COMMUNITY RISK ASSESSMENT
Standards of Cover
Deployment Analysis

September
2023

San Ramon Valley
FIRE PROTECTION DISTRICT

AP TRITON
VISION · INNOVATION · SOLUTIONS

Contents

Acknowledgments

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

Our sincere appreciation is extended to each of you…

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…and each of the firefighters, officers, paramedics, and support staff who daily serve the citizens and visitors of the San Ramon Valley Fire Protection District and the surrounding communities they serve.

Section I:
EVALUATION OF CURRENT CONDITIONS

Description of the San Ramon Valley Fire Protection District

The following section entails a general overview of the various components and services provided by the San Ramon Valley Fire Protection District (SRVFPD).

The San Ramon Valley Fire Protection District is an autonomous Special District organized and operating in accordance with the State of California Health & Safety Code.[1] The fire district encompasses approximately 155 square miles with an estimated 2022 resident population of 193,215. SRVFPD considers the district's population density to be comprised of approximately 28% urban, 22% suburban, and 50% rural areas.

History of the Fire District

Originally known as the Danville Farm Defense Fire District, the district was founded in 1912. In 1921, a new state law enabled the creation of special fire districts with the authority to levy taxes for their support.

The department was renamed the Danville Fire Protection District and purchased its first apparatus in 1922. The first fire station was completed in December 1925 at the cost of nearly $5,000. During this same time, the fire district boundaries were expanded by about 50 square miles to include additional communities.

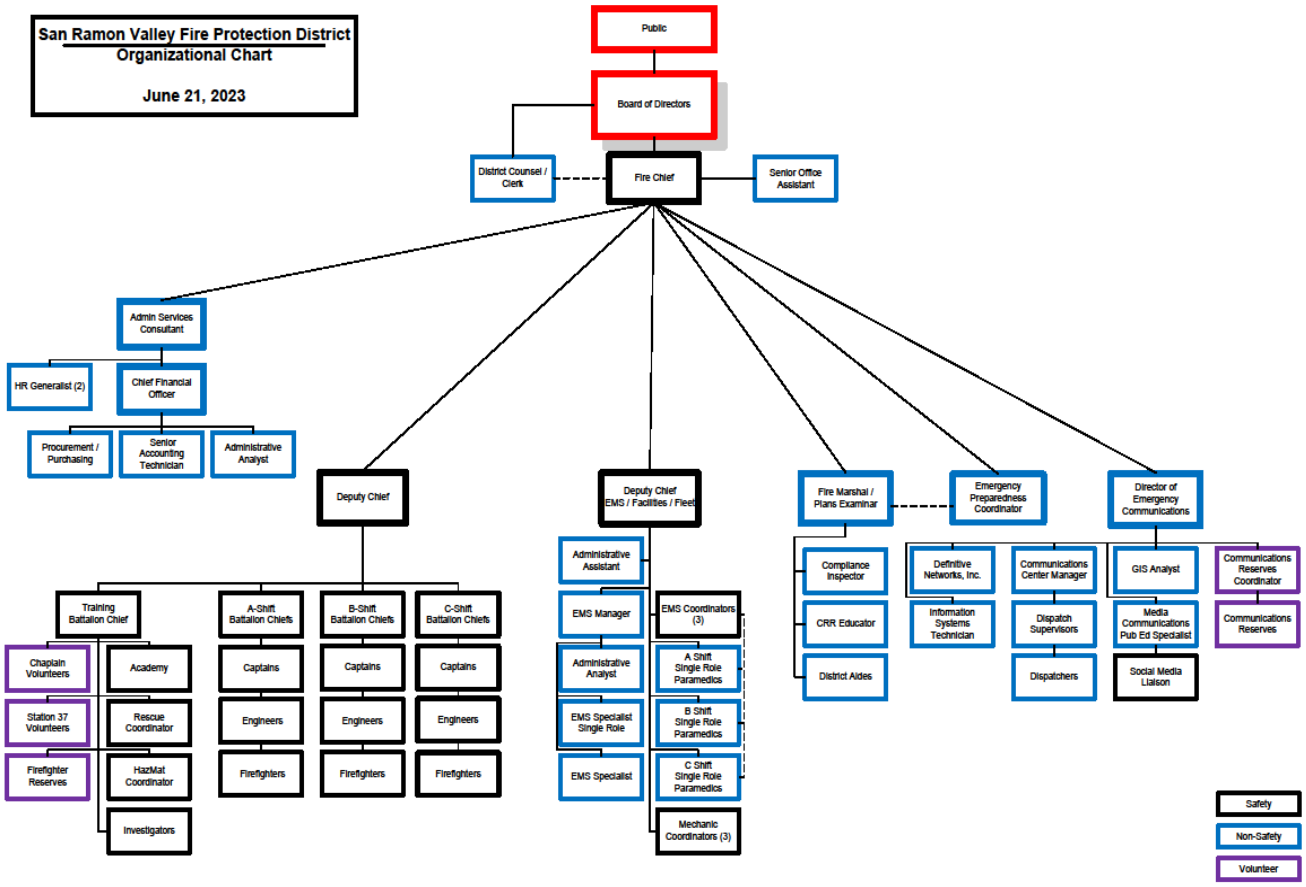
In 1997, the Local Agency Formation Commission (LAFCO) initiated the consolidation of the Danville Fire Protection District with the San Ramon Fire Protection District. Following the merger, the combined districts were renamed the San Ramon Valley Fire Protection District. In 1991, Tassajara Fire Protection District was annexed into SRVFPD. By 1997, the Dougherty Regional Fire Authority had become part of the San Ramon Valley Fire Protection District.

Organizational Structure of the Fire District

SRVFPD is overseen by a five-member elected Board of Directors (BOD) from which the membership appoints one as the Board President. The Fire Chief answers to the BOD and has a span of control of six, who comprise the fire district's Executive Staff.

The following figure illustrates the current organizational structure of SRVFPD.

Figure 1: SRVFPD Organizational Structure



The San Ramon Valley Fire Protection District consists of multiple divisions providing a wide variety of internal and external services. As shown in the preceding figure (dark blue boxes), the District Counsel/Clerk, Deputy Chief of Operations/Training, Deputy Chief/Fire Marshal, and Director of Emergency Communications/Technology comprise the Executive Team and answer directly to the Fire Chief.

The Director of Emergency Communications & Technology supervises the district's communication center and the various technology positions. The Emergency Preparedness Coordinator is responsible for disaster preparedness planning and mitigation.

Services Provided by the Fire District

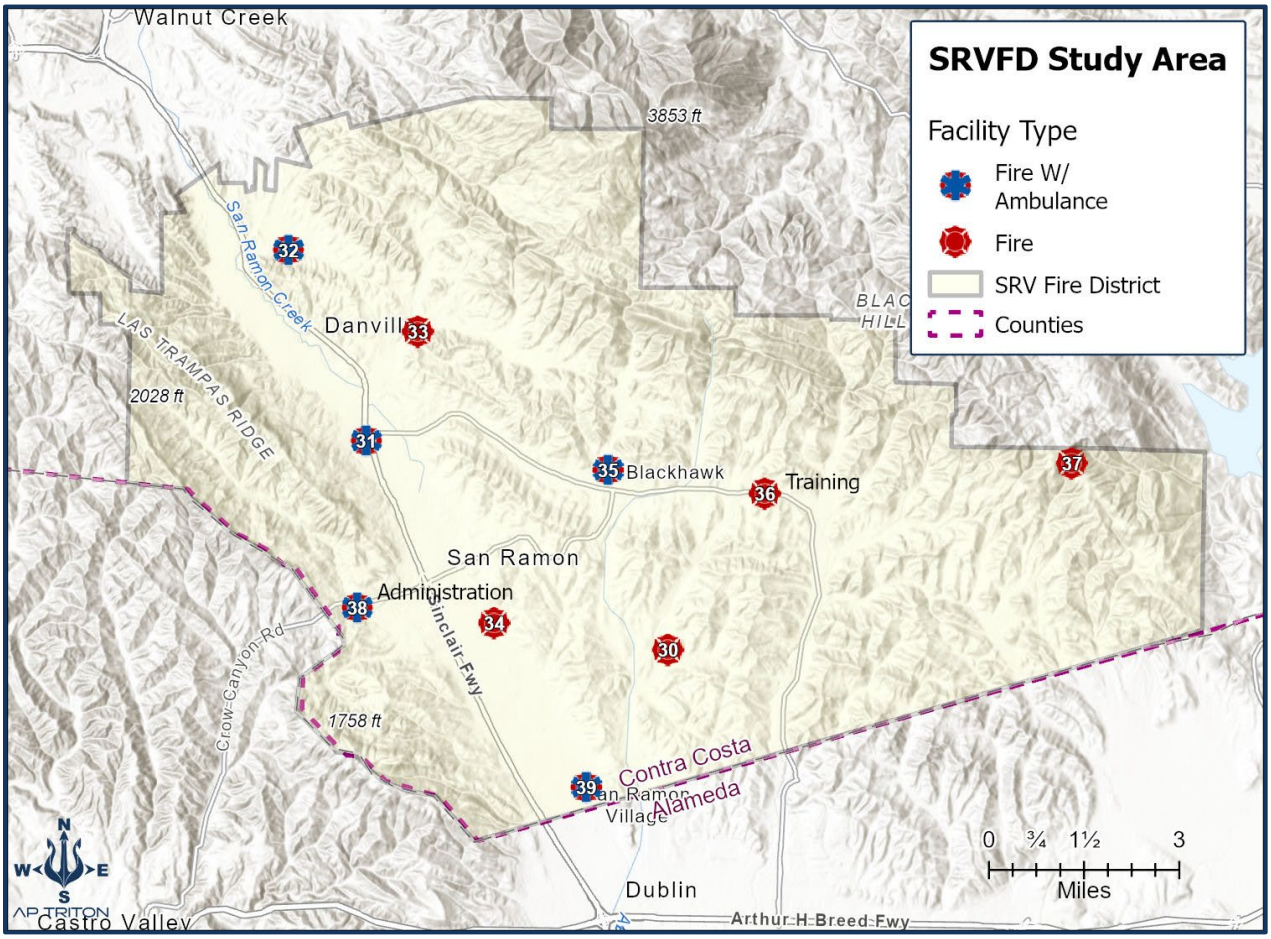
Emergency Operations & Deployment

The San Ramon Valley Fire Protection District deploys its personnel, apparatus, and ambulances from nine 24-hour staffed fire stations and one unstaffed station utilized by volunteer personnel.

The district is an all-hazards public safety agency providing traditional fire protection, wildland firefighting, and Emergency Medical Services (EMS) at both the Basic Life Support (BLS) and Advanced Life Support (ALS) levels. In addition, SRVFPD provides first-response EMS and patient transport.

The following figure illustrates the SRVFPD service area and its various facilities.

Figure 2: San Ramon Valley Fire Protection District Service Area



Special Operations

SRVFPD maintains a Hazardous Materials Response Team with personnel trained and state certified as Technician/Specialists. The district utilizes a California Office of Emergency Services (OES) Type II HazMat Response Vehicle deployed from Station 31.

San Ramon Valley Fire Protection District maintains a Rescue Team to provide technical rescue services. The team provides a wide variety of rescue services that include urban search and rescue (USAR), confined space, swiftwater, low- and high-angle rope, and other rescue services including K-9 search and rescue.

Rescue Team members have been trained and certified to the California OES Medium and Operational levels. A number of team members also participate in USAR Task Force 4 (CATF-4), which is based in Oakland and under the Federal Emergency Management Agency (FEMA).

Emergency Medical Services

SRVFPD has been providing ALS-level ambulance service since 1984. As the demand for EMS has increased, so have the services provided. The district staffs nine three-person ALS first responder (Paramedic) engine companies and two, four-person truck companies. SRVFPD also operates four 24-hour ALS ambulances staffed with two Firefighter/Paramedics and one 24-hour ambulance with two Single-Role Paramedics. There are three reserve ambulances cross-staffed by engine company personnel when needed.

Figure 3: SRVFPD Paramedic Ambulance Inventory (2022)

Unit No.	Make	Year	Condition	Status
RM-30	Chevy	2012	Fair	Reserve
SR-31	Ford	2022	Excellent	Frontline
PM-32	Dodge	2018	Good	Frontline
RM-33	Chevy	2012	Fair	Reserve
PM-35	Dodge	2018	Good	Frontline
RM-36	Dodge	2018	Fair	Reserve
PM-38	Dodge	2018	Good	Frontline
PM-39	Dodge	2018	Good	Frontline

SRVFPD has a contract with Contra Costa County to provide ambulance service. This contract includes requirements for level of care, response times, clinical standards, personnel standards, training, equipment, vehicles, communications, public education, and data reporting relating to ambulance service. This contract requires due diligence by SRVFPD staff to ensure compliance and reporting requirements are met.

As SRVFPD staff plan to meet EMS service demands and future needs by continually exploring options that are patientcare centered, community based, and designed to improve efficiencies within their EMS system. Fire service-based EMS Transportation systems, such as SRVFPD are uniquely positioned to enhance their system. These enhancements are available in large part because of the available capacities within their EMS systems and the payer mix of insurance that the patients have.

The fire service looks at Unit Hour Utilization Workload (UHUW)for dual-role firefighter/paramedics at an operational range of 0.18–0.25 UHUW. This includes all training, station, equipment and personnel maintenance, public education, and prevention activities, along with pre- and post-incident readiness. This also addresses the non-EMS responses assigned to these units (e.g., working structure fires, high-risk technical rescues, and public service assistance incidents).

The other Unit Hour Utilization (UHU) is for the number of transports a specific ambulance does or what the entire EMS transportation system does. These measurements do not include the Time on Task (TOT) time that is associated with total time committed to the specific EMS incident. There are numerous factors that are involved when looking at the TOT for each EMS incident. These times do not include the pre- and post-readiness times required. These times do include distance to hospital, traffic conditions, the hospital Ambulance Patient Offload Times (APOT)—or "Wall" times, return to in-service time, etc.

Figure 4: Unit Hour Utilization (UHU) Example

UHU Workload 6,308 EMS Incidents	Unit Hour Utilization 4,964 Transports	Total Time on Task EMS Incident Commitment
0.18 UHUW	0.14 UHU	61 minutes

There had been a recent trend within the California fire service as it relates to the COVID-19 pandemic and 911 responses. There was a downward trend in the number of 911 responses during the Covid-19 pandemic (2020 and 2021), specifically EMS responses. This trend has reversed in 2022 with responses increasing again.

Figure 5: SRVFPD Total Incident Responses (2018–2022)

Type	2018	2019	2020	2021	2022
Incidents:	9,740	10,103	9,361	9,511	11,359
EMS:	7,209	7,411	6,720	6,922	8,427
2018–2019	**2019–2020**	**2020–2021**	**2021–2022**	**Four-Year Average**	
+2.7%	-10.3%	+3.9%	+17.0%	+3.3%	

When performing a revenue evaluation of an EMS system, one of the key components is the patient population as it relates to insurance payer mix. This is broken down into specific areas within the healthcare insurance coverage. Many of the patients that are on both Medicare and Medi-Cal are assigned to Health Maintenance Organizations (HMO). These patients are assigned to large insurance companies, such as Kaiser and Blue Cross.

Figure 6: Insurance Payer Mix Example

Medicare	Medi-Cal	Commercial	Self-Pay
45%	18%	30%	7%

EMS Administration

The EMS system in the County is administered by Contra Costa County Emergency Medical Services Agency (CCCEMSA). CCCEMSA is a division of Contra Costa Health Services and has a broad spectrum of responsibilities related to the administration of the EMS system. This ranges from ensuring adequate training and continuing medical education to the certification and accreditation of EMS providers.

Other Services Provided by the District

Community Risk Reduction

Under the supervision of the Fire Marshal, the Community Risk Reduction Division conducts fire inspections, code enforcement, plan reviews, and fire and arson investigations including the use of an arson K-9.

Additional prevention activities are provided through multiple public education programs. These include elementary school programs (Kindergarten through Fifth Grade), fire extinguisher training, and intervention for families in juvenile fire-setting situations. This also includes providing comprehensive Fire Evacuation Plans.

The Community Risk Reduction Division seasonally inspects private and public properties for unabated combustible fuels and hazardous materials. The purpose of this is to ensure that property owners maintain a defensible space around their homes and properties.

Emergency Communications

The San Ramon Valley Fire Protection District operates the San Ramon Valley 911 Communications Center (SRV911). The center serves as the primary 911 Public Safety Answering Point (PSAP) and provides dispatch and emergency communications services for both the fire district and the San Ramon Police Department.

Dispatchers are trained to provide pre-arrival instructions to callers in a medical emergency in accordance with the Medical Priority Dispatch System™ (MPDS®). MPDS is also integrated into the computer-aided dispatch (CAD) system.

SRV911 maintains state-of-the-art telecommunications and emergency communications equipment. In 1996, the center was given an Accredited Center of Excellence by the National Academy of Emergency Medical Dispatch (NAEMD). It has been reaccredited six additional times since then.

Emergency Services Resources in Contra Costa County

The following describes some of the other elements that comprise the emergency services delivery system in the region.

Hospitals & Tertiary Care Facilities

The San Ramon Valley Fire Protection District has access to several hospitals and tertiary care facilities. The following figure is a list provided by SRVFPD of the various facilities available to transport patients.

Figure 7: Hospitals & Tertiary Care Facilities

Facility	Trauma Designation	Stroke Center	PCI/Cath Lab
Children's Hospital of Oakland	1	Yes	Yes
Contra Costa Regional Medical Center	No	Yes	Yes
Contra Costa Regional Psychiatric	N/A	No	No
Eden Medical Center	1	Yes	Yes
John Muir Concord	No	Yes	Yes
John Muir Walnut Creek	1	Yes	Yes
Kaiser–Antioch	No	Yes	Yes
Kaiser Permanente–Walnut Creek	No	Yes	Yes
San Ramon Regional Medical Center	No	Yes	Yes
Stanford Valley Care	No	Yes	Yes

In addition to the facilities listed in the preceding figure, there are three burn centers within the region: the Santa Clara Valley Burn Center, St. Francis Hospital Burn Center, and the Firefighters Burn Institute Regional Burn Center at UC Davis.

Mutual Aid Organizations

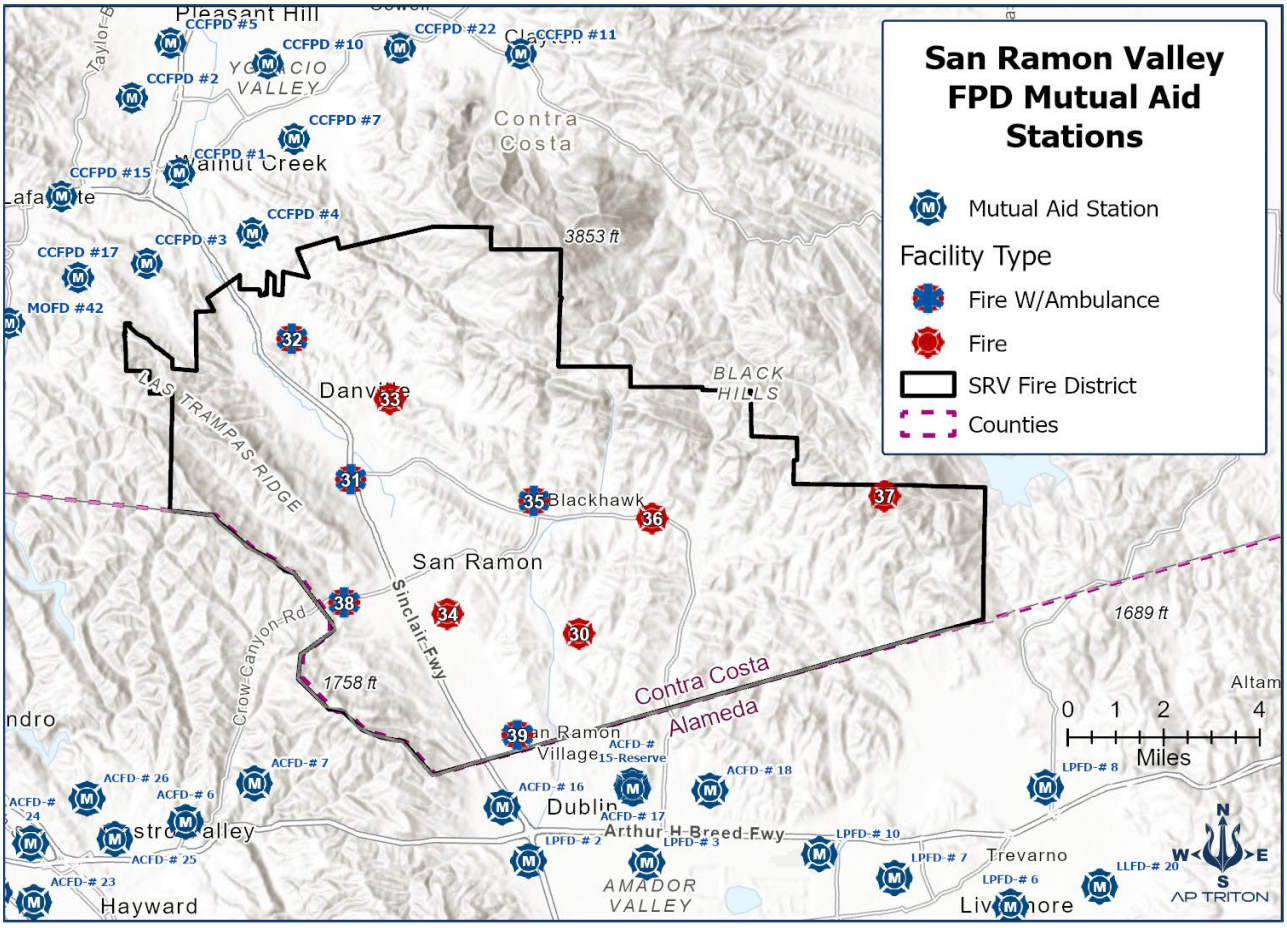
The San Ramon Valley Fire Protection District has mutual and automatic aid agreements with several fire agencies in the region. These organizations and their impact on SRVFPD's response capabilities and effective response force are addressed in more detail in the "Historical System Performance Review" section of this report. The following figure lists the acronyms for the various mutual aid agencies.

Figure 8: Mutual & Automatic Aid Agency Acronyms

Agency Name	Acronym
Alameda County Fire Department	ACFD
Contra Costa County Fire Protection District	CCCFPD
El Cerrito Fire Department	ECFD
Livermore/Pleasanton Fire Department	LPFD
Moraga-Orinda Fire District	MOFD
Pinole Fire Department	PFD
Richmond Fire Department	RFD
Rodeo Hercules Fire Protection District	RHFPD

The following figure is an illustration of mutual aid fire stations available to SRVFPD.

Figure 9: Mutual Aid Fire Stations Adjacent to SRVFPD



Air Medical Services

Critical care helicopter transport is available in Contra Costa County from a merger of REACH Air Medical Services and California Shock Trauma Air Rescue (CALSTAR). In partnership with the California Highway Patrol, SRVFPD firefighters provide advanced rescue operations and medical services.

Financial Analysis

Local Economy

The San Ramon Valley Fire Protection District, situated in Contra Costa County, is in a favorable economic environment. The communities of Alamo, Blackhawk, the Town of Danville, Diablo, the City of San Ramon, the southern area of Morgan Territory, and the Tassajara Valley are all located in the district. The district's service area encompasses approximately 155 square miles and serves a population of roughly 193,259. Since the 2008 recession, local economic conditions have improved significantly, and property values have improved above their pre-recession peaks. Property tax revenues are expected to continue to increase based on recent actual sales activity of residential properties.

The San Ramon Valley's location is a major asset as it is only 34 miles east of San Francisco. Thousands of commuters travel through the district daily with Interstate 680 bisecting the district. SRVFPD boundaries include expansive wildland and recreation areas, large single-family homes and multi-family residential complexes, hotels, a regional hospital, and a 585-acre business park.

SRVFPD Historical Financial Information

The SRVFPD operates on a fiscal year from July 1 to June 30 each year. As a government entity, SRVFPD utilizes the fund accounting method for recording revenues and expenditures. This methodology recognizes all receipts as revenue and all expenditures as expenses regardless of the typical accounting characterization. For example, loan proceeds and the repayment thereof would be treated as revenues and expenditures, respectively.

Comprehensive financial policies are necessary to safeguard the resources of any business but more so for public entities using taxpayer funds. The district has developed a set of policies designed to protect its financial resources. Purchasing policies, including the credit cards issued to certain officers of the fire district, include approval levels at certain dollar levels, use of forms for various transactions, and reviews.

The Other Post-Employment Benefits (OPEB) are health benefits provided to retirees and their dependents. These costs have been recognized and included in the long-range cash flow projections of the district. The district has elected to make additional payments against its outstanding OPEB balance to reduce its liability.

SRVFPD employees participate in the Contra Costa County Employees' Retirement Association (CCCERA) pension plan. California Public Employees' Retirement Law Section 20814 (c) requires employer contribution rates to be calculated and adopted annually and payments made to the system based on the actuarially determined rates. The district has adopted fund reserve policies to ensure monies are available to make the required contributions for both pension and OPEB. SRVFPD annually reviews the guidance of the Governmental Accounting Standards Board and amends its financial policies to follow best practices.

The district utilizes numerous funds to record its transactions, with the General Fund being utilized to record revenues not specifically identified or allocated to designated functions. SRVFPD uses over three funds in its accounting system, the General Fund, Debt Service Fund, and Capital Projects Fund. A Budget Stabilization Fund is included in the budget process but is a calculation based on fiscal policy that restricts fund balances from use without prior and specific authorization. As General Fund revenues typically support the remaining three funds, this study will focus on the General Fund activities and the impact the remaining funds have on the General Fund.

For purposes of analysis and presentation of the finances of the district, AP Triton classifies revenues and expenses as either recurring or non-recurring, with those identified as recurring being items that are expected on an annual basis, and which can be reasonably quantifiable. Non-recurring items, conversely, are items not expected on an annual basis or are not easily quantifiable. Examples of recurring revenues are property taxes, charges for service, intergovernmental reimbursements, and permits. Non-recurring revenues include loan and lease proceeds, grant revenues, insurance proceeds, and investment earnings. Recurring expenses include salaries and benefits, services and supplies, repairs and maintenance, fuel, utilities, and technology costs. Non-recurring expenditures include capital acquisitions, debt retirement, and transfers to other funds.

The ongoing COVID-19 pandemic and associated stay-at-home orders that began in March 2020 introduced a great deal of uncertainty regarding the economic outlook and the potential for negative impacts to district revenues and expenditures in future years.

During late FY 2019/20 and the first half of FY 2020/21, the district experienced a reduction in Emergency Medical Services (EMS) revenues and an increase in certain expenditures, particularly overtime related to COVID exposures and vaccination clinics; however, those impacts appear to have lessened during the second half of FY 2020/21. Property taxes, which represent approximately ninety percent (90%) of district revenues, have been relatively unaffected by any negative economic impacts of the pandemic and are expected to experience continued growth in future years[2].

Revenues

Property tax revenues have shown consistent growth from FY 2018–2019 through budgeted FY 2022–2023. Property tax revenues have increased from approximately $73,800,000 to approximately $88,200,000, respectively. In FY 2018–2019, the revenues from the Consolidated Dispatch Center were $1,350,000 and have increased to an estimated $2,101,462 in FY 2022–2023. Ambulance revenues have seen an approximate 21% increase between FY 2018–2019 and the FY 2022–2023 budget, growing from $4,858,000 to $5,903,000. Plan review fee revenues were approximately $820,000 in FY 2018–2019 but were budgeted at $535,350 in FY 2022–2023. Total recurring revenues increased from approximately $81,300,000 to $98,300,000 between FY 2018–2019 and the FY 2022–2023 budget.

Non-recurring revenues include $686,000 in State Aid/Grants in FY 2018–2019. In the FY 2022–2023 budget, State Aid/Grants are shown at $577,500, and federal grants were estimated at $365,000. Total non-recurring revenues were approximately $2,515,000, $2,521,000, $2,713,000, $(553,234), and $1,881,902 in FY 2018–2019, FY 2019–2020, FY 2020–2021, FY 2021–2022, and FY 2022–2023, respectively.

The following figure provides the various sources of historic revenues for the district.

Figure 10: SRVFPD General Fund Historic Revenues

Revenue	FY 18–19 Actual	FY 19–20 Actual	FY 20–21 Actual	FY 21–22 Actual	FY 22–23 Estimates
Property Taxes	73,773,914	77,282,053	80,539,051	84,572,284	88,229,832
Measure H	33,000	33,000	33,000	33,000	33,000
Measure X	—	—	—	740,000	740,000
SB-90	—	56,355	—	—	—
Intergovernmental	226,080	279,564	331,197	1,576,776	500,767
GEMT	120,085	(11,106)	444	(26,081)	231,692
Consolidated Dispatch	1,350,000	1,400,000	1,702,540	1,953,926	2,101,462
Ambulance Revenues	4,858,204	4,950,725	4,658,000	5,482,357	5,903,500
Other Charges for Service	910,059	598,186	353,969	368,774	535,350
Recurring Revenue:	**81,271,342**	**84,588,777**	**87,618,201**	**93,961,036**	**98,275,603**
State Aid/Grants	686,032	296,751	2,182,761	690,168	557,500
Federal Grants	—	384,806	566,789	809,697	365,194
Investment Earnings	1,738,398	1,758,395	(125,622)	(2,379,705)	850,873
Rent	66,308	67,979	76,036	66,568	78,334
Sales of Property	—	6,440	—	—	—
Other	24,983	6,853	13,642	260,038	10,001
Non-Recurring Revenue:	**2,515,721**	**2,521,224**	**2,713,606**	**(553,234)**	**1,881,902**
Total Revenue:	**83,787,063**	**87,110,001**	**90,331,807**	**93,407,802**	**100,157,505**

Expenses

General fund expenditures include costs related to various divisions of the district, including general government, board of directors, fire chief, operations, human resources, legal, finance, technology, communications, facilities, fleet, training, and emergency operations center. Non-recurring expenditures are typically transfers to the debt service and the capital improvements funds.

Typically contained within each division's expenditures are payroll and benefits costs, supplies, services, and other costs associated with the specific division.

General fund operating expenses were flat between FY 2018–2019 and FY 2019–2020, reflecting the economic downturn resulting from the COVID-19 pandemic and resulting spending limitations. The following figure provides historical information on the recurring expenses, by division, of the SRVFPD.

Figure 11: SRVFPD Recurring Expenses by Division

Expenses	FY 18–19 Actual	FY 19–20 Actual	FY 20–21 Actual	FY 21–22 Actual	FY 22–23 Estimates
District-Wide	9,904,508	8,322,822	11,048,718	11,501,121	14,648,111
Board of Directors	164,896	169,602	338,701	184,023	142,680
Fire Chief	696,047	701,901	702,951	887,213	950,906
District Counsel/Clerk	—	—	—	—	543,265
Human Resources	823,997	1,096,161	1,467,642	1,115,368	937,999
Finance	1,053,824	1,183,908	1,160,063	1,309,196	1,213,527
Community Risk Reduction	1,939,187	1,650,041	1,459,523	1,245,291	945,400
Technology	1,100,289	1,592,233	1,771,085	1,699,434	1,749,114
Communications	3,266,168	3,619,968	3,976,083	4,524,236	4,228,966
Emergency Preparedness	—	—	—	—	176,587
Facilities	880,920	977,900	1,057,029	1,153,529	1,166,276
Emergency Operations	45,593,775	46,190,227	52,241,804	54,955,628	55,305,338
Fleet	1,050,215	1,119,545	1,436,769	1,939,101	1,416,341
Training	509,563	616,641	716,327	787,767	768,105
Academy	797,485	1,024,735	1,443,368	1,770,670	1,012,660
EMS	1,478,781	1,517,597	1,645,943	1,552,505	3,631,552
Special Operations	701,278	867,459	680,564	508,815	1,310,666
Volunteer & Reserves	43,839	26,649	25,438	47,284	68,657
Other	—	—	—	—	—
Total Recurring Expenses:	**70,004,772**	**70,677,389**	**81,172,008**	**85,180,181**	**90,216,150**

Overall General Fund recurring expenses have increased from $70,005,000 in FY 2018–2019 to the proposed budgeted amount of $90,216,000 in FY 2022–2023. Of this $20,211,000 increase, $13,646,000 is related to salaries and benefit increases, and approximately $3,817,000 is additional prepayment of OPEB benefits to reduce the district's liability. Total authorized employees have grown from 180 to 201. Salaries and benefits with OPEB contributions are budgeted to be approximately 90% of recurring expenses in FY 2022–2023.

When removing the additional OPEB payment of approximately $7,866,000, this percentage decreases to approximately 81% of recurring expenses. Costs associated with the Central Garage operation have grown 31%, or approximately 7.75% annually, between FY 2018-2019 and the budgeted amount in FY 2022-2023. Supplies and Utilities have increased 15% or 3.75% annually in the same time period. Professional services increased as a new Division—District Counsel/Clerk was created in FY 2022–2023.

The following figure combines the various division expenditures into categories to identify increases by type of expense.

Figure 12: SRVFPD Operating Expenses by Category

Expenses	FY 18–19 Actual	FY 19–20 Actual	FY 20–21 Actual	FY 21–22 Actual	FY 22–23 Estimates
Salaries & Benefits	59,910,492	59,896,250	67,256,907	70,533,462	73,556,433
Central Garage	887,346	922,898	1,135,935	1,635,710	1,162,000
Maintenance & Repairs	582,325	537,843	424,091	437,165	525,926
Rents & Leases	244,069	128,497	217,494	79,352	202,583
Professional Services	2,512,845	3,287,371	4,030,394	4,367,146	4,870,266
Supplies & Utilities	1,818,765	1,967,116	2,107,188	2,224,015	2,083,735
Debt Service	—	—	—	102,406	—
OPEB Contribution	4,048,930	3,937,414	5,999,999	5,800,925	7,865,904
Total Recurring Expenses:	**70,004,772**	**70,677,389**	**81,172,008**	**85,180,181**	**90,266,877**

The General Fund provides the funding necessary to pay the district's debt obligations and to acquire capital items such as land, buildings, vehicles, and equipment. This is accomplished through transfers to those separate funds.

Unlike a for-profit business, municipalities do not have the ability to immediately respond to changing economic conditions and absent reductions in services, require reasonable reserves to continue to provide service levels. Fund balances have grown from $72,000,000 in FY 2018–2019 to approximately $91,200,000 in the FY 2022–2023 budget. Of these amounts, the SRVFPD has committed, by policy, General Fund "Dry Period" reserves of 50% of projected revenues for the subsequent fiscal year, a "Stabilization Arrangement" equivalent to 20% of the General Fund Expenditures, and an amount equal to twice the district's self-insured Workers' Compensation retention amount.

The Dry Period funds are intended to cover cash flow requirements between property tax payments, and the Stabilization Arrangement (rainy day fund) cannot be used without formal action by the Board of Directors.[3]

The FY 2022–2023 budget contemplated a surplus of approximately $2.0 million of General Fund, increasing the reserve balance.

Figure 13: Historical General Fund Reserve Balances

Reserves	FY 18–19 Actual	FY 19–20 Actual	FY 20–21 Actual	FY 21–22 Actual	FY 22–23 Estimates
Recurring Revenues	81,271,342	84,588,777	87,618,201	93,961,036	98,275,603
Non-Recurring Revenues	2,515,722	2,521,224	2,713,606	(553,234)	1,881,902
Total Revenues:	**83,787,064**	**87,110,001**	**90,331,807**	**93,407,802**	**100,157,505**
Recurring Expenses	70,004,772	70,677,389	81,172,008	85,180,181	90,216,150
Transfers Out	4,873,181	4,638,459	5,141,763	6,851,853	7,941,072
Total Expenses:	**74,877,953**	**75,315,848**	**86,313,771**	**92,032,034**	**98,157,222**
Increase (Decrease):	8,909,111	11,794,153	4,018,036	1,375,768	2,000,283
Beginning Fund Balance	63,073,441	71,982,551	83,776,704	87,794,740	89,170,508
Ending Fund Balance:	**71,982,551**	**83,776,704**	**87,794,740**	**89,170,508**	**91,170,791**
Dry Period Funds	41,893,532	43,555,001	45,165,904	46,703,901	50,078,753
Stabilization Committed	18,975,591	19,063,170	21,262,754	22,406,407	23,631,444
Uncommitted Reserves	11,113,429	21,158,534	21,366,082	20,060,200	17,460,594

The district has established a long-range capital improvement plan (CIP), formally adopted by the Board of Directors, that provides guidance for major capital expenditures, including the maintenance and replacement of facilities, apparatus, equipment, and technology. The funding for the CIP has been through transfers from the General Fund and through the issuance of debt instruments. Funds have been used to replace fire apparatus, make significant renovations to existing facilities, build new facilities, and acquire new technology and equipment.

Major projects funded between FY 2018–2019 and the budgeted FY 2022–2023 include the acquisition of pumpers, ladder trucks, heavy duty rescue unit, mobile communications unit, and Type 3 wildland engines. Additionally, the roof at Station 31 was replaced, a new fire station was constructed, and a joint public safety complex is being built.

Figure 14: SRVFPD Capital Improvement Plan Fund Historic Activity

Fund Balance	FY 18–19 Actual	FY 19–20 Actual	FY 20–21 Actual	FY 21–22 Actual	FY 22–23 Budget
Transfers from GF	2,989,012	3,090,764	3,198,503	3,310,450	2,360,412
Debt Proceeds	—	—	40,400,671	10,218,194	—
Technology Surcharge	—	29,131	18,277	17,997	17,724
Developer Contributions	—	—	—	1,975,000	—
Other	—	—	—	—	188,250
Investment Earnings	214,482	205,434	44,398	109,829	250,000
Inflows:	**3,203,494**	**3,325,329**	**43,661,849**	**15,631,470**	**2,816,386**
Professional Services	—	—	276,755	34,716	—
Legal Services	—	—	87,515	30,000	—
FLSD Tech Improvements	843	15,232	—	83,230	—
Facilities	515,931	1,298,456	2,326,539	20,005,965	19,036,195
Technology	21,264	107,819	69,400	219,931	2,008,319
Communications Center	39,670	4,523	38,413	60,996	7,237
Equipment	135,866	96,619	14,883	—	328,850
Fleet	5,006,046	2,022,823	111,269	1,767,783	10,856,786
Other	183,867	—	—	—	—
Debt Service	—	—	—	—	—
Outflows:	**5,903,487**	**3,545,472**	**2,924,774**	**22,202,621**	**32,237,387**
Net Surplus (Deficit):	**(2,699,993)**	**(220,143)**	**40,737,075**	**(6,571,151)**	**(29,421,001)**
Beginning Fund Balance	12,390,255	9,690,262	9,470,119	50,207,194	43,636,043
Ending Fund Balance:	**9,690,262**	**9,470,119**	**50,207,194**	**43,636,043**	**14,215,042**

Financial Projections

Financial projections are updated by the staff during the annual budget process. The following figure reflects the staff's forecast summarized revenues and expenditures of the General Fund.

Figure 15: Forecast General Fund Revenues and Expenditures[4]

Revenue/Expenses	FY 23–24 Forecast	FY 24–25 Forecast	FY 25–26 Forecast	FY 26–27 Forecast	FY 27–28 Forecast
Recurring Revenues	101,471,414	104,946,743	107,008,751	109,076,333	111,184,542
Non-Recurring Revenues	2,400,814	2,398,667	2,429,318	2,460,399	2,491,918
Total Revenues:	**103,872,228**	**107,345,410**	**109,438,069**	**111,536,732**	**113,676,460**
Recurring Expenses	95,435,624	95,325,622	98,493,030	88,972,601	90,404,701
Transfers Out	13,133,388	13,292,617	10,457,262	10,626,387	8,749,813
Total Expenses:	**108,569,012**	**108,618,239**	**108,950,292**	**99,598,988**	**99,154,514**
Increase (Decrease):	**(4,696,784)**	**(1,272,829)**	**487,777**	**11,937,744**	**14,521,946**
Beginning Balance:	**90,898,861**	**86,202,077**	**84,292,248**	**85,417,025**	**97,354,769**
Ending Fund Balance:	**86,202,077**	**84,292,248**	**85,417,025**	**97,354,769**	**111,876,715**
Dry Period Funds	50,735,707	52,473,372	53,504,376	54,538,167	55,592,271
Stabilization Committed	23,087,125	23,065,124	23,698,606	21,794,520	22,080,940
Uncommitted Reserves	12,379,245	9,390,572	8,214,044	21,022,082	34,203,504

Capital Facilities & Apparatus Inventories

Apparatus and other vehicles, trained personnel, firefighting, emergency medical equipment, and fire stations are the essential capital resources necessary for a fire district to carry out its mission. No matter how competent or numerous the firefighters are, if appropriate capital equipment is not available for operations personnel, it would be impossible for the San Ramon Valley Fire Protection District to perform its responsibilities effectively. The essential capital assets for emergency operations are facilities, apparatus, and other emergency response vehicles. This section of the report assessed SRVFPD's fire stations and frontline ambulances and apparatus.

Fire Station Features

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

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

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

In gathering information from SRVFPD, Triton asked the district to rate the condition of its fire stations using the criteria from NFPA 1500 and identified in the following figure. The results will be seen in the following figures.

Figure 16: Criteria Utilized to Determine Fire Station Condition

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

Fire Stations & Capital Facilities

The following section consists of an overview of the basic features of each of SRVPFD's ten fire stations.

