CITYGATE ASSOCIATES, LLC
FOLSOM (SACRAMENTO), CA MANAGEMENT CONSULTANTS

REGIONAL FIRE SERVICES DEPLOYMENT STUDY FOR THE COUNTY OF SAN DIEGO OFFICE OF EMERGENCY SERVICES

VOLUME 1 OF 3 – MAIN REPORT

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PART ONE

Executive Summary

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i. EXECUTIVE SUMMARY

The County of San Diego retained Citygate Associates, LLC to conduct a Regional Fire Services Deployment Study to include:

- A detailed Standards of Response Cover planning analysis (fire station and crew deployment) to examine the levels of fire department service throughout the region;
- Fire station and staffing infrastructure triggers for additional resources, if needed;
- A high-level analysis of logistical support services such as training and dispatch;
- Order of magnitude costs and governance strategies going forward.

This study does not assess the performance or needs of any individual fire agency, but instead is a deployment study for regional fire, rescue and EMS services within the County of San Diego in order to establish a blueprint for improving the County's regional fire protection and emergency medical system. As a regional study, it looks across political subdivision lines to what changes in a sub-region (for example, the Northwest County) as well as what additional resources countywide (for example, dispatching and helicopters) will provide significant improvements in fire and EMS services.

This comprehensive study is presented in six "Parts" including: (1) this Executive Summary summarizing the project followed by a complete list of findings and recommendations; (2) the introduction to the study detailing Citygate's project approach and the project background; (3) the fire station/crew deployment analysis supported by maps and response statistics; (4) the assessment of logistical support services; (5) the fiscal costs associated with fire services; and (6) system-wide governance strategies. Each of these Parts is comprised of one or more related sections that provide for logical groupings of information, findings, and recommendations.

To conduct the study, Citygate used several methods to gather, understand, and model information about fire services in the County of San Diego. We made a large document request to over 50 fire agencies via a web-based questionnaire to gain detailed information on stations, staffing, costs, current and prior service levels, and what other prior studies had to say. We received and assessed detailed electronic dispatch records of all fire service incidents countywide between 7/1/2007 - 6/30/2009. In subsequent site visits, Citygate team members followed up on this information by conducting focused interviews with various fire and governmental leaders as needed.

To analyze fire services deployment performance, Citygate programmed a geographic mapping response time over distance tool to model fire station coverage areas. We used a fire service statistics software program to model prior incident response times from over 627,547 incidents and 1,471,225 individual apparatus movements to understand actual response times, locations and types of emergencies. We developed findings and then validated our preliminary opinions by reviewing our draft technical work, findings and conclusions with County staff and representatives of the cities and fire agencies in the County.

POLICY CHOICES FRAMEWORK

As a starting point, County leadership needs to remember that there are no mandatory federal or state regulations directing the level of fire service staffing, response times and outcomes. Thus, communities have the level of fire services that they *can afford*, which is not always what they would desire. However, the body of regulations on the fire service provides that *if fire services are provided at all, they must be done so with the safety of the firefighters and citizens in mind* (see regulatory discussion in Section 2.3). Given this situation, the overall challenge for the County, the cities and the fire districts is to design fire services within the fiscal constraints that limit their ability to staff, train and equip a safe and effective fire/medical response force.

OVERALL ATTRIBUTES OF THE COUNTY OF SAN DIEGO'S FIRE SERVICES

The region does have a considerable fire services force. Currently, the region is served daily by 914 career firefighters deployed via 460 engines, ladders and specialty units based from 264 fire stations. This on-duty staffing does not include the over 700 volunteer firefighters, the military base fire crews, nor does it include year to year funding renewed under the Governor's General Executive Order to enhance helicopter and fire season staffing.[1] This force responded to 262,614 annual incidents in Fiscal Year 2008-09, which averages 30 per hour, or 1 new incident every 2 minutes countywide. The region's fire services protect the second largest California County with a 3.2 million resident population as of July 2009.

The region's spending in Fiscal Year 2008-09 on fire services totaled approximately $517 million not including the U.S. Forest Service or law enforcement and medical contract helicopter costs. This figure does include what CAL FIRE spends in the County protecting State Responsibility Areas.

The risks to protect in the County are very diverse and represent almost every type found in the United States from building and wildland fires to urban area technical rescues, airports and waterways. About the only serious fire risk not present in the County are major petroleum refineries.

[1] After the devastating 2003 Southern California Fire Siege, the current Governor started issuing an annual state-wide Executive Order (GEO) to enhance fire protection during peak fire season months statewide. In San Diego County, it funds two important additional CAL FIRE resources in the County: 1) the annual personnel cost for two additional helicopters during fire season as part of the CAL FIRE cooperative helicopter program with the San Diego Sheriff's Office; and 2) the annual personnel cost for 75 Seasonal Firefighters to bring 26 CAL FIRE engines up to 4 person staffing during peak fire seasons months.

ACCOMPLISHMENTS TO DATE

While there has been the criticism that County of San Diego fire services are fragmented with over 50 provider agencies, recognition has not been given to the progress made over the last several decades. In fact, there has been a constantly improving multi-agency set of coordinating efforts which actually started after the 1970 Laguna Firestorm, not just after the last two firestorms of this decade in 2003 and 2007.

Today, the County and the region's fire services are benefitting from the following:

- There is increased coordination with fewer dispatch centers and most agencies responding under the concept of sending the closest unit, regardless of agency boundary lines;
- The mutual aid system is widely developed and can under common protocols amass quickly the region's resources;
- There has been a significant increase in the acquiring and use of helicopter aircraft by local agencies in addition to the long-standing CAL FIRE and U.S. Forest Service rotary and fixed wing efforts;
- The County has reengaged on fire service leadership in the unincorporated area by:
  - Creating the San Diego County Fire Authority to consolidate small agencies;
  - Funding additional CAL FIRE year-round resources;
  - Establishing a set of best practices fire safe development regulations for new construction in County responsibility areas;
  - Funding fire apparatus, firefighter equipment and stipends to the Fire Authority partners with an annual net budget of approximately $15 million per year from the County General Fund revenues.

MAIN CHALLENGES

One can summarize the fire service challenges that face the County in four themes:

1. Providing the appropriate firefighter staffing to different risks to deliver the desired emergency outcome;
2. The need to logistically support a capable and safe multi-emergency response force;
3. The need to fiscally support over 50 fire departments across 18 cities, the County Fire Authority areas, along with the CAL FIRE and U.S. Forest Service responsibility area;
4. The need to coordinate and govern the fire and EMS services.

Challenge 1: Field Operations Deployment (Fire Stations and Staffing)

Fire department deployment, simply stated, is about the *speed* and *weight* of the attack. Speed calls for first-due, all risk intervention units (engines, ladder trucks and specialty companies) strategically located across a department. These units are tasked with controlling everyday, average emergencies without the incident escalating to second alarm or greater size, which then unnecessarily depletes the department's resources as multiple requests for service occur. Weight is about multiple-unit response for significant emergencies like a "room and contents structure fire," a multiple-patient incident, a vehicle accident with extrication required, or a complex rescue or wildland fire incident. In these situations, departments must assemble enough firefighters in a reasonable period in order to control the emergency safely without it escalating to greater alarms.

While no one city (even a metropolitan one) or fire district can stand by itself and handle every possible emergency without help, a desirable goal is for each agency within its area of responsibility to field enough of a response force to handle that community's day-to-day responses for primary single-unit response needs equitably to all neighborhoods. Also, the response force should be able to provide, using mutual aid if necessary, an effective initial response force (First Alarm) to moderately serious building and wildland fire events.

Response time goals are designed to deliver an outcome based on the values at risk. For example, an urban setting goal of confining a fire near the room of origin means more firefighters, more quickly, than a rural goal of confining a fire to the building of origin to prevent a wildfire from starting and spreading the fire to other buildings. The nationally published recommendations for building fires center around a typical detached home fire in an urban area, since this is the predominate building type in much of the United States. However, such singular formulas do not take into account the type of topography that fire units must traverse, population densities, the climate and age of the buildings, all of which can affect the incidence of fire.

The other type of risk that drives fire service deployment today is medical emergencies. For these risks, response times must serve two extremes; from the life threatening situations to those where an ill or injured person needs help but their condition is not as time sensitive. In the County of San Diego in Fiscal Year 2008-09, emergency medical calls were 78 percent of the total responses, as compared to 1.5 percent for building fires and .4 percent for wildland fires. These figures indicate the headache for the design of fire services across the County where short response times are desirable for a small quantity of serious incidents, but the response force has to be spread across a very challenging terrain and road network, which increases the cost of deploying a force in a short response time.

The published response time recommendations by the National Fire Protection Association (NFPA) to keep a building fire near the room of origin in an urban area, call for 90 percent of the incidents to receive the first-due unit within 4 minutes travel time. To the travel time must be added the steps of processing the call for help in a dispatch center, and the time it takes to notify the emergency crew, have them don the required protective clothing for the type of call and get the unit in-route. These steps of dispatch and crew turnout time are added to travel time for a ***total*** response time measure, which is what 911 callers perceive. While some recommendations suggest that dispatch and crew turnout time can add up to 140 seconds (60 seconds dispatch, 80 seconds turnout), in Citygate's experience with over 100 agency data sets, this is difficult if not impossible to achieve given modern safety clothing requirements which mandate what must be

donned by type of incident before the unit can begin moving. We find that a very achievable goal is 3 minutes for 90 percent of the critical incidents, combined dispatch and crew turnout time (60 seconds dispatch, 120 seconds turnout).[2]

Thus if 3 minutes for dispatch and crew turnout are added to 4 minutes travel, a total response time goal for 90 percent of the incidents for the first unit to a building fire would be *7 minutes*. In order to deliver the goal of keeping the fire near the room of origin, an effective response force of multiple firefighters and unit types must arrive quickly enough to work as a team to simultaneously handle the tasks needed. The published NFPA recommendations for the arrival of all the needed units are 8 minutes travel time, which, when 3 minutes are added for dispatch and crew turnout, the effective response force must all arrive to 90 percent of the building fires within *11 minutes* **total** response time. For rural area building fires in low population density areas, recommended travel time goals are 12 minutes, which means a total response time goal of 15 minutes.[3]

Since many agencies in the County of San Diego have not adopted response time goals, or have adopted differing ones based on local risks and desired outcomes, this study will benchmark the geographic predicted coverage using 4 minutes and 8 minutes travel time in fully developed areas. This means a **total** response times of 7 minutes for the first due unit and 11 minutes for the effective response force to building fires. Coincidentally, for serious medical emergencies, it is also desirable to have the first unit arrive within 7 minutes, 90 percent of the time. There are no published recommendations for wildfire response, other than local response planning should take into account the fuel and topography and strive to keep fires from becoming a conflagration.

Travel and Response Time Findings

In Part 3 of this study, *Standards of Response Cover Assessment*, Citygate's analysis of geographic station coverage areas in Section 4 along with a review of prior response statistics in Section 5 was performed on a quadrant basis to review performance at a sub-regional, but meaningful level. Two measures of fire crew coverage were obtained: how much of the road network was covered within different travel times, and what a review of prior response statistics said actually occurred. No geographic model can say what response times always will be due to the variances of traffic congestion, weather and/or the closest unit being already committed to a prior incident. In the western, more urbanized quadrants, here are the summary travel and response time findings for the existing fire station and staffing system:

[2] See Report Section 3.3.1
[3] See Report Section 5.1.7

Travel and Response Times in Western San Diego County

Measures	Northwest – Urban Population Density	Southwest – Urban Population Density
Road miles covered at 4 minutes Travel	59.77%	67.83%
Road miles covered at 5 minutes Travel	82.19%	87.73%
Minute at which 100% Travel coverage occurs	8 minutes	8 minutes
Actual **Total** Response Time @ 90%, 1st Unit, FY 08/09 EMS events	10:00 m/sec	10:15 m/sec
Actual **Total** Response Time @ 90%, 1st Unit, FY 08/09 building fire events	11:30 m/sec	8:30 m/sec

This data shows how hard it is to cover the San Diego region's road network due to topography. There is a large increase in percent of road mile coverage in just adding 1 minute more for travel.

The Citygate geographic analysis identified locations in these urban settings where there were areas without a fire station the size of an entire fire station normal size area, past the 5 minutes of travel.[4]

In the Northwest Quadrant, two such locations were identified where it would take adding 3 fire stations to increase coverage. Even if the local communities chose to build these three additional stations, the road mile coverage only increases from the current 82 percent to 83 percent since there are not as many total road miles in these outer, lighter suburban population density neighborhoods. The decision to add fire stations is made at the local government level based on risk, desired outcomes and ability to afford more coverage to a greater number of neighborhoods.

In the Southwest Quadrant, there were 11 areas the size of an entire fire station normal size area that are currently past the 5 minutes of travel time from the nearest fire station.

If the responsible local governments in these areas added 11 fire stations, the percent of road miles covered at the 5th minute increases from the current 87 percent to 91 percent. This would be very good coverage given the topography challenges and is a long-term goal for the affected agencies to strive for.

In the eastern, more rural quadrants, here are the summary findings for the existing fire station and staffing system:

[4] See Report Section 4.1.1

Travel and Response Times in Eastern San Diego County

Measures	Northeast – Urban & Suburban Population Density	Southeast – Urban & Suburban Population Density
Road miles covered at 12 minutes Travel	99%	99%
Actual Total Response Time @ 90%, 1st Unit, FY 08/09 EMS events	13:00 m/sec	16:00 m/sec
Actual Total Response Time @ 90%, 1st Unit, FY 08/09 building fire events	14:00 m/sec	19:15 m/sec

In the eastern areas, with a desired 12-minute (or better) travel time the developed road areas are within the existing fire station network. As the response times show, the first units are arriving on-scene better than or close to a desirable 15-minute total response time goal. This is significant given the shear size of these areas and the long segments of rural roads between population centers, upon which traffic accidents still occur.

In the eastern quadrants for the near term, Citygate finds that more fire stations are not necessary, absent more growth beyond the 12-minute travel time coverage. However, 18 of the rural stations that depend on part-time volunteer staffing on paid stipends are not completely getting the staffing hours necessary during the Monday though Friday workweek hours when the volunteers are away to school and jobs. This study has offered several findings and suggestions to improve this situation over time.[5]

Wildfire Response Findings

For wildfire response, most local government agencies plan a multi-unit response that will keep wildfires to a few acres in size, if reported promptly on normal fire weather days. Such fires account for the vast majority of the wildfires in the County. During extreme fire weather days, the agencies collectively respond with a very heavy ground- and aerial-based force to keep conflagrations from occurring.

In State Responsibility Areas, CAL FIRE has the response goal of responding to wildfires to keep them to less than ten acres in size in less than two hours from ignition of the fire, 95 percent of the time. Over a 10-year average in the County of San Diego, CAL FIRE's performance on this goal was 95.5 percent for 5,028 fire starts.[6] Yes, in this 10-year period, two fires, both on dangerous fire weather days, did turn into catastrophic conflagrations. Yet, without the impressive performance on the rest of the fire starts, conflagrations starting in the State Responsibility Areas could be much more frequent. As for local government fire departments, the total response time to deliver the first unit for wildfires 90 percent of the time was at 12:45 (minutes/seconds) in the urbanized Southwest Quadrant and ranged from there up to 33:30 (minutes/seconds) in the other quadrants. This is acceptable performance considering that many of these wildfire starts are in rugged areas, far from paved roads. Overall, the local government

[5] See Report Section 3.3.6
[6] See Report Section 5.1.4

fire departments also do an impressive job of keeping the bulk of wildfires small to manageable as countywide there are just over 1,000 wildfires per year.

In summary for the deployment analysis, Citygate finds that adding a modest number of additional fire stations would improve travel times in some segments of the western urban developed areas. The agencies responsible for these areas can do further local study and decide if, when and how to afford improvements.

In the eastern areas, the San Diego County Fire Authority needs to improve the availability of the part-time volunteer staffing, particularly during the Monday-Friday workday. The stipend, training and equipment costs of volunteers to ensure this coverage should be compared to the cost to employ a small number of career firefighters just to cover the 40-hour workweek timeframe.

All agencies in the County can focus on improving dispatch and turnout times, which will improve total response time performance without adding more fire stations.

Planning Criteria for Future Fire Stations

For planning criteria for future fire station location, timing and crew planning size, either for infill areas or new development, Citygate recommends[7] that jurisdictions with land use planning responsibilities adopt fire unit deployment performance measures based on population density zones in the table below. The more specific, measurable and consistent the policy is, the more it can be applied fairly to all uses and be sensitive to variations in risk and topography challenges. Citygate recommends these measures be:

Proposed Deployment Measures for the County of San Diego

By Population Density Per Square Mile

	Structure Fire Urban Area	Structure Fire Suburban Area	Structure Fire Rural Area	Structure Fire Remote Area	Wildfires Populated Areas	Wildfires Remote Areas*
	>3,000 people/sq. mi.	1,000-3,000 people/sq. mi.	1,000 to 500 people/sq. mi.	500 to 50 people/sq. mi. **	Permanent open space areas	
1st Due Travel Time	4	5	12	20	10	20***
Total Reflex Time	7	8	15	23	13	23
1st Alarm Travel Time	8	10	16	24	15	24
1st Alarm Total Reflex	11	13	19	27	18	27

* CAL FIRE or Forest Service Responsibility Lands.
** Less than 50 people per square mile there is acknowledgment that fire and EMS services are going to be substandard.
*** Includes primary attack aircraft.

[7] See Report Section 5.1.7

Challenge 2: Fire Service Support Functions

Fire department's need to have a management team that is the proper size, adequately trained and supported. There are increasing regulations to be dealt with in operating fire services, and the proper hiring, training and supervision of line employees requires an equally serious commitment to leadership, general management, training, fire apparatus, dispatch and a host of other support functions. Citygate was asked to give a high-level review to eight different support and special issues that affect the overall operation of the region's fire services. These issues ranged from training and fire prevention to helicopter and dispatch programs. The goal of this high-level review was to identify areas where operational and/or cost efficiencies might be obtained by some or all of the agencies working even more closely together than they do today. This is more important to smaller agencies that struggle to fund expensive, quality programs in areas like dispatch, training, hazardous materials incident response and helicopters. These programs carry significant cost and specialty staffing needs and are best delivered regionally.

Overall starting in Sections 1.3 and 15.1, Citygate found a high degree of regional cooperation and best practice sharing of resources. Depending on the issue, the regionalization of some support services can further be improved over time. Structures such as Joint Powers Authorities (JPAs) are good ways to share governance, revenue and service provision. Currently, JPAs are in use by two groups of agencies for dispatching and for a countywide hazardous materials incident response team. Other sharing of resources can be done via contracts for service and there are several examples of this such as in the area of dispatching, helicopters and fire apparatus maintenance. Citygate found in some support service themes that JPAs could be expanded, or that new JPAs or contracts for service could be created for more cost-effective cooperation. In other instances, some partial sharing already underway can be expanded.

Several key issues emerged in these support service theme reviews:

Training

First is the cost and delivery of fire service training. Fire department training programs have to be developed, delivered and the results have to be tracked, all of which require staffing. Then there are the facilities, which need classroom spaces, outdoor practice areas and specialty props. Water runoff has to be caught and treated and environmental "live fire" props are expensive and environmentally sensitive to site. While some training can be delivered via video to fire stations, firefighting and emergency medical responses use a lot of equipment that has to be practiced with to retain familiarity.

Ideally, a fire company should not have to drive more than 15 minutes from its station to a training site, or at worst no longer than 30 minutes. This lessens the unit's out-of-area time for emergency response and ensures the training center can be fully used without too much time between classes for units traveling back and forth. Currently countywide, there are 15 training centers of various types, all in the western County. From these centers, 85 stations (or 38 percent) are past 15 minutes travel distance and 37 stations (or 17 percent) are past 30 minutes travel distance.

Most of the stations beyond a reasonable travel distance are in the eastern quadrants. Citygate finds that some of the existing centers need physical improvement. There is only one training JPA, where others would be very beneficial. The eastern areas will need a layered approach to training with perhaps a northeast and southeast full training center, with several smaller sub-

regional classroom and paved areas for local practice, and perhaps some mobile training props that can be trucked between the sub-regional centers.[8]

Dispatch

A second key issue is dispatching. While over the years there has been some consolidation of fire dispatching into sub-regional centers, there is more consolidation that would provide cost-effective improvement. Currently there are five primary fire dispatch centers, but ideally this should be reduced to two over time. Currently, the Heartland (El Cajon area) and the North County communication JPAs are functionally consolidating their computer technologies. Hopefully this can continue into a full physical consolidation. That leaves San Diego City, CAL FIRE (which dispatches for many of the fire districts and Fire Authority agencies) and the City of Escondido (which is the last city to internally do combined police/fire dispatching). As a comparison this study noted that the Los Angeles County Fire Department has a single state-of-the-art dispatch center, which dispatches the same annual incident volume as all of the County of San Diego.

As with other issues in the fire service, the costs of technology and dispatcher training with quality assurance oversight have risen significantly. There are economies of scale as the computer system that a suburban city would buy is nearly if not the same cost as one that will handle regional needs. Smaller centers may not be able to afford the ideal number of dispatchers on duty and a best practice level of oversight.[9]

Helicopter Programs

A third issue is the needs of the helicopter programs. While these programs have been expanded and improved significantly in the last few years and are immensely valuable, some helicopter programs are still in need. Some need permanent physical facilities, some are considering the cost of external contract maintenance versus handling it internally perhaps with other helicopter program, and there is an upcoming issue of replacement pilots as they retire or otherwise leave the program.

The most critical of these issues is the replacement of helicopter pilots. It takes considerable time to become a certified firefighting pilot. Many of the current pilots are approaching retirement and not all of the agencies, being new to this endeavor, have a succession plan in place to replace them.

Last, but not least, is the unstable funding for two of the helicopter programs. Part of the shared CAL FIRE and Sheriff program depends on supplemental state funding under a Governor's Executive Order, which could expire when this governor's term ends. Part of the San Diego City Fire Department helicopter program depends on a significant amount of annual private fund raising.

Citygate observes that the pilot succession and finding permanent funding sources are critical path items for which more planning needs to be done to ensure the on-going viability of these very important, but expensive helicopter programs.[10]

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[8] See Report Section 10.4
[9] See Report Section 7.5.1
[10] See Report Section 6.4.3

Fire Prevention

The fourth supporting program area that deserves both a complement and more attention is fire prevention. Since the firestorms, the County fire prevention programs have become leading edge where the County has fire prevention responsibility. The County development ordinances require wildfire resistant building construction, the use of fire safety set backs and fire resistant landscape standards. Since 1986 the County has required the mandatory use of residential fire sprinklers in outlaying areas; thus currently in seven County Service Areas 50 percent of the new homes have fire sprinklers. The County also staffs fuel reduction and weed abatement programs. However, the County should *strongly consider limiting* more urban development in very rural, hard to serve areas where it may be difficult to fund urban levels of fire services.

The cities and independent fire districts all fund fire prevention at varying levels, and typically fund these programs less than they would desire. Fire Prevention codes have become very technical and advanced issues and new construction plan checking have become specialized, best handled by certified non-sworn personnel, not firefighters on limited term rotations. For many of the smaller agencies, Citygate suggests the agencies strongly consider one or more Fire Prevention JPAs to share the cost and to maintain skilled personnel across a wider area.[11]

Challenge 3: Fiscal Support

Underlying the findings and recommendations for improving field operations and support of those operations is the ever-present issue of cost and how to not only support the current level of services, but also how to support the cost of improvements. Although there is already a substantial $517,000,000 per year financial commitment to fire and EMS services, the reality is that expanding this financial commitment over the next several years will be very difficult because even a partial recovery of the economy is not expected until next year. Also, since the County, cities and fire districts are all so heavily reliant upon the Property Tax as a large or principal source of revenue, the tax assessment, collection and distribution cycle is not likely to reflect even a modest property tax-based revenue improvement for local government until 2013 and 2014.

