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VOLUME 1 OF 3
EXECUTIVE SUMMARY

FIRE DEPARTMENT STANDARDS OF RESPONSE COVER REVIEW

PERFORMED BY CITYGATE ASSOCIATES, LLC

in Partnership with The Omega Group and Animated Data

City of Sacramento Fire Department
JULY 20, 2016



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VOLUME 2 of 3 – Technical Report (separately bound)

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VOLUME 1—EXECUTIVE SUMMARY

The City of Sacramento Fire Department (the Department) retained Citygate Associates, LLC to perform a Fire Department Standards of Response Coverage (deployment) review. This study included reviewing the adequacy of the current fire station resource deployment system, the risks to be protected, and the emergency incident outcomes desired by the community. This report is presented in three volumes, including this Executive Summary (**Volume 1**) summarizing our findings and recommendations, a Technical Report (**Volume 2**) that includes a Standards of Coverage (deployment) assessment and community risk assessment, and a geographic map atlas (**Volume 3**) that displays fire unit travel time coverage.

1.1 POLICY CHOICES FRAMEWORK

First, as the City Council and Executive Management understand, there are no mandatory federal or state regulations directing the level of fire service response times and outcomes delivered by the City. The body of regulations on the fire service provides that *if fire services are provided, they must be done so with the safety of the firefighters and citizens in mind*. Historically, while the City has made significant investments in its fire services, it has been challenged to provide best practice response times Citywide as the City grew outward from the urban core over the last several decades.

1.2 CITYGATE'S OVERALL OPINIONS ON THE STATE OF THE CITY'S FIRE SERVICES

In brief, Citygate finds that the challenge of providing fire services in the City is similar to that found in many large cities ranging from urban to suburban areas over diverse terrain: providing an adequate level of fire services within the context of limited fiscal resources, competing needs, growing and aging populations, plus uncertainty surrounding the exact timing of future development in some areas. The City is currently providing for its needs through its own fire response resources and through the use of partnerships with its neighbors in an automatic aid response system on adjoining borders.

The City's current fire deployment system does not meet the Department's existing response time goal, nor align with best practice desired response times, especially outside of the downtown core as fire station spacing increases in the suburban areas. To improve response times, additional resources will be needed in all areas of the City. Traffic congestion is also an increasing problem that further strains the Department's response time coverage at morning and evening commute times. The City's growing employment base and regional, post-recession economic jobs recovery is yielding intense traffic congestion at rush hours. The geographic information system (GIS) travel time analysis in this study, and the prior incident travel time data for the Department's responses, clearly show the substantial hindrance this causes to emergency response travel in the City.

The only way to maintain reasonable response times in the near term will be for the City to add three ambulances during peak demand hours of the day, re-staff closed Fire Station 9 and add at least three additional infill fire stations over time, as those sites and stations can be programmed into the City’s Capital Improvement Budget and General Fund dollars are identified for additional fire unit crews.

During the timeframe of this study the Department added two more full-time ambulances at Stations 30 and 57 and their impact is not measured in this study. However, there are other neighborhood coverage needs for those units; they were not added only to lower workload on the busiest units in each Battalion area.

This study identified that too many ambulances are at or past desirable emergency incident commitment capacity (measured as Unit-Hour Utilization or UHU) for too many contiguous hours during the crew’s core work shift. Citygate recommends as a *first* step, to add three peak-hour (part-time) ambulances which will lower the utilization demand on the busiest ambulances, along with other strategies the Department is pursuing to lower hospital wait times and provide for alternative treatments for non-emergency patients. Even with three added peak-hour ambulances, some ambulances will still have utilizations above 30% per hour at times, but not for as many hours at a stretch, opening up time for other fire service duties and training.

The impact of the three added ambulances can immediately be measured and the alternative work schedules adjusted as needed during a trial period. If, after a trial period, enough workload is not removed from the overworked units, then additional units, even 24-hour-based units, may be needed. However, that cannot be determined until the added impact of three peak-hour ambulances is observed along with the impacts, if any, of other strategies to reduce the time spent on EMS incidents.

Throughout this report, Citygate makes key findings, and, where appropriate, specific action item recommendations. Overall, there are 18 key findings and 3 immediate action item recommendations.

1.3 FINDINGS AND RECOMMENDATIONS

1.3.1 Findings

Finding #1: The City Council has not adopted, *in one document, a commonly worded* and complete best-practices-based deployment measure or set of specialty response measures for all-risk emergency responses that includes all the response time segments of dispatch, crew turnout, and travel time, nor a goal statement tied to risks and outcome expectations. The deployment measure should have a second measurement statement to define multiple-unit response coverage for serious

emergencies. Making these deployment goal changes will meet the best practice recommendations of the Commission on Fire Accreditation International.

