

Village 8 West Fire, Rescue & EMS Needs Analysis

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Executive Summary

This analysis is intended to establish and memorialize the need for additional fire, rescue, and emergency medical services (EMS) for the southeast areas of the City of Chula Vista. More specifically, the current Fire Facility, Equipment, and Deployment Master Plan (FFMP) references the need for an additional fire station at La Media Rd, south of Main Street (Previously Rock Mountain Rd) in Otoy Ranch Village 8 West. The following analysis will provide the location and construction timing for this fire station.

The FFMP was completed to establish a fire station network capable of meeting incident response performance metrics adopted by the City Council for the Fire Department at City buildout. When the FFMP was completed in 2012, precise development plans were not available to support determining the location and timeframe for this fire station to be operational. The FFMP is limited in its discussion on page 134 regarding the Village 8 West Fire Station. The FFMP does however state that a fire station should be planned for the area around La Media Road and Rock Mountain Road; and that the station will house the primary unit for Villages 3, 4, 7, and 8. The FFMP goes on to recommend the Village 8 West station should be built to accommodate at least two units (engine and truck) and that system performance improves by 4 percentage points to 77% when the station is built at the suggested site. There is currently no known document that discusses a needs analysis related to the timing of the fire station within Village 8 West. It is the intent of this document to provide a thorough justification for the starting point at which the fire station should begin the two-year process for planning and build time.

A fire station located in Village 8 West is necessary to provide fire, rescue, and emergency medical services because existing fire stations and response companies were not intended to provide service to this area and do not have response capacity for this new population growth. This fire station will need to be initiated at the 600th single family and/or multi-family residential building permit (also referred to as dwelling units throughout this analysis document) issuance and should be located at/near the intersection of La Media Rd and Main Street in the north-central area of Village 8 West. In addition, based on current data information and the Public Safety Staffing Plan which incorporates several improvements to the response network capability, there is no longer a need for the suggested engine and truck (8 firefighters) at the Village 8 West fire station as recommended in the FFMP. With the new service capability of Fire Department based ambulance transportation, there will however, be a need to house an engine and an ambulance (4 firefighters, 2 ambulance transport employees).

There are two significant items that will be discussed in this analysis. First, is an examination of the need for a fire station to serve the Village 8 West area of the City. Second, the analysis will address the necessary starting point to initiate planning and implementation for fire station construction. This analysis will focus on travel time from the nearest fire station to emergency calls for service (CFS) based on specific call for service types and established performance metrics.

Village 8 West is adjacent to several existing and occupied neighborhood developments. Without the increase to fire service capability, additional CFS caused by population growth will have an impact on Fire Department response threshold standards. The performance of existing fire stations and response

companies currently does not have additional service capacity. The effects will progressively worsen as development approaches build out, and normal service demand continues to increase.

It is a rather easy task to determine the necessity of a fire station in Village 8 West due to the simple fact that the existing fire station network is currently not capable of meeting its City Council established response time thresholds. Any additional increase to service demand will continue to negatively affect the ability to achieve threshold compliance. Nonetheless, the analysis will evaluate the effect of population growth and its impact on the existing Fire Department response network.

This analysis differs from other studies in that it utilizes response data gathered from actual network performance based on historical responses versus theoretical formulas or algorithms. This is an important distinction since typical analysis of requirements for fire protection and emergency service delivery for future development uses theoretical formulas, calculations, or algorithms that focus on road network travel time. Methods such as these were used in the FFMP, produced by Emergency Services Consulting International and in several Otay Ranch Village fire protection plans produced by Dudek. Using posted speed limits for a given route, these methods typically produce the distance of travel that a response unit can reach within five minutes from a proposed fire station location. This method does not accurately take into account traffic calming measures, traffic congestion, time of day, or actual allowable road speed regardless of the posted limit.

By using actual performance based on historical responses, we are better able to forecast the distance emergency response vehicles can physically travel within five minutes. This is possible because actual road conditions and situations have been in place in the proposed areas of development and real information is at hand and can be used. Using this information will help to refine travel distance calculations.

Chula Vista Fire Department

Overview

The Chula Vista Fire Department (CVFD or Department) is the operating Department of the City of Chula Vista (City) designated to provide fire, rescue, and emergency medical services. The Department's jurisdiction encompasses the entire municipal limits of the city.

