIX B: MAPS

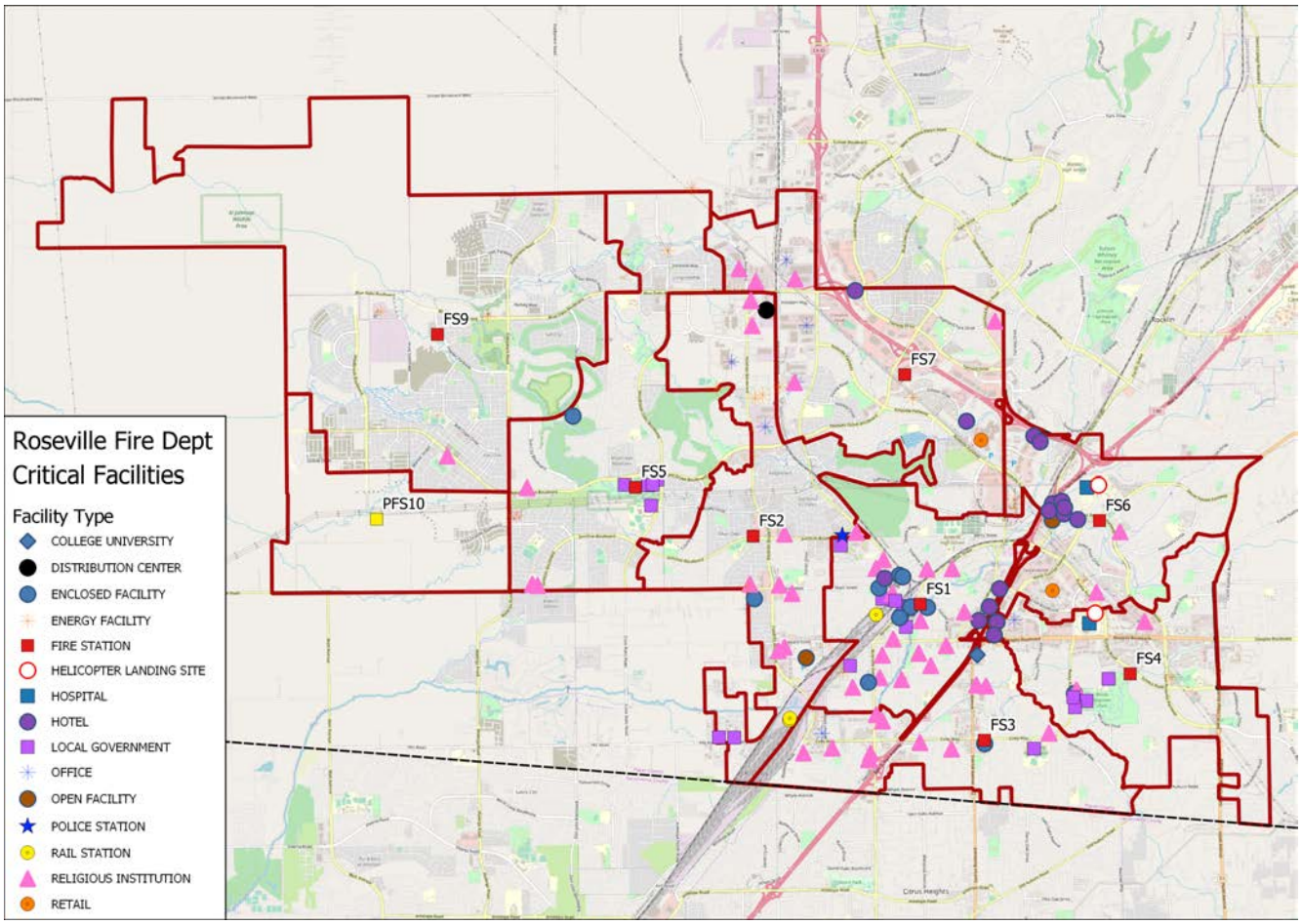
Developed/Undeveloped Areas