- Finding #2:** The Department has a standard response dispatching plan that considers the risk of different types of emergencies and pre-plans the response. Each type of call for service receives the combination of engine companies, truck companies, ambulances, specialty units, and command officers customarily needed to handle each type of incident based on experience.
- Finding #3:** Minimum apparatus staffing per unit on engine and ladder truck companies at four is a recognized best practice for the City’s size and risks.
- Finding #4:** Using the current 24 fire station locations, not including automatic aid stations, only the downtown, most-developed population density areas are within 4 minutes travel time of a fire engine. Traffic congestion has a marked negative impact on unit travel times in all but the core downtown existing fire station service areas.
- Finding #5:** Only the City’s core areas are within 8 minutes travel time of an Effective Response Force assignment of four engines, two ladder trucks, one ambulance and two Battalion Chiefs, with *no traffic congestion*.
- Finding #6:** The City is too large and has too much traffic congestion for only three command chief officers to cover in 8 minutes travel. The addition of a fourth command chief and relocation of others to balance coverage should be further explored.
- Finding #7:** The City is too large and has too much traffic congestion for two ladder trucks to cover together in 8 minutes travel. While the second ladder within 8 minutes is a desired asset, it does not need to be on-scene within 8 minutes. As Map #8b measures, most of the highly urbanized areas of the City are covered by two ladder trucks within 8 minutes travel during non-traffic-congested hours. However, the downtown core is covered by two ladder trucks even during traffic congestion periods.
- Finding #8:** At least four to six of the eight gaps identified beyond the adopted 4-minute travel time coverage should strongly be considered for permanent fire stations as economics permit. In addition to the existing four to six infill gaps, the Railyards project also will require a fire station due to its distance from existing fire stations.

- Finding #9:** A four-station increase would also add resource depth to the Department at peak hours of the day and when other units are assigned out of their station area for training.
- Finding #10:** The highest volume hours for incidents span from 8 am through 8 pm, and even later on Friday and Saturday. Given this, where additional units are needed, they could be peak-hour ambulances for 12 hours per day for at least 5-6 days per week.
- Finding #11:** National best practices as recommended by NFPA 1710 are for call processing to be 90 seconds, 90% of the time, and 120 seconds, 99% of the time. The call sorting processing and crew alerting requires additional time, and is currently taking 144 seconds for 90% of calls.
- Finding #12:** National best practices recommend turnout time to be 80 seconds for fires and 60 seconds for EMS incidents. Given station design and the legal requirement to don protective clothing before responding, Citygate finds, across a large set of clients, that a realistic goal is for turnout time to be 90 seconds to 90% of the emergent incidents. Sacramento is just under a 2-minute goal and to be commended for its performance close to a best-practices-based goal.
- Finding #13:** In the 2014/15 measurement period, the Department had a 90% travel time Citywide of 5:55 minutes/seconds. This travel time is 1:55 minutes longer than national best practice publications for metro/urban areas. This travel time is fairly consistent across urbanized areas of the City, and none of the Battalions or station areas in Sacramento met a 4-minute goal.
- Finding #14:** As measured from crew dispatch to the first unit arrival, none of the City's fire station areas perform under the Department's goal of 5 minutes. This is because: crew turnout times realistically take more than 1 minute; and large station areas, absent sufficient station coverage, require travel times longer than 4 minutes. Traffic congestion also negatively impacts travel time results.
- Finding #15:** Due to longer dispatch and travel times, with the current quantity of fire stations, the Department only has one station areas performing better than a Citygate-recommended Call Receipt to Arrival time of 7:00 minutes/seconds.
- Finding #16:** While some engines reach 20% Unit-Hour Utilization workloads, no engines approach a Citygate recommended threshold of 30%. At peak hours of the day, while many engines are busy with EMS events, adding engines into existing stations at this time is not yet necessary.

Finding #17: Ten (10) of the City’s 15 ambulances exceed a Citygate recommended 30% Unit-Hour Utilization rate for most of the daylight hours seven days a week. In Battalion 1, four ambulances exceed 30%; in Battalions 2 and 3, three ambulances per Battalion exceed 30%.

Finding #18: The workload on the ten busiest ambulances is past the critical saturation point and crew effectiveness, training, and availability for incidents suffers. Reliever ambulances are needed for peak hours of the day as soon as possible in all three Battalions.