Figure 17: SRVFPD Headquarters, EOC, and Communication Center

Address/Physical Location:	2401 Crow Canyon Road, San Ramon, CA 94583

Structure						
Date of Original Construction	2023					
Seismic Protection	Yes					
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	Drive-through Bays	0		Back-in Bays	0	
ADA Compliant	Yes					
Total Square Footage	24,724					
Facilities Available						
Sleeping Quarters	6	Bedrooms	6	Beds	6	Dorm Beds
Maximum Staffing Capability	6					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	6 bathrooms & showers					
Training/Meeting Rooms	Yes					
Washer/Dryer	No					
Safety & Security						
Sprinklered & Smoke Detection	Yes/Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	No					

Figure 18: SRVFPD Station 30

Address/Physical Location:	11445 Windemere Parkway, San Ramon, CA 94582

Structure						
Date of Original Construction	2002					
Seismic Protection	Yes (based on date of construction)					
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	Drive-through Bays	3	Back-in Bays	0		
ADA Compliant	No					
Total Square Footage	10,000					
Facilities Available						
Sleeping Quarters	8	Bedrooms	1	Beds	14	Dorm Beds
Maximum Staffing Capability	15					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	5 with 4 showers					
Training/Meeting Rooms	2					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 19: SRVFPD Station 31

Address/Physical Location:	800 San Ramon Valley Blvd, Danville, CA 94526

Structure						
Date of Original Construction	1975					
Seismic Protection	No					
Auxiliary Power	Yes					
General Condition	Fair					
Number of Apparatus Bays	Drive-through Bays	3	Back-in Bays	0		
ADA Compliant	No					
Total Square Footage	7,500					
Facilities Available						
Sleeping Quarters	14	Bedrooms	14	Beds	0	Dorm Beds
Maximum Staffing Capability	18					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	4 with 4 Showers					
Training/Meeting Rooms	2					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 20: SRVFPD Station 32

Address/Physical Location:	2100 Stone Valley Road, Alamo, CA 94507

Structure						
Date of Original Construction	2016					
Seismic Protection	Yes (based on date of construction)					
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	Drive-through Bays	3	Back-in Bays	0		
ADA Compliant	Yes					
Total Square Footage	8,000					
Facilities Available						
Sleeping Quarters	6	Bedrooms	12	Beds	0	Dorm Beds
Maximum Staffing Capability	12					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	4 with 3 showers					
Training/Meeting Rooms	0					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 21: SRVFPD Station 33

Address/Physical Location:	1051 Diablo Road, Danville, CA 94526

Structure						
Date of Original Construction	1965					
Seismic Protection	No					
Auxiliary Power	Yes					
General Condition	Good					
Number of Apparatus Bays	Drive-through Bays	2	Back-in Bays	0		
ADA Compliant	No					
Total Square Footage	8,000					
Facilities Available						
Sleeping Quarters	2	Bedrooms	1	Beds	6	Dorm Beds
Maximum Staffing Capability	7					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	4 with 4 Showers					
Training/Meeting Rooms	2					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 22: SRVFPD Station 34

Address/Physical Location:	12599 Alcosta Blvd, San Ramon, CA 94583

Structure						
Date of Original Construction	2023					
Seismic Protection	Yes					
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	Drive-through Bays	3	Back-in Bays	0		
ADA Compliant	Yes					
Total Square Footage	11,217					
Facilities Available						
Sleeping Quarters	10	Bedrooms	10	Beds	0	Dorm Beds
Maximum Staffing Capability	10					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	7 with 6 showers					
Training/Meeting Rooms	2					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 23: SRVFPD Station 35

Address/Physical Location:	505 Silver Oak Lane, Danville, CA 94506

Structure						
Date of Original Construction	1986					
Seismic Protection	No					
Auxiliary Power	Yes					
General Condition	Good					
Number of Apparatus Bays	Drive-through Bays	3	Back-in Bays	0		
ADA Compliant	No					
Total Square Footage	5,700					
Facilities Available						
Sleeping Quarters	7	Bedrooms	0	Beds	8	Dorm Beds
Maximum Staffing Capability	8					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	4 with 3 showers					
Training/Meeting Rooms	1					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 24: SRVFPD Station 36

Address/Physical Location:	2001 Lusitano Street, Danville, CA 94506

Structure						
Date of Original Construction	2009					
Seismic Protection	Yes					
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	Drive-through Bays	2	Back-in Bays	0		
ADA Compliant	No					
Total Square Footage	9,084					
Facilities Available						
Sleeping Quarters	6	Bedrooms	6	Beds	0	Dorm Beds
Maximum Staffing Capability	6					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	6 with 3 showers					
Training/Meeting Rooms	1					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 25: SRVFPD Station 37

Address/Physical Location:	10207-A Morgan Territory Road, Livermore, CA 94551

Structure						
Date of Original Construction	1993					
Seismic Protection	No					
Auxiliary Power	Yes					
General Condition	Fair					
Number of Apparatus Bays	Drive-through Bays	2	Back-in Bays	0		
ADA Compliant	No					
Total Square Footage	3,200					
Facilities Available						
Sleeping Quarters	0	Bedrooms	0	Beds	0	Dorm Beds
Maximum Staffing Capability	0					
Exercise/Workout Facilities	No					
Kitchen Facilities	Yes					
Individual Lockers Assigned	No					
Bathroom/Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	No					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	No					

Figure 26: SRVFPD Station 38

Address/Physical Location:	1600 Bollinger Canyon Road, San Ramon, CA 94583

Structure						
Date of Original Construction	1990					
Seismic Protection	Yes (based on date of construction)					
Auxiliary Power	Yes					
General Condition	Good					
Number of Apparatus Bays	Drive-through Bays	2	Back-in Bays	0		
ADA Compliant	No					
Total Square Footage	6,500					
Facilities Available						
Sleeping Quarters	2	Bedrooms	1	Beds	7	Dorm Beds
Maximum Staffing Capability	8					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	4 with 4 showers					
Training/Meeting Rooms	2					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 27: SRVFPD Station 39

Address/Physical Location:	9399 Fircrest Lane, San Ramon, CA 94583

Structure						
Date of Original Construction	1966					
Seismic Protection	No					
Auxiliary Power	Yes					
General Condition	Fair					
Number of Apparatus Bays	Drive-through Bays	0	Back-in Bays	2		
ADA Compliant	No					
Total Square Footage	6,500					
Facilities Available						
Sleeping Quarters	2	Bedrooms	1	Beds	10	Dorm Beds
Maximum Staffing Capability	11					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers Assigned	Yes					
Bathroom/Shower Facilities	4 with 3 showers					
Training/Meeting Rooms	2					
Washer/Dryer	Yes					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 28: Communications Building (Station 31)

Address/Physical Location:	800 San Ramon Valley Blvd, Danville, CA 94526

Structure						
Date of Original Construction	1975					
Seismic Protection	No					
Auxiliary Power	Yes					
General Condition	Good					
Number of Apparatus Bays	Drive-through Bays	0	Back-in Bays	3		
ADA Compliant	No					
Total Square Footage	Part of Station 31					
Facilities Available						
Sleeping Quarters	0	Bedrooms	0	Beds	0	Dorm Beds
Maximum Staffing Capability	0					
Exercise/Workout Facilities	No					
Kitchen Facilities	No					
Individual Lockers Assigned	No					
Bathroom/Shower Facilities	1					
Training/Meeting Rooms	1					
Washer/Dryer	No					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	No					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 29: SRVFPD Essential Services Warehouse (Station 36)

Address/Physical Location:	2001 Lusitano Street, Danville, CA 94506

Structure						
Date of Original Construction	2009					
Seismic Protection	Yes					
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	Drive-through Bays	0	Back-in Bays	5		
ADA Compliant	No					
Total Square Footage	9,400					
Facilities Available						
Sleeping Quarters	0	Bedrooms	0	Beds	0	Dorm Beds
Maximum Staffing Capability	0					
Exercise/Workout Facilities	No					
Kitchen Facilities	No					
Individual Lockers Assigned	No					
Bathroom/Shower Facilities	1					
Training/Meeting Rooms	No					
Washer/Dryer	1					
Safety & Security						
Station Sprinklered	Yes					
Smoke Detection	Yes					
Decontamination/Bio. Disposal	Yes					
Security System	Yes					
Apparatus Exhaust System	Yes					

Figure 30: San Ramon Valley Fire Protection District Training Center

Address/Physical Location:	6100 Camino Tassajara, Pleasanton, CA 94588

Structure					
Date of Original Construction	1990				
Seismic Protection	No				
Auxiliary Power	Yes				
General Condition	Fair				
Number of Apparatus Bays	Drive-through Bays	1	Back-in Bays	1	
ADA Compliant	No				
Total Square Footage	3,900				
Facilities Available					
Kitchen Facilities	No				
Individual Lockers Assigned	No				
Bathroom/Shower Facilities	1				
Training/Meeting Rooms	3				
Washer/Dryer	No				
Safety & Security					
Facility Sprinklered	No				
Smoke Detection	Yes				
Decontamination/Bio. Disposal	Yes				
Security System	Yes				
Apparatus Exhaust System	Yes				

Summary of the Fire Stations

The following figure is a summary list of some of the primary features of SRVFPD fire stations utilized for the deployment of personnel and apparatus.

Figure 31: Summary of SRVFPD Staffed Fire Station Features (2022)

Station	Square Footage	No. of Bays	Training & Meeting Rooms	Maximum Staffing	General Condition	Station Age
Station 30	10,000	3	2	15	Excellent	20 years
Station 31	7,500	3	3	18	Fair	47 years
Station 32	8,000	3	3	12	Excellent	6 years
Station 33	8,000	2	2	7	Good	57 years
Station 34	11,700	3	2	10	Excellent	New
Station 35	5,700	3	1	8	Good	36 years
Station 36	9,084	2	1	6	Excellent	13 years
Station 37	3,200	2	1	0	Fair	29 years
Station 38	6,500	2	2	8	Good	32 years
Station 39	6,500	2	2	11	Fair	56 years
Totals:	**76,184**	**25**	**19**	**95**	**Avg. Age:**	**29.6 years**

As shown in the preceding figure, SRVFPD's fire stations range in age from 0 to 57 years, averaging nearly 30 years old (as of 2022). According SRVFPD staff, four out of nine fire stations are in "Excellent" condition, three are in "Good" condition, and two are considered "Fair." Station 37 is excluded from the previous figure as it is a volunteer station with no staffing capacity and two drive-through apparatus bays.

Combined, the nine fire stations represented in the preceding figure have the capacity to house at least 95 personnel in a total of over 76,000 square feet. The district has ample training and meetings rooms among its fire stations.

Administration Building

A new administration facility for SRVFPD is currently under construction and expected to be completed by September 2023. The current Administration Building will become a new District Training Tower in the future.

Apparatus & Ambulances

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

As a part of this study, Triton requested that the district provide a complete inventory of its fleet. For each vehicle listed, SRVFPD was asked to rate its condition utilizing criteria described in the following figure, which will be shown in the apparatus inventory figures.

Figure 32: Criteria Used to Determine Apparatus & Vehicle Condition

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

Point Ranges	Condition Rating	Condition Description
Under 18 points	Condition I	Excellent
18–22 points	Condition II	Good
23–27 points	Condition III	Fair (consider replacement)
28 points or higher	Condition IV	Poor (immediate replacement)

In addition to its frontline fleet of engines, trucks, water tenders, and ambulances, the San Ramon Valley Fire Protection District maintains a large inventory of staff cars, command units, assorted trailers, and other support vehicles assigned to various chief officers, emergency operations, and other divisions.

The following figure lists the fleet inventory of SRVFPD's frontline apparatus as of 2022.

Figure 33: SRVFPD Frontline Engines, Trucks, & Wildland Apparatus Inventory (2022)

Unit	Type	Manufacturer	Year	Condition	Features
Engines & Trucks					
Engine 30	Type 1	Spartan	2011	Excellent	1500 gpm/600 gal.
Engine 31	Type 1	Pierce	2019	Excellent	1500 gpm/600 gal.
Engine 32	Type 1	Pierce	2019	Excellent	1500 gpm/600 gal.
Engine 33	Type 1	Spartan	2011	Good	1500 gpm/600 gal.
Engine 34	Type 1	Pierce	2019	Excellent	1500 gpm/600 gal.
Engine 35	Type 1	Spartan	2011	Good	1500 gpm/600 gal.
Engine 36	Type 1	Spartan	2006	Good	1500 gpm/600 gal.
Engine 37	Type 1	Ford	1981	Good	1500 gpm/600 gal.
Engine 38	Type 1	Pierce	2019	Excellent	1500 gpm/600 gal.
Engine 39	Type 1	Pierce	2018	Excellent	1500 gpm/600 gal.
Truck 31	Aerial	Pierce	2020	Excellent	1000 gpm/200 gal.
Truck 34	Aerial	ALF/LTI	2005	Good	1000 gpm/200 gal.
Wildland Engines					
Engine 3-31	Type 3	Hitech	2010	Good	500 gpm/500 gal.
Engine 3-32	Type 3	Hitech	2010	Excellent	500 gpm/500 gal.
Engine 3-33	Type 3	Hitech	2010	Good	500 gpm/500 gal.
Engine 3-34	Type 3	Hitech	2005	Good	500 gpm/500 gal.
Engine 3-35	Type 3	Hitech	2005	Good	500 gpm/500 gal.
Engine 3-36	Type 3	Freightliner	1996	Good	500 gpm/500 gal.
Engine 3-39	Type 3	Hitech	2010	Good	500 gpm/500 gal.
Engine 6-30	Type 6	Dodge	2019	Excellent	150 gpm/400 gal.
Engine 6-33	Type 6	Dodge	2019	Excellent	150 gpm/400 gal.
Engine 6-38	Type 6	Dodge	2019	Excellent	150 gpm/400 gal.
E-4-37	Type 6	Chevrolet	1986	Good	75 gpm/300 gal.
E-4-40	Type 6	Chevrolet	1983	Good	75 gpm/2800 gal.
WT-130	Tender	Peterbilt	1991	Fair	1000 gpm/500 gal.
WT-135	Tender	Freightliner	1995	Fair	500 gpm/2500 gal.
WT-238	Tender	International	1982	Fair	300 gpm/1500 gal.

As shown in the preceding figure, nearly all of SRVFPD's engines, trucks, and wildland apparatus are in "Good" or "Excellent" condition, while the three water tenders were considered to be in a "Fair" condition. The district also maintains several Type 1 and Type 3 engines in reserve.

Figure 34: SRVFPD Frontline Ambulance Fleet Inventory (2022)

Unit	Type	Manufacturer	Year	Condition
SR-31	Type I	Ford	2022	Excellent
PM-32	Type I	Dodge	2018	Good
PM-35	Type I	Dodge	2018	Good
PM-38	Type I	Dodge	2018	Good
PM-39	Type I	Dodge	2018	Good

As shown in the preceding figure, the SRVFPD operates all Type I ambulances on Dodge chassis, and each is currently considered in "Excellent" condition. A new ambulance will be delivered by the end of the first quarter of 2023 and assigned to the SR-31 Program.

Apparatus Maintenance & Replacement Planning

No piece of mechanical equipment or vehicle can be expected to last indefinitely. As apparatus and vehicles age, repairs tend to become more frequent and more complex. Parts may become more difficult to obtain, and downtime for repair and maintenance increases. Given that fire protection, EMS, and other emergencies prove critical to a community, downtime is one of the most frequently identified reasons for apparatus replacement.

To enable such planning, districts often turn to the accepted practice of establishing a life cycle for apparatus that results in an anticipated replacement date for each vehicle.

The reality is that it may be best to establish a life cycle for planning purposes, such as the development of replacement funding for various types of apparatus, yet apply a different method (such as a maintenance and performance review) for determining the actual replacement date, thereby achieving greater cost-effectiveness when possible. San Ramon Valley FPD has a capital improvement plan in place for apparatus replacement.

Future Apparatus Serviceability

Apparatus service life can readily be predicted based on factors such as vehicle type, call volume, age, and maintenance considerations.

NFPA 1901: Standard for Automotive Fire Apparatus recommends that fire apparatus 15 years of age or older be placed into reserve status, and that apparatus 25 years or older be replaced. This is a general guideline, and the standard recommends using the following objective criteria in evaluating fire apparatus lifespan:

- Vehicle road mileage.
- Engine operating hours.
- The quality of the preventative maintenance program.
- The quality of the driver-training program.
- Whether the fire apparatus was used within its design parameters.
- Whether the fire apparatus was manufactured on a custom or commercial chassis.
- The quality of workmanship by the original manufacturer.
- The quality of the components used in the manufacturing process.
- The availability of replacement parts.

It is important to note that age is not the only factor for evaluating serviceability and replacement. Vehicle mileage and pump hours on engines must also be considered. A two-year-old engine with 250,000 miles may need replacement sooner than a 10-year-old one with 2,500 miles.

Section II:
ALL-HAZARDS
COMMUNITY RISK ASSESSMENT

Community Overview

Contra Costa County is located in the East Bay region of the San Francisco Bay Area in California. The County comprises 720 square miles with six different terrains. The San Andreas, Calaveras, and Hayward faults run under the Bay Area. The City of San Ramon and the San Ramon Valley Fire Protection District lie in the southwest corner of Contra Costa County and southeast of Oakland.

Figure 35: Contra Costa County

Contra Costa County is home to 19 incorporated cities and many unincorporated communities.[5] The City of Concord is the most populated, followed by Antioch, Richmond, San Ramon, and Pittsburg. Martinez serves as the County seat. The least populated city is Clayton. Another 32 communities are census-designated places (e.g., Discovery Bay, Byron, Bay Point).

County Population & Demographics

Accurate population and demographic statistics specific to fire protection districts are often minimal and difficult to determine. Triton used both the U.S. Census Bureau and the State of California Department of Finance data for population and demographic estimates for SRVFPD. The U.S. Census Bureau estimates Contra Costa County's population as of April 2020 at 1,165,927 persons—which was an increase of about 10% from 2010.[6]

More than 18% of the population is age 60 years or over, while over 27% is age 19 years or younger.[7] The majority of the population (40.8%) is comprised of Caucasians, followed by Hispanic or Latinos (26.8%), Asians (19.3%), and Black or African American (9.5%).[8]

The Census Bureau estimates 367,883 individual households in the County have a median household income in the last 12 months of $73,721, with just over 9% of the population below the poverty level. Of the County's total housing units, over 66% are owner-occupied, and nearly 34% are renter-occupied.[9]

San Ramon Valley Fire Protection District

The San Ramon Valley Fire Protection District (SRVFPD) was created through the mergers of the Danville Fire Protection District and the San Ramon Fire Protection District in 1980. The district encompassed Alamo, Blackhawk, Danville, Diablo, and San Ramon. In 1991, the Tassajara Fire Protection District merged with SRVFPD, followed by the Dougherty Regional Fire Authority in 1997.

The City of San Ramon encompasses an area of nearly 19 square miles with a 2022 estimated population of 83,820 persons that is about half the population of the SRVFPD.[10] A little over 5% of the population is 5 years of age or less, with 10.5% of the population 65 years and older. Females represent nearly 50% of the population. Asians represent the largest race group at nearly 47% of the population. Just over 3% of the population under the age of 65 has some type of disability.

Figure 36: Memorial Park, San Ramon

Between 2015–2019, the median household income in San Ramon was $160,783, with a per capita income of $63,782. Nearly 4% of the population is considered to be in poverty. During 2015–2019, the employment rate in the City of San Ramon of persons aged 16 years and older was about 69%.[11]

There are several additional communities that make up the San Ramon Valley Fire Protection District, including the town of Danville with an estimated population of 43,352.[6] The District also includes the communities of Blackhawk, Diablo, Alamo, Southern Morgan Territory, and Tassajara Valley.

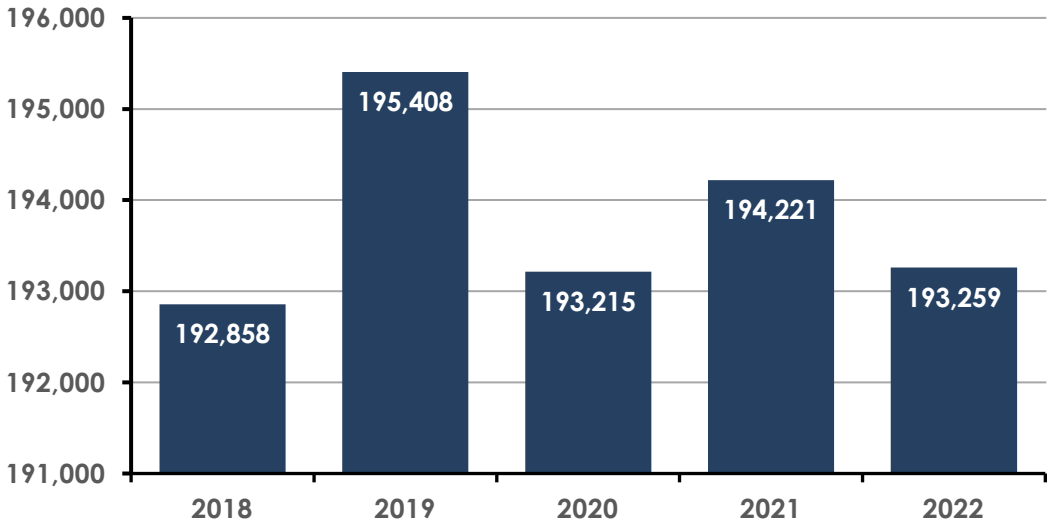
Community Risks in San Ramon Valley Fire Protection District

Every community expects to have a certain level of risk that impacts service delivery, whether a fire or EMS type of incident. This data provides SRVFPD with information on population, demographics, natural and human-caused disasters, occupancy types, and infrastructure. Understanding this information allows SRVFPD to develop programs that reduce community risks.

District Population

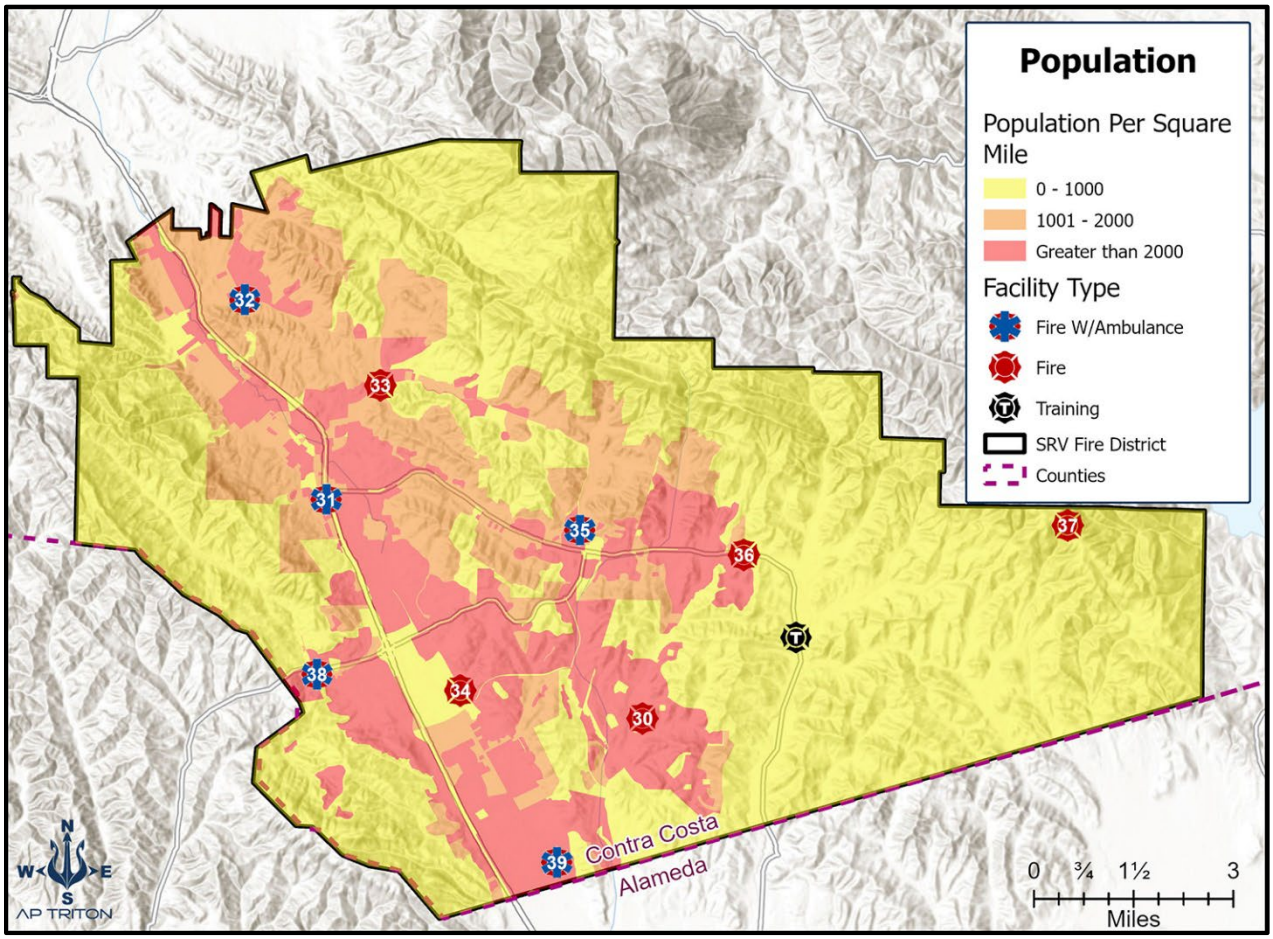
Information collected from the State of California Department of Finance as reported in the SRVFPD 2022 Annual Comprehensive Financial Report (ACFR) for fiscal year ending June 30, 2022, indicates an estimated population of 193,259 for SRVFPD. The ACFR indicates very little change from a population in 2020 of 193,215. This data does vary from the U. S. Census Bureau from the 2020 Census that indicates that the estimated population for SRVFPD was 162,338 with an average population density of 1,314 per square mile. The American Community Survey 5-year estimate lists a 2021 population of 165,425. Triton used the ACFR data for the following figure showing population between 2018–2022.

Figure 37: SRVFPD Population (2018–2022)



The highest population density is along and east of I-680 until reaching the mountains. The following figure identifies the population density for the district.

Figure 38: Population Density (2020)



At-Risk Populations

An area's population has different residents at higher risk of fires and other unintentional injuries. When an incident occurs, it affects service delivery for the department. The SRVFPD response area is considered urban but has other areas considered suburban or even rural, ranging from single-family homes to multifamily apartments. The National Fire Protection Association (NFPA) has identified groups with an increased risk of injury or death from a fire, as indicated below.[12]

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

Data from the 2019 U.S. Census American Community Survey 5-year estimates identified several groups in these categories that are more likely to need emergency services, specifically EMS, than other populations.[13]

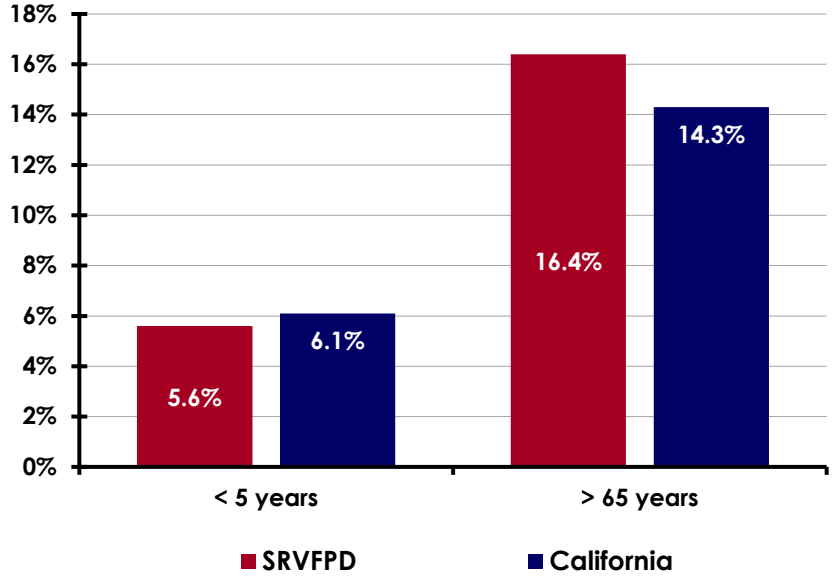
Age

A person's age in a high-risk population directly relates to an increase in unintentional injuries and death or injury from a fire. These age risks increase service demand, specifically for older adults needing additional medical care. Older adults are 2.6 times more likely to die in a fire than the United States' overall population.[14]

Children under the age of five are at more risk because of their inability to care for themselves and needing additional assistance during an emergency. Recent trend data (2018) from the U.S. Fire Administration indicates that this age group's relative risk of dying in a fire has dropped 30% in the last ten years and is credited to increased fire prevention and education.

The percentage of children under 5 years of age is 5.6%, which is nearly the same as California is 6.1%. The population of those over 65 years of age is 16.4% in SRVFPD, which is higher than the state at 14.3%. The median age is 42 compared to California at 38 years. The next figure shows the percentage of children less than 5 years of age and those 65 years and older.

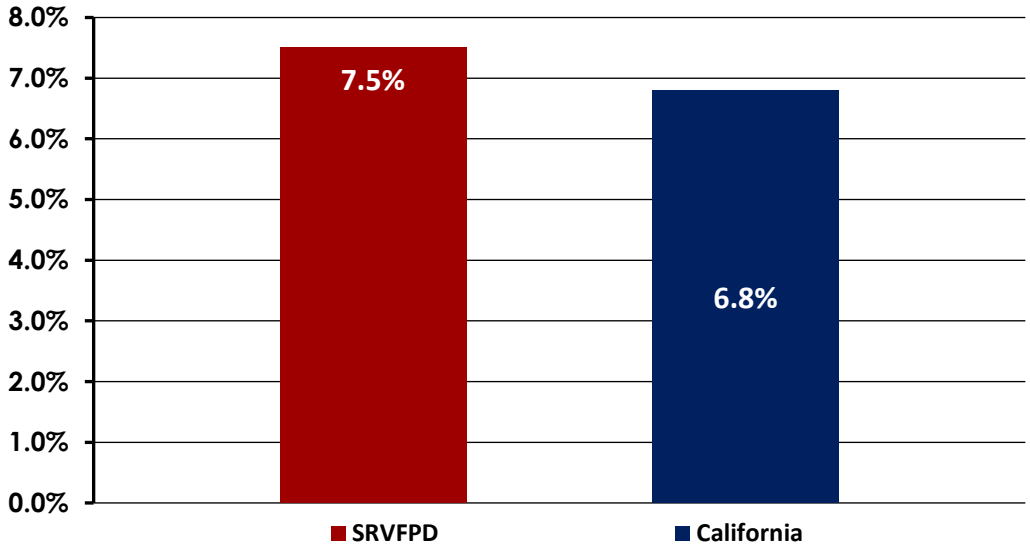
Figure 39: Percentage of Population by Age Risk



Disabilities

The residential population with disabilities is 7.5% in SRVFPD compared to the state at 6.8%. This population group may be unable to self-evacuate from a building during an emergency or need additional medical services because of their disability. This may create additional demand for medical services specifically as they age. The following figure depicts the percentage of households with a disability.

Figure 40: Households with a Disability



Language Barrier

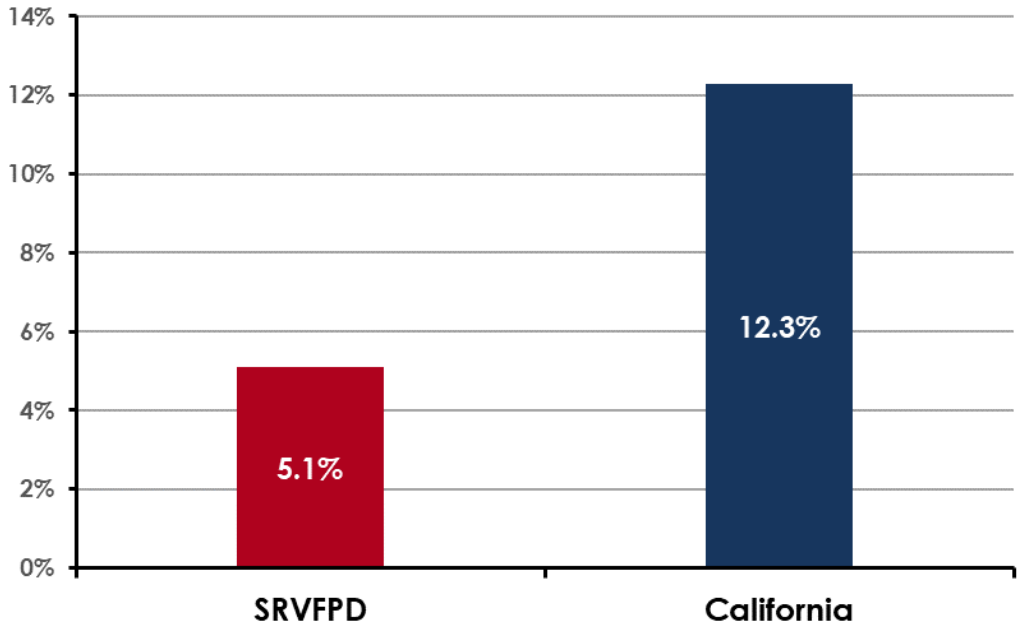
Although the number of people over 18 speaking a language other than English is approximately 1%, which is substantially lower than the state, SRVFPD may encounter someone who needs another type of communication. This population may not understand smoke alarm technology designed to provide early warning during a fire, which increases the risk of injuries or death in their home.

Poverty & Income

The lack of higher incomes generally increases the risk of fires and medical illnesses in the population. The inability to receive adequate medical services due to no or minimal health insurance and the general older and less maintained condition of their housing.

People living below the poverty level are considered at the highest risk when combined with other factors such as education levels, disabilities, or inability to work. The poverty level in SRVFPD is 5.1% compared to 12.3% in the state as shown in the following figure.

Figure 41: Poverty Levels



The 2022 median household income is $200,001, substantially higher than the state's $84,907. The following figure provides the income levels for SRVFPD compared to the state.

Figure 42: Income Levels

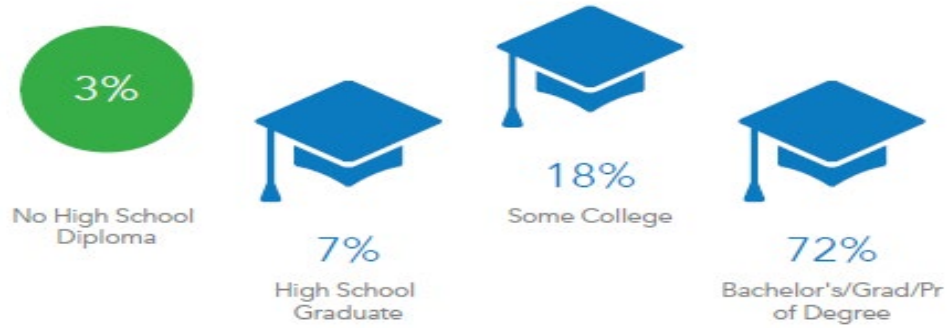
Income Amount	SRVFPD	California
< $15,000	3%	8.9%
$15,000–$24,999	1.2%	7.5%
$25,000–34,999	1.7%	7.5%
$35,000–$49,999	3%	10.5%
$50,000–$74,999	5.8%	15.5%
$75,000–$99,999	6.7%	12.4%
$100,000–$149,999	14.5%	16.6%
$150,000–$199,999	14.9%	8.9%
$200,000+	49.1%	12.2%

Other Demographics

Education

Educational attainment is not considered one of the at-risk populations but is recognized as another risk group when developing fire and life safety education programs. In the SRVFPD, 3% of the population does not have a diploma, compared to 7.5% for the state, where only 7.0% have a high school diploma. About 72% have a bachelor's degree or higher compared to the state at 33.9%. The following figure provides information on the levels of education in SRVFPD.

Figure 43: Education Levels in SRVFPD



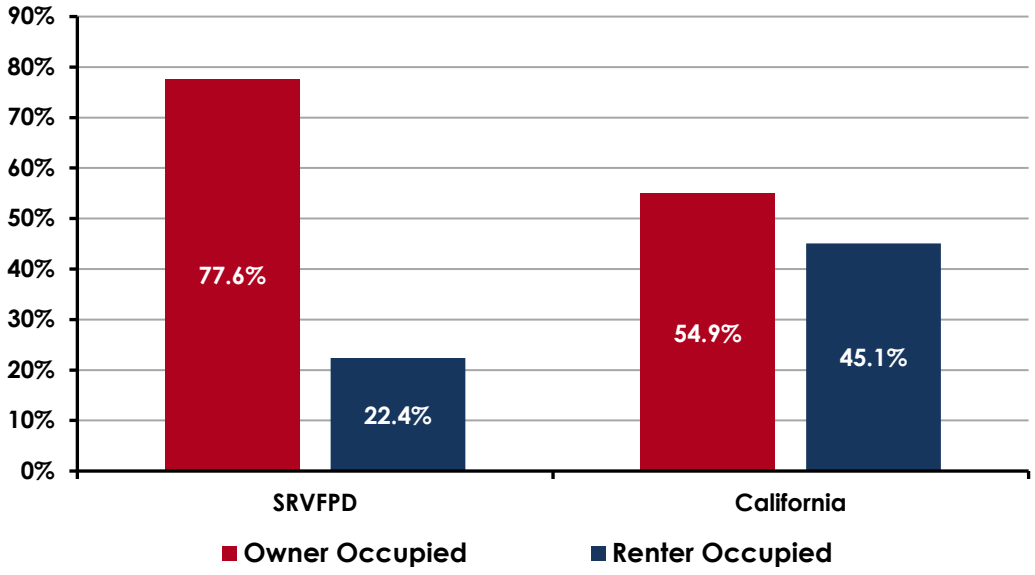
Housing Characteristics

The types of housing vary in a community and can provide insight into ownership, the age of the home, and the number of units in the building. In SRVFPD, there are approximately 45,749 housing units, of which 1,280 are vacant.[15] Vacant structures can pose a risk for the fire department and community if the building is not secured to prevent entry. If the building is not maintained, the structural integrity can degrade and present problems during a fire. Vandalism may create additional problems for the fire department and law enforcement.

Home Ownership

Homeownership in SRVFPD is 77.6% compared to the state at 54.9%. The following figure shows the percentage of owner- and renter-occupied housing in SRVFPD and the state.

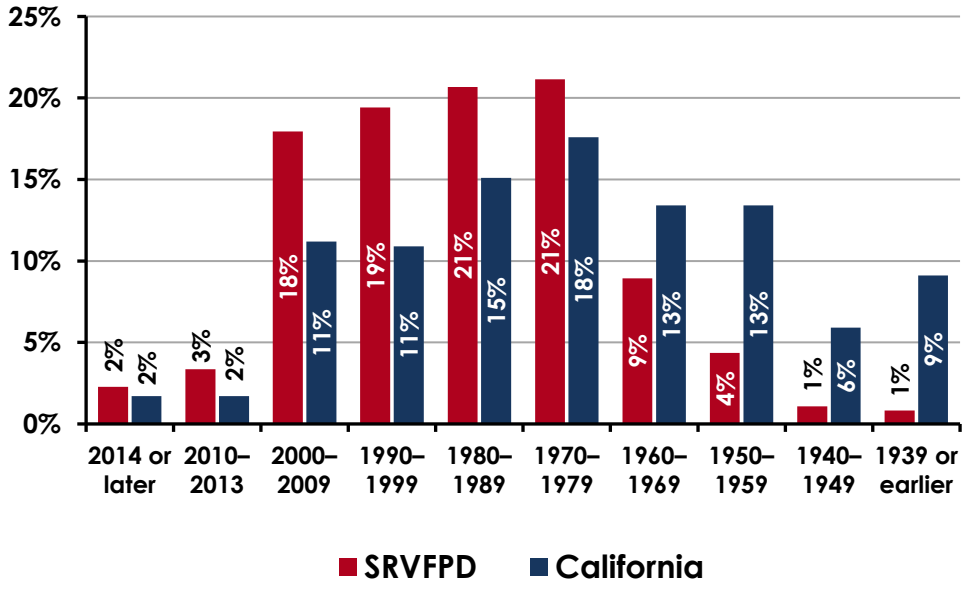
Figure 44: Housing Ownership



Age of Housing

All buildings are built to last a period of time, and as it ages, more problems occur when it is not maintained. Only 15% of the homes in SRVFPD were built before 1970, with high growth periods between 1970–2009. Homes built before smoke alarm and sprinkler requirements pose a higher risk to occupants if none are present. The following figure illustrates the percentage of housing built by year.

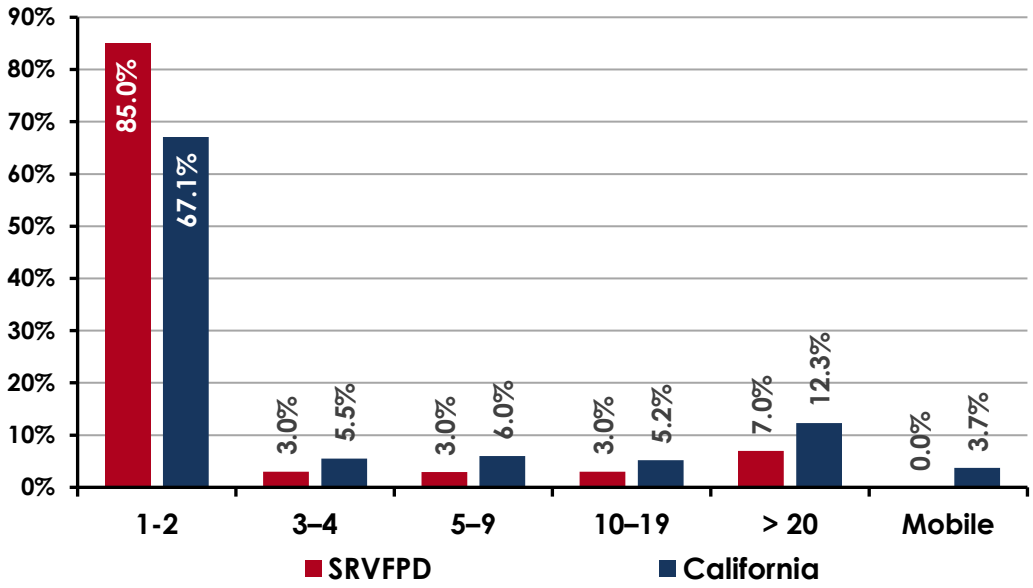
Figure 45: Comparison of SRVFPD to California Housing Ages



Housing Units

The number of people living in one- or two-family dwellings is 84.5% compared to the state at 67.1%. This high percentage is reflective of homeownership. The following figure lists the percentage of housing unit types.

Figure 46: Comparison of Housing Unit Types



Risk Classification

Risk Assessment Methodology

Developing a risk score to determine risks in a community is necessary to provide an organization with a method for creating response protocols for an incident. The Three-Axis Heron model establishes a score by reviewing probability, consequence, and impact factors and assigning a score between 2–10 in each category.[16] A description of the incident types for each risk will be found an appendix at the end of this report.

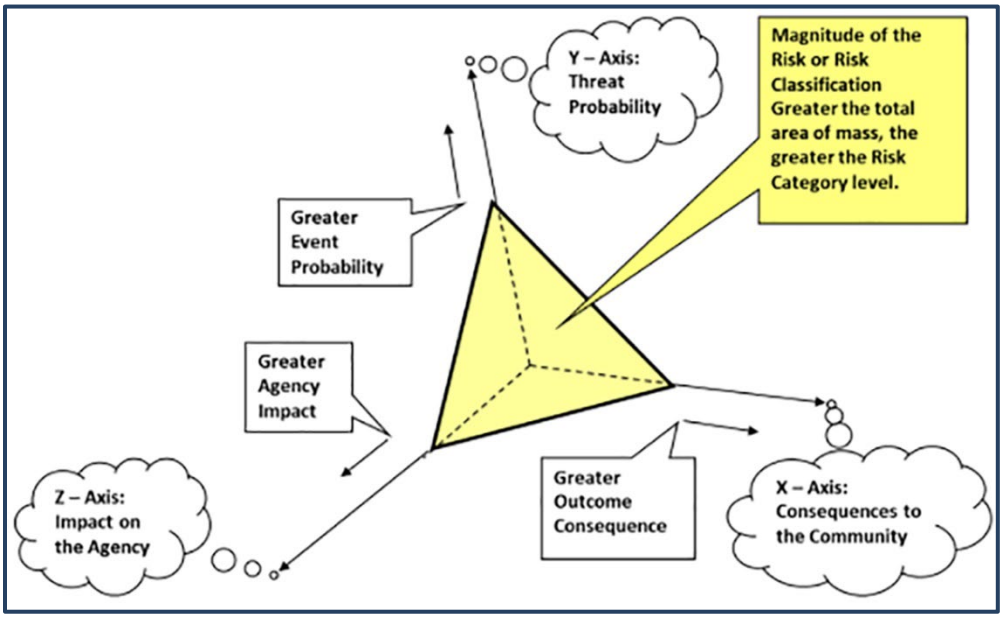
Use of the Three-Axis Heron Formula includes the following equation:

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

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

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

Figure 47: Three-Axis Risk Classification Process



When developing the score, each of the three scoring components is based on SRVFPD incident and staffing data. An example of a low-risk fire response scoring is based on the probability of that incident occurring. Most low-risk incident types are frequent (multiple times a day), but the consequence to the community and impact on SRVFPD is low. The probability of a low-risk incident in SRVFPD is 10 (high), while the consequence and impact is 2 (low). These numbers are placed into the above formula to create a score of 20.2. The score increases dramatically for a maximum risk incident. Although the probability is low (2), because the consequence to the community is a 10, and the impact on SRVFPD is the highest at 10, it gives a score of 73.5. The scores can help identify risk in the community and guide training and staffing decisions.

Figure 48: Risk Scores

Risk Score	General Category
0-24.99	Low
25-49.99	Moderate
50-69.99	High
70-100	Extreme

Probability

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

Figure 49: Probability or Likelihood of Occurrence

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

Consequence

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

Figure 50: Consequence to the Community

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

Impact

The third factor in determining the risk is the fire department's impact and the critical tasking needed to control or mitigate an incident. This includes the number of emergency responders and apparatus available, whether they are available internally or from external agencies. It measures the department's ability to respond to a given risk or incident while continuing to provide service to the remaining parts of the district. The following figure defines the score, category, and impact of operational forces during an incident.