In assessing the fiscal health and future of local governments in the County of San Diego, Citygate found, in summary, that most cities are struggling financially and will find it difficult to retain current fire service levels unless they make very large cuts in other service areas. In the unincorporated part of the County, for the most part, the larger fire protection districts appear to be able to retain current service levels for the next several years in spite of the economic downturn, if the statewide economy has indeed reached the bottom and is about to see economic growth. Almost all of the remaining fire agencies rely on County funding to maintain their current service levels, and the County itself is struggling financially.

Cost of Recommended Deployment Improvements

In Section 4 of this report, *Fire Station Coverage in the County*, Citygate found that there is a modest station coverage deficit in the two western quadrants. Filling these service level gaps would require at least 14 additional fire stations.

[11] See Report Section 9.7

Three of the fire stations would be in the Northwest Quadrant of the County. It would cost an estimated $19.8 million to construct these new fire stations and purchase the associated fire apparatus and an annual operating expense of $5.4 million to staff the three stations. This would provide a very small increase in the road miles traveled at the 4-minute travel time point from the current 59.77 percent to 60.95 percent and at the 5-minute travel time point the increase would only be from the current 82.19 percent to 83.08 percent.

The remaining 11 fire stations would be in the Southwest Quadrant. It would cost an estimated $72.6 million to construct these new fire stations and an annual operating expense of $20.1 million. This would provide a small increase in the road miles traveled at the 4-minute point from the current 67.83 percent to 72.26 percent and at the 5-minute point the increase would only be from the current 87.73 percent to 90.98 percent.

While no additional coverage gaps exist in the two eastern quadrants of the County, Citygate recommends deployment be improved through some staffing changes to supplement the very important volunteer and stipend firefighter program. With changes in demographics, work and leisure patterns, it is increasingly difficult to recruit and retain volunteers that can cost $5,000 to $10,000 in initial training and equipment expense. The County Fire Authority reports a turnover as high as 30 percent per year among volunteers. Stipend firefighters who work assigned shifts at a modest pay per shift also generally have other full-time employment. The most difficult "shifts" to fill are the daytime hours Monday through Friday.

The County Fire Authority, in order to provide a guaranteed minimum staffing of two firefighters per unit during the 40-hour work week period, should strongly consider staffing its 18 stations with a single career firefighter and a paid stipend firefighter on a Monday through Friday 40-hour week.

The estimated annual cost of this recommended *limited* career staffing is $2.1 million. This is compared to the estimated annual cost of $500,000 to fill the same shifts with stipend firefighters, if they are available. The stipend firefighter program has just gotten underway with County sponsorship; as the County evaluates the success or difficulty in filling the day time work day shifts with stipend firefighters, the County Fire Authority should conduct a cost-benefit study to determine how many more volunteers it makes sense to recruit, train and equip given annual turnover, versus staffing a few positions with career firefighters.

As the economy recovers, the question is whether there is a desire for a level of fire service beyond what can be afforded under the present fiscal structure. The public must recognize that improvements will probably take five to seven years as local government fiscal conditions slowly recover from the deep recession.

Before choosing a fiscal path, the agencies will need to address the issue of how fire services should be organized, coordinated and governed. The answers to these questions will provide the shape or boundaries within which fiscal solutions are to be fashioned.

Challenge 4: Coordination and Governance

The important fourth issue is what reorganization of fire and EMS services is both possible in the near term and cost effective. The challenge is how to procedurally affect the changes.

Current and Planned Governance Arrangements

The core of the current governance arrangement for fire and emergency medical services in the County of San Diego was described in the 2005 LAFCO report "*Fire Protection and Emergency Medical Services Review*," which recorded in the unincorporated portion of the County fifteen independent fire protection districts, one dependent fire protection district, five water districts that provide fire services, and seven County Service Areas (CSAs). Added to this are tribal fire agencies, nonprofit 501(c)(3) volunteer fire departments, the cities, military installations, CAL FIRE and the U.S. Forest Service. Each agency or organization has the independent authority to make policy without any mandatory requirement to coordinate that policy with their neighboring agencies.

The focus of the 2005 LAFCO report was on the unincorporated area; and, while acknowledging the presence of mutual aid agreements that appear to work well, noted that "There is no effective mechanism to comprehensively plan, fund, and administer an integrated system for regional fire protection and emergency medical services." In June 2008, the County adopted its final implementation strategy, known at the time of its adoption as the "Hybrid Plan," which recognized the practical difficulties of wholesale reorganization and instead proposed a three-step incremental approach to improve the organization of fire services within most of the territory that is within the CSA 135 boundaries.

Step I took in approximately 60 percent of the eventual 1.5 million acres of unincorporated territory and brought six volunteer fire companies under the umbrella of a newly formed County Fire Authority. In order to improve the level and coordination of fire service in the remaining portion of the unincorporated County, as part of Step I, the County also provided funding to help support other fire agencies, most of which were eventually planned to be reorganized and become a part of the CSA 135 in Steps II and III.

Step II is planned to be implemented in Fiscal Year 2010-11. It would bring five County Service Areas under the Fire Authority and expand the Fire Authority's responsibility to encompass 70 percent of the ultimate planned area.

Step III is to reorganize the Pine Valley and San Diego Rural Fire Protection Districts by merging them into CSA 135. For both agencies, CAL FIRE already provides staffing at fire stations under contract and thus has day-to-day operational coordination responsibilities.

County Fire Authority

The County Fire Authority was formed as the administrative agency to implement and operate the "Hybrid Plan". Located in the County Department of Land Use and Planning (DPLU), it was envisioned as an agency to:

- Ensure that fire perspectives were part of future County land use decisions;
- Allocate funding to fire agencies in the unincorporated area;
- Administer the funding contracts by ensuring that all policies, risk management issues and contract conditions are followed;
- Implement the County's Fire Enhancement Program (contracts for fire safety), Fire Safety and Fuels Reduction Program (dead, dying, diseased tree removal and

weed abatement) and the Fire Prevention Program (land use regulations and permits).

The DPLU already had a Fire Division responsible for the Fire Enhancement, Fire Safety and Fuels Reduction Program and the Fire Prevention Program. Adding responsibility to coordinate the contracting of financial support to fire agencies was a logical step and assigning Fire Warden responsibility to the Deputy County Administrative Officer (DCAO) already responsible for these other DPLU areas made good organizational sense for the start-up of the Fire Authority

Evaluation and Recommended Changes in the Current Organization

CAL FIRE and County Fire Authority Roles

As with most new organizational arrangements that are phased in, there usually are issues that cause some redesign. The Hybrid Plan did not specifically address responsibility for day-to-day coordination of fire and emergency response operations by assigning that responsibility. In fact, the plan specifically said that the Fire Warden would not have operational responsibility, which would remain with the individual local fire agencies. However, as a practical matter, CAL FIRE has assumed day-to-day coordination of fire activities through its training role, the provision of CAL FIRE staffed apparatus under contract to various fire agencies and the County, through its provision of Incident Command services by its on-duty Battalion Chiefs, and through its role in dispatching many of the fire agencies in unincorporated areas.

Citygate believes that CAL FIRE's role is a very positive development. They have extensive operational and management depth and experience as a very large permanent fire response presence in and around the east County fire agencies.

Citygate complements the County on showing leadership in increasing the coordination of fire services in its area of responsibility. As the Fire Authority has grown, so have its responsibilities past just that of fire code and pre-development review services. It is now managing the support and integration of local area fire agencies. The Fire Authority is becoming responsible for an array of services, all of which are typically found in a fire department headquarters unit.

Yet, the County has split responsibilities two ways with the Fire Authority working within DPLU and using CAL FIRE under contract for some day-to-day field level services. There is no singular chain-of-command for fire issues up to the Chief Administrative Officer and the Board of Supervisors, nor is there one high-level County administrator with the fire service background and systems knowledge to fully implement the remaining phases of the Fire Authority which will involve considerable work with multiple fire departments.

For these reasons, Citygate will discuss below the option of the County more fully consolidating all fire services functions within the Fire Authority, which could then operate in many respects like a fire department headquarters unit, reporting to the Deputy Chief Administrative Officer for Public Safety.

The expanding role of the Fire Authority makes this organization a good location for organizing and coordinating all fire planning and policy activities including fire code development and fire protection systems plan review. The Fire Authority is already establishing training, Injury and Illness Prevention Program requirements, volunteer firefighter standards and requirements for coordination and cooperation, including participation in the Incident Command System, Mutual Aid response and inspection/testing of fire equipment by agencies receiving County funding.

The Fire Authority's fire services planning, fire code development and fire service operations policy responsibility should at a minimum encompass:

- Developing operating policies and procedures that unify and standardize the operational response of fire companies under the supervision of the Fire Authority;
- Ensuring formal agreements and operating guidelines for mutual aid between all fire agencies, including tribal organizations and CAL FIRE, within the unincorporated County area;
- Working with OES, CAL FIRE, the U.S. Forest Service, and other independent agencies in the unincorporated area to ensure a seamless and coordinated disaster response by all of these agencies and an appropriate interface with the cities and federal facilities;
- Developing a long-term capital improvement plan for fire related infrastructure needs in the Fire Authority area of responsibility;
- Coordinating the unincorporated areas of the Operations Committee within the Unified Disaster Council;
- Providing policy and planning advice from a fire perspective to the County Department of Planning and Land Use.

Fire Authority Location and Management

While the Fire Authority was initially established as part of the Fire Division of DPLU, very few, if any, of the Fire Division and Fire Authority responsibilities are usually found within a government planning agency like DPLU. This is because operations and the planning of specialized emergency field operations is not part of the perspective and skill set of land use planning organizations. Planning activities are mostly tailored to pre-development review and construction. The Fire Code is a maintenance code designed to keep buildings fire safe over their entire life cycle, not just when a construction permit is needed. As such, fire prevention works best when it is tightly integrated with the fire crews who can perform inspections and notice issues in the field such as vegetation fire safety zones not being kept cleared.

In Citygate's opinion, fire responsibilities need to be relocated to report to the Deputy Chief Administrative Officer/General Manager of the Public Safety Group who is currently responsible for the County Office of Emergency Services and coordination with the County Sheriff's Department. This will bring all County public safety functions together where they can be most effectively coordinated and where an operational function such as fire can be more appropriately managed by staffs who are familiar with operational public safety and more familiar with the requirements of day-to-day safety operations. Daily interface between DPLU and the Fire Authority's fire code enforcement and permitting functions can be accomplished in a manner similar to many other jurisdictions by locating the appropriate Fire Prevention Division staff offices or assigned personnel adjacent to the planning offices or in a one-stop permitting center.

Moving the fire functions will require establishing a management position to oversee the subsections of the Fire Authority. Citygate recommends that a County Fire Services Director be appointed to manage the County Fire Authority as an effective approach to providing fire services leadership in the unincorporated area and management of the County direct fire

functions. A Fire Services Director would report directly to the Deputy Chief Administrative Officer/General Manager of the Public Safety Group. Chief Officers and Volunteer Fire Chiefs would continue to be responsible for fire stations and staff within appropriate zones of CSA 135, much as the fire chiefs of the various agencies do now. They would in turn report to the County Fire Services Director who will set policy, operational standards and continue to implement the phases of the Hybrid Plan.

Completion of the County Hybrid Plan

The County has adopted a three-step approach to implementing the Hybrid Plan. As we observe in this report,[12] it is an appropriate approach to bringing most of the fire services in the unincorporated area under unified leadership.

Citygate recommends that the County continue implementing the Hybrid Plan on the most aggressive time schedule practical. Step II would fold five CSAs (CSA 111-Boulevard, CSA 112-Campo, CSA 109-Mt. Laguna, CSA 110-Palomar, CSA 113-San Pasqual) into CSA 135 in Fiscal Year 2010-11 and Step III would bring the Pine Valley FPD and the San Diego Rural FPD into CSA 135 in Fiscal Year 2011-12.

Countywide Fire and Emergency Medical Service Planning

Other than the Unified Disaster Council and the semi-formal San Diego County Fire Chiefs Association, there is no "working group" that has both the delegated responsibility *and* the resources to plan and implement a similar level of coordination between cities and the fire districts, state and federal agencies in the unincorporated area. Nor is there a real "unified command" structure to vet issues and with certainty, make decisions the stakeholders will implement.

This gap in planning and coordination does not appear to be due to lack of willingness among the fire agencies. Citygate heard repeatedly among fire personnel that the various organizations would identify problems that needed to be solved, but there was little or very delayed follow through because there was no staff to research, develop draft proposals, and coordinate consideration and adoption of problem solutions.

Citygate recommends that the County Fire Authority, through a County Fire Services Director, offer to assume the "coordination" role for a formal organization of fire agencies that would be responsible to develop plans, including implementation steps, for adoption and implementation by the County fire agencies. The roles and responsibilities of the group would largely mirror that of the State of California Firescope Board of Directors that manages the policies of the statewide fire mutual aid system.

Where individual agencies want to partner via JPAs on dispatch, training or logistics, the County could offer to facilitate the governance and financing methods for service sharing across jurisdictions.

[12] See Report Section 15.4.3

FIRE PLAN PHASING

While all of the findings and recommendations in this report are summarized below, it is not realistic to anticipate that all of them can or should be given equal importance and priority in implementation.

First, Citygate believes that the most important actions the County can and should take over the next twenty-four months are to complete the reorganization already begun with formation of the County Fire Authority, reassignment of the Fire Division and Fire Authority to the Deputy CAO responsible for Public Safety, and appointment of a County Fire Services Director to manage the Fire Division and Fire Authority.

Second, the County should perform an assessment of the current and projected success of the stipend firefighter program and determine whether it is more cost-effective to fund career firefighters to fill some of the week-day fire shifts in 18 of the fire stations in the unincorporated portion of the County.

Third, all of the agencies providing firefighting services need to strongly consider the creation of a formal, representative based authority, with the staff and funding to plan and coordinate countywide multi-agency fire services.

Not only are these actions necessary precursors to implementing other recommendations in this report, they will most likely consume the County's organizational capacity to make further fire and EMS service improvements over the next 24 to 36 months. With this organization in place, the County Fire Authority or a newly established regional coordinating group will have the administrative structure to coordinate activities such as improvement of the training, fire prevention and dispatch functions through encouraging and facilitating Joint Powers Authorities or similar cooperative structures among the fire agencies.

The three highest priority actions recommended by Citygate will only be a nominal expense to the County over the next several years. The recommended organizational realignment and the work to develop specific plans to improve logistical support for the fire and EMS services will result in specific proposals and costs. Once these costs are available, the County can consider the need for a tax measure and whether the geographic areas that will benefit from the suggested program improvements might be asked to support a tax measure. For now, Citygate does not see a rationale in the near term for a tax measure covering CSA 135 or a countywide tax measure.

Citygate's entire set of findings and recommendations are summarized in the following section. For reference purposes, the findings and recommendation numbers refer to the sequential numbers in the main body of the report.

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ii. Comprehensive List of Findings and Recommendations

Throughout this study Citygate made findings and recommendations. They are repeated here as one listing, in the order in which they appear in the body of the report.

Section 3—Firefighting Staffing Needs in the County

Finding 3-1: Very few agencies in the County have a complete and current best practice designed fire deployment measure adopted by their elected officials that includes a beginning time measure starting from the point of fire dispatch receiving the 911-phone call, combined with 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. Adopting such deployment goals will meet the best practice recommendations of the Commission on Fire Accreditation International and the National Fire Protection Association (NFPA).

Finding 3-2: Fire flows above 2,500 gpm are a significant amount of firefighting water to deploy and a major fire at any one of the larger buildings would outstrip the on-duty fire staffing in smaller communities or rural areas. A 2,500-gpm building could be a one-story, 26,250 square foot (150'X175') business park building, which is not unusual in the region. Using the generally accepted figure of fifty gallons per minute per firefighter on large building fires, a fire in a building requiring 2,500 gallons per minute would require 50 firefighters, or *more than the on-duty staffing in any one city except for San Diego itself.* This is why serious fires require the response of multiple fire agencies using mutual or automatic aid agreements. A building fire this serious in a rural area would need mutual aid resources from a very large area of more than 30 minutes driving time.

Finding 3-3: The stipend firefighter program to assist in staffing volunteer area fire stations has just started in the County Fire Authority. As the County evaluates the success or difficulty in filling the day time work day shifts with stipend firefighters, the County Fire Authority should conduct a cost-benefit study as to how many more volunteers it makes sense to recruit, train and equip given annual turnover, versus staffing a few positions with career firefighters. In order

to provide a guaranteed minimum staffing of two firefighters per unit during the 40-hour work week period, the County Fire Authority should strongly consider staffing its 18 stations with a single career firefighter and a paid stipend firefighter on a Monday through Friday 40-hour work week.

SECTION 4—FIRE STATION COVERAGE IN THE COUNTY

Finding 4-1: In the rural eastern quadrants, over 95 percent of the road miles in the small areas of more dense population are covered within the 12-minute travel time guideline. There is not a need for additional fire stations in these two quadrants unless the residents want an improved travel time and/or additional, much denser development leads to significant population densities beyond that of a rural area standard of response.

Finding 4-2: There is a modest station coverage deficit in the two western quadrants. Filling these service level gaps would require at least 14 additional fire stations. Eleven of the new stations would be in the Southwest Quadrant. However, the capital outlay and annual operating cost increase to achieve the resultant small improvement in coverage is very significant.

Finding 4-3: Even with three more fire stations added across two gap areas in the Northwest Quadrant, there only would be an approximately 1 percent increase in road miles covered in five minutes of travel. This is due to the difficulty in covering the hardest-to-serve non-grid street type areas, bisected by open space. It will likely be cost-prohibitive to add even more fire stations, to cover all of the urban population street areas at the 90 percent coverage point at either 4 or 5 minutes of travel, given the Northwest Quadrant's topography and historic land use decisions.

Finding 4-4: In the Southwest Quadrant, 87.73 percent of the road miles are covered by the 5th minute without adding any new fire stations. This is neither a poor level of performance nor unusually long in comparison to other fire agencies with similar risks and topography challenges with whom Citygate has worked. Even with eleven more fire stations added to fill in the largest gap areas in the Southwest Quadrant, there is only a 4.43 percent increase in road mile coverage at the 4th minute and a 3.25 percent increase at the 5th minute of coverage.

Finding 4-5: As Map series #8 shows, both the Northwest and Southwest quadrants are completely covered at 99 percent by the 8th minute of travel, thus in-fill stations will help lower travel times where new stations are added.

Finding 4-6: If the policy choice were to be made to cover 90 percent of the urban area road network at a 4-minute travel time, given the County's topography and road network, it will require more than the additional 14 stations identified across 13 gap areas identified in this study. Due to topography and road system design, some of the additional stations will serve relatively few road miles in outer edge

areas, with comparably lower populations and call for service densities. Unless the agencies serving these pockets find other needs such as a high simultaneous call demand creating the need for more companies in a given area, then they may find it most cost-effective to cover all of the road miles to the 90 percent point by the 5th travel minute.

Finding 4-7: While 90-95 percent of the urban road network in both western quadrants is covered without additional stations by about the 6th minute, when 3 more minutes are added for dispatch and turnout times, then this will reflect a 9-minute first-due unit total response time. Such a measure will not confine most fires to the room of origin, or save medical emergency patients whose hearts and breathing have ceased. Such a response measure will keep most fires from spreading and starting conflagrations and provide stabilizing treatment to medical patients still viable upon arrival of the unit.

Finding 4-8: Given the mapping models in the less populated eastern quadrants, a modest increase of stations even where there are not many residents, likely cannot improve the wildfire initial attack times as the undeveloped areas are just too large and fires may start anywhere. The existing stations need adequate staffing, which when combined with early detection and a simultaneous aerial response, will provide quick control to most wildfires.

SECTION 5—INCIDENT RESPONSE STATISTICS REVIEW

Finding 5-1: The wildfire travel time measures support the mapping findings that the fire stations are correctly placed on the rural road network. Given the rough terrain and limited roads in many areas, more fire stations are not cost-effective. Rather, the existing stations need proper staffing backed up by initial attack aerial support to keep wildfires small.

Finding 5-2: In the urban western quadrants for EMS incidents, the overall current station and mutual/automatic aid system is delivering the first-due unit from 9:45 to 10:30 minutes/seconds which is longer by 3 minutes than a Citygate recommended best practice Total Response Time goal point of 7 minutes, 90 percent of the time for the first-due unit.

Finding 5-3: In the rural eastern quadrants, the station system delivers the first-due unit for EMS incidents from 13-16 minutes, close to a best practice goal of 14 minutes for areas with less than 500 people per square mile.

Finding 5-4: CAL FIRE and the regional mutual aid system are meeting the state's goal in keeping the wildfires in State Responsibility Areas to under 10 acres size in less than 2 hours from ignition, meeting this goal for 95.5 percent of the SRA wildfires over the last ten years. If only the two regional catastrophic fires in the last decade are to be counted against the total fire starts in the SRA (not including all the cities) then out of 4,022 ignitions, only two became firestorms. This is an impressive result in a climate zone so conducive to wildfires.

Finding 5-5: Both the current dispatch and crew turnout times are over a Citygate recommended goal point by 3 minutes total. Focus and training on these steps can easily reduce by at least 90 seconds or one-half the combined overage and bring the western quadrants' 90 percent performance measure to 9 minutes or less without adding resources.

Finding 5-6: The response statistics assessment verifies that in the western quadrants, the fire station gap areas contribute to performance longer than that most likely desired. However, this is also due to a very hard-to-serve non-grid street system and hilly topography. Many calls are answered in 5-7 minutes total response time.

Finding 5-7: In the southwestern quadrant**,** the multiple-unit coverage to serious incidents (first alarm), delivers close to acceptable performance by delivering four stations at 12:45 min/sec 90 percent of the time.

While this is past a usual Citygate recommended goal point of 11 minutes at 90 percent, if a 90-second reduction in combined dispatch/turnout time reduction is achieved, the time falls to 11:15 minutes/seconds before any fire station gaps are closed.

Finding 5-8: The region benefits from the mutual aid regional response system. While this system cannot replace additional fire stations in the gap areas, all the agencies should continue to participate in this valuable support system for simultaneous calls for service and multiple-unit serious emergencies.

Finding 5-9: While the region has a strong mutual aid, automatic aid and somewhat centralized dispatch system, with the exception of San Diego City and CAL FIRE the fire protection system is made up of a large number of small to medium-sized fire departments, each with its own training, culture and distinct way of doing business. Despite everyone's best efforts this will always be reflected in incident response and performance. Some jurisdictions are addressing this issue and consolidating.

Recommendation 5-1: Jurisdictions with land use planning responsibilities may adopt fire unit deployment performance measures based on population density zones in the table below, to direct fire station location timing and crew size planning. The more specific, measurable and consistent the policy is, the more it can be applied fairly to all uses and easily understood by a non-fire service reader. The measures should take into account a realistic crew turnout time of 2 minutes and 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. Citygate recommends these measures be:

Proposed Deployment Measures for the County of San Diego

By Population Density Per Square Mile

	Structure Fire Urban Area	Structure Fire Suburban Area	Structure Fire Rural Area	Structure Fire Remote Area	Wildfires Populated Areas	Wildfires Remote Areas*
	>3,000 people/sq. mi.	1,000-3,000 people/sq. mi.	1,000 to 500 people/sq. mi.	500 to 50 people/sq. mi. **	Permanent open space areas	
1st Due Travel Time	4	5	12	20	10	20***
Total Reflex Time	7	8	15	23	13	23
1st Alarm Travel Time	8	10	16	24	15	24
1st Alarm Total Reflex	11	13	19	27	18	27

* CAL FIRE or Forest Service Responsibility Lands.