1.3.2 Recommendations

Recommendation #1: Address Emergency Medical Services Workload by Adding Peak-Hour Ambulances:

- 1.1 Add at least three peak-hour ambulances Monday through Saturday, one in each of the three Battalions. Measure the workload reductions on the busiest units and adjust the additional ambulance hours as needed.
- 1.2 The ambulance system should be deployed using full- and part-time units to deliver transport services where needed to patients, within 8 minutes travel time, or 11:00 minutes/seconds total response time from fire dispatch receiving the call for assistance.

Recommendation #2: Address Service Gaps by Adding Fire Stations and Resources:

- 2.1 Identify the funding and timing to restore closed Fire Station 9 and add a fire station in the Delta Shores expansion area along with at least two other infill fire stations in the larger service gaps areas.
- 2.2 As fire stations are added and incident volumes and severity increase, the Department can explore/consider adding a fourth field Battalion Chief position per day.
- 2.3 When the Railyards project reaches 50% occupancy of the commercial and residential units, add a fire station and engine inside the project area.

Recommendation #3: Adopt Updated Best Practice City Council Deployment Measures

Policy: The City’s elected officials should adopt updated, complete performance measures to direct fire crew planning and to monitor the operation of the Department. The measures of time should be designed to deliver outcomes that will save patients medically salvageable upon arrival; and to keep small, but serious fires from becoming greater alarm fires. With this in mind, Citygate recommends the following measures:

- 3.1 Distribution of Fire Stations:** To treat medical patients and control small fires, the first-due unit should arrive within 7:00 minutes/seconds, 90% of the time from the receipt of the 9-1-1 call in the regional fire dispatch center. This equates to a 90-second dispatch time, 90-second company turnout time, and a 4-minute drive time in the most populated areas. The ambulance system should be deployed within 8:00 minutes travel time or 11:00 minutes total response time from fire dispatch receiving the call for assistance.
- 3.2 Multiple-Unit Effective Response Force for Serious Emergencies:** To confine residential fires near the room of origin, to stop wildland fires to under three acres, and to treat multiple medical patients at one incident, a multiple-unit response force of a minimum of four engines, two ladder trucks, one ambulance, and two Battalion Chiefs totaling 28 personnel should arrive within 11:00 minutes/seconds from the time of 9-1-1 call receipt in fire dispatch, 90% of the time. This equates to 90-seconds dispatch time, 90 seconds company turnout time, and 8 minutes drive time spacing for multiple units in the most populated areas.
- 3.3 Hazardous Materials Response:** Provide hazardous materials response designed to protect the community from the hazards associated with uncontrolled release of hazardous and toxic materials. The fundamental mission of the Fire Department response is to minimize or halt the release of a hazardous substance so it has minimal impact on the community. It can achieve this with a travel time in urban to suburban areas for the first company capable of investigating a HazMat release at the operations level within 4 minutes travel time or less than 90% of

the time. After size-up and scene evaluation is completed, a determination will be made whether to request additional resources from the Department’s hazardous materials team.

- 3.4** Technical Rescue: Respond to technical rescue emergencies as efficiently and effectively as possible with enough trained personnel to facilitate a successful rescue. Achieve a travel time for the first company in urban to suburban areas for size-up of the rescue within 4 minutes travel time or less, 90% of the time. Assemble additional resources for technical rescue capable of initiating a rescue within a total response time of 11:00 minutes/seconds, 90% of the time. Safely complete rescue/extrication to ensure delivery of patient to a definitive care facility.

1.4 SUMMARY OF REPORT THEMES

1.4.1 (Part One) Standards of Cover Assessment Summary

Fire department resource deployment, simply stated, is about the speed and weight of the attack. Speed calls for first-due, all-risk intervention units (engines, ladder trucks, ambulances, and/or specialty units) strategically located across a department service area. These units are tasked with controlling moderate emergencies, preventing the incident from escalating to second alarm or greater size, which unnecessarily depletes department resources as multiple requests for service occur. Weight is about multiple-unit response for serious emergencies, such as a room and contents structure fire, a multiple-patient incident, a vehicle accident with extrication required, or a heavy rescue incident. In these situations, enough firefighters must be assembled within a reasonable time frame to safely control the emergency, thereby keeping it from escalating to greater alarms.

In *Part One* of **Volume 2** of this study, Standards of Cover Assessment, Citygate’s analysis of prior response statistics and use of geographic mapping tools reveals that the City *does not* have an adequate number of fire stations to serve its diverse topography and population densities. The maps provided in **Volume 3** and the corresponding text explanation beginning in **Volume 2** describe the Department’s current performance in detail.