Currently, the Department's ten stations respond to nearly 24,000 CFS annually, while serving a population of 272,000 and covering an area over 52 square miles. Stations are staffed 7 days a week, 24 hours per day with a total daily staffing of 49 emergency response personnel including two battalion chiefs. Over the past five years, CFS have risen on average 6% annually.

The Department is an all hazard, full-service emergency response organization, and the mission is no longer single focused on extinguishing fires. As the mission began to evolve in the late 1960's, the Department has categorized these different core capabilities and services in the following ways to ensure efficiency and effectiveness:

- Fire Response
- Rescue Response
- EMS Response
- Hazardous Materials Response
- Pandemic Response
- Active Shooter & Mass Casualty Response
- Wildland Fire Response
- Disaster Management

Fire Station Network

A fire station network is built based on two concepts; distribution and concentration of resources. Distribution is spreading fire stations with the appropriate equipment and staffing throughout the service area to minimize travel times to CFS regardless of the volume. Concentration is adjusting the spread of fire stations with the appropriate equipment and staffing throughout the service area based on call volume and/or high-risk potential incidents requiring additional equipment and staffing to safely mitigate the incident.

Reliability, availability, and operational efficiency is the outcome of distribution and concentration of fire stations, equipment, and staffing demonstrated in the form of performance metrics. These performance metrics are outcome based, meaning they have a direct correlation to the amount of fire spread and/or loss, and the severity of irreversible damage to people suffering from a medical emergency.

Today, services are provided from ten fire stations located within the City. The Department staffs a fleet of fire apparatus which includes nine fire engines, two aerial trucks, one Urban Search and Rescue US&R company, two SQUAD response units, and two battalion command vehicles. The Department operates with engine companies in nine of the ten fire station locations and a standalone US&R at the tenth location; fire station 3(FS3). Two stations (FS1 and FS7) house truck companies alongside the engine

companies. FS7 is the hub for two squad units, which operate seven days/week from 0730-1730 hours to support peak call volume on the eastern portions of the city. Operational Battalion Chiefs also respond out of these two fire stations.

Performance Metrics

Department performance metrics are focused on outcomes of core capabilities and services provided. To ensure metrics are effective, they must be specific to the service, measurable, agreed upon, realistic, and time based. It may seem appropriate to have a specific metric for each core capability and service; however, the Department has found that by establishing the following three metrics, all other services are met when these are attained.

Fires

For structure fires, the following performance metric shall be met:

Initial Attack Force (IAF) - First unit on-scene within seven minutes 90% of the time, with four firefighters known as the IAF capable of establishing command, initiating fire attack and search and rescue.

This performance metric maintains distribution and reliability of resources within the firefighting core capability and service. Arriving prior to the seven-minute mark at fires is intended to initiate fire attack and search and rescue prior to flashover. Preventing flashover from occurring increases human survivability within the room of origin as well as in the building of origin and significantly reduces fire loss to room, contents, and overall structure. When the IAF performance metric is met, flashover is avoided, and the forward progress of the fire is stopped; however, it is not extinguished.

The best tactic to avoid flashover is to gain access to the structure, enter with hose-lines, and apply water on the fire as quickly as possible. Complicating this tactic is the Occupational Safety and Health Administration (OSHA) mandate called “two in, two out.” This mandate requires that firefighters may not enter to attack the fire without a Rapid Intervention Crew (RIC) made of two firefighters ready to deploy in the event that the rescue of a fallen firefighter is necessary. The exception to the OSHA mandate is a known threat to human life which requires immediate rescue by firefighters.

Staffing engine companies with less than four firefighters means the first arriving unit does not have enough firefighters to meet the “two in, two out” mandate. Therefore, fire attack must be delayed until a secondary fire engine arrives on-scene. This is contrary to preventing flashover from occurring. The method of staffing engine companies with four firefighters provides the necessary “two in, two out”, staffing levels required by OSHA and eliminates delays in attacking the fire in order to prevent flashover and stop forward progress of the fire.

Effective Response Force (ERF) – The arrival of 14 firefighters on-scene within ten minutes 90% of the time, capable of assuming command and control, establishing a water supply, supporting and backing up fire attack, completing search & rescue, performing ventilation of heat and smoke, and providing a Rapid Intervention Crew and a Safety Officer.