Figure 51: Impact on Operational Forces

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

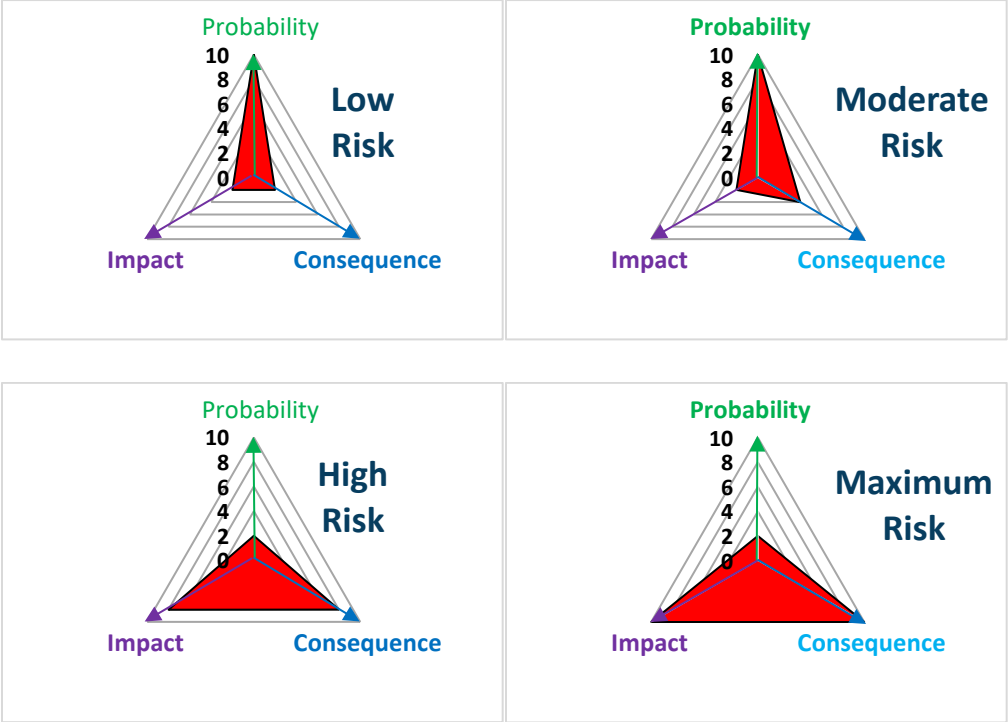
Fire Response

SRVFPD is the primary provider of prevention or mitigation of fire-related incidents. These range from low-risk incidents, such as a vehicle fire, to a maximum risk for a fire involving a school. Fire risks for a vehicle fire are considered low compared to a maximum risk for a school that houses students. This scoring is applied to four different types of fire incidents in SRVFPD to provide staffing needs to meet critical tasks on the fire ground. The following figures provide the risk score and classifications assigned to each type of fire risk in SRVFPD.

Figure 52: Fire Response Risk Assessment

Description	Low			Moderate			High			Maximum		
Risk Score	P	C	I	P	C	I	P	C	I	P	C	I
	10	2	2	10	4	2	2	8	8	2	10	10
Score Assigned	20.2			32.12			48			73.5		

Figure 53: Fire Risk Classifications



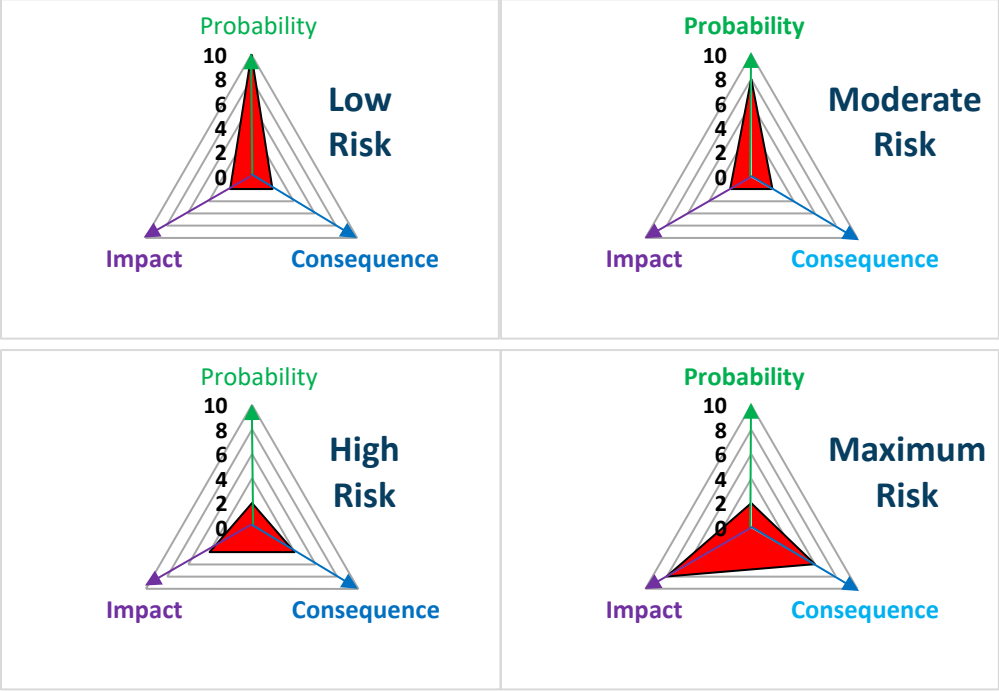
Emergency Medical Services

SRVFPD provides advanced life support emergency medical care in Contra Costa County. Low-risk incidents range from a medical assist to a maximum risk for an active shooter. The following figures provide the risk score and classifications assigned to each type of EMS risk occurring in the SRVFPD service area.

Figure 54: EMS Response Risk Assessment

Description	Low			Moderate			High			Maximum		
Risk Score	P	C	I	P	C	I	P	C	I	P	C	I
	10	2	2	8	2	2	2	4	4	2	6	8
Score Assigned	20.2			16.25			13.9			36.77		

Figure 55: EMS Risk Classifications



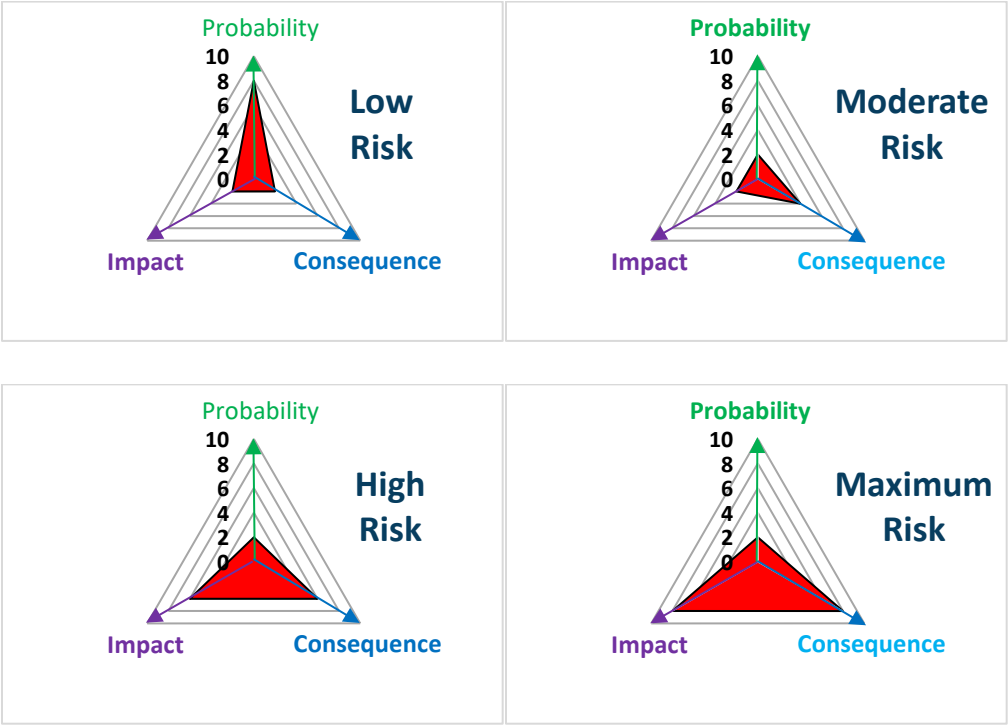
Technical Rescue

Rescue services can vary from a low-risk incident, such as accessing a locked vehicle with a child inside, to a confined space incident (maximum) that potentially requires many personnel to mitigate the incident. The following figures provide the risk score and classifications assigned to each type of technical rescue risk in SRVFPD.

Figure 56: Technical Rescue Response Risk Assessment

Description	Low			Moderate			High			Maximum		
Risk Score	P	C	I	P	C	I	P	C	I	P	C	I
	8	2	2	2	4	2	2	6	6	2	8	8
Score Assigned	16.25			8.49			28.1			48		

Figure 57: Technical Rescue Risk Classification



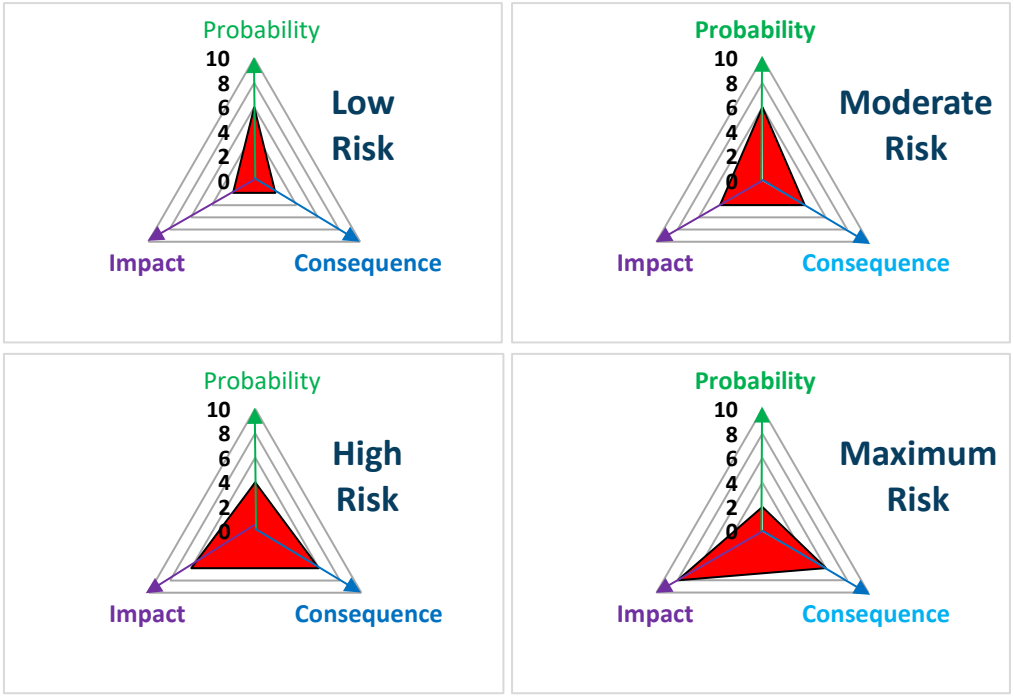
Hazardous Materials

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

Figure 58: Hazardous Materials Response Risk Assessment

Description	Low			Moderate			High			Maximum		
Risk Score	P	C	I	P	C	I	P	C	I	P	C	I
	6	2	2	6	4	4	4	6	6	2	6	8
Score Assigned	12.33			26.53			35			36.77		

Figure 59: Hazardous Materials 3-Axis Risk Assessment



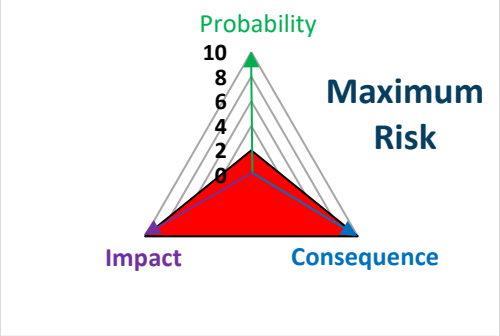
Wildland Fires

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

Figure 60: Wildland Fires Response Risk Assessment

Description	Low			Moderate			Maximum		
Risk Score	P	C	I	P	C	I	P	C	I
	8	2	2	6	6	6	2	10	10
Score Assigned	16.25			44.09			73.48		

Figure 61: Wildland Fire 3-Axis Risk Assessment



Physical Assets Protected

Most communities include a variety of occupancies or properties that are considered target hazards because they include special or unique risks to emergency responders and the occupants during an incident or event. Each of these occupancies have up-to-date pre-incident surveys completed annually. The surveys allow responders to become familiar with the building, property, and special hazards to assist them when making tactical and strategic decisions during an incident. SRVFPD has a robust preplan program that is assessed annually and updated as necessary.

Occupancy Types

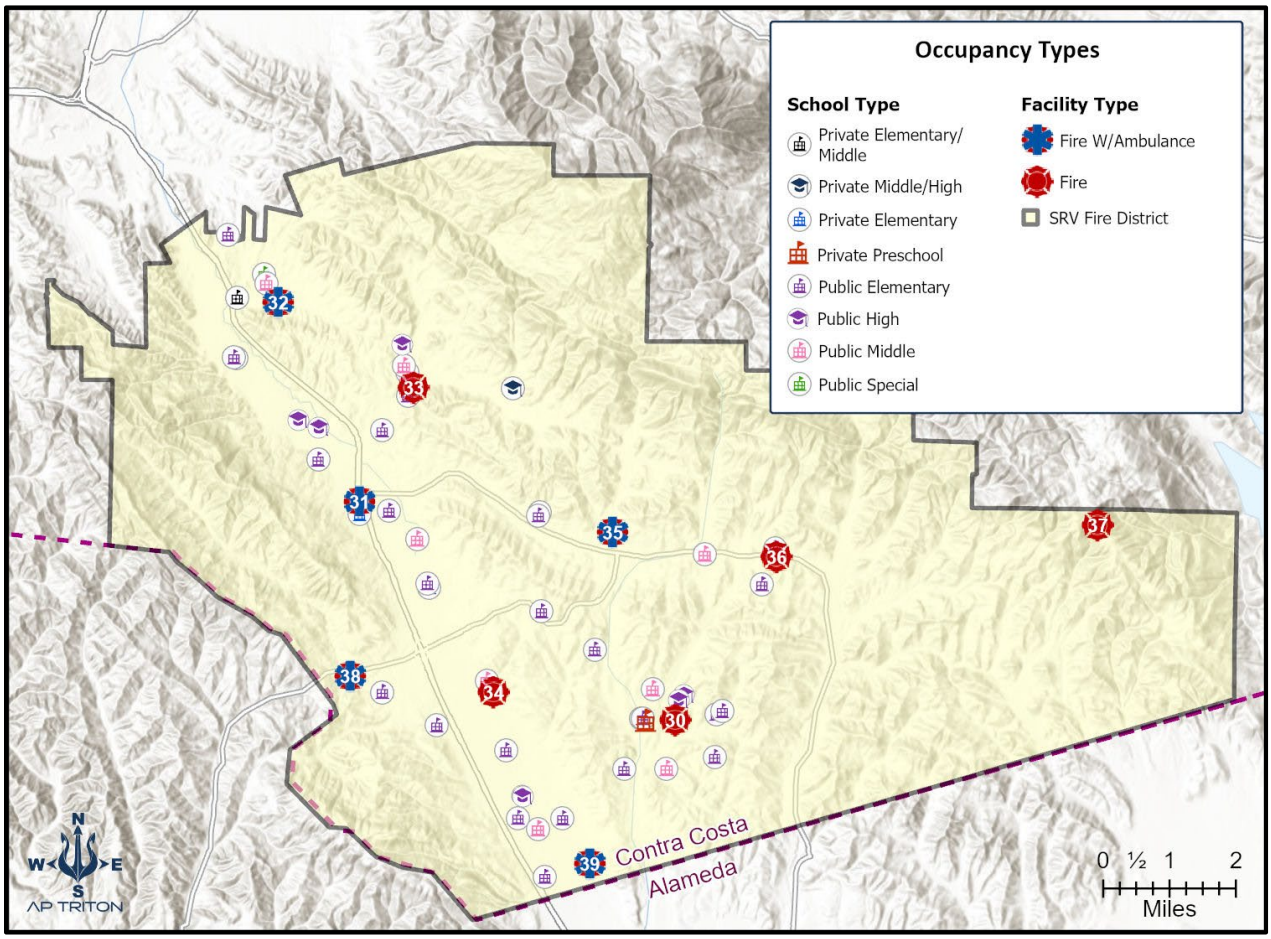
In addition to target hazards, most communities include occupancies or properties considered low, medium, or high risk based on how the occupancies are used and any special or unique risks they pose to emergency responders and the occupants during an incident or event. Therefore, fire and life safety inspection frequencies for these occupancies should be based on the level of risk they represent to the community.

Educational & Childcare Facilities

Public and private schools and childcare facilities increase risks in any community and require substantial assistance during a significant event, such as a mass casualty or fire response. In SRVFPD, numerous schools and childcare facilities require inspections and pre-incident plans to ensure the property is safe and that emergency responders are familiar with the location and site-specific hazards.

The following figure provides the location of educational occupancies in SRVFPD.

Figure 62: Educational Occupancies

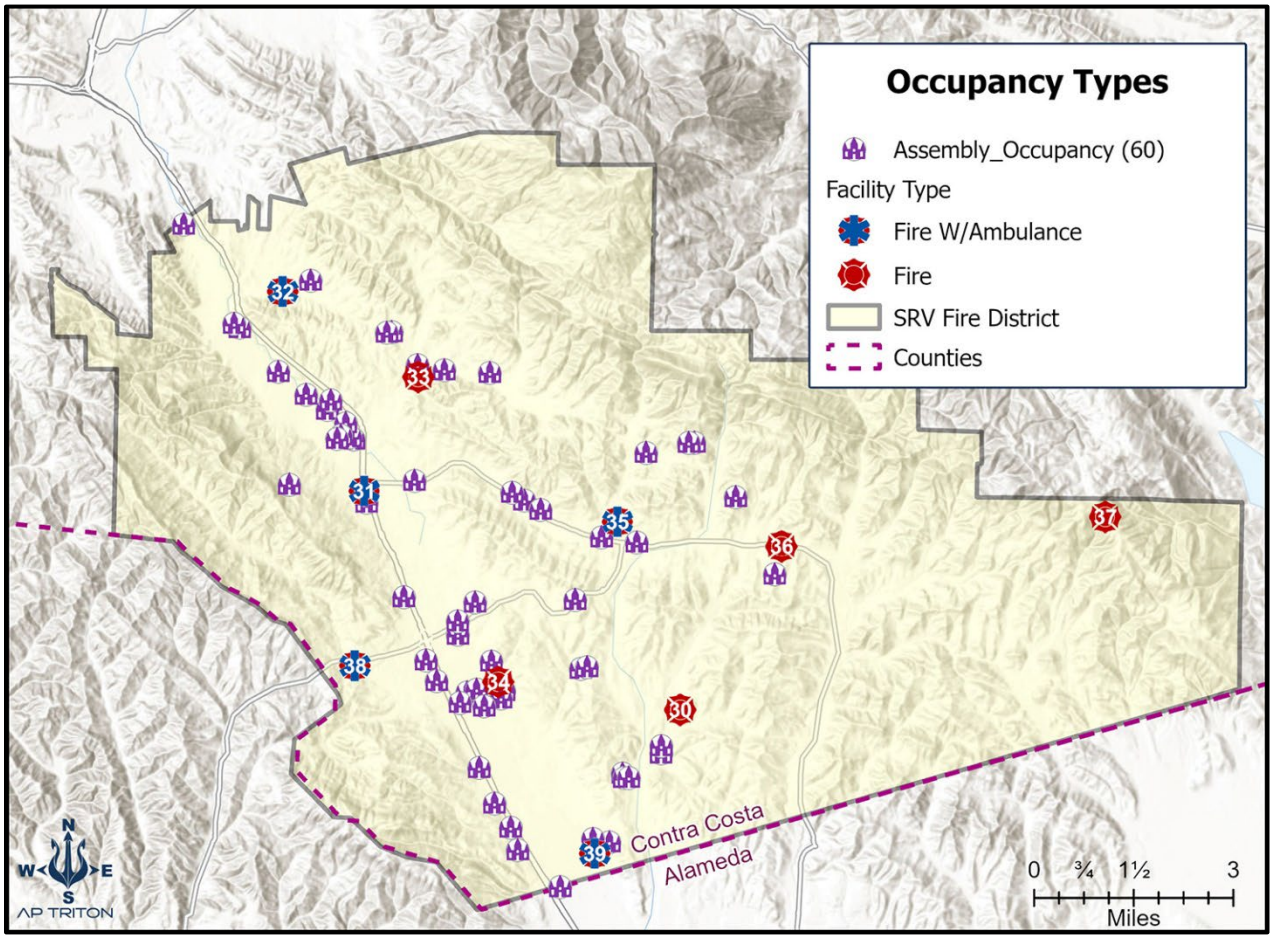


Assembly

Risks increase when a large group gathers in a single location or building such as a place of worship, entertainment, or eating establishment. Other special events may include outside festivals such as street fairs or large sporting venues.

These occupancies or outdoor venues may require many responders during an incident if a fire or active shooter incident occurs. Significant outdoor events should be required to submit a public safety plan. Currently, SRVFPD has a process in place that includes an inspection—if warranted—and a fee schedule. The plan should include emergency vehicle access and egress, fire protection, emergency medical services, public assembly areas, directing of vehicular traffic and attendees, vendor, and food concessions, need for law enforcement, fire or EMS personnel, and weather monitoring. The following figure indicates the locations of major assembly occupancies within SRVFPD.

Figure 63: Major Assembly Occupancies

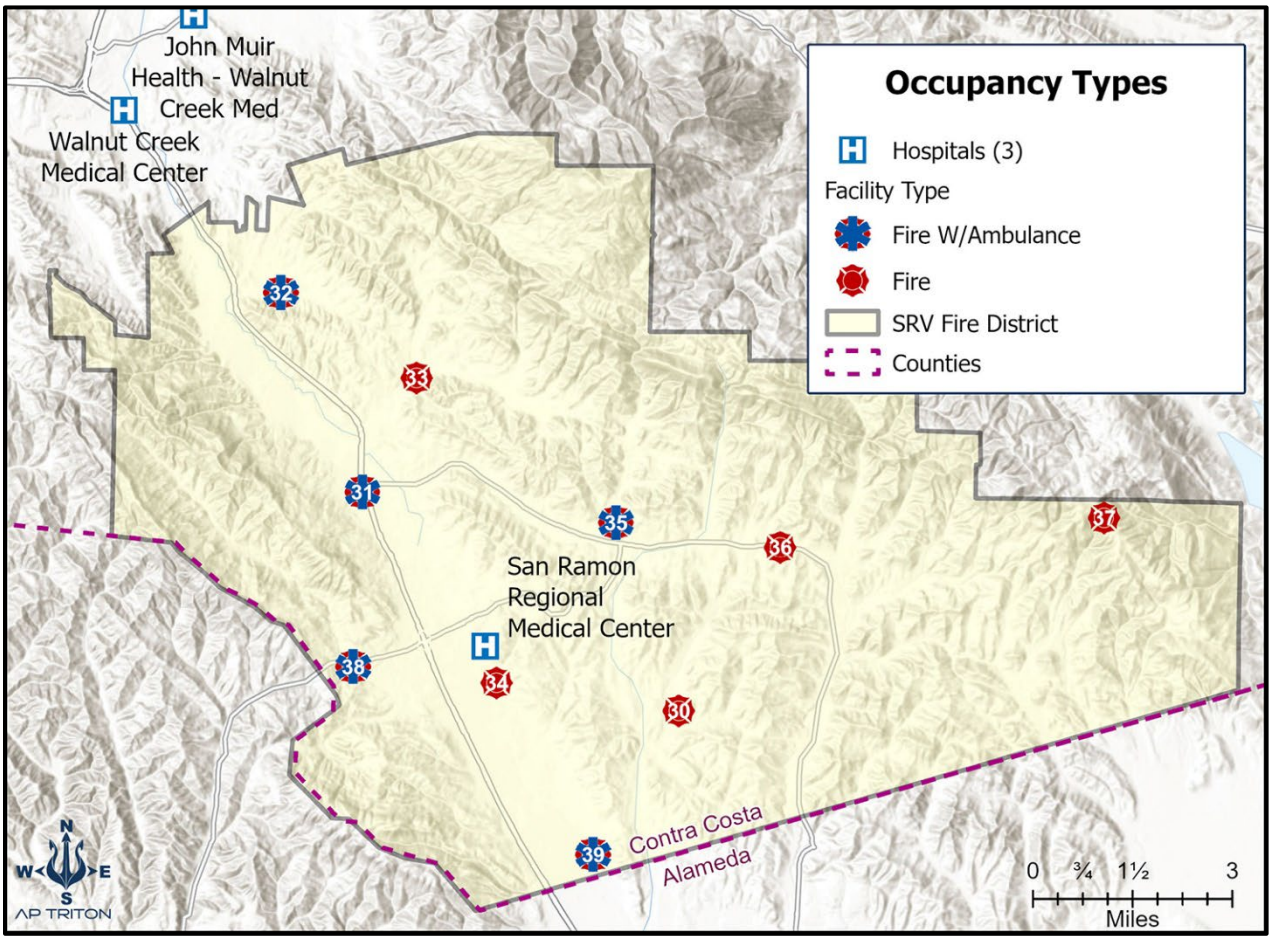


Hospital & Medical Facilities

These facilities provide medical care in the community to assist the sick or people seeking medical attention. Hospitals are at a higher risk because of the inability of patients to self-evacuate from the facility. These locations require additional fire and life safety requirements than medical clinics to provide enhanced protection for the occupants. Other protection includes a fire alarm to notify the occupants of an emergency or a fire sprinkler system to control or extinguish a fire.

The San Ramon Medical Center provides a 123-bed hospital with numerous programs and treatments available for the community. Other medical offices and outpatient surgical facilities are located throughout the district.

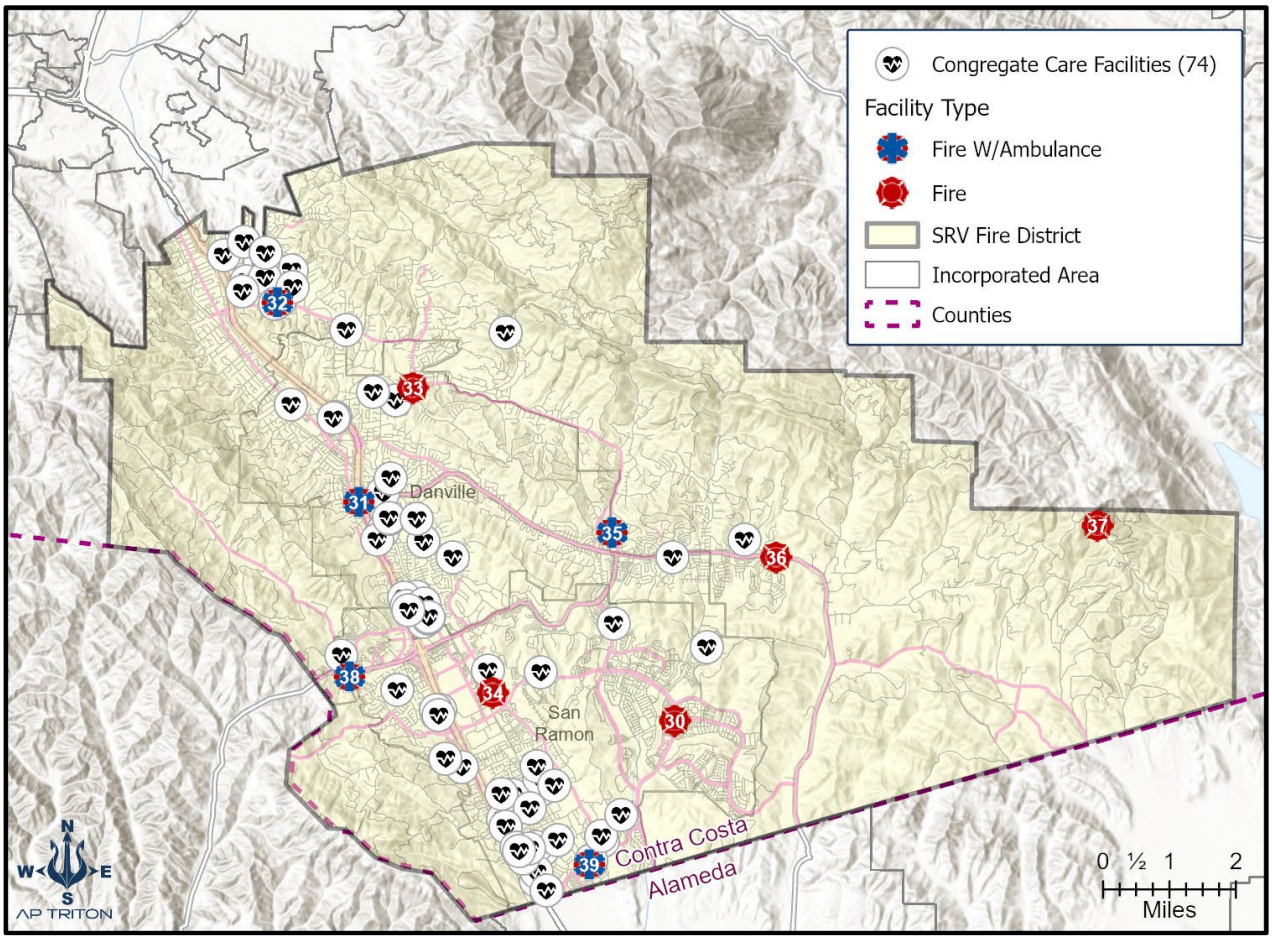
Figure 64: Medical Facilities



Congregate Care Facilities

As people age, the need for additional care may require them to seek a facility to meet their needs. Depending on their mobility or cognitive conditions, they may need more assistance when evacuating the building. Staff should have developed plans for removing the occupants or patients during an emergency. Like a hospital, these locations require additional fire protection systems to protect the occupants. Special locking arrangements for areas where patients with dementia or Alzheimer's are living are allowed to prevent them from leaving the facility. The following figure shows the locations of congregate care facilities in SRVFPD.

Figure 65: Congregate Care Facilities

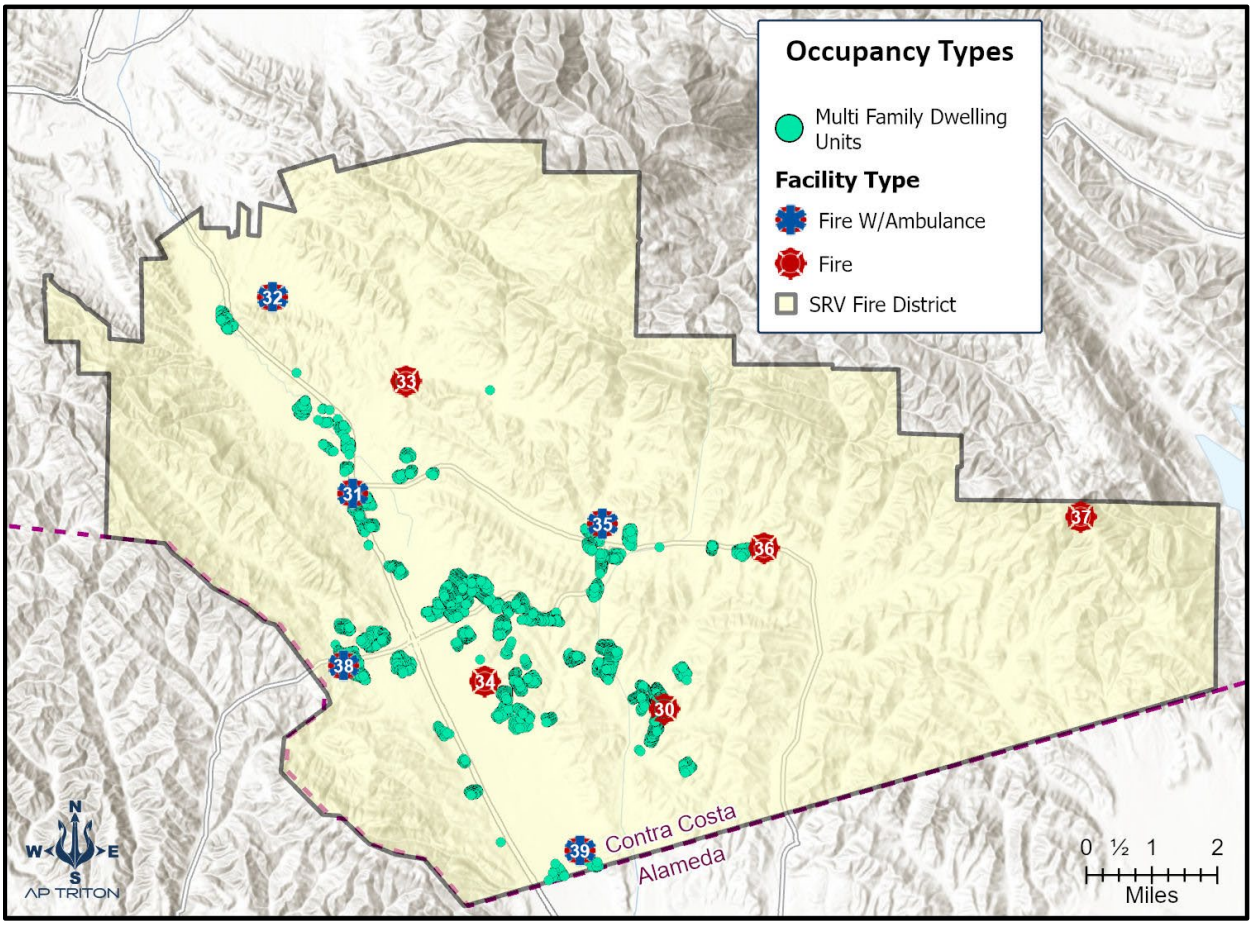


Multi-Family Housing

Although multifamily housing has fewer fires caused by electrical or heating malfunctions, the risk of cooking fires is twice the rate of other types of building fires.[17] Updated building and fire codes now require these buildings to have a commercial fire sprinkler system installed and, in most cases, a fire alarm system and interconnected smoke alarms are required in all bedrooms, hallways, and floors. These fire protection systems are designed to provide enough time for the occupants to evacuate the building.

Depending on the system design, the attics in many residential fire sprinkler installations are unprotected and can create problems when a fire reaches this location. Fires can spread from exterior areas, such as when landscaping materials ignite and travel to the roof or attic. The following figure shows the locations of multifamily housing.

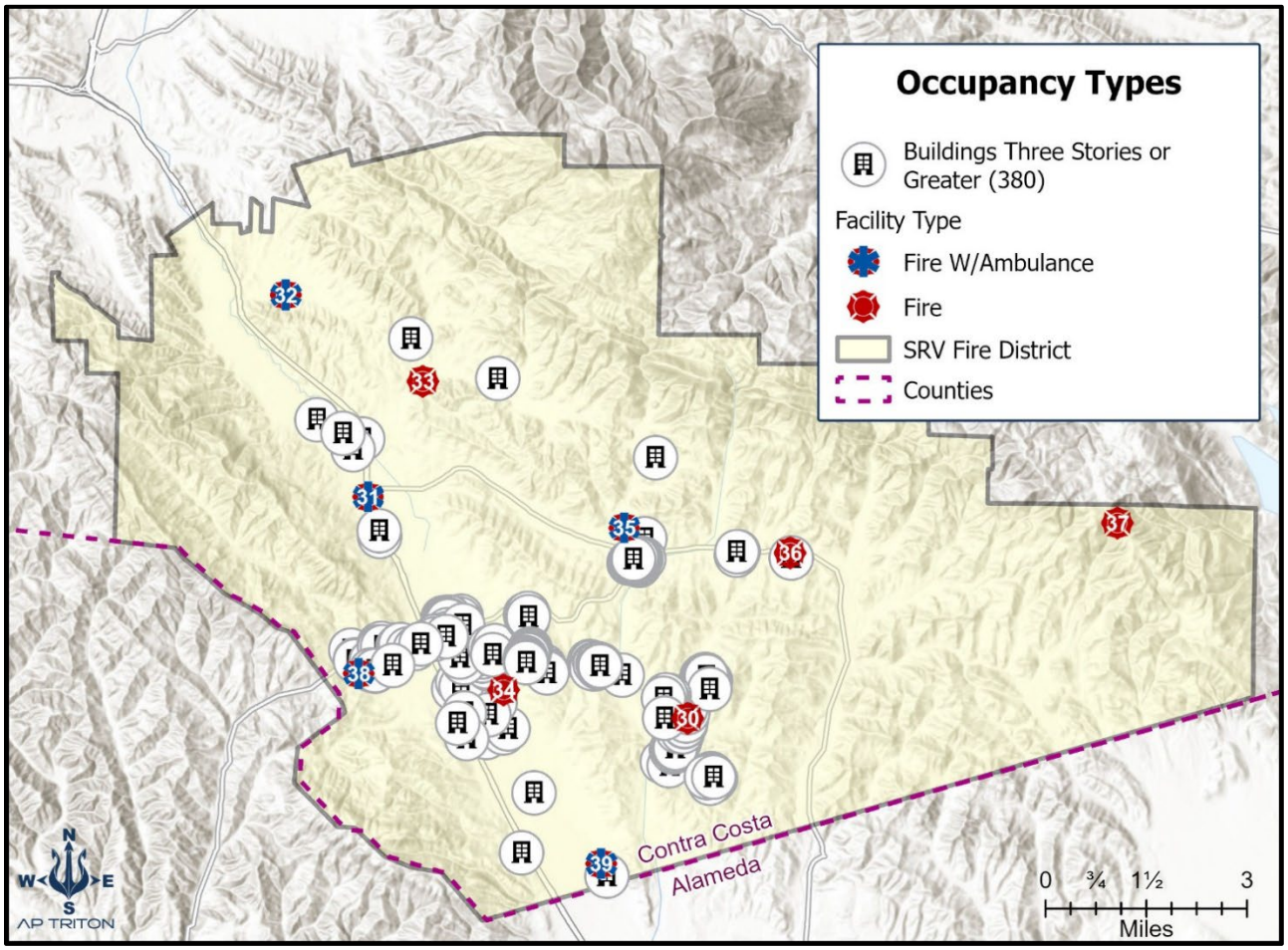
Figure 66: Multi-Family Housing



Buildings Three or More Stories in Height

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

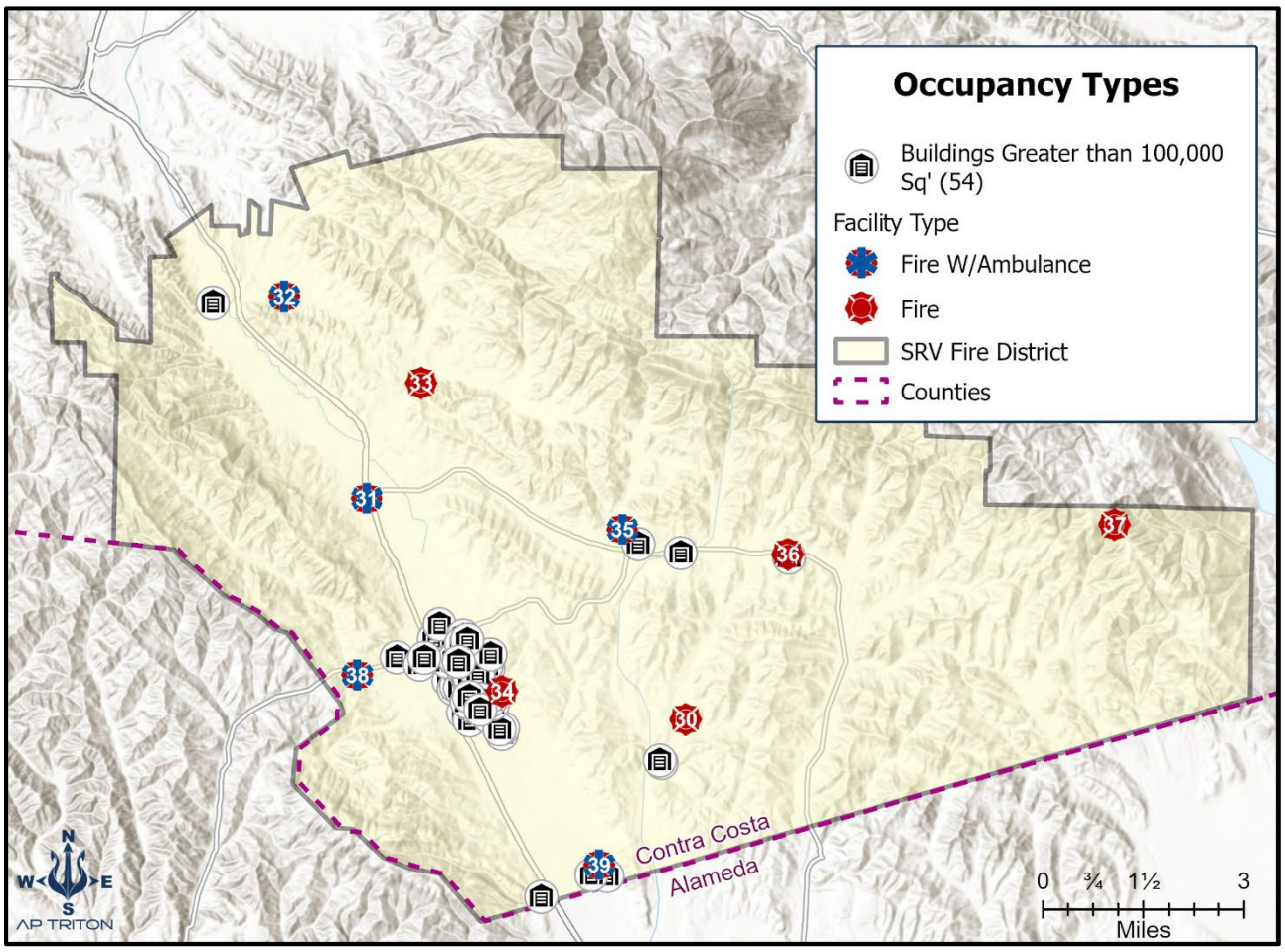
Figure 67: Buildings Three or More Stories in Height



Large Square Footage Buildings

Large buildings, such as warehouses, strip malls, and large "box" stores, need more significant volumes of water for firefighting and require more firefighters to advance hose lines long distances into the building. An incident at one of these locations may require automatic aid into SRVFPD. The following figure shows the locations of buildings greater than 100,000 square feet in area.

Figure 68: Large Buildings Greater than 100,000 Square Feet



Hazardous Substances & Processes

If a building or facility stores or produces hazardous materials, it may require special personal protective clothing and equipment to control or mitigate the event. Hazmat 31 is equipped with the necessary equipment to mitigate such incidents. Locations that have hazardous materials on-site for any time during the year exceeding the limits established by the Environmental Protection Agency are required to file Tier II reports.