For effective outcomes on serious medical emergencies and to keep serious, but still emerging, fires small, national best practices and Citygate both recommend that the first-due fire unit should arrive within 7:00 minutes/seconds of fire dispatch receiving the 9-1-1 call, 90% of the time. The Department’s actual performance from fire dispatch call receipt to first crew on scene is 8:24 minutes/seconds to 90% of fire/EMS incidents. As can be seen in Table 1, only one

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station areas meet a 90%-best-practice goal of 7:00 minutes/seconds from fire dispatch receipt to first unit on scene:

Table 1—Fire Dispatch Receipt to Arrival Time Analysis (90% Baseline Performance in 2014/15)

Battalion/Station	Minutes (Incidents) at 90% Performance
Department-Wide	08:24 (47,089)
Battalion 01	07:52 (15,495)
Station 01	07:13 (1,455)
Station 02	06:53 (2,771)
Station 04	07:45 (2,650)
Station 05	07:53 (1,277)
Station 06	07:32 (3,379)
Station 08	08:53 (1,276)
Station 12	08:01 (1,185)
Station 14	09:04 (1,502))
Battalion 02	08:19 (17,737)
Station 07	08:25 (2,493)
Station 10	08:19 (3,125)
Station 11	08:31 (1,733)
Station 13	08:41 (1,185)
Station 16	08:05 (3,108)
Station 56	07:51 (2,486)
Station 57	08:08 (2,408)
Station 60	09:01 (1,199)
Battalion 03	09:00 (13,857)
Station 03	13:10 (163)
Station 15	09:52 (2,491)
Station 17	08:00 (3,121)
Station 18	09:02 (1,021)
Station 19	08:35 (974)
Station 20	08:08 (3,837)
Station 30	09:26 (1,232)
Station 43	09:39 (1,018)

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The Department is also not meeting its budget goal of “4:00 minutes travel time, plus 1:00 minute turnout time.” The reality is, as shown in the next table, instead of a 5:00 minute/second response time from crew notification, the Citywide actual performance is 06:57 minutes/seconds, or 1:57 longer.

Table 2—Crew Dispatch to Arrival Time Analysis (90% Baseline Performance in 2014/15)

Battalion/Station	Minutes (Incidents) at 90% Performance
Department-Wide	06:57 (46,340)
Battalion 01	06:25 (15,236)
Station 01	05:42 (1,441)
Station 02	05:32 (2,711)
Station 04	06:17 (2,610)
Station 05	06:30 (1,254)
Station 06	06:09 (3,309)
Station 08	07:26 (1,267)
Station 12	06:37 (1,179)
Station 14	07:34 (1,465)
Battalion 02	06:54 (17,455)
Station 07	07:02 (2,441)
Station 10	06:51 (3,068)
Station 11	07:13 (1,717)
Station 13	07:18 (1,176)
Station 16	06:42 (3,047)
Station 56	06:27 (2,446)
Station 57	06:40 (2,371)
Station 60	07:32 (1,189)
Battalion 03	07:33 (13,649)
Station 03	12:09 (162)
Station 15	08:23 (2,464)
Station 17	06:32 (3,064)
Station 18	07:44 (1,011)
Station 19	07:08 (964)
Station 20	06:37 (3,754)
Station 30	08:04 (1,221)
Station 43	08:18 (1,009)

As **Volume 2** of this report will detail, the dispatch processing time can use slight improvement. While the crew turnout time to don mandated safety clothing and get the unit moving is commendable at 2 minutes 90% of the time, the goal should be 90 seconds during waking hours. However, the travel times Citywide are longer than an urban best-practices recommendation of 4 minutes, and no station area meets this aggressive goal. The results in the following table are reflective of the large size of some station areas, simultaneous calls for service, road network design, and traffic congestion issues:

Table 3—Travel Time Analysis (90% Baseline Performance in 2014/15)

Battalion/Station	Time (Incidents)
Department-Wide	05:55 (39,552)
Battalion 01	05:23 (13,054)
Station 01	04:27 (1,322)
Station 02	04:31 (2,175)
Station 04	05:20 (2,340)
Station 05	05:30 (1,033)
Station 06	05:07 (2,641)
Station 08	06:18 (1,191)
Station 12	05:30 (1,089)
Station 14	06:35 (1,263)
Battalion 02	05:53 (15,027)
Station 07	06:01 (1,955)
Station 10	05:52 (2,540)
Station 11	05:59 (1,590)
Station 13	06:02 (1,099)
Station 16	05:47 (2,391)
Station 56	05:24 (2,212)
Station 57	05:41 (2,115)
Station 60	06:29 (1,125)
Battalion 03	06:30 (11,471)
Station 03	10:24 (143)
Station 15	07:18 (2,248)
Station 17	05:38 (2,380)
Station 18	06:28 (944)
Station 19	05:53 (872)
Station 20	05:42 (2,929)
Station 30	07:08 (1,020)
Station 43	06:45 (935)

Short of adding additional fire stations and, at a minimum, ambulances for simultaneous incident coverage at peak hours of the day, given the City’s road network and traffic congestion, there is no way to appreciably lower emergency fire unit *travel* times.

