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March 14, 2024

TO: Emergency Services Advisory Committee

FROM: Ron Munds, General Manager

SUBJECT: **Agenda Item 3 – 3/14/2024 Emergency Services Advisory Committee Meeting**
Presentation of a Standard of Cover Assessment Report regarding Fire and Emergency Services in Los Osos

STAFF RECOMMENDATION:

Receive information and provide feedback

DISCUSSION:

Background

In early 2023, staff began moving forward with developing a strategic plan for emergency services for the community. It became apparent that outside help was needed to evaluate the current level of service, response times, areas of improvement in the delivery of services, the effectiveness of inter-jurisdictional response agreements and ability to deliver services into the future. With the help of Chief Provence and the Emergency Services Advisory Committee (ESAC), staff developed a scope of work for consultant services for a Standard of Cover (SOC) study.

The Board approved the release of the Request for Proposals (RFP) for consultant services at the July 2023 Board meeting and approved a contract with Citygate Associates LLC (Citygate) in September 2023. The work plan for the study included the following elements, using Commission on Fire Accreditation International Standards of Coverage process, for the community risk assessment/Standards of Coverage:

- Extensive review of all background information regarding the demographics of Los Osos
- Review of Existing Deployment
- Community Outcome Expectations
- Community Risk Assessment
- Critical Task Study
- Distribution Study
- Concentration Study
- Reliability and Historical Response Effectiveness Study
- Overall Deployment Evaluation

Standard of Cover Assessment Report Summary

The report (Executive Summary attached) provides an in-depth assessment of the delivery of emergency services based on nationally recognized guidelines and best practices, federal and state mandates, and relevant local and regional operating procedures to the community. The report provides twenty-four (24) findings, six (6) recommendations (both attached) and suggestions for the "next steps" the District should take to improve emergency services to the community.

Attachment
Standard of Cover Study Executive Summary – Including Findings & Recommendations (complete study available on the District's website; https://www.losososcsd.org/los-osos-csd-standard-of-coverage-final-report-for-emergency-services)

CITYGATE
FIRE & EMS

STANDARDS OF COVERAGE ASSESSMENT

LOS OSOS COMMUNITY SERVICES DISTRICT

FEBRUARY 15, 2024

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EXECUTIVE SUMMARY

The Los Osos, California Community Services District (District) retained Citygate Associates, LLC (Citygate) to conduct a modified Standards of Coverage (SOC) Assessment based on nationally recognized guidelines and best practices, federal and state mandates, and relevant local and regional operating procedures. This assessment is intended to evaluate the District's current fire service staffing and response performance and recommend appropriate staffing and deployment of firefighting and emergency medical service resources to best protect the values at risk within the District service area from fire and non-fire hazards. The study is also intended to provide recommendations for potential future improvement of services and incorporate relevant data analysis and benchmarking to recommended best practice standards and District-established performance goals.

This report is presented in multiple parts, including this Executive Summary; study introduction and background information; the detailed SOC assessment supported by response statistics; all findings and recommendations; next steps; and the full community risk assessment (**Appendix A**). Overall, there are **24** findings and **6** actionable recommendations.

POLICY CHOICES FRAMEWORK

There are no mandatory federal or state regulations directing the level of fire service staffing, response times, or outcomes. If services are provided, however, local, state, and federal regulations must be followed to ensure the safety of the public and the personnel providing the services.

The level of service provided, and any resultant cost, is a local policy choice. Thus, there is often a constructive tension between the desired level of fire service and the level that can be funded, and many communities may not have the level of fire services they desire.

OVERALL ASSESSMENT SUMMARY

The District serves a suburban/rural population with a mixed land-use pattern typical of other communities of similar size and demographics along the central California coast. The District provides fire services with a staff of eight full-time personnel and up to 25 reserve firefighters (nine active at the time of this report) from a single fire station located in the south-central section of the District staffing one engine and one paramedic squad. The District contracts with the California Department of Forestry and Fire Protection (CAL FIRE) San Luis Obispo Unit to provide fire response staffing and administration services with the District retaining ownership of the physical assets. Citygate finds the station location to be adequate to provide first-unit travel times sufficiently quick to facilitate positive outcomes in the more densely populated areas of the District's service area, and the District's physical response units appropriately configured to protect the values at risk from most hazards likely to impact the service area.

FIRE SERVICE DEPLOYMENT SUMMARY

Fire service deployment, simply summarized, is about the ***speed*** and ***weight*** of response. *Speed* refers to initial response resources—typically engines, squads, or ambulances— strategically deployed across a jurisdiction within a specified time interval to mitigate routine-to-moderate emergencies to achieve desired outcomes. *Weight* refers to multiple-unit responses for more serious emergencies such as building fires, multiple-patient medical emergencies, vehicle collisions with extrication required, or technical rescue incidents where enough firefighters must be assembled within a time interval to safely control the emergency and prevent it from escalating into an even more serious event.

Adequate incident response is not defined by the number of physical apparatus responding to a particular emergency, rather it is defined as the appropriate number of firefighters with the right training and equipment to safely mitigate the emergency. Within the fire service deployment process, positive outcomes are the goal. From that, staffing and travel time can be calculated to determine appropriate fire station spacing (distribution and concentration). Serious medical emergencies and building fires have the most severe time constraints.

Typical desired outcomes in *urban/suburban* density communities include preventing death and permanent impairment from medical emergencies where possible and confining building fires to the room or compartment of origin. To achieve this, the initial (first-due) unit should arrive within 7:00 to 8:00 minutes before brain death becomes irreversible or an incipient building fire expands beyond the room or compartment of origin, and the full multiple-unit Effective Response Force (ERF) should arrive within 11:00 to 12:00 minutes with enough personnel to safely perform all the critical tasks necessary to mitigate the emergency and prevent it from becoming even more serious. In *rural* density communities, desired outcomes typically include preventing death from a medical emergency where possible and confining building fires to the building of origin, which means that the first-due unit should arrive within 10:00 minutes and the full ERF should arrive within about 20:00 minutes.

Even where state or local fire codes require fire sprinklers in residential dwellings, it will be many more decades before enough homes within the District service area are remodeled or replaced with automatic fire sprinklers. If desired outcomes include confining fire damage to only part of the inside of an affected building or minimizing permanent impairment or death resulting from a medical emergency, then the District will need first-due unit response performance consistent with Citygate's recommended 7:30–8:30 minutes of a 9-1-1 dispatch notification. More serious incidents requiring assistance from other local fire agencies to resolve are infrequent; however, response times for those resources are significantly longer than required to facilitate positive outcomes in most instances.

Staffing Summary

Over the four-year study period from July 1, 2019, through June 30, 2023, the District's staffing model provided a minimum of four response personnel on duty daily, including three full-time CAL FIRE personnel and one reserve firefighter. With recent changes to minimum training and certification requirements in addition to attrition, the reserve firefighter cadre has dwindled from an authorized maximum of 25 to nine active at the time of this study. With no residency or service requirements and a self-scheduling process, very few reserve firefighters are signing up for shifts resulting in only three response personnel on duty most days. Citygate finds this staffing model *insufficient* to ensure both response units are staffed with at least two personnel each and, when only three personnel are available, both units respond as a single unit leaving (1) no immediate response capacity for a concurrent incident, which occur 13 percent of the time, and (2) insufficient staffing to initiate a rescue requiring respiratory protective equipment in conformance with federal OSHA regulations.

Service Demand Summary

Over the most recent four fiscal years, overall service demand increased nearly 17 percent, with EMS calls representing 74 percent of total demand. Residents over the age of 65 increased from 19.4 percent of the population in 2000 to nearly 28 percent in 2023, suggesting an aging service area population likely to drive up future service demand, particularly for emergency medical services.

The District experienced two or more simultaneous calls for service 13.2 percent of the time over the four-year study period, with total simultaneous incidents increasing approximately 29 percent over the same period. Citygate's analysis also found individual response unit utilization to be well below maximum, indicating capacity for additional non-concurrent service demand is available.

Response Performance Summary

Response performance consists of the following distinct components:

- **Call processing/dispatch** – time interval from receipt of 9-1-1 call until completion of the dispatch notification
- **Crew turnout** – time interval from completion of the dispatch notification until the start of vehicle movement to the emergency incident
- **First-unit travel** – time interval from the start of apparatus travel until arrival at the emergency incident
- **First-unit call to arrival** – time interval from receipt of the 9-1-1 call until the first response apparatus arrives at the emergency incident

As the following table shows, call processing/dispatch and crew turnout performance appear to meet recommended best practice goals; however, the call processing component does not include the time for the Sheriff's Department PSAP dispatch center to transfer the initial 9-1-1 call to the San Luis Obispo CAL FIRE Unit ECC. This additional call processing step will most likely be resolved when the two dispatch centers are consolidated into a new joint facility in the near future.

Table 1—Response Performance Summary (RY 19/20–RY 22/23)

Response Component	Best Practice		90th Percentile Performance	Performance vs. Best Practice
	Time	Source		
Call Processing / Dispatch	1:00 1:30	NFPA Citygate	1:04	**+0:04** **- 0:26**
Crew Turnout	1:00-1:20 2:00	NFPA Citygate	2:06	**+0:26 to 1:06** **+0:06**
First-Unit Travel	4:00	NFPA Citygate	6:04	**-2:04**
First-Unit Call to Arrival	6:00 7:30	NFPA Citygate	8:23	**-2:23** **-0:53**
ERF Travel	8:00	NFPA Citygate	15:46	**-7:46**
ERF Call to Arrival	10:20 11:30	NFPA Citygate	18:44	**-8:24** **-7:14**

First-unit travel performance is 2:00 minutes slower than the Citygate and NFPA-recommended 4:00-minute best practice goal to facilitate positive outcomes in urban/suburban density communities. Overall first-unit call-to-arrival performance, however, is just less than 1:00 minute slower than Citygate's 7:30-minute recommended best practice goal to facilitate positive outcomes in urban/suburban density communities, suggesting that most emergent calls are nearer the core of the service area than the outer, more-rural sections.

At nearly 19:00 minutes, response performance to more serious/complex incidents requiring outside mutual aid resources is *significantly slower* than Citygate's recommended 11:30-minute best practice goal to facilitate positive outcomes in urban/suburban density communities, and thus should not be expected to result in positive outcomes in most cases. This is unavoidable in light of the longer travel distance for mutual aid resources. Over the four-year study period, there were only two incidents where an entire Effective Response Force of two engines, the squad, and a chief officer arrived at the incident, and small data sets such as this are typically quite volatile depending on the incident locations and responding mutual aid resources. While the occurrence of these more serious incidents is infrequent, it is important consider the rate of simultaneous incidents, as well

as the federal OSHA regulation requiring at least four trained personnel to initiate a rescue requiring respiratory protective equipment.

Considering response performance, Citygate recommends the District adopt first-unit response performance goals to drive future deployment planning and response performance monitoring, to include a 1:00-minute call processing/dispatch, 2:00-minute crew turnout, and 5:00-minute travel goal, for a total first-unit response time goal of 8:00 minutes 90 percent of the time. Due to the relative infrequency of more serious incidents requiring mutual aid and the extended distance and associated time for those resources to travel into the District service area, Citygate does not recommend adopting a specific ERF response goal, but rather recommends the District seek to update its automatic and mutual aid agreements to ensure a timely response of the most proximal resources as needed for these less frequent events.

KEY CHALLENGE

From this assessment, Citygate finds the District's key challenge is maintaining adequate daily staffing to provide a reasonable *speed and weight of response* to facilitate positive outcomes and ensure sufficient staffing for at least one concurrent emergency incident. Given current and projected future service demand, aging demographics, simultaneous incident activity, and increasing calls for service outside the District to Montana de Oro State Park, Citygate considers four response personnel, with at least two being paramedics, as the *minimum* daily on-duty staffing level needed to provide this level of service over the near term.

Citygate finds the key challenge to maintaining this minimum daily staffing level is the small cadre of active reserve firefighters with no residency or service requirement and a self-scheduling process for shift coverage. Citygate recommends the District seek to identify opportunities to improve reserve firefighter participation and shift staffing and/or fund additional overtime for full-time personnel to maintain that minimum staffing level. If unable to substantially improve reserve firefighter participation and shift staffing, the District should consider funding an additional full-time position on each shift, with reserve firefighters continuing to augment full-time staffing as available.

Four personnel on duty, however, *does not* provide a minimally sufficient *weight of response* to complete the critical tasks necessary to safely resolve even a moderately complex or more serious event such as a building fire, multiple patient EMS, vehicle collision with extrication required, or technical rescue. Given the extended travel distance for the mutual aid resources needed to achieve an acceptable weight of response (ERF), Citygate recommends the District strive to increase its minimum daily staffing over time, as fiscal resources allow, to at least six personnel on duty to provide enough staffing to complete at least the key critical tasks in sufficient time to facilitate desired outcomes. Ideally, this staffing model could be achieved with a combination of full-time and reserve personnel.

FINDINGS AND RECOMMENDATIONS

The following are all findings and recommendations from this assessment.

Findings

Finding #1: District response apparatus types and quantities are appropriate to protect against most hazards likely to impact the service area.

Finding #2: The District's minimum daily staffing of three response personnel (four as reserve firefighter personnel are available and self-scheduled), is minimally sufficient to resolve most routine calls for service; however, it is *insufficient* to deliver enough personnel to safely complete the critical tasks necessary to resolve the relatively infrequent occurrence of more serious/complex incidents.

Finding #3: Agreements with other local fire agencies for automatic/mutual aid response have not been reviewed or updated in many years.

Finding #4: The San Luis Obispo CAL FIRE Unit has established response performance standards for the District *partially* consistent with best practice recommendations as published by the Commission on Fire Accreditation International and the National Fire Protection Association to guide future fire crew staffing, apparatus types, and deployment methods.

Finding #5: The District's current deployment model is intended to provide a minimum of four response personnel on duty daily, including three full-time personnel and one reserve firefighter; however, with only 9 active reserve firefighters currently and no residency or minimum monthly or annual shift requirement, the District is significantly challenged to maintain four-person staffing on most days.

Finding #6: The District has a standard response plan that considers risk and establishes an appropriate initial response for each incident type; each type of call for service receives the combination of engines, specialty units, and command officers customarily needed to effectively control that type of incident based on experience.

Finding #7: The additional response resources needed to deliver an Effective Response force sufficient to resolve more complex or serious emergencies are too distant with insufficient staffing to expect positive outcomes in most instances.

Finding #8: Overall service demand increased 16.7 percent over the four-year study period for an average annual increase of 5.3 percent.

Finding #9: EMS service demand accounted for nearly 74 percent of total service demand over the four-year study period, with an average annual increased of 3.7 percent.

Finding #10: Two or more simultaneous calls for service occur 13.2 percent of the time with three or more occurring only 1.3 percent of the time.

Finding #11: Simultaneous incident activity increased approximately 29 percent over the four-year study period, peaking in RY 20/21.

Finding #12: The District provides more aid to other jurisdictions than it receives.

Finding #13: Call processing / dispatch performance appears to nearly meet a 1:00-minute best practice standard; however, this performance measurement does not include the Sheriff's Department PSAP dispatch center call answering / transfer time component to the San Luis Obispo CAL FIRE Unit ECC.

Finding #14: Crew turnout performance over the four-year study period was slightly slower than a Citygate-recommended 2:00-minute best practice goal; however, turnout performance has eroded about 20.5 percent over the most recent 24-month period.

Finding #15: First-unit travel performance over the four-year study period was slightly more than 6:00 minutes, or slightly more than 2:00 minutes (52 percent) slower than a Citygate-recommended 4:00-minute best practice goal to facilitate desired outcomes due to a very large service area; road network, design, and maintenance; traffic; traffic calming measures; and limited access to some neighborhoods.

Finding #16: At 8:23 minutes, first-unit call-to-arrival performance over the four-year study period was only 53 seconds (12 percent) slower than Citygate's 7:30-minute best practice goal to achieve desired outcomes; however, this does not include the Sheriff's Department PSAP dispatch center call answering and transfer time component.

Finding #17: At 18:44 minutes, ERF call-to-arrival performance over the four-year study period was 7:14 minutes (63 percent) slower than Citygate's 11:30-minute best practice goal to facilitate desired outcomes in urban/suburban communities.

Finding #18: The fire station is adequately located to provide first-unit travel times to facilitate positive outcomes in the more densely populated areas of the District's service area.

Finding #19: The District's population is aging, with persons over 65 years of age increasing from19.4 percent in 2000 to nearly 28 percent in 2023, which can likely be expected to drive up future service demand, particularly for emergency medical services.

Finding #20: The District's individual response unit hourly utilization is well below recommended maximum saturation levels indicating sufficient capacity for additional non-concurrent service demand.

Finding #21: Citygate considers four response personnel, with at least two being paramedics, as the *minimum* daily on duty staffing level needed to provide a reasonable *speed of response* to facilitate positive outcomes in the higher population density areas of the District and ensure sufficient staffing for at least one concurrent emergency incident.

Finding #22: The District's current daily staffing model of four personnel *does not* provide a minimally sufficient weight of response to complete the critical tasks necessary to safely resolve even a moderately complex or more serious event such as a building fire, multiple patient EMS, vehicle collision with extrication required, or technical rescue.

Finding #23: Positive outcomes for more complex/serious emergency events should not be expected in most instances given the insufficient on-duty staffing and long response time for mutual aid resources.

Finding #24: Calls for service at Montana de Oro State Park are increasingly impacting service availability within the District.

Recommendations

Recommendation #1: **Adopt Response Goal Policies:** The District should adopt response performance measures to aid deployment planning and to monitor response performance. The measures of time should be designed to deliver outcomes that will save EMS patients, when possible, upon arrival and keep small but serious fires from becoming more serious. With this is mind, Citygate recommends the following measures:

1.1 **First-Due Unit:** To treat pre-hospital medical emergencies and control small fires, the first-due unit should arrive within 8:00 minutes, 90 percent of the time, from the receipt of the 9-1-1 call at the CAL FIRE San Luis Obispo ECC to incidents within the District service area. This equates to 1:00-minute for call processing / dispatch, 2:00 minutes for crew turnout, and 5:00 minutes for travel.

1.2 **Multiple-Unit Effective Response Force for Serious Emergencies:** To confine building fires near the room or rooms of origin, keep vegetation fires under one acre in size, and treat multiple medical patients at a single incident, a multiple-unit ERF of at least **16** personnel, including at least one Chief Officer, should arrive as soon as possible in the District from the time of call receipt at the CAL FIRE San Luis Obispo ECC.

1.3 **Hazardous Materials Response:** To protect the District service area from hazards associated with uncontrolled release of hazardous and toxic materials, the fundamental mission of the District's response is to isolate the hazard, deny entry into the hazard zone, and minimize impacts on the community. This can be achieved with a first-due total response time of 8:00 minutes or less within the service area to provide initial hazard evaluation and mitigation actions. After the initial evaluation is completed, a determination can be made whether to request additional resources to mitigate the hazard.

1.4 **Technical Rescue:** To respond to technical rescue emergencies as efficiently and effectively as possible with enough trained personnel to facilitate a successful rescue, a first-due total response time of 8:00 minutes or less within the service area to evaluate the situation and initiate rescue actions. Additional resources should assemble as soon as possible to safely complete rescue/extrication and delivery of the victim to the appropriate emergency medical care facility.

Recommendation #2: Consider ensuring four personnel, including at least two paramedics, is the *minimum* daily staffing level over the near term.

Recommendation #3: Seek to identify opportunities to improve reserve firefighter participation and shift staffing, and/or fund additional overtime for full-time personnel to maintain four-person daily staffing.

Recommendation #4: If unable to substantially improve reserve firefighter participation and shift staffing, the District should consider funding an additional full-time position on each shift to ensure a minimum staffing level of four personnel daily.

Recommendation #5: The District should seek to increase its minimum daily staffing over time to at least six on-duty personnel daily to provide enough staffing to complete the key critical tasks at more complex/serious incidents in sufficient time to facilitate desired outcomes. Ideally, this staffing model could be achieved with a combination of full-time and reserve personnel.

Recommendation #6: Update/revise automatic/mutual aid agreements as needed to ensure timely response of the most proximal resources for more serious/complex incidents requiring additional resources.

NEXT STEPS

Near Term

- Review and absorb the content, findings, and recommendations of this report.
- Adopt response performance goals as recommended.
- Develop a plan to fund and maintain a minimum daily staffing level of four response personnel, to include at least two paramedics.

Longer Term

- Seek funding opportunities to increase daily response staffing to six personnel.
- Monitor response performance against adopted goals.