As previously stated, stopping flashover does not mitigate the fire problem, and to safely do so, additional firefighters are required. Fighting a fire requires the right concentration and reliability of resources to meet this metric. Critical tasks must be completed simultaneous to fire attack in order to increase survivability and reduce fire loss. Coordinating resources, extinguishing the fire, searching for victims, and performing ventilation are required by the ERF. ERF drives the necessity of having the correct number of firefighters on-scene in a timely manner. By meeting this metric, the fire can be extinguished minimizing property damage and potential injury or death of occupants, and firefighters can then move to secondary property conservation tasks such as salvage and overhaul.

Emergency Medical Services (EMS)

For emergency medical calls, the following performance metric shall be met:

Emergency Medical Services (EMS) - First unit on-scene within seven minutes 90% of the time, capable of establishing command, providing basic life support patient care, and initiating advanced life support patient care.

This performance metric maintains distribution and reliability of resources within the EMS response core capability and service. Arriving prior to the seven-minute mark is intended to provide basic life support patient care to stabilize the sick and injured. Once the patient is stabilized, advanced life support skills can be initiated prior to the arrival of the transporting ambulance. With the arrival of the first unit on-scene within seven minutes, survivability increases significantly.

Current Fire Department Performance Metric Compliance

Current Department operational performance does not meet established performance metrics. Many factors contribute to this including: firefighter per capita, fire station locations, population growth, aging population, increase in call volume, development, and traffic calming measures.

Below shows the performance of the Department's current fire station network:

Fires (IAF):

- First unit on-scene within 7 minutes 90% of the time with four firefighters capable of establishing command, initiating fire attack and search & rescue. Actual performance for 2019 is 76.5%

Fires (ERF):

- Effective firefighting force with 14 firefighters on-scene within 10 minutes 90% of the time capable of assuming command and control, establishing a water supply, supporting and backing up fire attack, completing search & rescue, ventilation of heat and smoke, providing a rapid intervention crew, and safety officer. Actual performance for 2019 is 84.5%

EMS:

- First unit on-scene within 7 minutes 90% of the time capable of establishing command, providing basic life support patient care, and initiating advanced life support patient care. Actual performance in 2019 for EMS calls only is 81.3%

While Department performance metrics are formulated on a citywide basis, a closer look at individual response areas in the eastern portion of the City reveals inconsistencies with service levels as compared to the west. The Department is implementing measures to improve performance in the east with the goal of matching performance in the west. The opening of FS10, implementation of SQUADS, and implementation of 4.0 staffing are some examples. The fire station network in the region of Village 8 West, shows an average compliance well below all three performance metrics identified above. These gaps are demonstrated in the performance of FS4, FS6, FS7, and FS8 in the table below (Table 1):

FS Performance Near Village 8 West										
	Station 4		Station 6		Station 7		Station 8			
2019	Response Time at 90%	Compliance %	Standard	Avg Compliance						
ALS 1st Unit	0:07:26	86%	0:07:39	83%	0:08:13	77%	0:07:56	78%	7 min @ 90%	81%
IAF	0:08:30	56%	0:09:05	50%	0:10:00	62%	0:10:40	73%	7 min @ 90%	60%
ERF	0:10:49	80%	0:21:51	0%	0:13:24	83%	0:13:34	33%	10 min @ 90%	49%

Table 1

FS10 located in Millenia is not part of this analysis since it was placed into service in May 2020 and limited data is available to analyze. At the time this analysis was completed, FS10 had only been in service for two full months. FS10 averaged 2 CFS per day which did have a positive impact on FS7 and FS8 performance metrics; however, not enough to bring metrics into compliance. Using this as an indication, the impact of FS10 is not enough to compensate for the additional service demand forecasted from Village 8 West.

In addition to FS10 improving FS7 and FS8 performance gaps, FS10 is geographically not the primary FS to support CFS in Village 8 West. Using the intersection of La Media and Santa Luna as the gateway to Village 8 West from existing fire stations and response companies, Figures 1, 2, and 3 below show travel



Figure 1



Figure 2



Figure 3

*Travel distance measured using Bob Pletcher Way when accessible in the future.

distances from FS7 and FS10 to this intersection. Maps were produced using City of Chula Vista’s GIS CVmapper.