Population drives service demand and development brings population, which increases traffic congestion. Traffic congestion now has measurable, negative effects on fire unit travel times during rush hours. The geographic mapping analysis in this study found that only **66%** of the City’s public streets are within 4 minutes travel time of an *active* fire station. Of the current fire stations and ambulance companies, travel coverage at commute hours is negatively impacted by **23.7%**. More importantly, the multi-unit fire department coverage at commute hours is much more severely impacted at **36.6%**, as several units must travel across large sections of the City. The maps in this study show where this normal and reduced coverage occurs.

The Department is staffed for several serious building fires at a time, and multiple medical calls for service at a time. The regional automatic and mutual aid response system delivers greater alarm and multiple-incident support, when needed, although with longer response times.

Overall Deployment Evaluation

The Department serves a diverse land use pattern in a geographically challenging area in Sacramento County. There is intense urbanization bisected by multiple busy highways, along with commuter and commercial rail lines, some of which have limited over and under crossings. Not all of the neighborhoods served by the Department have streets laid out in a grid pattern with multiple connection points allowing quick emergency response. Additionally, there are open spaces, major rivers, and hills that either bisect the communities served, or create boundaries and challenges for responding units both from within the City and by adjoining fire departments.

While the City and now the state-mandated Fire Code requires fire sprinklers in dwellings, it will be many more decades before enough buildings are added, replaced, or remodeled using automatic fire sprinklers. For the foreseeable future, the City will need both first-due firefighting unit and Effective Response Force (First Alarm) coverage in all parts of the City, consistent with current best practices for differing population densities and risks to be protected.

As shown in Tables 1-3, the City’s response times are longer than desired. Citygate submits there are four principal reasons for this situation: (1) too few stations; (2) traffic congestion; (3) high workload rates on many key companies; and (4) some fire station areas that are too large.

The Path Ahead

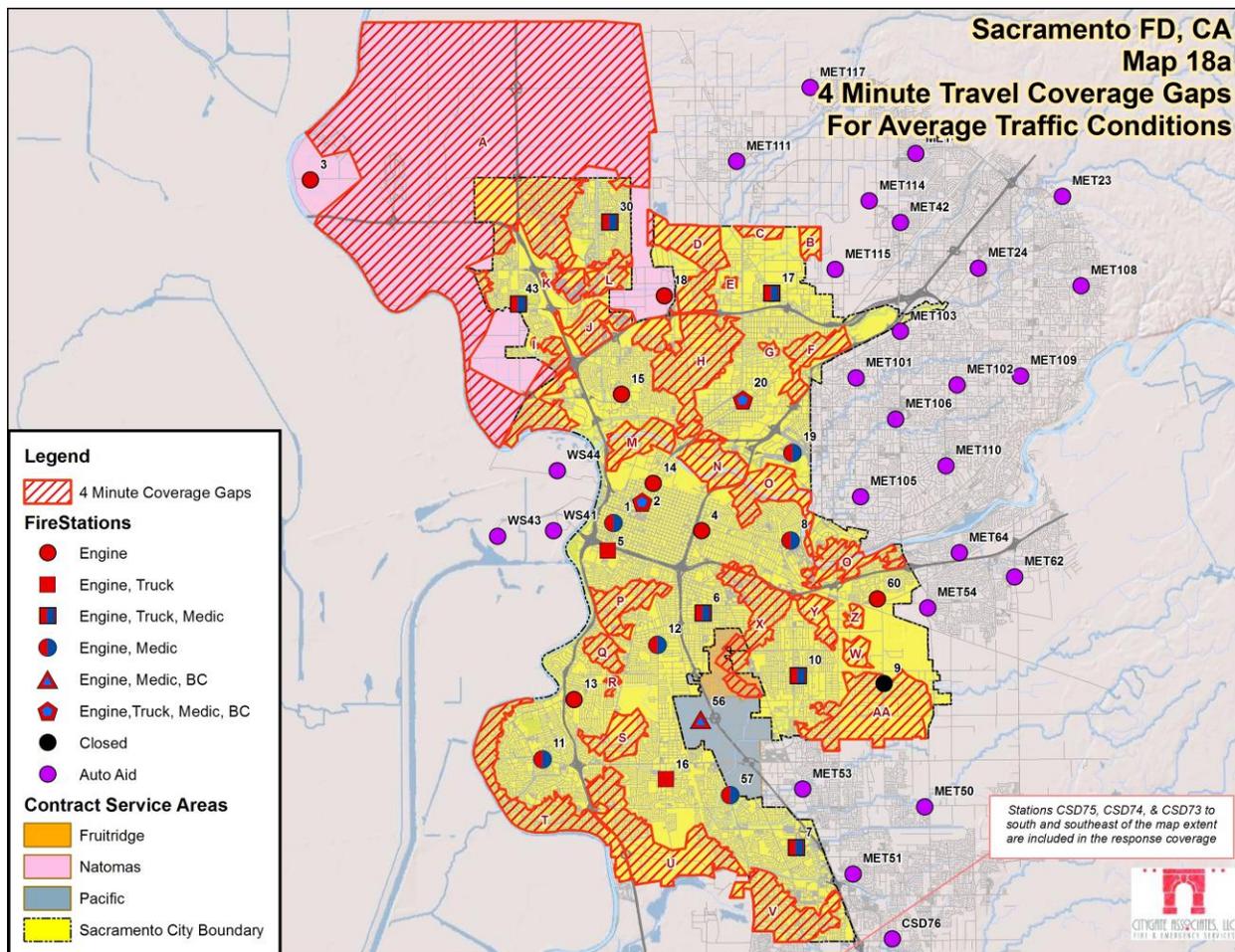
If the City wants to provide the three outcomes below, the City will have to increase its deployment of fire crews by adding at least 4 to 6 key missing fire stations, and increase the number of ambulances at peak hours of the day in all three Battalion areas. The three outcomes are:

- ◆ Provide equitable response times to all similar risk neighborhoods
- ◆ Provide for depth of response when multiple incidents occur
- ◆ Provide for a concentration of response forces in the core for high-risk venues.

If the City chooses not to adopt these three policy goals for fire services delivery, then it should adopt a travel time goal that it can afford, understanding that longer response times will mean the most time-sensitive emergencies could experience undesirable outcomes.

The geographic mapping assessment portion of this study identified the following 27 coverage gap areas where the current fire station system cannot reach within 4 minutes travel time:

Figure 1—4 Minute Travel Coverage Gaps



Using several factors, Citygate identified eight gaps significant enough to consider adding fire stations. They are a mix of infill neighborhoods and expanding new construction areas. Citygate suggests the following priorities for adding fire stations:

Table 4—Coverage Gaps and Suggested Order for Adding Stations

Gap ID	Population	Incidents	Road Miles Not Covered at 4-Minute Travel	Risk and Building Fire	Second-Due Unit Travel and UHU %	Deployment Need Fill Order	Type
U (Delta Shores)	12,467	2,965	44	Moderate	High	1	New Const. Underway
H	14,205	4,729	53.4	Moderate	High	2	Infill
O	10,044	1,752	45.8	Moderate	High	3	Infill
AA*	7,082	1,266	33.5	High**	High	4	Restore
P	7,868	1,005	24.9	Low	Moderate	5	Infill
X	1,193	396	7.6	Moderate	High	6	Infill
D	9,747	1,206	17.7	Moderate	High	7	Infill + New Const.
A**	29,864	4,545	191.9	Low*	High	8	New Const.
Total	92,470	17,864	418.8				

* This encompasses closed Station 9’s area

** Not yet fully developed

The order of adding additional fire stations is complicated with issues other than the population, incidents, and 4-minute covered miles measured by Citygate in this study. The other issues in siting a station are land cost, availability, zoning, environmental, and traffic safety to mention a few. As additional staffing dollars are identified, the quickest way to add a fire company would be to reopen Station 9 in Gap AA. The timing of the other top three infill sites will be determined by City staff as they address all of the siting issues and forward to the City Council Capital Improvement Program (CIP) budget requests as part of the normal budget cycle.

Area “U,” which is the Delta Shores Specific Plan Area, is a top priority because it is a large urban development a significant distance from the two nearest fire stations and construction is underway. It is anticipated that Delta Shores, in Phase I, will add approximately 13,000 residents and 1,400 square feet of retail/commercial development. For new construction areas, in general, Citygate recommends that fire stations and crews be online when 50% of a combination of commercial and residential units are given certificates of occupancy for use.

Additionally, the intense development in the proposed Railyards project (Area M on Map #18a, shown on the previous page as Figure 1) will require an additional fire station and engine company, and perhaps an additional ambulance, given the density of development and that the area is beyond the 4-minute reach of Stations 14 and 15. The additional station and crew should

be operational when the Railyards project reaches 50% occupancy of the commercial and residential units.