These reports to local jurisdictions, local emergency planning committees, and the State's Emergency Response Commission are required by the Emergency Planning and Community Right-to-Know Act of 1986, also known as SARA Title III. These thresholds require submission:

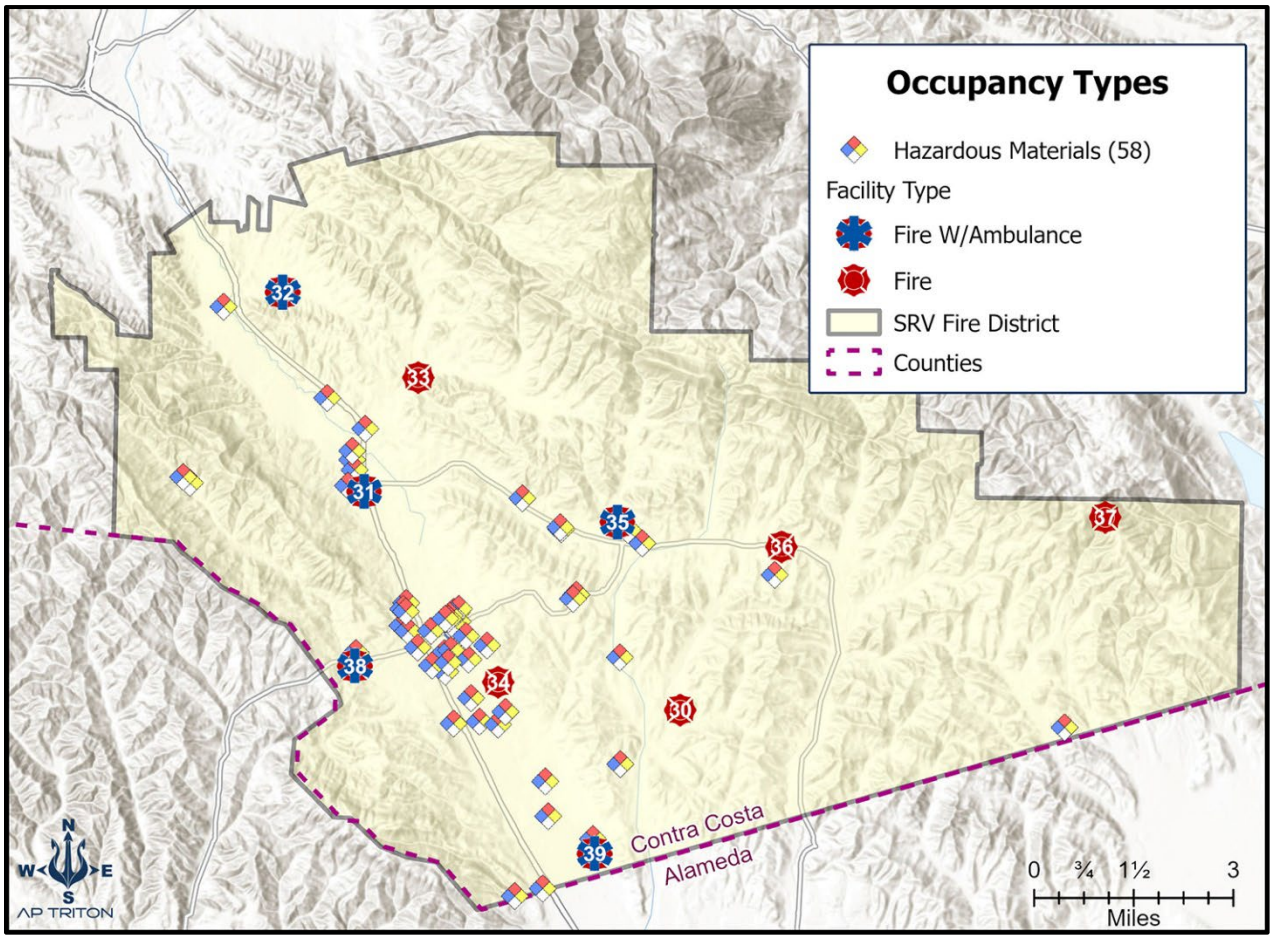
- Ten thousand pounds for hazardous chemicals.
- Less than 500 pounds or the threshold planning quantity for extremely hazardous chemicals.

California requires additional reporting quantities through a five-tier system that authorizes the treatment and storage of hazardous waste. This reporting is completed online and is available for viewing by emergency responders during an incident through the California Environmental Reporting System. California also requires reporting of the following products:

- Gasoline in underground storage tanks at retail gas stations with more than 75,000 gallons (all grades combined).
- Diesel fuel underground storage tanks at retail gas stations with more than 100,000 gallons (all grades combined).

The following figure provides the location of occupancies with hazardous materials.

Figure 69: Hazardous Materials Facilities



All-Hazards Community Risk Assessment

A risk assessment is the first component of a comprehensive plan to determine the risks in a community. Next, an all-hazards analysis reviews how the risks impact the fire department and EMS service delivery.

Community Land Use

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

- **Low Risk:** Areas for agricultural purposes, open and vacant spaces, low-density residential, and other low-intensity uses.
- **Moderate Risk:** Medium-density one- and two-family dwellings, minor commercial and office uses, minimal intensity retail sales, and similarly sized business activities.
- **High Risk:** Higher concentrated business districts, mixed-use areas, high-density residential, industrial, storage facilities, schools, and significant mercantile development.
- **Maximum Risk:** Hospitals, assisted living facilities, major industrial or commercial occupancy.

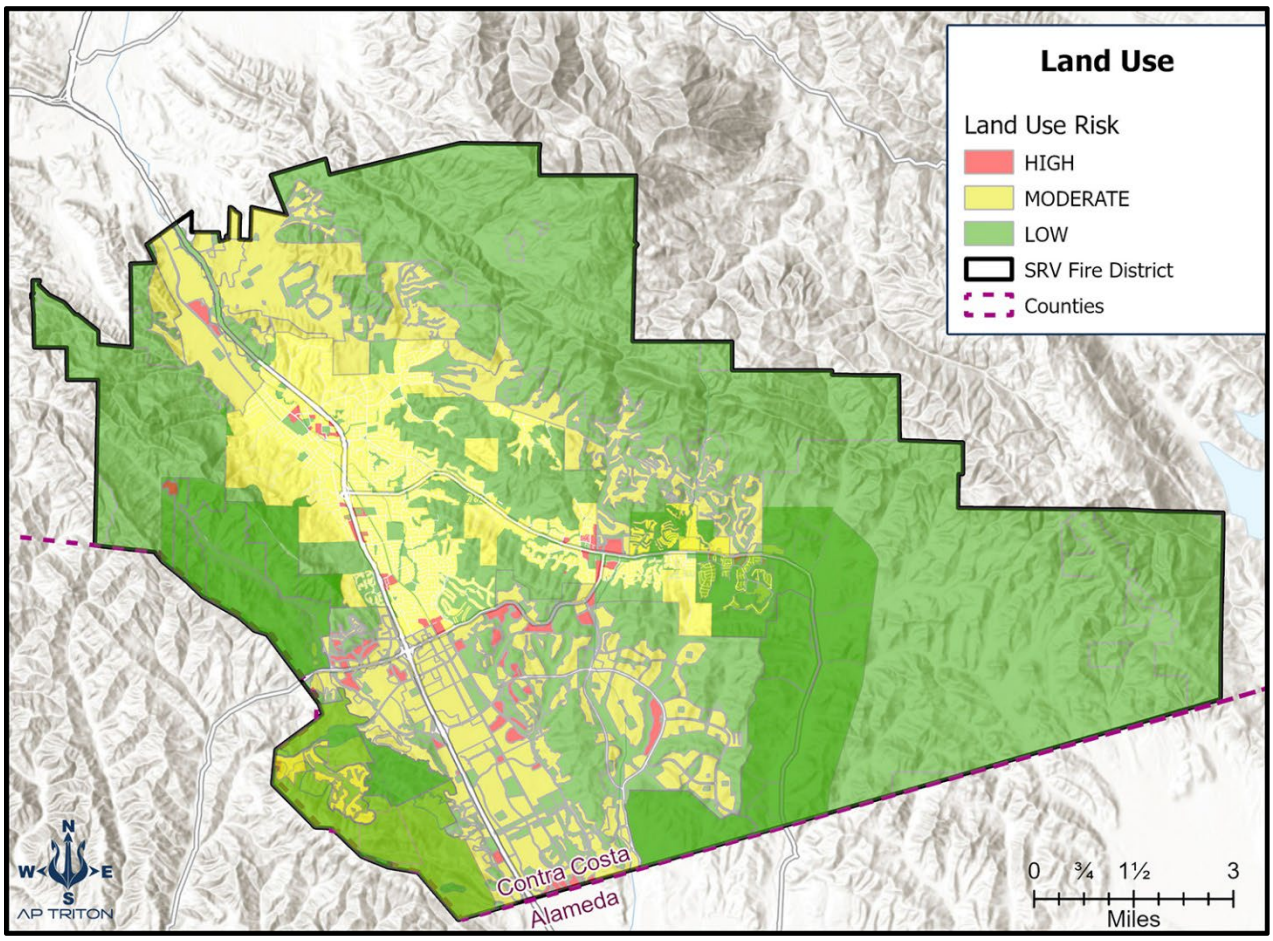
SRVFPD provides fire and emergency medical services for several governmental jurisdictions, including the City of San Ramon, Town of Danville, and Contra Costa County. Each of these has general land use plans to assist the communities in managing growth.

The City of San Ramon planning area includes more than 18 square miles in the city limits and 30 square miles in its Sphere of Influence which includes the city. There is also an Urban Growth Boundary that contains unincorporated areas of the county and the city. Since most of the city has been developed and little vacant land is available, growth can occur through future annexations or the redevelopment of existing properties or infill sites.[18]

The Town of Danville's General Plan, last adopted in 2013, discusses the city's transition from an unincorporated area of Contra Costa County to a population of more than 43,000 people, according to the 2020 U.S. Census. Like the City of San Ramon, Danville is nearing the buildout of its existing vacant land, shifting development to infill sites, and redevelopment of existing properties. The General Plan states, "… *Danville will continue growing after 2030, although estimating the rate and character of growth that far in the future is extremely difficult.*" Danville is primarily a residential community with any new commercial development clustered in downtown or undeveloped sites zoned for these buildings.[19]

Although most of the SRVFPD land use designations are in the General Plans for the City of San Ramon or Town of Danville, some small areas are in Contra Costa County. SRVFPD must continue to monitor how future growth affects its service delivery and develop plans to meet any expansion of services.

Figure 70: Land Use Designations



Spatial Visualization of Data & Information

Spatial analysis is the ability to view data visually using maps or charts. This visualization provides another tool to analyze a fire department or outside agency's data to determine community risks.

Environmental Hazards

All communities are continually threatened by physical hazards daily. Hazards can range from wildfires, earthquakes, flooding from heavy rains, or droughts. Mitigation plans provide public and emergency responders with information to understand the risks and prepare for an event.

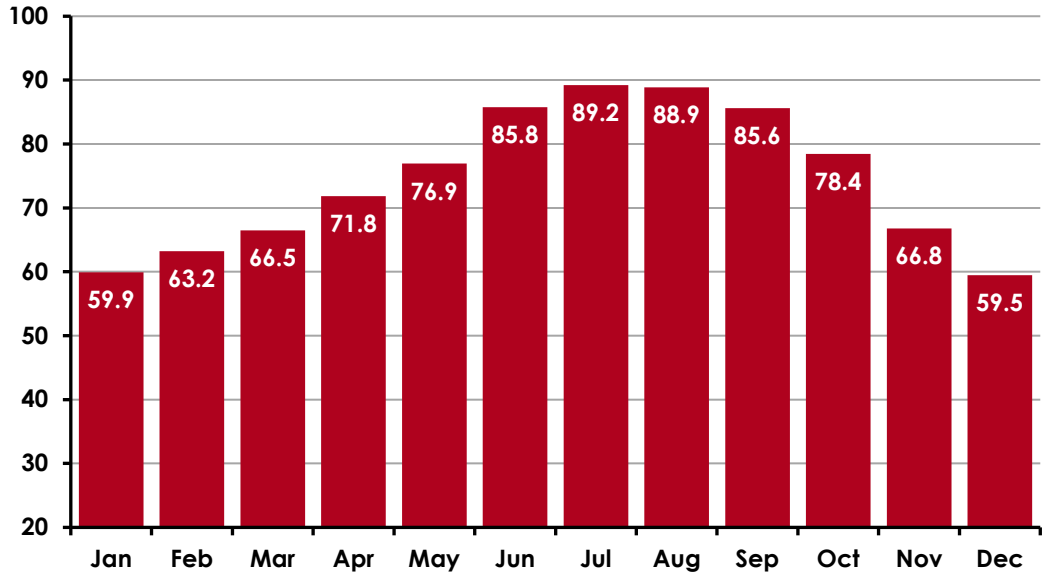
Weather Conditions

Temperature

The temperature can impact the fire department and the entire San Ramon Valley. The average high temperatures range from a low of 59.5°F during December to a high of 89.2°F in August. The average daily low temperature occurs in December at 38.1°F, and the warmest is during August at 58.6°F.[20]

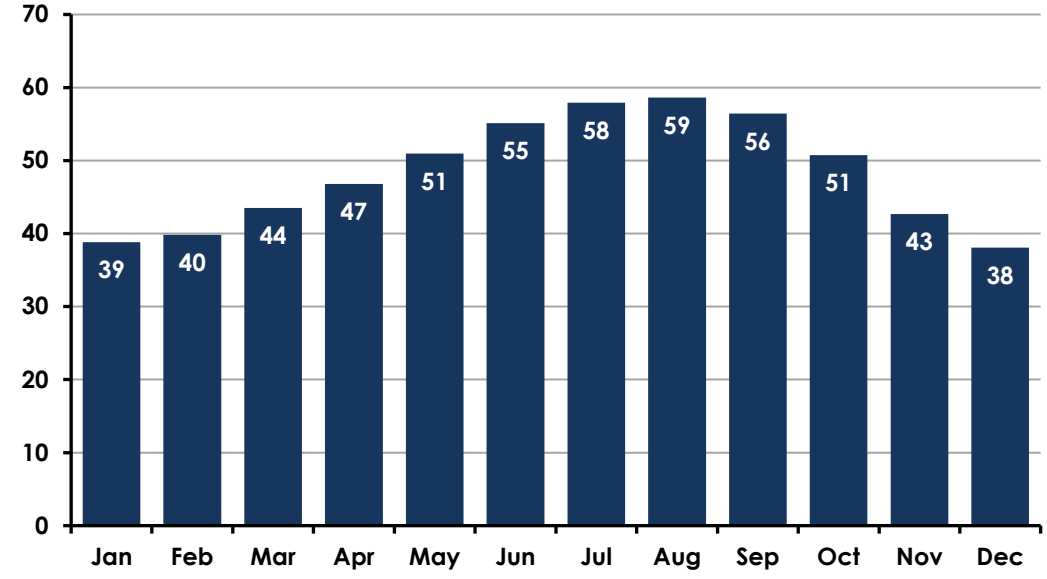
The heat index measures how hot it feels when the humidity and air temperature are combined and can quickly impact unprepared residents without air conditioning and emergency responders. Extreme heat affects firefighters during extended incident operations and requires additional rehabilitation resources to prevent heat exhaustion. The following figure displays the average daily high temperature.

Figure 71: Average Daily High Temperature (2011–2022)



The following figure shows the average daily low temperature.

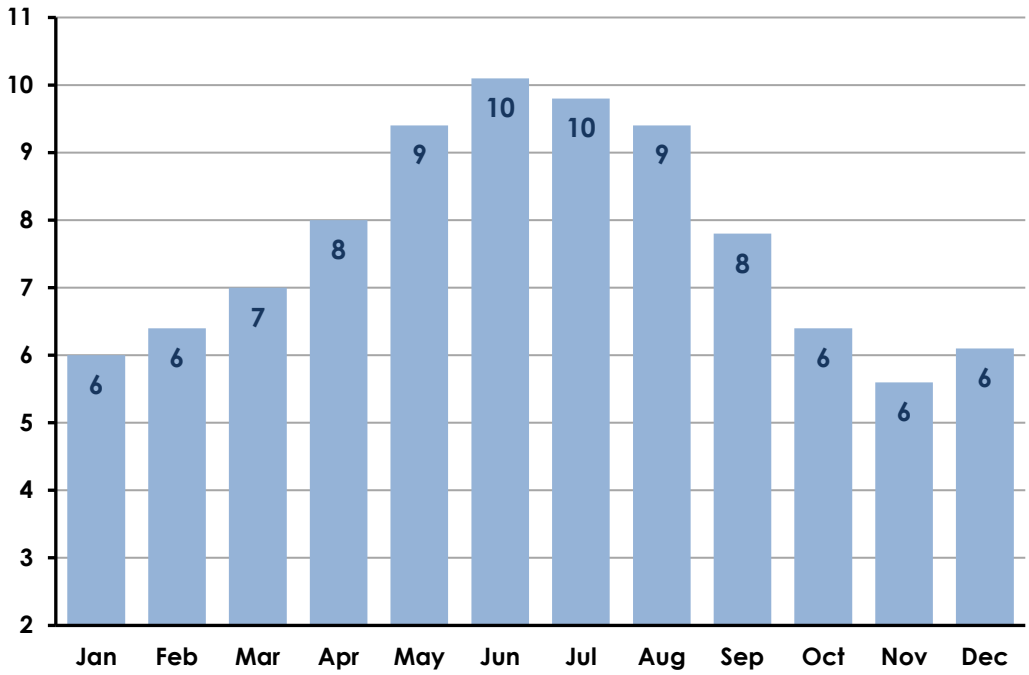
Figure 72: Average Daily Low Temperature (2011–2022)



Winds

Wind speed and direction influences how SRVFPD manages events such as a wildfire or hazardous materials incident. Data from Livermore Airport shows the prevailing winds are from the west, and the highest average winds occur between May and June of each year.[21] The following figure shows the average monthly wind speeds.

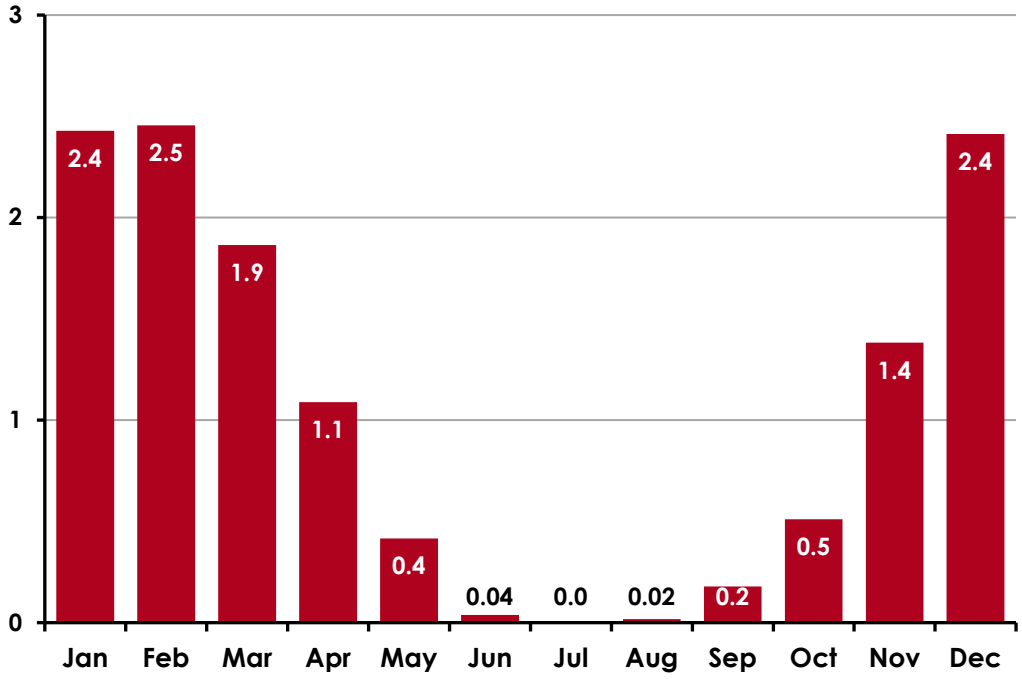
Figure 73: Average Monthly Wind Speeds (2011–2022)



Drought

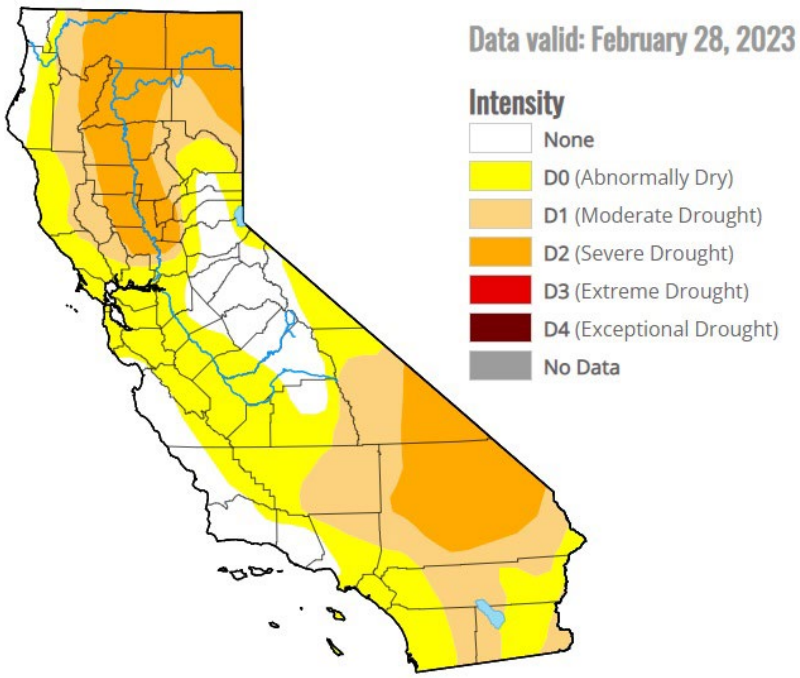
Drought is an extended length of time without rain or other forms of precipitation. It becomes difficult to grow crops or replenish water supplies without sufficient rainfall. Droughts occur over a long period and may become persistent. In SRVFPD, Wildland Urban Interface (WUI) becomes a primary concern during a drought. The current drought conditions in the San Ramon Valley are considered abnormally dry after the exceptional rains in the last few months. Most precipitation occurs between November through March, as indicated in the following figure.

Figure 74: Monthly Precipitation (2011–2022)



The following figure shows the drought conditions as of February 2023.

Figure 75: Drought Conditions

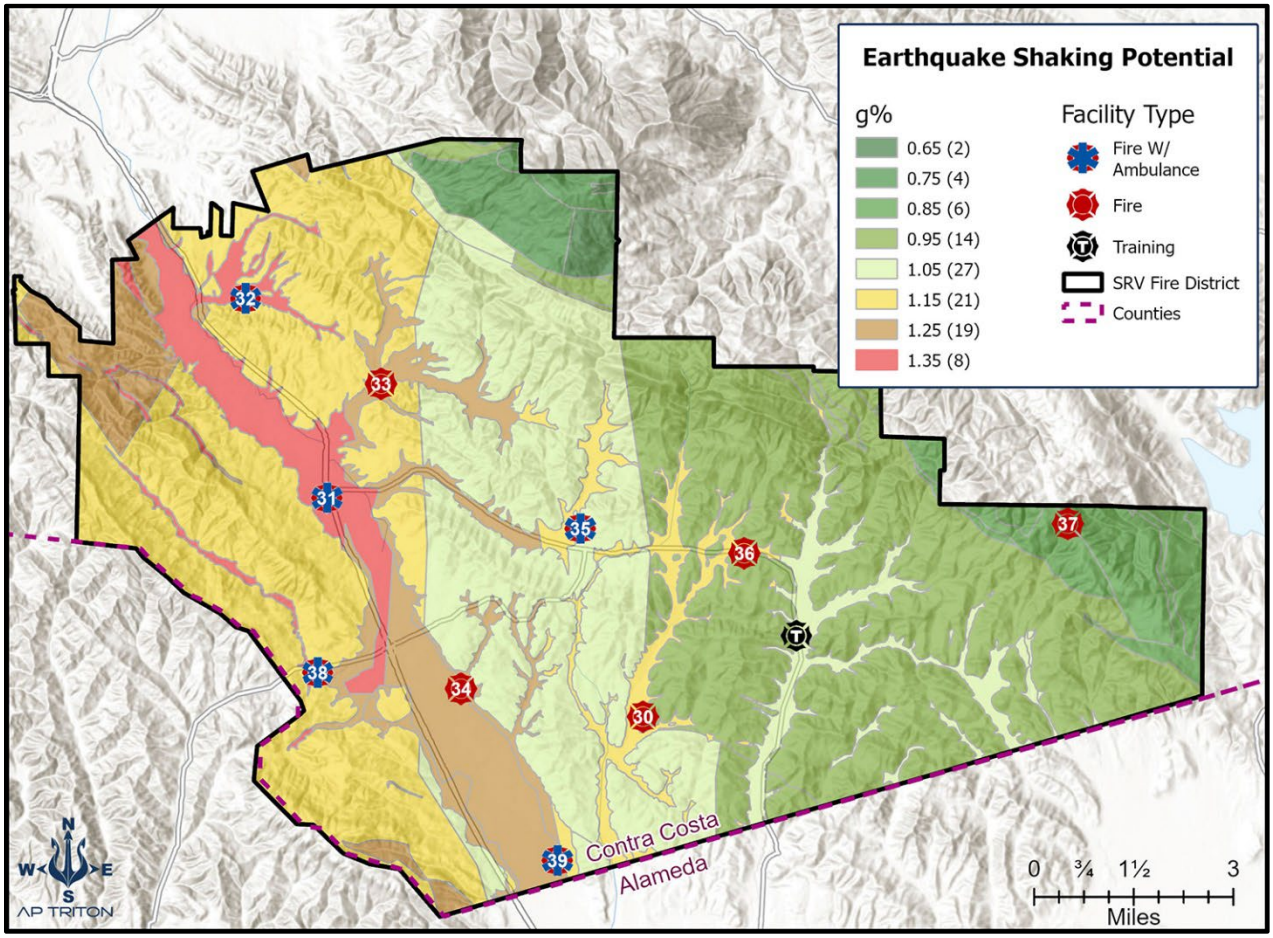


Earthquakes

SRVFPD is much like most of California and has a high risk of an earthquake occurring in its response area. The United States Geological Society has identified several faults in the San Ramon Valley that directly threaten the district.

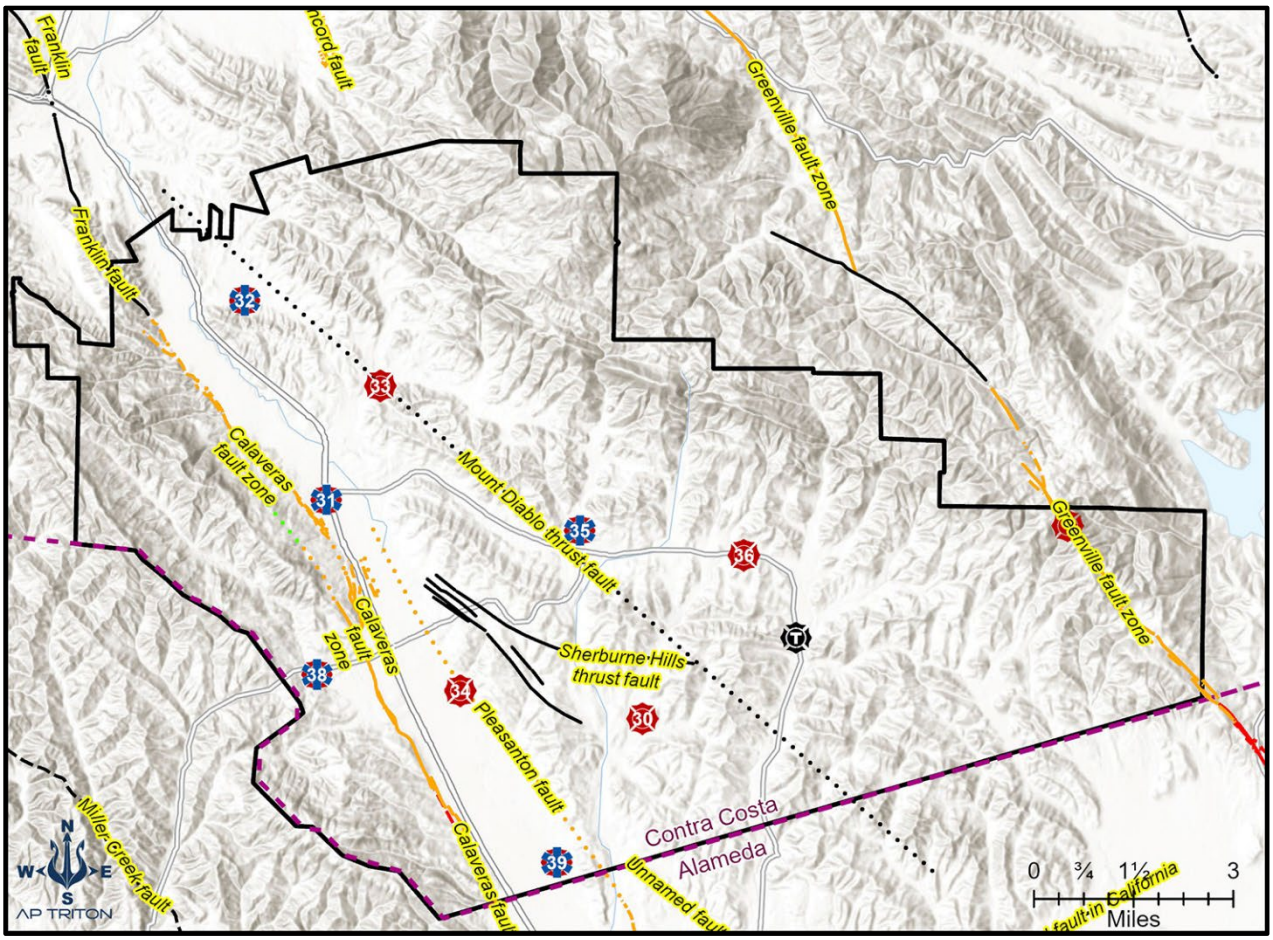
The Calaveras Fault, which terminates near Danville, is considered "*one of the most geologically active and complex faults in the Bay Area.*"[22] The probability of an earthquake of 6.7 magnitude along this fault in the next 30 years is 26%. To the east of SRVFPD is the Mount Diablo thrust fault. Ground shaking in the area is considered high because of the many faults in the area. During an earthquake, the seismic waves from the event cause soils to lose their strength; thus, a building may collapse. The following figures show the earthquake risks and fault locations in SRVFPD.

Figure 76: Earthquake Risks



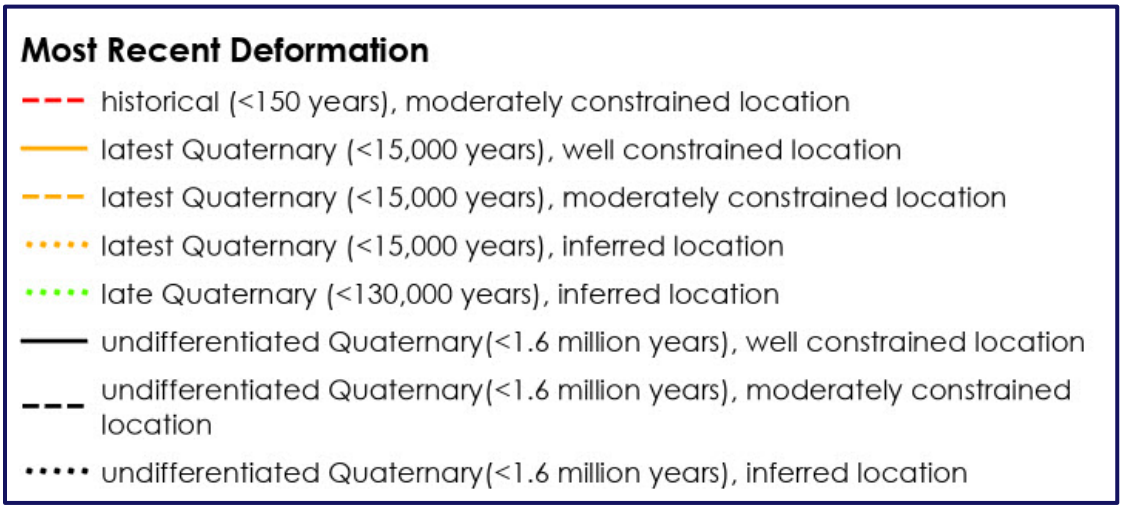
The preceding figure shows the expected relative intensity of ground shaking in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years.[23] A higher g% represents an increased shaking potential.

Figure 77: Earthquake Faults



The next figure lists the fault types as of 2020 and referenced in the preceding figure.

Figure 78: Earthquake Faults (2020)



Wildland Fires

The likelihood of wildland fires in San Ramon is a medium risk, according to the 2018 Hazard Mitigation Plan (HMP). Although the overall risk is not high, the eastern and western sides of the district range from low to very high. Most of the very high areas are in Danville.

Prevention and mitigation provide the best method to reduce risks in an urban interface to reduce the chance of a wildland fire. This defensible space surrounding the property focuses on vegetated or landscaped areas and how to harden the home or building from fire. Removing fuels such as dead trees, plants, grasses, or weeds is a first step for the property owner. The National Fire Protection Association (NFPA) provides information on developing defensible spaces by breaking the property into three zones.[24]

Immediate Zone—This area is between 0–5 feet from the furthest extent of the building that is considered noncombustible.

- Clean the roofs and gutters of leaves and pine needles.
- Replace missing or loose shingles to prevent ember penetration.
- Install metal mesh screens around any exterior vents to reduce embers passing through the opening.
- Remove combustible materials away from the exterior walls or items stored under decks or porches.

Intermediate Zone—This area is between 5–30 feet away from the furthest exterior portion of the building.

- Clear vegetation around propane tanks and create fuel breaks using driveways, paths, etc.
- Keep grasses cut to no more than 4" in height.
- Prune trees within 6–10 feet from the ground.
- Space trees, so the crowns are separated to prevent a spreading fire.
- Keep trees at least 10 feet away from a building.
- Maintain shrubs and trees in small clusters on the property.

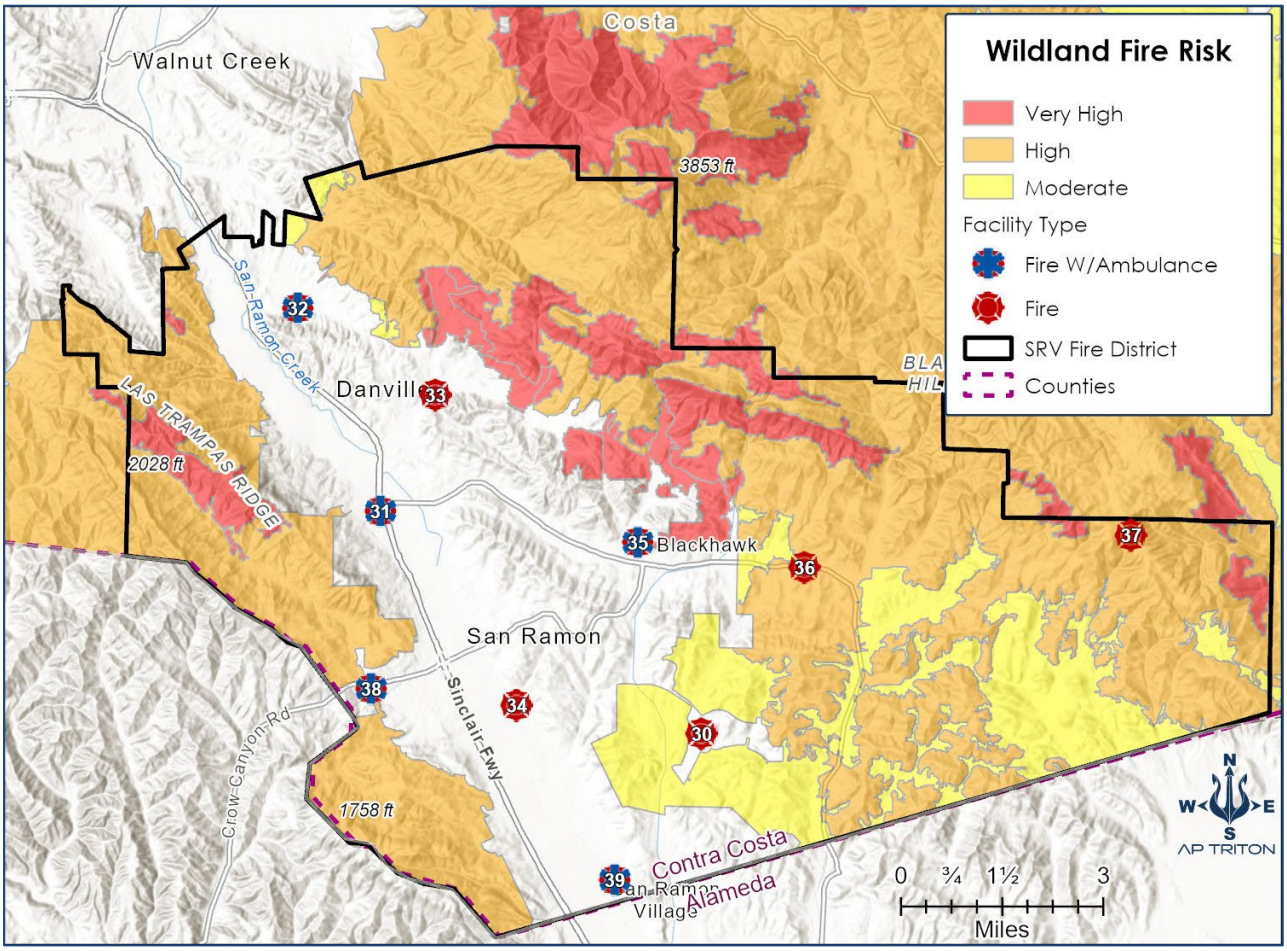
Extended Zone—The area is between 30–100 feet from the building.

- Remove dense accumulations of dead vegetative material.
- Cut back any small trees growing in developed areas to reduce fuels.
- Remove vegetative material away from storage sheds or other small buildings.

Following the NFPA guidance for defensible spaces reduces the impact on a property during a wildfire. Programs have been developed from grant funding to assist homeowners in removing vegetative materials and establishing chipping programs. These programs also reduce risks to firefighters when they respond to a wildfire. Overgrown vegetation can prevent emergency responders from gaining access to the property, thus increasing their risks during the incident.

SRVFPD provides training to the community on how to prepare their property for a wildfire using CERT and a robust Vegetation management program. This program is offered through a free workshop that teaches the community about home ignition zones, defensible spaces, fire-resistant construction, and evacuation planning. Another training opportunity includes working with homeowner associations near locations where the wildfire risk is a threat. The wildfire risk is shown in the following figure.

Figure 79: Wildland Fire Risk



Flooding

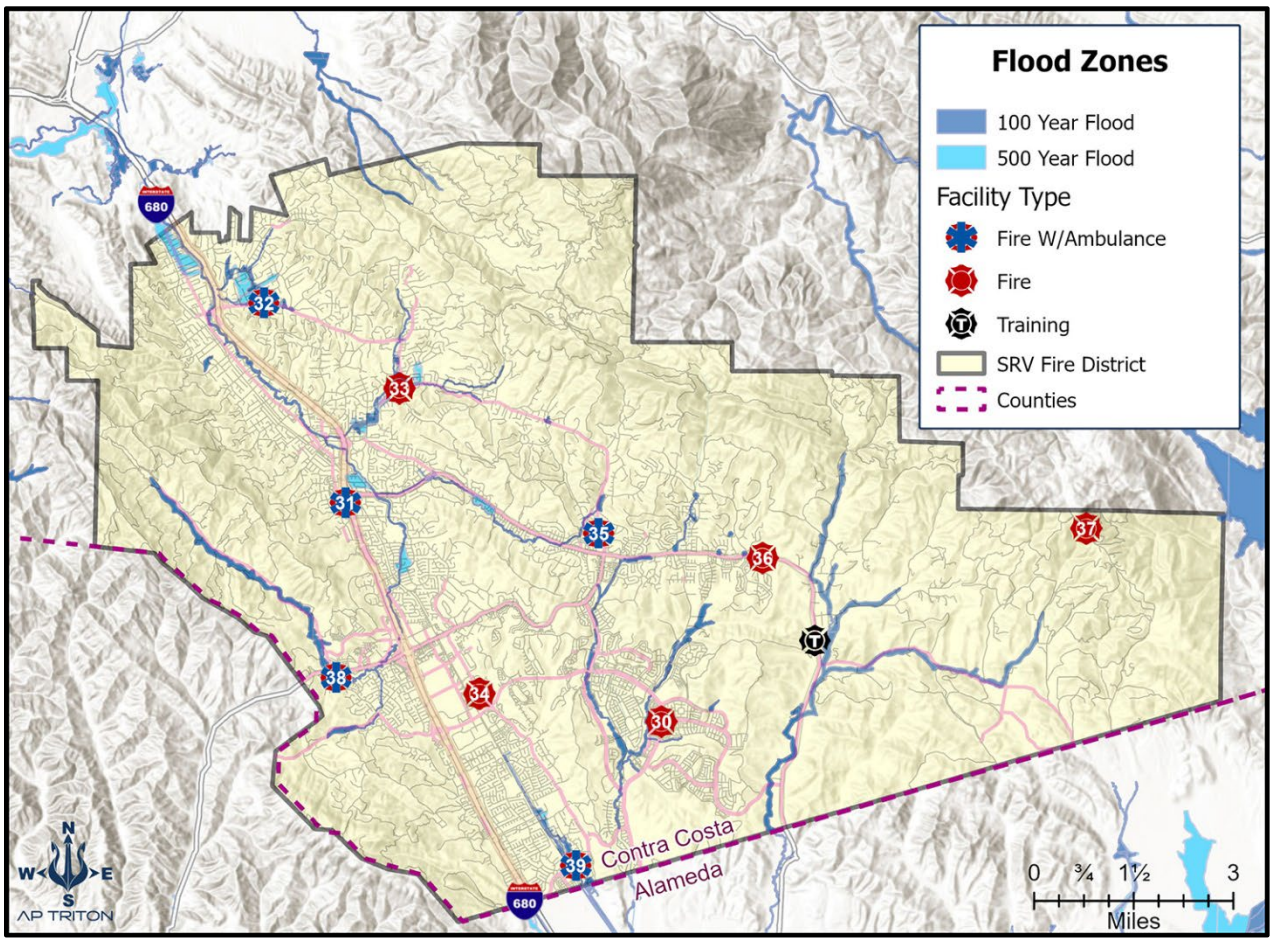
According to FEMA's website, there are "AE" regulatory floodways and other flood-prone areas in SRVFPD.[25]

- An area classified as "A" zone is exposed to a 1% chance of a flood event but does not have a "…detailed hydraulic analysis."
- The "AE" designation is considered "Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods." and is further defined as a 26% chance of a flood occurring in 30 years.
- Zone "AO" is subject to a "1-percent annual chance of shallow flooding (usually sheet flow on sloping terrain)" with an average depth of 1–3 feet and derived from detailed hydraulic analysis.
- Zone "X" is a "moderate risk area within the 0.2-percent annual chance floodplain.

Locations in the district are primarily along creeks flowing through low-lying areas. Several fire station locations are in or near flood-risk areas. Station 32 has Zone AE directly north of the station, which may impact the neighborhood's response. Station 33 is located in Risk Zone X, and A Zone AE passes through the area to the north and east. Station 39 has a Risk Zone AE on either side of the station and to the north.

Other flooding can occur during heavy rain events, and SRVFPD is aware of locations in their response area where flooding can cause delayed responses. Flooding risks are shown on the map in the following figure.

Figure 80: Flood Risks/Zones



Critical Infrastructure

There are buildings, facilities, and other assets considered essential to society and the economy to function in every community. Critical infrastructure is defined as "… *assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof*." There are sixteen defined Critical Infrastructure Sectors (CIS).[26]

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

Highways & Streets

For emergency responders to travel to an incident quickly and safely, an adequate system of roads and streets is necessary. Access to homes and businesses improves when interconnectivity between streets allows more than one approach to the incident location. When an incident occurs on a dead-end street, such as a cul-de-sac, responders may face access issues when vehicles block the road. Controlled access highways can limit fire response if unable to arrive at the incident. Other problems for SRVFPD include immediate access to a water supply during a fire incident involving a truck hauling flammable liquids.

Interstate 680 passes through the district, and other major collector streets include Alcosta Boulevard, San Ramon Valley Boulevard, Diablo Road, Bollinger Canyon Road, Crow Canyon Road, Sycamore Valley Road, Camino Tassajara, and Dougherty Road, Stone Valley Road, El Cerro Boulevard.

Communications

When an incident occurs, essential facilities to receive and transmit alarm information require a communication center to communicate with emergency responders properly. Other communications are critical to the community, such as cellular phones, Voice over Internet Protocol (VoIP) telephone systems, or transmission lines from the local telephone company. These systems allow the public to notify emergency services of an incident. Internet services are essential for the public, commercial establishments, and emergency services to conduct daily business. Whether the internet services are through cellular access or an internet service provider, the failure of these communication systems can significantly impact emergency services and the public.

The San Ramon Valley 911 Communications Center is a Primary PSAP for the City of San Ramon and a secondary PSAP to the SRVFPD. The center is accredited in Emergency Medical and Fire protocols through the International Academy of Emergency Dispatch. The SRV 911 consolidated police and fire services in 2016 as a partnership to improve response times and service. The Center is staffed and managed by SRVFPD and operates three 48/96-hour shifts. There is mandatory staffing of at least four personnel that can be increased during Red Flag or other major events in the district.