SECTION 1—INTRODUCTION AND BACKGROUND

The Los Osos, California Community Services District (District) retained Citygate Associates, LLC (Citygate) to conduct a modified Standards of Coverage Assessment based on nationally recognized guidelines and best practices, federal and state mandates, and relevant local and regional operating procedures. This assessment is intended to evaluate the District's current fire service staffing and response performance and recommend appropriate staffing and deployment of firefighting and emergency medical service resources to best protect the values at risk within the District service area from fire and non-fire hazards. The study is also intended to provide recommendations for potential future improvement of services and incorporate relevant data analysis and benchmarking to recommended best practice standards and District-established performance goals.

Citygate's Work Plan reflects Citygate's Project Team members' experience in fire administration and deployment. Citygate utilizes various National Fire Protection Association (NFPA) and Insurance Services Office (ISO) publications as best practice guidelines, along with the self-assessment criteria of the Commission on Fire Accreditation International (CFAI). This is a systems-based approach using local risk and demographics to determine the level of protection best fitting the District's needs.

1.1 REPORT ORGANIZATION

This report is organized into the following sections.

Executive Summary A summary of current services and significant challenges, including all findings and recommendations.

Section 1 Introduction and Background: An introduction to the study and background information about the District.

Section 2 Standards of Coverage Assessment: An overview of the SOC process and detailed analysis of the District's existing deployment model, emergency outcome expectations, community risk assessment summary, staffing needed for different emergencies (critical tasks), reliability and historical response measures effectiveness, and a concluding overall deployment evaluation.

Appendix A Community Risk Assessment: A comprehensive assessment of the values at risk to be protected within the District service area and evaluation of the fire and non-fire hazards likely to impact the service area as related to services provided by the District.

1.1.1 Goals of the Report

This report cites findings and makes recommendations, as appropriate, related to each finding. Throughout the report, findings and recommendations are sequentially numbered.

This document provides technical information about how fire services are provided and legally regulated and how the District is currently providing fire and emergency medical services (EMS). This information is presented in the form of recommendations and policy choices for the District to consider.

The result is a solid technical foundation upon which to understand the advantages and disadvantages of the choices facing District leadership regarding the best way to provide services and, more specifically, at what level of desired outcome and expense.

1.1.2 Limitations of the Report

There are no federal or state regulations mandating the level of fire service staffing, response performance, or outcomes. Through the public policy process, each community or jurisdiction is expected to understand local fire and non-fire risks and its ability to pay for fire services, and then choose its level of services accordingly. *If* fire services are provided at all, federal and state regulations specify how to safely provide them, both for the public and the personnel providing services.

While this report and technical explanation can provide a framework for the discussion of District fire and emergency medical services, neither this report nor the Citygate team can make the final decisions or cost out every possible alternative in detail. Once final policy choices receive District Board of Directors direction, District staff can conduct any final cost and fiscal analyses as typically completed in the District's normal budget preparation process.

1.2 Project Approach and Scope of Work

1.2.1 Project Approach and Research Methods

Citygate utilized multiple sources to gather, understand, and model information about the District and its fire department. Citygate requested a substantial amount of relevant background data and information to better understand current service level, the history of service level decisions, and other prior studies.

In virtual meetings, Citygate performed focused interviews of the Department's project team members and other project stakeholders. Citygate reviewed demographic information about the service area, including the potential for future growth and development. Citygate also obtained response data from which to model current and projected fire service deployment, with the goal to identify the location(s) of station(s) and crew quantities needed to best serve the District and rural service area as it currently exists and facilitate future deployment planning.

Once Citygate gained an understanding of the District's service area and its fire and non-fire risks, Citygate developed a model for fire services that was tested against prior response data to ensure an appropriate fit. Citygate also considered future District growth and service demand to address both current and longer-range needs. The result is a framework for maintain or enhancing District services while meeting reasonable community expectations and fiscal realities.

1.2.2 Project Scope of Work

Citygate's approach to this assessment involved:

- Reviewing data and information provided by the District and CAL FIRE and conducting listening sessions with designated project stakeholders.
- Utilizing StatsFD™, an incident response time analysis program, to review prior incident service demand and response performance and plot the results on graphs and geographic mapping exhibits.
- Identifying and evaluating future District and rural service area population and related development growth.
- Recommending appropriate response performance goals.

1.3 Service Area Overview

Located on California's central coast on the southern end of Morro Bay approximately 11 miles west of the City of San Luis Obispo, the Los Osos Community Services District was formed in 1998 by petition of area residents after previous failed attempts in 1979 and 1991. The District formation replaced a portion of County Service Area 9 originally established in 1973. The District's service area encompasses 14.8 square miles including 5.1 square miles within the District proper as well as 9.7 square miles of unincorporated San Luis Obispo County adjacent to the District's eastern boundary.

Governed by a five-member Board of Directors elected at large to staggered four-year terms, the District provides water, solid waste, street lighting, fire and emergency medical, parks and recreation, and storm drainage services under a General Manager appointed by the Board of Directors. In addition to the General Manager, the District has a staff of nine personnel.

The District and adjacent service area are predominantly residential in nature with less than 500 businesses providing retail sales, financial, real estate, lodging, automotive, health, legal, and other related services. The District's adopted 2023-24 budget is $9.25 million.

1.3.1 Future Growth and Development

The Los Osos Community Plan, a component of the San Luis Obispo County General Plan and Local Coastal Program and adopted by the County Board of Supervisors in December 2020, envisions the Los Osos community to maintain its small-town atmosphere yet promote expanded tourism and environmentally friendly businesses. The community "desires to uphold its values and scale, take control of its own destiny, discourage gated communities, encourage neighborhood and community continuity, and be unique." The Plan further envisions containing urban development within the existing Urban Reserve Line (URL) with controlled development sustained by resources and services. The URL is defined by a greenbelt including productive agricultural lands and open space managed to protect the Morro Bay estuary.

Future infill development is projected to increase the District population by 4,200 people to 18,600 by 2035,[1] a 29 percent increase over the current population as shown in Appendix A (Table 19).

1.4 Fire Department Overview

1.4.1 Organization

The District contracts with the California Department of Forestry and Fire Protection (CAL FIRE) San Luis Obispo Unit for its fire response staffing and administration services with the District retaining ownership of the physical assets used to provide those services.

The District provides fire suppression, Basic Life Support (BLS) and Advanced Life Support (ALS) pre-hospital emergency medical, initial rescue and hazardous materials response, fire prevention, and related fire and life safety services with a staff of eight full-time personnel and up to 25 reserve firefighters (nine active at the time of this report). Contract administration, procurement, vehicle maintenance, dispatch, major incident management, and other related services are provided by CAL FIRE personnel from the San Luis Obispo Unit headquarters in the City of San Luis Obispo.

1.4.2 Facilities, Response Resources, and Staffing

The District provides fire response services from a single fire station located in the south-central section of the District on Bayview Heights Drive with a combination of full-time and part-time reserve firefighter personnel staffing one engine with two full-time personnel including at least one paramedic, and one medium-duty squad staffed with one full-time paramedic plus one reserve firefighter as available and self-scheduled. At the time of this assessment, reserve firefighter availability and scheduled shift staffing was extremely low with most days unstaffed, resulting in

1 Source: Los Osos Community Plan, Table C-3.

only the three full-time CAL FIRE personnel on duty for emergency response.[2] In addition to the engine and squad, the District has one reserve engine, a ¾-ton utility pickup truck, and one ¾-ton command vehicle (assigned to the designated CAL FIRE North Coast Battalion Chief).

1.4.3 Service Capacity

Service capacity refers to a fire agency's available response force; the size, type, and condition of its response fleet and any specialized equipment; core and specialized performance capabilities and competencies; resource distribution and concentration; availability of automatic or mutual aid; and any other agency-specific factors influencing its ability to meet current and prospective future service demand relative to the risks to be protected.

The District's service capacity for fire and non-fire risks consists of a minimum of three personnel on duty daily, at least two of whom are paramedics, staffing one engine and one squad. As available and self-scheduled, one reserve firefighter is also assigned to the squad. Low reserve firefighter availability is severely impacting the District's ability to maintain a desired daily minimum staffing of four personnel.

All full-time and reserve response personnel are trained to either the Emergency Medical Technician (EMT) level, capable of providing Basic Life Support (BLS) pre-hospital emergency medical care with County-authorized optional scopes of service, or to the Emergency Medical Technician Paramedic (EMT-P) level, capable of providing Advanced Life Support (ALS) pre-hospital emergency medical care. Ground ambulance transportation is provided by San Luis Ambulance Service, a privately held company, under an exclusive operating area contract with the San Luis Obispo County Emergency Medical Services Agency. Pursuant to this contract, Los Osos is designated as an urban response zone with ambulance response performance required within 10:00 minutes 90 percent of the time. District and CAL FIRE staff advised Citygate that this response performance requirement has not been met for many years, and San Luis Ambulance has recently begun staffing a 12-hour ambulance in Los Osos during daytime hours to help improve response performance.

Response personnel are also trained to the U.S. Department of Transportation Hazardous Material First Responder Operational (FRO) level to provide initial hazardous material incident assessment, hazard isolation, and support for the regional hazardous material technical response team from San Luis Obispo County Fire Department Station 52 in Meridian, approximately 41 miles northeast of Los Osos.

2 Source: CAL FIRE Battalion Chief Paul Provence

All response personnel are further trained to the Confined Space Awareness Level. Additional technical rescue capability is available as needed from the San Luis Obispo County Fire Department Station 30 in Paso Robles, approximately 31 miles northeast of Los Osos.

The District also has automatic or mutual aid agreements with neighboring fire agencies to provide the augmented staffing needed for more serious/complex incidents; however, those resources are at least 12:00–15:00 minutes' travel time or longer from Los Osos and are typically staffed with only two personnel. In addition, staff advised Citygate that most of these agreements have not been reviewed and updated in many years.

Finding #1:	District response apparatus types and quantities are appropriate to protect against most hazards likely to impact the service area.
Finding #2:	The District's minimum daily staffing of three response personnel (four as reserve firefighter personnel are available and self-scheduled), is minimally sufficient to resolve most routine calls for service; however, it is *insufficient* to deliver enough personnel to safely complete the critical tasks necessary to resolve the relatively infrequent occurrence of more serious/complex incidents.
Finding #3:	Agreements with other local fire agencies for automatic/mutual aid response have not been reviewed or updated in many years.

SECTION 2—STANDARDS OF COVERAGE ASSESSMENT

This section provides a detailed assessment of the District's current ability to deploy and mitigate emergency hazards within its service area. The response analysis uses prior response statistics to help the Department and the community understand the capabilities and limitations of the current response system.

2.1 STANDARDS OF COVERAGE PROCESS OVERVIEW

The core methodology used by Citygate in the scope of its deployment analysis work is *Standards of Cover*, fifth and sixth editions, which is a systems-based approach to fire department deployment published by the CFAI. This approach uses local risk and demographics to determine the level of protection best fitting a community's needs.

The SOC method evaluates deployment as part of a fire agency's self-assessment process. This approach uses risk and community outcome expectations to help elected officials make informed decisions on fire and EMS first responder deployment levels. Citygate has adopted this methodology as a comprehensive tool to evaluate fire station locations and staffing levels. Depending on the needs of the assessment, the depth of the components may vary.

Such a systems-based approach to deployment, rather than a one-size-fits-all prescriptive formula, allows for local determination. In this comprehensive approach, an agency can match local needs (risks and expectations) with the costs of various levels of service. In an informed public policy discussion, a governing board "purchases" the fire and emergency medical service levels the community needs and can afford.

While working with multiple components to conduct a deployment analysis is admittedly more work, it yields a much better result than using only a singular component. For instance, if only travel time is considered and frequency of multiple calls is not, the analysis could miss over-worked companies. If a risk assessment for deployment is not considered and deployment is based only on travel time, a community could under-deploy to incidents.

The following table describes the eight elements of the SOC process.

Table 2—Standards of Coverage Process Elements

SOC Element		Description
1	**Existing Deployment**	Describing the current deployment model and response performance goals the agency has in place today.
2	**Community Outcome Expectations**	Reviewing the expectations of the community for responses to emergencies.
3	**Community Risk Assessment**	Identifying and quantifying the assets at risk to fire and non-fire hazards likely to impact the community. (For this report, see **Appendix A—Community Risk Assessment**.)
4	**Critical Task Analysis**	Reviewing the tasks that must be performed and the personnel required to deliver the stated outcome expectation.
5	**Distribution Analysis**	Reviewing the spacing of first-due response resources (typically engines) to control routine emergencies.
6	**Concentration Analysis**	Reviewing the spacing of fire stations so that more complex emergencies can receive sufficient resources and personnel in a timely manner (First Alarm Assignment or ERF).
7	**Reliability and Historical Response Effectiveness Analysis**	Using prior response statistics to determine the percent of compliance the existing system delivers.
8	**Overall Evaluation**	Proposing Standard of Coverage statements by risk type, as necessary.

Source: CFAI, Standards of Cover, Fifth Edition

Simply summarized, fire service deployment is about the ***speed*** and ***weight*** of the response. *Speed* refers to initial response (first-due), all-risk intervention resources (e.g., engines, ladder trucks, squads, or ambulances) strategically deployed across a jurisdiction for response to emergencies within a specified time interval to control routine-to-moderate emergencies to achieve desired outcomes and prevent the incident from escalating to greater size or severity. *Weight* refers to multiple-unit responses for more serious emergencies, such as building fires, multiple-patient medical emergencies, vehicle collisions with extrication required, or technical rescue incidents where enough firefighters must be assembled within a reasonable time interval to safely control the emergency and prevent it from escalating into a more serious event and achieve desired outcomes. The following table illustrates this deployment paradigm.

Table 3—Fire Service Deployment Paradigm

Element	Description	Purpose
Speed of Response	Travel time of first-due, all-risk intervention units strategically located across a jurisdiction.	To control routine-to-moderate emergencies to achieve desired outcomes and prevent the incident from escalating in size or complexity.
Weight of Response	Number of firefighters in a multiple-unit response for serious emergencies.	To assemble enough firefighters within a reasonable time frame to safely control a more complex emergency without escalation and achieve desired outcomes.

Thus, smaller fires and less complex emergencies require a single-unit or two-unit response (fully staffed engine or specialty resource) within a relatively short response time. Larger or more complex incidents require more units and personnel to control. In either case, if the crews arrive too late or the total number of personnel is too few for the emergency, they are drawn into an escalating and more dangerous situation. The science of fire crew deployment is to spread crews out across a community or jurisdiction for quick response to keep emergencies small with positive outcomes without spreading resources so far apart that they cannot assemble quickly enough to effectively control more serious emergencies.

For this assessment, all elements of the SOC process were used except the distribution and concentration analysis due to the single District fire station and long travel distance for mutual aid resources.

2.2 CURRENT DEPLOYMENT

SOC ELEMENT 1 OF 8
EXISTING DEPLOYMENT POLICIES

Nationally recognized standards and best practices suggest using several incremental measurements to define response time. Ideally, the clock starts when the San Luis Obispo CAL FIRE Unit Emergency Communications Center (ECC) dispatcher receives the emergency call. For Los Osos, the response time clock starts when the ECC receives the 9-1-1 call into its computer-aided dispatch (CAD) system. Response time increments include ECC call processing / dispatch, crew response unit boarding (commonly called crew turnout), and actual driving (travel) time. Response performance best practices include specific time goals for each of these three increments, which combined equal total response time, or call-to-arrival time. Call-to-arrival time is a fire agency's true customer service metric. Response performance goals should also address response performance to other risks within the service area, such as hazardous materials and technical rescue, as recommended by the CFAI. While CAL FIRE provides response time standards partially compliant with CFAI in its contract with the District, the District has a

service-level history that can be documented in response times, number of response companies, and minimum staffing, which were evaluated for this study.

Currently, NFPA Standard 1710, a recommended deployment standard for career fire departments in urban/suburban areas, recommends initial (first-due) intervention unit arrival within a 4:00-minute *travel* time and recommends arrival of all the resources comprising the multiple-unit First Alarm within 8:00 minutes' *travel* at 90 percent or better reliability.[3]

If the travel time measures recommended by the NFPA (and Citygate) are added to dispatch processing and crew turnout times recommended by Citygate and best practices, then a realistic 90 percent first-unit total response time goal for urban/suburban response zones is 7:30 minutes from the fire dispatch center receiving the call. This includes 1:30 minutes for call processing / dispatch, 2:00 minutes for crew turnout, and 4:00 minutes for travel. For the District and unincorporated service area outside the District, Citygate considers a realistic 90 percent first-unit total response time goal to be 8:30 minutes, which includes 1:30 minutes call processing / dispatch, 2:00 minutes crew turnout, and 5:00 minutes travel as further discussed in Section 2.6.

Finding #4:	The San Luis Obispo CAL FIRE Unit has established response performance standards for the District *partially* consistent with best practice recommendations as published by the Commission on Fire Accreditation International and the National Fire Protection Association to guide future fire crew staffing, apparatus types, and deployment methods.

2.2.1 Current Deployment Model

The District's current deployment model consists of a minimum of three full-time response personnel on duty daily at the single fire station, plus a reserve firefighter as available and self-scheduled. The District's fire budget authorizes up to 25 reserve firefighters; however, at the time of this study there were only nine. This few number of reserve firefighters, coupled with no residency or minimum monthly or annual shift requirements, has resulted in no reserve firefighters scheduled to work on most days. In addition to the daily fire station staffing, a full-time CAL FIRE Battalion Chief is on duty daily, typically within the South Coast area, for response to more serious emergencies.

3 Source: NFPA 1710 – Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition).

Finding #5: The District's current deployment model is intended to provide a minimum of four response personnel on duty daily, including three full-time personnel and one reserve firefighter; however, with only 9 active reserve firefighters currently and no residency or minimum monthly or annual shift requirement, the District is significantly challenged to maintain four-person staffing on most days.

Response Plan

The District provides fire suppression, pre-hospital emergency medical, and initial hazardous material release and rescue services. Given these hazards, the District utilizes a tiered response plan calling for different types and numbers of resources depending on incident/hazard type. The CAL FIRE ECC CAD system selects and dispatches the most appropriate resource types pursuant to the District's response plan, as shown in the following table.

Table 4—Response Plan by Incident Type

Incident Type	Resources Dispatched	Total Personnel[1]
EMS	BLS – Engine or Squad, Ambulance ALS – Engine, Squad, Ambulance	**4** **5-6**
Vehicle Accident	Engine, Squad, Ambulance, Chief Officer	**6-7**
Vehicle Fire – Passenger **Commercial**	Engine, Squad 2 Engines, Squad, Chief Officer	**3-4** **6-7**
Building Fire – Residential **Commercial**	6 Engines, Squad, Chief Officer 5 Engines, Truck, Squad, Chief Officer	**14-15** **15-16**
Vegetation Fire	*Low Dispatch Level:*[1] 3 engines, Chief Officer *Medium Dispatch Level:*[1] 7 engines, Air Attack, 2 Air Tankers, Copter, 2 Dozers, 2 Hand Crews, Water Tender, Chief Officer *High Dispatch Level*:[1] 8 engines, Air Attack, 3 Air Tankers, 2 Copters, 2 Dozers, 2 Hand Crews, Water Tender, Chief Officer	**7-8** **56-64** **64-75**
Water Rescue – Surf **Swiftwater**	Engine, Squad, USAR, 2 Boats, MBHP, H-70, Ambulance 2 Engines, Squad, USAR, Rescue, Ambulance, Chief Officer	**19-24** **16-20**
Hazardous Material Release	Engine, Squad, HazMat, Ambulance, Chief Officer	**12-15**

[1] District plus CAL FIRE state resources

Finding #6:	The District has a standard response plan that considers risk and establishes an appropriate initial response for each incident type; each type of call for service receives the combination of engines, specialty units, and command officers customarily needed to effectively control that type of incident based on experience.

2.3 OUTCOME EXPECTATIONS

SOC ELEMENT 2 OF 8
COMMUNITY OUTCOME EXPECTATIONS

The SOC process begins by reviewing existing emergency services outcome expectations. This includes determining for what purpose the response system exists and whether the governing body has adopted any response performance measures. If it has, the time measures used must be understood and sound data must be available to evaluate performance.

Current national best practice is to measure percent completion of a goal (e.g., 90 percent of responses) instead of an average measure. Mathematically, this is called a fractile measure.[4] Measuring the average only identifies the central or middle point of response time performance for all calls for service in the data set. Using an average makes it impossible to know how many incidents had response times that were far above or just above the average.