Based on figures 1, 2, and 3, FS7 provides the nearest response companies at 1.01 miles. This puts FS10 being the second closest at 1.98 miles currently and then 1.44 miles when Bob Pletcher Way becomes accessible. It should be noted that routing from FS10 to Village 8 West via Bob Pletcher Way utilizes

residential streets, requires three additional turns, and includes more controlled/uncontrolled intersections when compared to routing in Figure 2. Based on this and even though Figure 3 is the shortest travel distance, Figure 2 may prove to be the quickest route.

A thorough analysis is provided later in this report in the Surrounding Area Fire Station Capacity section detailing response from FS7 response companies.

Village 8 West Development

Village 8 West Overview

Village 8 West is located at the southerly edge of the Otay Valley Parcel of Otay Ranch. The town center of Village 8 West is located at the intersection of Main Street (formerly Rock Mountain Road) and La Media Road. Village 8 West is surrounded by Village 4 to the west, Village 2 and 7 to the north, Village 8 East to the east, and Multiple Species Conservation Program (MSCP) open space to the south. Village 8 West currently consists of vacant, undeveloped land.

Population Forecast

According to the Sectional Planning Area (SPA) Plan for Otay Ranch Village 8 West, 2,334 residential units are anticipated (Table 2.1 Site Utilization Summary). Referencing the 2019 Residential Growth Forecast shows the City of Chula Vista has a persons per residential unit factor of 3.30. This factor multiplied by the number of residential units will generate a population growth of 7,702 at build out. No adjustments were made to the persons per unit factor, as Chula Vista has only seen a 0.123 increase in this factor since 2010.

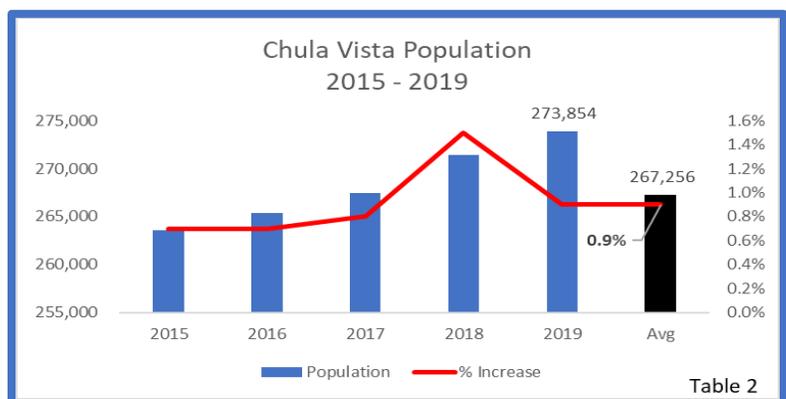
Service Demand Forecast

Fire service demand can be influenced by high risk occupancies or known hazards in an area, (e.g., wildland urban interface), and population. For this analysis, population will be the sole factor in determining the anticipated CFS and therefore impacting the Department’s ability to respond within prescribed performance metrics.