The Center uses Central Square Enterprise Computer-Aided Dispatch software to track the 911 incident information. Emergency Medical and Fire Dispatch software allows telecommunicators to screen calls to dispatch the appropriate units for the incident. The center is accredited through in fire and EMS protocols through the International Academy of Emergency Dispatch. All telecommunicators are crossed trained for each workstation and rotate throughout the shift. Automatic vehicle location software is used to dispatch the closest unit for an incident. Mobile computers on apparatus provide information on the incident, such as routing and pre-incident plans.

Energy

The ability to provide energy is a necessary component of a thriving community. The community depends on energy sources, whether it is electricity generation and transmission systems, fuel distribution and storage tanks, or natural gas pipelines and regulator stations. Pacific Gas and Electric Company (PG&E) provides power and natural gas for the SRVFPD district.

Electricity

High-voltage electrical transmission lines travel through the SRVFPD. A 230-kilovolt line travels along the Iron Horse Regional Trail. Other lines pass through the southern portion of the district and then in a northeastern direction crossing Dougherty Rd, Bollinger Canyon Rd, and Camino Tassajara.

PG&E may implement Public Safety Power Shutoffs (PSPS) during red flag warnings. These warnings occur when there are high winds (> 25 mph or gusts above 45 mph), low humidity, or when PG&E observes an issue to prevent a fire from igniting because of power lines causing a spark even in locations not considered at risk. These shutoffs are usually temporary. PG&E alerts customers before power is shut off, but in order to receive it, the customer must sign up for text, phone messages, or email notifications.[27]

Water & Wastewater Distribution

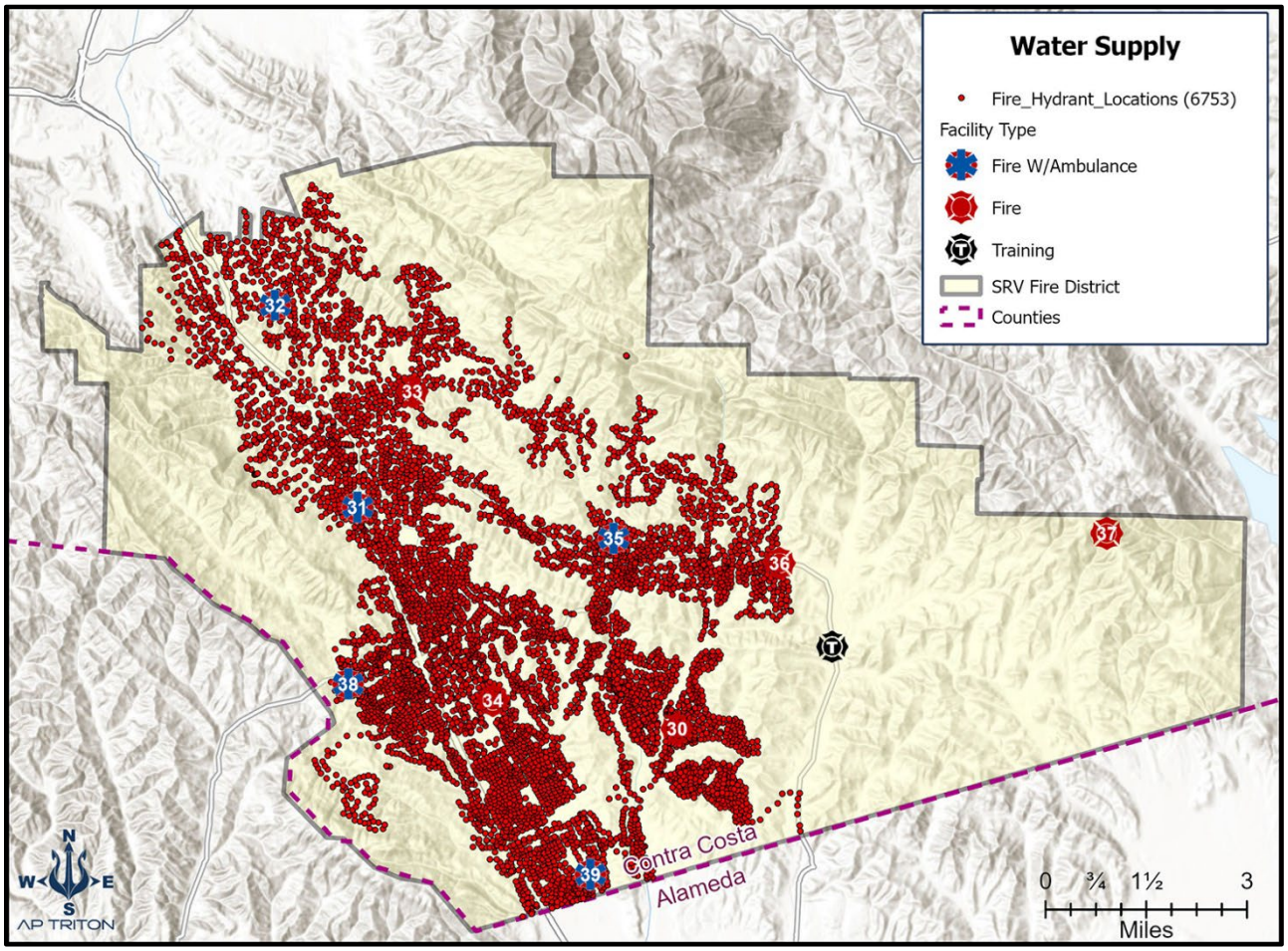
Controlling a fire becomes challenging without an adequate water supply and distribution system consisting of water storage, mains, and a fire hydrant system. A system of well-distributed hydrants and appropriately sized water mains are necessary to provide the required water for fireground use.

The East Bay Municipal Utility District (EBMUD) provides water services to the majority of SRVFPD. There are approximately 1.4 million customers who receive water from EBMUD in their 332-square-mile service area. Ninety percent of the water for the system comes from the Mokelumne Watershed in the western Sierra Nevada mountains and is stored in the Pardee and Camanche reservoirs. The water is treated in six treatment plants in the service area. The distribution system consists of 4,200 miles of water mains, 164 drinking water tanks, 135 pumping plants, and 100 pressure regulators or rate control stations. During Red Flag Warnings, EBMUD may lose power to its facilities for up to two days if PG&E turns off electricity. When this occurs, EBMUD implements its action plan to minimize the effect on its customers from an outage. Backup generators are available to maintain the system's integrity for storing, firefighting, and pressurizing the distribution lines.[28] Hydrant locations are shown in the following figure.

Wastewater services are provided to the majority of SRVFPD by Central Contra Costa Sanitary District (Central San). Central San serves nearly half a million residents and more than 3,000 businesses within a 145-square-mile service area, which includes Alamo, Danville, Lafayette, Moraga, Orinda, Pleasant Hill, Walnut Creek; portions of Martinez and San Ramon; and unincorporated communities within central Contra Costa County. Central San collects and cleans more than 13 billion gallons of wastewater per year. Maintains, cleans, and repairs 1,540 miles of sewer lines and 18 pumping stations.

Other parts of SRVFPD are covered by the Dublin San Ramon Services District (DSRSD) for water and wastewater services. Founded in 1953, DSRSD serves more than 196,000 people and distributes drinking water for approximately 100,400 people. DSRSD has served in Dublin since March 1961 and in Dougherty Valley since May 2000. DSRSD provides wastewater collection and treatment for approximately 168,600 people in Dublin and southern San Ramon since March 1961. In 2006, DSRSD and East Bay Municipal Utility District (EBMUD) formed the San Ramon Valley Recycled Water Program (SRVRWP). The program serves DSRSD, EBMUD, and Pleasanton irrigation customers at 480 locations.

Figure 81: Hydrant Locations



Governmental Buildings

Governmental buildings are typically located close to their customers to manage proper public services. The buildings are considered a part of the critical infrastructure needed to operate services provided by local, state, or Federal government. Locations of governmental facilities are shown in the following figure.

Figure 82: Governmental Facilities

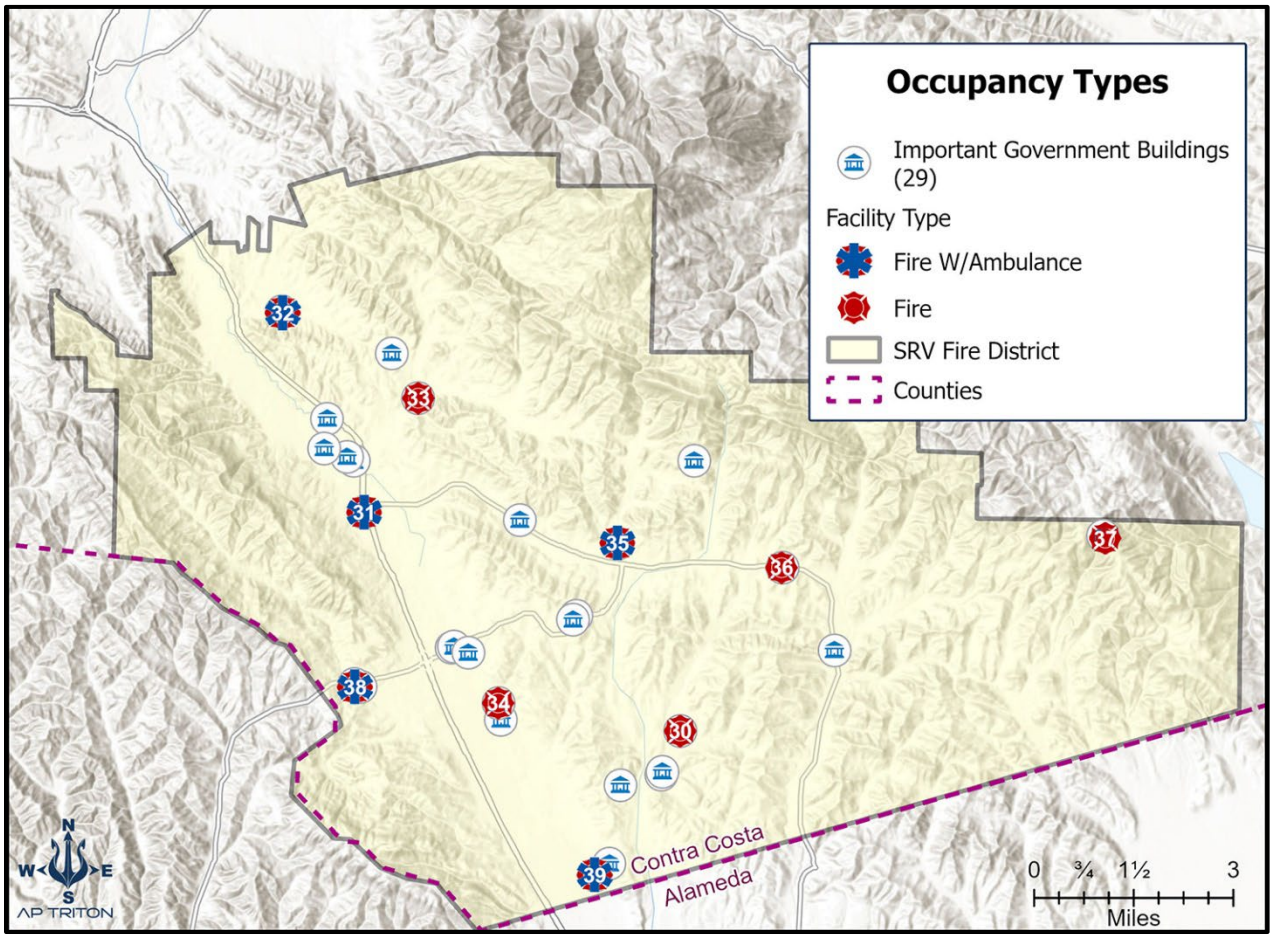


Figure 83: List of Government Buildings in the SRVFPD Service Area

Building Name	Address
Dougherty Station Community Center	17011 BOLLINGER CANYON RD
SRVUSD Service Center	3300 CROW CANYON RD
SRVUSD Service Center	3280 CROW CANYON RD
Danville Community Center	420 FRONT ST
Danville Town Meeting Hall	201 FRONT ST
Oak Hill Park Community Center	3005 STONE VALLEY RD
USPS Danville Branch	2605 CAMINO TASSAJARA RD
Danville Town Offices/Danville PD	510 LA GONDA WAY
San Ramon City Hall	7000 BOLLINGER CANYON RD
San Ramon PD	2401 CROW CANYON RD
SRVFPD Administration	1500 BOLLINGER CANYON RD
San Ramon–Alcosta Senior & Community Center	9300 ALCOSTA BLVD
USPS Danville Branch	23 RAILROAD AVE
USPS San Ramon Branch	12935 ALCOSTA BLVD
San Ramon Public Services Maintenance	5050 CROW CANYON RD
San Ramon Service Center	5000 CROW CANYON RD
San Ramon Amador Rancho Community Center	2011 RANCHO PARK LOOP
Dougherty Station Library–Contra Costa County	17017 BOLLINGER CANYON RD
Blackhawk Sheriff's Office Station	1092 EAGLE NEST PL
SRVFPD Station 30	11445 WINDEMERE PKWY
SRVFPD Station 31/Dispatch	800 SAN RAMON VALLEY BLVD
SRVFPD Station 32	2100 STONE VALLEY RD
SRVFPD Station 33	1051 DIABLO RD
SRVFPD Station 34	12599 ALCOSTA BLVD
SRVFPD Station 35	505 SILVER OAK LN
SRVFPD Station 36	2001 LUSITANO ST
SRVFPD Station 37	10207-A MORGAN TERRITORY RD
SRVFPD Station 39	9399 FIRCREST LN
SRVFPD Training Site	6100 CAMINO TASSAJARA RD

Comparison of Fire Risks in Other Communities

Fire Loss

In 2021 (2022 national data not available at time of report), fire departments responded to more than 1.35 million incidents in the United States that caused 3,800 civilian fire fatalities and over 14,700 civilian fire injuries. The property damage was estimated at more than $15.9 billion. The NFPA reported that 64% of the fire deaths occurred in one- or two-family dwellings. Although the 2021 NFPA Fire Loss Report did not list damages from wildfires, the amount was significant, much like previous years.[29]

Fire loss can vary yearly based on the number of fires occurring or the amount of property exposed during an incident. In 2019 the per capita fire loss was $13.16 and increased to $52.78 in 2020 but decreased to $21.89 in 2021. The following figure compares the property loss per capita in SRVFPD to the United States.

Figure 84: SRVFPD 2021 Property Loss per Capita

Year	SRVFPD Property Loss per Capita	U.S. Property Loss per Capita
2019	$13.16	$45.58
2020	$52.78	$66.07
2021	$21.89	$47.91

The number of fires per 1,000 population in the SRVFPD response area is lower than the national average, as shown in the following figure.

Figure 85: Fires per 1,000 Population

Year	SRVFPD Fires per 1,000 Population	U.S. Fires per 1,000 Population
2019	1.2	4.0
2020	1.2	4.2
2021	1.0	4.1

Intentionally Set Fires

Intentionally set fires, or in many cases considered arson, is defined as "any willful or malicious burning or attempt to burn, with or without intent to defraud, a dwelling house, public building, motor vehicle or aircraft, personal property of another, etc."[30] Based on data from SRVFPD, the number of intentionally set fires has remained low since 2018. The below figure lists the number of intentionally set fires in SRVFPD.

Figure 86: Intentionally Set Fires

Year	Intentionally Set Fires
2018	1
2019	2
2020	2
2021	2
2022	6

ISO Fire Protection Class Rating

The Insurance Services Office, Inc. (ISO©) is an independent company that collects and analyzes data about municipal fire suppression efforts in communities throughout the United States. According to their report, the ISO's Public Protection Classification program (PPC), "is a proven and reliable predictor of future fire losses." All other factors being equal, property insurance rates are expected to be lower in areas with lower (better) ISO PPC Class ratings.

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

SRVFPD received 90.18 credits during its most recent inspection, providing the department with a Class 1/1Y rating. The first rating number applies to any property within five miles of a fire station and within 1,000 feet of a fire hydrant. The second number is for any property beyond 1,000 feet from a fire hydrant but within five road miles of a fire station.

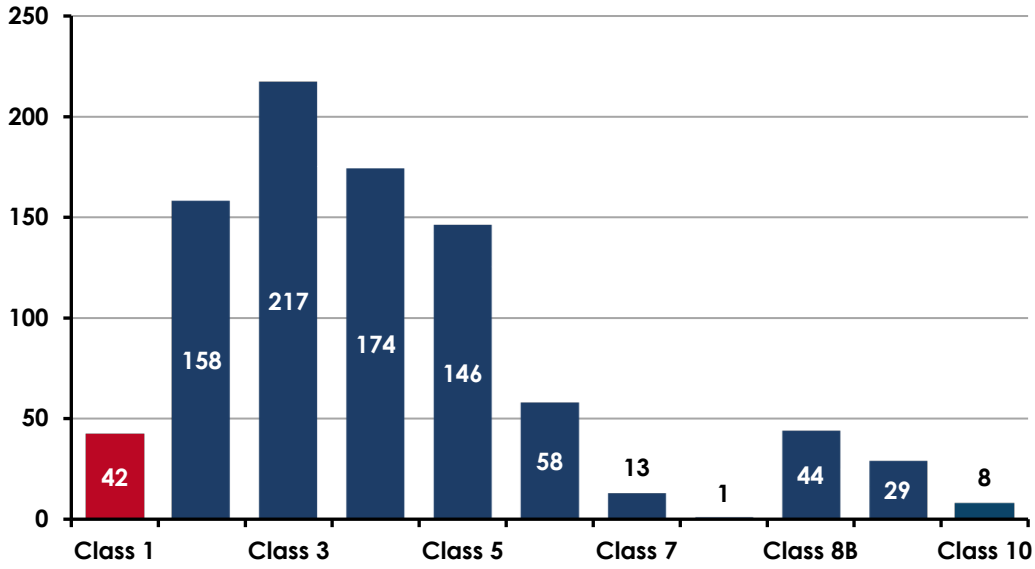
SRVFPD should review the earned credits and attempt to improve the score. Areas for improvement include 0.5 credits for a reserve ladder and service truck and 6.44 for company personnel. SRVFPD is adding new auto aid agreements to improve its score.

Figure 87: ISO Earned & Available Credits for SRVFPD

ISO Feature	Earned Credit	Available Credit
Emergency Communications	10	10
Fire Department	39.52	50
Water Supply	38.90	40
Divergence Factor	-3.64	0
Community Risk Reduction	5.4	5.5
Totals:	**90.18**	**105.5**

The Divergence Factor (negative points) is given when the fire department and water supply scores are incompatible. The following figure shows the ISO rating of fire agencies in California. SRVFPD is among the 5% of departments in California and 1% nationwide that received a Class 1 rating.

Figure 88: ISO Classifications in California



Section III:
STANDARDS OF COVER
& DEPLOYMENT ANALYSIS

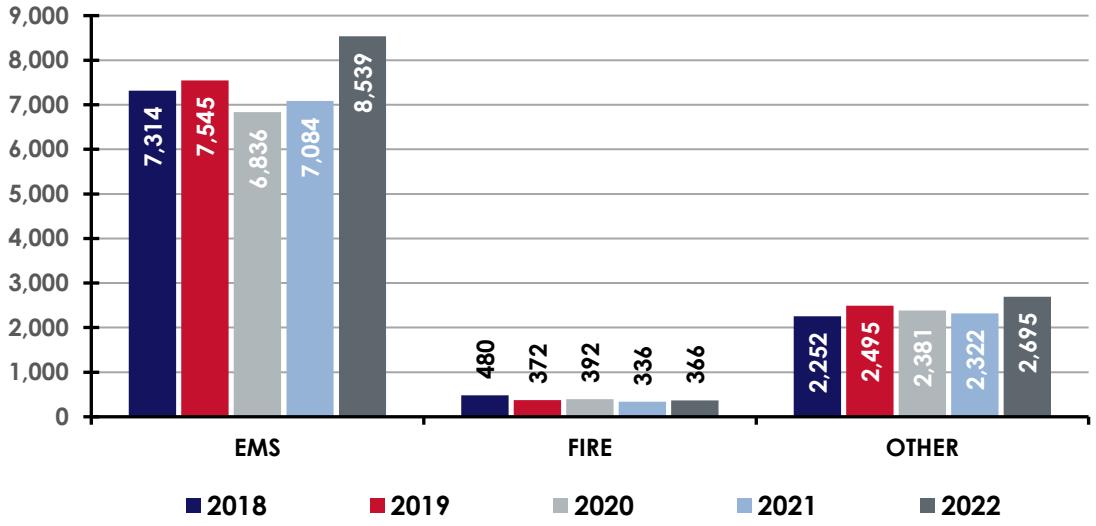
Historical Response Workload

In analyzing the service delivery and performance of SRVFPD, incident and unit response data were requested by Triton for the calendar years of 2018 through the end of 2022. In addition, SRVFPD provided data from its records management system (RMS) and electronic Patient Care Reports (ePCR) for EMS-specific data points. Both data sets were utilized in this section's assembly of analysis. This data does not include when units were added or removed from service but is designed to show total system workload and status.

Service Demand

The following figure shows the response workload by general type for the last five years. The total response workload has increased by over 14% over the full five-year period. EMS incidents still comprised the majority of the total volume; however, it decreased some in 2020–2021 due to the pandemic effects of less traffic and less personal interaction. There was a reluctance during the pandemic months of 2020–2021 to seek medical treatment by many who feared that medical workers were a source of exposure. EMS incident call volume rebounded significantly in 2022.

Figure 89: Response Workload History (2018–2022)



SRVFPD responded to over 45,000 incidents over the five-year period. From the previous figure, total responses have been relatively unstable. The following figure shows the response by type, more specifically. Emergency medical responses and motor vehicle collisions were the most common incident types, comprising 73.4% of the total responses.

Figure 90: SRVFPD Incident Response Changes

Year	All Incidents	Change
2018	9,740	—
2019	10,103	3% increase
2020	9,361	8% decrease
2021	9,511	2% increase
2022	11,359	17% Increase

The following figure shows incident responses by incident type.

Figure 91: SRVFPD Responses by Incident Type

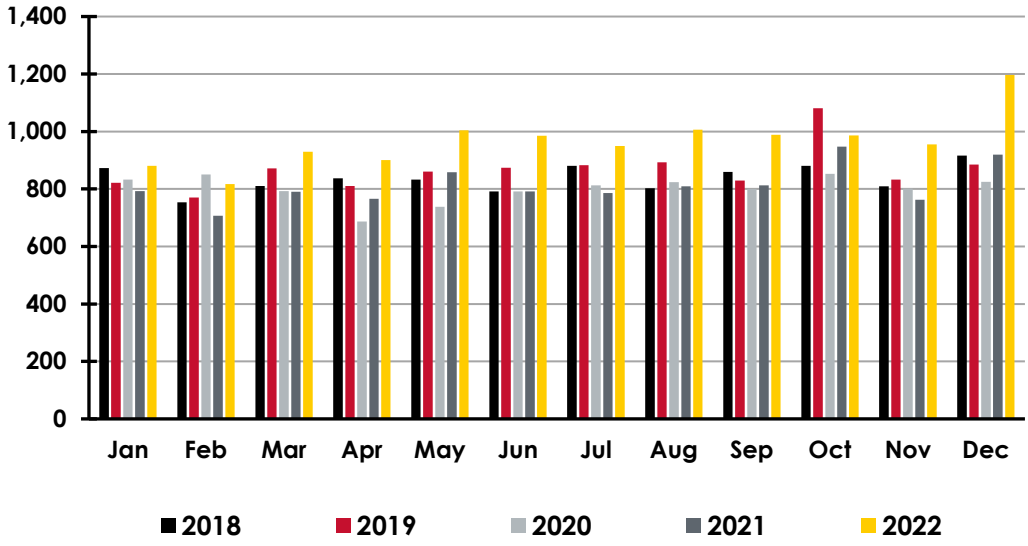
Incident Type Description	Percent of Total*
Emergency Medical Services	73%
Other Incident Types	23%
Other Fires	2%
Structure Fires	1%
Vehicle Fires	1%
Wildland Fires	< 1%
Alarms	< 1%
Rescues	< 1%
Hazardous Incident	< 1%

*Percentages rounded to the nearest integer.

Temporal Analysis

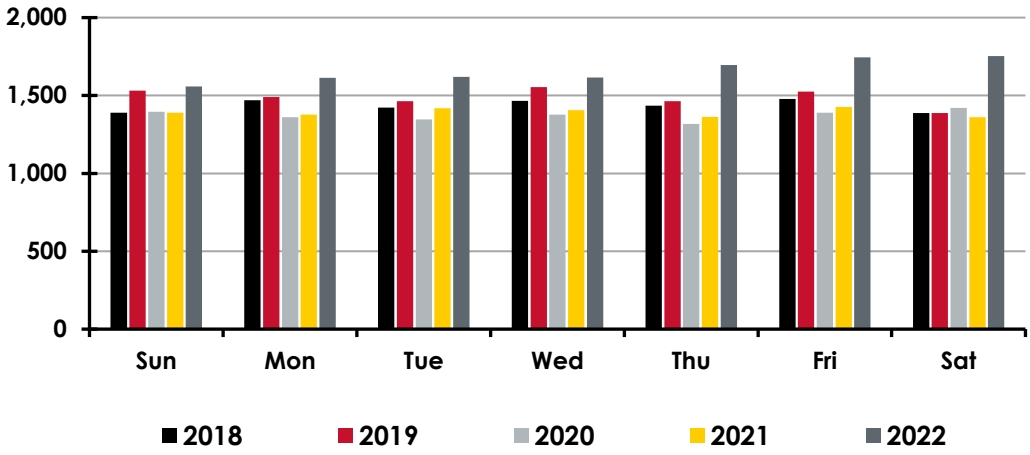
This analysis shows how responses change in volume over various measures of time. The following figure shows the change in volume over the months during the study period, indicating seasonality in the response pattern.

Figure 92: SRVFPD Monthly Response Workload (2018–2022)



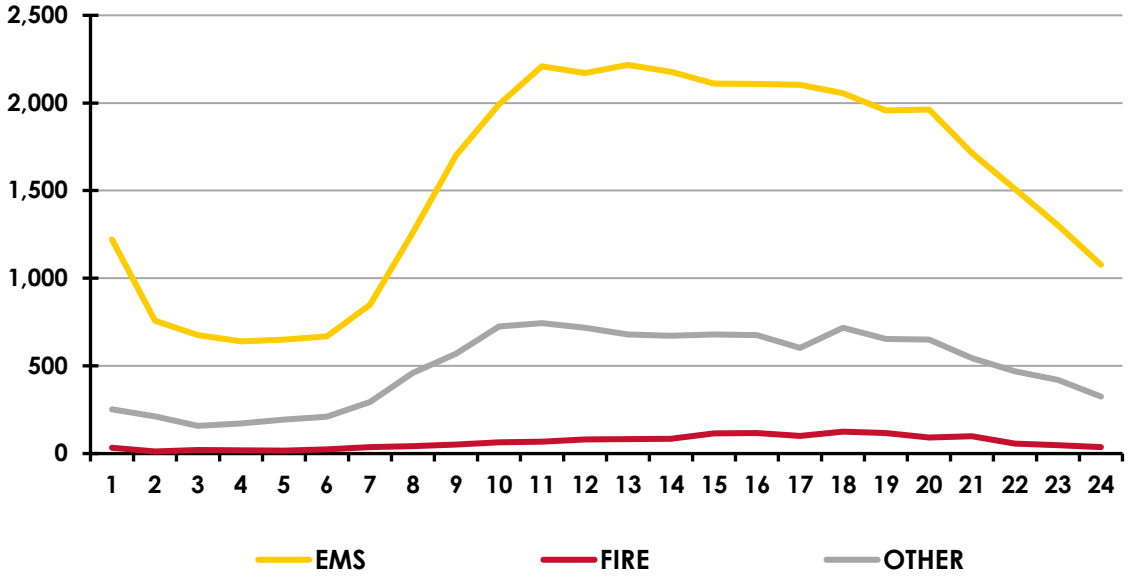
The busiest month for SRVFPD has been December, after which total monthly volume slightly declines until the late fall months. Next, response workload is shown by the day of the week. Fridays and Saturdays tend to have the most responses.

Figure 93: SRVFPD Daily Response Workload (2018–2022)



Response workload by the hour of the day typically shows fire district activity higher during daytime hours, as in the case of SRVFPD incidents. This is because response workload correlates with the more active time of people's daily lives. In San Ramon Valley, the district's activity begins to increase at 6:00 a.m. until it reaches its first peak at 10:00 a.m. This level is generally maintained until 5:00 p.m., when it begins to decrease.

Figure 94: SRVFPD Hourly Response Workload (2018–2022)



Response Unit Workload

The response workload for each of the SRVFPD apparatus is shown in the following figures. Many incidents, like structure fires and severe motor vehicle collisions, require more than one unit to respond. Grouped by type, engines handle the most workload.

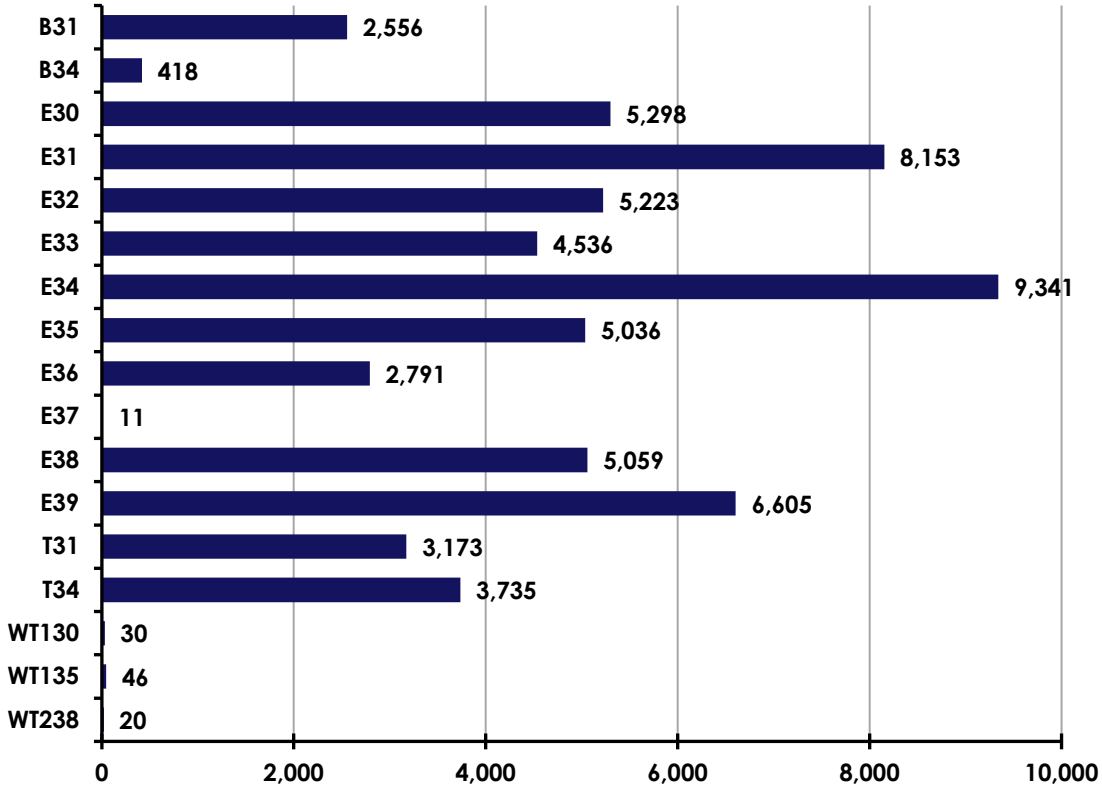
The EMS units are next, followed by the truck companies and then the Water Tenders. Engine 34 is the busiest unit in the department. Paramedic Unit 38 is the busiest rescue unit, while Truck 34 is the busiest ladder company. Frontline Apparatus responded to 86.5 % of all requests for service from 2018 through the end of 2022. The next figure shows call signs.

Figure 95: Unit Radio ID Descriptors

Designator	Typical Staffing	Description
B	1	Battalion Chief
E	3	Engine Company
HM	3	Hazmat unit
PM	2	Paramedic unit
RM	3	Rescue/Paramedic
SR	2	Single Role Unit
T	4	Ladder Truck
WT	2	Water Tender

The following figure is an illustration of service demand by individual frontline apparatus. All units were included regardless of response numbers.

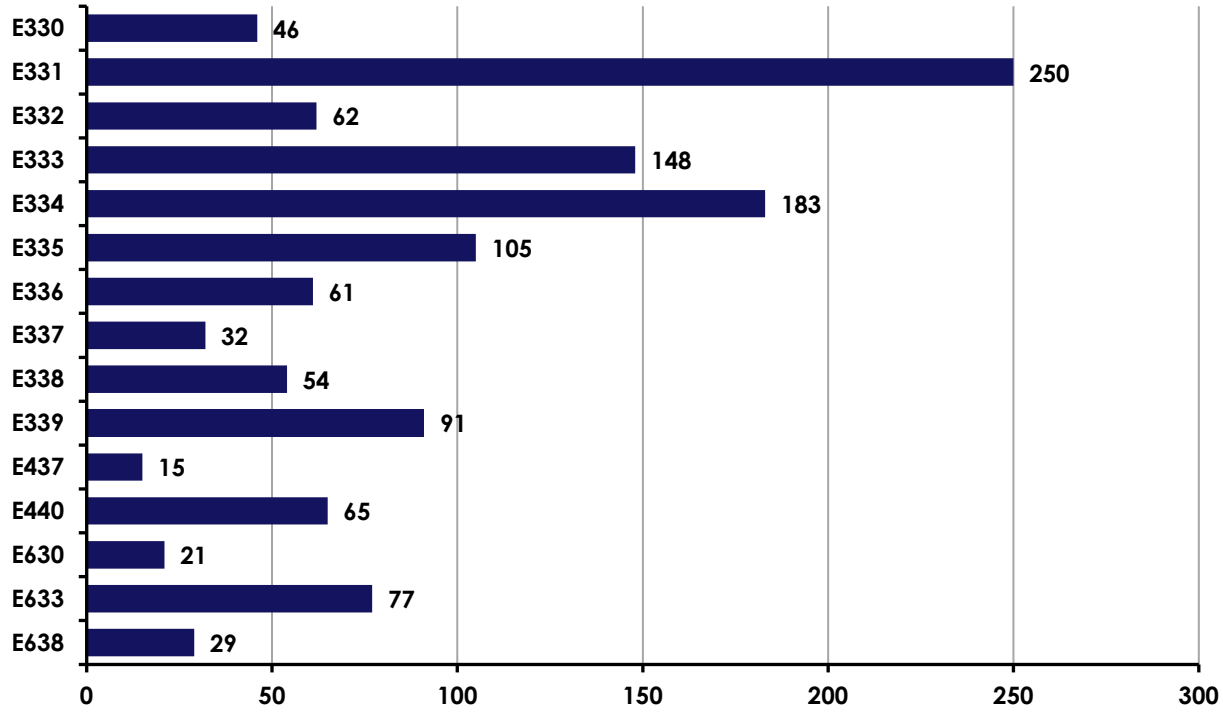
Figure 96: SRVFPD Service Demand on Frontline Apparatus (2018–2022)



Note that Battalion 34 was added in 2021.

The following figure outlines frontline-designated units of wildland type—Type 3 and Type 6 engines. All units were included regardless of response numbers. This wildland service demand represents 1.8% of the total amount of unit responses. The Type 6 engines at stations 30, 33, and 38 replaced Type 3 engines in 2021.

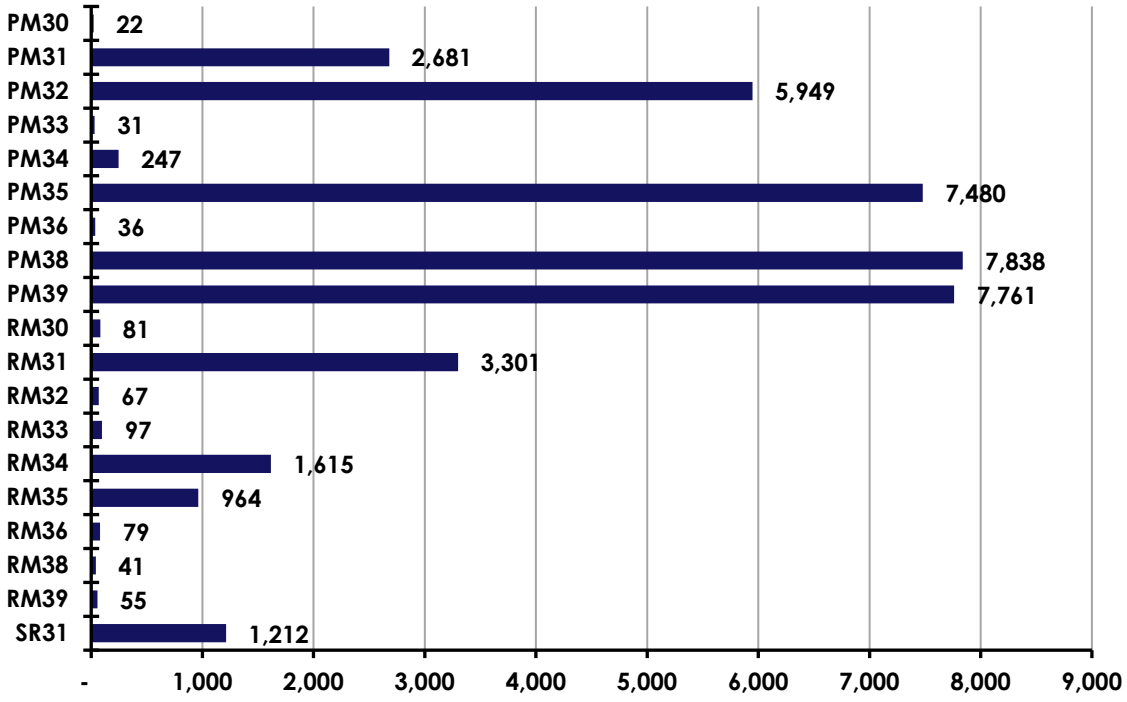
Figure 97: SRVFPD Service Demand of Wildland Units (2018–2022)



Note that Engines 630, 633, and 638 were added in 2021.

The following figure illustrates the service demand of the medic units and cross-staffed (CS) medic units. PM 31 and SR 31 are now the same unit.

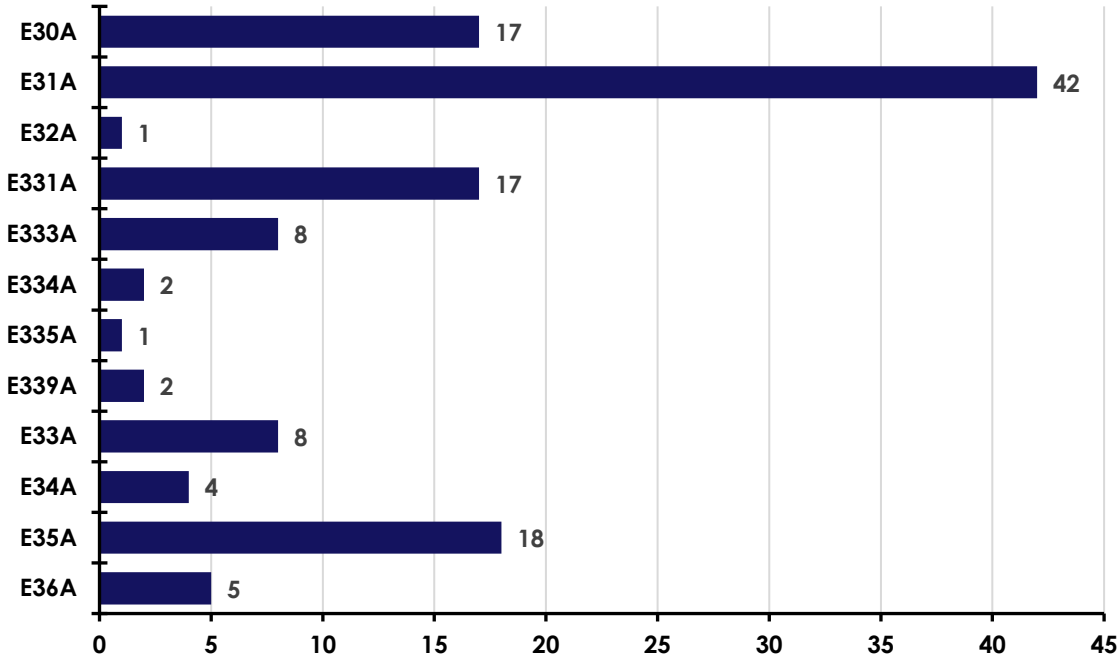
Fiaure 98: SRVFPD Service Demand on Ambulances (2018–2022)



Cross-staffed medic units represented 6.9 % of the overall responses to service requests from 2018 through 2022.

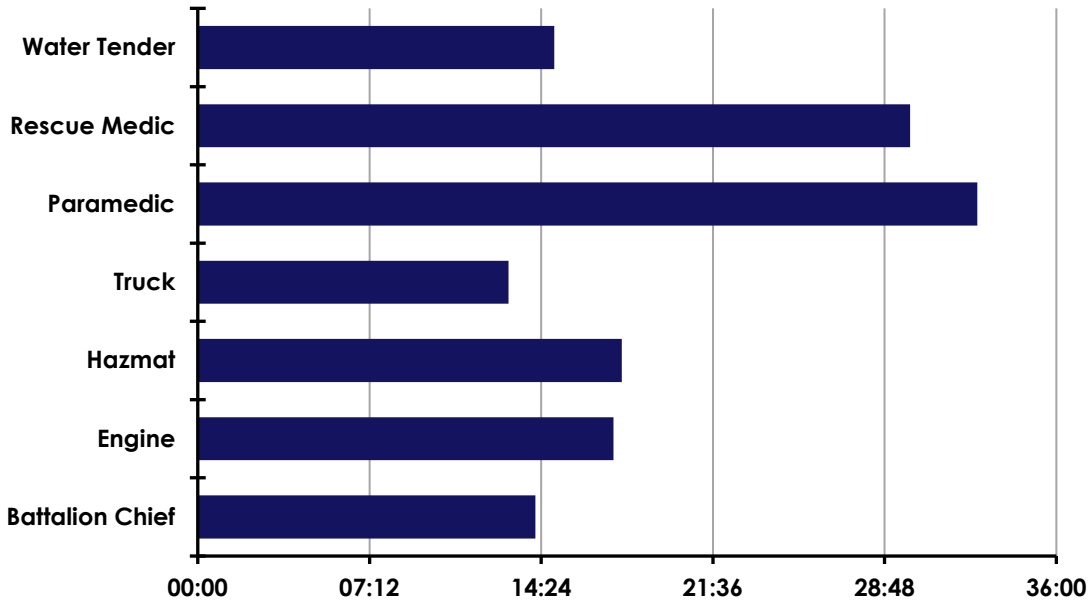
The following figure illustrates the utilization of units listed as being in "Reserve" status. For the most part, these units see little use. Reserve units represent only 0.39% of the overall responses to service requests from 2018 through 2022. These are typically red flag, out-of-county, or special event up-staffing.