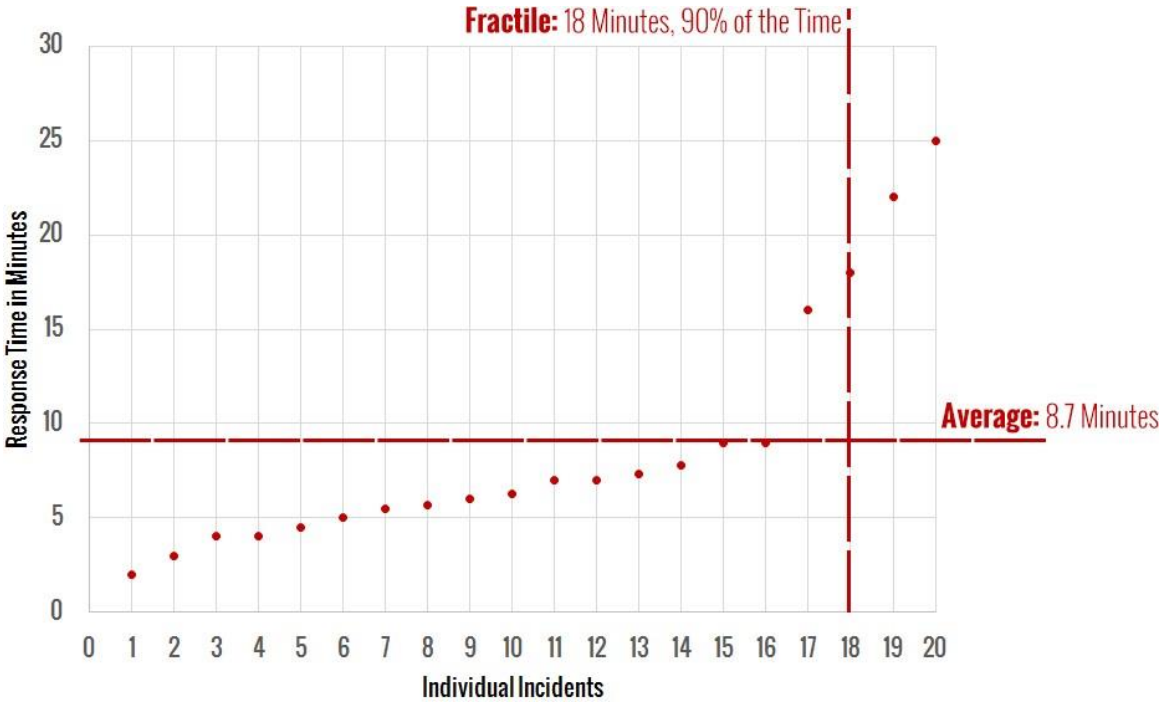
For example, the following figure shows response times for a hypothetical fire department. This a small agency receives 20 calls for service each month, and each response time has been plotted on the following graph from shortest response time to longest response time.

The graph shows the average response time is 8.7 minutes. However, the average response time fails to properly account for four calls for service with response times far exceeding a threshold in which positive outcomes could be expected. In fact, it is evident in that 20 percent of responses are far too slow and that this jurisdiction has a potential life-threatening service delivery problem. Average response time as a measurement tool for fire services is simply not sufficient. This is a significant issue in larger cities if hundreds or thousands of calls are answered far beyond the average point.

By using the fractile measurement with 90 percent of responses in mind, this small example jurisdiction has a response time of 18:00 minutes, 90 percent of the time. This fractile measurement is far more accurate at reflecting the service delivery situation of this small fictitious agency.

4 A *fractile* is that point below which a stated fraction of the values lie. The fraction is often given in percent; the term percentile may then be used.

Figure 1—Fractile versus Average Response Time Measurements



More importantly, within the SOC process, positive outcomes are the goal. From that goal, crew size and response time can be calculated to allow appropriate fire station spacing (distribution and concentration). Emergency medical incidents include situations with the most severe time constraints. The human brain can only survive 4:00 to 6:00 minutes without oxygen. Cardiac arrest and other events can cause oxygen deprivation to the brain. While cardiac arrests make up a small percentage, drowning, choking, trauma constrictions, or other similar events can have the same effect. In a building fire, a small incipient fire can grow to involve the entire room in a 6:00- to 8:00-minute time frame. If fire service response is to achieve positive outcomes in severe emergency medical situations and incipient fire situations, *all* responding crews must arrive, assess the situation, and deploy effective measures before brain death occurs or the fire spreads beyond the room of origin.

Thus, from the time the 9-1-1 call is received by the dispatch center, an effective deployment system is *beginning* to manage the problem within a 7:00- to 8:00-minute total response time. This is right at the point that brain death is becoming irreversible, and the fire has grown to the point of leaving the room of origin and becoming very serious. Thus, the District needs a first-due response goal that is within a range to give hope for a positive outcome. It is important to note that the fire or medical emergency continues to deteriorate from the time of inception, not from the time the fire engine starts to drive the response route. Ideally, the emergency is noticed immediately, and the 9-1-1 system is activated promptly. In the best of circumstances, this step of awareness—calling 9-1-1 and giving the dispatcher accurate information—takes 1:00 minute. Crew notification

and travel time take additional minutes. Upon arrival, the crew must approach the injured party or emergency, assess the situation, and appropriately deploy its skills and tools. Even in easy-to-access situations, this step can take 2:00 minutes or more. This time frame may be increased considerably due to long driveways, apartment buildings with limited access, multiple-story buildings or office complexes, or shopping centers.

Unfortunately, there are times when the emergency has become too severe, even before the 9-1-1 notification or fire department response, for the responding crew to reverse; however, when an appropriate response time policy is combined with a well-designed deployment system, then only anomalies like bad weather, poor traffic conditions, or multiple emergencies slow down the response system. Consequently, a properly designed system will give the public hope of a positive outcome for their tax dollar expenditure.

For this report, total response time is the sum of 9-1-1 call processing / dispatch, crew turnout, and travel time, which is consistent with CFAI and NFPA best practice recommendations.

2.4 COMMUNITY RISK ASSESSMENT

SOC ELEMENT 3 OF 8
COMMUNITY RISK ASSESSMENT

The third element of the SOC process is a community risk assessment. Within the context of an SOC study, the objectives of a community risk assessment are to:

- Identify the values at risk to be protected within the community or service area.
- Identify the specific hazards with the potential to adversely impact the community or service area.
- Quantify the overall risk associated with each hazard.
- Establish a foundation for current/future deployment decisions and risk-reduction/hazard mitigation planning and evaluation.

A *hazard* is broadly defined as a situation or condition that can cause or contribute to harm. Examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. *Risk* is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity* of *resultant impacts* to people, property, the environment, and the community.

2.4.1 Risk Assessment Methodology

The methodology employed by Citygate to assess community risks as an integral element of an SOC study incorporates the following elements:

- Identification of geographic planning sub-zones (risk planning zones) appropriate to the community or jurisdiction.
- Identification and quantification, to the extent data is available, of the values at risk to various hazards within the community or service area.
- Identification of the fire and non-fire hazards to be evaluated.
- Determination of the probability of occurrence for each identified hazard over the ensuing 12 months.
- Determination of *probable* impact severity of a hazard occurrence by risk planning zone.
- Determination of overall risk by hazard and risk planning zone.

2.4.2 Values at Risk to Be Protected

Broadly defined, *values at risk* are those tangibles of significant importance or value to the community or jurisdiction that are potentially at risk of harm or damage from a hazard occurrence. Values at risk typically include people, critical facilities/infrastructure, buildings, and key economic, cultural, historic, and natural resources.

People

Residents, employees, visitors, and travelers through a community or jurisdiction are vulnerable to harm from a hazard occurrence. Particularly vulnerable are specific at-risk populations, including those unable to care for themselves or self-evacuate in the event of an emergency. Key demographic data for the District service area includes:

- Slightly more than 36 percent of the population is under 10 years or over 65 years of age.
- The service area population is predominantly White Only (75 percent), followed by Two or More Races (19 percent), Asian Alone (5 percent), and Black / African American Alone (1 percent), with 17 percent of the population being of Hispanic origin or ethnicity.
- Of the population over 24 years of age, more than 94 percent has completed high school or equivalency.
- Of the population over 24 years of age, 46 percent has an undergraduate degree and nearly 19 percent has a graduate or professional degree.

- Of the population 15 years of age or older, nearly 95 percent is in the workforce; slightly more than 5 percent are unemployed.
- Median household income is slightly more than $117,000.
- The population below the federal poverty level is 10 percent.
- Nearly 9 percent of the population under age 65 does not have health insurance coverage.
- Slightly more than 10 percent of the population under age 65 has a disability.

The District's population over the age of 65 has increased from 19.4 percent in 2000 to nearly 28 percent in 2023, an increase of 8.3 percent, suggesting an aging service area population likely to drive future service demand, particularly for emergency medical services.

Critical Infrastructure / Key Resources

The U.S. Department of Homeland Security defines critical infrastructure and key resources (CIKR) as those physical assets essential to the public health and safety, economic vitality, and resilience of a community, such as lifeline utilities infrastructure, telecommunications infrastructure, essential government services facilities, public safety facilities, schools, hospitals, airports, etc. District staff identified 13 critical facilities within the service area as identified in **Appendix A**. A hazard occurrence with significant impact severity affecting one or more of these facilities would likely adversely impact critical public or community services.

Buildings

The District service area includes approximately 6,500 residential housing units and nearly 500 businesses employing nearly 2,300 employees, including offices, professional services, retail sales, restaurants/bars, motels, churches, schools, government facilities, healthcare facilities, and other business types as described in **Appendix A**.

2.4.3 Hazard Identification

Citygate utilized prior risk studies where available, fire and non-fire hazards as identified by the CFAI, and agency/jurisdiction-specific data and information to identify the hazards to be evaluated for this study.

Following review and evaluation of the hazards identified in the San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan and the fire and non-fire hazards as identified by the CFAI as they relate to services provided by the District, Citygate evaluated the following six hazards for this assessment:

- Building fire
- Vegetation/wildland fire
- Medical emergency
- Hazardous material release/spill
- Technical rescue
- Marine incident

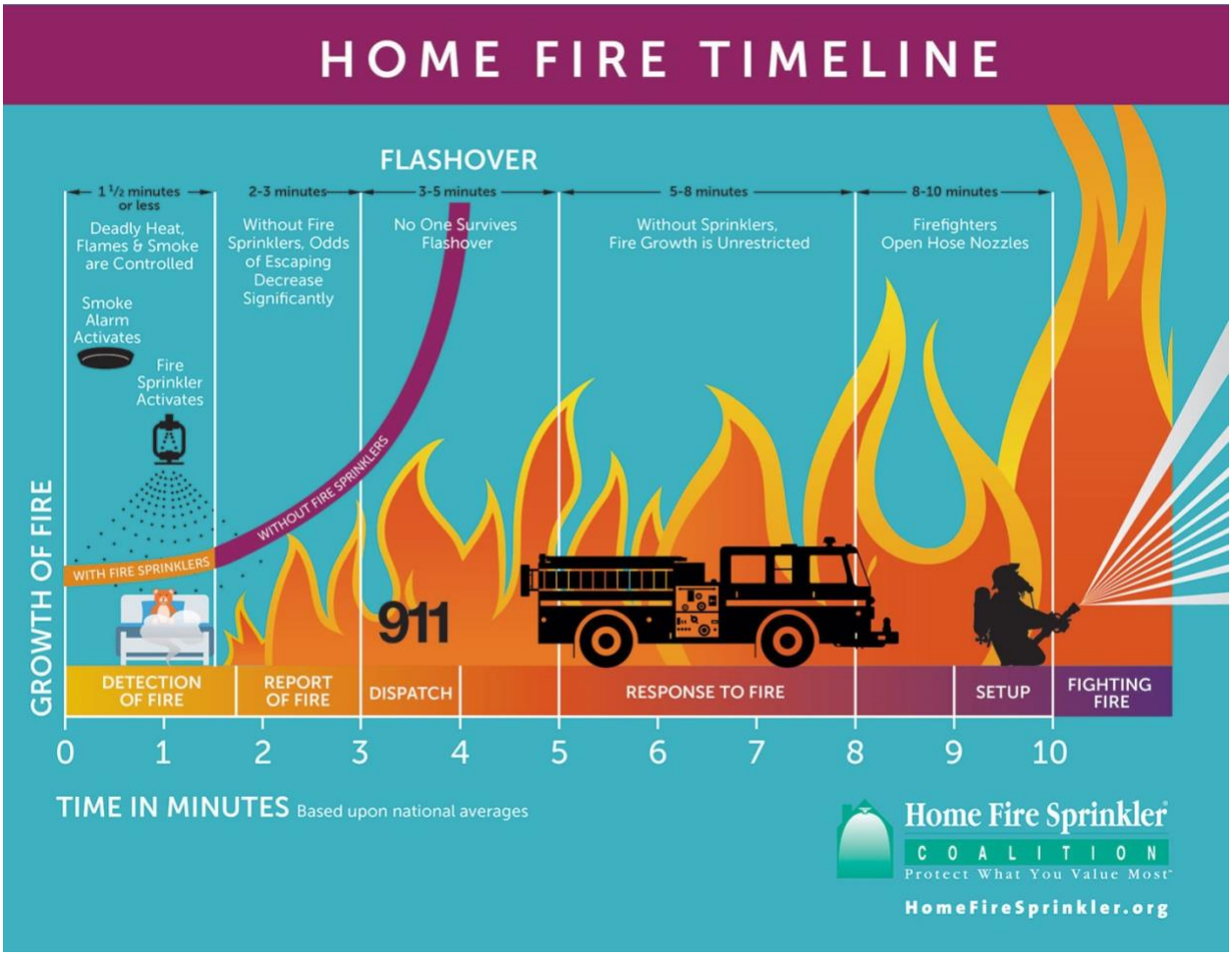
Because building fires and medical emergencies have the most severe time constraints if positive outcomes are to be achieved, the following is a brief overview of building fire and medical emergency risk. **Appendix A** contains the full risk assessment for all six hazards.

Building Fire Risk

One of the primary hazards in any community is building fire. Building fire risk factors include building density, size, age, occupancy, and construction materials and methods, as well as the number of stories, the required fire flow, the proximity to other buildings, built-in fire protection/alarm systems, an available fire suppression water supply, building fire service capacity, fire suppression resource deployment (distribution/concentration), staffing, and response time.

The following figure illustrates the building fire progression timeline and shows that flashover, which is the point at which the entire room erupts into fire after all the combustible objects in that room reach their ignition temperature, can occur as early as 3:00 to 5:00 minutes from the initial ignition. Human survival in a room after flashover is extremely improbable.

Figure 2—Building Fire Progression Timeline

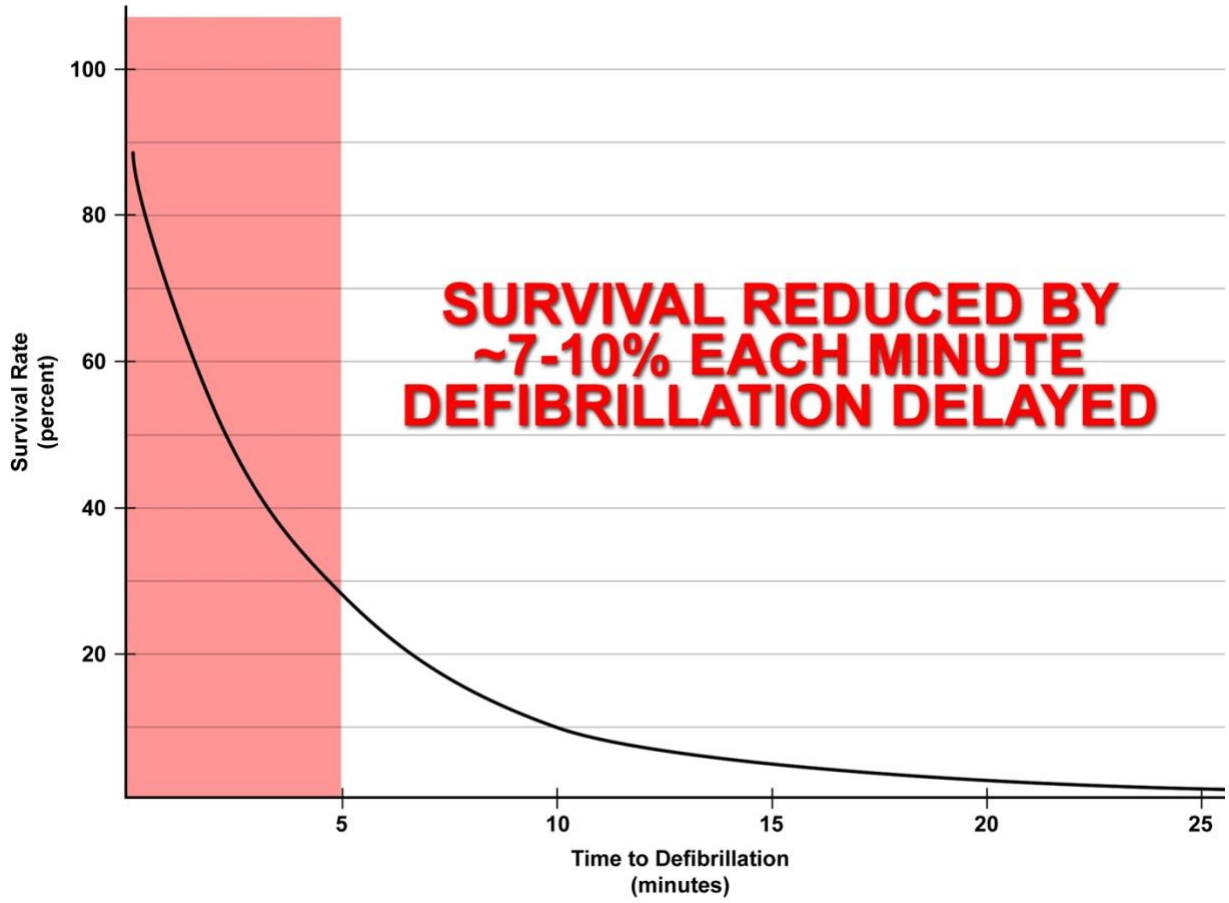


Source: http://www.firesprinklerassoc.org

Medical Emergency Risk

Fire service demand in most jurisdictions is predominantly for medical emergencies. The following figure illustrates the reduced survivability of a cardiac arrest victim as time to defibrillation increases.

Figure 3—Survival Rate versus Time of Defibrillation



The District provides BLS and ALS pre-hospital emergency medical services, with all response personnel trained to the EMT or paramedic level.

2.4.4 Risk Assessment Summary

The Department's overall risk for the six hazards related to emergency services provided by the Department range from **Moderate** to **High**, as summarized in the following table. See **Appendix A** for the full risk assessment.

Table 5—Overall Risk by Hazard

Hazard	Planning Zone
	Sta. 15
Building Fire	Moderate
Vegetation/Wildland Fire	High
Medical Emergency	High
Hazardous Material	Moderate
Technical Rescue	High
Marine Incident	Moderate

2.5 Critical Task Time Measures—What Must Be Done over What Time Frame to Achieve the Stated Outcome Expectation?

SOC Element 4 of 8
CRITICAL TASK TIME STUDY

SOC studies use critical task information to determine the number of firefighters needed within a time frame to achieve desired objectives on fire and emergency medical incidents. The following tables illustrate critical tasks typical of building fire and medical emergency incident, including the minimum number of personnel required to complete each task. These tables are composites from Citygate clients in suburban/rural departments similar to Los Osos, with units staffed with 2-3 personnel per apparatus. It is important to understand the following relative to these tables:

- It can take a considerable amount of time after a task is ordered by command to complete the task and achieve the desired outcome.
- Task completion time is usually a function of the number of personnel that are *simultaneously* available. The fewer firefighters available, the longer some tasks will take to complete. Conversely, with more firefighters available, some tasks are completed concurrently.
- Some tasks must be conducted by a minimum of two firefighters to comply with safety regulations. For example, two firefighters are required to search a smoke-filled room for a victim.

2.5.1 Critical Firefighting Tasks

The following table illustrates the critical tasks required to control a typical single-family dwelling fire with eight response units (6 engines, one squad, and one Chief Officer, for a total Effective

Response Force (ERF) of 14–15 personnel). These tasks are taken from typical fire departments' operational procedures, which are consistent with the customary findings of other agencies using the SOC process. No conditions exist to override the Occupational Safety and Health Administration (OSHA) two-in/two-out safety policy, which requires that firefighters enter atmospheres such as building fires that are immediately dangerous to life and health in teams of two while two more firefighters are outside and immediately ready to rescue them should trouble arise.

Scenario: Simulated approximately 2,000 square-foot, two-story, single-family residential fire with unknown rescue situation. Responding companies receive dispatch information typical for a witnessed fire. Upon arrival, they find approximately 50 percent of the second floor involved in fire.