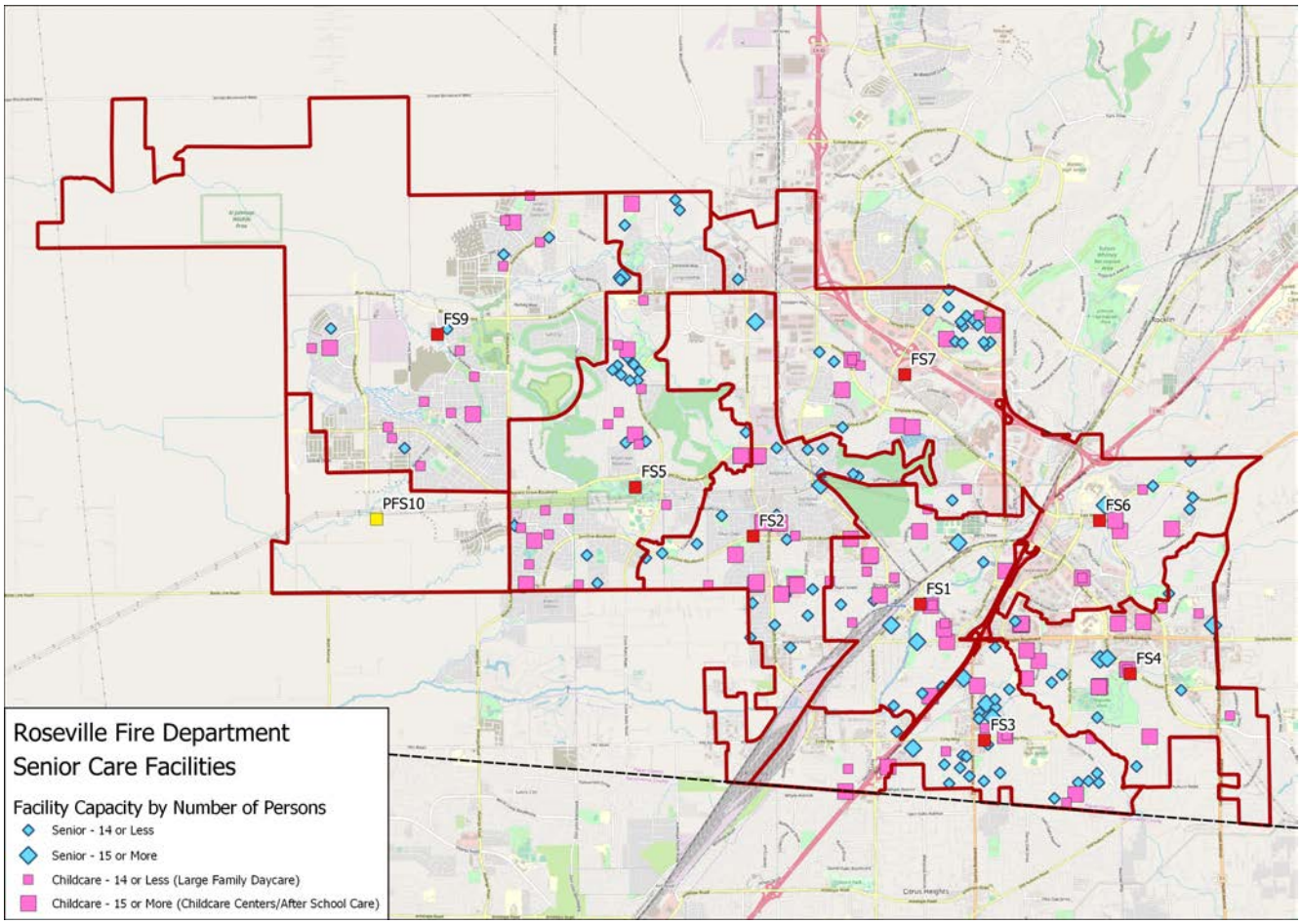
Building Stock by Age