** Less than 50 people per square mile there is acknowledgment that fire and EMS services are going to be substandard.

*** Includes primary attack aircraft.

5-1.1 Distribution of Fire Stations for **Initial** Response to Built-up Suburban Areas of Greater than 3,000 People per Square Mile: To treat and transport medical patients and confine small fires *to* the room of origin, the first-due unit staffed with a minimum of 2 firefighters should arrive within 7 minutes, 90 percent of the time from the receipt of the 911 call. This equates to 1-minute dispatch time, 2 minutes crew turnout time and 4 minutes travel time spacing for single units.

5-1.2 Effective Response Force (**First Alarm**) for Built-up Suburban Areas of Greater than 3,000 People per Square Mile: To treat and transport medical patients and to confine fires *near* the room of origin, a multiple-unit response of at least 15 firefighters should arrive within 11 minutes from the time of 911-call receipt, 90 percent of the time. This equates to 1-minute dispatch time, 2 minutes crew turnout time and 8 minutes travel time spacing for multiple units.

5-1.3 Suburban Areas of 1,000 to 3,000 people per square mile should have first-due fire unit *travel* time coverage of 5 minutes, 90 percent of the time; and the effective response force of at least 10 firefighters should have a *travel* time of 10 minutes with a resultant 13-minute total response time, 90 percent of the time. Fires will be contained to the building of origin to prevent a wildland fire. Medical patients salvageable upon arrival will receive appropriate care for their condition.

5-1.4 Rural Areas of less than 1,000 to 500 people per square mile should have first-due unit *travel* times of 12 minutes, 90 percent of the time. Rural areas should receive the effective response force of at least 6 firefighters within 16 minutes *travel* time with a resultant 19-minute total response time, 90 percent of the time. Fires will be contained to the building of origin to prevent a wildland fire from escaping assuming adequate defensible space and built-in construction features are provided. Medical patients salvageable upon arrival will receive appropriate care for their condition.

5-1.5 Structure Fire Remote Area of 500 to 50 people per square mile should have first-due unit *travel* times of 20 minutes, 90% of the time. Remote areas should receive the effective response force of at least 6-firefighters within 24 minutes *travel* time with a resultant 27-minute total response time, 90% of the time. Fires will be contained to the property of origin to prevent a wildland fire from escaping assuming adequate defensible space and built-in construction features are provided. Medical patients salvageable upon arrival will receive appropriate care for their condition.

5-1.6 Extreme Remote Area of less than 50 people per square mile may have travel times over 20 minutes. Because these areas are extremely remote with very little development potential, it becomes cost prohibitive to provide adequate fire and emergency medical protection services. Individuals choosing to live in these areas acknowledge that deficiencies in services exist.

5-1.7 Wildland Fires in or near populated areas should have first-due unit *travel* times of 10 minutes, 90 percent of the time; and the effective response force of at least 10 firefighters should have a *travel* time of 15 minutes with a resultant 18-minute total response time, 90 percent of the time. Fires will be contained to less than 5 acres to prevent a more serious wildfire.

5-1.8 Wildland Fires in remote areas should have first-due unit *travel* times of 20 minutes, 90 percent of the time; and the effective response force of at least 6 firefighters should have a *travel* time of 24 minutes with a resultant 27-minute total response time, 90 percent of the time; Fires will be contained to less than 10 acres to prevent a more serious wildfire.

5-1.9 Aggregate Population Definitions: Where more than one square mile is significantly populated, and/or a contiguous area with multiple zoning types, aggregates into a population "cluster," these measures from the Commission on Fire Accreditation can guide the determination of response time measures and the need for fire stations:

Area	Aggregate Population	First-Due unit Travel Time Goal
Metropolitan	> 200,000 people	4 minutes
Urban	> 30,000 people	4 minutes
Suburban	>10,000 to 30,000 people	5 minutes
Rural	1,000 to 10,000 people	12 minutes
Remote	500 -1,000 people	20 minutes
Extreme Remote	<500	> 20 minutes

Recommendation 5-2: The County Fire Authority, in order to provide a guaranteed minimum staffing of two firefighters per unit during the 40-hour work week period, should strongly consider staffing its 18 stations with a single career firefighter on a Monday through Friday 40-hour week. This position can maintain the apparatus and station, assist with volunteer training and lessen the need to hire two volunteers for this coverage.

5-2.1 The County Fire Authority should conduct a cost-benefit study as to how many more volunteers it makes sense to recruit, train and equip given annual turnover, versus staffing a few positions with career firefighters as Recommendation 2 stated.

Recommendation 5-3: The agencies in the western County areas that could benefit from closing the fire station gaps indentified in this study can complete their own internal analysis of cost-benefit and as appropriate over time, find the funding to add fire stations.

Recommendation 5-4: All of the fire department agencies in the County need to focus on reducing to the extent possible dispatch center processing times to 1 minute for 90 percent of the calls for service, and to 2 minutes, 90 percent of the time for crew turnout activities. In some cases this will take computer system work to accurately track these time segments and to provide periodic reporting back to the personnel. A "shot clock" in each apparatus bay, activated by the dispatch alert system would help crews improve their turnout times.

Recommendation 5-5: All the fire agencies in the County need to continue and improve where needed, the dispatching of the closest available resource, regardless of political jurisdiction lines. As this study shows, when dispatch centers always send the closest available unit, good regional coverage exists in most areas. However, this is dependent on the dispatch centers sending the closest unit every time and the political boundaries not acting as barriers. Further, catastrophic emergencies absolutely require a multiple regional response that does not occur without pre-design and the policy direction to ensure it.

Recommendation 5-6: Citygate recommends that the on-going sub-regional consolidation efforts under way continue, both in the cities and unincorporated areas. Further consolidations for both dispatching and field operations will improve response times by standardizing operations where multiple fire departments have to operate together.

Recommendation 5-7: To maintain and improve wildfire initial ignition suppression, the current CAL FIRE enhanced staffing levels and aerial response capabilities have to be maintained, and a permanent funding source secured, rather than continuing under a situational Governor's order.

SECTION 6—AERIAL FIREFIGHTING PROGRAMS REVIEW

Finding 6-1: Citygate believes that while aircraft are complex, expensive tools to operate, the Achilles Heel of all three programs – CAL FIRE, Sheriff and San Diego Fire – is the ability to provide trained pilots. The aircraft are worthless without pilots trained in Southern California wildfire conditions. All three programs expressed this concern to Citygate. It is most immediate in the Sheriff's Department, but the others also will face it.

Finding 6-2: Citygate sees aircraft program management overlap and logistical expense duplication due to differing approaches by multiple aircraft operators. Some have inadequate physical facilities. Some have to outsource maintenance, which is likely more expensive. As in ground-based fire services in the County of San Diego, there is program fragmentation. However, in the case of aircraft, there are so few that it fails the common sense test to have so many individual fire helicopter programs for so few ships and pilots.

Recommendation 6-1: The County of San Diego should support the San Diego CAL FIRE Unit request to place a new helicopter in the County of San Diego that would result in an additional "twin engine" helicopter with staff in the County. This would accomplish the County's goal of adding a helicopter module to the County without the need for local government funding. The new "twin engine" helicopter also meets the CAL FIRE requirement for night firefighting capabilities under the FIRESCOPE and CAL FIRE guidelines. The County would benefit by having the state purchase the helicopter ($12 million), provide required maintenance, provide a relief fire helicopter, and fund the annual CAL FIRE staffing cost ($1.5 million per year).

Recommendation 6-2: The County of San Diego also should work with the state to continue the partnership between the County Sheriffs Department Aviation Unit and CAL FIRE San Diego. The loss of the Governor's Executive Order *annual 2 million dollar* firefighter staffing for Copter 10 and 12, would seriously compromise the program. Alternative funding sources should be explored to provide permanent funding for

the program. Options include County-funded CAL FIRE staffing [Schedule "A"] for the helicopter program with the County receiving reimbursement for fire response from the agency with jurisdiction. This would include reimbursement for the Schedule "A" staffing on the County helicopters. An Advanced Life Support or paramedic component of this program should be considered as an augmentation to the current helicopter rescue program. CAL FIRE Paramedics would enhance this already outstanding program.

An alternative to the above State-funded suggestions could be a long-term partnership between the County of San Diego and CAL FIRE. A partnership where the County funds the helicopter and pilot and CAL FIRE permanently funds the firefighter positions could allow the current program to continue. The County purchase of an additional "twin engine" Type Two helicopter for the Sheriff's Department could also increase the surge capacity with three firefighting helicopters plus having a helicopter available for night operations.

Recommendation 6-3: At a minimum, the helicopter agencies should establish a joint working group or formal Joint Powers Authority (JPA) to solve the issues of:

a. Training replacement pilots;

b. Providing certified helicopter mechanics at a joint price;

c. Secure the funds to maintain the CAL FIRE aerial assets now dependent on the Governor's order for funding;

d. Secure the funding to continue the training and radio equipment capability programs to integrate military assets.

Recommendation 6-4: Long-term, the helicopter agencies need to seriously consider, via contracting or through a JPA, establishing a singular, fire department managed aerial operations unit.

SECTION 7—FIRE DISPATCH CENTER REVIEW

Finding 7-1: Even given this report's abbreviated review, there are clearly too many fire dispatch centers in the County of San Diego. Ideally, there would be one or at most two. The most likely two would be the City of San Diego, given its size and call volume, and one for the rest of the County, including CAL FIRE.

Finding 7-2: Citygate broadly endorses the eight (8) recommendations of the 2009 dispatch center study to ask the parties to work through the issues in the direction of merger, and in the short-term, using technology links to eliminate lag time when requesting resources between centers.

Finding 7-3: Citygate compliments the Heartland and North County JPAs on making progress towards at least a dispatch technology merger. These efforts should be supported and encouraged to proceed to talks about a full merger of the JPAs.

Recommendation 7-1: Citygate recommends that the County and City and Fire District leadership groups empanel a task force to identify and overcome the barriers to dispatch center consolidation.

Recommendation 7-2: Citygate recommends that in the near term, at least Escondido obtain pricing from one or more centers and select one with which to consolidate its fire dispatching. If this and a full Heartland and North County merger were to occur, the centers would consolidate from five down to three large ones – CAL FIRE, San Diego City and North Comm/Heartland, whose centers are already technology interlinked.

SECTION 8—LOGISTICAL SUPPORT REVIEW

Finding 8-1: While logistical support might appear to be an area where considerable savings could be made through joint purchasing of small equipment and supplies, the general consensus is that the "just-in-time" availability of most items from vendors is more cost effective than agencies creating and operating a central warehousing and delivery operation. This outsourcing of warehousing and delivery to the vendors is a practice that is now very common among fire agencies in California, as they have measured the cost effectiveness of continuing to operate their own local "stores" operation.

Finding 8-2: As discussed in Section 14 on volunteers, development of common apparatus specifications, joint apparatus purchasing and sub-regional apparatus maintenance at maintenance centers and/or through mobile mechanics is an issue that the County needs to address aggressively. With leadership in this area it is likely that other agencies in the County of San Diego would join in on purchasing and maintenance with a cost savings and improved service for everyone involved.

Recommendation 8-1: Following current best practices from NFPA, the County and CAL FIRE need to jointly develop an apparatus procurement and maintenance plan. Part of that plan needs to include a fire apparatus maintenance training and certification program for the technicians and operators.

Recommendation 8-2: The larger agencies in the County should consider establishing a logistical support Joint Powers Authority (JPA) to publish supply specifications, issue bids and decide what goods to store locally versus direct delivery from the source to each fire station.

SECTION 9—FIRE PREVENTION REVIEW

Recommendation 9-1: The agencies should align as much as possible the fire prevention supplemental fire code provisions across the County. Since all agencies do adopt the basic statewide building and fire codes, they can strive for countywide common regulations on supplemental fire prevention requirements. A limited term task force with one-time, shared funding should be developed to do the integration of these requirements.

Recommendation 9-2: To assist with the burden of providing certified and experienced fire prevention staff in all disciplines in the smaller agencies, some of the agencies and/or the County should take the lead in researching the formation of a sub-regional or countywide fire prevention Joint Powers Authority (JPA) similar to the dispatch JPAs. This JPA could jointly fund and operate centralized technical prevention activities such as plan checking, fire code violation enforcement, wildland fuel reduction and arson investigation programs to name a few.

SECTION 10—FIREFIGHTER TRAINING REVIEW

Finding 10-1: **Training Centers** – There are not enough regional training towers in terms of location or in sufficient number to satisfy the countywide training needs if all agencies were training to standards frequently found in suburban fire departments. Manipulative skills are the primary basis of a firefighter's job. While classrooms provide an environment where didactic training can occur, without the follow-up of manipulative training and practice the muscle memory required to function correctly during an emergency will not develop. This is why it is so critical that firefighters have ready access to training facilities. In terms of travel distance, 15 minutes from station to facility should be the goal with 30 minutes being the maximum limit in the urban areas to avoid deployment gaps and to maximize training center utilization.

Finding 10-2: **Training Records** – There are a number of areas in the training field that can be streamlined. For example, training records tracking is done using a number of different systems, each of which has its champions and detractors. Another area is in standardizing specifications for many items so that firefighters train on similar equipment. Finally, there is a need to develop a common field operations manual similar to that used by North County and El Cajon area agencies.

Finding 10-3: **Multi-Agency Cooperation** – The Heartland JPA Training business model has a lot to recommend itself for local agencies to combine their resources for the best blend of cost and quality service delivery. Only the very largest agencies can justify sole proprietorship of a very expensive training facility. Most of the fire agencies in the County of San Diego have less than eight stations. Consider

that San Diego City has one training facility, albeit very large, that supports 43 stations. Based on the current locations of existing or planned facilities, it appears that in the western County the current number of existing and planned facilities is adequate.

Finding 10-4: **Eastern County Training Facilities** – Departments on the east side of the County of San Diego have no ready access to any training facilities, with the possible exception of classrooms in fire stations or a few mobile props towed in on trailers. This does not mean that no manipulative training or practice occurs, but there are many skills that are simply better taught and learned where the correct amenities and props are located. Because these stations are so widely dispersed, it would be economically hard to justify erecting enough facilities to meet even the 30-minute travel standard. The rural agencies will have to develop a system that employs large fixed, smaller satellite and mobile facilities to balance need versus travel time to remote centers.

Recommendation 10-1: **Commit to Regional Operational Standards and Training Programs** – All of the fire agencies have to commit to operating within regional operational standards from which training and other standardization can flow.

Recommendation 10-2: **Expand the Informal Training Cooperation to Formal Structures** – Existing and new Joint Powers Authorities (JPAs) have to be operated to provide administrative oversight, cost sharing ability and revenue sources for regional training.

Recommendation 10-3: **Needs Assessment** – Once the regional commitments and JPAs are in place, conduct a training needs analysis. The analysis should cover what common training exists and what common training needs have to be developed. The results of this analysis will drive the resultant need for facilities, and the shared training staff to design, deliver and monitor programs.

Recommendation 10-4: **Training Facilities** – Develop at least two full-fledged training facilities on the east side of the County. Given that there are a number of tribal departments along the I-8 corridor, perhaps the one on the south end could be a cooperative venture between the County and the tribal departments in that area.

SECTION 11—TRIBAL FIRE DEPARTMENTS REVIEW

Finding 11-1: In many cases, the tribal fire departments have capabilities that could be more fully integrated into the regional firefighting delivery system.

Finding 11-2: Tribal sovereignty creates issues in how to develop more formal working cooperation with other departments; however, this can be overcome through appropriately written agreements.

Finding 11-3: The tribal fire departments are trying to fulfill all of the training and education requirements that their neighboring jurisdictions are also trying to fulfill.

Recommendation 11-1: The San Diego County Fire Chiefs Association and the Indigenous Fire Chiefs Association of San Diego Tribes need to further enhance their understanding of each other and each group's role. Initially this could best be done through facilitated meetings with the short-term goal of integrating operations where appropriate through automatic and mutual aid agreements. Eventually the Indigenous Fire Chiefs should be a section of the County Chiefs.

Recommendation 11-2: A small ad hoc task group consisting of attorneys and fire chiefs with appropriate backgrounds needs to research and ultimately develop a model mutual aid/automatic aid agreement that can be used between the tribal departments and the other departments in the County of San Diego.

SECTION 12—SPECIALTY INCIDENT RESPONSE NEEDS REVIEW

Finding 12-1: Overall, the region's fire departments have been leaders in developing specialty response teams, sharing them, obtaining grants and using the mutual aid system to dispatch them. While any one team may need more funds from time to time for training or updated equipment, these are modest issues the regional agencies can determine how to cost share. The Hazardous Materials JPA is an excellent example of shared governance and cost sharing for the common good. It or another new JPA could operate other regional specialty teams.

Finding 12-2: Given this brief overview of specialty response systems, only two deficits stand out that warrant further review. First, is that while the regional airports may meet FAA minimums, the local fire departments are not really equipped for small and business aircraft crashes.

Second, the Port of San Diego has no significant firefighting or special operations fireboat other than limited capability on commercial tugs. The Port has grown in commercial cargo volumes and types, and in tourism cruise vessels. While incidents in these vessels are infrequent worldwide, they do occur, as do earthquakes, where water-based firefighting and pumping would be very useful.

Recommendation 12-1: Citygate recommends the Unified Port of San Diego conduct a risk and response systems review of its marine firefighting and special response needs.

Recommendation 12-2: Citygate recommends the County of San Diego, which operates the suburban airports, work with other appropriate local government agencies, the tenants and carriers to develop a revenue stream that will provide for enhanced on and off airport firefighting and EMS patient rescue.

SECTION 13—VOLUNTEER PROGRAM REVIEW

Finding 13-1: The volunteer fire service has to contend with unparalleled changes in the requirements to be volunteers, including: simultaneous growth in call volume; "urban service" expectations in rural areas; cultural changes in rural communities; and an increasingly aging population. All of these forces, any one of which would be difficult to absorb, have all converged simultaneously. While these changes are difficult on the volunteers, the phased integration of the volunteers into a County support and regulatory structure is necessary and should be completed.

Finding 13-2: The concern about apparatus maintenance travel time is significant and requires action. The ownership issue should be worked to closure.

Finding 13-3: It appears that consolidating the CAL FIRE Management Group and the Julian Cuyamaca Management Group into one Management Group would create efficiencies.

Recommendation 13-1: While the concept of using mobile mechanics traveling to each fire station has merit, the safety considerations of having mechanics work under vehicles on any issue more significant than a brake adjustment also should be a concern. Citygate recommends that the County explore placing a "running repair" shop in the eastern County at a suitable location.

Recommendation 13-2: It is not in Citygate's scope to ascertain the implied liability to the County of the volunteers operating apparatus that may not be properly maintained, but logically it would seem that there is some. With that in mind, the County should consider taking over the maintenance of volunteer-owned apparatus under the following conditions: (1) the apparatus maintenance be brought up to date and current for a reasonable period, say six months; (2) the apparatus meet the conditions of NFPA 1901 Standard for Automotive Fire Apparatus 1991 Edition and NFPA 1912 Standard for Fire Apparatus Refurbishing; and (3) the title be deeded to the County for a term with the proviso that at the end of its useful life the apparatus will be returned to the company for sale.

Recommendation 13-3: The County Counsel should investigate the implied liability issue of the volunteers operating apparatus that may not be properly maintained. If the County has a liability with volunteers or reserves operating apparatus that it has no control over, then either proper maintenance of it needs to be ensured or that apparatus should not be used.

SECTION 14—FISCAL ASSESSMENT

Finding 14-1: In summary, most cities are financially struggling. If the economy does not recover fast enough to start a substantial flow of revenue to cities within the next 24 months, most cities will find it difficult to retain current fire service levels. In the unincorporated part of the County, most fire protection districts appear to be able to retain current service levels in spite of the economic downturn, if the state has indeed reached the bottom and is about to see economic growth. Almost all of the remaining fire agencies rely on County funding to maintain their current service levels, and the County itself is struggling financially.

Finding 14-2: However, as the fire districts use some or all of their reserves, they will not have the ability to increase staffing. As the deployment sections of this study identified, many of the rural fire stations have difficulty scheduling volunteer per diem firefighters during the Monday through Friday 40-hour workweek. One way to help this would be to staff these stations with one firefighter on a 40-hour week. However, most of the smaller agencies do not currently have the revenue to do this.

SECTION 15—GOVERNANCE APPROACHES TO IMPROVING FIRE SERVICES

Finding 15-1: Citygate believes that CAL FIRE's role in day-to-day operational coordination is a very positive development. They have extensive operational and management depth and experience as a very large, permanent fire response presence in and around the east County fire agencies. However, their explicit authority is acknowledged informally and not as a formal County policy. Providing CAL FIRE with an acknowledged role will help address the 2005 LAFCO report concern that there needs to be an effective mechanism to administer an integrated system for regional fire protection and emergency medical services.

Finding 15-2: The expanding role of the Fire Authority makes this organization a good location for organizing and coordinating planning and policy activities.

Finding 15-3: Most of the Fire Division and Fire Authority responsibilities are not traditionally found within a government planning department like DPLU because fire service field operations and the planning for specialized emergency field operations or the fire service response to disasters are not part of the perspective and skill set of land use planning organizations.

Finding 15-4: Now that the initial organizational steps have been taken to establish the Fire Authority, fire responsibilities need to be relocated to report to the Deputy Chief Administrative Officer/General Manager of the Public Safety Group where it is more appropriately aligned with other public safety activities and has the organizational position to exercise the public safety policy, coordination and implementation responsibility that Citygate recommends be assigned to the Fire Authority.

Recommendation 15-1: In addition to its current responsibilities, the Fire Authority should have operations committee membership within the Unified Disaster Council to work with other unincorporated area emergency agencies to ensure a coordinated disaster response, develop a long-term capital plan for fire infrastructure needs in its responsibility area, develop standard operating policies and procedures, ensure formal mutual aid agreements, and provide a fire perspective to DPLU.

Recommendation 15-2: The Fire Authority and most, if not all, of the Fire Division functions should be moved under the Deputy Chief Administrative Officer/General Manager of the Public Safety who is currently responsible for the County Office of Emergency Services and coordination with the County Sheriff's Department. This organization realignment will bring all County public safety functions together where they can be most effectively coordinated and where an operational function such as fire can be more appropriately managed by staff who are familiar with operational public safety and more familiar with the requirements of day-to-day safety operations. To the extent that there needs to be a daily interface between DPLU and Fire Division planning, code enforcement and permitting activities, this can be accomplished like many agencies do, by locating the appropriate Fire Prevention Division staff offices adjacent to the planning offices or in a one-stop permitting center.

Recommendation 15-3: Citygate recommends that a County Fire Services Director as manager of the County Fire Authority is an effective approach to providing leadership in the unincorporated area and management of the County direct fire functions. A County Fire Services Director would report directly to the Deputy Chief Administrative Officer/General Manager of the Public Safety Group, supervise the Fire Authority and other Fire Division employees, and through them have operational responsibility for the fire stations and staff that are merged into CSA 135.

Recommendation 15-4: Citygate recommends that the County continue implementing the Hybrid Plan on the most aggressive time schedule practical. Step II would fold five CSAs (CSA 111-Boulevard, CSA 112-Campo, CSA 109-Mt Laguna, CSA 110-Palomar, CSA 113-San Pasqual) into CSA 135 in Fiscal Year 2010-11 and Step III would bring the Pine Valley FPD and the San Diego Rural FPD into CSA 135 in Fiscal Year 2011-12.