Figure 99: Service Demand on Reserve Units (2018–2022)



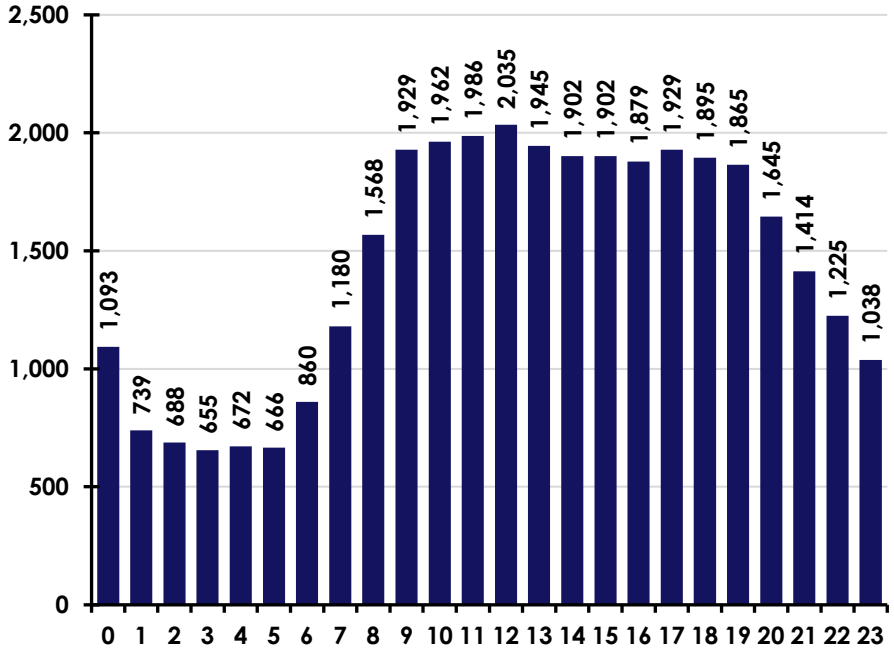
The amount of time spent on the scene can affect the firefighters' workload and the availability of resources for the next or concurrent incident. The following figure details the average amount of time each type of unit was committed to a scene.

Figure 100: Average Time Committed to an Incident Type by Unit



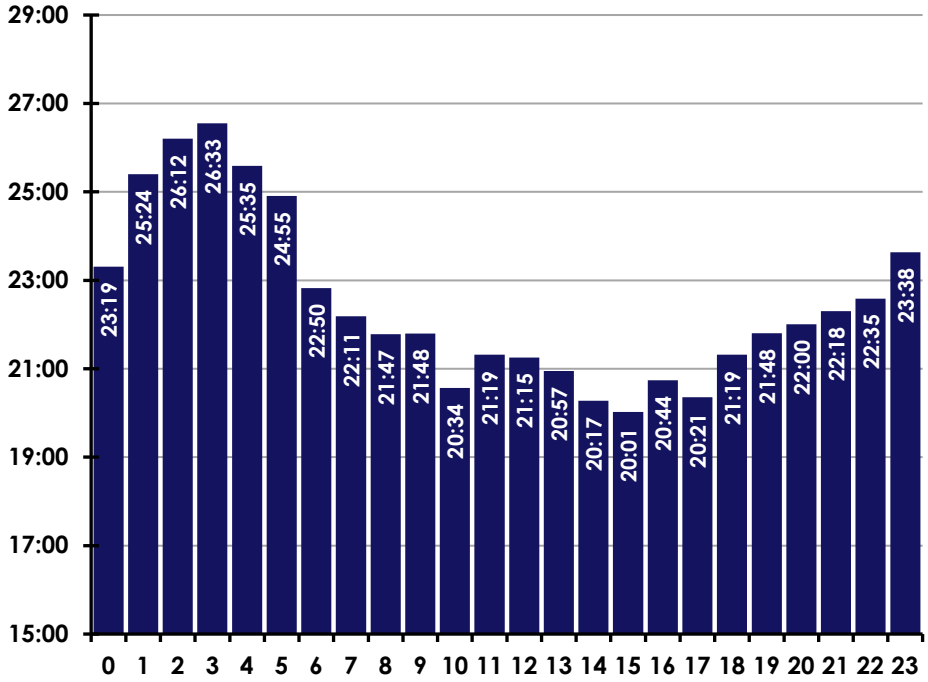
Ambulance units spend the most amount of time committed to an incident. However, engine and truck firefighting crews spend a similar amount of time, depending upon the incident type.

Figure 101: Time Committed (in hours) to Incidents by Hour of the Day



The average amount of time spent from unit dispatched to unit clear is listed by hour of the day in the following figure. This includes all units, all call types, and priorities.

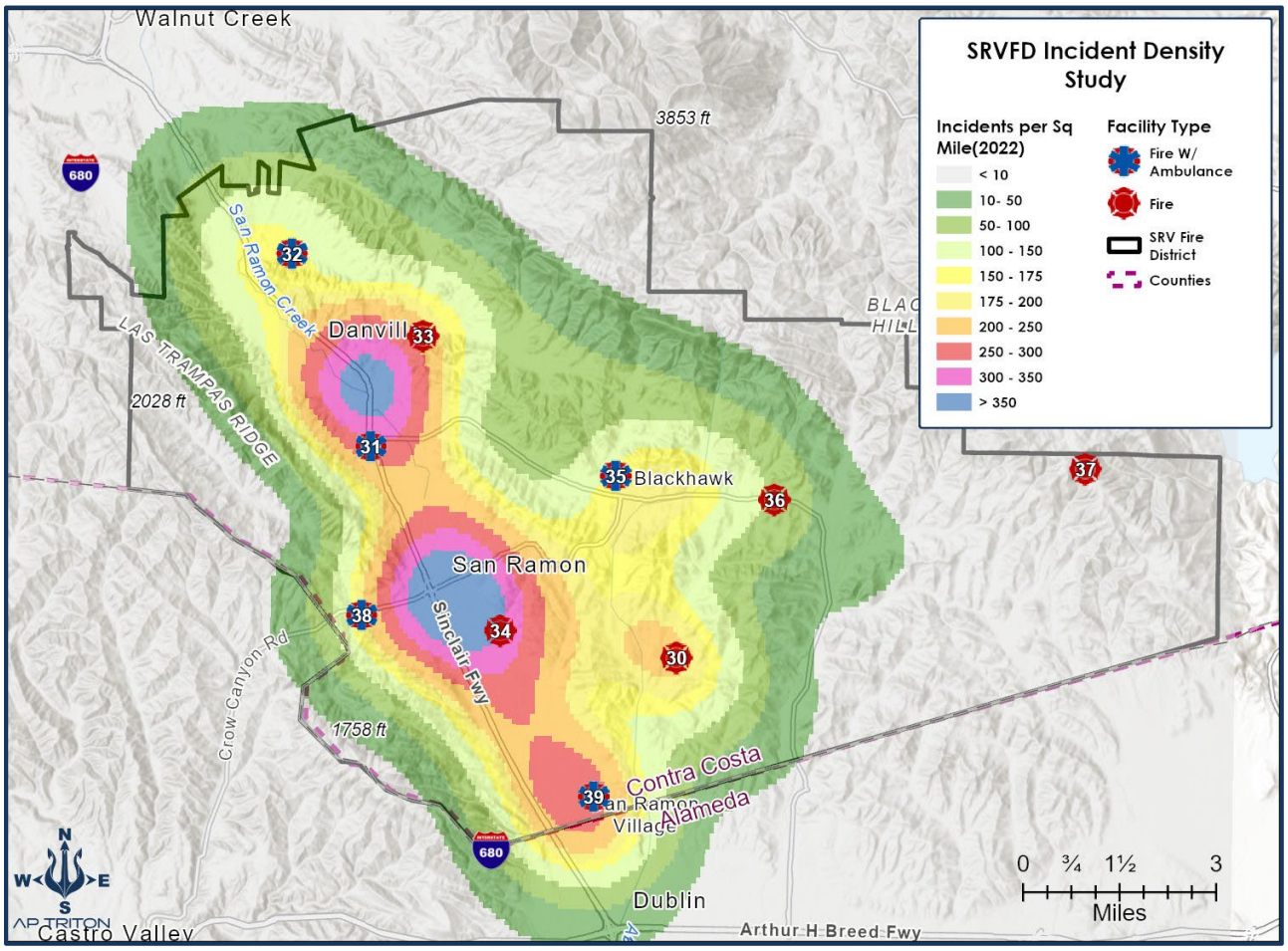
Figure 102: Average Time Committed to an Incident for All Units & Types



Spatial Analysis

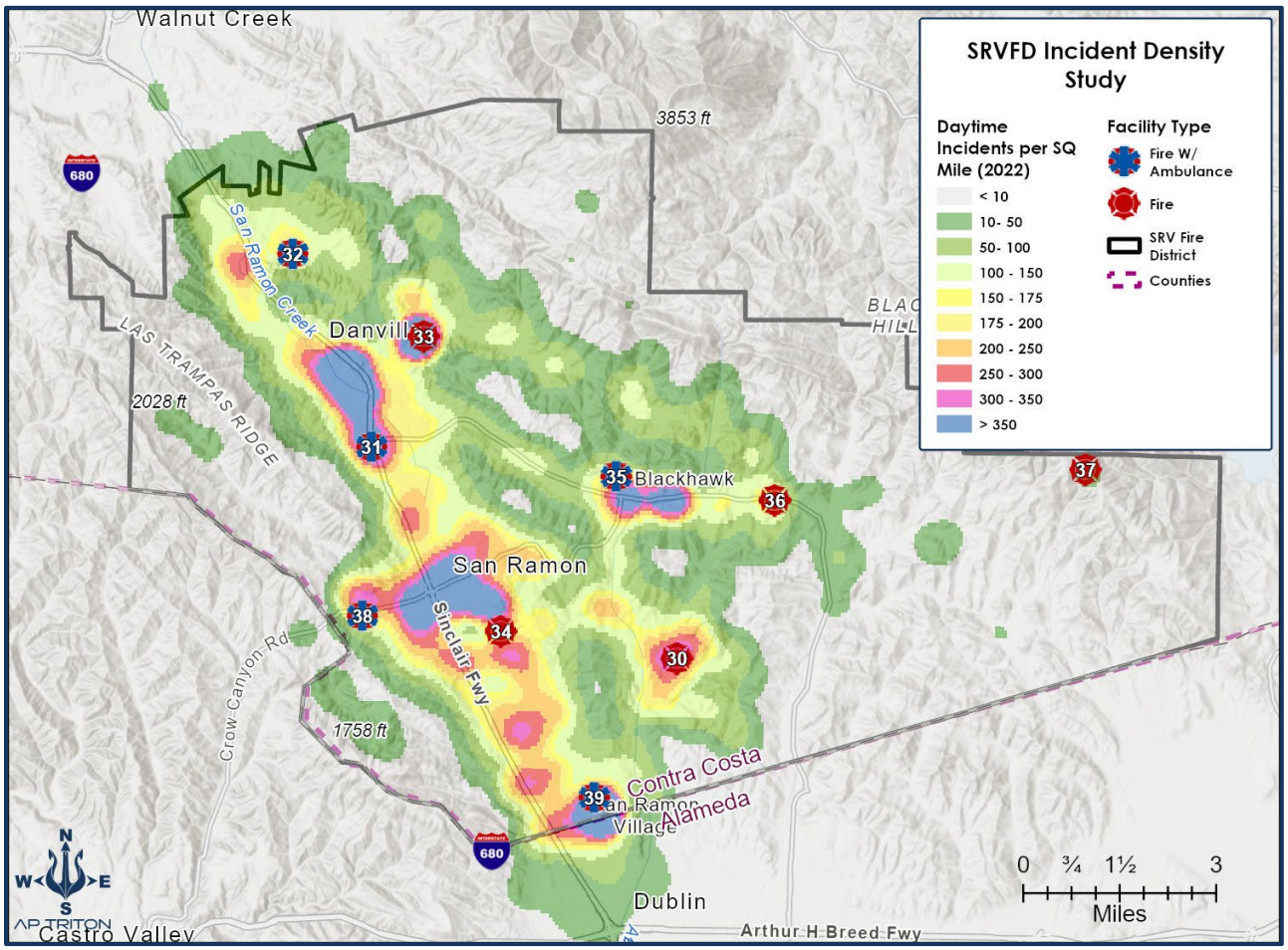
Triton also examined response workload geographically. The distribution of heavier service demand can be evaluated against the location of the fire station. The following figure shows the density of response workload during the study period.

Figure 103: SRVFPD Call Density—All Incident Types



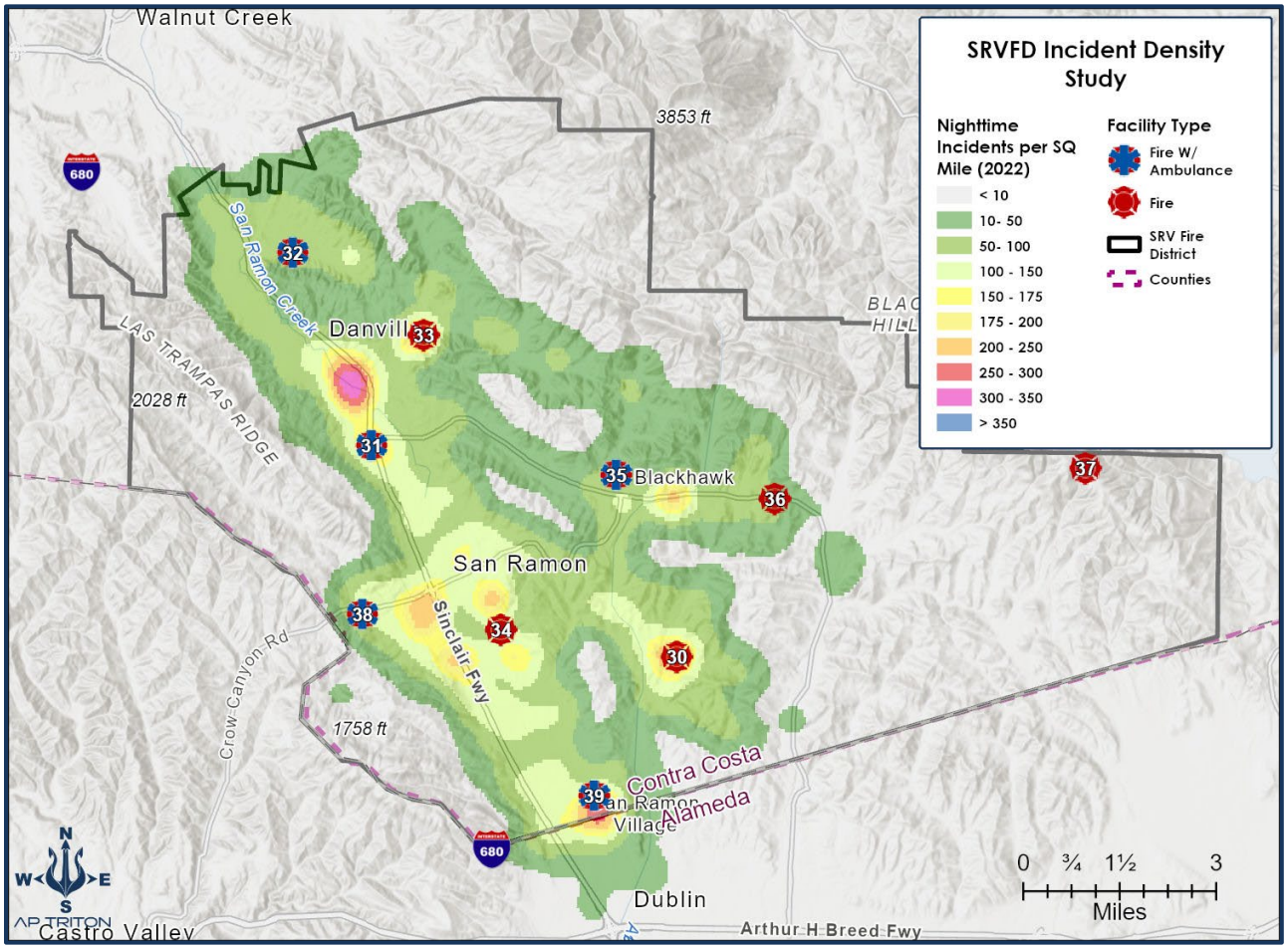
The previous figure is reflective of the predominance of emergency medical incidents within the dataset. The following figures show the differences in demand between day (7 a.m.–8 p.m.) and night (9 p.m.–7 a.m.) incidents.

Figure 104: SRVFPD Call Density—All Daytime Incident Types



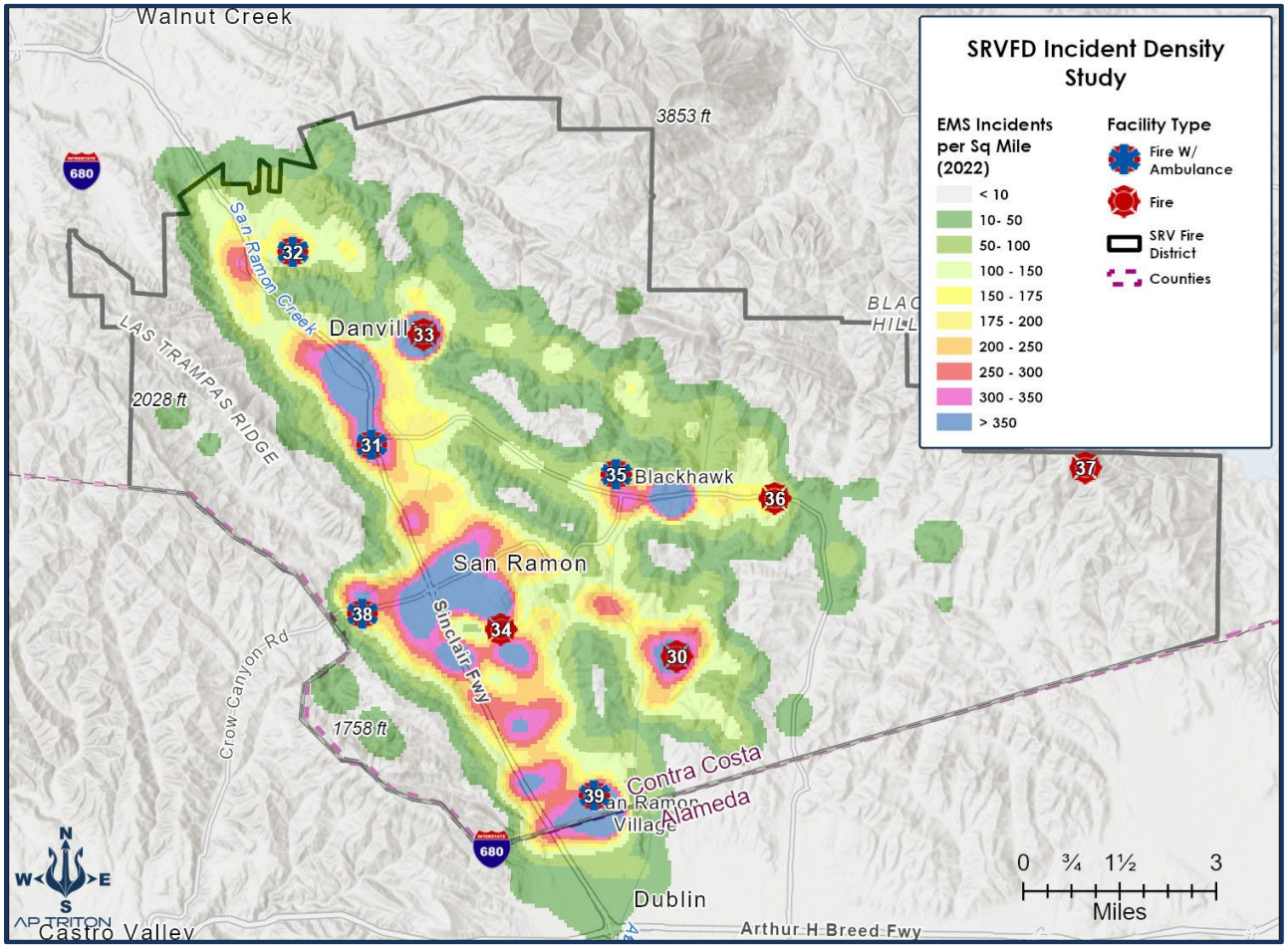
The pattern in the preceding figure closely mimics the overall demand during the day because of EMS incident demand. This is expected due to the rise in the volume of incidents during the day.

Figure 105: SRVFPD Call Density—Nighttime All Incidents



As noted previously, workload during the evening is lower, but the heavier demand density lessens in the areas previously identified. At night, the greater concentrations of activity are found north of station 31 and near Station 39.

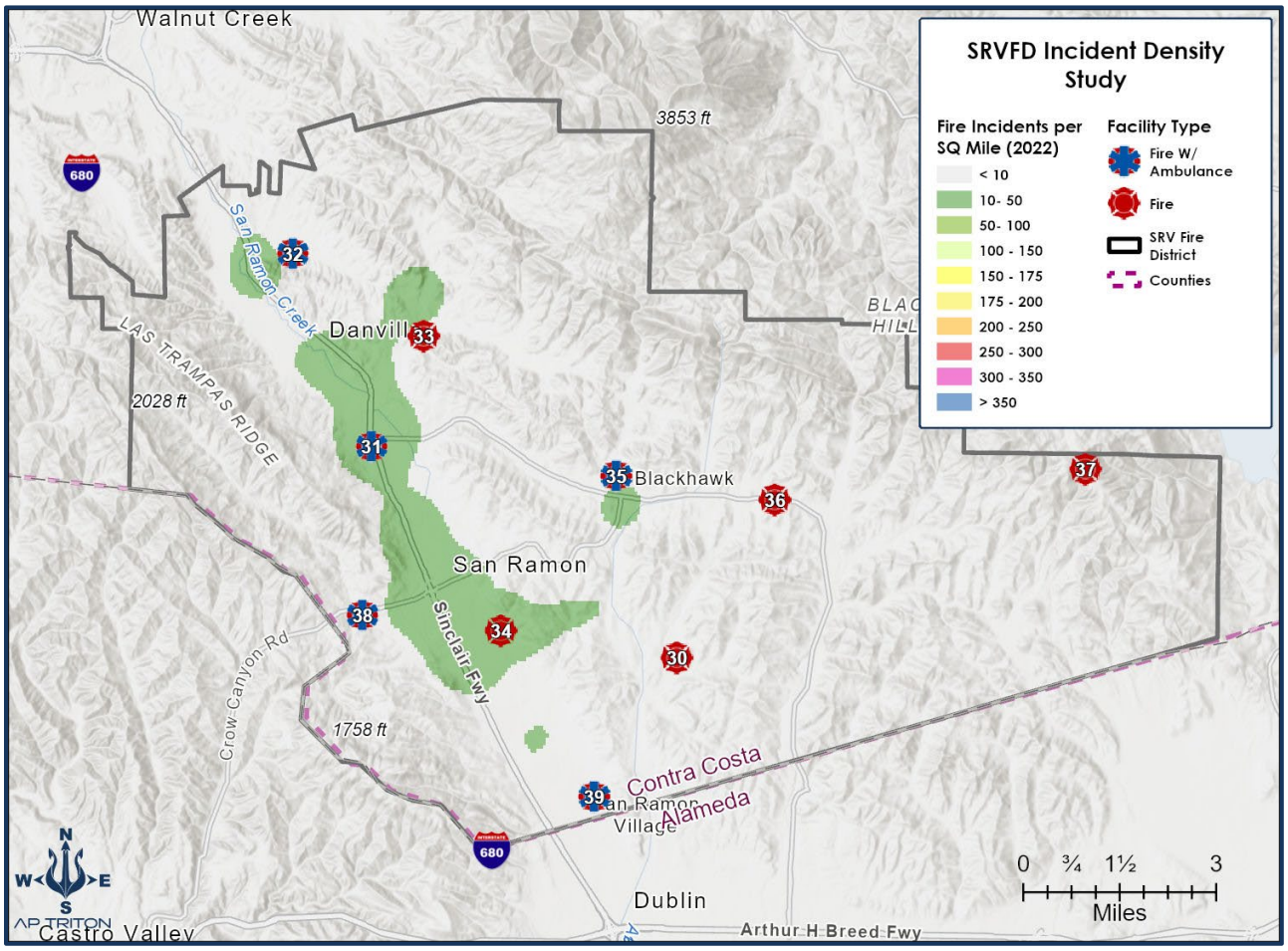
Figure 106: SRVFPD Call Density—EMS Incidents



Because of the predominance of EMS-type incidents in the workload data, this map mimics the overall demand density map and follows areas of population concentration. EMS demand is located near all stations however the most concentrated EMS areas include stations 31, 34 and 39.

The following figure shows the level of fire density within the district.

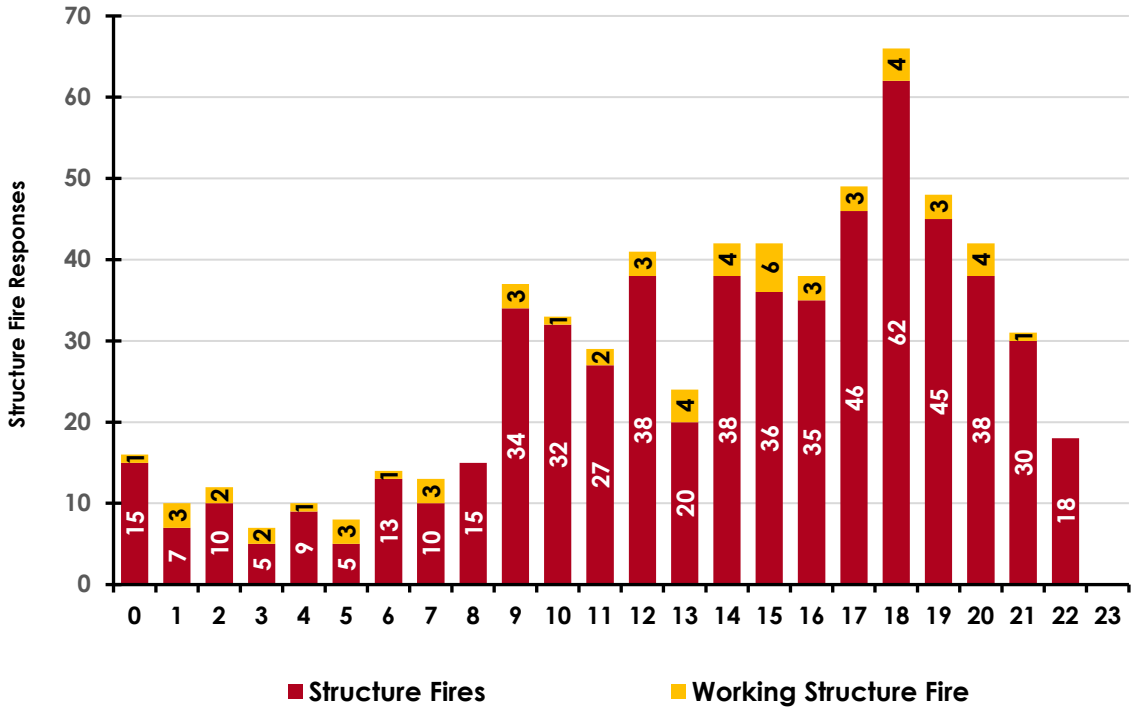
Figure 107: SRVFPD Call Density—Fire Incidents



The preceding figure indicates that most structure fires occurred near Stations 31 and 34. More fires occurred during the afternoon and early evening hours, as shown in the following figure.

The next figure illustrates the number of structure fires by hour of the day.

Figure 108: Structure Fires by Hour of Day (2018–2022)



The next figure lists the most frequent locations of calls.

Figure 109: Most Frequent Incident Locations (2018–2022)

Location	Type	No. Calls
4000 Camino Tassajara Rd, Blackhawk	Assisted Living	768
9199 Fircrest Ln, San Ramon	Assisted Living	598
950 Diablo Rd, Danville	Assisted Living	523
1027 Diablo Rd, Danville	Assisted Living	507
18888 Bollinger Canyon Rd, San Ramon	Assisted Living	356
400 W El Pintado Rd, Danville	Assisted Living	344
9205 Fircrest Ln, San Ramon	Assisted Living	297
336 Diablo Rd, Danville	Rehab Facility	279
6001 Norris Canyon Rd, San Ramon	Hospital Complex	246
2305 Camino Ramon, San Ramon	Medical Offices	236
3000 Damani Ct, Tassajara	Multifamily	177
214 Westvale Ct, San Ramon	Multifamily	173
2311 Ivy Hill Way, San Ramon	Multifamily	160
12720 Alcosta Blvd, San Ramon	Assisted Living	159
3131 Stone Valley Rd, Danville	High School	153
20709 San Ramon Valley Blvd, San Ramon	Assisted Living	130
10550 Albion Rd, San Ramon	High School	130
35 Laurel Dr, Danville	Multifamily	128
2300 Camino Ramon, San Ramon	Medical Offices	121
18000 San Ramon Valley Blvd, San Ramon	Hotel	120
6000 Bollinger Canyon Rd, San Ramon	Commercial	118
17115 Bollinger Canyon Rd, San Ramon	Multifamily	118
501 Danville Blvd, Danville	High School	116
9870 Broadmoor Dr, San Ramon	High School	103
20503 San Ramon Valley Blvd	Assisted Living	103

Resource Distribution

SRVFPD operates out of 10 fire stations; one (Station 37) is not duty-staffed on-site. Other facilities include an administration building, a training center, and a supply warehouse. The following figures illustrate the street sections that can be reached in varying minutes of travel time by stations with a first response engine apparatus. This is based on the population density set forth by the district's adopted response time objectives. The travel model is based on posted road speeds modified to account for turning, stops, and acceleration. They do not consider congestion, construction, weather, darkness, and other non-controllable factors.