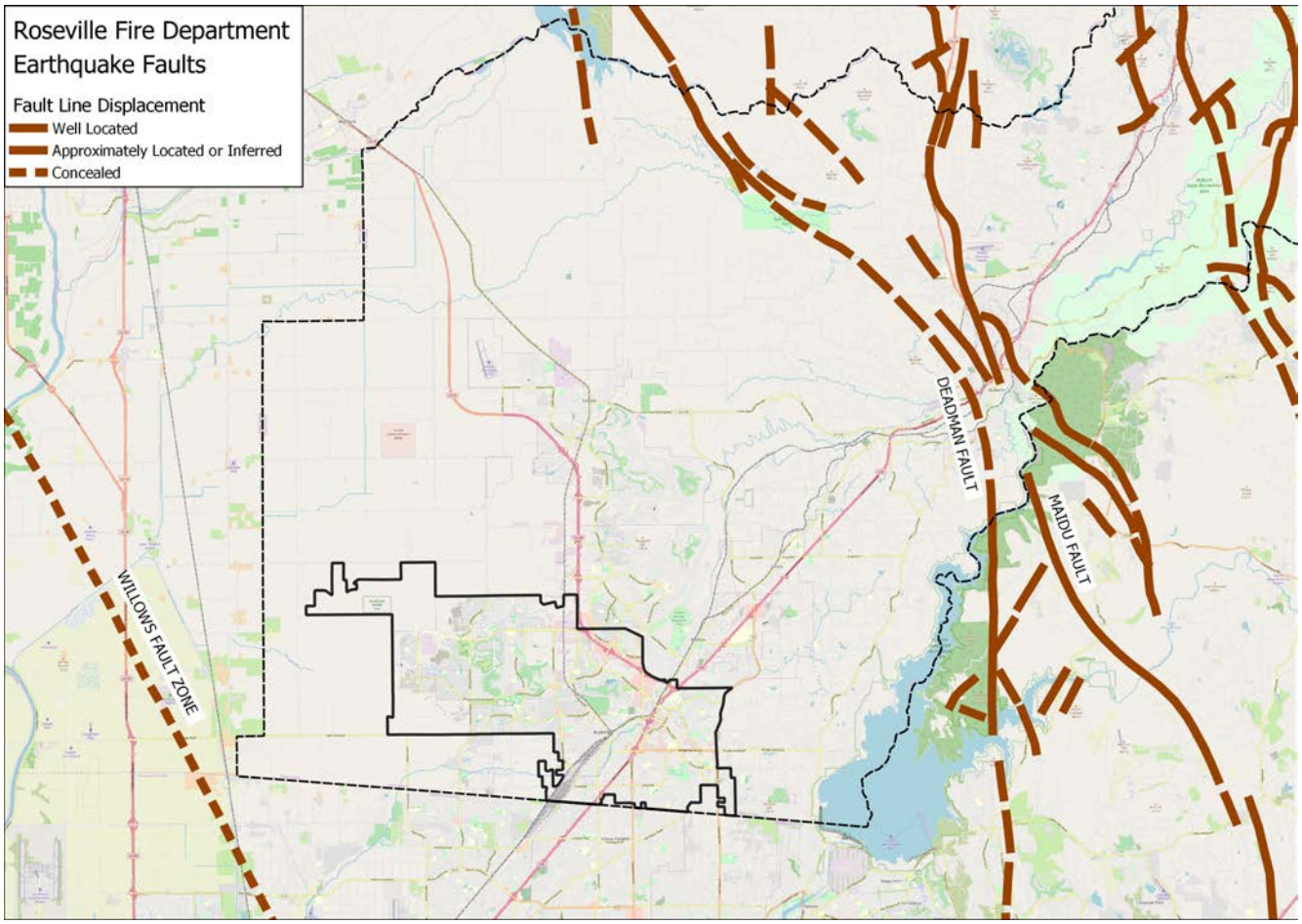
Critical Facilities



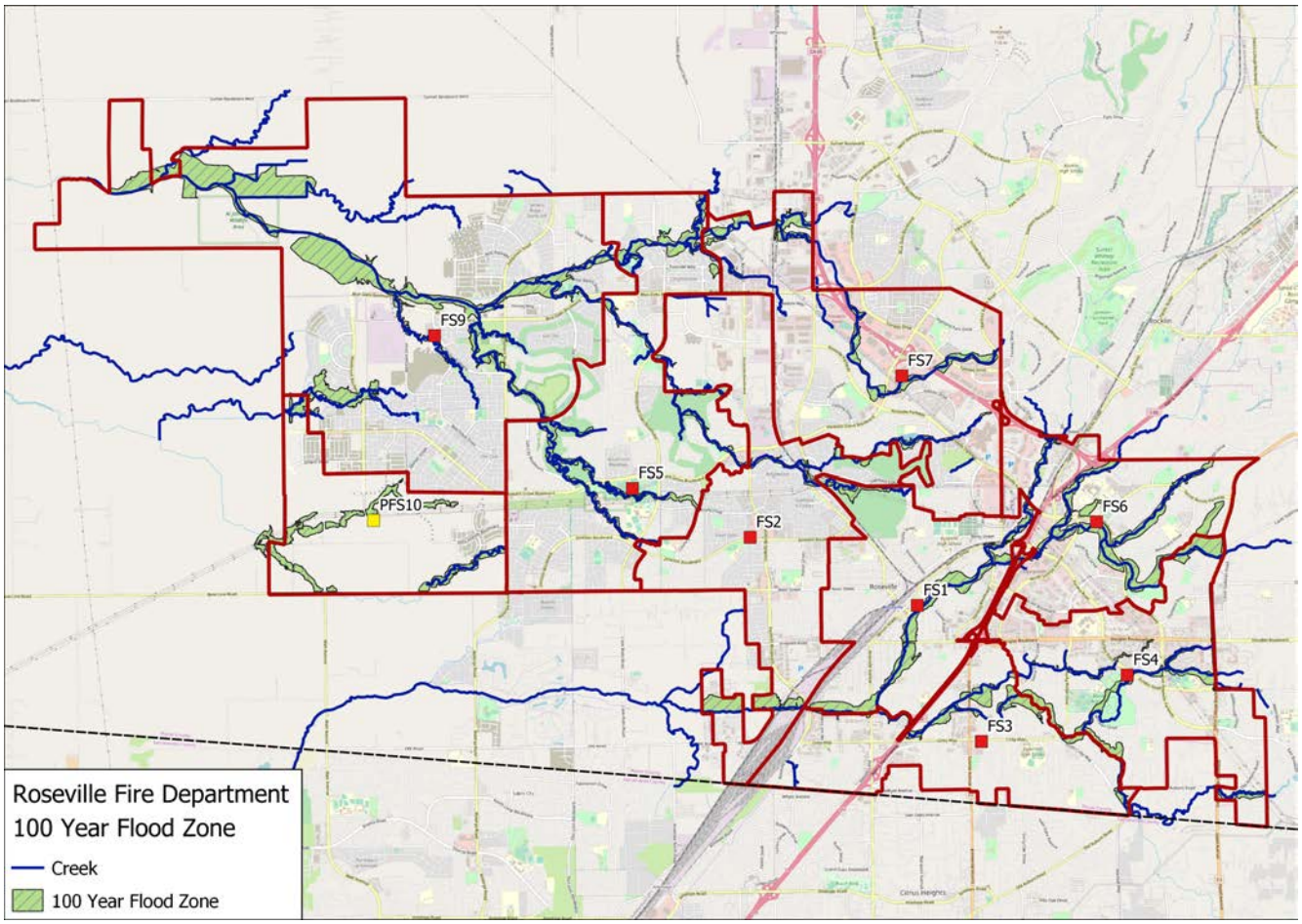