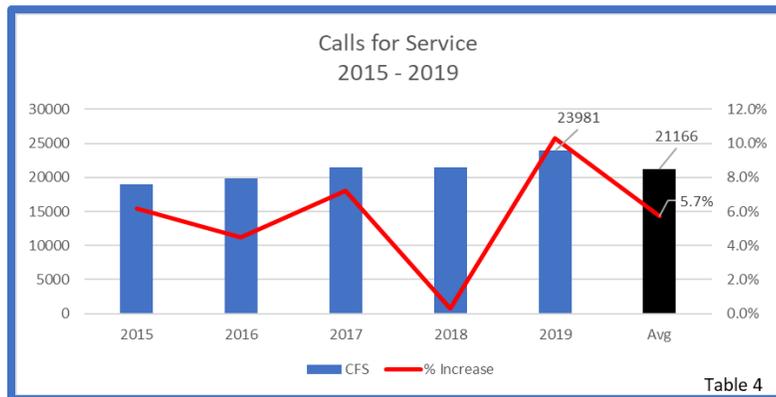
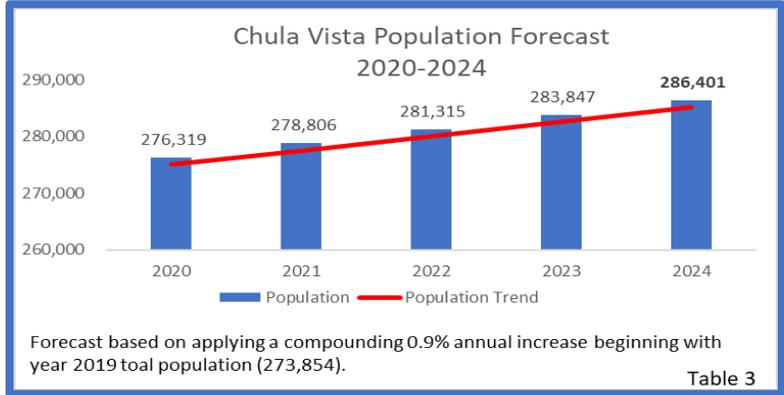
In order to determine service demand, the City’s population growth, the Department’s CFS growth, and Department calls per capita trends need to be analyzed. Once this is done, per capita trends can then be multiplied against the anticipated population of Village 8 West, which will translate to service demand. This service demand is then compared against the performance of the existing fire station network to demonstrate the impacts of adding population and therefore, CFS.

Population

Chula Vista’s population has experienced steady growth for many years. Data demonstrating this increase is derived from the City of Chula Vista Residential Growth Forecast that is produced annually and uses the California Department of Finance population data; the 2019 forecast was used for this analysis.

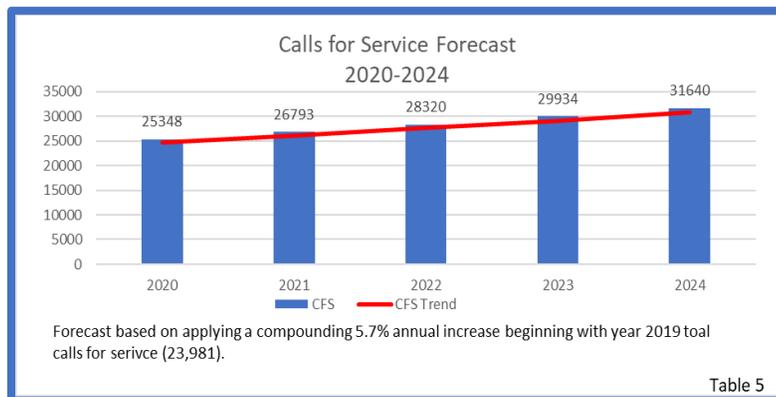


In reviewing data from 2015 thru 2019 (Table 2), the City’s population has grown over 10,000 with an average increase of 0.9% over this period. Using this average increase of 0.9% for future projections brings the City’s population to 286,401 by 2024 (Table 3).



Calls for Service

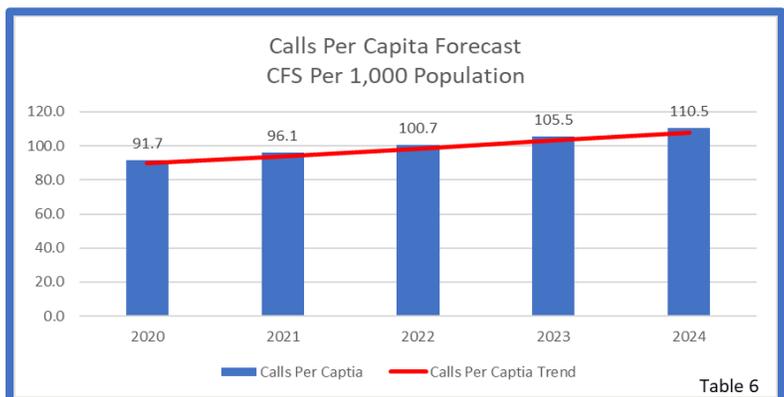
The Department’s CFS have had a steady growth for many years. Data demonstrating this increase is derived from the City of Chula Vista Fire Department’s Annual Response Reports from 2015 thru 2019.