If the top four Citygate recommended gaps were filled over time with a fire station and at least one fully-staffed engine, as funds allow, the total population receiving improved coverage would amount to 43,798 residents, which is the aggregate size of a modest suburban city. All eight gaps amount to 92,470 residents beyond a desired 4-minute travel time goal.

Over time, if all eight fire stations were to be added, another 17,864 emergencies would receive improved customer service, and 418 miles of public streets would be added to the 4-minute travel time coverage areas.

In addition to the infill coverage gaps from physical fire station locations, Citygate found the workload on 10 of the City's 15 ambulances exceed our recommended 30% Unit-Hour Utilization (UHU) rate for most of the daylight hours, seven days a week. In Battalion 1, four ambulances exceed 30%; in Battalions 2 and 3, three ambulances per Battalion exceed 30%. The workload on these ten busiest ambulances is past the critical saturation point, and crew effectiveness, training, and availability for incidents suffers (see Technical Volume 2, page 62 for the discussion of the workload UHU factor). Reliever ambulances are needed for peak hours of the day as soon as possible in all three Battalions.

1.4.2 (Part Two) Community Risk Assessment Summary

The objective of a community risk assessment is to:

- ◆ Identify the hazards with potential to adversely impact the community or jurisdiction
- ◆ Quantify the probability of occurrence for each identified hazard
- ◆ Identify and evaluate factors likely to influence impact severity for each identified hazard
- ◆ Determine overall risk by hazard.

A hazard is broadly defined as a situation or condition that can cause or contribute to harm. Hazard examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. Probability is the likelihood of occurrence of a particular hazard, and impacts or consequences are the adverse effects that a hazard occurrence has on people, property, and/or the community as a whole. Risk is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity of resultant impacts*, and risk vulnerability is a measure of the probability of the existing deployment model's ability to protect against or mitigate a specific hazard. These terms are further explained in Volume 2.

Citygate’s evaluation of the various risks likely to adversely impact Sacramento yields the following conclusions:

1. Sacramento has very diverse metropolitan and suburban population densities within the City limits.
2. Sacramento’s population is projected to grow by over 33% over the next 20 years
3. Sacramento has a mix of residential, commercial, office, and industrial buildings typical of a large western metropolitan city
4. Sacramento has a vast transportation network including highways and other primary vehicle transportation routes, railways, mass transportation modes, and airports
5. The City of Sacramento has varying levels of risk relative to nine hazards specifically relating to fire department services as follows:
 - a. Building Fire Risk
 - b. Wildland Fire Risk
 - c. Emergency Medical Service Risk
 - d. Hazardous Materials Risk
 - e. Technical Rescue Risk
 - f. Transportation Risk
 - g. Maritime Risk
 - h. Earthquake/Seismic Activity Risk
 - i. Flood Risk

For this analysis, six risk assessment zones were established in collaboration with the Department’s Project Team as shown in Figure 2.