Recommendation 15-5: Citygate recommends that the County Fire Authority, through a County Fire Services Director, offer to assume the "coordination" role for a formal organization of fire agencies that would be responsible to develop plans, including implementation steps, for adoption and implementation by the County fire agencies. This organization could

be as informal as one created by an MOU or as formal as a Joint Powers Authority. However, there does need to be a formal working group recognized and accepted by all agencies.

The membership of the regional fire planning and decision group should include the CAL FIRE Unit Chief, U.S. Forest Service Fire Chief, three Fire Chief representatives from smaller cities, the Fire Chief of the City of San Diego, the County Fire Services Director representing the Fire Authority agencies, a Fire Chief representing the fire districts that are not part of the Fire Authority, and a Volunteer Fire Chief. The chairperson would rotate annually between the County Fire Services Director, the City of San Diego Fire Chief and the CAL FIRE Unit Chief as the largest providers. The roles and responsibilities of the group would largely mirror that of the State of California FIRESCOPE Board of Directors that manages the policies of the statewide fire mutual aid system. As California OES staffs and provides resources to FIRESCOPE, the San Diego County Fire Authority could staff and resource the board to accomplish the needed regional planning and coordination work.

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PART TWO

Project Background

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SECTION 1

INTRODUCTION AND BACKGROUND TO THE REGIONAL DEPLOYMENT STUDY

The County of San Diego has requested that Citygate Associates, LLC conduct a deployment study for regional fire, rescue and EMS services within the County of San Diego in order to establish a blueprint for improving the County's regional fire protection and emergency medical system. The challenges facing public officials in the County of San Diego are not unique. Growing communities in California all face the dilemma of how to provide services as there is usually not a high enough growth rate in General Fund revenue sources to build up fire services as fast as the communities would prefer.

In order to assess and develop recommendations for improvement in the County's regional fire and emergency response system, this study assesses current levels of service, identifies future needs, provides options for streamlining regional governance structures and offers cost feasible proposals that will improve the region's ability over time to respond to natural or manmade disasters. This study will enhance the delivery of fire and emergency medical services in the County of San Diego.

The core of this project is a deployment study known as a regional Standards of Response Coverage study. This approach to determining deployment needs is based on risks and desired outcomes. It evaluates the capabilities of the existing deployment system, and if gaps exist between service levels and desired outcomes, proposes improvements possible over time. As a regional study, it looks across political subdivision lines to what is needed in a sub-region (for example the Northwest County) as well as at the resources needed countywide (for example, dispatching and helicopters). It does not look within each independent agency's boundaries. Many County of San Diego fire agencies have already completed stand-alone deployment studies; and for most of the smaller agencies, this regional study will be adequate to meet their need to understand their own local situation.

In addition to the Standards of Response Coverage portion of the deployment study, Citygate also performed the following:

1. Reviewed the County of San Diego's agreement with CAL FIRE, for level of service provided under the contract and the current status of the contract.
2. Identified and assessed training centers, their capabilities, and governance and funding sources/system and how accessible the training centers are to the various agencies.
3. Identified various Joint Powers Agreements and the role these agreements perform in the overall emergency response system structure along with

recommended changes and/or new Joint Powers Agreements to more effectively support regional fire services.

4. Identified regional support services capabilities, such as logistics, dispatch and fire prevention, that need to be enhanced in order to support regional fire services.
5. Reviewed regional auto and mutual aid agreements and the role they perform in the overall emergency response system.
6. Reviewed the air support programs related to fire/rescue/EMS capabilities.
7. Reviewed the integration of the Emergency Medical Services system with the regional firefighting resources.

1.1 Project Approach and Research Methods

In order to conduct the deployment study and to assess the related support systems, Citygate used several tools to gather, understand, and model information about the fire and emergency response services in the County of San Diego. We started by making a large document request to all of the fire agencies in the County via an on-line questionnaire to gain background information on costs, current and prior service levels, the history of service level decisions and what other prior studies had to say. We reviewed prior studies, met with the LAFCO and County staff responsible for preparing the core prior studies, and reviewed demographic and growth information about the County. We obtained detailed information from CAL FIRE and the County Fire Authority and we received and assessed detailed electronic dispatch records of all incidents between 7/1/2007 - 6/30/2009.

In subsequent site visits, Citygate team members followed up on this information by conducting focused interviews with various stakeholders as needed.

Once Citygate gained an understanding of service levels in the County and the related fire, rescue, and EMS risks, the Citygate team evaluated the organizational, staffing, and capital improvements that might be needed to improve service levels and the associated costs of these improvements. We developed findings and then validated our preliminary opinions by reviewing our draft technical work, findings and conclusions with County staff and representatives of the cities and fire agencies in the County.

1.2 Report Organization

This report is structured into the following sections that group appropriate information together for the reader.

This Volume (**Volume 1**) includes:

Part One—Executive Summary

i. Executive Summary

ii. Comprehensive List of Findings and Recommendations

Part Two—Project Background

Section 1 Introduction and Background to the Regional Deployment Study

Part Three—Standards of Response Cover Assessment

Section 2 Introduction to Fire Deployment and the SOC Process (*Introduction and Background)*

Section 3 Firefighter Staffing Needs in the County *(Risks, Desired Outcomes, Response Time Goals and Staffing Levels)*

Section 4 Fire Station Coverage in the County (*Geographic Mapping Analysis)*

Section 5 Incident Response Statistics Review *(Analysis and Integrated Deployment Recommendations)*

Part Four—Support Services Review

Section 6 Aerial Firefighting Programs Review

Section 7 Fire Dispatch Center Review

Section 8 Logistical Support Review

Section 9 Fire Prevention Review

Section 10 Firefighter Training Review

Section 11 Tribal Fire Departments Review

Section 12 Special Incident Response Needs Review

Section 13 Volunteer Program Review

Part Five—Fiscal Assessment

Section 14 Analysis of Funding Sources and Financing Options

Part Six—Governance Issues

Section 15 Governance Approaches to Improve Fire Services

Separately attached:

Volume 2—Response Coverage Geographic Maps

Volume 3—In-depth Response Statistics Analysis

As each of the sections throughout this report impart information, Citygate will cite findings and make recommendations, if appropriate, that relate to each finding. Within each section, there is a sequential numbering of all of the findings and recommendations. To provide a comprehensive summary, a complete ordered listing of all these same findings and recommendations is provided in the previous section, *Comprehensive List of Findings and Recommendations.*

The result is a solid technical foundation upon which to understand the adequacy of current fire and emergency services in the County of San Diego and the cost-effectiveness of improvements in those services.

This report, with its technical explanations, findings and recommendations, provides a framework for the discussion of fire services and the policy choices that the County Board of Supervisors and officials in individual fire agencies will need to make. While the current economic environment leaves little room for enhancing services without having to prioritize the use of scarce existing public funds, this report provides a positive assessment of current fire and emergency response services and serves as a planning tool for improvement and response to growth over the next several decades.

1.3 PROJECT BACKGROUND

1.3.1 Who Provides Fire and Emergency Response Protection

Fire and emergency response in the County of San Diego is provided by over sixty separate government agencies, volunteer fire departments, and Indian tribal organizations. The government agencies include resources on federal installations such as Camp Pendleton, the State of California through CAL FIRE, the United States Forest Service, the County of San Diego, the San Diego County Fire Authority, 18 cities, 7 Community Service Areas formed by the County, and 21 Fire and/or Water Districts. There are Volunteer Fire Departments operating as non-profit 501(c)(3) organizations, which in some cases are fiscally and/or operationally associated with CAL FIRE and/or the Fire Authority.

Collectively these various organizations operate 460 primary fire engines, ladder trucks and specialty apparatus out of 264 fire stations with a daily staffing of 914 career firefighters. Over 700 volunteers are available, principally throughout the unincorporated portion of the County, to supplement the full-time staff. These fire station based resource totals do not include helicopter, wildland fire hand crew resources and military base fire units. Combined, agencies in the County responded to 262,614 incidents in Fiscal Year 2008-09. Funding for these primary fire and emergency response resources exceeds $517,000,000 annually, not including military fire departments, law enforcement and contracted costs for EMS helicopter transport services.

As shown in the table below, Emergency Medical Service (EMS) represents the greatest portion of the incidents that required a response this past fiscal year, while Building Fires and Wildland Fires represent the smallest number of responses.

County Fire Service Incidents by Type in Fiscal Year 2008-09

Type	Count
EMS	205,989
Building Fires	4,152
Wildland Fires	1,073
Other Fires	9,333
Other Incidents	42,067
Total	262,614

The fire and emergency response resources are stitched together in a network through five sub-regional fire dispatch centers (two of which are in the process of partially consolidating) that facilitate the operation of automatic and mutual aid resources. In most cases this permits the closest neighboring resources to be called to an emergency when the size of the emergency exceeds the capacity of the primary responding agency. The mutual aid can also be called when there are overlapping calls that have already fully absorbed the resources of the primary agency.

In addition to the sub-regional dispatch centers and the mutual aid agreements, the resource "backbone" to this fire and emergency response network is the weight of resources provided by the collective cities and CAL FIRE. While currently fiscally stressed by the recession, the cities in total represent a large and well trained pool of staff and equipment. The cities provide an adequate response in terms of timeliness and the volume of resources to all but the largest of emergencies such as catastrophic wildfires.

CAL FIRE operates out of 26 stations in the State Responsibility Area, utilizing 26 fire engines, 4 conservation camps fielding up to 19 firefighting hand crews at peak times, bulldozers and multiple types of air resources. In addition, CAL FIRE provides (under contract to local agencies in the eastern County area) 14 staffed engines and keeps an additional 8 engine companies open in wintertime under an Amador contract with local agencies when the fire season is over in order to provide added year-round coverage. CAL FIRE's well trained, led and equipped fire resources represent a significant base in the eastern County area that is supplemented by fire volunteers and volunteer fire companies that combine to provide a typical rural area response time to emergencies. Additionally in the national forest areas, the United States Forest Service staffs 14 fire engines during the wildland fire season.

Sections 2 through 5 of this report will explore, in detail, the deployment of resources and response times throughout the County, measuring this against best practice guidelines for urban, suburban and rural areas in the County.

For greater detail regarding the history and formation dates of the Districts and Community Service Areas, the 2005 report "*Fire Protection and Emergency Medical Services Review*" prepared by the San Diego County LAFCO is an excellent resource. A summary of the service providers in the unincorporated portions of the County is addressed in the 2007 report "*Reorganization of Structural Fire Protection and Emergency Medical Services in Unincorporated San Diego County,*" also prepared by LAFCO.

Both of these LAFCO documents provided proposals and baseline information that were the subject of a later County report, *The Hybrid Plan*, that proposed a phased reorganization of fire resources in the unincorporated portion of the County encompassed within the boundaries of the County Service Area 135. This plan was largely adopted by the County and is currently being implemented in 3 distinct steps, briefly described in Section 1.3.3 below.

1.3.2 What is the Present Governance Arrangement Among Fire Service Providers?

The County of San Diego does not have one consolidated point of authority for making policy and operational decisions for fire and emergency response services. There are over 60 fire service providers in the County, most of whom have the independent authority under the California Government Code to make policy. For the most part, the variety of fire providing organizations in the County of San Diego is very similar to that found in most California counties that have a mix of urban/suburban development and large tracts of unincorporated, state and federal rural lands. Local government fire service agencies in their present form arose to provide fire service to what were once more isolated pockets of development, and have remained in place as development has expanded and filled in the spaces between many of these formerly small populations.

In November 2004, the unincorporated area County voters approved Measure C, an advisory measure that expressed support for the consolidation of unincorporated area fire service agencies. In 2005, LAFCO completed a state required Municipal Service Review (MSR) for fire protection services and concluded that the fire system was:

> *"…characterized by duplicate organizations and redundant layers of management…*
>
> *The region's agencies have not developed universal response criterion; do not provide a unified command; do not employ unified standards for training and safety personnel…Because emergency services are divided among so many agencies – no single authority is accountable for creating and implementing a comprehensive vision for the region."*

In California there is not legislative authority for a larger agency such as a county to unilaterally "undo" or "disband" independent fire districts or water districts providing fire services and non-profit volunteer fire departments. Also, there is no authority under the California Government Code for a larger agency to compel cities to organize their fire service in a particular manner.

While the Local Agency Formation Commission initiated action in 2005 to consolidate fire services provided by special districts, with the goal of forming a single independent fire district, the difficulty of following through on such a sweeping reorganization is illustrated by three years of study, alternative proposals, and finally adoption of an incremental approach in 2008 by the County Board of Supervisors that was also approved by LAFCO.

The County and agencies within the County have taken the initial steps toward consolidation and the creation of larger, more cost-effective, operational units. For example, six of the cities have engaged in some form of consolidation and the City of Vista provides fire services under contract to the neighboring Vista Fire Protection District. Some of the volunteer organizations have been incorporated into the County Fire Authority as Phase I of the October 2008 County

Hybrid Plan. Under this plan, CAL FIRE, via a contract with the County, provides day-to-day operational direction to many of the fire companies staffed by the independent agencies and volunteer organizations in eastern rural San Diego County. Such arrangements can be expected to become more common as cities and districts seek to retain current service levels by finding ways to reduce duplication of costs among neighboring agencies.

Who has Day-to-Day Operational Authority?

Among the County of San Diego's over 60 fire resource agencies and organizations there is a substantial degree of operational coordination. While there are 18 independent cities in the County, six of them have entered into administrative (functional) consolidations that have created two larger fire departments. All of the region's cities participate in countywide fire department organizations that serve as a forum for identifying operational issues and all are participants in automatic (closest unit boundary drop) or mutual aid agreements. Resources are dispatched, as needed, across jurisdictional boundaries; and at an emergency the well understood "Incident Command System" provides an effective direction at the scene.

Many of the fire service providers in the unincorporated County actually receive day-to-day operational direction from CAL FIRE as a result of either having contracted with CAL FIRE to staff their engine companies and/or to provide dispatch services. Many of these organizations also receive funding from the County Fire Authority under contracts that specify that either the agency will be using the funding to contract with CAL FIRE or specify the cooperation with CAL FIRE and the County Fire Authority.

The remaining fire agencies are generally the larger fire and water districts that provide fire service comparable in scope to that of a mid-sized city and coordinate their activities with other county agencies in the same way as the cities do.

The path of growing coordination, cooperation and consolidation that is occurring in the County of San Diego mirrors what is occurring elsewhere in the state. This report will recommend that the path already laid out by the County of San Diego in the "October 2008 Hybrid Plan" and the cooperation and consolidation among cities be continued as a deliberate policy and not as a by-product of occasional large disasters. The County Fire Authority needs to be expanded through the already planned "steps," the cooperative regional fire organizations need to be strengthened with the resources to allow them to set goals and have the staff assigned to facilitate the action to achieve the goals, and the role of CAL FIRE in providing operational direction in much of the rural County needs to be acknowledged and formalized by all of the participating parties.

1.3.3 What Changes in Governance or Operational Arrangements are Planned?

CSA 135

The unincorporated portion of the County of San Diego, that is not state or federal land, and 10 of the 18 cities are part of County Service Area (CSA) 135, formed in 1994 to support an 800 MHz communications system. In 2008 the County Board of Supervisors approved a plan (the Hybrid Plan) to establish the County Fire Authority as the coordinating agency over the fire service providers in the CSA 135 boundaries, except the cities. The plan was to be implemented in three steps.

LAFCO approved, at the request of the County, the additional authority for CSA 135 to provide structural fire protection and emergency medical services within the Step I portion of the CSA boundaries.

Step I took in approximately 60 percent of the eventual 1.5 million acres of unincorporated territory. It brought six volunteer fire companies under the umbrella of the Fire Authority and provided funding to help support fire agencies, most of whom were eventually planned to be reorganized and become a part of the CSA 135 in Steps II and III. This County support has provided money to contract with CAL FIRE to staff engine companies and to individual agencies and volunteer organizations to provide stipends to volunteers who work fire station shifts and thus are reliably available to respond to emergencies.

Step II was planned to be implemented in Fiscal Year 2010-11. It would bring five County Service Areas under the Fire Authority and expand the Fire Authority's responsibility to encompass 70 percent of the ultimate planned area.

Step III is to reorganize the Pine Valley and San Diego Rural Fire Protection Districts by merging them into CSA 135. The Julian-Cuyamaca Fire Protection District reserved the right to decide to join at the time Step III is to be implemented in Fiscal Year 2011-12.

Significantly, all of the County Service areas, plus the San Diego Rural FPD and the Julian-Cuyamaca FPD, all receive financial assistance from the County which is administered by the Fire Authority. All but the Julian-Cuyamaca FPD are coordinated by CAL FIRE on a day-to-day basis for field operations.

While Steps II and III have not yet been implemented, some functional consolidation is proceeding in Steps I, II and III areas through a combination of CAL FIRE day-to-day operational coordination and Fire Authority contract requirements for coordination and training. While substantial improvements can be made to this emerging framework, the County and its contractor, CAL FIRE, are putting the backbone of unification into place.

Zones 7 and 8

The terms "Zone 7 and Zone 8" refer loosely to both geographic areas and a collection of Fire and Water Districts (providing fire service) and volunteer fire departments. More recently the designations have changed to "CAL FIRE Management Group" (Zone 7) and the Julian-Cuyamaca Management Group (Zone 8). Membership has been changing over the past year, with agencies shifting to the CAL FIRE Management Group as they contract for CAL FIRE services and recognize the management coordination function that CAL FIRE is performing in day-to-day field operations. Section 13 of this report on "Volunteer Issues" contains a more extensive description of agencies within each group and their functional relationship to CAL FIRE.

By July 2010, it is anticipated that the Julian-Cuyamaca Management Group will consist of the Julian-Cuyamaca and the Borrego Springs Fire Protection Districts and the San Pasqual and Mt. Laguna Volunteer Fire Departments.

The CAL FIRE Management Group is expected to consist of:

- San Diego Rural Fire Protection District
- Valley Center Fire Protection District

- Deer Springs Fire Protection District
- Pine Valley Fire Protection District
- Yuima Municipal Water District
- Ramona Municipal Water District
- Boulevard, Campo, DeLuz, Intermountain, Ocotillo Wells, Palomar, Ranchita, Shelter Valley and Sunshine Summit Volunteer Fire Departments
- San Diego County Fire Authority funded CAL FIRE "Amador" stations and Warner Springs fire station.

Consolidations

While the San Diego County Fire Authority represents one form of consolidation, there are a number of other cooperative arrangements in the County that also are consolidation examples. The Heartland Communications Authority and the North County Communication Centers are consolidating to share a Computer Aided Dispatch system, for both the hardware and software, while maintaining two dispatch locations. The Heartland Training Facility Authority (a JPA) has been operating for years to economically provide training overhead and facilities to departments in the El Cajon and southwest County areas.

The Cities of Del Mar, Encinitas and Solana Beach have joined with the Rancho Santa Fe Fire Protection District to share management services. Rancho Santa Fe Fire Protection District will provide some Battalion Chief coverage for Encinitas. Encinitas will provide operational oversight for Del Mar including supervision of Del Mar's fire suppression operations, emergency management, fire prevention activities, emergency medical services and administrative functions. Encinitas would also provide Solana Beach with the services of its Fire Chief and two Deputy Chiefs to oversee training and assist with the purchase of materials, services and fire equipment and management of service contracts. The agencies believe that the agreement provides a means to reduce redundancy, improve efficiency and develop consistent policies and procedures leading to greater interoperability.

The cities of El Cajon, La Mesa and Lemon Grove have shared duty chief staffing and have now entered into a Joint Powers Agreement that creates a shared management team to supervise the three fire departments as the Heartland Fire and Rescue. This creates a unified command over a larger geographic area and saves the agencies money.

A different approach to consolidation is reflected by the contract between the City of Vista and the Vista Fire Protection District. The City of Vista, 19 square miles, provides the full range of fire service under contract to the District, which is also 19 square miles. This only adds another approximately 10 percent population to the service requirements of the City and reflects a cost-effective approach to providing service.

Both economic imperatives as well as the reality that larger fire service organizations provide for more effective coordination of service delivery will very likely lead to further consolidations in the County of San Diego.

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PART THREE

Standards of Response Cover Assessment

(Fire Station and Staffing Deployment)

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SECTION 2

INTRODUCTION TO FIRE DEPLOYMENT AND THE STANDARDS OF RESPONSE COVER PROCESS *(INTRODUCTION AND BACKGROUND)*

2.1 PURPOSE AND ORGANIZATION OF THE DEPLOYMENT ANALYSIS SECTIONS

Report Sections 2 through 5 provide an in-depth analysis of the current ability of the countywide fire deployment system to deploy to and meet the emergency risks presented in the County. The response analysis will use geographic mapping and a review of prior response statistics to help the community visualize what the current response system can and cannot deliver.

The major sub-headings in the deployment sections are indicated in *italics* below:

Section 2 Introduction to Fire Deployment and the Standards of Response Cover Process

- *Introduction and Background*

Section 3 Firefighter Staffing Needs in the County

- *Risks, Desired Outcomes, Response Time Goals and Staffing Levels*

Section 4 Fire Station Coverage in the County

- *Geographic Mapping Analysis*

Section 5 Incident Response Statistics Review

- *Analysis and Integrated Deployment Recommendations*

Separately attached to this report volume, given the large document sizes, are:

Volume 2 Response Coverage Geographic Maps

Volume 3 In-depth Response Statistics Appendix.

2.2 County of San Diego Deployment Assessment Approach and Research Methods

To analyze the deployment systems in the County of San Diego, Citygate used several tools to gather, understand, and model information about the fire departments for this study. Citygate issued an information request via a web-based survey to each Department. Citygate team members followed up on this information by conducting focused interviews of fire management team members and other appropriate agency staffs. We reviewed demographic information about the County, its cities and fire districts, including proposed developments, and managed growth projections. As we collected and understood information about the service areas, Citygate obtained electronic map and response data from SANDAG, SANGIS and the five regional fire dispatch centers upon which to model current and projected fire services deployment. The goal was to identify the location(s) of stations and crew quantities required to serve the countywide area.

Once Citygate gained an understanding of the countywide service area with its fire, rescue, and EMS risks, the Citygate team developed a deployment model of fire services that was tested against the mapping and prior response data to ensure an appropriate fit. This resulted in Citygate being able to propose an approach to providing fire services across the County that would also meet reasonable expectations and fiscal abilities for the various providers in the County area.

2.3 General Fire Services Deployment Policy and Regulatory Background

In the United States, there are no federal or state regulations on what a minimum level of fire services has to be. Each community, through the public policy process, is expected to understand the local fire risks, their ability to pay, and then to choose their level of fire services. **If** fire services are provided at all, the federal and state regulations specify how to do it safely for the personnel providing the service and the public.

While this report and technical explanation can provide a framework for the discussion of fire services across the County, neither this report nor the Citygate consulting team can make the final decisions or cost out in detail every possible alternative. Once final policy choices are determined by the various stakeholder agencies, each agency will have to determine its financing and preferred timelines to make adjustments to fire services.

The challenges facing the agencies in the County of San Diego are not unique. At the start of this project in the Fall of 2009, the revenue for all California communities did not match needs in an atmosphere made worse by a state budget deficit. This fire service deployment assessment has to acknowledge that the individual agencies may desire improved fire services, but in the near term cannot afford any improvements. Thus, this assessment will suggest how to prioritize existing services to revenues, while laying out a road map for future improvements that can be followed when revenue growth occurs.