Table 6—First Alarm Residential Fire Critical Tasks (14–15 Personnel)

Critical Task Description		Personnel Required
First-Due Engine (2 Personnel)		
1	Conditions report	1
2	Establish supply line to hydrant	2
3	Deploy initial fire attack line to point of building access	2
4	Operate pump and charge attack line	1
5	Establish incident command	1
6	Conduct primary search	2
Squad (1-2 Personnel)		
1	If necessary, establish supply line to hydrant	1-2
2	Deploy a backup attack line	1–2
3	Establish Initial Rapid Intervention Crew	2
4	Establish Incident Rehab upon arrival of 3rd engine	1-2
Second-Due Engine (2 Personnel)		
1	Conduct initial search and rescue, if not already completed	2
2	Deploy ground ladders to roof	1–2
3	Establish horizontal or vertical building ventilation	1–2
4	Open concealed spaces as required	2
Chief Officer		
1	Transfer of incident command	1
2	Establish exterior command and scene safety	1
Third-Due Engine (2 Personnel)		
2	Secure utilities	2
3	Deploy second attack line as needed	2
4	Conduct secondary search	2
5	Assist other crews as assigned	1-2
Fourth-Due Engine (2 Personnel)		
1	Assist other crews as assigned	2
Fifth-Due Engine (2 Personnel)		
1	Assist other crews as assigned	2
Sixth-Due Engine (2 Personnel)		
1	Assist other crews as assigned	2

Grouped together, these duties form an ERF, or First Alarm Assignment. These distinct tasks must be performed to effectively achieve the desired outcome; arriving on-scene does not stop the emergency from escalating. While firefighters accomplish these tasks, the incident progression clock keeps running.

Many studies have shown that a small fire can spread to engulf an entire room in fewer than 4:00 to 5:00 minutes after free burning has started. Once the room is completely superheated and involved in fire (known as flashover), the fire will spread quickly both vertically and horizontally throughout the structure. For this reason, it is imperative that fire suppression and search/rescue operations commence before the flashover point occurs if the outcome goal is to keep the fire damage in or near the room of origin and to rescue persons unable to self-evacuate. In addition, flashover presents a life-threatening situation to both firefighters and any occupants of the building. Fire fatalities typically include persons under 10 and over 65 years of age and those unable to self-evacuate, and slightly more than 36 percent of the service area population falls within those age groups.

Given the locations of mutual aid fire stations, on-duty staffing, and travel distance needed to assemble a 14–15-person ERF within the District service area to safely perform the above critical tasks would take too long to expect to confine a building fire to the room of origin prior to flashover.

2.5.2 Critical Medical Emergency Tasks

The Department responds to more than 1,000 EMS incidents annually, including vehicle accidents, strokes, heart attacks, difficulty breathing, falls, childbirths, and other medical emergencies.

For comparison, the following table summarizes the critical tasks required for a cardiac arrest patient.

Table 7—Cardiac Arrest Critical Tasks – Engine, Squad, and Ambulance (5–6 Personnel)

Critical Task		Personnel Required	Critical Task Description
1	Chest compressions	1–2	Compression of chest to circulate blood
2	Ventilate/oxygenate	1–2	Mouth-to-mouth, bag-valve-mask, apply O_2
3	Airway control	1–2	Manual techniques/intubation/cricothyroidotomy
4	Defibrillate	1–2	Electrical defibrillation of dysrhythmia
5	Establish I.V.	1–2	Peripheral or central intravenous access
6	Control hemorrhage	1–2	Direct pressure, pressure bandage, tourniquet
7	Splint fractures	2–3	Manual, board splint, HARE traction, spine
8	Interpret ECG	2	Identify type and treat dysrhythmia
9	Administer drugs	2	Administer appropriate pharmacological agents
10	Spinal immobilization	2–5	Prevent or limit paralysis to extremities
11	Extricate patient	3–4	Remove patient from vehicle, entrapment
12	Patient charting	1–2	Record vitals, treatments administered, etc.
13	Hospital communication	1–2	Receive treatment orders from physician
14	Treat en route to hospital	2–3	Continue to treat/monitor/transport patient

2.5.3 Critical Task Analysis and Effective Response Force (ERF) Size

What does a deployment study derive from a critical task analysis? The time required to complete the critical tasks necessary to stop the escalation of an emergency (as shown in Table 6 and Table 7) must be compared to outcomes. As stated, after approximately 4:00 to 5:00 minutes of free burning a room, fire will escalate to the point of flashover. At this point, the entire room is engulfed in fire, the entire building becomes threatened, and human survival near or in the room of a fire's origin becomes impossible. Additionally, brain death begins to occur within 4:00 to 6:00 minutes of the heart stopping. Thus, the ERF must arrive in time to prevent these emergency events from becoming worse.

The Department's daily on-duty staffing is ***insufficient*** to deliver a recommended ERF of 16–17 firefighters[5] to a low/medium hazard building fire given the locations and travel time for the mutual aid resources needed to achieve that ERF staffing. Mitigating an emergency event is a team effort once the units have arrived. This refers to the *weight* of response analogy; if too few personnel

5 NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments (2020 Edition).

arrive too slowly, the emergency will escalate instead of improving. The outcome times, of course, will be longer and yield less-desirable results if the arriving force is later or smaller.

The number of personnel and the arrival time frame can be critical in a serious fire. Fires in older or multiple-story buildings could require the initial firefighters to rescue trapped or immobile occupants. If the ERF is too small, rescue and fire suppression tasks *cannot* be conducted simultaneously. Thus, achieving good performance requires *adequate staffing* (and training).

Fires and complex medical incidents require additional units to arrive in time to complete an effective intervention. Time is one factor that comes from *proper station placement and the staffing model used*. When fire stations are spaced too far apart and one unit must cover another unit's area or multiple units are needed, the units may be too far away, and the emergency will escalate and result in a less-than-desirable outcome. When only one, or a subset of fire stations are staffed, response times are frequently inadequate to meet the speed or weight metrics outlined earlier.

Previous critical task studies conducted by Citygate and NFPA Standard 1710 identify that all units need to arrive at a building fire with 16–17 firefighters within 11:30 minutes (from the time of a 9-1-1 call) to effectively perform the tasks of rescue, fire suppression, and ventilation.

If fewer firefighters arrive, all tasks may not be completed. Most likely, the search team would be delayed, as would ventilation. The attack lines would only consist of two firefighters, which does not allow for rapid movement of the hose line above the first floor in a multiple-story building. Because rescue is conducted with at least two two-person teams, when rescue is essential, other tasks are not completed in a simultaneous, timely manner. Therefore, effective deployment is about the **speed** *(travel time)* and the **weight** *(number of firefighters)* of the response.

While 3–4 initial response personnel may begin to manage a moderate risk, confined residential fire, even a full ERF will be seriously slowed if the fire is above the first floor in a low-rise apartment building or commercial/industrial building. This is where the capability to add additional personnel and resources to the standard response within a reasonable time frame to facilitate positive outcomes becomes critical.

The fact that it takes the District more than 18:00 minutes[6] to deliver an ERF of only 6–7 personnel[7] to a moderate risk building fire within the service area reflects the real-world difficulty of confining serious building fires to or near the room of origin and preventing the spread of fire to adjoining buildings. This is a typical desired outcome in urban/suburban areas and requires more firefighters

6 Reference: Table 17.
7 Includes 2 engines, squad, and Chief Officer

more quickly than the typical rural outcome of keeping the fire contained to the building, rather than the room, of origin.

> **Finding #7:** The additional response resources needed to deliver an Effective Response force sufficient to resolve more complex or serious emergencies are too distant with insufficient staffing to expect positive outcomes in most instances.

2.6 STATISTICAL ANALYSIS

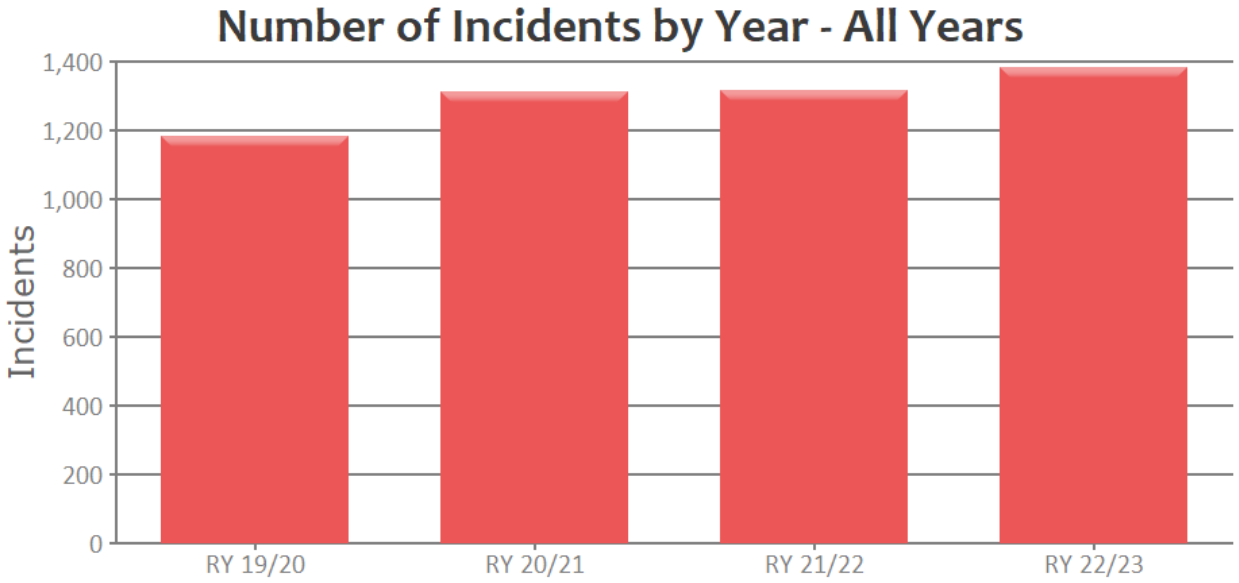
SOC ELEMENT 7 OF 8
RELIABILITY AND HISTORICAL RESPONSE EFFECTIVENESS STUDIES

Examination of actual response time data provides a picture of actual response performance with simultaneous calls, traffic congestion, units out of position, and delayed travel time for events such as periods of severe weather. The following subsections provide summary statistical information regarding District fire services.

2.6.1 Demand for Service

Over the four-year study period from July 1, 2019, through June 30, 2023, the District responded to 5,198 calls for service as summarized in the following figure. Overall service demand increased 16.7 percent over the four years.

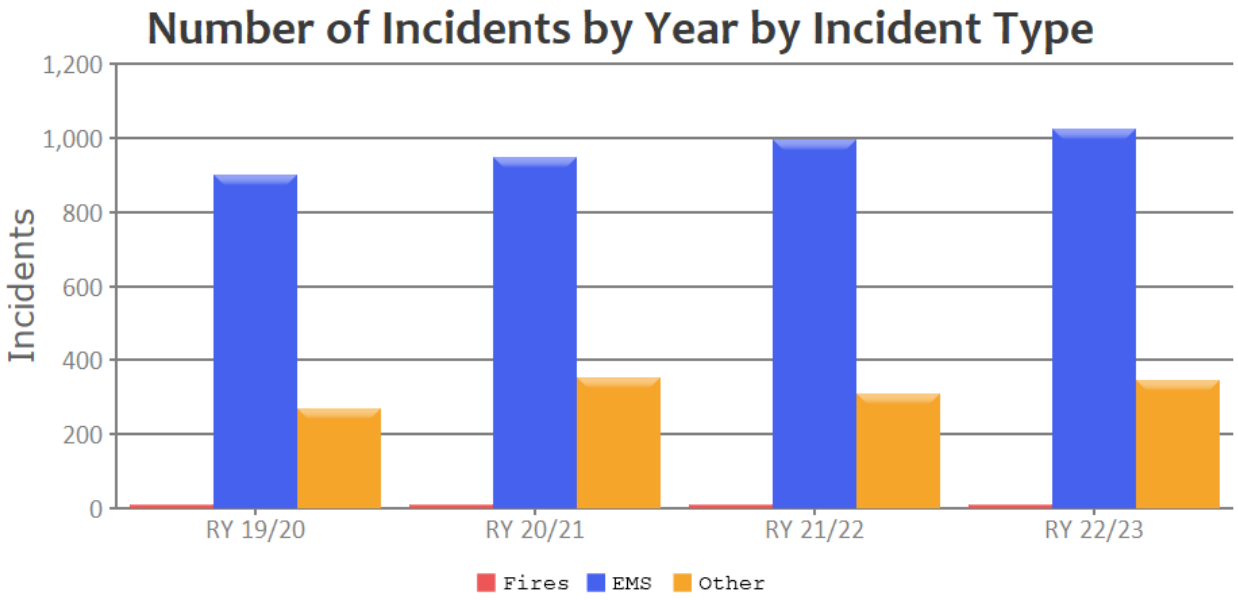
Figure 4—Annual Service Demand by Year



Finding #8: Overall service demand increased 16.7 percent over the four-year study period for an average annual increase of 5.3 percent.

The following figure illustrates annual service demand by incident type and shows that EMS incidents represented 74 percent of total service demand over the four-year study period.

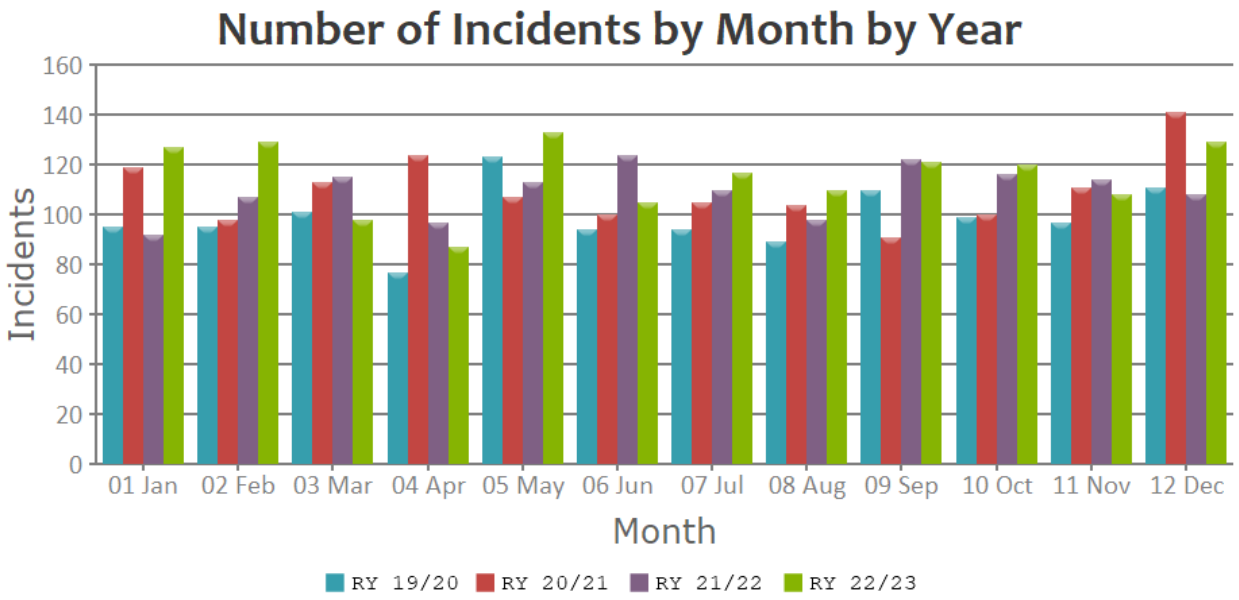
Figure 5—Annual Service Demand by Incident Type



Finding #9: EMS service demand accounted for nearly 74 percent of total service demand over the four-year study period, with an average annual increased of 3.7 percent.

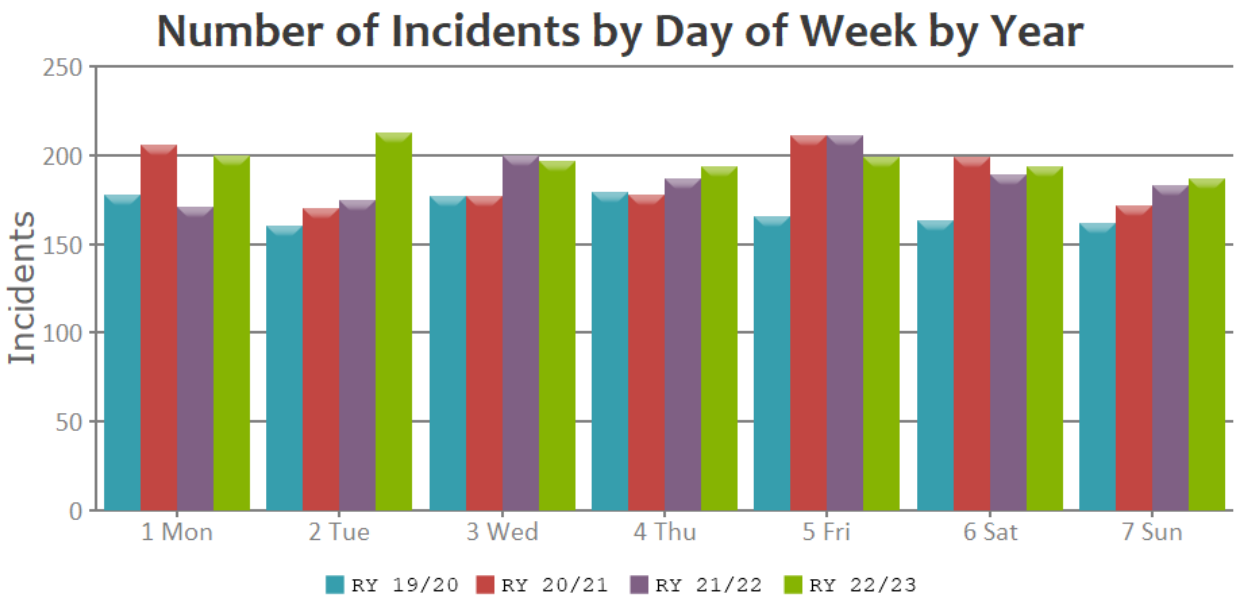
The following figure summarizes service demand by month and year. As the figure illustrates, monthly service demand is relatively consistent all year with a slight peak in May and December.

Figure 6—Service Demand by Month and Year



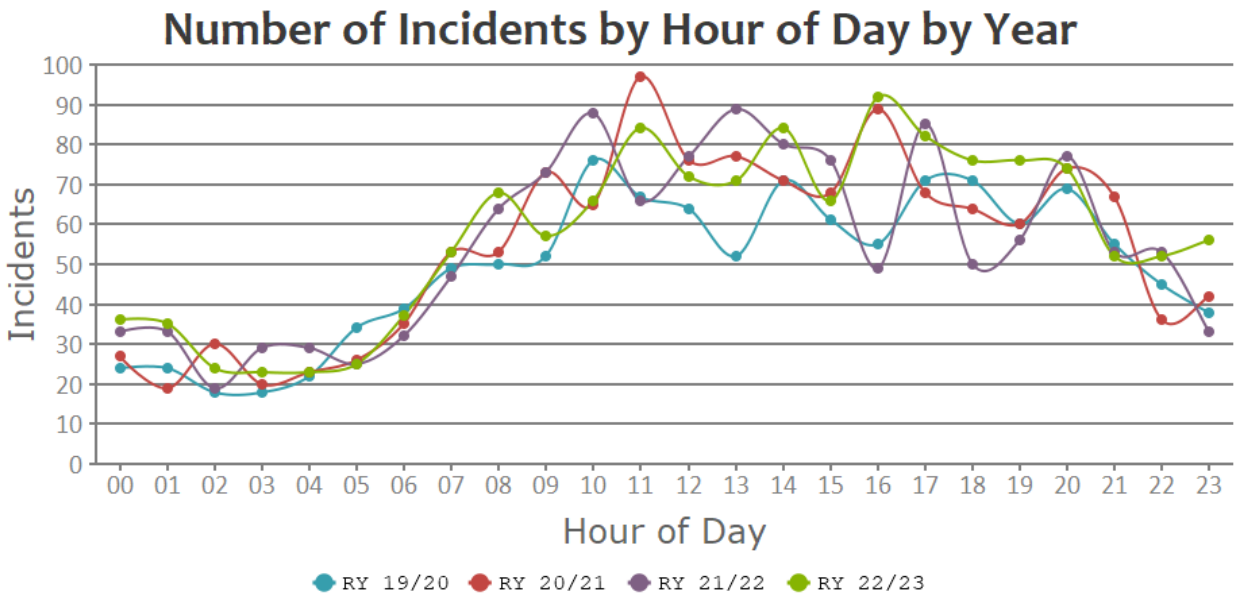
The following illustrates service demand by day of week, showing fairly consistent demand across all days of the week in RY 22/23 with a slight increase on Tuesdays.