Senior Care Facilities



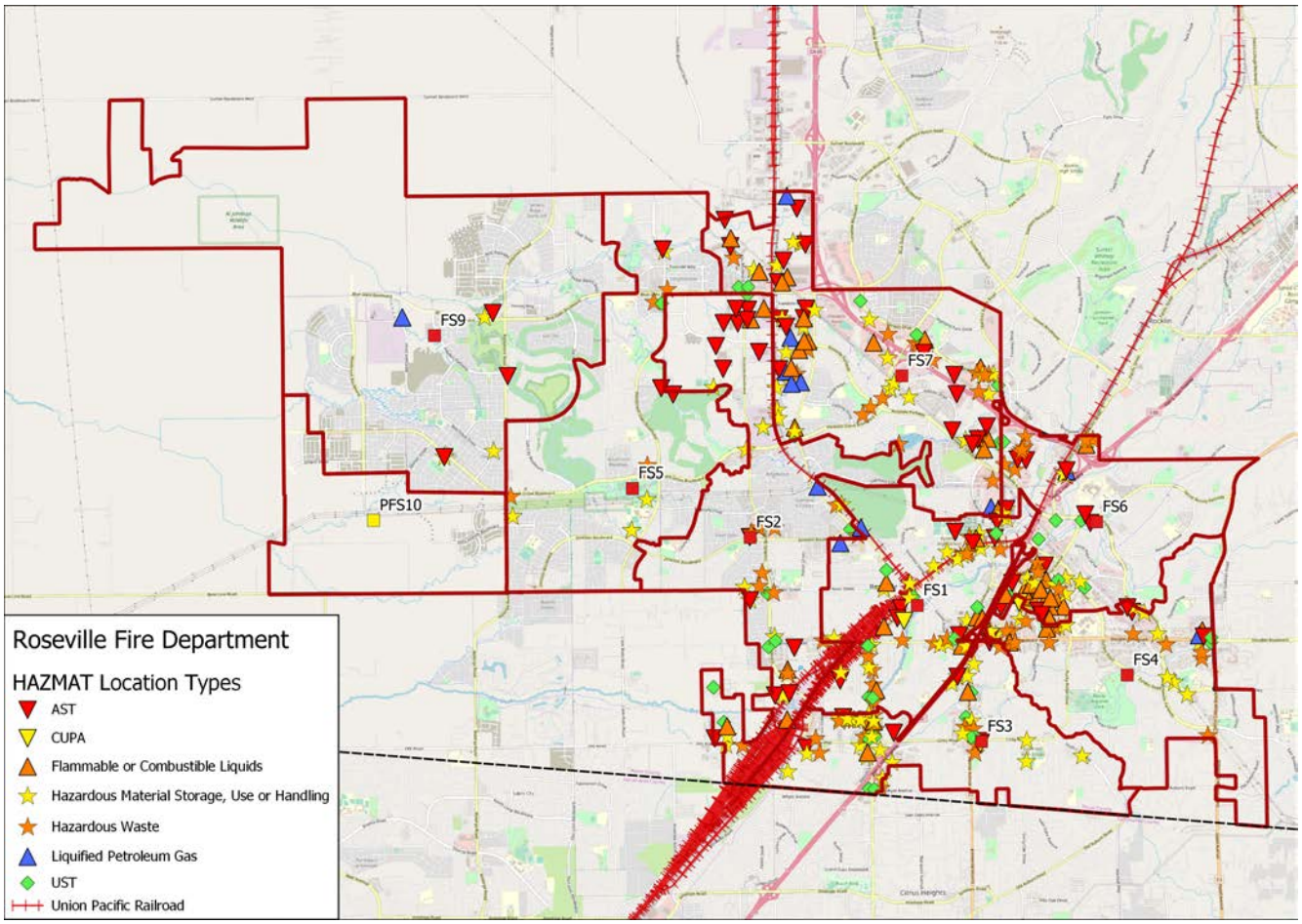