Figure 110: Travel Times from SRVFPD Fire Stations—4 Minutes or Less

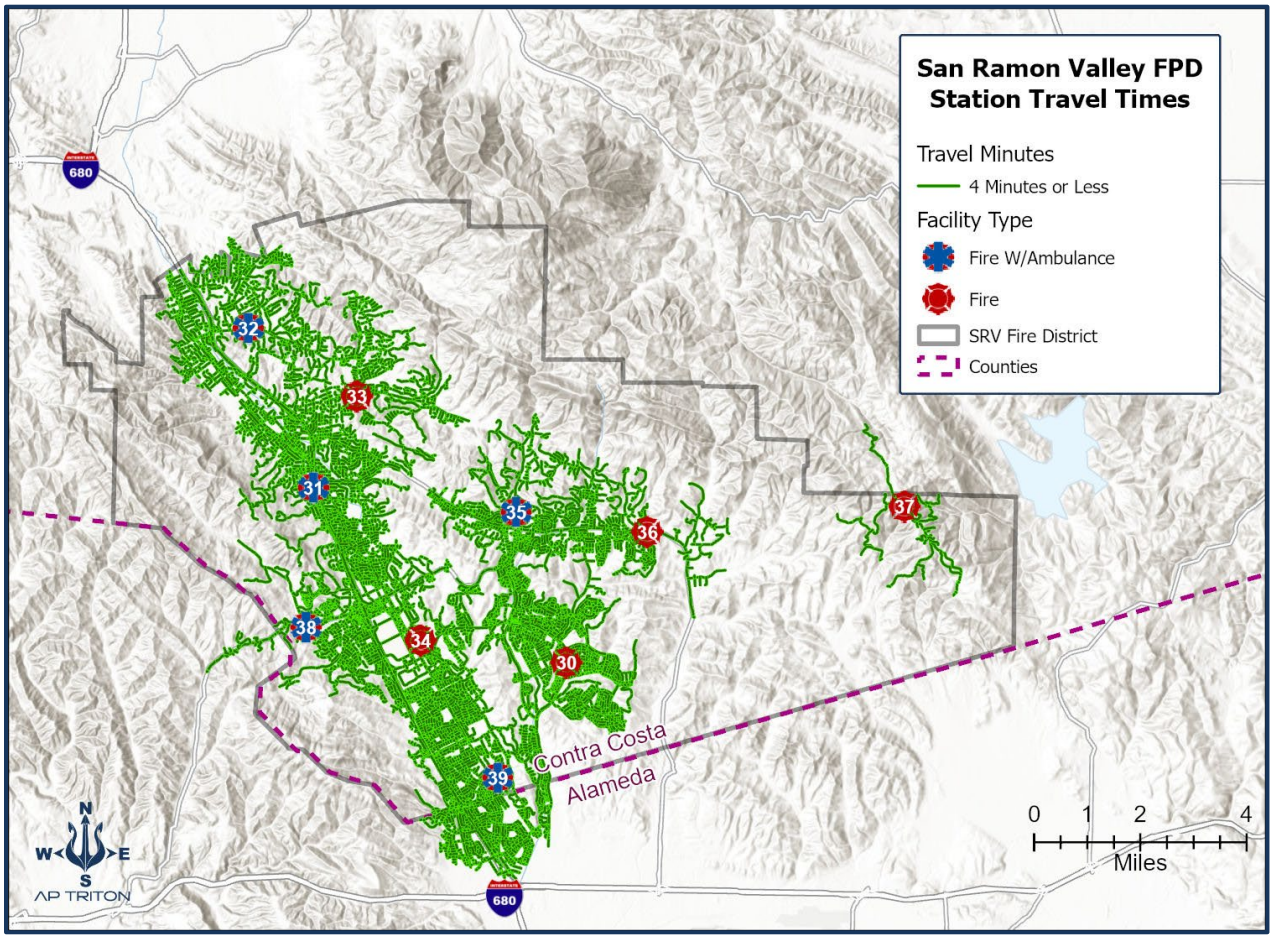


Figure 111: Travel Times from SRVFPD Fire Stations—4–5 Minutes

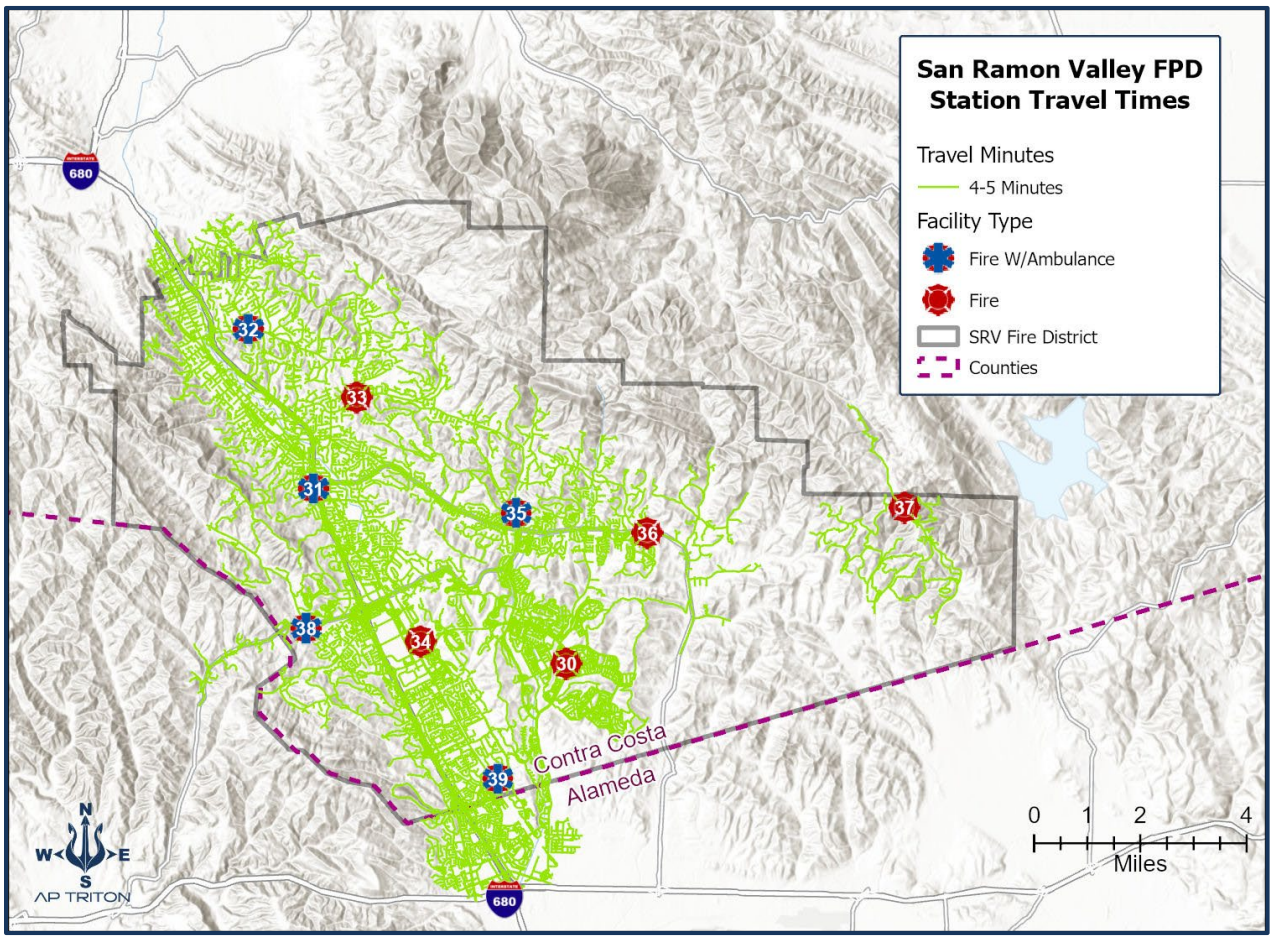


Figure 112: Travel Times from SRVFPD Fire Stations—5–8 Minutes

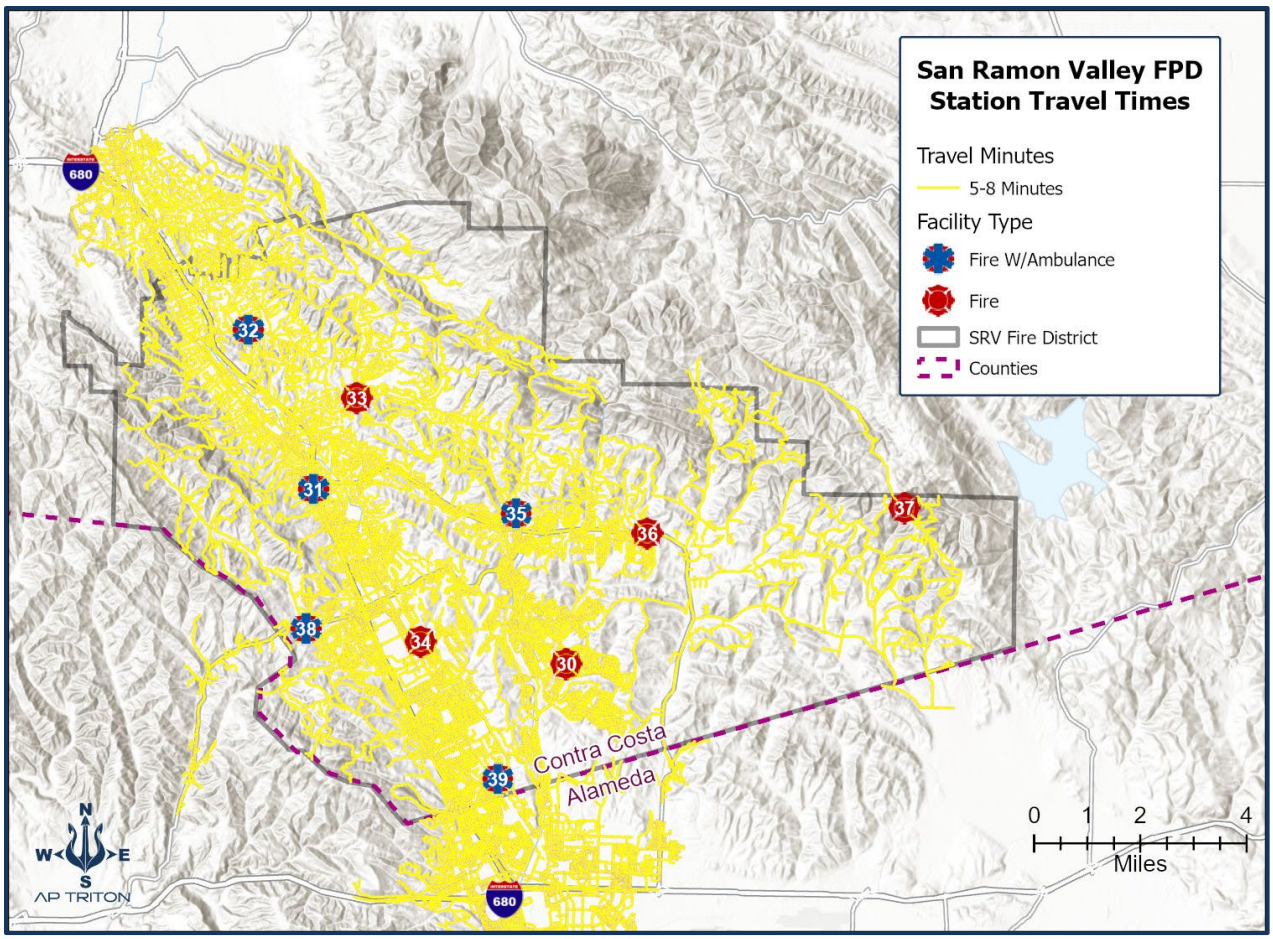


Figure 113: Travel Times from SRVFPD Fire Stations—8–10 Minutes

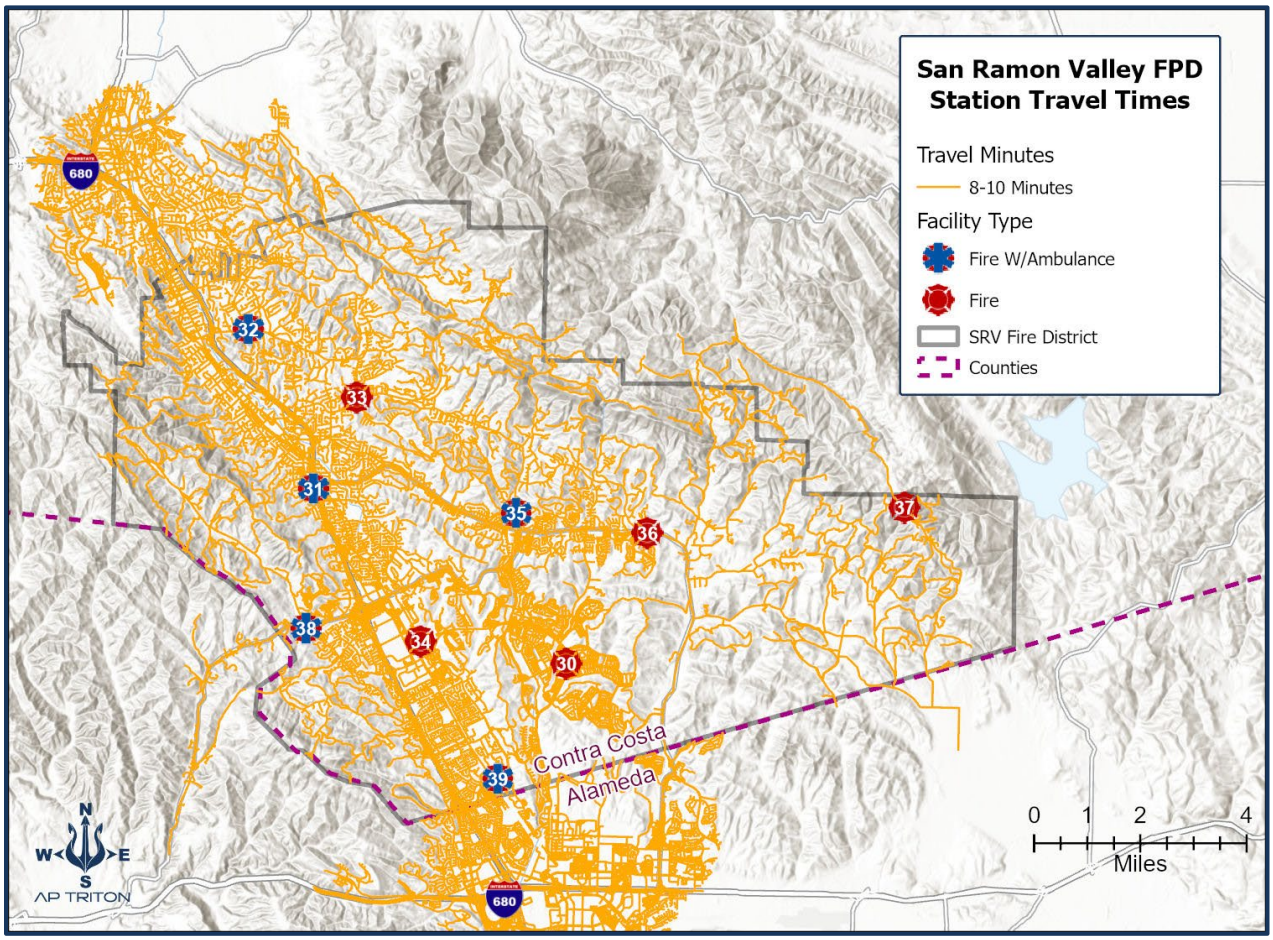
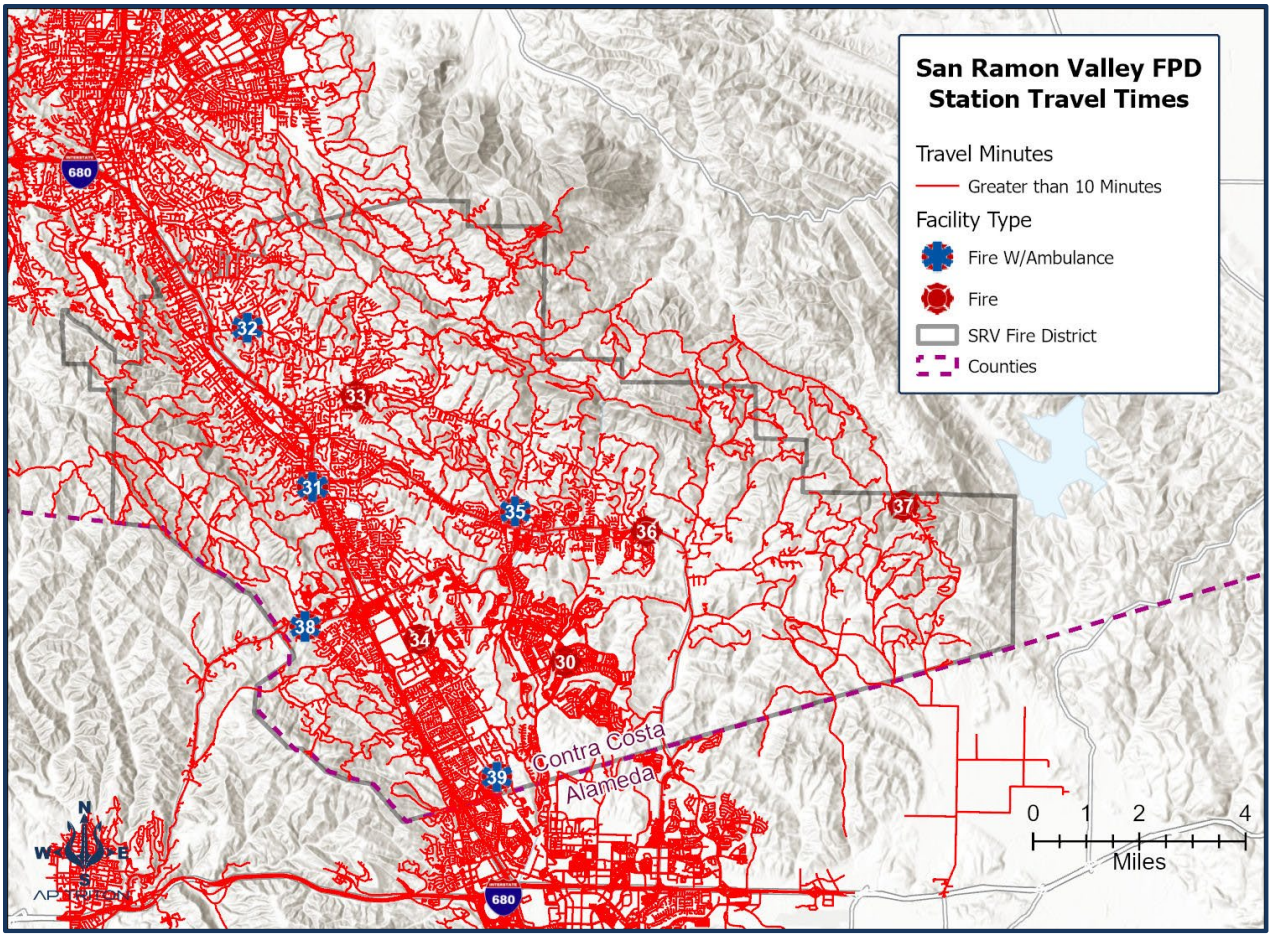
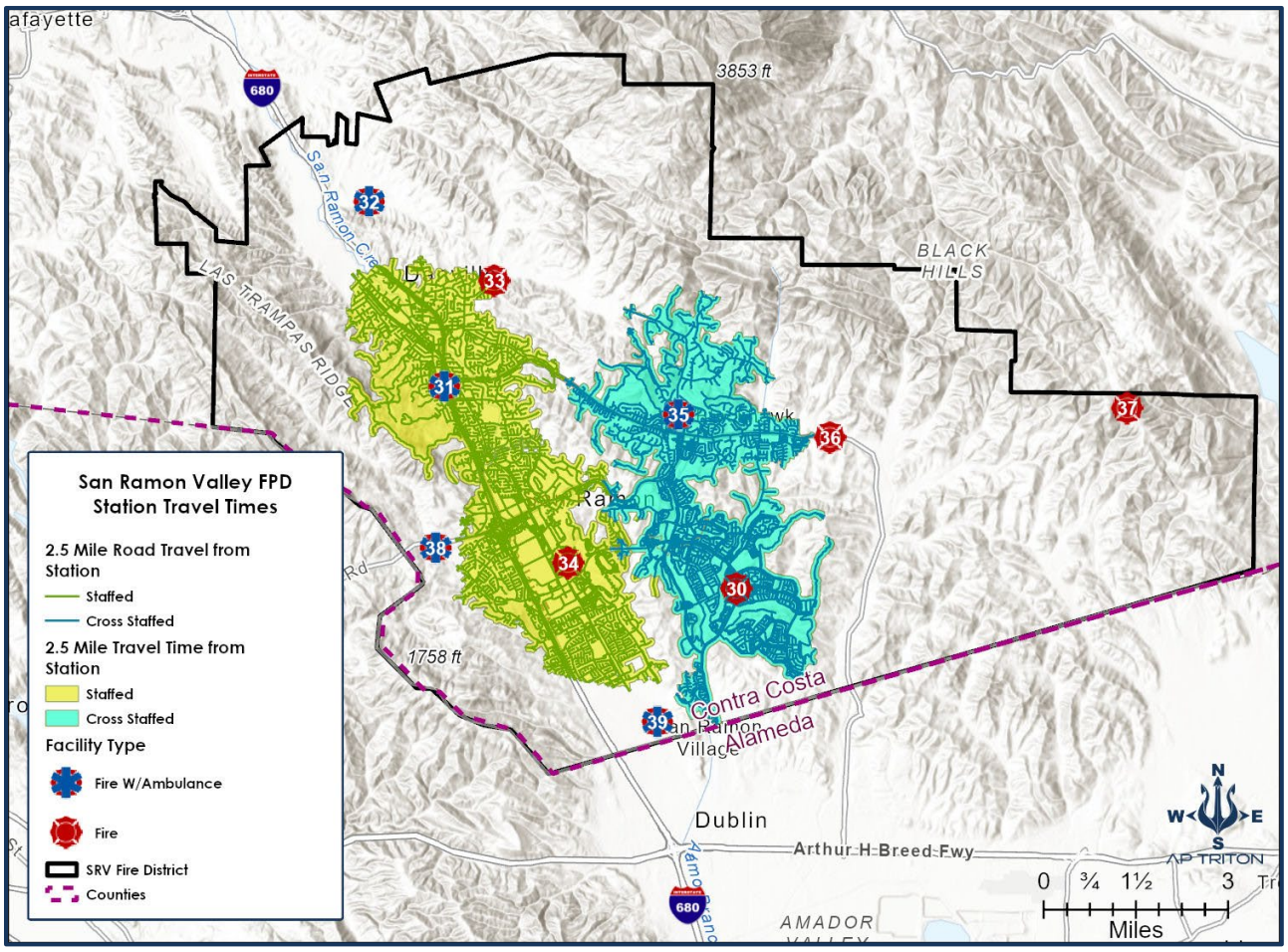


Figure 114: Travel Times from SRVFPD Fire Stations—Greater than 10 Minutes



The overall coverage of fire incident demand is 78.5% at four minutes travel time. Coverage increases to nearly 94% at seven minutes, presuming engines are available and responding from their assigned stations.

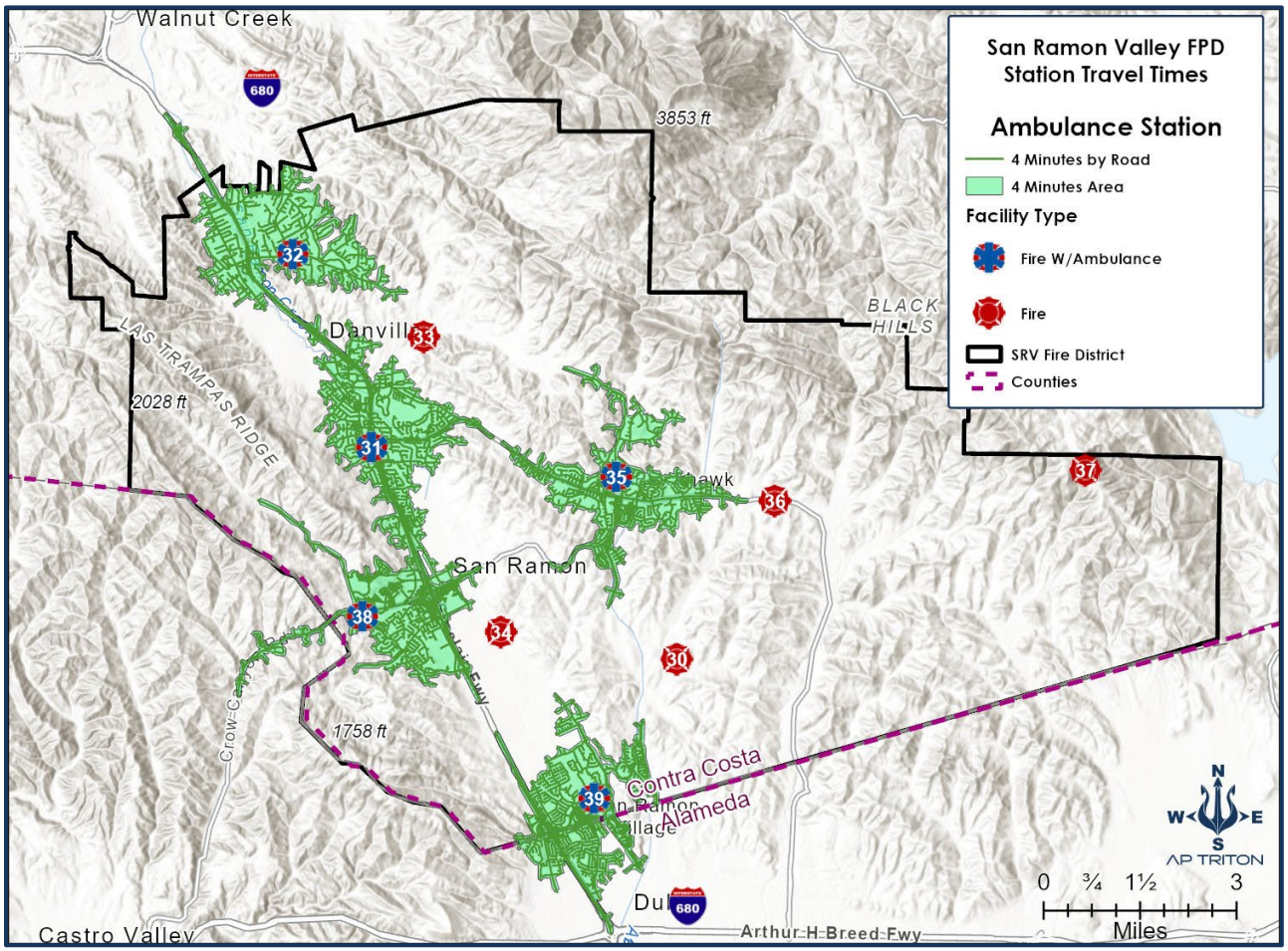
Figure 115: Ladder Truck 2.5-Mile Coverage



The preceding figure shows the 2.5-mile travel distance for ladder trucks as recommended by ISO. SRVFPD has two ladder trucks that are constantly staffed and two additional ladder trucks that can be staffed by taking an engine out of service and having the crew staff a ladder truck. While cross staffing is not recognized by ISO it does allow for additional coverage when needed but at the loss of an engine company.

The next figure shows the 4-minute response coverage for staffed ambulances.

Figure 116: Ambulance 4-Minute Response Coverage



Effective Response Force Capability Analysis

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

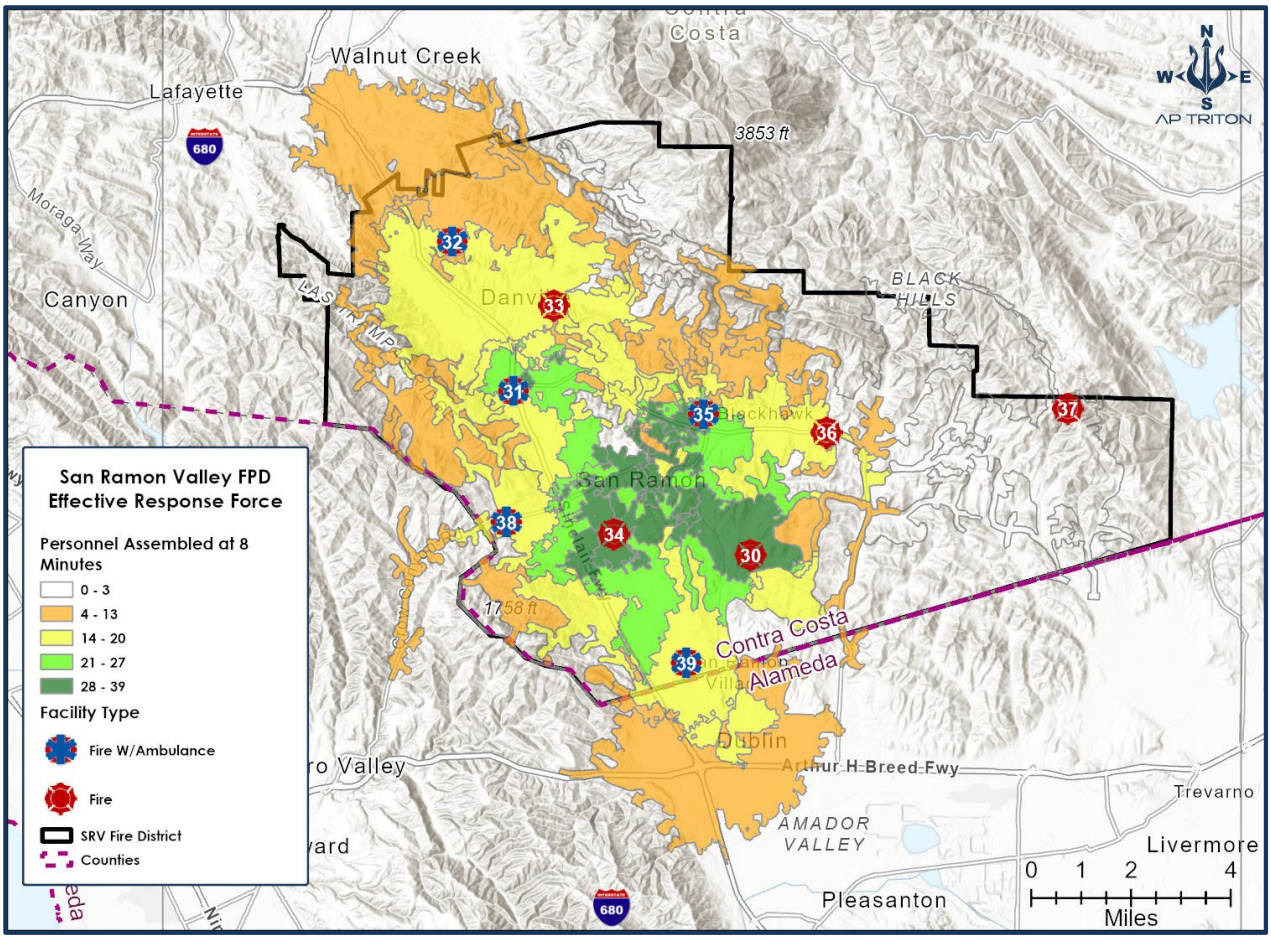
The current SRVFPD response time goal for delivering a full ERF to a building fire is within 13 minutes in the urban area, 14 minutes in suburban areas, 21 minutes in rural areas, and 45 minutes in wilderness areas.

SRVFPD currently defines the minimum full effective response force for low-rise, high-rise, and commercial building fires as four fire engines, one ladder, one paramedic unit, and two Battalion Chiefs, for a total of 20 firefighters. More firefighters can be summoned by declaring a second alarm. While several units are dispatched when a fire is reported, once the first unit arrives, and the scene is assessed, responding units may be canceled while en route.

NFPA 1710 defines the desired ERF for single family residences at 17 firefighters and for commercial or multifamily buildings at 28 firefighters.

The following figure shows the amount of personnel that can potentially arrive within eight minutes to areas within the SRVFPD.

Figure 117: Effective Response Force at 8 Minutes—Personnel



Impact of Mutual Aid

SRVFPD relies upon mutual aid from adjacent agencies during a structure fire and other incidents when needed. These are very important relationships that enable the department to ensure it has sufficient staff and apparatus to fight the fire. The following figure details the mutual aid capabilities from the adjacent agencies. From the incident densities outlined, it would seem the most impactful mutual aid agencies include ACFD near station 39 and CCCFPD near Station 32.

Travel times from other stations to the areas with the highest activity levels such as 31, 34 and 38 are limited by topography and the road network.

Figure 118: Mutual Aid Stations

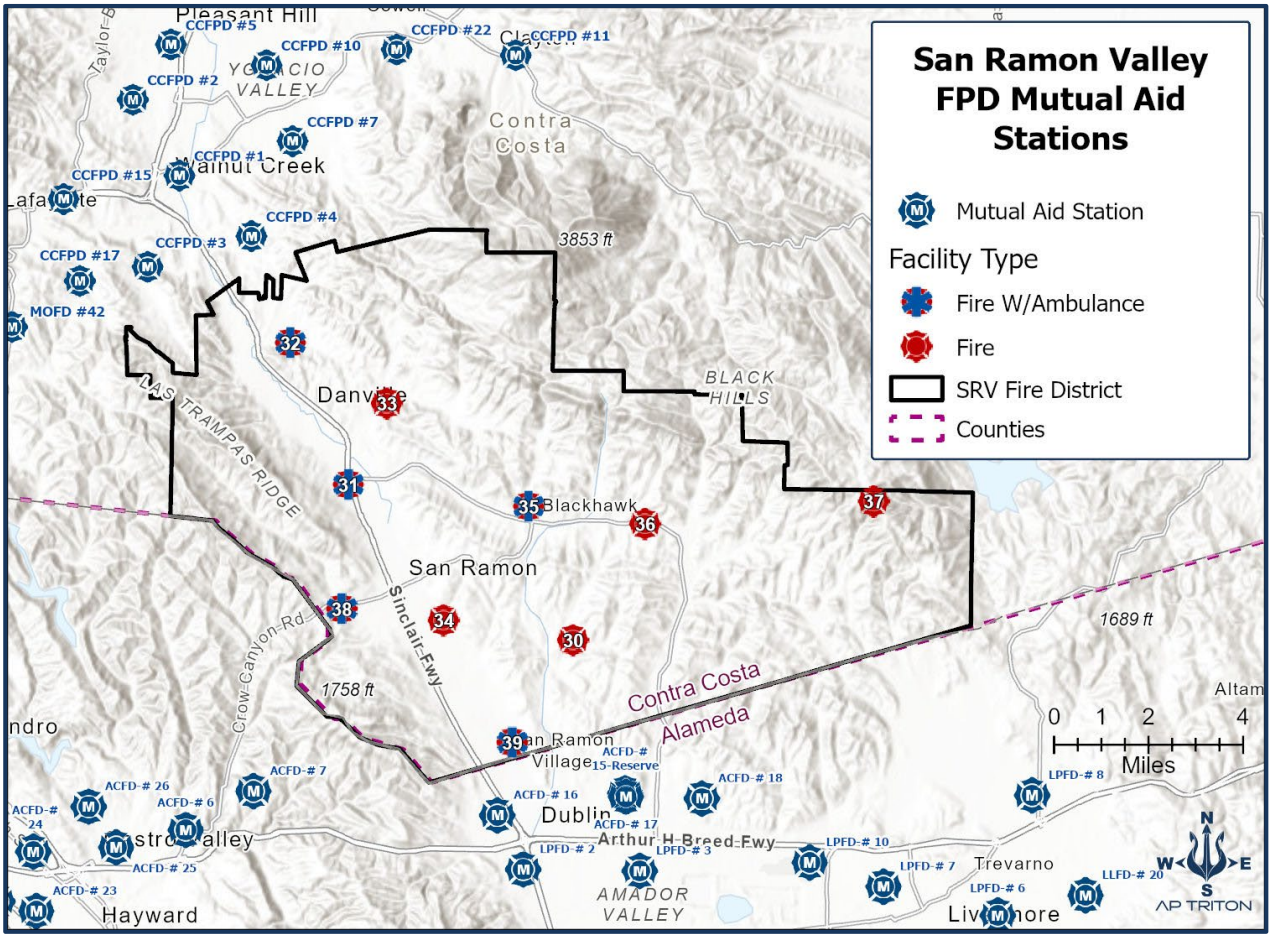


Figure 119: Mutual/Automatic Aid Fire Agencies

Fire Agency	Location	No. of Staff	No. of Engines	No. of Aerials	Staff
Contra Costa County FPD					
Station 1	Walnut Creek	7	1	1	7
Station 3	Walnut Creek	3	1	0	3
Station 4	Walnut Creek	3	1	0	3
Station 7	Walnut Creek	3	1	0	3
Station 15	Lafayette	3	1	0	3
Alameda County Fire Department					
Station 6	Castro Valley	3	1	0	3
Station 16	Dublin	3	1	0	3
Station 17	Dublin	7	1	1	7
Station 18	Dublin	3	1	0	3
Livermore-Pleasanton Fire Department					
Station 2	Pleasanton	3	1	0	3
Station 8	Livermore	3	1	0	3
Station 10	Livermore	3	1	0	3

SRVFPD reciprocates by providing aid to its adjacent agencies when requested. According to SRVFPD data, about 3% of the incidents were recorded as providing mutual aid. Most were to addresses with a Dublin postal address. The next most mutual aid was given to Walnut Creek postal addresses, with Alamo addresses the third most.

When a structure fire is reported, the reality may be something else, perhaps less threatening. Nevertheless, an engine often arrives and handles the fire threat, canceling the other units dispatched. SRVFPD increased staffing and updated alarm assignments in 2022 and significantly improved the time needed to attain an effective firefighting force (ERF) of apparatus and staffing on scene of working structure fires. The following figure details the structure fire responses that achieved the ERF compared to the department's alarm assignment protocol.

Figure 120: Effective Firefighting Force Response Performance

Description	2018	2019	2020	2021	2022
Structure Fires—Dispatched	150	126	138	104	112
Structure Fires with ERF	7	8	13	18	6
First-Alarm ERF Response Time	0:24:15	0:20:52	0:26:12	0:21:20	0:15:30
Working Structure Fires	10	10	10	7	16

Resource Reliability

In this section, the workload is analyzed at the unit level rather than at the district level, as previously shown. Unit-level workload analysis can reveal further insights into the stress level the firefighters and apparatus are experiencing. For instance, units are only effective if available within their station. Therefore, if they are already handling an incident when another incident is reported, a unit from further away must respond, increasing the response times. Unit Hour Utilization (UHU) calculates the percentage of time a unit is not available for a response because it is committed to an incident during a calendar year. This is important because the higher the percentage, the more time the unit is unavailable to respond to another incident.

This analysis only measures response incidents and does not include other unmeasured activities in the dataset, such as training time and station duties. This also shows single unit workload and does not identify stations with multiple response units. When evaluating the effectiveness of any resource deployment plan, it is necessary to evaluate the workload of the individual response units to determine to what extent their availability for dispatch is affecting the response time performance. It is also important to note that UHU is only one measure of apparatus workload.

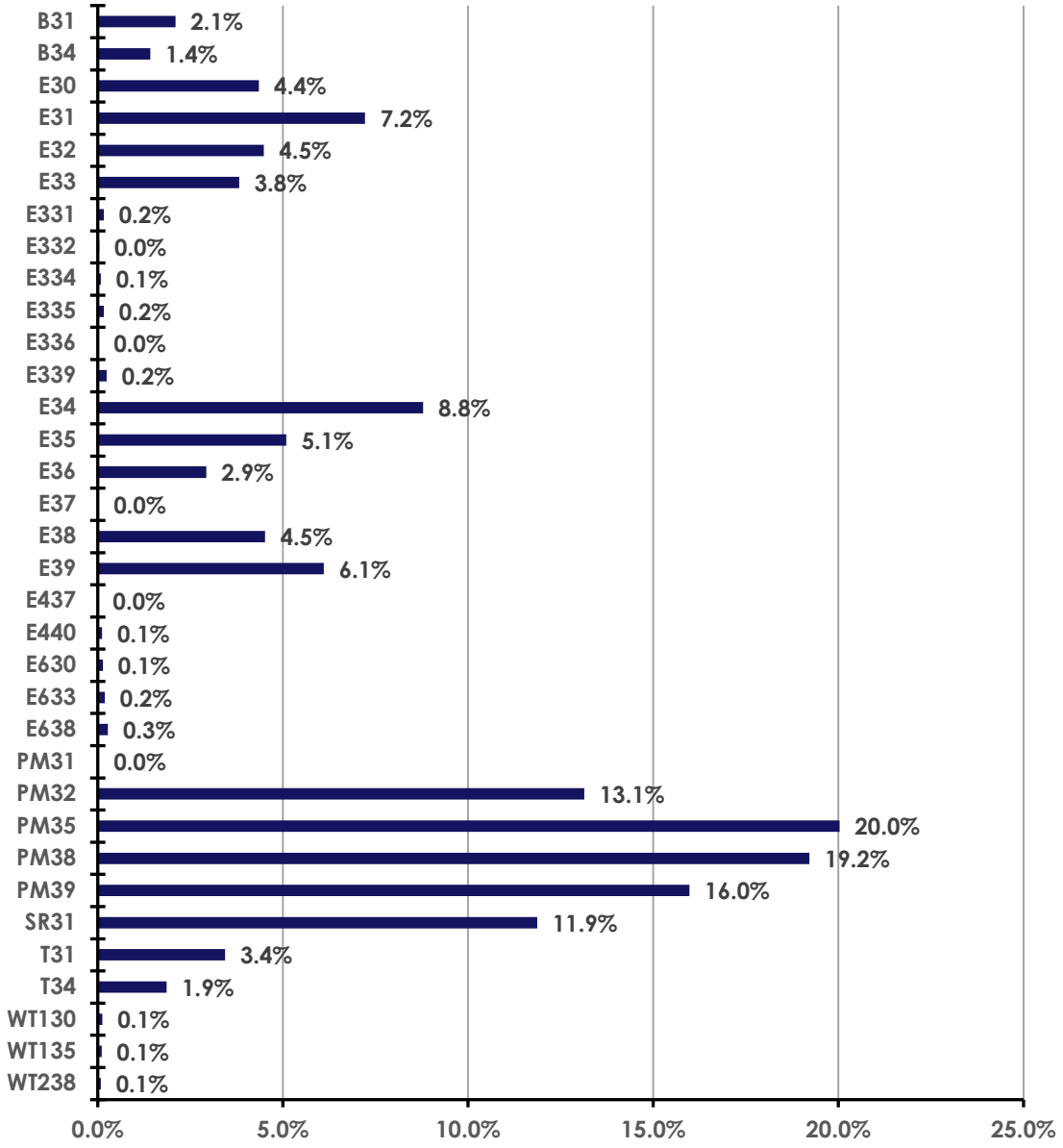
In May 2015, the Henrico County (Virginia) Division of Fire (HCDF) published an article in Fire Engineering about its method for studying UHU workload[31]. The study resulted in developing a general commitment factor scale, as shown in the following figure. The method utilized by Triton to analyze UHU is the same as used by HCDF.

Figure 121: Commitment Factor Scale

Factor	Indication	Description
16-24%	Ideal	Can maintain training and physical fitness and can consistently achieve response time benchmarks. Units are available more than 75% of the day.
25%	System Stress	Availability and unit sustainability are not questioned. First-due units respond to their assigned areas 75% of the time; response benchmarks are rarely missed.
26-29%	Evaluation Range	The community will experience delayed responses. Less than 30% of the day, first-due units are unavailable; thus, neighboring responders will likely exceed goals.
30%	Line in the Sand	Not Sustainable: The community has less than a 70% chance of timely emergency response, and immediate relief is vital. At or exceeding 30%, personnel assigned to units may show signs of fatigue and burnout and may be at increased risk of errors. Training and physical fitness are not consistently completed.

The following figure details the UHU for each of the SRVFPD units for 2022.

Figure 122: Unit Hour Utilization of Frontline Apparatus



Concurrency

One way to look at resource workload is to examine the number of times multiple incidents occur within the same time frame. Therefore, incidents during the study period were examined to determine the frequency of concurrent incidents.

This is important because concurrent incidents can stretch available resources and delay response to other emergencies. Therefore, this factor significantly impacts total response times to emergencies in the jurisdiction.

The following figure shows the number of times that one or more incidents occurred concurrently during the study period. Multiple incidents occurring in the same hour have increased in 2021 and 2022.

Figure 123: Concurrent Incident Percentage

Concurrent Incidents	2018	2019	2020	2021	2022
Single Incident	57%	56%	57%	55%	50%
Two Incidents	31%	32%	31%	32%	33%
Three Incidents	10%	9%	9%	10%	12%
Four Incidents	2%	2%	2%	2%	3%
Five Incidents	0.5%	0.5%	0.4%	0.5%	0.7%
Six Incidents	0.0%	0.2%	0.1%	0.1%	0.2%
Seven Incidents	0.0%	0.1%	0.0%	0.1%	0.1%
Eight or More Incidents	0.0%	0.1%	0.0%	0.0%	0.1%

Note: Percentages rounded to the nearest integer.

It is also useful to review the number of times that one or more response units are committed to incidents simultaneously. The following figure shows the number of times one or more SRVFPD response units were committed to incidents.

It is more common for multiple response units to be simultaneously committed to incidents than a single unit, with two to four concurrent responses occurring in significant numbers. There has been a slight increase in service requests requiring eight or more units in 2021 & 2022.

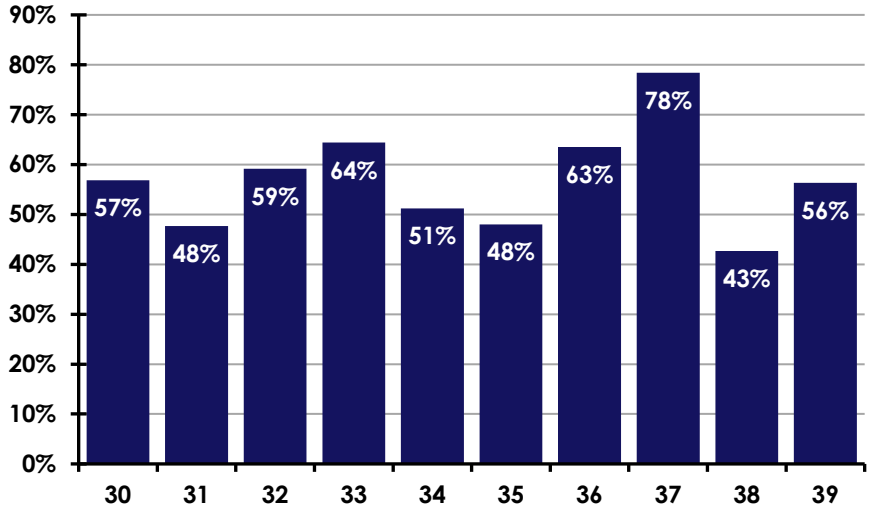
Figure 124: SRVFPD Unit Concurrency

No. of Units	2018	2019	2020	2021	2022
Single Unit	20%	20%	21%	19%	19%
Two Units	27%	27%	27%	26%	26%
Three Units	18%	19%	18%	19%	19%
Four Units	13%	14%	13%	13%	13%
Five Units	8%	8%	7%	8%	8%
Six Units	5%	5%	5%	5%	5%
Seven Units	3%	3%	3%	3%	3%
Eight or More Units	6%	5%	5%	6%	6%

Note: Percentages rounded to the nearest integer.

How reliably a station crew responds within its assigned area is important not only to its ability to handle the incident, but also to its response time performance. When busier units are on assignment, other stations must handle incidents outside their own response zones. This is especially true during fire events that require multiple units from several stations. The following figure measures the percentage of time that a station was able to respond to an incident in its assigned area.

Figure 125: Response Reliability within Assigned Response Zones



Note that Station 37 is not staffed. However, other stations' apparatus nearby would respond to this area to assist with incidents.

Queuing Analysis of Fire Station Reliability

A process called a "queuing analysis" was used to evaluate how well each fire station serves the community by the hour of the day. This process utilized a probability analysis to determine the likelihood that a crew from a particular fire station would or would not be available to respond to an incident. It uses the following variables: incidents per hour (all calls, both emergent and non-emergent), number of staffed response units, number of incidents occurring during the day (0800–1959 hours), number occurring at night (2000–0759), and average time committed per incident (one hour).

The next figure lists the number of incidents occurring by day and night by each station. These represented all incidents (emergent and non-emergent) and were used to conduct the queuing analysis.

Figure 126: SRVFPD Call by Day & Night (2022)

Fire Station	Day Calls (0800–1959)	Night Calls (2000–0759)
Station 30	713	428
Station 31	1,240	553
Station 32	693	370
Station 33	691	294
Station 34	1,376	635
Station 35	786	335
Station 36	361	167
Station 38	691	316
Station 39	982	408

The following figure shows the number of responses by station by the hour of the day for 2022. The analysis was based on the number of staffed units available to SRVFPD at each fire station. Station 37 was excluded from the analyses since it is not staffed daily.

The right-hand columns in the following figure show the probability that an apparatus would not be available for an incident. Percentages above 10% indicate a system with insufficient resources to ensure a reliable response. For example, the figure indicates that the probability of waiting for an SRVFPD apparatus is highest during the day and at Stations 30, 33, and 36, respectively.

Figure 127: Wait Probability at SRVFPD Staffed Fire Stations (2022)

Fire Station	No. Day Units	No. Night Units	Calls/Hour (0800–1959)	Calls/Hour (2000–0759)	Wait Probability	
					Day	Night
Station 30	1	1	0.16	0.06	**15%**	**9%**
Station 31	3	3	0.26	0.09	**0%**	**0%**
Station 32	2	2	0.16	0.06	**1%**	**0%**
Station 33	1	1	0.15	0.05	**14%**	**6%**
Station 34	2	2	0.28	0.09	**4%**	**1%**
Station 35	2	2	0.15	0.06	**1%**	**0%**
Station 36	1	1	0.08	0.03	**7%**	**3%**
Station 38	2	2	0.14	0.05	**1%**	**0%**
Station 39	2	2	0.19	0.08	**2%**	**0%**

The wait probability of night calls at each fire station are below the 10% threshold—although the night calls at Station 30 are close at 9%. Therefore, incidents during the day have the highest probability of a "customer" being required to wait for the next closest or available apparatus.

Reliability Discussion

Although useful, a queuing analysis has limitations. It assumes that incidents occur at a constant rate. This is not always true in emergency services. It also assumes that each incident requires an equal amount of time from the response units. While SRVFPD's average time committed to an incident (just over 25 minutes) was used for service time, some incidents require less or substantially more than the average.

As shown, Stations 30, and 33 were all over the 10% threshold during the 12-hour daytime hours of 0800–1959. During 2022, Station 30 had a wait probability of 15%, while Station 33 had a 14% wait probability.

Historical System Performance

Operational Performance Standards

Incident data for the period between January 1, 2018, and December 31, 2022, was evaluated in detail to determine SRVFPD's current performance.

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

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

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

The total incident response time continuum consists of several steps, beginning with the initiation of the incident and concluding with its appropriate mitigation. The time required for each of the components varies. In addition, the policies and practices of the department directly influence some of the steps.

SRVFPD's response performance was compared to its stated objectives provided by the district as requested for this study and other industry standards including NFPA 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, and NFPA 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.

Recommendations from ISO and the Center for Public Safety Excellence (CPSE) are also used. SRVFPD also has response performance requirements in its ambulance services agreement with Contra Costa County. The following figure summarizes the current performance standards used in this section to evaluate performance results.

Figure 128: Summary of Current Performance Goals

Incident Interval	Performance Goal
911 call answer time (time from the first ring to answer).	Within 15 seconds, 90% of the time Within 20 seconds, 95% of the time
Call process time (time from acceptance at the dispatch center until notification of response units).	Within 60 seconds, 90% of the time
Turnout time (time from notification of response personnel until initiation of movement towards the incident).	Within 120 seconds, 90% of the time
First unit travel time (time from initiation of response until the arrival of the first unit at the incident).	• Within 4 minutes, 90% of the time (Urban) • Within 7 minutes, 90% of the time (Suburban) • Within 12 minutes, 90% of the time (Rural) • Within 42 minutes, 90% of the time (Wilderness)
First unit response time (time from receipt of call until the arrival of the first unit at the incident).	• Within 7 minutes, 90% of the time (Urban) • Within 10 minutes. 90% of the time (Suburban) • Within 15 minutes, 90% of the time (Rural) • Within 45 minutes, 90% of the time (Wilderness)
Priority 1 Ambulance response time (unit dispatched to arrival)	• Within 11minutes and 45 seconds, 95% of the time (Urban/Suburban) • Within 20 minutes, 95% of the time (Rural)
Full effective response time (time from dispatch until all units initially dispatched arrive at the incident. Response resources needed for a moderate risk building fire are used for the evaluation).	• Within 13 minutes, 90% of the time (Urban) • Within 14 minutes. 90% of the time (Suburban) • Within 21 minutes, 90% of the time (Rural) • Within 45 minutes, 90% of the time (Wilderness)

All response time elements are reported at a given percentile, consistent with NFPA Standards 1710 and 1225 and SRVFPD's performance goals. Percentile reporting is a methodology by which response times are sorted from least to greatest, and a "line" is drawn at a certain percentage of the calls to determine the percentile. The point at which the "line" crosses the 90th percentile, for example, is the percentile time performance. Thus, 90% of the time were found to be at or less than the result. Only 10% were longer.

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

A detailed description and review of each phase of the response time continuum follows.[32] Finally, all phases will be compared to SRVFPD's current performance goals.

Detection

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

Call Processing

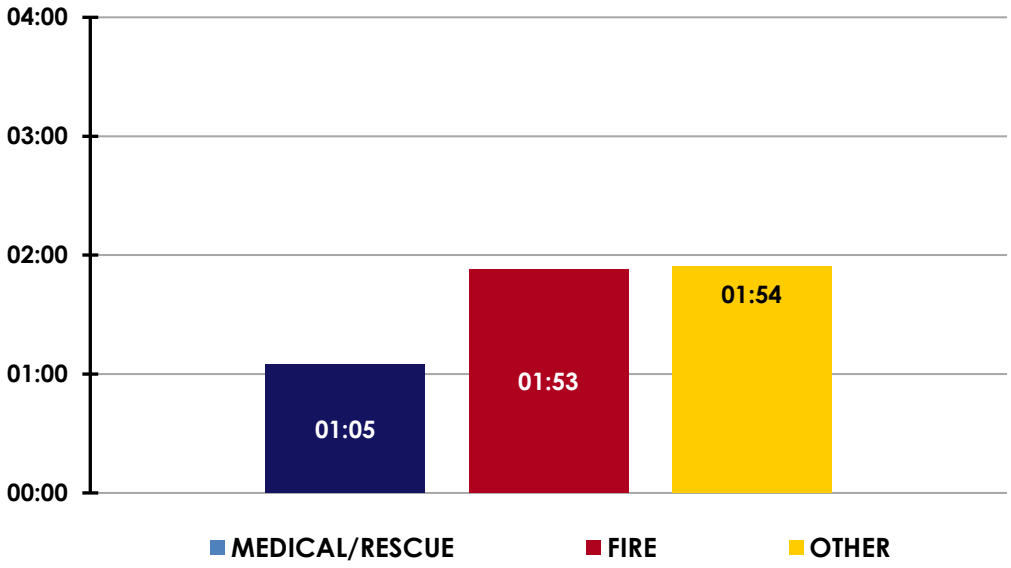
The call processing phase has two parts. First, most emergency incidents are reported by telephone to the 911 Emergency Communications Center (ECC). Call takers must quickly elicit accurate information about the nature and location of the incident from persons who are apt to be excited. Lay people well-trained in reporting emergencies can reduce the time required for this phase. The dispatcher must identify the correct units based on incident type and location, dispatch them to the emergency, and continue to update information about the emergency while the units respond. Step one of this phase, labeled "call processing time," begins when the 911 call is answered at the ECC and ends when response personnel are notified of the emergency.

NFPA Standard 1225 (2022) recommends that 911 calls be answered within 15 seconds, 90% of the time and within 20 seconds, 95% of the time. The San Ramon Valley 911 Communications Center provided data indicating that over the last twelve months a 98% compliance rate in answering 911 calls within 10 seconds.

The second part of the call processing phase—called "dispatch time"—begins when the call is received at the ECC and ends when response units are notified of the incident. NFPA 1710 standard states this phase should occur within 64 seconds, 90% of the time for simple dispatches and within 90 seconds, 90% of the time for incidents requiring additional information or medical dispatch questioning or MPDS. SRVFPD's current objectives stipulate that this phase should occur within 60 seconds, 90% of the time with no determination of dispatch type.

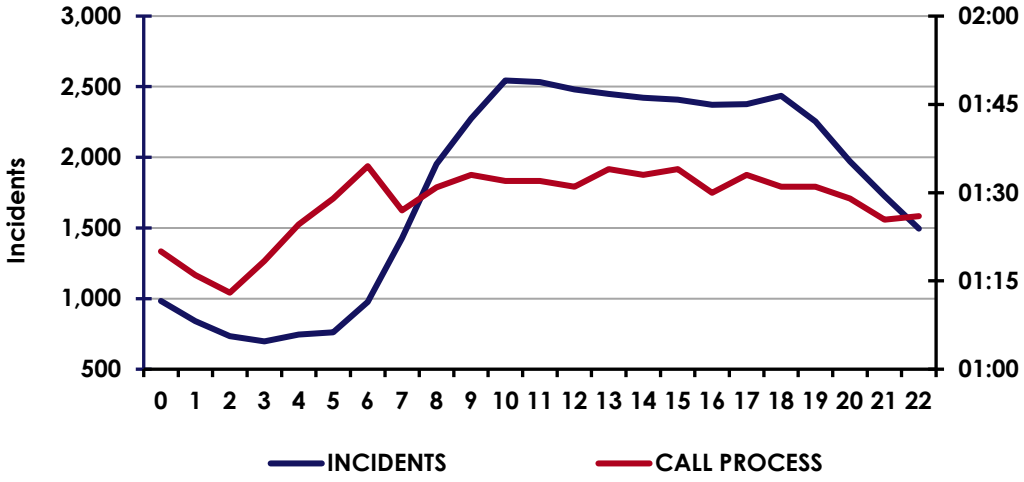
The following figure illustrates the ECC's performance from the time it receives the call until it notifies response units. Overall performance during the study period was over the objectives set, although the Medical/Rescue performance was very close to the goal.

Figure 129: Call Processing by Incident Type



The workload at the dispatch center can influence call processing performance. The following figure illustrates performance at different times of the day compared to SRVFPD's response workload. The call processing performance increases by 20 seconds with the increase in incident volume.