Figure 7—Service Demand by Day of Week



The following graph illustrates service demand by hour of day by year, showing demand increases dramatically after about 6:30 A.M., and tapers off beginning at about 8:00 P.M.

Figure 8—Service Demand by Hour of Day and Year



2.6.2 Simultaneous Incident Activity

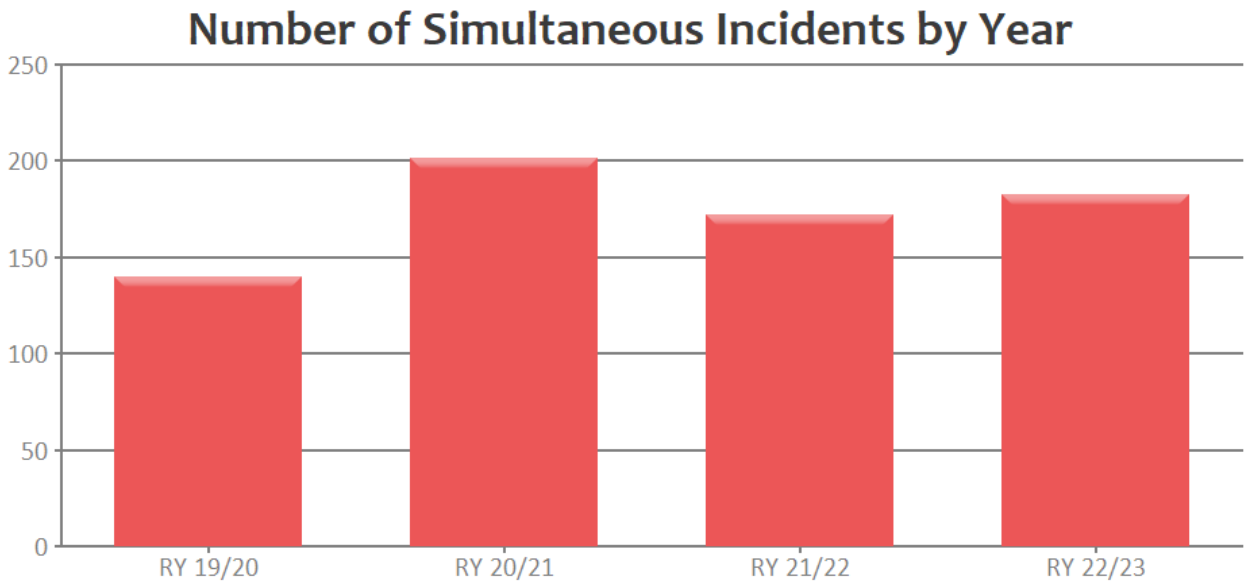
Simultaneous incidents occur when other incidents are underway at the time a new incident begins. In RY 22/23, simultaneous incidents occurred slightly more than 13 percent of time. When simultaneous incidents occur, a significant response time delay can be expected for a second or subsequent simultaneous incident requiring response by a mutual aid resource from another agency. The following table summarizes simultaneous incident activity for RY 22/23.

Table 8—Simultaneous Incident Activity (RY 22/23)

Number of Simultaneous Incidents	Percent of Occurrence
1 or more	**13.22%**
2 or more	1.30%
3 or more	0.14%

The following figure shows simultaneous incident activity by year, peaking in RY 20/21.

Figure 9—Simultaneous Incident Activity by Year



Finding #10: Two or more simultaneous calls for service occur 13.2 percent of the time with three or more occurring only 1.3 percent of the time.

Finding #11: Simultaneous incident activity increased approximately 29 percent over the four-year study period, peaking in RY 20/21.

2.6.3 Station Workload Demand

The following table summarizes station workload by hour of day for RY 22/23. The percentage shown is the percent probability of the station having an active incident during that hour of day. The percentage considers both the number and the duration of incidents.

Table 9—Station-Hour Utilization (RY 22/23)

Hour of Day	Sta. 15
00:00	7.07%
01:00	5.69%
02:00	5.44%
03:00	5.05%
04:00	4.69%
05:00	4.27%
06:00	6.87%
07:00	9.06%
08:00	12.65%
09:00	10.77%
10:00	11.42%
11:00	15.53%
12:00	14.61%
13:00	11.36%
14:00	13.61%
15:00	10.50%
16:00	15.92%
17:00	14.92%
18:00	14.21%
19:00	14.29%
20:00	13.22%
21:00	8.56%
22:00	10.88%
23:00	9.72%
Overall	10.43%
Incidents	**1,383**

2.6.4 Aid Activity

The following table summarizes aid activity over the four-year study period. As the table shows, more aid was provided than was received.

Table 10—Aid Activity by Year

Aid Type	RY 19/20	RY 20/21	RY 21/22	RY 22/23	Total
Aid Received	4	3	4	4	**15**
Aid Provided to Another Jurisdiction	1	1	5	35	**42**

Finding #12: The District provides more aid to other jurisdictions than it receives.

2.6.5 Operational Performance

This section reports operational performance for the first apparatus arriving at an emergency incident. Measurements are the number of minutes and seconds for 90 percent completion of the following response performance components:

- Call processing/dispatch
- Crew turnout
- First-unit travel
- First-unit call to arrival

In the measures to follow, only fire and EMS incidents are used to ensure analysis of the most acute emergencies.

Call Processing / Dispatch

Call processing measures the time interval from the first incident timestamp until completion of the dispatch notification. If the first incident timestamp takes place at the time the public-safety answering point (PSAP) physically answers a 9-1-1 call (at times, calls can briefly be held in queue), then call processing begins at PSAP time. In San Luis Obispo County, the primary PSAP is the Sheriff's Department dispatch center. For unincorporated areas of the county including the District service area, the dispatching of fire resources is performed by the CAL FIRE San Luis Obispo Emergency Command Center after receiving a 9-1-1 call transfer from the primary PSAP.

In addition, not all requests for assistance are received via landline 9-1-1. Generally, there are numerous ways that requests for assistance are received, including landline telephone, cellular telephone, SMS text message, fire, or law enforcement-initiated requests, TTY/TDD operator, etc., that each have a separate timestamp at a different point in the processing operation. This is not much of a factor if most requests are received via 9-1-1 PSAP.

The call processing times presented here do not include the PSAP time. Further, after the Sheriff's dispatch center receives the call, the first timestamp is delayed until the dispatcher initiates an

incident type code in the system. Due to primary PSAP off-the-hook-answer timestamps not being available, call processing performance is likely too short as measured in the following table. To accurately calculate total call processing time, the times shown in the table would need to include the added PSAP call answer/transfer component.

The current best practice standard for call processing / dispatch performance is 1:00 minute 90 percent of the time for incidents with an imminent threat to life or significant loss/damage to property. As the following table shows, 90th percentile call processing / dispatch performance over the four-year period was just over 1:00 minute but increased in the most recent reporting year.

Table 11—90th Percentile Call Processing / Dispatch Performance

Station	Overall	RY 19/20	RY 20/21	RY 21/22	RY 22/23
15	**01:04**	00:57	00:59	00:59	01:14

Finding #13: Call processing / dispatch performance appears to nearly meet a 1:00-minute best practice standard; however, this performance measurement does not include the Sheriff's Department PSAP dispatch center call answering / transfer time component to the San Luis Obispo CAL FIRE Unit ECC.

Crew Turnout

Crew turnout measures the time interval from completion of the dispatch notification until the start of vehicle movement to the emergency incident. While the NFPA recommends 1:00 to 1:20 minutes for crew turnout depending on the type of protective clothing that must be donned, Citygate has found very few agencies that can meet that performance standard, and thus has long recommended 2:00 minutes averaged across a 24-hour day as an achievable goal for on-duty station personnel. The following table summarizes 90th percentile crew turnout performance.

Table 12—90th Percentile Crew Turnout Performance

Station	Overall	RY 19/20	RY 20/21	RY 21/22	RY 22/23
15	**2:06**	1:43	1:57	2:17	2:21

Finding #14: Crew turnout performance over the four-year study period was slightly slower than a Citygate-recommended 2:00-minute best practice goal; however, turnout performance has eroded about 20.5 percent over the most recent 24-month period.

First-Unit Travel

First-unit travel measures the time interval from the start of apparatus travel until arrival at the emergency incident. In most urban/suburban jurisdictions, a 90th percentile first-unit travel time of 4:00 minutes or less would be considered highly desirable to achieve desired outcomes.

As the following table shows, 90th percentile first-unit travel performance was slightly more than 6:00 minutes over the four-year period, or 2:00 minutes (52 percent) slower than the recommended 4:00-minute best practice goal to facilitate desired outcomes. Citygate finds this is due to multiple factors, including:

- A 15-square mile service area, including 9.7 square miles of unincorporated San Luis Obispo County outside the District boundary
- Road network, design, and maintenance
- Traffic though Los Osos Valley Road corridor to Montana de Oro State Park
- Traffic calming measures
- Limited access to some neighborhoods

Table 13—90th Percentile First-Unit Travel Performance

Station	Overall	RY 19/20	RY 20/21	RY 21/22	RY 22/23
15	**6:04**	6:10	6:22	5:54	5:44

Finding #15: First-unit travel performance over the four-year study period was slightly more than 6:00 minutes, or slightly more than 2:00 minutes (52 percent) slower than a Citygate-recommended 4:00-minute best practice goal to facilitate desired outcomes due to a very large service area; road network, design, and maintenance; traffic; traffic calming measures; and limited access to some neighborhoods.

First-Unit Call to Arrival

First-unit call to arrival measures the time interval from receipt of the 9-1-1 call until the first response apparatus arrives at the emergency incident and is a fire agency's true customer service measure. While the District has not established a total response time goal, Citygate has long recommended a 7:30-minute first-unit call-to-arrival goal at 90 percent compliance to achieve desired outcomes in urban/suburban density communities. As the table illustrates, first-unit call-to-arrival performance over the four-year study period was only 53 seconds (11.8 percent) slower

than the 7:30-minute goal, which is commendable considering the size of the service area and a single station; however, this does not include the Sheriff's Department PSAP dispatch center call answering and transfer time component.

Table 14—90th Percentile First-Unit Call-to-Arrival Performance

Station	Overall	RY 19/20	RY 20/21	RY 21/22	RY 22/23
15	**8:23**	8:04	8:35	8:24	8:19

Finding #16: At 8:23 minutes, first-unit call-to-arrival performance over the four-year study period was only 53 seconds (12 percent) slower than Citygate's 7:30-minute best practice goal to achieve desired outcomes; however, this does not include the Sheriff's Department PSAP dispatch center call answering and transfer time component.

2.6.6 Effective Response Force (ERF) Performance

The District's minimum ERF for building fires is two engines, one squad, and one chief officer for a total of 6-7 personnel. Over the four-year study period, there were only 12 ERF incidents (building fires) two of which had more than the Station 15 units arrive. Performance measurements based on 20 or fewer incidents can be very volatile.

The following table shows 90th percentile ERF call-to-arrival performance over the four-year study period. At 18:44 minutes, performance was 7:14 minutes (63 percent) slower than Citygate's 11:30-minute best practice goal to facilitate desired outcomes in urban/suburban communities.

Table 15—90th Percentile ERF Call to Arrival Performance

Station Area	Overall	RY 19/20	RY 20/21	RY 21/22	RY 22/23
15	18:44	0	0	13:16	18:44

Finding #17: At 18:44 minutes, ERF call-to-arrival performance over the four-year study period was 7:14 minutes (63 percent) slower than Citygate's 11:30-minute best practice goal to facilitate desired outcomes in urban/suburban communities.

2.7 Overall Deployment Evaluation

SOC Element 8 of 8
Overall Evaluation

The District serves a suburban/rural population with a mixed land-use pattern typical of other communities of similar size and demographics along the central California coast.

In addition to other services, the District provides fire services with a staff of eight full-time personnel and up to 25 reserve firefighters (nine active at the time of this report) from a single fire station located in the south-central section of the District staffing one engine and one squad. The District contracts with the California Department of Forestry and Fire Protection (CAL FIRE) San Luis Obispo Unit to provide fire response staffing and administration services with the District retaining ownership of the physical assets used to provide those services. Citygate finds the station location to be adequate to provide first-unit travel times sufficiently quick to facilitate positive outcomes in the more densely populated areas of the District's service area, and the District's physical response units appropriately configured to protect the values at risk from most hazards likely to impact the service area.

Even where state or local fire codes require fire sprinklers in residential dwellings, it will be many more decades before enough homes within the District service area are remodeled or replaced with automatic fire sprinklers. If desired outcomes include confining fire damage to only part of the inside of an affected building or minimizing permanent impairment or death resulting from a medical emergency, then the District will need first-due unit response performance consistent with Citygate's recommended 7:30–8:30 minutes of a 9-1-1 dispatch notification. More serious complex incidents requiring assistance from other local fire agencies to resolve are infrequent; however, response times for those resources are significantly longer than required to facilitate positive outcomes in most instances.

Over the four-year study period from July 1, 2019, through June 30, 2023, the District's staffing model provided a minimum of four response personnel on duty daily, including three full-time CAL FIRE personnel and one reserve firefighter. With recent changes to minimum training and certification requirements in addition to attrition, the reserve firefighter cadre has dwindled from an authorized maximum of 25 to nine active at the time of this study. With no residency or service requirements and a self-scheduling process, very few reserve firefighters are signing up for shifts resulting in only three response personnel on duty most days. Citygate finds this staffing model *insufficient* to ensure both response units are staffed with at least two personnel each and, when only three personnel are available, both units respond as a single unit leaving (1) no immediate response capacity for a concurrent incident, which occur 13 percent of the time, and (2) insufficient staffing to initiate a rescue requiring respiratory protective equipment in conformance with federal OSHA regulations.

Over the most recent four fiscal years, overall service demand increased nearly 17 percent, with EMS calls representing 74 percent of total demand. Residents over the age of 65 increased from 19.4 percent of the population in 2000 to nearly 28 percent in 2023, suggesting an aging service area population likely to drive up future service demand, particularly for emergency medical services.

The District experienced two or more simultaneous calls for service 13.2 percent of the time over the four-year study period, with total simultaneous incidents increasing approximately 29 percent over the same period. Citygate's analysis also found individual response unit utilization to be well below maximum, indicating capacity for additional non-concurrent service demand is available.

From this review and assessment, given current and projected future service demand, the aging demographics, simultaneous incident activity, and increasing calls for service outside the District to Montana de Oro State Park, Citygate considers four response personnel, with at least two being paramedics, as the *minimum* daily on duty staffing level needed to provide a reasonable *speed of response* to facilitate positive outcomes in the higher population density areas of the District and ensure sufficient staffing for at least one concurrent emergency incident. This recommended minimum staffing level, however, *does not* provide a minimally sufficient *weight of response* to complete the critical tasks necessary to safely resolve even a moderately complex or more serious event such as a building fire, multiple patient EMS, vehicle collision with extrication required, or technical rescue.

Citygate finds the key challenge to maintaining the current staffing level is the small cadre of active reserve firefighters with no residency or service requirement and a self-scheduling process for shift coverage. The District should seek to identify opportunities to improve reserve firefighter participation and shift staffing and/or fund additional overtime for full-time personnel to maintain its current desired 4-person staffing level. If unable to substantially improve reserve firefighter participation/attendance, the District should consider funding a fourth full-time firefighter on each shift, with reserve firefighters continuing to be to augment full-time staffing as available.

Given the extended travel distance for the mutual aid resources needed to achieve an acceptable weight of response (ERF) for more serious emergency events, Citygate recommends the District strive to increase its minimum daily staffing over time as fiscal resources allow to at least six on duty personnel daily to provide enough staffing to complete at least the key critical tasks in sufficient time to facilitate desired outcomes. Ideally, this staffing model could be achieved with a combination of full-time and reserve personnel.

As the following table shows, call processing/dispatch and crew turnout performance appear to meet recommended best practice goals; however, the call processing component does not include the time for the Sheriff's Department PSAP dispatch center to transfer the initial 9-1-1 call to the San Luis Obispo CAL FIRE Unit ECC. This additional call processing step will most likely be resolved when the two dispatch centers are consolidated into a new joint facility in the near future.

Table 16—Response Performance Summary (RY 19/20–RY 22/23)

Response Component	Best Practice		90th Percentile Performance	Performance vs. Best Practice
	Time	Source		
Call Processing / Dispatch	1:00 1:30	NFPA Citygate	1:04	**+0:04 - 0:26**
Crew Turnout	1:00-1:20 2:00	NFPA Citygate	2:06	**+0:26 to 1:06 +0:06**
First-Unit Travel	4:00	NFPA Citygate	6:04	**-2:04**
First-Unit Call to Arrival	6:00 7:30	NFPA Citygate	8:23	**-2:23 -0:53**
ERF Travel	8:00	NFPA Citygate	15:46	**-7:46**
ERF Call to Arrival	10:20 11:30	NFPA Citygate	18:44	**-8:24 -7:14**

First-unit *travel* performance is 2:00 minutes slower than the Citygate and NFPA-recommended 4:00-minute best practice goal to facilitate positive outcomes in urban/suburban density communities. First-unit *call-to-arrival* performance, however, is just less than 1:00 minute slower than Citygate's 7:30-minute recommended best practice goal to facilitate positive outcomes in urban/suburban density communities, suggesting that most emergent calls are nearer the core of the service area than the outer, more-rural sections.

At nearly 19:00 minutes, response performance to more serious/complex incidents requiring outside mutual aid resources is *significantly slower* than Citygate's recommended 11:30-minute best practice goal to facilitate positive outcomes in urban/suburban density communities, and thus should not be expected to result in positive outcomes in most cases. This is unavoidable considering the longer travel distance for mutual aid resources. Over the four-year study period, there were only two incidents where an entire Effective Response Force of two engines, the squad, and a chief officer arrived at the incident, and small data sets such as this are typically quite volatile depending on the incident locations and responding mutual aid resources. While the occurrence of these more serious incidents is infrequent, it is important consider the rate of simultaneous incidents, as well as the federal OSHA regulation requiring at least four trained personnel to initiate a rescue requiring respiratory protective equipment.

Considering response performance, Citygate recommends the District adopt first-unit response performance goals to drive future deployment planning and response performance monitoring, to include a 1:00-minute call processing/dispatch, 2:00-minute crew turnout, and 5:00-minute travel goal, for a total first-unit response time goal of 8:00 minutes 90 percent of the time. Due to the

relative infrequency of more serious incidents requiring mutual aid and the extended distance and associated time for those resources to travel into the District service area, Citygate does not recommend adopting a specific ERF response goal, but rather recommends the District seek to update its automatic and mutual aid agreements to ensure a timely response of the most proximal resources as needed for these less frequent events.

Finding #18: The fire station is adequately located to provide first-unit travel times to facilitate positive outcomes in the more densely populated areas of the District's service area.

Finding #19: The District's population is aging, with persons over 65 years of age increasing from19.4 percent in 2000 to nearly 28 percent in 2023, which can likely be expected to drive up future service demand, particularly for emergency medical services.

Finding #20: The District's individual response unit hourly utilization is well below recommended maximum saturation levels indicating sufficient capacity for additional non-concurrent service demand.

Finding #21: Citygate considers four response personnel, with at least two being paramedics, as the *minimum* daily on duty staffing level needed to provide a reasonable *speed of response* to facilitate positive outcomes in the higher population density areas of the District and ensure sufficient staffing for at least one concurrent emergency incident.

Finding #22: The District's current daily staffing model of four personnel *does not* provide a minimally sufficient weight of response to complete the critical tasks necessary to safely resolve even a moderately complex or more serious event such as a building fire, multiple patient EMS, vehicle collision with extrication required, or technical rescue.

Finding #23: Positive outcomes for more complex/serious emergency events should not be expected in most instances given the insufficient on-duty staffing and long response time for mutual aid resources.

Finding #24: Calls for service at Montana de Oro State Park are increasingly impacting service availability within the District.

2.7.1 Deployment Recommendations

Based on the technical analysis and findings contained in this assessment, Citygate makes the following deployment recommendations.