Figure 2—Risk Assessment Zones

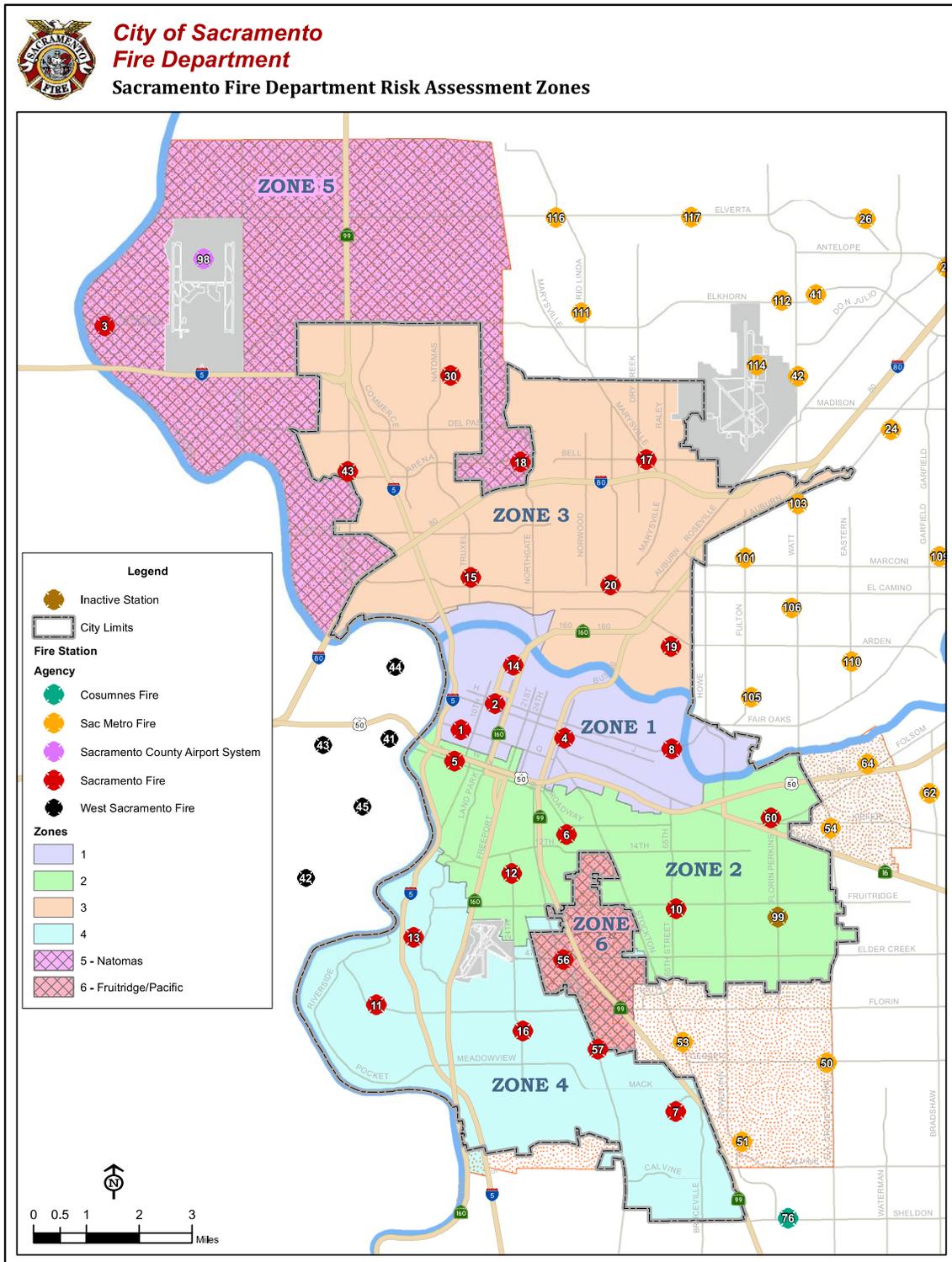


Table 5 summarizes Sacramento’s overall risk by hazard and risk zone.

Table 5—Overall Risk Summary by Hazard and Risk Zone

Risk	Risk Assessment Zone					
	1	2	3	4	5	6
Building Fire	High	Moderate	Moderate	High	Low	Moderate
Wildland Fire	Moderate	Moderate	Moderate	Low	Low	Low
EMS	High	High	High	High	High	High
Hazardous Material	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Technical Rescue	Moderate	High	Moderate	High	Moderate	Low
Transportation	High	High	High	High	High	High
Maritime	Low	Low	Low	Low	Low	Low
Earthquake/Seismic Activity	Low	Low	Low	Low	Low	Low
Flood	Low	Low	Moderate	Moderate	Moderate	Moderate

The complete community risk assessment in Volume 2 will describe the risk analysis process and risk factors used to determine overall risk as shown in Table 5 in more detail.

1.5 NEXT STEPS

The purpose of a Standards of Cover study is to compare the City’s current performance against the local risks to be protected and nationally recognized best practices. This analysis of performance forms the base from which to make recommendations for changes, if any, in fire station locations, equipment types, staffing, and headquarters programs.

As one step, the City Council should adopt updated and best-practices-based response time goals for the City and provide accountability for the Fire Department personnel to meet those standards. The goals identified in Recommendation #3 meet the City’s risk and emergency outcome needs and correlate to national best practices. Measurement and planning as the City continues to evolve over time will be necessary for the City to meet these goals. Citygate recommends that the City’s next steps be to work through the issues identified in this study over the following time lines:

1.5.1 Short-Term Steps

- ◆ Absorb the policy recommendations of this fire services study and adopt updated City performance measures to drive the deployment of firefighting and emergency medical resources.

- ◆ Immediately add a minimum of three peak-hour ambulance companies.
- ◆ Restore funding for a fire engine and crew at closed Fire Station 9.
- ◆ Require fire stations be added inside the Delta Shores and Railyards new project areas.
- ◆ Develop the costs and a timeline for a minimum of two additional infill fire stations.

1.5.2 Long-Term Steps

- ◆ Monitor the effect of growth and traffic congestion on incident demand volume at peak hours of the day.
- ◆ If traffic congestion continues to decay response times, even with additional ambulances and fire crews, then more peak-hour and 24-hour ambulances and perhaps engines will become necessary to maintain response times to critical events.