In addition to restrictions on local government finance, there have been a number of new state and federal laws, regulations, and court cases over the last decade that limit the flexibility of fire agencies in determining their staffing levels, training, and methods of operation. These are given an abbreviated overview below:

1. 1999 OSHA Staffing Policies – Federal OSHA applied the confined space safety regulations for work inside tanks and underground spaces to America's firefighters. This requires in atmospheres that are "IDLH" (Immediately Dangerous to Life and Health) that there be teams of two inside and two outside in constant communication, and with the outside pair equipped and ready to rescue the inside pair. This situation occurs in building fires where the fire and smoke conditions are serious enough to require the wearing of self-contained breathing apparatus (SCBA). This is commonly called the "2-in/2-out" policy. This policy requires that firefighters enter serious building fires in teams of two, while two more firefighters are outside and immediately ready to rescue them should trouble arise.

   While under OSHA policy one of the outside "two-out" personnel can also be the incident commander (typically a chief officer) or fire apparatus operator, this person must be fully suited-up in protective clothing, have a breathing apparatus donned except for the face piece, meet all physical requirements to enter IDLH atmospheres and thus be ready to immediately help with the rescue of interior firefighters in trouble.

2. May 2001 National Staffing Guidelines – The National Fire Protection Association (NFPA) Standard on Career Fire Service Deployment was issued seven years ago. While *advisory* to local governments, as it starts to become locally adopted and used, it develops momentum, forcing adoption by neighboring communities. NFPA 1710 calls for four-person fire crew staffing, arriving on one or two apparatus as a "company." The initial attack crew should arrive at the emergency within four minutes travel time, 90 percent of the time, and the total effective response force (first alarm assignment) shall arrive within eight minutes travel time, 90 percent of the time.

3. Hazardous Materials Incident Command – The on-scene Incident Commanders (Battalion Chiefs) at Hazardous Materials Incidents must have certification compliant with NFPA 472, Standard for Emergency Response to Hazardous Materials Incidents. This is also now an OSHA requirement.

2.4 General Fire Deployment Background Information

The Commission on Fire Accreditation International recommends a systems approach known as "Standards of Response Coverage" to evaluate deployment as part of the self-assessment process of a fire agency. This approach uses risk and community expectations on outcomes to assist elected officials in making informed decisions on fire, rescue and emergency medical service deployment levels. Citygate has adopted this methodology as a comprehensive tool to evaluate fire station and fire crew locations. Depending on the needs of the study, the depth of the components can vary.

Such a systems approach to deployment, rather than a one-size-fits-all prescriptive formula, allows for local determination of the level of deployment to meet the risks presented in each community. In this comprehensive approach, each agency can match local need (risks and outcome expectations) with the costs of various levels of service. In an informed public policy

debate, elected officials "purchase" the fire, rescue, and EMS service levels (insurance) 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 any singular component can. If we only look to travel time, for instance, and do not look at the frequency of multiple and overlapping calls, the analysis could miss over-worked companies. If we do not use risk assessment for deployment, and merely base deployment on travel time, a community could under-deploy to incidents.

The Standard of Response Cover process consists of eight parts:

1. Existing Deployment – each agency has something in place today.
2. Community Outcome Expectations – what does the community expect out of the response agency?
3. Community Risk Assessment – what assets are at risk in the community?
4. Critical Task Time Study – how long does it take firefighters to complete tasks to achieve the expected outcomes?
5. Distribution Study – the locating of first-due resources (typically engines).
6. Concentration Study – first alarm assignment or the effective response force.
7. Reliability and Historical Response Effectiveness Studies – using prior response statistics to determine what percent of compliance the existing system delivers.
8. Overall Evaluation – proposed standard of cover statements by risk type.

Fire department deployment, simply stated, is about the ***speed*** and ***weight*** of the attack. Speed calls for first-due, all risk intervention units (engines and trucks) strategically located across a department. These units are tasked with controlling everyday, average emergencies without the incident escalating to second alarm or greater size, which then unnecessarily depletes the department resources as multiple requests for service occur. Weight is about multiple-unit response for significant emergencies like a room and contents structure fire, a multiple-patient incident, a vehicle accident with extrication required, or a heavy rescue incident. In these situations, departments must assemble enough firefighters in a reasonable period in order to control the emergency safely without it escalating to greater alarms.

Thus, small fires and medical emergencies require a single- or two-unit response (engine and ambulance) with a quick response time. Larger incidents require more companies. In either case, if the companies arrive too late or the total personnel sent to the emergency are too few for the emergency type, they are drawn into a losing and more dangerous battle. The art of fire company deployment is to spread companies out across a community for quick response to keep emergencies small with positive outcomes, without spreading the stations so far apart that they cannot quickly amass enough companies to be effective in major emergencies.

Given the need for companies to be stationed throughout communities of differing types for prompt response instead of all companies responding from a central fire station, large communities are faced with neighborhood equity of response issues. When one or more areas grow beyond the reasonable travel distance of the nearest fire station, the choices available to the elected officials are limited: add more neighborhood fire stations, or tell certain segments of the

community that they have longer response times, even if the type of fire risk found is the same as other areas.

For the purposes of this fire services study, Citygate used all eight components of the Standards of Response Cover process (at varying levels of detail) to understand the risks in the County, how the fire departments are staffed and deployed today, and then modeled those parameters using geographic mapping and response statistical analysis tools.

Thus, Citygate tailored the deployment recommendations in this report to the countywide service area unique needs, and did not use one-size-fits-all national recommendations.

The next section will discuss and make findings about each component of the deployment system. From these findings of fact about the countywide fire deployment system, Citygate is then able to make deployment change recommendations.

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SECTION 3

FIREFIGHTER STAFFING NEEDS IN THE COUNTY *(RISKS, DESIRED OUTCOMES, RESPONSE TIME GOALS AND STAFFING LEVELS)*

3.1 COMMUNITY OUTCOME EXPECTATIONS – WHAT IS EXPECTED OF THE FIRE DEPARTMENT?

The first step in the Standards of Response Cover process is to review existing fire and emergency medical outcome expectations. This can be restated as follows: for what purpose does the current response system exist? Have the governing bodies adopted any response time performance measures? If so, the time measures in use need to be understood and good data collected.

Each developed community, if asked, would probably expect that fires be confined to the room or nearby area of fire origin, and that medical patients have their injuries stabilized and be transported to the appropriate care location. Thus, the challenge faced by the well-developed areas is to maintain an equitable level of fire service deployment across their entire service area without adding significantly more resources as demand for services grows and traffic congestion increases, slowing response times.

In lightly populated areas or rural zones, many residents and travelers understand they have moved beyond receiving quick, urban emergency response times. In these areas, the emergency response is still needed, but with longer times, the outcome goals are different. For example, instead of keeping a building fire to the room of origin, the goal is to keep a building fire from spreading to wildland areas and thus causing a severe wildfire.

3.1.1 Response Time Guidelines

In urban areas, the Insurance Services Office (ISO) Fire Department Grading Schedule would like to see first-due fire engines stations spaced 1.5 miles apart and ladder trucks spaced 2.5 miles apart, which, given travel speeds on surface streets, is a 3- to 4-minute travel time for first-due engines and a 7- to 8-minute travel time for first-due ladder trucks.

For career fire departments in urban areas, the National Fire Protection Association (NFPA) guideline 1710 on fire services deployment suggests a 4-minute travel time for the initial fire apparatus response and 8 minutes travel time maximum for the follow-on units.

NFPA1720 for combination (volunteer + career) fire departments recommends response times that vary by population densities. For areas with less than 500 people per square mile, as is much of eastern San Diego County, NFPA 1720 recommends a travel time of 12 minutes.

The ISO grades community fire defenses on a 10-point scale, with Class 1 being the best. Typically, urban areas are rated Class 3. Some heavily deployed departments with high risks are rated Class 1. There are no Class 1 Fire Departments in the County of San Diego, and they are rare across the United States. As population densities and risks decrease, so does fire protection. In rural areas there are not typically water mains and fire hydrants, so water has to be trucked to the fire. In emerging suburban and rural areas, fire departments are typically rated at Classes 5 to 9. Class 10 means no protection exists, or the fire department is inadequately equipped or staffed, or that the area is more than 5 miles (approximately 10-12 minutes) driving distance from a fire station.

3.1.2 Response Time Components

Response time in the fire service has been defined differently over the decades. When the term "response time" is used, it by itself does not define when time begins, stops, or how many responding vehicles are measured. Nor does the term imply how the measure is to be reported, such as using an average of the data (mid-point) or using a percent completion of a goal point, like 90 percent of the calls by minute X. Today, a best practice is to report response time as *Total* Response Time, which includes three component parts:

- Call-handling time – time of 911 call answer until time of responding unit initial notification.
- Turnout time – time of crew notification until time unit is responding. The crew has to hear the dispatch message, don the personal safety clothing mandated by the type of emergency, and get the unit rolling.
- Travel time – time from when the unit begins travel until time the unit arrives on the scene.
- First-Due and Effective Response Force (First Alarm) – total response time should be measured for both the primary responding unit, and for serious emergencies, for the multiple units (commonly called the First Alarm) needed to quickly stop the escalation of the emergency into a greater problem.
- Levels of Measure – historically agencies reported one measure for the entire department. The problem with this is that only one measure, either an average or percent of goal completion, when many fire stations and units are involved, causes the data to be averaged so that a few high performing stations make the data look better by hiding a few poor performing stations. The better practice is to use three levels of measure – agency wide, fire station area, and individual units.

3.1.3 Desired Outcomes

For many reasons, it is not necessary for an agency to only deploy to meet the ISO measures. The ISO criteria are designed to evaluate the fire protection system for underwriting purposes. They are assessing a department's ability to stop a building fire *conflagration*. The ISO system does not address small fires, auto fires, wildland fires and emergency medical incidents. In addition, underwriters today can issue fire premiums in Grading Schedule "bands" such as 3-5 and give safer buildings in a community a single higher rating of Class 1 for example.

Thus, if an agency only tries to meet the ISO or NFPA station placement criteria, they do not necessarily deliver better outcomes, given the diversity of risk across American communities. Importantly within the Standards of Response Coverage process, positive outcomes are the goal, and from that the needed company size and response time can be calculated to allow efficient fire station spacing.

Emergency medical incidents have situations with the most severe time constraints. In a heart attack that stops the heart, a trauma that causes severe blood loss, or in a respiratory emergency, the brain can only live 8 to 10 minutes maximum without oxygen. Not only heart attacks, but also other emergencies can cause oxygen deprivation to the brain. Heart attacks make up a small percentage. Drowning, choking, trauma, constrictions, or other similar events have the same effect on the brain and the same time constraints.

In a building fire, a small incipient fire can grow to involve the entire room in a 4- to 5-minute time frame. The point in time where the entire room becomes involved in fire is called "flashover," when everything is burning, life is no longer possible, and the fire will shortly spread beyond the room of origin.

If fire service response is to achieve positive outcomes in severe EMS situations and incipient fire situations, ***all*** the companies must arrive, size up the situation and deploy effective measures before brain damage or death occurs or the fire spreads beyond the room of origin. *This is typically the goal in built-up urban-suburban areas, where the road network and tax base is sufficient to support fairly quick fire department response times.*

In emerging suburban and rural areas, most national fire deployment guidelines strive for doing what is possible, safely, with a smaller staffed force that arrives well into the emergency timeline. Thus outcome expectations are less than those in urban areas.

Given that the emergency started before or as it was noticed and continues to escalate through the steps of calling 911, dispatch notification of the companies, their response, and equipment set-up once on scene, there are three "clocks" that fire and emergency medical companies must work against to achieve successful outcomes:

1. The time it takes an incipient room fire to fully engulf a room in 4 to 5 minutes, thus substantially damaging the building and most probably injuring or killing occupants.
2. When the heart stops in a heart attack, the brain starts to die from lack of oxygen in 4 to 6 minutes and brain damage becomes irreversible at about the 10-minute point.
3. In a trauma patient, severe blood loss and organ damage becomes so great after the first hour that survival is difficult if not impossible. The goal of trauma

medicine is to stabilize the patient in the field as soon as possible after the injury, and to transport them to a trauma center were appropriate medical intervention can be initiated within one hour of the injury.

Somewhat coincidently, in all three severe situations above, the first responder emergency company must arrive on-scene within 5 to 7 minutes of the 911-phone call to have a chance at a successful resolution. Further, the follow-on (additional) companies for serious emergencies must arrive within the 8- to 11-minute point. These response times need to include the time steps for the dispatcher to process the caller's information, alert the stations needed, and the companies to then don OSHA-mandated safety clothing and drive safely to the emergency.

The sum of these three time steps – dispatch, company turnout and drive time – comprises total response time. Thus, to get the first firefighters on-scene within only 5 to 7 minutes of the 911 call being answered is very challenging to all parts of the system, even in urban areas, as this study will describe later in detail.

The three event timelines above start with the emergency happening. It is important to note the fire or medical emergency continues to deteriorate from the time of inception, not the time the fire engine actually starts to drive the response route. It is hoped that the emergency is noticed immediately and the 911 system is activated. This step of awareness – calling 911 and giving the dispatcher accurate information – takes, in the best of circumstances, 1 minute. Then company notification and travel take additional minutes. Once arrived, the company must walk to the patient or emergency, size up the problem and deploy their skills and tools. Even in easy to access situations, this step can take 2 or more minutes. It is considerably longer up long driveways, apartment buildings with limited access, multi-storied office buildings or shopping center buildings such as those found in many parts of the County.

Current best practice nationally is to measure percent completion of a goal (i.e., 90 percent of responses) instead of an average measure, as many fire departments did in the past. Response goal measures should start with the time of fire dispatch receiving the 911 call to the arrival of the first unit at the emergency, and the measure should state what is delivered and what the expected outcome is desired to be.

Percent of completed goal measures are better than the measure of average, because average just identifies the central or middle point of response time performance for all calls for service in the data set. From an average statement, it is impossible to know how many incidents had response times that were considerably over the average or just over. For example, if a department had an average response time of 5 minutes for 5,000 calls for service, it cannot be determined how many calls past the average point of 5 minutes were answered slightly past the 5th minute, in the 6th minute or way beyond at 10 minutes. This is a significant issue if hundreds or thousands of calls are answered much beyond the average point.

In national recommendations, it has been accepted to take 60 seconds, 90 percent of the time to receive and dispatch critical emergencies and another 60-80 seconds for the company to receive the dispatch and get the apparatus moving. However, as will be discussed later, this is unrealistic, given the need to don mandated protective safety clothing and to be seated and belted in before the apparatus begins to move.

Thus, from the time of 911 *receiving the call*, an effective deployment system is ***beginning*** to manage the problem within 7 minutes total reflex time (1-minute call processing, 2 minutes crew

turnout, 4 minutes drive time). This is right at the point that brain death is becoming irreversible and the fire has grown to the point to leave the room of origin and become very serious. Yes, sometimes the emergency is too severe even before the fire department is called in for the responding company to reverse the outcome. However, given an appropriate response time policy and if the system is well designed, then only issues like bad weather, poor traffic conditions or a significant number of multiple emergencies will slow the response system. Consequently, a properly designed system will give the citizens hope of a positive outcome for their tax dollar expenditure.

3.1.4 Existing San Diego Region Deployment Policy

As already mentioned in the background information, the setting of fire service levels in communities is left to local control. Only in the last ten years or less, has America's fire service begun the process to identify and develop the measurement tools to assist elected officials with understanding and choosing levels of fire service deployment. Prior to this period, communities occasionally followed the ISO fire station spacing measures, the advice of their Fire Chief, or the request of community or developer interests to "add another fire station."

In this study, Citygate received survey data from 53 fire agencies on deployment related questions. Three questions were asked of the agencies about their deployment policies, if any. When asked if they had a policy at all, 34 agencies (or 57 percent) answered *yes*, they had some form of policy to guide fire services deployment. When further asked if the agency elected officials had formally adopted the policy, only 12 agencies (or 20 percent) answered *yes*. Finally, when asked if the adopted policy was consistent with or contained in the agency's General Plan, only 7 agencies (or 12 percent) answered *yes*.

Many of the fire department policy statements were adopted to quantify how the agency does in the context of agency budget measures or annual report statements. When not adopted, it is difficult to use such fire department only "policy" in public hearings where elected officials have to deal with existing communities that desire expanded services, or resist the location of a new fire station, or a developer does not want to contribute to increasing fire services.

In reviewing the policy statements submitted by the agencies, all generally follow the current published national advice on deployment in using percent of a goal, over a time period. Most are consistent in specifying shorter response times in higher population density or risk areas. However, many do not contain specific desired outcomes, or the time measurement start point, or both. Such vague policy statements become hard to measure and justify when the agency is using it as a fire services deployment design standards tool with community members or new development applicants. The more specific, measurable and consistent the policy is, the more it can be applied fairly to all uses and easily understood by a non-fire service reader.

As for the County itself, it does have a fire unit response time policy contained in the General Plan Safety Element. The County policy uses three land use categories and three maximum travel time measures to set the fire response for the first-due unit. The travel time measures are 5, 10, and a maximum of 20 minutes. Further, consistent with national best practice recommendations, the County policy also takes into consideration multiple factors such as risk, geography and density of development. The County policy allows for appropriate mitigations such as the use of a rural water supply and residential automatic fire sprinklers.

The County Emergency Medical Services Agency has a fire department paramedic response time goal in urban areas of 8 minutes, 90 percent of the time for fire first responders (P-801). However, this policy does not state when the time measure starts. Verbally, it is "understood" to be when the fire dispatch center receives the 911-call. If so, then when 3 minutes are subtracted for dispatch and crew turnout times, the result is a 5-minute travel time measure, which is consistent with the County General Plan specification of 5 minutes for the "town" land use designation.

Finding 3-1: Very few agencies in the County have a complete and current best practice designed fire deployment measure adopted by their elected officials that includes a beginning time measure starting from the point of fire dispatch receiving the 911-phone call, combined with 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. Adopting such deployment goals will meet the best practice recommendations of the Commission on Fire Accreditation International and the National Fire Protection Association (NFPA).

3.1.5 Response Time Measures for this Study

Since there are a variety of response time measures used by agencies in the San Diego region and not all have been adopted by elected officials, this study will use as benchmarks the travel time recommendations of NFPA 1710 and 1720 for career and combination (volunteer) fire service deployment. The study will report response time historical measures for total response time, as well as for each component of dispatch, crew turnout and travel times. Being a regional study, the data will be reported sub-regionally by quadrant, not for each individual agency.

3.2 RISK ASSESSMENT

Both newcomers to the County, as well as long-term residents, may not realize the community-by-community assets that are at risk today in such a vibrant and diverse region. The area's fire departments are charged with responding to a variety of emergencies, including fires, medical calls, special hazards and cargo transportation emergencies on the highway. Some agencies handle airports and harbors. Almost every community is exposed to the threats of wildfire.

Building fire quantity and dollar loss is modest when compared to eastern United States communities. Much of the San Diego region is of newer building construction, using better materials and building codes, than communities over 75+ years old. The County of San Diego enjoys a very modest climate, which does not cause the buildings to badly age nor require the heating and electrical loads found necessary in the snow regions of the United States.

However, as the San Diego region is all too painfully aware, it is very much at risk to human and property loss due to wildland fires. The region's climate and fuel types are some of the most conducive in the world to wildfires. The last two "mega" firestorms in 2003 and 2007 were the largest firestorms in size and building loss in the County's history. When combined, in a space of

just four years, 744,577 acres or 27 percent of the entire County area was burned. The total structure loss in just two fires was 5,894, which in direct and indirect economic impacts was a loss of over 2 billion dollars.

Large wildfires are not unique in the County's history. Almost every decade since 1900 has recorded large-scale wildland fires, many with modest to severe structure losses. Examples are the Ramona-Poway fire in 1967 and the Laguna firestorm in 1970. Every year, there are many smaller wildfires that harm the environment and threaten and damage small quantities of homes or commercial buildings. Since 1933, of the state's 20 largest wildfires by acreage, 3 were in the County of San Diego; when measuring by structures lost, 4 of the largest 20 fires (or 20 percent) were in the County of San Diego, with all of these occurring in the last 40 years.

The region's population now totals 4,251 square miles containing 3.1 million residents, not counting employees that commute from out of the county, tourists and the military. The region is California's second largest and houses substantial numbers of commercial and industrial businesses that not only employ a significant number or workers, but also some companies use hazardous materials in their business processes. There are large to small health care facilities, universities, airports, a large port, pipelines and railroads. San Diego's fire agencies protect almost every type of risk found in the United States, except for large petroleum refineries.

Finally, there is the threat of earthquakes. While the wildfires are more frequent, it is always possible that a serious earthquake will task the region's first responders with fires, rescues and medical emergencies.

In order to understand the importance of response time in achieving satisfactory outcomes, the deployment of resources must be based upon assessment of the values at risk. There are actually many different *types* of values at risk depending upon the nature of the emergency. At a very basic level, a fire in a structure is among the most frequent events with a measurable outcome. A *single* patient medical emergency is a different event, and while it is the most frequent, it is normally not as threatening to life and property as the structure fire since the structure fire can spread from building to building and eventually become a conflagration.

3.2.1 Building Fire Risk

One of the risk measures the ISO collects is called fire flow, or the amount of water that would need to be applied if the building were seriously involved in fire. The measure of fire flow is expressed in gallons per minute (gpm). In the San Diego region there are thousands of commercial buildings. It would not be unusual to find a modestly sized commercial building with a fire flow of 2,000 gpm. Larger buildings could range up to 6,000 gpm fire flows.

Finding 3-2: Fire flows above 2,500 gpm are a significant amount of firefighting water to deploy and a major fire at any one of the larger buildings would outstrip the on-duty fire staffing in smaller communities or rural areas. A 2,500-gpm building could be a one-story, 26,250 square foot (150'X175') business park building, which is not unusual in the region. Using the generally accepted figure of fifty gallons per minute per firefighter on large building fires, a fire in a building requiring 2,500 gallons per minute would require 50 firefighters, or *more than the on-duty staffing in any one city except for San Diego itself.* This is why serious fires require the response of multiple fire agencies using mutual or automatic aid agreements. A building fire this serious in a rural area would need mutual aid resources from a very large area of more than 30 minutes driving time.

An effective response force is the deployment of multiple units (pumpers, ladder trucks and an incident commander) so they can arrive close enough together to combat serious fires and keep them to less than greater alarm size. This refers back to the earlier points in this report on *speed* and *weight* of attack. The massing of units in a timely manner (*weight*) must be such that serious fires do not typically become larger. Since zoning has placed these buildings throughout the urban area, this places additional pressure to have a multiple-unit effective response force of pumpers, and, also importantly, ladder trucks throughout the more built-up areas of the region.

A response system can be designed with staffing and station locations to accomplish desired outcomes. An outcome example is, "confine a residential fire to the room of origin." That outcome requires a more aggressive response time and staffing plan than "confine the fire to the building of origin, to keep it from spreading to adjoining structures or to wildland areas." As such, fire deployment planning takes direction from policy makers as to the outcomes desired by the community.

By delivering emergency medical care using Emergency Medical Technicians or Paramedics via fire engines and ambulances, many communities in the region have committed to a higher level of emergency medical care with the resultant need for adequate response times.

3.2.2 Wildland Fire Risk

The County of San Diego is no stranger to the threats and impacts of wildfires. Due to the Mediterranean climate, topography and native vegetation patterns, this risk will never go away. Nor can the risk be mitigated to an insignificant level, by building standards, vegetation management and zoning. The fact is that populations have and will continue to build in wildfire threat areas.