Recommendation #1:	**Adopt Response Goal Policies:** The District should adopt response performance measures to aid deployment planning and to monitor response performance. The measures of time should be designed to deliver outcomes that will save EMS patients, when possible, upon arrival and keep small but serious fires from becoming more serious. With this is mind, Citygate recommends the following measures: **1.1 First-Due Unit:** To treat pre-hospital medical emergencies and control small fires, the first-due unit should arrive within 8:00 minutes, 90 percent of the time, from the receipt of the 9-1-1 call at the CAL FIRE San Luis Obispo ECC to incidents within the District service area. This equates to 1:00-minute for call processing / dispatch, 2:00 minutes for crew turnout, and 5:00 minutes for travel. **1.2 Multiple-Unit Effective Response Force for Serious Emergencies:** To confine building fires near the room or rooms of origin, keep vegetation fires under one acre in size, and treat multiple medical patients at a single incident, a multiple-unit ERF of at least **16** personnel, including at least one Chief Officer, should arrive as soon as possible in the District from the time of call receipt at the CAL FIRE San Luis Obispo ECC.

1.3 <u>Hazardous Materials Response:</u> To protect the District service area from hazards associated with uncontrolled release of hazardous and toxic materials, the fundamental mission of the District's response is to isolate the hazard, deny entry into the hazard zone, and minimize impacts on the community. This can be achieved with a first-due total response time of 8:00 minutes or less within the service area to provide initial hazard evaluation and mitigation actions. After the initial evaluation is completed, a determination can be made whether to request additional resources to mitigate the hazard.

1.4 <u>Technical Rescue:</u> To respond to technical rescue emergencies as efficiently and effectively as possible with enough trained personnel to facilitate a successful rescue, a first-due total response time of 8:00 minutes or less within the service area to evaluate the situation and initiate rescue actions. Additional resources should assemble as soon as possible to safely complete rescue/extrication and delivery of the victim to the appropriate emergency medical care facility.

Recommendation #2: Consider ensuring four personnel, including at least two paramedics, is the *minimum* daily staffing level over the near term.

Recommendation #3: Seek to identify opportunities to improve reserve firefighter participation and shift staffing, and/or fund additional overtime for full-time personnel to maintain four-person daily staffing.

Recommendation #4: If unable to substantially improve reserve firefighter participation and shift staffing, the District should consider funding an additional full-time position on each shift to ensure a minimum staffing level of four personnel daily.

Recommendation #5:	The District should seek to increase its minimum daily staffing over time to at least six on-duty personnel daily to provide enough staffing to complete the key critical tasks at more complex/serious incidents in sufficient time to facilitate desired outcomes. Ideally, this staffing model could be achieved with a combination of full-time and reserve personnel.
Recommendation #6:	Update/revise automatic/mutual aid agreements as needed to ensure timely response of the most proximal resources for more serious/complex incidents requiring additional resources.

APPENDIX A—COMMUNITY RISK ASSESSMENT

A.1 COMMUNITY RISK ASSESSMENT

SOC ELEMENT 3 OF 8
COMMUNITY RISK ASSESSMENT

The third element of the Standards of Coverage (SOC) process is a community risk assessment. Within the context of an SOC study, the objectives of a community risk assessment are to:

- Identify the values at risk to be protected within the community or service area.
- Identify the specific hazards with the potential to adversely impact the community or service area.
- Quantify the overall risk associated with each hazard.
- Establish a foundation for current/future deployment decisions and risk-reduction / hazard-mitigation planning and evaluation.

A hazard is broadly defined as a situation or condition that can cause or contribute to harm. Examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. Risk is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity of resultant impacts* to people, property, and the community as a whole.

A.1.1 Risk Assessment Methodology

The methodology employed by Citygate to assess community risks as an integral element of an SOC study incorporates the following elements:

- Identification of geographic planning sub-zones (risk zones) appropriate to the community or jurisdiction.
- Identification and quantification, to the extent data is available, of the specific values at risk to various hazards within the community or service area.
- Identification of the fire and non-fire hazards likely to impact the community or service area relative to services provided by the fire agency.
- Determination of the probability of occurrence for each hazard.
- Determination of probable impact severity of a hazard occurrence by planning zone.

- Determination of the impact severity of a hazard occurrence on the fire agency's overall response capacity.
- Determination of overall risk by hazard considering probability of occurrence and likely impact severity according to the following table.

Table 17—Overall Risk

Probability	Impact				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	Low	Low	Low	Moderate	High
Unlikely	Low	Low	Low	Moderate	High
Possible	Low	Low	Moderate	High	Extreme
Probable	Low	Low	Moderate	High	Extreme
Frequent	Low	Moderate	High	Extreme	Extreme

For this assessment, Citygate used the following data sources to understand the hazards and values to be protected within the Los Osos CSD service area:

- Esri and U. S. Census Bureau population and demographic data
- District and County Geographical Information Systems (GIS) data
- County General Plan and Zoning information
- County Hazard Mitigation Plan
- Department and other District data and information.

A.1.2 Risk Assessment Summary

Citygate's evaluation of the values at risk and hazards likely to impact the service area yields the following:

1. The Department serves an unincorporated suburban community with a varied land use pattern and population density ranging from less than 500 to more than 5,500 people per square mile.

2. The District population is projected to grow nearly 29 percent over the 2020 census population to 18,600 people by 2035.[8]

3. The service area has a moderate inventory of residential and non-residential buildings to protect.

4. The service area has numerous resources to be protected, as identified in this assessment.

5. San Luis Obispo County has multiple mass emergency notification options available to effectively communicate emergency information to the public in a timely manner.

6. The service area's risk for six hazards related to emergency services provided by the Department range from **Moderate** to **High** as summarized in the following table.

Table 18—Overall Risk by Incident Type

Hazard	Planning Zone
	Sta. 15
Building Fire	Moderate
Vegetation/Wildland Fire	High
Medical Emergency	High
Hazardous Material	Moderate
Technical Rescue	High
Marine Incident	Moderate

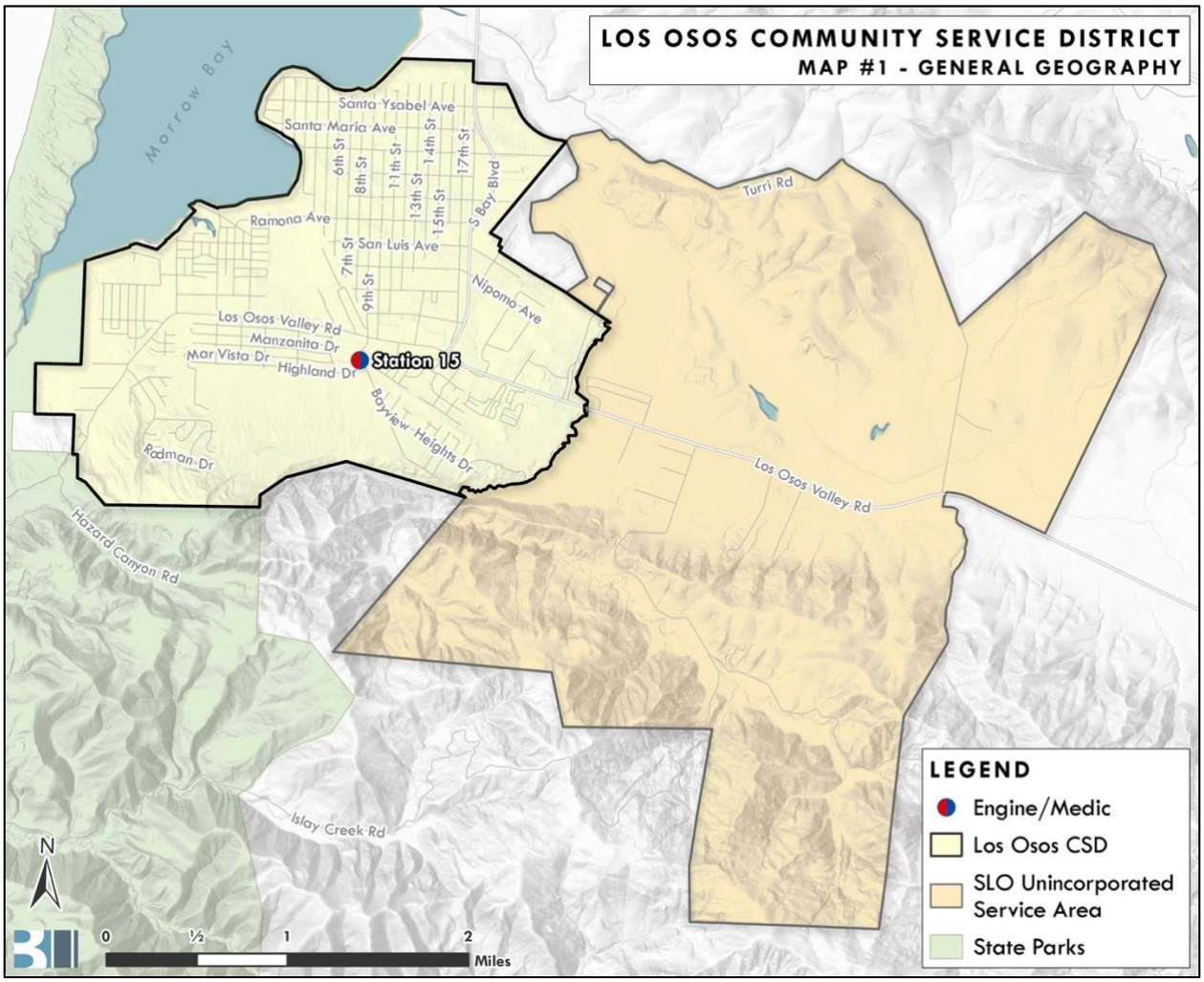
A.1.3 Planning Zones

The Commission on Fire Accreditation International (CFAI) recommends jurisdictions establish geographic planning zones to better understand risk at a sub-jurisdictional level. For example, portions of a jurisdiction may contain predominantly moderate risk building occupancies, such as detached single-family residences, while other areas contain high-risk or maximum-risk occupancies, such as commercial and industrial buildings with a high hazard fire load. If risk were to be evaluated on a jurisdiction-wide basis, the predominant moderate risk could outweigh the high or maximum risk and may not be a significant factor in an overall assessment of risk. If, however, high-risk or maximum-risk occupancies are a larger percentage of the risk in a smaller

8 Source: 2020 San Luis Obispo County Los Osos Community Plan, Table C-3.

planning zone, then they become a more significant risk factor. Another consideration in establishing planning zones is that the jurisdiction's record management system must also track the specific zone for each incident to appropriately evaluate service demand and response performance relative to each specific zone. For this assessment, Citygate utilized a single planning zone to include the CSD and adjacent unincorporated service area as shown in the following map.

Figure 10—Risk Planning Zone



A.1.4 Values at Risk to Be Protected

Values at risk, broadly defined, are tangibles of significant importance or value to the community or jurisdiction potentially at risk of harm or damage from a hazard occurrence. Values at risk typically include people, critical facilities/infrastructure, buildings, and key economic, cultural, historic, or natural resources.

People

Residents, employees, visitors, and travelers in a community or jurisdiction are vulnerable to harm from a hazard occurrence. Particularly vulnerable are specific at-risk populations, including those unable to care for themselves or self-evacuate in the event of an emergency. At-risk populations typically include children under the age of 10, the elderly, people housed in institutional settings, and households below the federal poverty level. The following table summarizes key service area demographic data.

Table 19—Key Demographic Data – District Service Area

Demographic	2023
Population	**14,386**
Under 10 Years	8.7%
10–14 Years	4.9%
15–64 Years	58.7%
65–74 Years	16.7%
75 Years and Older	11.0%
Median Age	49.1
Daytime Population	10,504
Housing Units	**6,542**
Owner-Occupied	66.90%
Renter-Occupied	25.00%
Vacant	8.1%
Median Household Size	2.38
Median Home Value	$764,457
Ethnicity	
White Alone	74.6%
Black / African American Alone	0.60%
Asian Alone	5.5%
Other / Two or More Races	19.3%
Hispanic / Latino Origin	17.0%
Diversity Index	58.5
Education (Population over 24 Years of Age)	**11,190**
High School Graduate or Equivalent	94.4%
Undergraduate Degree	46.0%
Graduate/Professional Degree	18.8%
Employment (Population over 15 Years of Age)	**7,114**
In Labor Force	94.7%
Unemployed	5.3%
Median Household Income	$117,091
Population below Poverty Level*	10.0%
Population under age 65 with Disabilities*	10.3%
Population without Health Insurance Coverage*	8.9%

Source: Esri and U.S. Census Bureau

* Los Osos Census-Designated Place

Of note from the previous table is the following:

- Slightly more than 36 percent of the population is under 10 years or over 65 years of age.
- The service area population is predominantly White Only (75 percent), followed by Two or More Races (19 percent), Asian Alone (5 percent), and Black / African American Alone (1 percent), with 17 percent of the population being of Hispanic origin or ethnicity.
- Of the population over 24 years of age, more than 94 percent has completed high school or equivalency.
- Of the population over 24 years of age, 46 percent has an undergraduate degree and nearly 19 percent has a graduate or professional degree.
- Of the population 15 years of age or older, nearly 95 percent is in the workforce; slightly more than 5 percent are unemployed.
- Median household income is slightly more than $117,000.
- The population below the federal poverty level is 10 percent.
- Nearly 9 percent of the population under age 65 does not have health insurance coverage.
- Slightly more than 10 percent of the population under age 65 has a disability.

It should also be noted that the District's population over the age of 65 has increased from 19.4 percent in 2000 to nearly 28 percent in 2023, an increase of 8.3 percent, suggesting an aging service area population likely to drive future service demand, particularly for emergency medical services.

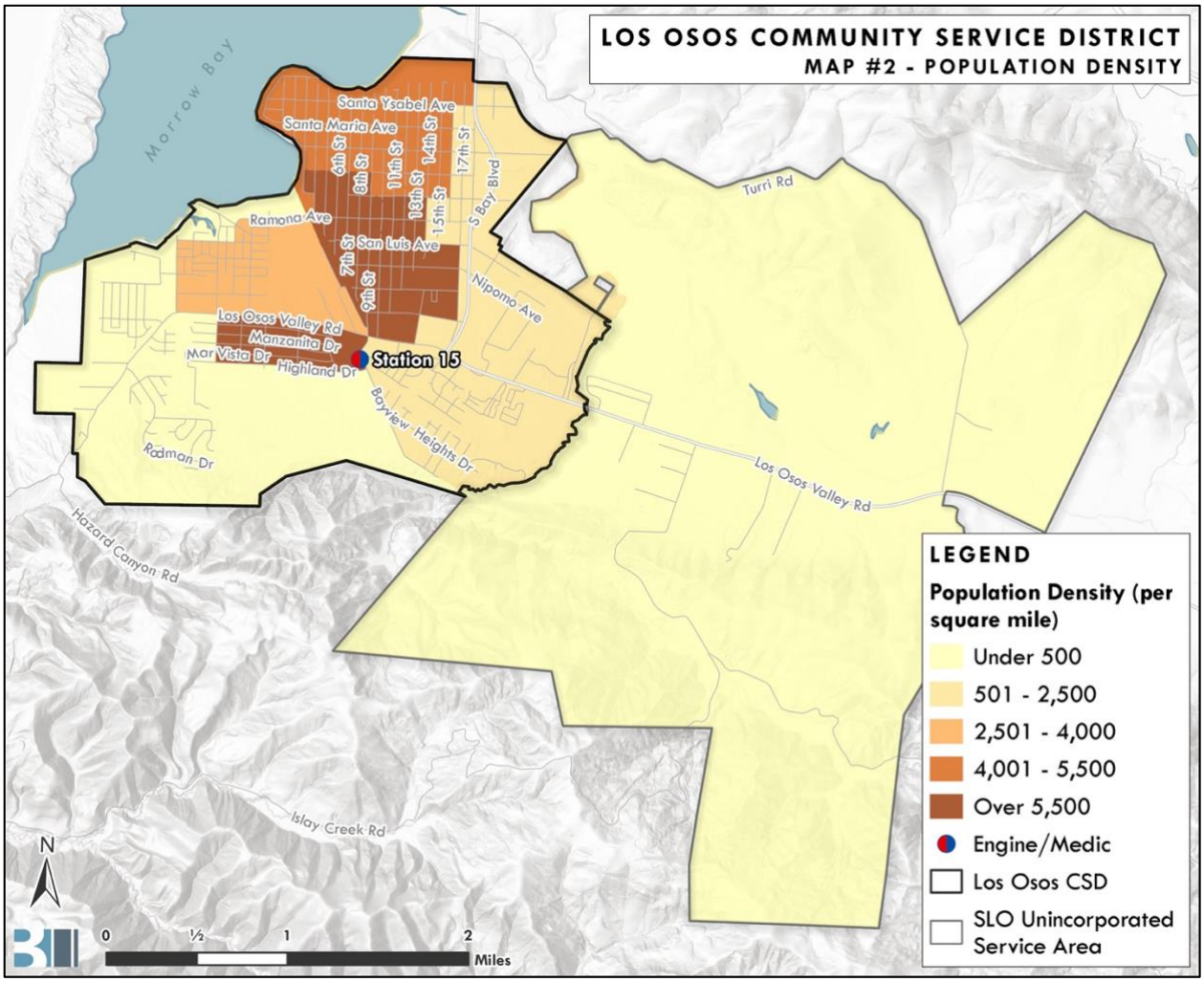
The 2020 Los Osos Community Plan projects the District's population will increase by nearly 29 percent over the 2020 census population to 18,600 people by 2035.[9]

Population Density

The following figure illustrates population density within the District service area ranging from less than 500 to more than 5,500 people per square mile.

9 Source: 2020 San Luis Obispo County Los Osos Community Plan, Table C-3.

Figure 11—Population Density



Buildings

The service area has approximately 6,500 residential housing units and nearly 500 businesses employing nearly 2,300 employees.[10]

Building Occupancy Risk Categories

The CFAI identifies the following four risk categories that relate to building occupancy:

10 Source: Esri Community Analyst – Community Profile (2023) and Business Summary (2023).

Low Risk – includes detached garages, storage sheds, outbuildings, and similar building occupancies that pose a relatively low risk of harm to humans or the community if damaged or destroyed by fire.

Moderate Risk – includes detached single-family or two-family dwellings; mobile homes; commercial and industrial buildings smaller than 10,000 square feet without a high hazard fire load; aircraft; railroad facilities; and similar building occupancies where loss of life or property damage is limited to the single building.

High Risk – includes apartment/condominium buildings; commercial and industrial buildings larger than 10,000 square feet without a high hazard fire load; low-occupant load buildings with high fuel loading or hazardous materials; and similar occupancies with potential for substantial loss of life or unusual property damage or financial impact.

Maximum Risk – includes buildings or facilities with unusually high risk requiring an Effective Response Force (ERF) involving a significant augmentation of resources and personnel and where a fire would pose the potential for a catastrophic event involving large loss of life or significant economic impact to the community.

Critical Facilities

The U.S. Department of Homeland Security defines critical infrastructure and key resources as those physical assets essential to the public health and safety, economic vitality, and resilience of a community, such as lifeline utilities infrastructure, telecommunications infrastructure, essential government services facilities, public safety facilities, schools, hospitals, airports, etc. There are 13 critical facilities within the District as shown in the following table.[11] A hazard occurrence with significant impact severity affecting one or more of these facilities would likely adversely impact critical public or community services.

Table 20—Critical Facilities

Critical Facility Category	Number
Day Care	6
Education	3
Public Safety	3
Communications	1
Total	**13**

11 Source: 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan, Annex K, Table K.7, and Los Osos CSD staff

Economic Resources

The service area has nearly 500 businesses employing nearly 2,300 employees. Key economic sectors include services, retail trade, and finance/insurance/real estate.[12]

Natural Resources[13]

Key natural resources within the service area include:

- Los Osos Oaks State Reserve
- Baywood Park
- Audubon Overlook
- Elfin Forest
- Sweet Springs Nature Preserve
- Montana de Oro State Park
- Los Osos Community Park
- Los Osos School (1872)
- Morro Bay Estuary

Special/Unique Risks

The following facilities are special or unique risks within the service area:

- Mobile home parks
- Rantec Power Systems Inc.
- Elder care facilities
- Morro Bay Cable Landing Station

12 Source: Esri Community Analyst – Business Summary (2023).
13 Source: 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan, Annex K.