In reviewing data from 2015 thru 2019 (Table 4), the Department’s CFS have grown by nearly 5,000 with an average annual increase of 5.7% over this period. Using this average increase of 5.7% in future projections brings the Department’s CFS to 31,640 by 2024 (Table 5).

Calls per Capita

Combining the City’s population and the Department’s call for service forecasts establishes a trend of the number of calls generated within a 12-month period per 1,000 residents. This is referred to as calls per capita and is used to determine service demand due to development and population growth. Using these forecasts allows for future calls per capita to be



established (Table 6) and provides an understanding of the impacts when dwelling units are not located within existing fire station service areas.

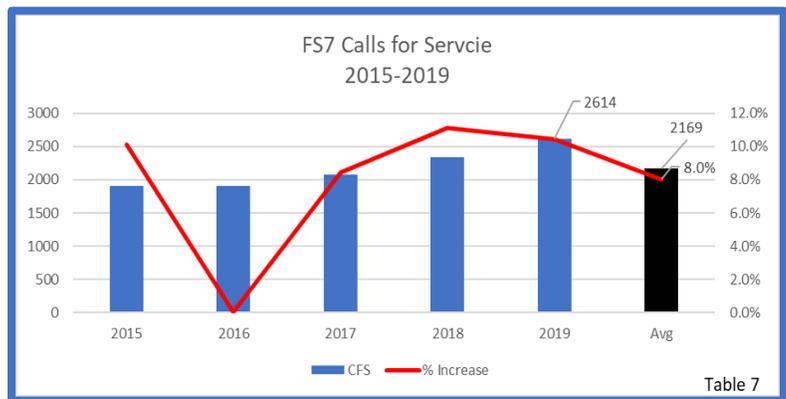
Village 8 West Service Demand

Based on the planned 2,334 dwelling units in Village 8 West multiplied by Chula Vista’s occupancy factor of 3.3 persons per dwelling unit, a population growth of 7,702 residents can be anticipated at buildout. When multiplied by the number of calls per capita, this development is expected to produce 618 CFS annually. Without an additional fire station and response unit(s) located in this area, the corresponding increased service demand would be distributed directly to FS7 located at 1640 Santa Venetia, just north of the Village 8 West development.

Surrounding Area Fire Station Capacity

In 2019, FS7 responded to 2,614 CFS with two response units, Engine 57 and Truck 57. Historical FS7 call volume from 2015 through 2019 (Table 7) indicates an increase of over 700 CFS with an average increase of 8% per year. Just over half of this increase is attributed to the addition of new dwelling units in Otay Ranch Village 2.

The Chula Vista Development Services Department Accela Report on Village 2 Dwelling Unit Permits Issued by Year shows that 1,664 dwelling unit permits were issued between 2015 and 2019. This multiplied by Chula Vista’s occupancy factor of 3.3 persons per dwelling unit, is estimated to have produced a population growth of 5,491 residents. When multiplied by the number of calls per capita, this development produced an estimated 434 additional CFS. These additional CFS make up 3.9% of the annual increases from 2015 to 2019.



The remaining 4.1% increase in CFS growth can be attributed to rising community service demand. Based on this information, the FS7 CFS will reach 3,196 by 2024, adding approximately 582 CFS each year. In addition to the normal increase in CFS, by 2024, Village 2 will grow by an additional 2,871 dwelling units. Using the same methodology from above, the new Village 2 dwelling units would add 9,474 residents to the population. This added population is expected to generate an additional 961 CFS annually. When added to the forecasted CFS in 2024, FS7’s annual CFS volume is expected to increase to 4,157.

In analyzing the current capacity of FS7, performance of Engine 57 and Truck 57 are below standard compliance for all three performance metrics (Table 8). Adding additional service demand to FS7 will result in diminishing performance and negatively impact public safety to existing and future residents.