Of course there should be building construction, vegetation and zoning mitigations where practical to lessen risks and fire control expenses. Even with these measures, the region always will need to have on stand-by a well trained, staffed and equipped wildland firefighting force.

Wildfires while different than building fires, also need to be responded to in layers, using the same *speed* and *weight* of attack philosophy. These fires will grow at different rates due to

topography, wind, temperature and fuel types. These variables create wide differences in how dangerous a wildfire at first notice will be, unlike building fires, which are more similar than not when burning. Some of the wildfire threats can be understood ahead of an emergency so suppression forces can be pre-staged in higher threat areas, or have staffing increased in dangerous fire weather days.

Across sections of the County with average to high wildfire threats, the *speed* of attack is needed, so that a few initial units can quickly respond and be staffed and equipped to keep the fire small and not spreading to catastrophic proportions. This means that all primary fire station areas need wildland fire apparatus, equipment, training and at least minimal staffing. Given that most of the populated areas in the County can field three fire stations to locations on and near the paved road network in about 12 minutes driving time, this would place a small firefighting force at emerging fires to quickly assess the situation and begin control. Fires larger than 3-5 acres, especially on windy, warm days, will quickly need the *weight* of attack to deploy multiple crews with hoses, tools and trucked in water for direct fire attack, while in other cases, hand crews and bulldozers will be needed to indirectly clear fuels ahead of a fires movement. Airborne assets will be used for command and control, direct extinguishment and to ferry small teams of hand crews to remote areas for direct fire attack.

The regions fire departments cooperate together in joint response plans, so that when a dispatch center or first-due unit has the facts to understand a serious fire is emerging, the initial response force can be doubled or tripled in minutes, along with the appropriate air assets being launched. Fires that go unnoticed for long, or start in remote areas, will always be the most difficult to contain to less than dangerous sizes. When large dangerous fires occur, then the entire public safety system is taxed to evacuate residents, control the fire, and care for displaced populations. In addition to personal economic impacts, large wildfires also disrupt commerce and will create direct and indirect economic losses.

Published national fire and EMS response time goals center around building fires and medical emergencies. Where wildland fires are mentioned, the recommendations are not time-based, but advise agencies to build response measures consistent with risk and desired outcomes. NFPA 1710 on Career Fire Service Deployment in Section 5.7.1 states, "Wildland fire suppression operations shall be organized to ensure that the fire department's wildland fire suppression capability includes personnel, equipment, and resources to deploy wildland direct operations that can address marginal situations before they get out of control and wildland indirect firefighting operations that can be assembled and placed into operation against major wildland fires.

NFPA 1710 Section 5.7.4.1 goes on to state that:

> *"on-duty wildland fire-fighting personnel numbers shall be determined through task analyses that take the following factors into consideration:*
>
> *(1) Life hazard to the populace protected.*
>
> *(2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters.*
>
> *(3) The number of trained response personnel available to the department, including mutual aid resources.*
>
> *(4) Potential property loss.*

(5) Nature, configuration, hazards, and internal protection of the properties involved.

(6) Types of wildland tactics and evolutions employed as standard procedure, type of apparatus used, and the results expected to be obtained at the fire scene.

(7) Topography, vegetation, and terrain in the response area(s)"

CAL FIRE's statewide goal is to contain all wild fires within the first two hours to 10 acres or less 95 percent of all fires responded. Aircraft initial response criteria have been established to deliver retardants to the fire scene on state responsibility lands within 20 minutes of dispatch and to provide follow-up aircraft as needed.

As this deployment study goes into greater detail about staffing and fire station locations, the points above for wildland fire control also will be taken into consideration.

3.2.3 Emergency Medical Services

For decades, fire departments have responded to medical emergencies outside of hospitals. Even as the use of ambulances began, in many communities at first, there was not enough demand or a payment system for private ambulances to be feasible. County of San Diego communities were no different and as organized fire departments emerged, especially in smaller communities outside of San Diego, these departments operated basic ambulances. Starting in 1972 many of these programs upgraded to the then new and state-of-the-art, Emergency Medical Technician (EMT) level. After the success of a new Los Angeles County Fire Department Paramedic program made popular by a television show called "*Emergency*!" As paramedicine emerged beyond the experimental phase, the State of California saw the governance of EMS, along with the oversight of clinical care and ambulance operations as the responsibility of regional government (the counties). Thus San Diego County Emergency Medical Services came into being. In 1975, San Diego County area fire departments started to train and deploy paramedics in cooperation with the University of California Medical Center (UCSD) under the regional policy guidance of the County of San Diego.

Over time as the EMS systems grew, the complexity of paying for ambulance operations created tension and regulators saw the need to ensure adequate service as being a "public good." This meant creating market areas called Exclusive Operating Areas (EOA's) where the number of ambulance operators is limited so that the quantity of patients transported and billed ensures a quality operation, instead of too many companies operating unprofitably and offering poor service. California, through legislation, gave the County EMS agencies the power to create and control via bidding these EOA's. This created tension as private ambulance operators merged into larger companies and wanted areas in which fire departments had or wanted to also operate ambulances. Finally a California Supreme Court case drew a line and, past a certain date, gave the counties the full power to decide who operated within an EOA for both public and private EMS providers. Prior to a certain date, if a public agency was operating a certain level of EMS service, including paramedic ambulances, it could continue to do so indefinitely; these grandfathered rights are called "201 rights" after the State Government Code Section that describes them.

Given that many County of San Diego area suburban fire departments had long been in the ambulance business, and then had converted to paramedic service levels, many fire departments

in the County hold 201 rights and continue to this day operating fire department paramedic level ambulance service. Some cities, like Chula Vista, hold 201 rights but have decided to contract their ambulance service to a private provider. San Diego City, after a long period of using contract private ambulance providers, created a public-private corporation to run its emergency and non-emergency medical services. San Diego City Fire Department is a full partner and co-provider in this program.

What this means today, is that very much like fire services, ambulance services are controlled by multiple public agencies, with the County ensuring clinical oversight, economic viability of providers, facilitating the trauma system and contracting for advanced medical care helicopter transport.

This means that many fire departments operate dual role fire and paramedic services in which firefighter/paramedics go to both types of calls. Thus firefighting and ambulance staffing is intertwined, and co-dependent. Given this and a "201" agency's right to operate an ambulance service, it means that the County alone cannot re-organize ambulance services away from an agency, unless the agency holding "201" rights agrees to some form of conversion.

The public is generally not aware of the above brief description of a very complex model. Since about 1972, the public perception in America has been that if 911 is called, an EMS system responds to care for and as needed, transport the sick and injured to a definitive care facility. The residents of the County of San Diego are no different; and over almost 40 years, the majority of emergency calls for service have grown to be EMS, as the response statistics portion of this study (Section 5) will explain.

This "dual role" fire and EMS system has large benefits and some drawbacks. It leverages the "stand-by" firefighting force to serve the daily EMS patient needs. This means additional training, equipment and certification standards for firefighters. It means blending medical payment economics (insurers) with local government revenue (taxes/fees).

The operational downside is that in communities with dual role fire departments with first-responder and/or ambulance based paramedics; the community runs the risk that at times of serious fires the EMS system will be under-deployed. Or when a serious fire breaks out, the response of some firefighters will be delayed, as they are out-of-service on medical incidents.

This trade-off of using firefighters for more than just firefighting has been accepted by most communities in the newer built-up and moderate climate western states, since the fire service and building codes have made huge advances in limiting the number and severity of building fires over the past 40 years. This study is a deployment study of fire station locations and staffing. It is not a clinical or fiscal audit of the current multi-layered EMS system in the County of San Diego.

3.2.4 Technical Emergencies – Hazardous Materials, Technical Fires and Rescue

For longer than EMS has been in the fire service, fire departments have responded to specialty rescue calls where tools and special knowledge are needed to extricate a victim. Over the same recent 40-year period that EMS grew in the fire service, so did the technical complexity of society and the need for a response to all kinds of occasional, but critical emergencies. Since it had the "time" to handle more than firefighting duties, the fire service has continued to accept new technical response challenges to further increase the payback benefit from the public investment in a stand-by emergency force.

Currently, many fire departments train to at least a basic response level in handling hazardous materials releases, auto accident patient extrication, technical rescues in any environment – (at, below, or very high above grade level), plus specialty fires that occur in aircraft, boats and other unique environments such as hi-tech manufacturing.

This places even more pressure on the fire service to be the "jack of all trades, master of none." These specialty services also place demands on additional training, equipment and in some cases, additional personnel. There are significant safety regulations placed on the fire service to operate with the safety of the firefighter and public in the forefront. All of this means these specialty services cost additional money and require more overhead staff for training, command and equipment repair. As with EMS, during serious fires, it is possible that either the fire or specialty rescue response will be slowed since the first large emergency to occur has greatly consumed the on-duty staffing.

In some cases, the technical complexity, cost and low frequency of actual emergencies causes agencies to partner to provide a regional effort. Examples of this are regional hazardous materials response teams and helicopter units.

In the County of San Diego all the technical risks typical in any urban environment exist and in some cases the area's fire departments have cost-shared, co-staffed and/or done both to provide regional technical services. The two largest examples of this are the San Diego County Regional Hazardous Materials Response Team, operated by a Joint Powers Authority (JPA) on behalf of all jurisdictions. The County Regional Disaster Council manages the JPA and cost sharing. The City of San Diego Fire Department and County Health Department share in the provision of the staffing and response units that in turn are paid for by the JPA partner agencies. For helicopters, two agencies – CAL FIRE and the San Diego County Sheriff's Office – share resources. For critical patient EMS helicopter services, the County awards a contract to a private regional provider to handle this expensive service.

Since technical incident specialty services such as hazardous materials team units are not as response time sensitive and thus not provided from each fire station, this deployment study will not measure or map them. It is up to each fire agency to determine its risk exposure, desired outcomes and ability (in staffing and other costs) to either fully train up to the level of their local technical incident risks, or to contract for services past the first response basic fire station unit level, as many departments do with the regional hazardous material team JPA. In most all cases, the speed of response is not as critical in technical, complex situations, as the neighborhood fire unit can begin assessment and stabilization of the problem while the regional unit responds. Where shared services exist, they are spaced out based where the highest frequency of use is, not for as much response time distance coverage. Thus this study will paint the picture of how the neighborhood first response system works, not the time it takes for the hazardous materials team to arrive.

3.3 Staffing – What Must Be Done Over What Timeframe to Achieve the Stated Outcome Expectation?

The next step in the Standards of Response Cover process is to take the risk information above and review what the firefighting staffing is, and what it is capable of, over what timeframe.

Fires and complex medical emergencies require a timely, coordinated effort in order to stop the escalation of the emergency. Once the tasks and time to accomplish them to deliver a desired outcome are set, travel time, and thus station spacing, can be calculated to deliver the requisite number of firefighters over an appropriate timeframe.

3.3.1 Offensive vs. Defensive Strategies in Structure Fires Based on Risk Presented

Most fire departments use a strategy that places emphasis upon the distinction between offensive or defensive methods. These strategies can be summarized:

> It is important to have an understanding of the duties and tasks required at a structural fire to meet the strategic goals and tactical objectives of the fire department response. Firefighting operations fall in one of two strategies – **offensive or defensive.**
>
> Offensive strategy is characterized primarily by firefighters working **inside** the structure on fire. This strategy is riskier to firefighters but much more effective for performing rescues and attacking the fire at its seat.
>
> Defensive strategy is characterized by firefighters working **outside** the structure on fire. This strategy is generally safer for firefighters; however, it also means no rescues can be performed and the building on fire is a total loss.
>
> > We may risk our lives a lot to protect savable lives.
> >
> > We may risk our lives a little to protect savable property.
> >
> > We will not risk our lives at all to save what is already lost.
>
> Considering the level of risk, the Incident Commander will choose the proper strategy to be used at the fire scene. The Incident Commander must take into consideration the available resources (including firefighters) when determining the appropriate strategy to address any incident. The strategy can also change with conditions or because certain benchmarks are achieved or not achieved. For example, an important benchmark is "all clear," which means that all persons who can be saved have been removed from danger or placed in a safe refuge area.
>
> Once it has been determined that the structure is safe to enter, an **offensive** fire attack is centered on life safety of the occupants. When it is safe to do so, departments will initiate offensive operations at the scene of a structure fire. Initial attack efforts will be directed at supporting a primary search – the first attack line will go between the victims and the fire to protect avenues of rescue and escape.
>
> The decision to operate in a **defensive** strategy indicates that the offensive attack strategy, or the potential for one, has been abandoned for reasons of personnel safety, and the involved structure has been conceded as lost (the Incident Commander makes a conscious decision to write the structure off). The announcement of a change to a defensive strategy means all personnel will withdraw from the structure and maintain a safe distance from the building.

Officers will account for their crews. Interior lines will be withdrawn and repositioned. Exposed properties will be identified and protected.

For safety, federal and state Occupational Health and Safety Regulations (OSHA) mandate that firefighters cannot enter a burning structure past the incipient or small fire stage without doing so in teams of two, one team inside and one team outside, ready to rescue them. This totals a minimum of 4 firefighters on the fireground to initiate an interior attack. The only exception is when there is a known life inside to be rescued. This reason, along with the fact that a four-person company can perform more tasks simultaneously than a three-person company, is why NFPA Deployment Standard 1710 for career fire departments recommends four-person company staffing on engines (pumpers) as well as on ladder trucks.

Many fire department deployment studies using the Standards of Response Coverage process, as well as NFPA guidelines, arrive at the same fact – that an average risk structure fire (typically defined by the NFPA as a modest single-family dwelling of 2,000 square feet and 2 stories) needs a minimum of 14 to 15 firefighters, *plus* one on-scene incident commander. The NFPA 1710 recommendation is that the first unit should arrive on-scene within 6:20 minutes/seconds of fire dispatch call receipt (60 seconds dispatch, 60-80 seconds company turnout, and 4-minute travel), 90 percent of the time. The balance of the units should arrive within 10:20 minutes/seconds of fire dispatch call receipt (8-minute travel), 90 percent of the time, if they hope to keep the fire near or to the room of origin. The NFPA recommendation of 60 seconds dispatch time is generally attainable; the 60-80 second company turnout time is generally unattainable considering the time it takes firefighters to don the required full personal protective equipment. Citygate recommends that a more realistic turnout time, and one with which many departments can comply, is the 120-second, 90 percent of the time point.

For an extreme example, to confine a fire to one room in a multi-story building requires many more firefighters than in a single-story family home in a suburban zone. The amount of staffing needed can be derived from the desired outcome and risk class. If the community desires to confine a one-room fire in a residence to the room or area of origin, that effort will require a minimum of 14 personnel including an incident commander. This number of firefighters is the minimum needed to safely conduct the *simultaneous* operational tasks of rescue, fire attack, and ventilation plus providing for firefighter accountability and incident command *in a modest, two fire hose line house fire*. A significant fire in a two-story residential building or a one-story commercial or multi-story building would require, at a minimum, an additional two to three engines and an additional truck and chief officer, for upwards of 12 plus additional personnel. As the required fire flow water gallonage increases, concurrently the required number of firefighters increases. Simultaneously, the travel distance for additional personnel increases creating an exponential impact on the fire problem.

A typical auto accident requiring multiple-patient extrication or other specialty rescue incidents will require a minimum of 10 firefighters plus the incident commander for accountability and control. An emerging wildland fire typically needs the response of 10-20 firefighters in less than 15 minutes total if the fire is to be kept small on dangerous fire weather days. Wildland fires that are already serious upon initial 911 reporting can have upwards of 30-50 firefighters immediately dispatched. A mid or high-rise building fire can require 25 firefighters on the initial response and if the fire is serious to catastrophic, a high-rise fire will require 200 plus firefighters.

Technical rescue incidents such a victim trapped in a confined space vessel or below ground will need 15-20 firefighters to run a safe operation under Occupational Safety and Health (OSHA) regulations. No one agency other than San Diego City and CAL FIRE has a large force on duty to immediately respond to incidents requiring large staffing levels. Even these two agencies have their staffing spread out across vast areas. This means that all fire departments in the County have to cooperate (which they do) in the mutual aid system for a prompt and joint response.

As a result, all agencies staff for the common, everyday typical emergency – an EMS event involving one or several patients, small wildland fires or technical rescues. This ability to staff for the "high volume, lower risk" calls for service workload is co-dependent on regional mutual aid and dispatch communications. The County of San Diego started mutual aid and radio system integration after the disastrous Laguna Fire Storm of 1970. These efforts spread across Southern California. Today a common command system based in mutual aid, that was created in Southern California, is the federal government response required standard for disasters. Yet, an integrated, regional response is still rare in many sections of the United States. The County of San Diego has always been in the forefront of the evolution of a common system woven from multiple agencies.

While such complex inter-agency systems always need to adapt and improve, at least the County of San Diego's regional agencies do not need to be told they need to, or how to do it.

3.3.2 Daily Unit Staffing Example

There are 18 cities in the region and several large fire districts the size of smaller cities, and each fire department has a different daily staffing plan. Since this is a regional study, this section will use as an example a typical staffing plan of a middle-sized city in the County, operating six fire stations, whose service includes paramedic ambulances.

Below is a typical minimum daily unit staffing assignment in such a department:

Units and Daily Staffing Plan

Minimum Per Unit			Extended
5 Engines @	3	Firefighters/day	15
1 Ladder Truck @	3	Firefighters/day	3
3 Ambulances @	2	Firefighter/paramedics	6
1 Battalion Chief @	1	Per day for command	1
		Total 24/hr Personnel:	*25*

In addition to the daily staffing listed above, almost all departments in the County operate under an automatic aid or "closest unit" agreement managed by a common regional fire dispatch center. This policy means that building fires in many communities receive a mix of units from their own and automatic aid partner agencies. This "closest unit" response system not only helps by providing the units in the least response time without regard to jurisdiction, but also leaves other local units available for back-to-back or simultaneous calls for service that can occur. Otherwise, without a neighboring closest unit system, a four- or five-station fire department has to commit 100 percent of its resources to a building fire and has nothing left if another call for

service occurs. Plus some of the local department's resources may not even be the closest to an emergency where the neighboring agencies are closer. Thus a closest unit system provides the best customer service and does not unnecessarily drain one agency of all of its resources at once.

3.3.3 Firefighter Staffing – Building Fires and Typical EMS Incidents

If a jurisdiction provides fire services at all, safety of the public and firefighters must be the first consideration. Additionally, the chief officers, as on-scene incident commanders, must be well trained and competent, since they are liable for mistakes that violate the law. An under-staffed, poorly led, token force will not only be unable to stop a fire, it also opens the jurisdiction up for real liability should the fire department fail.

As stated earlier in this section, national norms indicate that 14 to 15 firefighters, plus an incident commander, are needed at significant building fires if the expected outcome is to contain the fire to within or near the room of origin and to be able to simultaneously and safely perform all the critical tasks needed. The reason for this is that the clock is still running on the problem after arrival, and too few firefighters on-scene will mean the fire can still grow faster than the efforts to contain it. Chief officers also need to arrive at the scene in a timely manner in order to intervene and provide the necessary incident command leadership and critical decision making to the organization.

To meet a goal of sending 14-15 firefighters plus an incident commander, a department the size of the sample above will have to send 3 engines, 1 ambulance and 1 ladder truck to serious building fires, or 58 percent of its on-duty force. Then, to augment its staffing above 14-15, it has to send additional units via automatic aid. Given the modest occurrence of building fires in the San Diego region, most urban area departments can typically field enough firefighters at a modest building fire. Given the distances between rural communities, most rural departments cannot field 14 firefighters within urban response times. During a serious emergency, the remaining units in a suburban area department and/or automatic aid units would cover any such simultaneous calls. If the fire or rescue incident required more forces, then the remaining agency units would be sent along with more units from the near-by region.

3.3.4 Company Critical Task Time Measures

In order to understand the time it takes to complete all the needed tasks on a moderate residential fire and a modest emergency medical rescue, a typical suburban fire department provided information using their standard operating procedures to demonstrate how much time the entire operations take. The following tables start with the time of fire dispatch notification and finish with the outcome achieved. There are several important themes contained in these tables:

- These results were obtained under best conditions, in that the day was sunny and moderate in temperature. The structure fire response times are from actual events, showing how units arrive at staggered intervals.
- It is noticeable how much time it takes after arrival or after the event is ordered by command to actually accomplish key tasks to arrive at the actual outcome. This is because it requires firefighters to carry out the ordered tasks. The fewer the firefighters, the longer some task completion times will be. *Critical steps* are highlighted in ***grey*** in the table.

- The time for task completion is usually a function of how many personnel are ***simultaneously*** available so that firefighters can complete some tasks simultaneously.
- Some tasks have to be assigned to a minimum of two firefighters to comply with safety regulations. An example is that two firefighters would be required for searching a smoke filled room for a victim.

The following tables of unit and individual duties are required at a first alarm fire scene at a typical single-family dwelling fire. This set of duties is taken from typical suburban fire department operational procedures. This set of needed duties is entirely consistent with the usual and customary findings of other agencies using the Standards of Response Cover process and that found in NFPA 1710 or in CAL-OSHA regulations on firefighter safety. No conditions existed to override the OSHA 2-in/2-out safety policy.

Shown below are the critical tasks for a typical single-family house fire with a room burning on the second floor. The response force is three engines, one ladder truck, one ambulance and one battalion chief responding for a total of 16 personnel:

Critical Tasks – Structure Fires

Structure Fire Incident Tasks	Time From Arrival 1st Engine	Total Reflex Time
Pre-arrival time of dispatch, turnout and travel to 90% of structure fire calls		07:45
1st engine on-scene	00:00	
Conditions report	00:09	
Incident Command established	00:21	
Initial Rapid Intervention Force established	00:30	
2nd engine on scene	00:39	08:24
Water supply secured	01:07	
First line charged	01:28	
Truck on scene	01:39	
Entry - fire attack team	01:50	09:15
Full Rapid Intervention Crew established	02:37	
3rd engine on scene	03:34	
Primary search "all clear"	05:27	13:12
All clear/primary search completed	06:08	
Fire under control	07:29	15:14
Roof open (ventilation complete)	07:29	
Utilities secured	07:35	
Fire out / **incident under control**	08:00	16:24

The above duties grouped together to form an *effective response force or first alarm assignment*. Remember that the above discrete tasks must be performed simultaneously and effectively to achieve the desired outcome. Just arriving on-scene does not stop the escalation of the emergency. Firefighters accomplishing the above tasks do, but as they are being performed, the clock is still running, and it has been since the emergency first started.

Fire spread in a structure can double in size during its free burn period. Many studies have shown that a small fire can spread to engulf the entire room in less than 4 to 5 minutes after open burning has started. Once the room is completely superheated and involved in fire (known as flashover), the fire will spread quickly throughout the structure and into the attic and walls. For this reason, it is imperative that fire attack and search commence before the flashover point occurs, if the outcome goal is to keep the fire damage in or near the room of origin. In addition, flashover presents a serious danger to both firefighters and any occupants of the building.

For comparison purposes, the critical task table below reviews the tasks needed on a typical auto accident rescue. The situation modeled was a two-car collision with two patients. Both drivers required moderate extrication with power tools and the vehicles were upright with no fuel hazards. Two engines, one rescue unit/truck, one ambulance and one battalion chief responded with a total of twelve (12) personnel.