Earthquake Faults



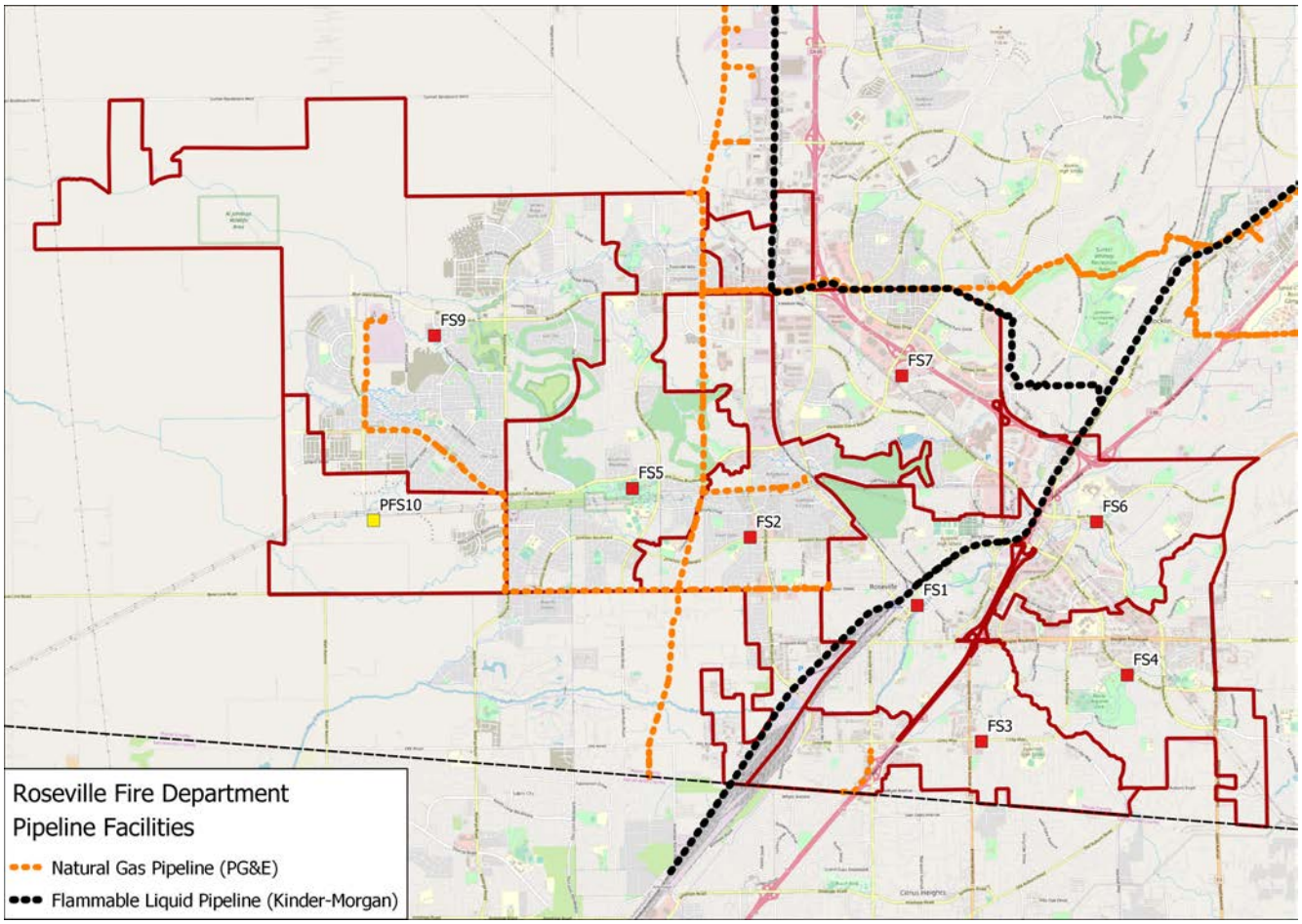
100 Year Flood Zone