A.1.5 Hazard Identification

Citygate utilizes prior risk studies where available, fire and non-fire hazards as identified by the CFAI, and agency/jurisdiction-specific data and information to identify the hazards to be evaluated for this study. The 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) identifies the following 13 hazards likely to impact the County:

1. Adverse weather
2. Agricultural pest infestation and plant disease / marine invasive species
3. Biological agents
4. Coastal storm / coastal erosion / sea level rise
5. Dam incidents
6. Drought / water shortage
7. Earthquake
8. Flood
9. Landslide / debris flow
10. Subsidence
11. Tsunami
12. Wildfire
13. Hazardous materials

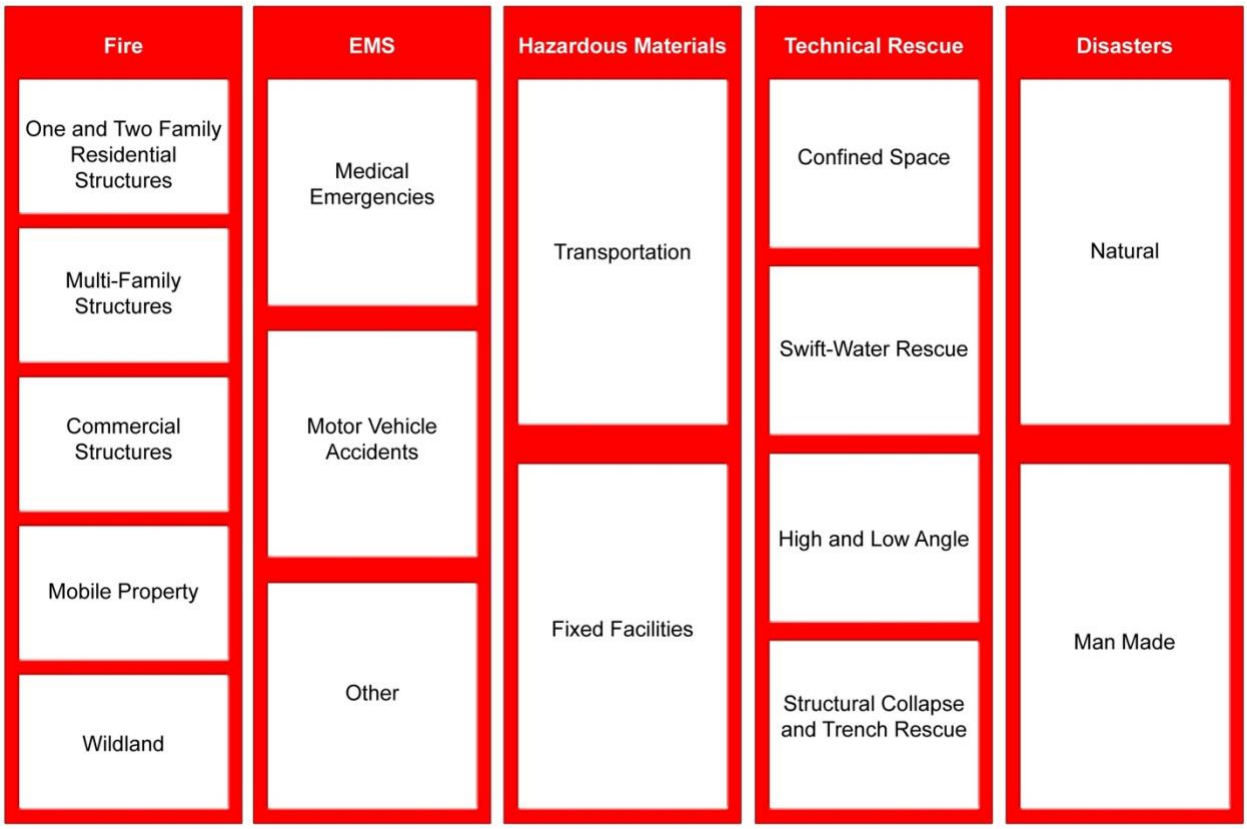
Annex K of the MJHMP identifies the following five hazards as likely to impact the Los Osos CSD:

1. Adverse weather
2. Coastal storm / coastal erosion / sea level rise
3. Drought
4. Earthquake
5. Wildfire

Although the District has no legal authority or responsibility to mitigate any hazards other than possibly for wildfire, it does provide services related to many hazards, including fire suppression, emergency medical services, and initial technical rescue and hazardous material response.

The CFAI groups hazards into fire and non-fire categories, as shown in the following figure. Identification, qualification, and quantification of the various fire and non-fire hazards are important factors in evaluating how resources are or can be deployed to mitigate those risks.

Figure 12—Commission on Fire Accreditation International Hazard Categories



Source: CFAI *Standards of Cover* (Fifth Edition)

Subsequent to review and evaluation of the hazards identified in the San Luis Obispo County MJHMP and the fire and non-fire hazards as identified by the CFAI as they relate to services provided by the District, Citygate evaluated the following six hazards for this assessment:

1. Building fire
2. Vegetation/wildland fire
3. Medical emergency
4. Hazardous material release/spill
5. Technical rescue
6. Marine incident

A.1.6 Service Capacity

Service capacity refers to an agency's available response force; the size, types, and condition of its response fleet and any specialized equipment; core and specialized performance capabilities and competencies; resource distribution and concentration; availability of automatic or mutual aid; and any other agency-specific factors influencing its ability to meet current and prospective future service demand and response performance relative to the risks to be protected.

The Department's service capacity for fire and non-fire risk consists of a minimum of three personnel on duty daily staffing one engine and one paramedic squad, plus one Battalion Chief assigned to serve CAL FIRE San Luis Obispo Unit's coastal area.

All response personnel are trained to either the Emergency Medical Technician (EMT) level, capable of providing Basic Life Support (BLS) pre-hospital emergency medical care, or EMT-Paramedic (Paramedic) level, capable of providing Advanced Life Support (ALS) pre-hospital emergency medical care. Ground paramedic ambulance service is provided by San Luis Ambulance Services, a private-sector ambulance provider operating under an exclusive operating area contract administered by the San Luis County Emergency Medical Services Agency.

Response personnel are also trained to the U.S. Department of Transportation Hazardous Material First Responder Operational (FRO) level to provide initial hazardous material incident assessment, hazard isolation, and support the Department's hazardous material response team. The Department has one person trained to the Hazardous Materials Technician level who also serves on the San Luis Obispo County Fire Hazardous Materials Response Team.

All response personnel are further trained to the Confined Space Awareness level. Technical rescue response services, when needed, are provided by San Luis Obispo County Fire personnel from Station 21 in San Luis Obispo and Station 30 in Paso Robles.

A.1.7 Probability of Occurrence

Probability of occurrence refers to the probability of a future hazard occurrence during a specific period. Because the CFAI agency accreditation process requires annual review of an agency's risk assessment and baseline performance measures, Citygate recommends using the 12 months following the completion of an SOC study as an appropriate period for the probability of occurrence evaluation. The following table describes the five probability of occurrence categories and related characteristics used for this analysis.

Table 21—Probability of Occurrence Categories

Category	General Characteristics	Anticipated Frequency of Occurrence
Rare	• Hazard ***may occur*** under exceptional circumstances.	> 10 years
Unlikely	• Hazard ***could occur*** at some time. • No recorded or anecdotal evidence of occurrence. • Little opportunity, reason, or means for hazard to occur.	2–10 years
Possible	• Hazard ***should occur*** at some time. • Infrequent, random recorded or anecdotal evidence of occurrence. • Some opportunity, reason, or means for hazard to occur.	1–23 months
Probable	• Hazard will ***probably occur*** occasionally. • Regular recorded or strong anecdotal evidence of occurrence. • Considerable opportunity, reason, or means for hazard to occur.	1–4 weeks
Frequent	• Hazard is ***expected to occur*** regularly. • High level of recorded or anecdotal evidence of regular occurrence. • Strong opportunity, reason, or means for hazard to occur. • Frequent hazard recurrence.	Daily to weekly

Citygate's SOC assessments use recent multiple-year hazard response data to determine the probability of hazard occurrence for the ensuing 12-month period.

A.1.8 Impact Severity

Impact severity refers to the *probable* extent a hazard occurrence has on people, buildings, lifeline services, the environment, and the community as a whole. The following table describes the five impact severity categories and general characteristics used for this analysis.

Table 22—Impact Severity Categories

Category	General Characteristics
Insignificant	• No injuries or fatalities • Few to no persons displaced for short duration • Little or no personal support required • Inconsequential to no damage • Minimal to no community disruption • No measurable environmental impacts • Minimal to no financial loss • No wildland Fire Hazard Severity Zones (FHSZs)
Minor	• Few injuries; no fatalities; minor medical treatment only • Some displacement of persons for less than 24 hours • Some personal support required • Some minor damage • Minor community disruption of short duration • Small environmental impacts with no lasting effects • Minor financial loss • No wildland FHSZs
Moderate	• Medical treatment required; some hospitalizations; few fatalities • Localized displacement of persons for fewer than 24 hours • Personal support satisfied with local resources • Localized damage • Normal community functioning with some inconvenience • No measurable environmental impacts with no long-term effects, or small impacts with long-term effect • Moderate financial loss • Less than 25% of area in *Moderate* or *High* wildland FHSZs
Major	• Extensive injuries; significant hospitalizations; many fatalities • Large number of persons displaced for more than 24 hours • External resources required for personal support • Significant damage • Significant community disruption; some services not available • Some impact to environment with long-term effects • Major financial loss with some financial assistance required • More than 25% of area in *Moderate* or *High* wildland FHSZs; less than 25% in *Very High* wildland FHSZs
Extreme	• Large number of severe injuries requiring hospitalization; significant fatalities • General displacement for extended duration • Extensive personal support required • Extensive damage • Community unable to function without significant external support • Significant impact to environment and/or permanent damage • Catastrophic financial loss; unable to function without significant support • More than 50% of area in *High* wildland FHSZs; more than 25% of area in *Very High* wildland FHSZs

A.1.9 Overall Risk

Overall risk was determined by considering the probability of occurrence, reasonably expected impact severity according to the following table.

Table 23—Overall Risk

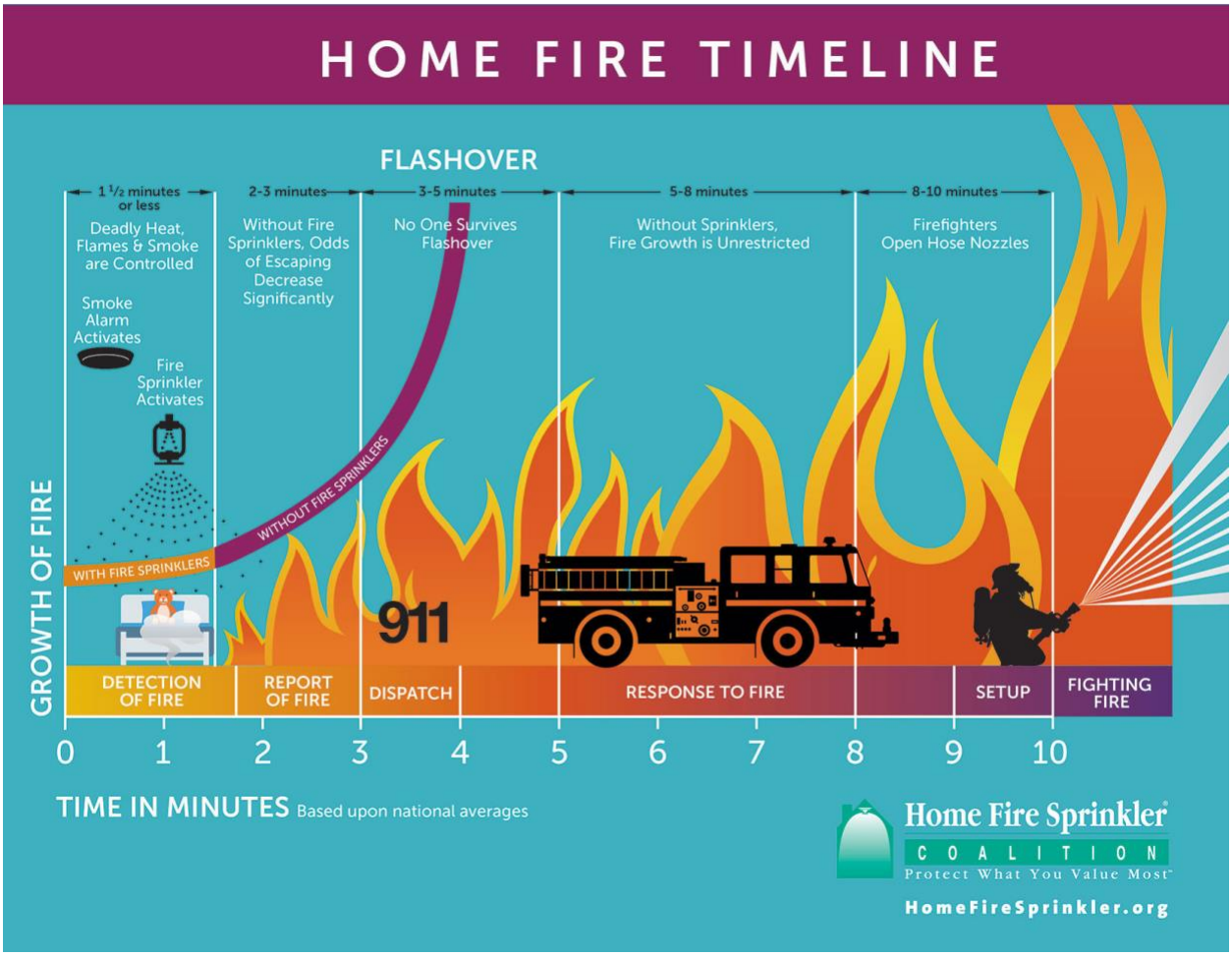
Probability of Occurrence	Probable Impact Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	*Low*	*Low*	*Low*	*Moderate*	*High*
Unlikely	*Low*	*Low*	*Low*	*Moderate*	*High*
Possible	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Probable	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Frequent	*Low*	*Moderate*	*High*	*Extreme*	*Extreme*

A.1.10 Building Fire Risk

One of the primary hazards in any community is building fire. Building fire risk factors include building size, age, construction type, density, occupancy, and height above ground level; required fire flow; proximity to other buildings; built-in fire protection/alarm systems; available fire suppression water supply; building fire service capacity; and fire suppression resource deployment (distribution/concentration), staffing, and response time. Citygate used available data from the Department and the U.S. Census Bureau to assist in determining the service area's building fire risk.

The following figure illustrates the building fire progression timeline and shows that flashover, which is the point at which the entire room erupts into fire after all the combustible objects in that room reach their ignition temperature, can occur as early as 3:00 to 5:00 minutes from the initial ignition. Human survival in a room after flashover is extremely improbable.

Figure 13—Building Fire Progression Timeline



Source: http://www.firesprinklerassoc.org.

Population Density

The District service area population density ranges from less than 500 to more than 5,500 people per square mile. Although risk analysis across a wide spectrum of other Citygate clients shows no direct correlation between population density and building fire *occurrence*, it is reasonable to conclude that building fire *risk* relative to potential impact on human life is greater as population density increases, particularly in areas with high density, multiple-story buildings.

Water Supply

A reliable public water system providing adequate volume, pressure, and flow duration in close proximity to all buildings is a critical factor in mitigating the potential impact severity of a community's building fire risk. Potable water within the service area is provided by the District, Golden State Water, and S&T Mutual Water Company. According to District and Department

staff, available fire flow volume and pressure are generally adequate throughout the service area with the exception of areas without fire hydrants.

Building Fire Service Demand

For the four-year period from July 1, 2019, through June 30, 2023, the service area experienced 21 building fire incidents comprising 0.40 percent of total service demand over the same period, as summarized in the following table.

Table 24—Building Fire Service Demand

Hazard	Year	Sta. 15	Percent of Total Demand
Building Fire	RY 19/20	7	0.59%
	RY 20/21	5	0.38%
	RY 21/22	4	0.30%
	RY 22/23	5	0.36%
	Total	**21**	**0.40%**

Building Fire Risk Assessment

The following table summarizes Citygate's assessment of the service area's building fire risk.

Table 25—Building Fire Risk Assessment

Building Fire Risk	Sta. 15
Probability of Occurrence	Possible
Probable Impact Severity	Moderate
Overall Risk	**Moderate**

A.1.11Vegetation/Wildland Fire Risk

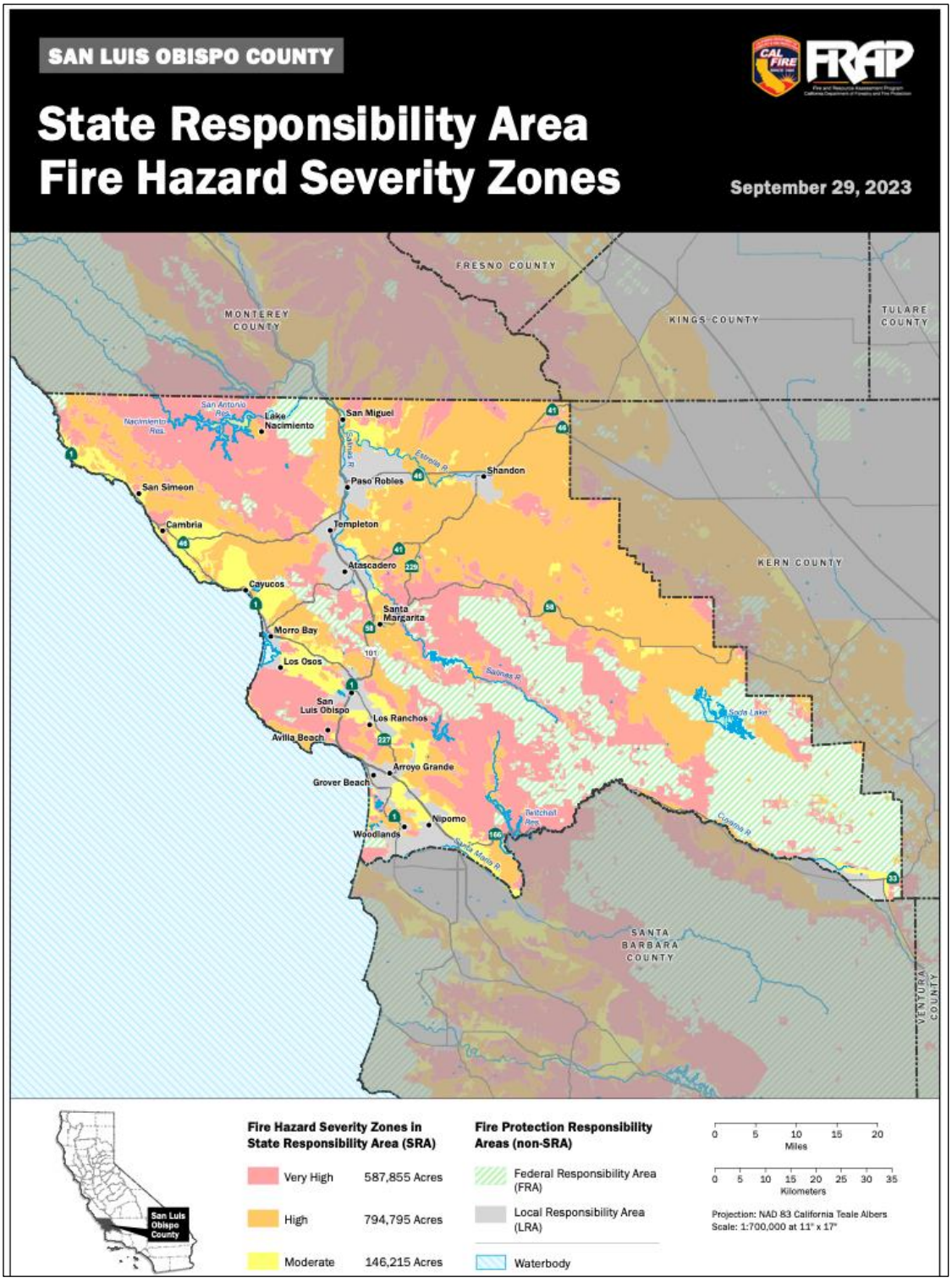
Several areas within and adjacent to the service area are susceptible to a vegetation/wildland fire. Vegetation/wildland fire risk factors include vegetative fuel types and configuration, weather, topography, prior fires, water supply, mitigation measures, and vegetation/wildland fire service capacity.

Wildland Fire Hazard Severity Zones

CAL FIRE designates wildland Fire Hazard Severity Zones (FHSZ) throughout the state based on analysis of multiple wildland fire hazard factors and modeling of potential wildland fire behavior.