Critical Tasks – Auto Incident – 2 Vehicle, 2 Patients – Air Transport

Vehicle Extrication Critical Tasks	Time From Arrival 1st Engine	Total Reflex Time
Pre-arrival time of dispatch, turnout and travel to 90% of emergency medical calls		07:15
1st engine and ambulance on scene	00:00	
Size up and upgrade to rescue response	00:15	
Hazard identification	00:45	
Truck on scene	01:00	
Patient contact – pt #1	01:30	
Patient contact – pt #2	01:30	
Pre-connect hose line charged	02:00	
Vehicle stabilization initiated	02:00	
Engine #2 on scene	02:15	
Vehicle #1 stabilized	04:50	
Vehicle #1 battery disconnected	05:16	
Patient #1 care initiated / c-spine	05:30	12:45
Power tools set up in work area	06:00	
Vehicle #2 stabilized	06:15	
Patient #2 care initiated / c-spine	07:00	14:15
Vehicle #2 door opened (spreaders)	10:00	
Patient #2 removed from vehicle	12:15	19:30
Vehicle #1 door removed	15:00	
Vehicle #1 dash pushed forward (rams)	17:45	
Patient #1 removed from vehicle	20:30	27:45
Patient #2 ready for transport	21:00	
Patient #1 ready for transport	22:30	29:45

The table above shows typical task times for good patient care outcomes. These patient care times and steps are consistent with County of San Diego EMS Agency patient care protocols and would provide positive outcomes where medically possible.

3.3.5 Critical Task Measures Evaluation

What does a deployment study derive from a response time and company task time analysis? The total completion times above to stop the escalation of the emergency have to be compared to outcomes. We know from nationally published fire service "time vs. temperature" tables that

after about 4 to 5 minutes of free burning a room fire will grow to the point of flashover where the entire room is engulfed, the structure becomes threatened and human survival near or in the fire room becomes impossible. We know that brain death begins to occur within 4 to 6 minutes of the heart having stopped. Thus, the effective response force must arrive in time to stop these catastrophic events from occurring.

The response and task completion times discussed above show that the residents of an urban-suburban area are able to expect positive outcomes and have a better than not chance of survival in a *modest* fire or medical emergency, when the first responding unit *is* available in 7 minutes or less total response time and the balance of the effective response force (First Alarm) can arrive within 11 minutes from the time of fire dispatch receipt.

The point of the tables above is that mitigating an emergency event is a team effort once the units have arrived. This refers back to the "*weight*" of response analogy. If too few personnel arrive too slowly, then the emergency will get worse, not better. Control of the structure fire incident still took 7:30 minutes/seconds after the time of the first unit's arrival, or 15:14 minutes/seconds from fire dispatch notification. The outcome times, of course, will be longer, with less desirable results, if the arriving force is later or smaller.

The quantity of staffing and the time frame it arrives in can be critical in a serious fire. As the risk assessment portion of this study identified, the region's building stock is diverse and includes large and multi-story buildings, any of which can slow the firefighting times as personnel and tools have to be walked to upper floors. Fires in these buildings could well require the initial firefighters needing to rescue trapped, or immobile (the very young or elderly) occupants. If a lightly staffed force arrives, they cannot simultaneously conduct rescue and firefighting operations.

In EMS trauma incidents, the patient is initially being assessed within 11 minutes total reflex time and is able to be transported within 22 minutes. These times are good for trauma patients, when all the needed units can arrive by minute 7, which is not always possible at the outer areas of the region, or when multiple calls for service occur.

The auto accident, while only being moderate in size, required 12 personnel. If a building fire occurred at the same time, then ***100*** percent of the entire on-duty force in this sample sized suburban agency would be committed to two incidents. Response needs greater than this always will require automatic/mutual aid assistance from adjoining departments.

Fires and complex medical incidents require that the other needed units arrive in time to complete an effective intervention. Time is one factor that comes from ***proper station placement***. Good performance also comes from ***adequate staffing***. On the fire and rescue time measures above, the fire department can do a good job, in terms of time, on one moderate building fire and one or two routine medical calls at the same time. This is typical of departments that staff fewer 3-person companies for average, routine emergencies. However, major fires and medical emergencies where the closest unit is not available to respond ***will*** challenge such a response system to deliver good outcomes, so smaller departments are co-dependent for severe emergency coverage with their neighbors. This factor **must** be taken into account when we look at fire station locations. Operating as a "single" regional system is a great, cost-effective idea, as long as all of the partners maintain their levels of service.

Previous critical task studies conducted by Citygate, the Standard of Response Cover documents reviewed from accredited fire departments, and NFPA recommendations all arrive at the need for 14-15 firefighters plus a command chief arriving within 11 minutes (from the time of call) at a room and contents structure fire to be able to ***simultaneously and effectively*** perform the tasks of rescue, fire attack and ventilation.

If fewer firefighters arrive, what from the list of tasks mentioned would not be done? Most likely, the search team will be delayed, as will ventilation. The attack lines only have two firefighters, which does not allow for rapid movement above the first floor deployment. Rescue is done with only two-person teams; thus, when rescue is essential, other tasks are not done in a simultaneous, timely manner. Remember what this report stated in the beginning: effective deployment is about the **speed** *(travel time)* and the **weight** *(firefighters)* of the attack.

Yes, 14-15 initial firefighters plus a battalion chief can handle a moderate risk house fire (especially on the first floor). An effective response force of even 15 will be seriously slowed if the fire is above the first floor in a low-rise apartment building or commercial / industrial building.

3.3.6 County of San Diego Regional Firefighter Staffing Discussion

Career Staffed Fire Departments

The sections above describe the need for adequate staffing to accomplish the various tasks at two typical emergencies. Other events, such as wildfires and technical rescues, can take as many or even more than 15 or so firefighters on the effective response force (First Alarm). For wildland fires on dangerous fire weather days, the fire departments can dispatch two or three times that number of personnel immediately to a report of an emerging fire.

This study, while using measures of fire station travel coverage maps and historical response times, also has to acknowledge that fire stations and fire trucks do not control the emergency – firefighters do. In this measure, the firefighter per unit daily staffing can vary widely across the 50 plus agencies in the County of San Diego. NFPA 1710 recommends a crew per unit of four firefighters, so that upon arrival of the first unit, teams of two can immediately and safely enter dangerous environments without waiting for additional units to arrive.

In the County of San Diego, staffing varies from 4 career firefighters per unit in San Diego City and CAL FIRE, to three per unit on most city and larger fire district units, down to one or two on a rural, largely volunteer staffed unit.

Four firefighters per crew definitely makes sense in urban areas with routine working building fires in congested zoning areas, and in wildland areas where crews may be alone for the initial attack period, as the second due unit is coming from much farther away. In the suburban areas, most departments staff at 3 firefighters per unit, given the much lower fire response volumes, and where the majority of the calls for service are EMS related.

When the daily number of firefighters on-duty countywide is counted, it is approximately 812 career firefighters plus over 600 volunteers and military base firefighters who were not part of this study. The daily career firefighter force sounds like a very large amount, which it is, **if** it could be massed within an hour or so driving time to a catastrophic emergency, which it **cannot** due to the large size of the County. Of these 812 career firefighters per day, 312 (or 38 percent)

are in San Diego City or CAL FIRE spread across the back-country. So the urban areas can send one to five alarms of firefighters in an hour or less, but due to travel times, this is not possible in the rural areas. The stations are spread too far apart. Most cities and larger fire districts are all next to each other in the coastal plain area of the County. So when one fire agency has a greater alarm fire, even if they are staffed with 3 firefighters per unit, they can quickly get help from their immediate neighbors.

In understanding staffing per agency in the County of San Diego, two issues emerge as problematic. First, the CAL FIRE staffing of four per unit is atypical to other parts of the state and is dependent on the on-going support of the Governor and Legislature to "up staff" San Diego units from 3 to 4 firefighters. Additionally, via a current Governor's Executive Order (which can always be rescinded), CAL FIRE keeps all of its career stations open year-round, not just for wildland fire season. The issue becomes what happens to the "weight" of wildland fire attack if these supplemental staffing funds are reduced in the future by the state?

Volunteer Staffed Fire Departments or Stations

The question that comes frequently is, why not use more volunteer firefighters, even in the incorporated areas? All volunteer-based fire departments are under great pressure today to maintain an adequate roster. The reasons for this are not unique to any one type of community and are placing pressure on small community volunteer systems across the state and nation:

- Economic pressures result in more two-income families and less time to volunteer.
- In a commuter economy, more jobs are clustered in metropolitan and dense suburban areas. Communities that formerly were small towns increasingly have residents who work elsewhere, and many of the younger age people who would consider volunteering are just too busy.
- Due to the growth in society of complex systems and technology, the fire service was given more missions, like emergency medical services, hazardous materials response, and technical rescue. This dramatically increased the needed training hours for volunteers, causing many to drop out as the time commitments became unbearable.
- In January 2004, due to rising firefighter injuries and deaths, especially in the volunteer ranks, more safety regulations and training minimums were placed on all firefighters. Assembly Bills 2118 and SB 1207 required volunteer firefighters to receive the same level of training that the full-time staff receives. AB 2118 was Chaptered in 2002, and was delayed to 2004. It requires *"…provides that the California Occupational Safety and Health Act applies to volunteer firefighters. Equipment and training for volunteers to meet the same requirements as regular firefighters."*

This safety regulatory change meant that in California, there is only one "type" of trained firefighter, regardless of pay standing. Thus a volunteer firefighter is not a lesser position, but one with the same training and protective equipment costs as a career firefighter. Additional training and additional responses mean a significant time commitment for "true" volunteers, who are serving for love of the community and to give something back. Most departments feel that it

takes 100-120 hours of training per year to meet safety minimums, and this time is expended before a volunteer goes on a single incident.

In addition, most employers today are unwilling to allow volunteers to leave their jobs to respond to an emergency dispatch. Across the fire service, volunteer programs have been changing and adapting to a different model. The current model that most San Diego area agencies use understands the commitment needed, and usually includes two types of volunteers: the first is the usual community-based person; the second is a younger person who desires to be a career firefighter. While the younger person is going through community college fire science classes, after obtaining basic firefighter certification, they work "part-time" for shift stipend or for an hourly wage, without benefits. These personnel are used successfully to increase daily station staffing and are called "stipend" firefighters or part-time firefighters. They do not need to live in the community they serve, as they are often not needed to respond from home with quick travel times. Community-based volunteers can be used from home for major emergencies, within their limited training as they gain certifications and experience. Once they meet state minimums, they also can be used for per diem shifts.

The staffing is very thin on the rural, volunteer companies in the County of San Diego. While the ideal staffing per unit is four, staffing with one per unit is generally considered unsafe, as when driving with red lights and siren, it is safer to have two looking at traffic, handling the radio and mapping the route. Then upon arrival, one firefighter cannot accomplish very much in dangerous situations where the OSHA safety regulations mandate teams of two. Thus the minimum staffing in rural departments that are part or fully volunteer is two. Volunteers who respond from home to the station, or are assigned station duty shifts for a minimum wage or stipend amount, supplement the minimum staffing.

The San Diego County Fire Authority for its operational area of 15 fire stations has a policy of minimum staffing with two volunteer firefighters, some of whom are compensated on a part-time pay or stipend system. They and their partners maintain a volunteer force of several hundred to try to maintain coverage 24/7/365.

However, this policy is not fully working, according to staff, both because it is new and because during the 40-hour workweek, many stations cannot be staffed with two. Many of the volunteers are away working or going to school during the regular workday. With changes in demographics, work and leisure patterns, it is increasingly difficult to recruit and retain volunteers that can cost $5,000 to $10,000 in initial training and equipment expense. The County Fire Authority reports a turnover rate as high as 30 percent per year among volunteers. Stipend firefighters who work assigned shifts at a modest pay per shift also generally have other full-time employment. The most difficult "shifts" to fill are the daytime hours Monday through Friday.

Finding 3-3: The stipend firefighter program to assist in staffing volunteer area fire stations has just started in the County Fire Authority. As the County evaluates the success or difficulty in filling the day time work day shifts with stipend firefighters, the County Fire Authority should conduct a cost-benefit study as to how many more volunteers it makes sense to recruit, train and equip given annual turnover, versus staffing a few positions with career firefighters. In order to provide a guaranteed minimum staffing of two firefighters per unit during the 40-hour work week period, the County Fire Authority should strongly consider staffing its 18 stations with a single career firefighter and a paid stipend firefighter on a Monday through Friday 40-hour work week.

After the mapping and response statistics sections in this study, integrated recommendations will address this issue and offer some advice on how to stabilize the staffing of the rural stations, and ensure staffing during hours when it is difficult to attract volunteers.

SECTION 4

FIRE STATION COVERAGE IN THE COUNTY *(GEOGRAPHIC MAPPING ANALYSIS)*

4.1 CURRENT STATION LOCATION CONFIGURATIONS

As part of this fire services study, it is appropriate to understand what the existing stations do and do not cover, if there are any coverage gaps needing one or more stations, and what, if anything, to do about them as the region continues to evolve. In brief, there are two geographic perspectives to fire station deployment:

- Distribution – the spreading out or spacing of first-due fire units to stop routine emergencies.
- Concentration – the clustering of fire stations close enough together so that building fires can receive enough resources from multiple fire stations quickly enough. This is known as the Effective Response Force or commonly the "first alarm assignment" – the collection of a sufficient number of firefighters on-scene, delivered within the concentration time goal to stop the escalation of the problem.

To analyze first-due and first alarm fire unit travel time coverage for this study, Citygate used a geographic mapping tool called *FireView* that can measure travel time over the street network. Prior incident travel time data is used to calibrate the model to reflect fire truck speeds, not posted speed limits for passenger cars. Citygate ran several deployment map studies and analyzed fire station spacing in all regions of the County.

The attached Map Atlas bound as Volume 2 of this study displays these fire station travel time studies. Since this is a regional study and many agencies have not officially adopted response time goals, this study used as a benchmark in the urban areas, the NFPA 1710 recommendations for urban coverage at 4 minutes travel time for first-due units to deliver good outcomes. For a first alarm, multiple-unit coverage, the "concentration" of units measure in the urban zone is based on an 8-minute travel time as suggested in NFPA 1710. When one minute is added for dispatch reflex time and two minutes for company notification times, 4-minute travel time maps then effectively show the area covered within 7 minutes for first-due units and 11 minutes for a first alarm assignment from the time the 911 call is made. Additionally, to look at the difference one or more minutes of travel coverage makes in covering the road network typical to the San Diego region, we also modeled urban coverage from the 5th minute to 8th minute of travel.

For emerging suburban and rural areas, we again used the recommendations in NFPA 1720 for combination (substantially volunteer) departments. This rural travel time benchmark is 12

minutes. There is not a concentration measure recommended for rural areas, other than to amass the necessary firefighters and then operate safely for the type of emergency found.

The map set in this study shows coverage from the closest fire stations regardless of jurisdiction boundaries. This is because most of the departments operate this way under sub-regional dispatch centers.

Map Design and Scale Note – Due to the size of the County and the need to see detailed travel time coverages, the mapping set splits the County into four quadrants – Northwest, Southwest, Northeast and Southeast. The quadrants were designed to keep most agencies completely in one quadrant, except for three that are too large – CAL FIRE, San Diego City and the County Fire Authority areas. Maps are numbered into series, with the number identifying the type of measure and, if needed, a letter after the number indentifying a subset of the main numbered theme. Thus Map #3 and Map #5 show very different measures.

In the travel time measure maps, population densities also are displayed. This helps to understand where to prioritize fire station locations, as people drive the call for service counts, much more so than do buildings or open space areas.

Given that current fire service deployment recommendations, such as NFPA 1720 and the Standards of Response Cover 5th Edition manual from the Commission on Fire Accreditation, use population densities to recommend differing levels of response time need, this study aggregated the parcel level County population data into these themes:

Metropolitan-Urban	Population > **2,000** people per square mile
Suburban	Population **1,000 - 2,000** people per square mile
Rural	Population < **1,000** people per square mile
Wilderness	Rural area not accessible by a maintained road

The Map Themes are:

- #1 and #2 – Countywide overview maps of fire station locations and wildfire threat.
- #3 – Four- and twelve-minute travel time coverage over population densities.
- #4 – Five-minute travel time coverage.
- #5 – The "concentration" coverage of the closest four fire stations at 8 minutes travel.
- #6 – The "concentration" coverage of the closest three fire stations at 8 minutes travel.
- #7 – Ladder Truck coverage at 8 minutes travel.
- #8 – Coverage by minute for first-due units, 5th through 8th minutes of travel.

- #9 through #16 – Plots of incident locations and densities.
- #17 through #19 – Station gap coverage analysis and additional stations identification.

Each map theme is explained in detail below:

Map #1 – Existing Fire Station Locations

This first map shows the entire County and all of the current fire stations, including some military and Tribal fire departments. The other important message in this map is to notice how challenging the topography is in the County. Mesas and canyons bisect most urban communities, and then in the east, there are the foothills and rugged open spaces. Other than a few small urban centers, almost no community has a grid type street network that exists on flat terrain covering a large area. This means a curvilinear street network with frequent dead ends against canyons is very, very difficult to serve efficiently with a small number of fire stations.

Map #2 – Wildfire Threat Areas

Displayed at the countywide view are the areas that present a significant wildfire threat. This map is a composite of several wildfire risk measures, and was developed in cooperation with CAL FIRE Sacramento staff. It represents the areas capable of sustaining wildfire based on expected fire frequency, fuels, topography and weather.

As can be seen, most of the County is subject to this threat except for very urban areas closer to the coast and the eastern desert areas with more sparse fuels. This means that every fire agency in the County has to be trained, equipped and integrated into a seamless wildland fire response system – which they largely are.

Maps #3 – First-Due Unit Distribution – Existing Stations (4-Minute Travel)

Northwest and Southwest Quadrants

These two maps show in green colored street segments the *distribution* or first-due response time for each fire station per a desirable suburban response goal of *4 minutes* travel time. Thus, the computer shows how far each company can reach within 7 minutes fire department *total* response time from the time of the fire communications center receiving the call. Therefore, the limit of color per station area is the time an engine could reach the 4-minute travel time limit, ***assuming*** they are in-station and encounter no unusual traffic delays. In addition, the computer uses speed limits per roadway type that are slowed by actual fire unit travel times. As a result, the projection is a very close modeling of the real world.

The colored areas under the green travel time coverage extents are the urban and suburban population densities. These were built using SANDAG 2009 data that is used for other uses such as traffic models and freeway construction apportionments. As such, this data is very current and reflects what is occupied today. As can be seen in both western quadrants, there are some populated areas outside of a 4-minute travel time from the nearest fire station. There are not many suburban areas, as land use zoning has concentrated populations. In many cases where the streets are not covered within 4 minutes, these are the outer and in some cases, the "dead ends" of the street network where it stops against rugged terrain. Where there is no population density color, the population is sparse at less than 1,000 per square mile.

In a later map series, the travel coverage will be re-measured at the 5th minute of travel, and then in a gap analysis map series, areas that could use increased coverage will be identified.

A goal for urban developed areas could be to cover 90 percent of the geography containing the highest population densities with a first-due unit coverage plan based on a goal measure statement to deliver acceptable outcomes. This would only leave the very hard-to-serve outer edge areas with longer coverage times, and depending on the emergency, with less effective outcomes. There should be some overlap between station areas so that a second-due unit can have a chance of an adequate response time when it covers a call for another station. The outer perimeter areas are hard to serve, and in many cases, cost-prohibitive to serve for a small number of occupied properties and a low calls for service volume.

As can be seen in this measure, western quadrants are very hard to serve. The positive news is that the existing stations are all appropriately located in higher development density areas. However, due to very challenging topography and the resultant non-grid street network, there are service gaps at the 4th minute of travel.

This is especially true where there is a lack of north-south prime arterial roads due to the many canyons that run east to west, down slope to the ocean.

The message to be taken from these maps is that it would be very challenging for the agencies in these areas to improve travel time coverage without adding fire stations as will be seen in the next section on how many fire stations are needed for different levels of coverage on the existing road network and terrain in the County.

Northeast and Southeast Quadrants

These two maps also use population density against *12-minute* travel time coverage for more rural areas. While there are pockets of urban density, such as downtown Fallbrook, these are fairly small areas. The positive result from this measure is that in both quadrants, the historical placement of fire stations in the center of towns, results in very good travel time coverage except for some road segments that span non-populated areas.

Map #3b shows the coverage with the U.S. Forest Service fire season only stations activated. Since most of these stations are in populated areas, in some cases near other fire stations, there is little increased coverage due to just these stations.

Map #4 – First-Due Unit Distribution – Existing Stations (5-Minute Travel)

This set of 4 maps shows the increased coverage from a 5th minute of travel time. In earlier years before the fire service separately measured and understood dispatch and crew turnout time importance, it was thought that an "average of 5 minutes response time" would be sufficient in the urban area.

As can be seen in the western two quadrants, there is improvement with one more minute of travel, but the entire populated street network is still not covered. In the eastern quadrants, five minutes of travel does cover most of the more inhabited towns and villages, since this is where the fire stations are located.

In the next section of the mapping analysis, the coverage gaps will be more costly examined and the measure of road miles covered per minute of travel will be used to quantify just how many inhabited road miles are covered per minute of travel time.

Map #5 – Concentration (First Alarm)

These map exhibits show the *concentration* or massing of fire companies for serious fire or rescue calls. Building fires, in particular, require 14+ firefighters arriving within a reasonable time frame to work together and effectively to stop the escalation of the emergency. Otherwise, if too few firefighters arrive, or arrive too late in the fire's progress, the result is a greater alarm fire, which is more dangerous to the public and the firefighters.

The concentration map exhibits look at a region's ability to deploy four of its stations within 8 minutes travel time (11 minutes total fire department response time from the 911 call receipt). In many departments that staff ladder trucks, this measure is typically 3 stations with pumpers and a 4th station with a ladder truck location. Since not all departments in a region operate this way, by measuring four stations, with at least 3 firefighters per engine, this map shows the delivery of a minimum of 12 firefighters. This minimum can increase with more firefighters per unit, or more units such as ladder trucks, ambulances and chief officers. This measure ensures that a minimum number of firefighters can be deployed at the incident to work ***simultaneously*** and effectively to stop the spread of a modest fire.

The green color in the map shows the area where the region's current fire deployment system should deliver the initial effective response force.

Northwest and Southwest Quadrants

Streets without the green highlights do not have coverage from four stations in 8 minutes travel time. As can be seen, due to the spacing of the urban area fire stations, an effective response force can be gathered in the core of all the western communities. All parts of the system are dependent on automatic aid companies across jurisdiction boundary lines for a complete effective response force.

Northeast and Southeast Quadrants

In the eastern areas, at 8 minutes for four stations, this measure cannot be met except in the core of Fallbrook and Valley Center. This is because the rural area stations are just too far apart. However, when 3 stations are delivered in 12 minutes, which is the spacing desired for individual rural stations, then we obtain almost complete coverage.

Map #6a-b – Multiple Engine Coverage

These two maps show the coverage from three stations. This reflects a primary baseline effort for agencies that do not operate ladder trucks, but can send at least 3 stations in the urban area that when staffed with 3 firefighters per unit, would deliver 9 firefighters in 8 minutes travel time.

In the two western quadrants, there is very good coverage of the urban populated areas, except for the ends of some areas or those areas that would benefit from one or more additional fire stations. However, the bulk of the urban area is covered by three fire stations at the 8th minute of travel.

In the eastern quadrant, given the mostly rural population densities, the 3-station measure is at 12 minutes travel time. Even given the wide station spacing in the rural areas, there is good 3-station coverage for the higher population density towns. There is not an expectation that roads that traverse mostly open space areas would need this level of multiple unit coverage.

Map #7 – Ladder Truck Coverage

Measured on this map is the ladder truck coverage at the 8-minute travel time measure, consistent with the needs for an effective response to building fires. In the northwest quadrant, there is modest coverage for the more urban areas. Not all departments operate ladder trucks, or have more than one, which in some cases would be necessary to complete the 8-minute coverage.