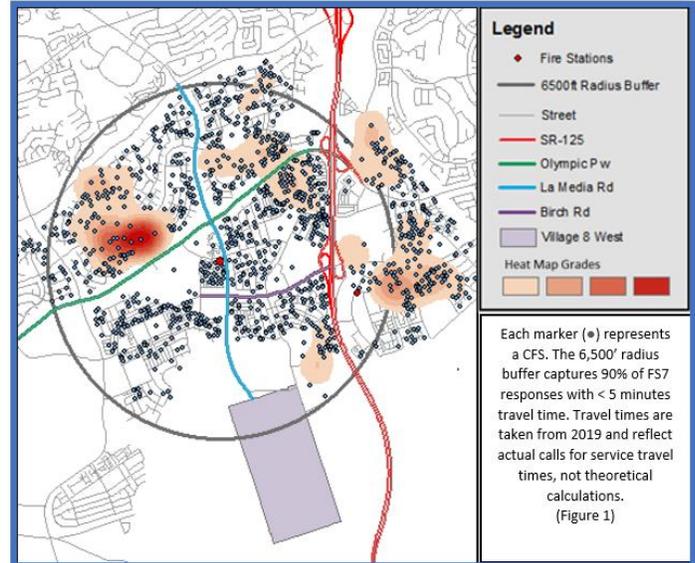
Fire Station 7			
2019	Response Time at 90%	Compliance %	Standard
ALS 1st Unit	0:08:13	77%	7 min @ 90%
IAF	0:10:00	62%	7 min @ 90%
ERF	0:13:24	83%	10 min @ 90%

Table 8

Findings

Village 8 West is the next major development in the City; the development is outside of the current sphere of coverage of the Department. Current Department metrics are below standard compliance indicating a lack of service capacity to absorb impacts of this development. Village 8 West would increase service area, population, and CFS demands, negatively impact current Department compliance.

As described above, FS7 does not have the capacity to serve Village 8 West. In the map to the right (Figure 1), a circle is shown which indicates a 6,500-foot radius buffer. Using historical travel data previously mentioned in this analysis, the circumference indicates the maximum travel distance a response unit can travel within five minutes. This captures the northern 20% of the Village 8 West development, which is shown in purple. Based on this, the Department can support limited development and population growth of up to 600 dwelling units in Village 8 West. At 600 dwelling units the population growth is estimated to be 1,980, which will generate approximately one CFS per day.



Conclusions

The Department concurs with the FFMP assertion that a fire station is necessary in Village 8 West. There is currently no known document that provides a needs analysis related to the timing and location of the fire station within Village 8 West. It is the intent of this document to provide a thorough justification for the starting point at which the fire station should begin the two-year process for planning and build time.

The Department concludes that the starting point for planning and build time of a fire station in Village 8 West shall coincide with the issuance of the 600th single family and/or multi-family building permit. To be specific, two years from the date of the 600th permit issued an operational fire station shall be ready for service. It is at this point that response data described in this analysis demonstrates an increased erosion in the compliance standards at FS7 and FS10.

Regarding the location of a Fire Station within Village 8 West, the Department recommends a location at or near Main Street and La Media Parkway. This will provide ideal access to main thoroughfares and access to Village 8 West, additional planned development, and the existing City.

Summary of Findings

Below are the critical elements of the Village 8 West Fire, Rescue, & EMS Needs Analysis:

1. Village 8 West is anticipated to add 7,702 in population that will increase Department annual CFS by 618 at buildout.
2. Current Department Metric Performance for FS7 are below each of the three Department standards:
 - a. ALS 1st Unit: 77%
 - b. IAF: 62%
 - c. ERF: 83%
3. Village 2 is still developing and is anticipated to add 9,474 in population, increasing Department annual CFS by 961 at buildout. This development is directly serviced by FS7.
4. FS7 annual CFS are forecasted to increase by over 1,543 CFS from 2019 to 2024 and reach a total of 4,157 CFS, not including impacts from Village 8 West.
5. Village 8 West is geographically 80% outside of the closest fire station (FS7) five-minute travel time threshold based on actual incident responses.
6. Two years from the date of the 600th permit issued an operational fire station shall be ready for service; located at/near Main Street and La Media Road.

References

1. Fire Facility and Equipment Master Plan, 2012
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5. Chula Vista Fire Department Annual Stats, 2018
6. Chula Vista Fire Department Annual Stats, 2019
7. Chula Vista Residential Growth Forecast, 2015
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9. Chula Vista Residential Growth Forecast, 2017
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11. Chula Vista Residential Growth Forecast, 2019
12. Otay Ranch Village 8 West SPA, 2020
13. Chula Vista Development Services Department Accela Report on Village 2 Dwelling Unit Permits Issued by Year