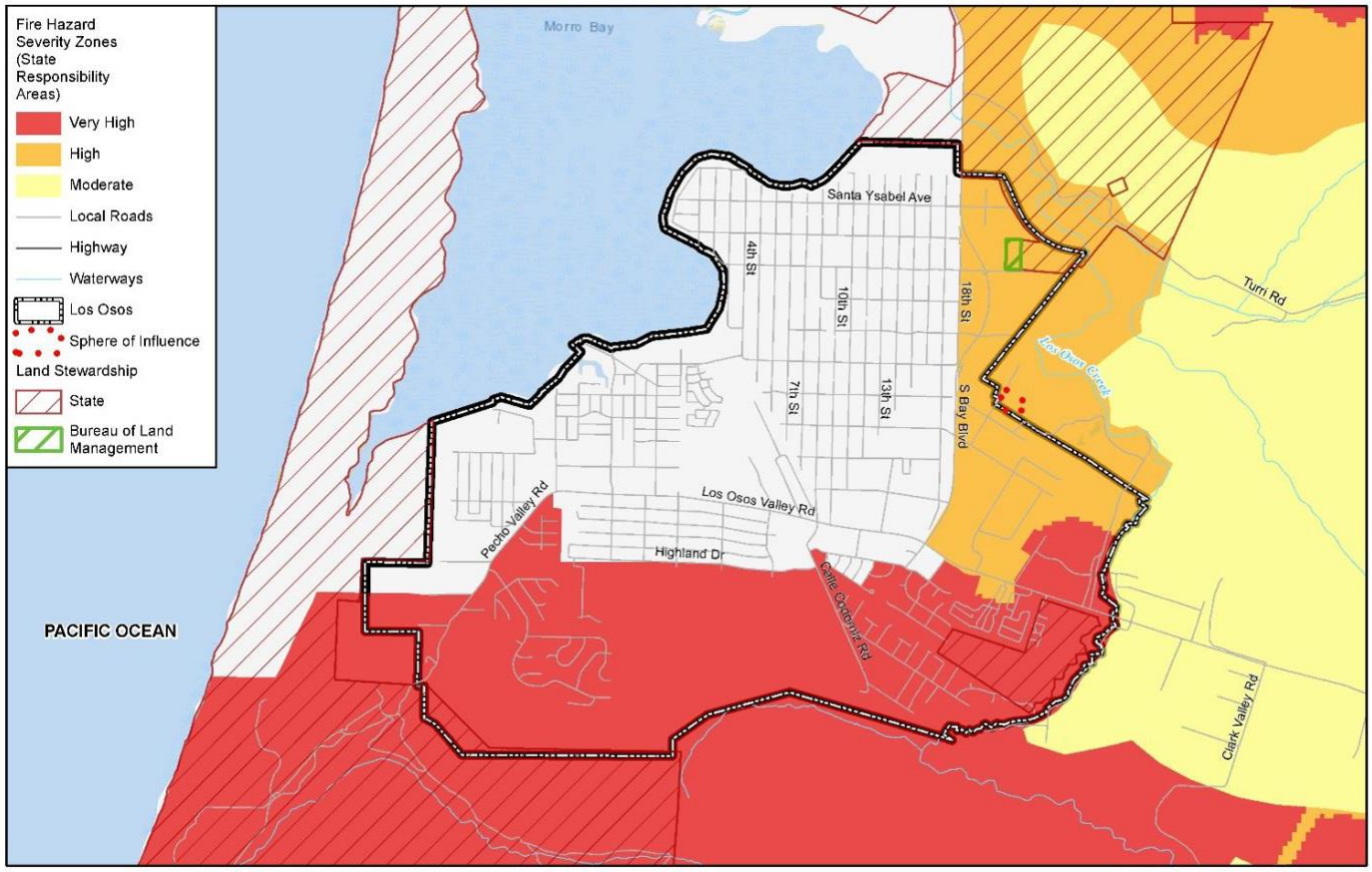
For State Responsibility Areas (SRAs) where CAL FIRE has fiscal responsibility for wildland fire protection, CAL FIRE designates Moderate, High, and Very High FHSZs by county, as shown in yellow, orange, and red, respectively, in the following map for San Luis Obispo County.

Figure 14—SRA Wildland Fire Hazard Severity Zones



In addition, the 2019 San Luis Obispo County MJHMP identifies ***Moderate***, ***High***, and ***Very High*** wildfire hazard zones within and adjacent to the District as shown in the following map.[14]

Figure 15—Los Osos CSD Wildland Fire Hazard Severity Zones



Vegetative Fuels

Vegetative fuel factors influencing fire intensity and spread include fuel type (vegetation species), height, arrangement, density, and moisture. In addition to decorative landscape species, vegetative fuels within the service area consist of a mix of annual grasses and weeds, brush, and mixed deciduous and conifer tree species. Once ignited, vegetation fires can burn intensely and contribute to rapid fire spread under the right fuel, weather, and topographic conditions.

Weather

Weather elements, including temperature, relative humidity, wind, and lightning, also affect vegetation/wildland fire potential and behavior. High temperatures and low relative humidity dry

14 Source: 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan, Annex K, Figure K.4.

out vegetative fuels, creating a situation where fuels will more readily ignite and burn more intensely. Wind is the most significant weather factor influencing vegetation/wildland fire behavior, with higher wind speeds increasing fire spread and intensity. Fuel and weather conditions most conducive to vegetation/wildfires generally occur from late June through October; however, above-normal temperatures and drought can increase that period on either end.

Topography

Vegetation/wildland fires tend to burn more intensely and spread faster when burning uphill and up-canyon, except for a wind-driven downhill or down-canyon fire. The hilly sections of the service area contribute more to vegetation/wildland fire behavior and spread than the flatter areas.

Water Supply

Another significant vegetation fire impact severity factor is water supply immediately available for fire suppression. According to Department staff, available fire flow and hydrant spacing is generally adequate in those sections of the service area with fire hydrants.

Wildland Fire History[15]

Although there have been no recent large, damaging wildfires in the immediate vicinity of the District service area, 490 wildfires have occurred in San Luis Obispo County from 1900 through 2018, including 15 fires larger than 20,000 acres.

Vegetation/Wildland Fire Hazard Mitigation

Hazard mitigation refers to specific actions or measures taken to prevent a hazard from occurring or to minimize the severity of impacts resulting from a hazard occurrence. While none of the hazards subject to this study can be entirely prevented, measures *can* be taken to minimize the impacts when those hazards do occur. In addition to fire-resistive construction materials and methods required in High Fire Hazard Areas, an annual vegetative fuel reduction project has been implemented in the Bay Oaks neighborhood. The San Luis Obispo County Fire Department, in collaboration with CAL FIRE and California Polytechnic State University San Luis Obispo, is also currently in the process of developing a Countywide Community Wildfire Protection Plan (CWPP) that will identify and prioritize prospective wildfire mitigation projects within designated wildfire hazard areas.

15 Source: 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan, Table 5-113.

Vegetation/Wildland Fire Service Demand

Over the four-year study period, the Department responded to only three vegetation/wildfires, comprising 0.06 percent of total service demand over the same period, as summarized in the following table.

Table 26—Vegetation/Wildland Fire Service Demand

Hazard	Year	Sta. 15	Percent of Total Demand
Vegetation / Wildland Fire	RY 19/20	0	0.00%
	RY 20/21	0	0.00%
	RY 21/22	1	0.08%
	RY 22/23	2	0.14%
	Total	**3**	**0.06%**

Vegetation/Wildland Fire Risk Assessment

The following table summarizes Citygate's assessment of the service area's vegetation/wildland fire risk.

Table 27—Vegetation/Wildland Fire Risk Assessment

Vegetation/Wildland Fire Risk	Sta. 15
Probability of Occurrence	Possible
Probable Impact Severity	Major
Overall Risk	**High**

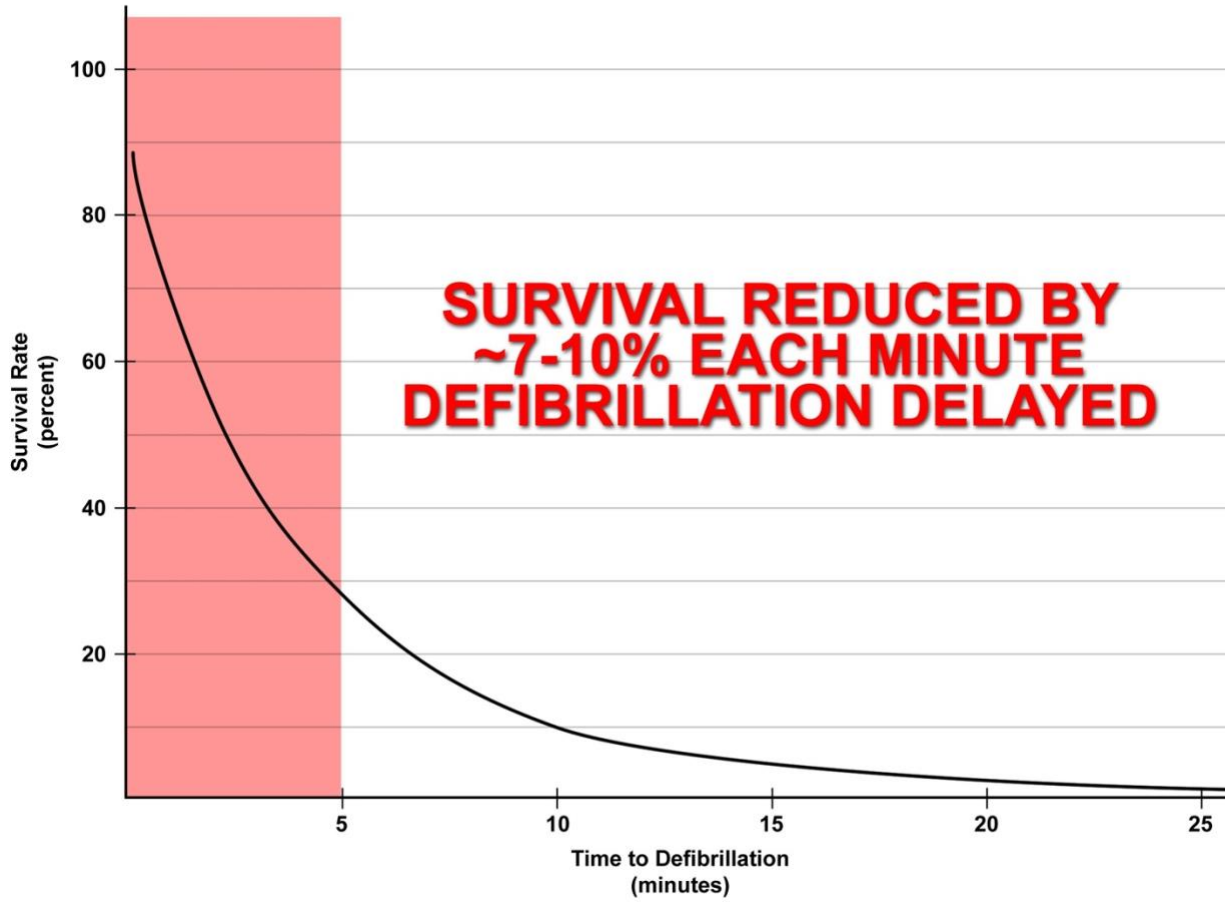
A.1.12 Medical Emergency Risk

Medical emergency risk in most communities is predominantly a function of population density, demographics, violence, health insurance coverage, and vehicle traffic.

Medical emergency risk can also be categorized as either a medical emergency resulting from a traumatic injury or a health-related condition or event. Cardiac arrest is one serious medical emergency among many where there is an interruption or blockage of oxygen to the brain.

The following figure illustrates the reduced survivability of a cardiac arrest victim as time to defibrillation increases. While early defibrillation is one factor in cardiac arrest survivability, other factors can influence survivability as well, such as early CPR and pre-hospital advanced life support interventions.

Figure 16—Survival Rate versus Time to Defibrillation



Population Density

Population density in the service area ranges from less than 500 to more than 5,500 people per square mile as shown in Figure 11. Risk analysis across a wide spectrum of other Citygate clients shows a direct correlation between population density and the *occurrence* of medical emergencies, particularly in high urban population density zones.

Demographics

Medical emergency risk tends to be higher among older, poorer, less educated, and uninsured populations. As shown in Table 19, nearly 28 percent of the service area population is 65 and older; 5.6 percent of the population over 24 years of age has less than a high school education or

equivalent; 10 percent of the population is at or below poverty level; and 8.9 percent of the population under age 65 does not have health insurance coverage.[16]

Vehicle Traffic

Medical emergency risk tends to be higher in areas of a community with a high volume of daily vehicle traffic, particularly areas with high traffic volume traveling at high speeds. The service area's transportation network includes Los Osos Valley Road (the only road connecting the service area with Highway 1 and the City of San Luis Obispo to the east) and South Bay Boulevard (the only road connecting the service area with Morro Bay and Highway 1 to the north). Both roads experience periods of high traffic volume from visitors traveling to and from Montana de Oro State Park.

Medical Emergency Service Demand

Medical emergency service demand over the four-year study period includes more than 3,800 calls for service comprising nearly 74 percent of total service demand over the same period, as summarized in the following table.

Table 28—Medical Emergency Service Demand

Hazard	Year	Sta. 15	Percent of Total Demand
Medical Emergency	**RY 19/20**	901	76.03%
	RY 20/21	944	71.90%
	RY 21/22	991	75.30%
	RY 22/23	1,005	72.67%
	Total	**3,841**	**73.89%**

As the table shows, medical emergency service demand varies by year and has fluctuated overall by less than five percent over the four-year study period.

Medical Emergency Risk Assessment

The following table summarizes Citygate's assessment of the service area's medical emergency risk.

16 Source: ESRI and US Census Bureau.

Table 29—Medical Emergency Risk Assessment

Medical Emergency Risk	Sta. 15
Probability of Occurrence	Frequent
Probable Impact Severity	Moderate
Overall Risk	**High**

A.1.13Hazardous Material Risk

Hazardous material risk factors include fixed facilities that store, use, or produce hazardous chemicals or waste; underground pipelines conveying hazardous materials; aviation, railroad, maritime, and vehicle transportation of hazardous commodities into or through a jurisdiction; vulnerable populations; emergency evacuation planning and related training; and specialized hazardous material service capacity.

Fixed Hazardous Materials Facilities

Department staff identified one facility within the service area that poses a potential risk for spill or release of a hazardous material.

Transportation-Related Hazardous Materials

The service area also has some transportation-related hazardous material risk from truck traffic delivering products to the service area, some of which may be transporting hazardous commodities.

Population Density

Because hazardous material emergencies have the potential to adversely impact human health, it is logical that the higher the population density, the greater the potential population exposed to a hazardous material release or spill. As shown in Figure 11, the service area population density ranges from less than 500 to more than 5,500 people per square mile.

Vulnerable Populations

Persons vulnerable to a hazardous material release/spill include individuals or groups unable to self-evacuate, generally including children under the age of 10, the elderly, and persons confined to an institution or other setting where they are unable to leave voluntarily. As shown in Table 19, more than 36 percent of the population is under age 10 or is 65 years and older.

Emergency Evacuation Planning, Training, Implementation, and Effectiveness

Another significant hazardous material impact severity factor is a jurisdiction's shelter-in-place / emergency evacuation planning and training. In the event of a hazardous material release or spill,

time can be a critical factor in notifying potentially affected persons, particularly at-risk populations, to either shelter-in-place or evacuate to a safe location. Essential to this process is an effective emergency plan that incorporates one or more mass emergency notification capabilities, as well as pre-established evacuation procedures. It is also essential to conduct regular, periodic exercises involving these two emergency plan elements to evaluate readiness and to identify and remediate any planning or training gaps to ensure ongoing emergency incident readiness and effectiveness.

San Luis Obispo County recently established pre-determined evacuation zones as part of a Countywide evacuation planning project. During an emergency, evacuation warnings and orders, including affected evacuation zones, are communicated to the public by Wireless Emergency Alerts (WEA), the Emergency Alert System (EAS) that requires local radio and television stations to broadcast emergency information, and AlertSLO—a free subscription and reverse 9-1-1-based mass emergency notification system that is used to provide emergency alerts, notifications, and other emergency information to email accounts, cell phones, smartphones, tablets, and landline telephones. In addition, an outdoor siren alert system is in place to alert local residents of an emergency at the Diablo Canyon Nuclear Power Plant approximately 15 miles southwest of the District.

Hazardous Material Service Demand

The service area experienced 33 hazardous material incidents over the four-year study period, comprising 0.63 percent of total service demand over the same period as summarized in the following table.

Table 30—Hazardous Material Service Demand

Hazard	Year	Sta. 15	Percent of Total Demand
Hazardous Material	RY 19/20	10	0.84%
	RY 20/21	9	0.69%
	RY 21/22	4	0.30%
	RY 22/23	10	0.72%
	Total	**33**	**0.63%**

Hazardous Material Risk Assessment

The following table summarizes Citygate's assessment of the service area's hazardous material risk.

Table 31—Hazardous Material Risk Assessment

Hazardous Material Risk	Sta. 15
Probability of Occurrence	Possible
Probable Impact Severity	Moderate
Overall Risk	**Moderate**

A.1.14Technical Rescue Risk

Technical rescue risk factors include active construction projects; structural collapse potential; confined spaces, such as tanks and underground vaults; bodies of water, including rivers and streams; industrial machinery use; transportation volume; and earthquake, flood, and landslide potential.

Construction Activity

There is generally some construction activity occurring within the service area.

Confined Spaces

There are occasional confined spaces within the service area relative to active construction or maintenance projects.

Bodies of Water

Bodies of water within the District service area include the Pacific Ocean, Morro Bay, Los Osos Creek, Islay Creek, and other smaller bodies of water and waterways.

Transportation Volume

Another technical rescue risk factor is transportation-related incidents requiring technical rescue. This risk factor is primarily a function of vehicle, railway, maritime, and aviation traffic. Vehicle traffic volume is the greatest of these factors within the service area, with Los Osos Valley Road and South Bay Boulevard being the primary travel routes into and out of the service area—both of which have high daily traffic volume that increases significantly on weekends, holidays, and during summer months from visitors traveling to and from Montana de Oro State Park.

Earthquake Risk[17]

The District is located in a geologically complex and seismically active region, with three fault zones with potential to impact the District service area, including the Los Osos Fault with potential

17 Source: 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan, Section 5.

to generate a magnitude 6.8 earthquake. In addition, some areas of the District are filled with sand and are at moderate to high-risk in relation to the effects of liquefaction. The County has experienced several damaging earthquakes previously, including the 2003 6.5 magnitude San Simeon Earthquake and the 2004 6.0 magnitude Parkfield Earthquake.

The 2019 San Luis Obispo County MJHMP identifies the District as likely to experience a critical severity event over an extensive area resulting in a high overall earthquake risk.

Technical Rescue Service Demand

The Department responded to 8 technical rescue incidents over the four-year study period, comprising 0.15 percent of total service demand for the same period, as summarized in the following table.

Table 32—Technical Rescue Service Demand

Hazard	Year	Sta. 15	Percent of Total Demand
Technical Rescue	RY 19/20	0	0.00%
	RY 20/21	3	0.23%
	RY 21/22	1	0.08%
	RY 22/23	4	0.29%
	Total	**8**	**0.15%**

Technical Rescue Risk Assessment

The following table summarizes Citygate's assessment of the service area's technical rescue risk.

Table 33—Technical Rescue Risk Assessment

Technical Rescue Risk	Sta. 15
Probability of Occurrence	Possible
Probable Impact Severity	Major
Overall Risk	**High**

A.1.15Marine Incident Risk

Marine incident risk factors include waterway and near-shore recreational activities and watercraft storage and use in or on waterways within the service area.

Waterways

Bodies of water within the District service area include the Pacific Ocean, Morro Bay, Los Osos Creek, Islay Creek, and other smaller bodies of water and waterways.

Recreational Activity

The service area's waterways are popular for water recreation activities including swimming, snorkeling, fishing, paddle boarding, kayaking, etc.

Watercraft Storage

There is no watercraft storage on any of the waterways within the service area.

Watercraft/Vessel Activity

With the exception of the Pacific Ocean coastal zone, there is no watercraft/vessel activity within the service area.

Marine Incident Service Capacity

The Department's marine safety service capacity includes the same capacity as for other hazards identified in Section A.1.6.

Marine Incident Service Demand

Over the four-year study period, the Department responded to 8 marine incidents, comprising 0.15 percent of total service demand for the same period, as summarized in the following table.

Table 34—Marine Incident Service Demand

Hazard	Year	Sta. 15	Percent of Total Demand
Marine Incident	RY 19/20	0	0.00%
	RY 20/21	3	0.23%
	RY 21/22	3	0.23%
	RY 22/23	2	0.14%
	Total	**8**	**0.15%**

Marine Risk Assessment

The following table summarizes Citygate's assessment of the service area's marine incident risk.

Table 35—Marine Incident Risk Analysis

Marine Incident Risk	Sta. 15
Probability of Occurrence	Possible
Probable Impact Severity	Moderate
Overall Risk	**Moderate**