Figure 130: Call Processing by Hour of Day

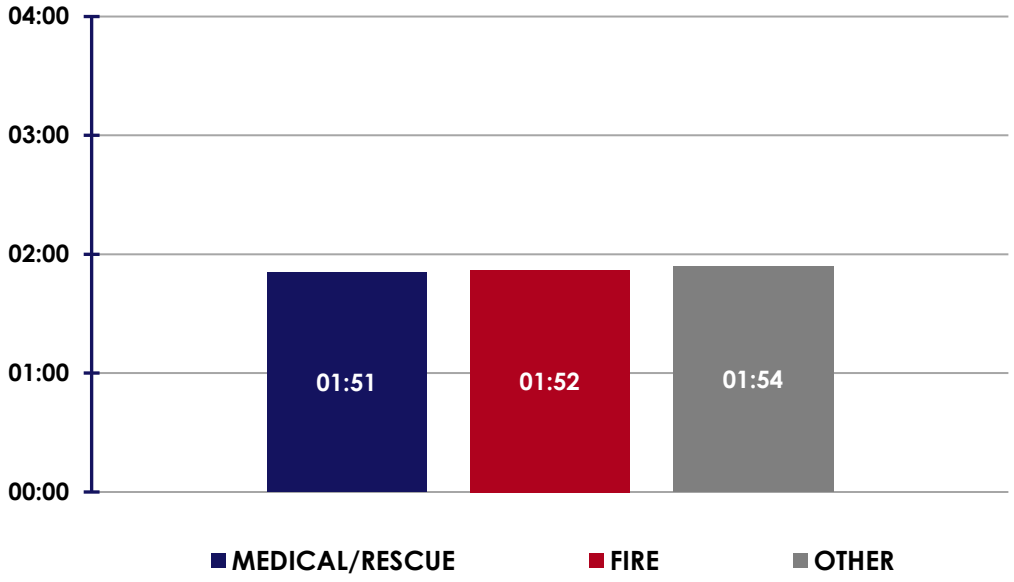


Turnout Time

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

The current SRVFPD performance goal for turnout time is within 120 seconds, 90% of the time for priority emergency incidents. The NFPA 1710 standard is 60 seconds for EMS, and 80 seconds for fire incidents, 90% of the time for priority incidents. The following figure lists turnout time by incident type. During the study period, turnout times for priority incidents were within the objective set by the department. Turnout Time was best for medical/rescue incidents.

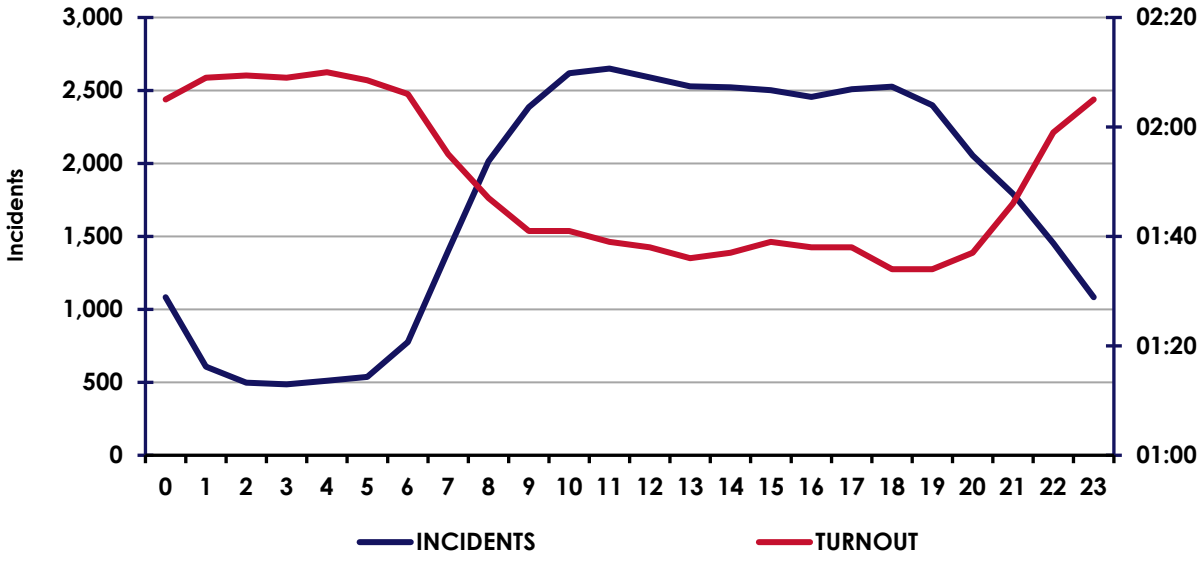
Figure 131: Turnout Time by Incident Type



Turnout time can vary by the hour of the day. In this case, turnout time varied by 73 seconds between the early morning and daytime hours, as shown in the following.

The longest turnout times occurred during 02:00–03:00 hours (2:55), with the shortest during 18:00–19:00 hours (1:41).

Figure 132: Turnout Time by Hour of Day

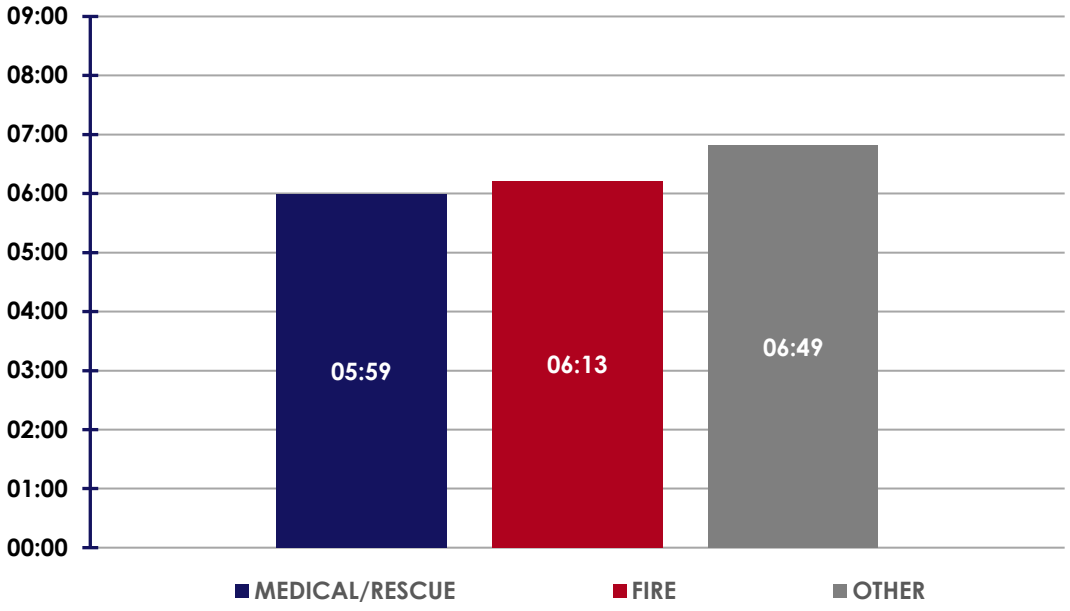


Distribution & Initial Arriving Unit Travel Time

Travel time is potentially the longest of the response phases. The distance between the fire station and the location of the emergency influences response time the most. The quality and connectivity of streets, traffic, driver training, geography, and environmental conditions are also factors. This phase begins with the initial apparatus movement toward the incident location and ends when response personnel and apparatus arrive at the emergency's location.

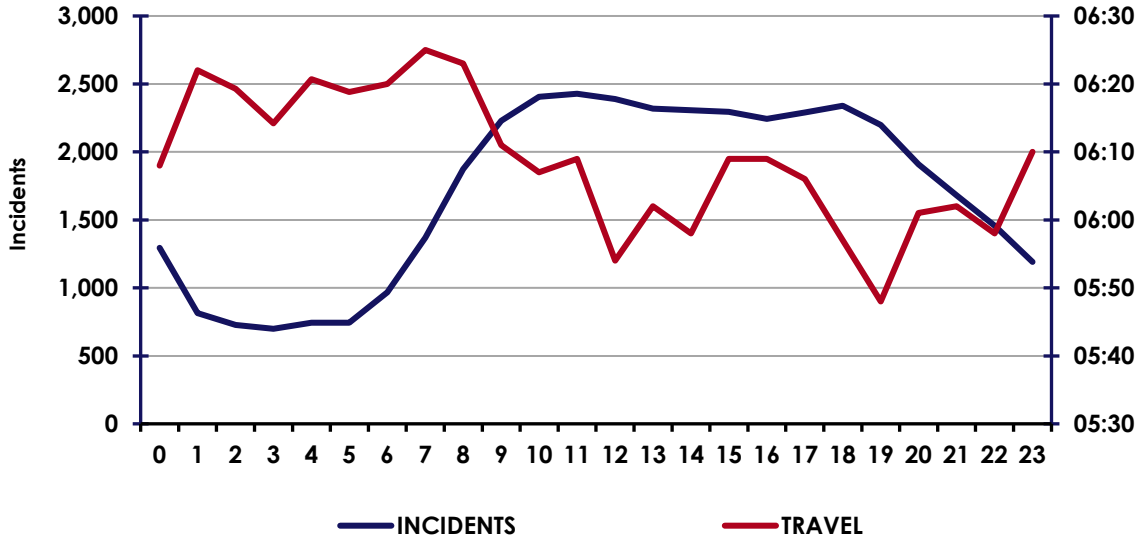
SRVFPD's current standards at 90% are 4 minutes for urban, 7 minutes for suburban, 12 minutes for rural, and 42 minutes for wilderness areas. The NFPA standard at 90% is 4 minutes regardless of the type of area. The majority of SRVFPD's calls are in the urban area however the figure below shows all areas combined.

Figure 133: Travel Time by Incident Type



Travel time can vary considerably by the time of day. Heavy traffic during morning and evening rush hours can slow the district's response. Concurrent incidents also can increase travel time since units from more distant stations would need to respond. Morning commuter traffic appears to affect travel time more than evening commuter traffic. The following figure shows the travel time performance and the hourly workload. There is a significant inverse correlation between the number of incidents and travel time. The travel time in the middle of the night is unusual.

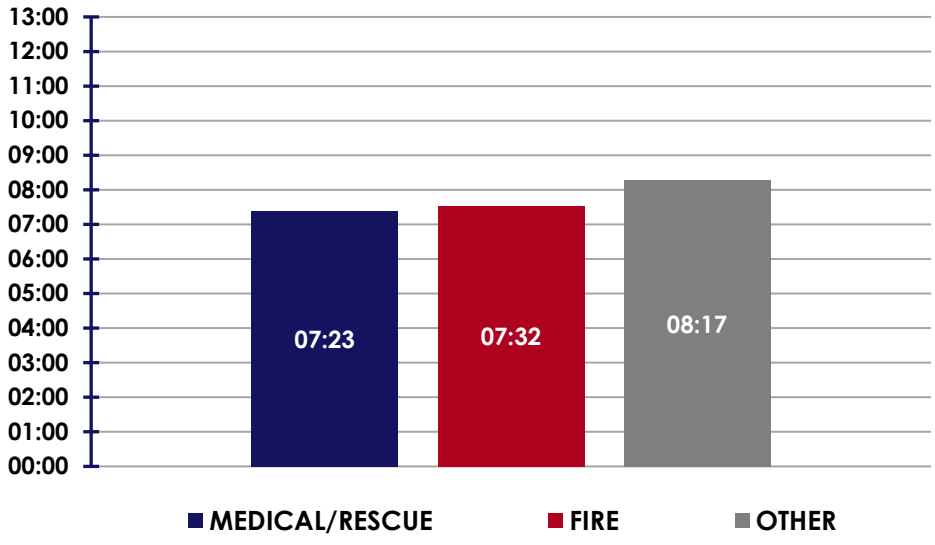
Figure 134: Travel Time by Hour of Day



First Arriving Unit Response Time

First arriving unit response time is defined as the period between the notifications of response personnel by the dispatch center that an emergency is in progress until the arrival of the first Fire Department response unit at the emergency. The following figure illustrates the response time for priority incident types. SRVFPD's current standards at 90% are 6 minutes for urban, 9 minutes for suburban, 14 minutes for rural, and 44 minutes for wilderness areas. The NFPA standard at 90% is 5 minutes for EMS and 5 minutes and 20 seconds for fire incidents regardless of the type of area.

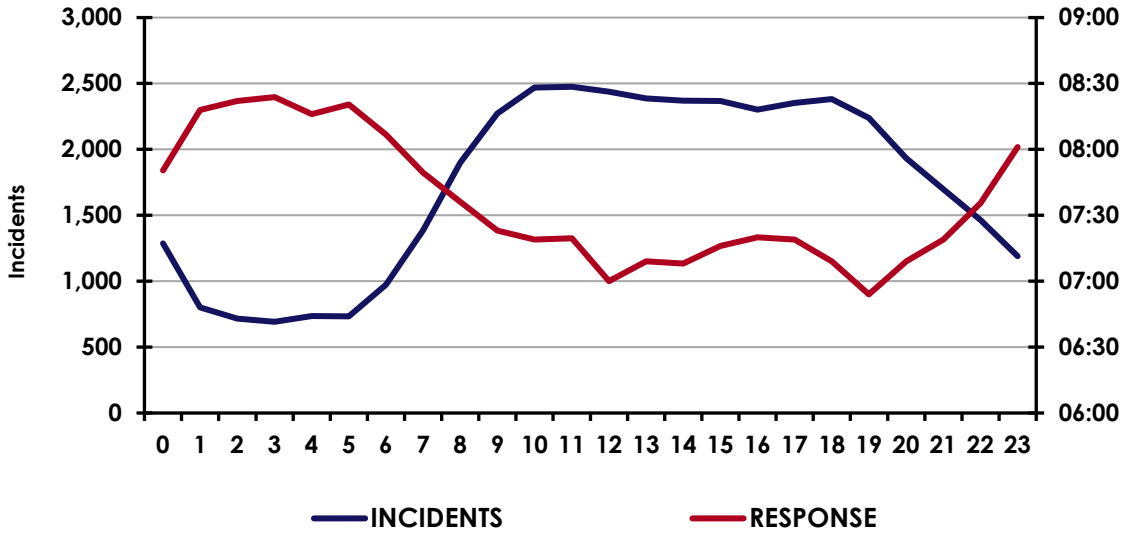
Figure 135: Response Time—Dispatch to Arrival by Incident Type



First Arriving Unit Received to Arrival Time

From the customers' standpoint, response time begins when an emergency occurs. Their first contact with emergency services is when they call for help, usually by dialing 911. The call received to arrival time phase combines the answer/transfer, call processing, turnout, and travel time phases. SRVFPD's current standards at 90% are 7 minutes for urban, 10 minutes for suburban, 15 minutes for rural, and 45 minutes for wilderness areas. The NFPA standard at 90% is 6 minutes, 4 seconds for EMS and 6 minutes and 20 seconds for fire incidents regardless of the type of area. The following figure shows received to arrival performance by time of the day compared to incident activity by time of day. Again, from the customers' standpoint, received to arrival is quickest during the day and slowest during the early morning hours.

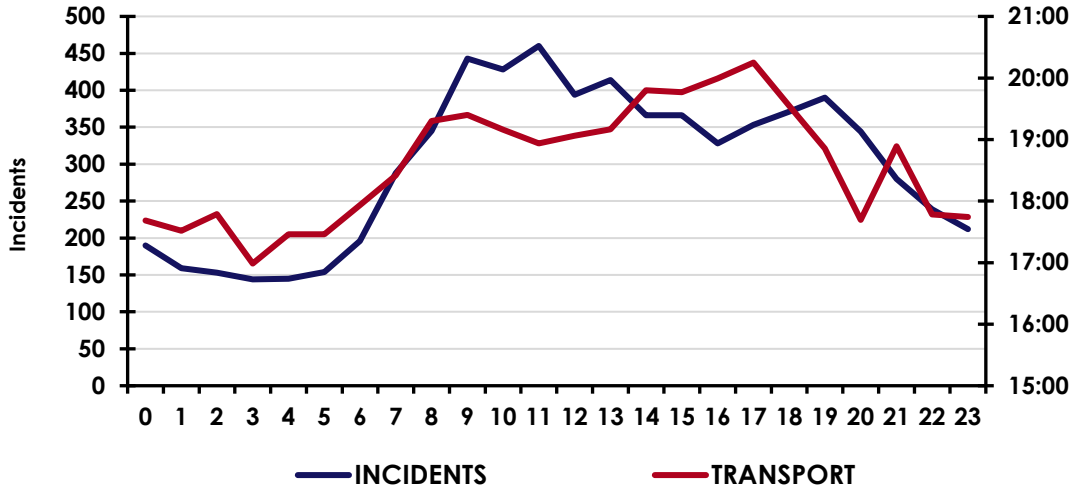
Figure 136: Response Time from Received to First On-Scene



Patient Transport Analysis

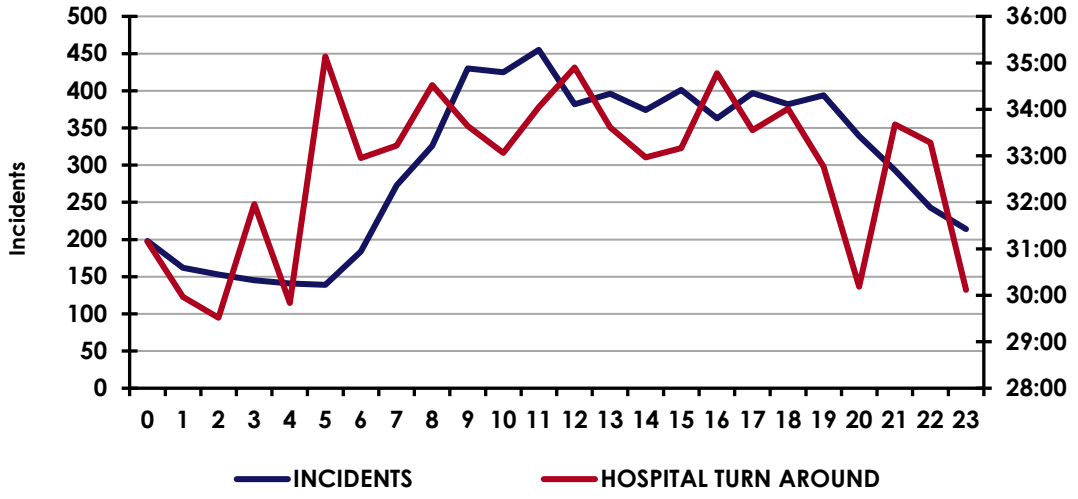
When patients are transported, the additional time spent on the related activities is measured. One is the time spent traveling from the scene to the hospital. This can vary not only depending on factors such as the traffic, weather, and time of day but also on the patient's choice of hospital or the patient's condition that warrants a specialized facility. The following figure shows the travel time variance during the hour of the day against the level of EMS incident workload.

Figure 137: Patient Transport Times by Hour of the Day



Travel time for transport-capable units increases during the daytime and peaks in the late afternoon hours, presumably due to increased traffic inhibiting the transport unit. The following figure measures the time spent for a unit to arrive at the hospital, deliver the patient, and prepare the unit to be declared available for service. This is measured by the hour of the day against the EMS incident workload. Units become available for service most quickly during the morning hours. This time increases as the midday and evening approaches. There may be several causes. Busier emergency rooms may take longer to accept the patient from EMS crews. The hospital turnaround time is from arrival at the hospital to being available again. This is also identified as Ambulance Patient Offload Time (APOT) or "Wall" time when delayed.

Figure 138: APOT ("Wall") Time by Hour of Day



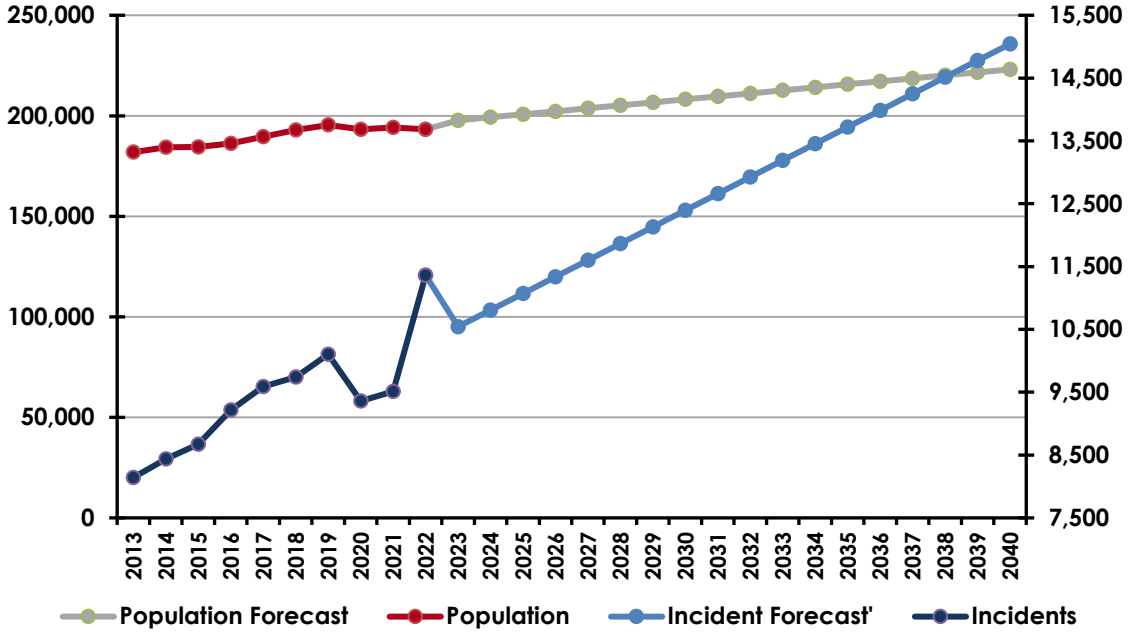
Population & Incident Workload Projections

Projected Service Demand

Prior to the pandemic, the utilization rate of the fire district per 1,000 population generally had been stable, as shown in the following figure. However, the COVID-19 pandemic in 2020 to 2022 has significantly impacted this rate. In addition, many EMS systems across the country experienced a reduction in demand due in part to reduced traffic incidents with work-from-home situations, and the fear of transmission of the virus when going out in public, including the hospital. Nevertheless, despite the recent dip in utilization, the rate is expected to stabilize through 2040. The significant dip in incidents from the COVID-19 pandemic in 2020 and 2021, then the steep increase in 2022 does severely impact computer forecasting as seen in the figures below. It is unlikely there will be a dip in 2023 as currently forecasted.

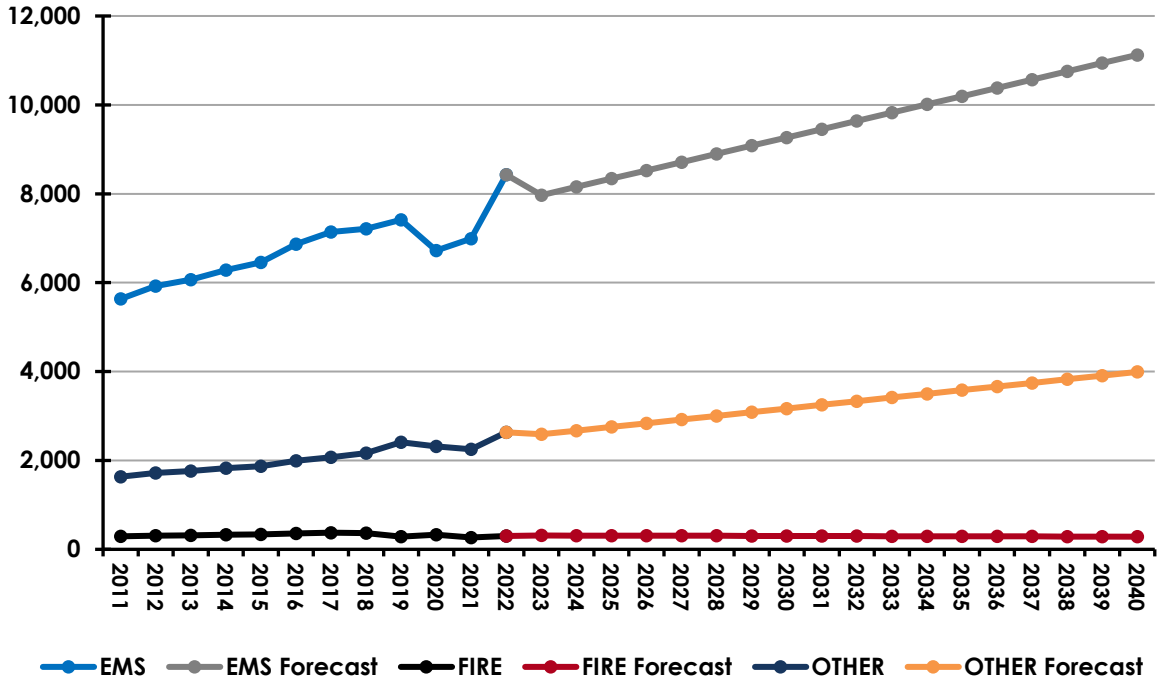
A forecast for a future population can be calculated using the growth rate data based on the U.S. Census Bureau estimates of the service area. Because the district covers several incorporated and unincorporated areas, a local forecast based only on incorporated areas cannot be used. The COVID-19 pandemic also impacted population as seen in the numbers in 2020 to 2022. The loss of population along with Census forecasting for California post COVID has lowered the forecasted population. The Census-based forecast calculated a population of 223,000 in 2040. This averages to about 18% growth over the period and an additional 30,000 residents as shown in the following figure. However, if the pandemic trends reverse the population increase could be higher.

Figure 139: Population and Incident Projections



The increased utilization rate, plus expected population growth, will potentially increase SRVFPD's workload, as shown in the following figure. Response workload could reach over 15,000 incidents per year by 2040, a 33% increase driven primarily by EMS requests.

Figure 140: Service Demand Projections by Incident Type (2023–2040)



The impacts of the COVID-19 pandemic on statistics and forecasting are significant. California has also seen population changes driven partially by remote work that are not fully understood yet. Triton feels that this uncertainty makes forecasting very difficult at this time and the computer models less reliable than usual.

Section IV:
FINDINGS & RECOMMENDATIONS

Findings & Observations

The following section outlines some of Triton's findings and observations during this study. Strategies and recommendations will follow this section. The current performance level and overall system delivery provided by the SRVFPD is outstanding. The district can quantify the high-level system delivery in numerous ways, including response times and patient care data.

As EMS systems are evolving across the Country and the SRVFPD continues to be committed to providing a very high level and efficient EMS service throughout the communities served. The district has taken a long-term approach to how EMS delivery should evolve to meet increased call volume and external demands. It is very clear that the goal of providing quality patient care continues to be a priority for the district.

Operations & Deployment

The wait probability for stations 30 and 33 and the unit hour utilization for E-34 and E-31 should be monitored and future staffing decisions should consider these metrics.

Future suppression staffing should also evaluate the need for staffed Truck Company at station 30, that would improve the wait probability and improve Truck coverage.

SRVFPD has been working on and training for the need to meet the behavioral and mental health needs of the community. As these programs are developed and implemented, there could be a need to modify or provide a "tiered dispatch" system. These programs may require working with Contra Costa County Department of Public Health, to bring additional County health care resources into the system.

SRVFPD has a robust Pre-Plan and inspection program for identified target hazard locations that is updated annually. The identified list of childcare facilities for infants, preschoolers, or afterschool care appears to be limited to the San Ramon area. The process for identifying these facilities should be reviewed for all areas of the district to ensure these facilities are captured.

Response Performance

The establishment of fire and EMS response time standards and targets is a primary responsibility of policymakers, based on community risk, and SRVFPD's capabilities. SRVFPD should review the current response performance goals and evaluate past performance to determine if changes are warranted. SRVFPD meets or is close to most current performance goals except for first unit travel time and full effective response force to larger incidents. These are impacted by road and terrain challenges in parts of the district, but concurrent incidents and resource reliability as identified in this report should be monitored.

Ambulance Operations

The ambulance operational observations can be broken into a couple of identified areas; response times/travel times, EMS incident volume/locations, and EMS medic unit workload distribution for both Single Role (SR)medic units and firefighter/paramedic (PM) medic units. Each of these medic units has its respective missions. SR medic units are focused on patient care as their primary role. The firefighter/PM medic units have dual missions, one as the first responders and one as a patient care role.

SRVFPD's contract with Contra Costa County to provide ambulance service includes requirements for level of care, response times, clinical standards, personnel standards, training, equipment, vehicles, communications, public education, and data reporting. Triton did not identify any concerns in SRVFPD's performance in compliance and reporting requirements of this contract.

There are other outside factors that have impacts on the ambulance delivery system, including APOT or wall time that should be included in workload calculations.

Personnel & Staffing

SRVFPD should monitor EMS and fire suppression workloads as future staffing changes are evaluated. The addition of Single Role Paramedics to operate ambulances is a cost-effective way to increase EMS capabilities while keeping all risk firefighter paramedics more available. To keep the Class 1 rating from ISO the district will also have to increase suppression staffing as call volume and population increases.

Unit Hour Utilization rates for ambulances that run higher than suppression units need continuous monitoring for not just system performance, but also employee health and wellbeing.

Recruitment

There have been some areas of opportunity identified along with challenges in this critical area. As the State comes out of the COVID-19 pandemic, the EMT/paramedic training institutions have begun to deliver larger classes for both the EMT and EMT-P levels. However, the State is still short thousands of paramedics compared to before the pandemic. Standard recruitment processes are no longer meeting the demands of most EMS providers throughout the State.

SRVFPD currently has a robust recruitment program which consists of District Aids, reserves, and the high school iQuest program. In 2022, SRVFPD started a single-role paramedic program to bolster the recruitment pipeline for paramedics. SRVFPD has also developed a plan with the Fire Candidate Testing Center (FCTC) and has a goal of participating in recruitment presentations in the five Bay Area Counties. These will be at colleges and paramedic programs starting this year. SRVFPD also has a well-established scholarship program that provides financial aid to District Aids and reserves to attend Firefighter I academies and paramedic programs.

Fire Stations & Facilities

The SRVFPD has a robust facility replacement plan, but two stations are over 50 years old, and one is over 40 years old.

Medical Training/Education

Medical Training is continually evaluated and reviewed through the Continuous Quality Improvement (CQI) process, and the EMS education and training programs completed annually. The most recent example to quantify the abilities of the personnel within SRVFPD was the usage of personnel to assist the Contra Costa County Department of Public Health during the COVID-19 pandemic since SRVFPD was able on multiple levels and times to assist in the greater needs of the Contra Costa County residents.

This area of prehospital EMS and public health has seen some of the most technological improvements for prehospital personnel as telehealth options have become more accessible to doctors/healthcare-hospital systems. Having paramedics able to provide these services to the patient may allow better healthcare access to all community members. As the district continues to assist the Contra Costa County Department of Public Health, there could be an opportunity to expand into community paramedicine. This would require joint training from the prehospital and hospital personnel, allowing access to County healthcare resources.

Medical Control

As other system issues impact prehospital EMS providers, including APOT times, increased traffic times, and hospital diversions, there will be direct impacts that can affect the patient care delivered by the district. This is where the Local Emergency Medical Services Agency (LEMSA) and the County medical directors need to assist with options for the EMS system providers.

There are numerous options that need to be explored including alternative destinations, County Public Health intervention/resources, and Release at Scene (RAS) using telehealth options. The establishment of a treatment plan, allowing for a 12–24 hour follow up with healthcare providers is also a possibility. There is the ability to explore pilot programs that could expand scope of practice to better meet the needs of the communities served. The LEMSA will need to be involved in these processes, for both the medical control and potential funding.

These opportunities for improvement to the overall healthcare access points will take a lead EMS provider agency to demonstrate to the LEMSA and public health that it is possible.

Continue piloting the tiered dispatching program for behavioral mental health patients to also involve public health agencies for the potential of a "warm handoff" of these patients. This might be the single largest area of opportunity for SRVFPD as the need for improved community healthcare access and patient follow-up.

Financial

SRVFPD continues to experience growth in property tax valuations and related revenues. The district's conservative financial policies have produced an uncommitted operating reserve that exceeds 10% of its annual operating costs. This is in addition to the commitment of 50% of projected annual revenues (dry period funds) and the stabilization requirements (rainy day funds) amounting to the combined balance of twice the Workmen's Compensation retention amount and 20% of the General Fund expenses. Combined, these funds exceed 90% of the district's expected annual expenditures.

The SRVFPD has created a Capital Improvements Plan to maintain, improve and replace buildings, apparatus, equipment, and technology and has created a system using General Fund transfers and the use of debt instruments to fund the outflows. Fleet units are replaced on a scheduled basis. The district should continue to review, evaluate, and update its fiscal policies as the fiscal landscape changes and new fiscal threats emerge.

Proposed Strategies & Recommendations

The following section describes proposed strategies and recommendations identified by Triton. They are not presented in any order of priority, and Triton recommends that SRVFPD, stakeholders, and the Board of Directors develop priorities and timelines for implementation of chosen items.

Recommendation 1: Sustainable Recruitment Process

Monitor current recruitment programs to ensure a sustainable recruitment process that can meet the single role (SR) EMT and EMT-P, and firefighter/paramedic level is maintained. This would also include focusing on the local recruitment needs of the communities served. The coordination between the EMS academy and firefighter/paramedic academy will be critical moving forward as the staffing demands for both the single role and suppression operations increase. The process for each academy is to support the overall mission of providing quality new staff for the district without creating staffing shortages on either operational functions or single-role or firefighter/paramedics.

There is a continued critical need to have sufficient firefighter/paramedics available to meet the district's staffing needs. This serves multiple purposes to provide the critical demands of the role of a first responder and then as the patient care EMS provider.

Recommendation 2: Add Single-Role Paramedic Ambulance at Station 34

When evaluating ambulance coverage and anticipating future ambulance needs, there could be a need for an additional SR medic unit. Current data indicates that Station 34 is the next service demand area for SR unit. This would address the current service demands on the dual-role medic units responding to this area. This unit could be staffed in numerous ways, including 24-hour or peak activity staffing such as 0700-1900 each day. There are also options that could be implemented using different patient care levels such as a Basic Life Support (BLS), unit.

The additional medic units give more opportunities to meet service level demands during peak activity times. This would assist in continuing the high level of timely patient care. The staffing models available can be driven by the data collected in this report and the EMS system needs of the district.

This SR medic units will be able to assist with APOT "wall times" of other district PM medic units that would otherwise be committed to inappropriate extended time demands on EMS transports. With the addition of more SR medic units come the opportunities for expanded EMS service roles of these SR medic units to assist the district in meeting internal and external service demands.

These demands can be met with multiple operational options. The SR medic units can be developed at peak times and locations within the heavier EMS response areas. Also, these SR medic units can be staffed at either the BLS/ALS or higher level allowing for a more expanded role in the delivery of EMS and health care access.

Recommendation 3: Continue the Comprehensive CQI and EMS Education Programs

Continue the comprehensive CQI and EMS education opportunities within the organization. These training/education functions have been and will continue to be critical to ensuring the highest level of patient care delivery as opportunities become available for the district to continue to assist and possibly expand EMS delivery services. An established training/educational process will allow staff to receive these new EMS skill sets. Additionally, training will be critical in the demonstration of the dedication that the district has to providing quality EMS patient care over several decades.

Recommendation 4: The District Should Continue to Participate in the "Warm Handoff" program.

Continue piloting a tiered dispatching program for behavioral mental health patients to also involve public health agencies for the potential of a "warm handoff" of these patients. This might be the single largest area of opportunity for SRVFPD as the need for improved community healthcare access and patient follow-up. Much of this opportunity lies directly with the LEMSA and public health agencies to implement.

Recommendation 5: Ensure Station Replacement Projects Continue

The SRVFPD has a robust facility replacement plan, but two stations are over 50 years old, and one is over 40 years old. The district should ensure that replacement plans for stations 33, 39, and 31 stay on track.

Recommendation 6: Consider adding a 12-hour peak-demand ambulance or quick-response unit during the daytime hours at Station 30 and Station 33.

For all risk fire responses, the queuing analysis of 2022 incidents showed that Stations 30 and 33 were each over the recommended 10% threshold during the 12-hour daytime hours of 0800–1959. Stations 30 and 33 have a wait probability of 15% and 14% respectively.

One option to address the wait probability deficit would be to assign a 12-hour peak-demand unit during the daytime hours at Stations 30 and 33. As shown in the next figure, adding a peak-demand unit at Stations 30 and 33 would potentially reduce the wait probabilities to 1% each.

Figure 141: Potential Wait Probability Reductions at Stations 30 & 33

Fire Station	No. Day Units	No. Night Units	Current Wait		Wait Reductions	
			Day	Night	Day	Night
Station 30	**2**	1	**15%**	9%	**1%**	9%
Station 31	3	3	0%	0%	0%	0%
Station 32	2	2	1%	0%	1%	0%
Station 33	**2**	1	**14%**	6%	**1%**	6%
Station 34	2	2	4%	1%	4%	1%
Station 35	2	2	1%	0%	1%	0%
Station 36	1	1	7%	3%	7%	3%
Station 38	2	2	1%	0%	1%	0%
Station 39	2	2	2%	0%	2%	0%

Since most calls are EMS, deploying two-person firefighter ambulance or quick-response vehicles (QRV) might be the most efficient and cost-effective option to improving the wait probability. This could be a combination of an ambulance at one station and a QRV at another. The response zone for such units could be expanded beyond the assigned fire station's usual service area.

The district may also consider staffing a Type 6 wildland unit with a Firefighter/Paramedic and company officer with an expanded response area.

Recommendation 7: Consider adding a Truck Company at Station 30

As identified, there are several buildings three stories or over in Station 30's area which are outside the recommended 2.5-mile travel distance of a staffed Truck Company. An alternative to a 12-hour unit as in Recommendation 6, SRVFPD could consider staffing a Truck Company 24-hours a day at Station 30 as the next step. This recommendation would also improve SRVFPD's score in the next Public Protection Classification review by ISO.

Recommendation 8: Response Performance Goals

SRVFPD should review the current Response Performance Goals and evaluate past performance to determine if changes are warranted.

Some NFPA recommendations are difficult to attain but represent the highest-level goals, and all agencies should balance their goals against these, community risks, citizen expectations, and capabilities. The following figure shows the current established goals, NFPA Standards, and SRVFPD's performance in 2022.

Figure 142: Response Performance Goals, Standards, & Actuals

Interval	Current Goal	NFPA 1710 (2020 edition)	2022 Performance[1]
911 call answer time	15 sec., at 90% 20 sec., at 95%	15 sec., at 90% 20 sec. at 95% (NFPA 1225)	98% at 10 sec.
Call process time	1 min., @ 90%	Basic Incidents–64 sec. @ 90% Incidents needing EMD, or additional information–90 sec. @ 90%	EMS 1:05 Fire 1:53 Other 1:54
Turnout time	2 min., @ 90	EMS–60 seconds @ 90% Fire–80 seconds @ 90%	EMS 1:51 Fire 1:52 Other 1:54
First unit travel time	• 4 min., @ 90% (Urban) • 7 min., @ 90% (Suburban)	4 min., @ 90%	EMS 5:59 Fire 6:13 Other 6:49
First unit total response time	• 7 min., @ 90% (Urban) • 10 min., @ 90% (Suburban)	EMS 6:04 min., @ 90% Fire 6:24 min. @ 90%	EMS 7:23 Fire 7:32 Other 8:17
Priority 1Ambulance response time (dispatch to arrival)	• Within 11:45 @ 95% (Urban/Suburb.) • Within 20 minutes, @ 95% (Rural)	No Separate Ambulance Standard when first unit is ALS	9:12 (@95%)
Full effective response force response time	• 13 min., @ 90% (Urban) • 14 min., @t 90% (Suburb.)	10:24 min., @ 90%	15:30

[1]At the 90th percentile.

As stated, the establishment of fire and EMS response time standards is a primary responsibility of policymakers, based on community risk, citizen expectations, and capabilities. SRVFPD meets or is close to most current performance goals except for first unit travel time and full effective response force to larger incidents. These are impacted by the road network and terrain in parts of the district.

The CPSE recommends that all agencies incorporate an all-hazard, quality improvement model based on risk analysis and self-assessment that promotes the establishment of community-adopted performance targets for fire and emergency services. The process of monitoring performance and looking for ways to improve is a continuous activity. The following figure shows performance goal changes for consideration by SRVFPD. To attain improvements the implementation of additional recommendations may be needed.

Figure 143: Performance Goals Changes for Consideration

Interval	Recommendations
911 call answer time	Keep goal of within 15 seconds 90% of the time and within 20 seconds 95% of the time.
Call process time	Consider adopting NFPA 1710 standard: Basic Incidents–64 seconds @ 90%. Incidents needing MPDS, or additional information – 90 seconds @90%. Review process for fire calls to look for efficiencies. Review night staffing to ensure adequate staff is available.
Turnout time	Keep goal of 2 min., 90% of the time for fires. Consider 90 seconds, 90% of the time for EMS. Review night performance.
First unit travel time	Keep goal of 4 min., 90% of the time (Urban). Monitor night travel times for efficiencies. Consider updating goal to 6 min., 90% of the time (Suburban). Monitor night travel times for efficiencies.
First unit total response time	Keep goal of 7 min., 90% of the time (Urban) Consider updating goal to 9 min., 90% of the time (Suburban)
Priority 1 Ambulance response time (receipt of call to arrival)	Keep contracted time within 11:45 95% of the time (Urban/Suburban) Keep contracted time within 20 minutes, 95% of the time (Rural)
Full effective response force response time	Keep Current goals. Review response plans and Mutual Aid Agreements to look for possible improvements. Consider other staffing recommendation to improve resource availability to improve performance towards current goal.

Recommendation 9: Develop APOT Billing Program

SRVFPD should consider a program to bill hospitals for APOT times. When hospitals delay the transfer of patients from the ambulance crew to hospital personnel the impacts to the EMS system are tangible. The increased time that the ambulance is not available to respond to another call for help and the increased Unit Hour Workload time on the crew has negative impacts. SRVFPD can use existing Wait Time Fees or establish specific APOT Fee. Other agencies that are implementing APOT Billing are granting 30 to 45 minutes for patient offload before billing begins and are charging between $58 and $129 every 15 minutes after that. The intent is not revenue generation but to encourage hospitals to improve systems for patient throughput.

Recommendation 10: Develop Additional Mobile Integrated Healthcare Programs (MIH)

As identified in Recommendation 4, MIH programs will need to be developed to manage the growing workload of the healthcare System. There are numerous options that should be explored by SRVFPD including alternative destinations, County Public Health intervention/resources, and Release at Scene (RAS) using telehealth options. The establishment of a treatment plan, allowing for a 12–24 hour follow up with healthcare providers is also a possibility. There is the ability to explore pilot programs that could expand scope of practice to better meet the needs of communities serviced.

These opportunities for improvement to the overall healthcare access points will take State Legislation to authorize and a strong EMS provider agency like SRVFPD to demonstrate to the LEMSA and public health officials that it is possible.

Recommendation 11: Consider Relocating Station 39

Station 39 is located very near the district border and although there is high call volume in the area moving the station towards station 34 would improve overall district coverage and provide closer support to the busiest part of the district.

Recommendation 12: Review Response Plans to Ensure Consistency with Identified Risk

Using the Risk Analysis in this report review current response plans to ensure responses are consistent with identified risks. The review should include the type and number of resources to achieve the Effective Response Force for each incident type. The plan should also identify any auto or mutual aid resources that may be needed.

Section V:
APPENDICES

Appendix A: Risk Classifications

The following are the risk classifications determined by incident type.

Fire

Low Risk

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

Moderate Risk

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

High Risk

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

Maximum Risk

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

EMS Risks

Low Risk

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

Moderate Risk

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

High Risk

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

Maximum Risk

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

Technical Rescue

Low Risk

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

Moderate Risk

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

High Risk

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

Maximum Risk

A multiple-unit response is required to control or mitigate a maximum-risk technical rescue incident. Support is required from a specialized technical rescue team and may have multiple operations locations. This type of incident will involve full-scale technical rescue operations such as victims endangered or trapped by structural collapse, swift water, or earth cave-ins. This incident will require multiple alarms and may expand beyond the identified critical tasking. Recall of off-duty personnel or assistance from auto or mutual aid may occur during a disaster or when additional alarms and command staff are needed.

Hazardous Materials

Low Risk

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

Moderate Risk

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

High Risk

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

Maximum Risk

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

Wildland Urban Interface

Low Risk

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

Moderate Risk

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

High Risk

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

Appendix B: Table of Figures

Appendix C: References

[1] Fire Protection District Law of 1987, Health & Safety Code, Section 13800, of California.

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[23] Earthquake Shaking Potential for California, revised 2016.

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