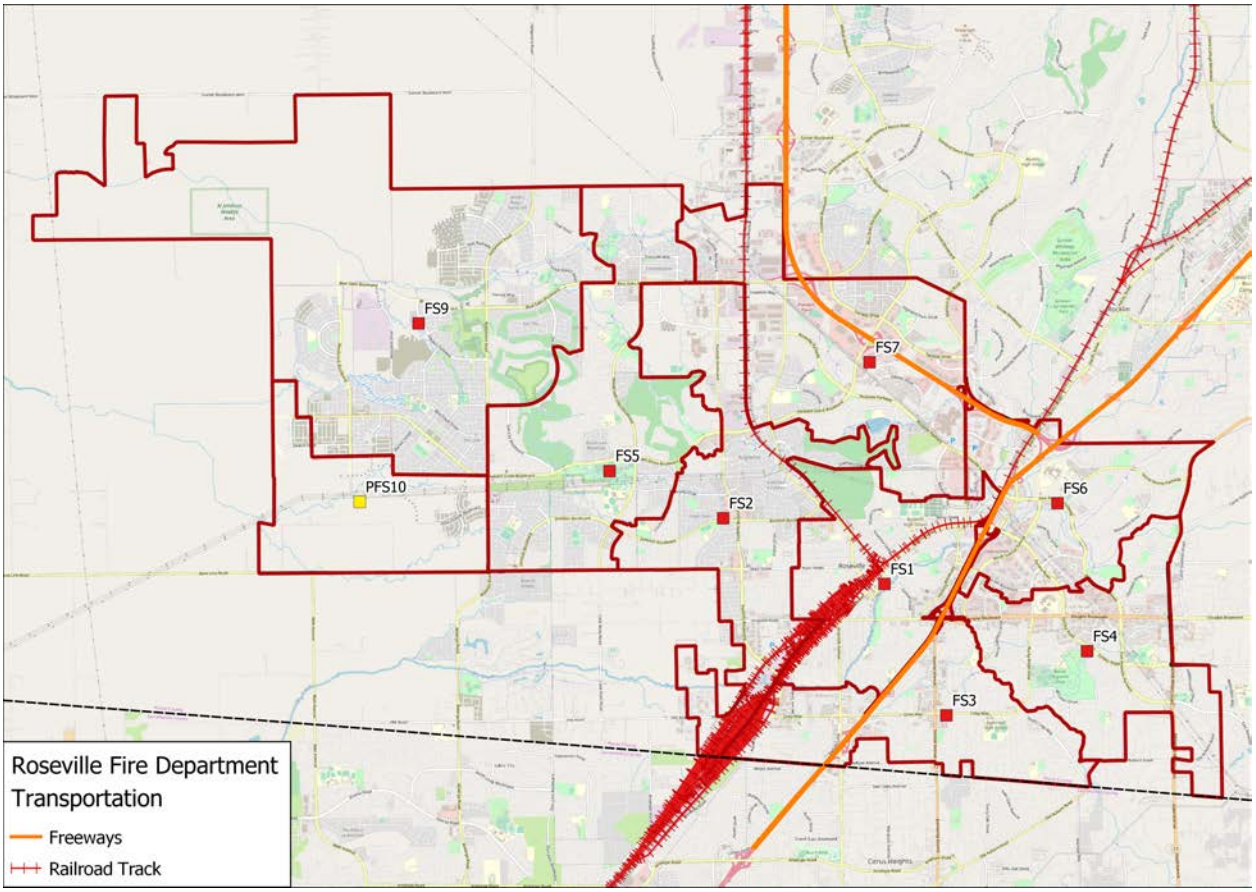
Industrial Fixed Facilities HazMat



Pipeline Facilities



Transportation



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