In the southwest quadrant, there is excellent coverage in the urban core, modest coverage in the outer suburban areas. There are gaps in the northwest section of this area, where more than one additional fire station would be necessary to improve coverage, as the 4 and 5-minute travel time maps displayed.

In the two eastern quadrants, there is limited ladder truck coverage since hardly any agency operates this type of unit in low population density, one- and two-story building communities. In some cases these units are staffed by tribal fire departments given their desired risk coverage for their casino operations.

Map #8 – Extended Single Unit Coverage at 5 Plus Minutes

Given the first-due fire station area gaps that occur at the 4th and even 5th minute, the question becomes at what minute of travel time does 90-100 percent of the road network receive a first-due unit from the *existing* fire station placement? Two maps for the urban area western quadrants display this. Maps #8 show the coverage in different colors per minute from the 5th through 8th minute or stated this way from 4:01 to 7:59 minutes/seconds.

In the Northwest quadrant, the coverage is 99 percent by the 8th minute; there is little blue showing from the 7th-8th minute of travel.

In the Southwest quadrant, again 99 percent of the streets are covered by the 8th minute, with some blue at the 7th-8th minute travel coverage where the station gaps were the largest in northwest San Diego and northern Santee. However, these 7-8 minute areas are small in size. The actual measures by minute will be described in the next subsection covering gap analysis.

Map #9 – All Incident Locations

This is an overlay of the exact location for all fire department incident types for the most recent year of incident data in this study. It is apparent that there is a need for fire department services in almost all populated or traversed areas of the County. It also should be noted that call for service volumes are higher where the population densities and human activity are the highest. This is normal, as people drive calls for service more than do open space areas.

Map #10 – EMS Incident Locations

These maps further breaks out only the emergency medical and rescue call locations. Again, with the majority of the calls for service being emergency medical, almost all streets need fire department first responder EMS services.

Map #11 – All Fire Type Locations

This set identifies the location of all fires in the County. All fires include any type of fire call from auto to dumpster to building or wildland. There are obviously fewer fires than medical or

rescue calls. Even given this, it is evident that all first-due station areas experience fires, while those with the greatest population density have the most fires.

Map #12 – Structure Fire Locations

Similar to the previous maps, this set only displays structure fires for three years of data. While the structure fire count is a smaller subset of the total fire count, there are two meaningful findings to this map. There are still structure fires in every first-due fire company area. The location of many of the building fires parallels the higher risk and older building type commercial areas in the more built-up areas of the County. Fires in the more complicated building types must be controlled quickly or the losses will be very large.

Map #13 – All Incident Location Hot Spots

This map set examines, by mathematical density, where clusters of incident activity occurred. In this set, all incidents are plotted by high-density workload. For each density measure, the darker the color, the greater the quantity of incidents in a small area. This type of map makes the location of frequent workload more meaningful than just mapping the dots of all locations as done in Map #9. Given the low call for service volume in the eastern quadrants, there are not enough calls for service to show up in clusters on the density plot. However, the density trends are clearly evident in the western quadrants.

Why is this perspective important? Overlap of units and ensuring the delivery of a good concentration for the effective response force. When comparing this type of map with the concentration map, the best concentration of unit coverage (First Alarm) should be where the greatest density of calls for service occurs. For most of the County, this occurs in the highest population density areas.

Map #14 – EMS Incident Location Densities

This map set is similar to Map #11, but only the medical and rescue hot spots of activity are plotted. The clusters of activity look very similar to the all-incident set in Map #13 because medical calls are such a large part of the total.

Map #15 – All Fire Location Densities

This map sets shows the hot spot activity for all types of fires. Again, the call-for-service density is highest in the most densely populated areas.

Map #16 – Structure Fire Densities

This map only shows the structure fire workload by density. Here, the activity clusters are fewer, due to the lower quantity of structure fires. Given the older building stock and population densities, there are the most building fires again in the oldest, most densely populated areas.

4.1.1 Possible Improvement Scenarios – Gap Analysis

As these baseline coverage maps were understood, Citygate identified and tested the impacts of possible scenarios for the redeployment of staff and station locations. The next series of maps will explain the best-fit choices identified for redeployment and/or additional fire stations.

In this section, a series of maps was created to analyze how many fire stations might be beneficial to add, in order to improve response time measures at the most cost-effective level.

In Citygate's experience, for fire risks typical to communities in the western states, we do not often see that there is a critical deficit if the travel time to common emergencies is 60 seconds longer at the outer ends of the road network that each fire station covers. This would mean a 5-minute travel time goal measure instead of the NFPA #1710 recommended 4-minute travel time ideal goal. Our geographic tools can measure the percent of the total road miles covered per minute of fire unit travel time from each fire station. In many cases the data for the urban areas in the western County showed a significant road mile coverage increase by adding one more minute of travel from the 4th to 5th minute.

To identify one or more highly desirable additional fire station areas, we looked for "gaps" in the deployment system where there was a significant quantity of road miles with existing development on them, past the 5th travel minute from an existing fire station. We then identified the largest gaps, where the gap was as large or larger than an entire 4-minute travel coverage station area. Thus we looked for gaps that were the size of an entire "missing" first-due fire station district.

For each quadrant a series of maps is prepared starting with an overview of the area with any large gaps outlined. Then each gap has a tight scale view to show in red colored streets the area beyond 5 minutes travel from any fire station. The next view in blue shows the improvement by adding one or more fire stations to the gap. Then the final image shows the quadrant with the additional street coverage in blue from the added stations.

Finally, each quadrant has a data table showing the percent of street coverage by minute for the existing and filled in gaps.

Map #17 – Improved 3-Station Concentration with Additional Stations

This pair of maps for the western quadrants shows the positive improvements to 3-station concentration at 8 minutes of travel if the larger missing fire station areas received additional fire stations. With 13 more fire stations across the two quadrants, this three-unit coverage by the 8th minute of travel is improved to almost the entire urban population density street network.

Map #18 – First-Due Unit Gap Analysis – Western Quadrants

The *Northwest* Quadrant overview map for the improvement scenarios identifies three areas that are completely beyond a 5-minute travel time reach from an existing fire station and these areas are the size of an entire station coverage area. The detailed views of these areas are numbered one and two. The northern most area is a two-station gap and the southern most area is a one-station gap. In both gaps, the areas filled in with the blue new station coverage still do not cover all of the street segments in red. In these cases the red areas will have to be further analyzed by the local agencies to determine potential growth and the need for even more stations to provide 5-minute or less travel time coverage to each neighborhood. These maps clearly show the difficulty in covering the street network in less than 4 or even 5 minutes, due to street design and topography.

The *Southwest* Quadrant overview map identifies 11 areas that meet the criteria for being beyond the 5th travel minute of coverage and being larger than a single station area. Of these 11 locations, 10 are within the City of San Diego. As can be seen from the detailed scale maps, most

of the areas are difficult-to-serve areas. Some areas cannot be effectively covered with only one more fire station. As in the northwest quadrant, the local agencies will have to look at further growth and simultaneous call for service demand to determine if some of these areas are large enough for additional stations. Other areas are unique and need further discussion:

Gap #4: The identified additional station site is too far east to cover enough of the gap. Ideally, if an available parcel can be found in the western section of the gap, the efficiency of coverage received from the additional station will be greatly increased.

Gap #9: This area does not have "normal" coverage gap, even at 4 minutes travel time. However, due to call for service densities as seen in the companion image, the fire department does not always have enough units available. Also, on the west side, the railroad bisects the water front area and frequent rail traffic prevents a timely response west of the tracks. Given these issues and additional in-depth analysis already completed by the San Diego Fire Department staff, San Diego has identified the need for the two additional station locations shown to improve response time coverage west of the tracks and overall unit reliability. *Currently these are the only two fire stations planned by San Diego City in the next five years due to the weak economy.*

Map #19 – First-Due Unit Gap Analysis – Eastern Quadrants

In both eastern quadrants, there are no travel time gaps larger than 12 minutes travel time, where an area has anything more than very sparse population or is comprised of open stretches of road connecting different areas. As stated previously, the stations in the area are correctly placed in the more populated areas.

Given this finding, if the County limits population densities outside of the current 12-minute travel time coverage due for a variety of factors in addition to fire services, such as water availability, then more fire stations in the future will not be needed. What the areas lack, however, is sufficient staffing to provide a response that can meet the needs of a serious incident. *This will be mentioned further after the next section analyzes the historical incident data.*

4.1.2 Gap Analysis Road Mile Measures

Western Quadrants

The following four tables display the number of road miles in each quadrant that are covered by the desirable travel times for each area.

Northwest Quadrant – Percent of Road Miles Covered

Northwest Quadrant				
Zone	**Urban**	**Suburban**	**Rural/Open**	**Total**
4 minute current	59.77%	43.96%	29.01%	45.89%
5 minute current	82.19%	68.37%	43.88%	65.33%
+ 3 more Stations @ 4 minutes	*60.95%*	*44.19%*		
+ 3 more Stations @ 5 minutes	*83.08%*	*68.48%*		
6 minute current	90.56%	80.08%	51.57%	73.67%
7 minute current	96.71%	91.48%	61.54%	81.78%
8 minute current	99.04%	96.52%	68.33%	86.15%

In the northwest area table above, it can be seen that increasing the travel time goal to 5-minutes adds 22.4 percent more road miles to the urban population density coverage. The other areas also have large increases. However, even with three more fire stations added across two gap areas in the Northwest Quadrant, only a small percentage increase in road miles covered in five minutes is obtained. This is due to the difficulty in covering the hardest-to-serve non-grid street type areas, bisected by open space. It will likely be cost prohibitive to add even more fire stations, to cover all of the urban population street areas in the Northwest Quadrant at the 90 percent coverage point at either 4 or 5 minutes of travel, given the quadrant's topography and historic land use decisions.

Southwest Quadrant – Percent of Road Miles Covered

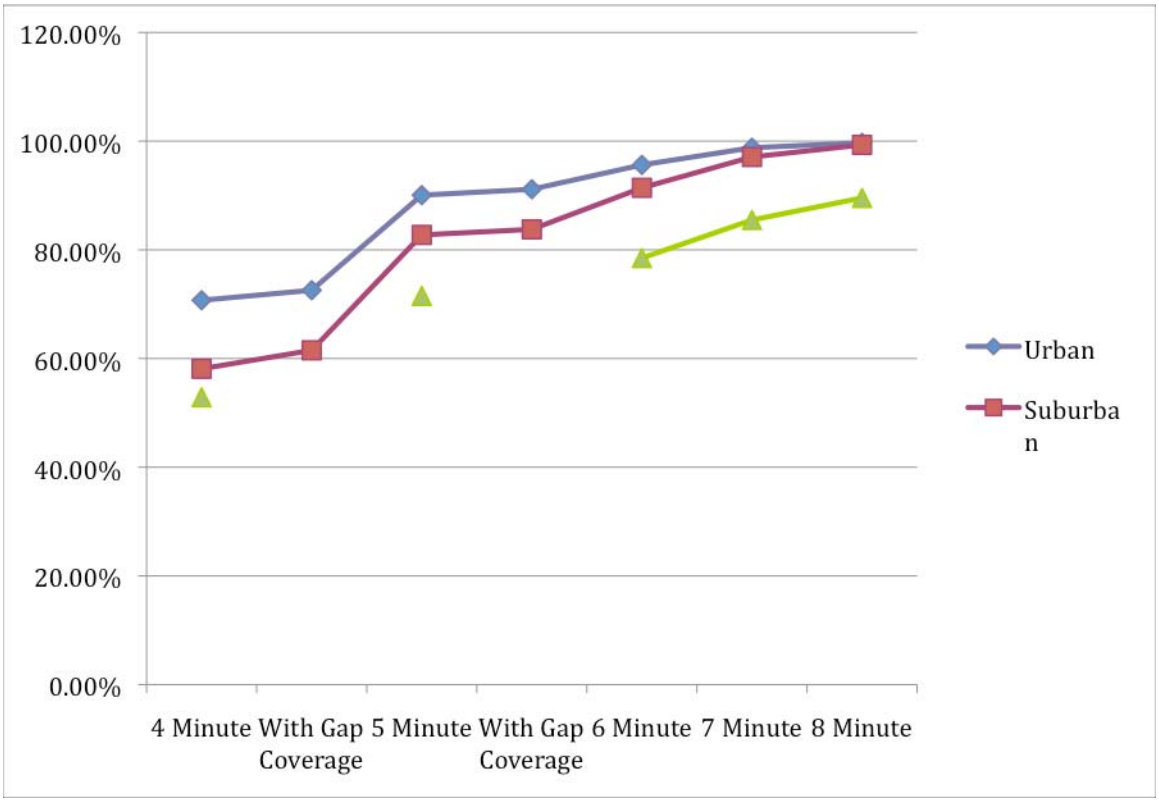
Southwest Quadrant				
Zone	**Urban**	**Suburban**	**Rural/Open**	**Total**
4 minute current	67.83%	58.11%	51.11%	63.37%
5 minute current	87.73%	82.74%	70.60%	83.46%
+ 11 more Stations @ 4 minutes	72.26%	61.51%		
+ 11 more Stations @ 5 minutes	90.98%	83.77%		
6 minute current	95.63%	91.41%	78.49%	91.39%
7 minute current	98.79%	97.09%	85.49%	95.59%
8 minute current	99.69%	99.31%	89.55%	97.30%

In the Southwest Quadrant, again notice the increase of 19.9 percent in road miles covered in the urban area from the 4th to the 5th minute, with no new fire stations. After the addition of 11 more fire stations the increase is only 4.43 percent at the 4th minute and 3.25 percent at the 5th minute. There is a similarly small improvement in coverage in the suburban areas of the Southwest

Quadrant. As the road network becomes more convoluted, it is harder and harder to obtain 90 percent or better coverage at a low number of minutes. The 90.98 percent urban measure at the 5th minute after adding 11 stations is so high due to the efficiency of a highly urban area with much of the street network in a traditional grid design.

As Maps #8 show, both the Northwest and Southwest Quadrants are completely covered by the 8th minute of travel, thus in-fill stations *will* help lower travel times.

Below is a chart for the *South*west Quadrant of how the coverage by mile increases in percent as either travel minutes and/or additional stations are added. This graph shows visually what the table above measured, in that the coverage gains occur in very small increments above the 6th minute of travel time. Thus as the chart graphically shows, the largest improvements are gained from the 4th to 6th minute of travel by adding stations.



Eastern Quadrants

In both eastern quadrants the road mile coverage is excellent at the 12-minute of travel given the relative "clustering" of populated areas. Over 90 percent of the road miles in small clusters of population are covered within the 12-minute travel time guideline. Even the 5-minute coverage is good in the most densely populated, but small in size areas. As the gap analysis maps showed, there is not currently a need for more fire stations in these areas, unless the residents want lower travel times, or new populations occur outside of the current 12-minute coverage area.

Northeast Quadrant – Percent of Road Miles Covered

Northeast Quadrant				
Zone	**Urban**	**Suburban**	**Rural/Open**	**Total**
4 Minute	53.15%	35.60%	14.78%	17.93%
5 Minute	71.94%	55.76%	23.00%	27.37%
12 Minute	**99.12%**	**98.94%**	**68.81%**	72.07%

Southeast Quadrant – Percent of Road Miles Covered

Southeast Quadrant				
Zone	**Urban**	**Suburban**	**Rural/Open**	**Total**
4 Minute	59.07%	49.01%	16.26%	18.58%
5 Minute	78.85%	65.83%	24.62%	27.55%
12 Minute	**100.00%**	**99.73%**	**65.23%**	67.38%

4.2 MAPPING MEASURES EVALUATION

Based on the above mapping evaluation, Citygate offers the following findings:

Finding 4-1: In the rural eastern quadrants, over 95 percent of the road miles in the small areas of more dense population are covered within the 12-minute travel time guideline. There is not a need for additional fire stations in these two quadrants unless the residents want an improved travel time and/or additional, much denser development leads to significant population densities beyond that of a rural area standard of response.

Finding 4-2: There is a modest station coverage deficit in the two western quadrants. Filling these service level gaps would require at least 14 additional fire stations. Eleven of the new stations would be in the Southwest Quadrant. However, the capital outlay and annual operating cost increase to achieve the resultant small improvement in coverage is very significant.

Finding 4-3: Even with three more fire stations added across two gap areas in the Northwest Quadrant, there only would be an approximately 1 percent increase in road miles covered in five minutes of travel. This is due to the difficulty in covering the hardest-to-serve non-grid street type areas, bisected by open space. It will likely be cost-prohibitive to add even more fire stations, to cover all of the urban population street areas at the 90 percent coverage point at either 4 or 5 minutes of travel, given the Northwest Quadrant's topography and historic land use decisions.

Finding 4-4: In the Southwest Quadrant, 87.73 percent of the road miles are covered by the 5th minute without adding any new fire stations. This is neither a poor level of performance nor unusually long in comparison to other fire agencies with similar risks and topography challenges with whom Citygate has worked. Even with eleven more fire stations added to fill in the largest gap areas in the Southwest Quadrant, there is only a 4.43 percent increase in road mile coverage at the 4th minute and a 3.25 percent increase at the 5th minute of coverage.

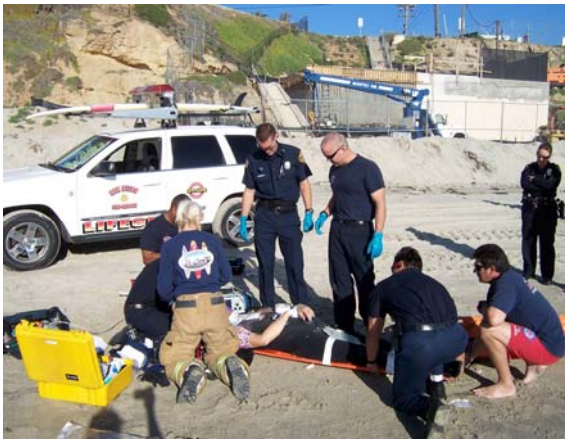
Finding 4-5: As Map series #8 shows, both the Northwest and Southwest quadrants are completely covered at 99 percent by the 8th minute of travel, thus in-fill stations will help lower travel times where new stations are added.

Finding 4-6: If the policy choice were to be made to cover 90 percent of the urban area road network at a 4-minute travel time, given the County's topography and road network, it will require more than the additional 14 stations identified across 13 gap areas identified in this study. Due to topography and road system design, some of the additional stations will serve relatively few road miles in outer edge areas, with comparably lower populations and call for service densities. Unless the agencies serving these pockets find other needs such as a high simultaneous call demand creating the need for more companies in a given area, then they may find it most cost-effective to cover all of the road miles to the 90 percent point by the 5th travel minute.

Finding 4-7: While 90-95 percent of the urban road network in both western quadrants is covered without additional stations by about the 6th minute, when 3 more minutes are added for dispatch and turnout times, then this will reflect a 9-minute first-due unit total response time. Such a measure will not confine most fires to the room of origin, or save medical emergency patients whose hearts and breathing have ceased. Such a response measure will keep most fires from spreading and starting conflagrations and provide stabilizing treatment to medical patients still viable upon arrival of the unit.

Finding 4-8: Given the mapping models in the less populated eastern quadrants, a modest increase of stations even where there are not many residents, likely cannot improve the wildfire initial attack times as the undeveloped areas are just too large and fires may start anywhere. The existing stations need adequate staffing, which when combined with early detection and a simultaneous aerial response, will provide quick control to most wildfires.

After the historical response statistics are analyzed in the next section of this report, then an integrated set of deployment recommendations will be made.



SECTION 5

INCIDENT RESPONSE STATISTICS REVIEW *(ANALYSIS AND INTEGRATED DEPLOYMENT RECOMMENDATIONS)*

5.1 CURRENT WORKLOAD STATISTICS SUMMARY

In this section of the Standards of Response Cover process, prior response statistics are used to determine what percent of compliance the existing system delivers. In other words, if the geographic map measures say the system will respond with a given travel time, does it actually deliver up to expectations? A detailed analysis of in-depth statistics is provided in Volume 3 of this report. What follows is a summary of those comprehensive measures and findings.

The sections of this report that concentrated on mapping the distribution and concentration of fire stations used geographic mapping tools to estimate travel time over the street network. Thus, the maps show what *should* occur from the station placements. However, in the real world, traffic, weather, and units being out of quarters on other business such as training or fire prevention duties affect response times. Further, if a station area has simultaneous calls for service, referred to as "call-stacking," the cover or second-due engine must travel much farther. Thus, a complete Standards of Response Coverage study looks at the actual response time performance of the system from incident records. Only when combined with map measures can the system fully be understood and configured.

As a review of actual performance occurs, there are two perspectives to keep in mind. First, the recommendations of NFPA 1710 only require that a single fire *department-wide* performance measure of 90 percent of the historical incidents (not geography) be maintained. This allows the possibility that a few stations with great response time performance can "mask" the performance of stations with poorer travel times.

In the Accreditation philosophy for the Standards of Response Coverage approach, it is recommended that the performance of each *station area* also be determined to ensure **equity** of coverage. However, even this approach is not perfect – a station area may well have less than 90 percent performance, but serves lower-risk open space areas with limited buildings thereby not having an economic justification for better performance. In addition, the study must discuss just what is measured within the under-performing statistic. For example, a station area with a first-due performance of 88 percent with only 50 calls in the 88th to 90th percentile is far different from an area with 500 calls for service in that 88th to 90th percentile.

All measures, then, must be understood in the complete context of geography, risk, and actual numbers of calls for service that exceed the community's performance measure. Each

department's response time performance must be compared to outcomes such as fire loss or medical cases and be contrasted to the community's outcome expectations. A community could be well deployed and have poor outcomes, or the reverse. A balanced system will avoid such extremes and strive for equity of service within each category of risk.

Fire departments are required to report response statistics in a format published by the U.S. Fire Administration called the National Fire Incident Reporting System (NFIRS). The private sector develops software to do this reporting according to state and federal specifications.

Data sets for this section of the study were extracted from the five regional and city Fire Communications Centers that provide dispatching and NFIRS records services to the County's over 50 fire departments.

Total response time in this study is measured from the time of receiving the call at a Fire Communications center to the unit being on-scene. This time does **not** include the time it takes to receive a 911 call at a City's police dispatch center or the Sheriff's communication center for other areas and transfer the call to the appropriate regional fire communications center. While the computer systems are not linked to track this data, the call answer and transfer process typically takes less than 30-seconds.

For suburban and urban population density areas, NFPA 1710 recommends a 4-minute fire unit travel time, which when a more realistic 2 minutes is added for turnout time and 1 minute for dispatch processing aggregates to a 7-minute total reflex (customer) measure. For multiple-unit calls, the outer NFPA 1710 recommended measurement is 8 travel minutes, plus two for turnout and 1 minute for dispatch, which is an 11-minute total reflex measure. These measures are also consistent with good outcomes for urban/suburban risks as identified in the Standards of Response Cover Process.

Data sets were "cleaned" to eliminate records without enough time stamps or records with impossible times, such as a 23-hour response. The data sets were modeled in the NFIRS 5 Alive fire service analysis tool for fire service deployment statistics.

For this statistics review, we are modeling each quadrant's prior performance and comparing the data results to the "ideal" per NFPA 1710 and 1720 for fire service deployment, since many individual agency measures are not specific enough or have been adopted by elected officials. Later, this study will integrate all the SOC study elements to propose refined deployment measures that best meet the risk and expectations found in the County.

All fire dispatch centers were able to provide data beginning no later than 1/1/2007. All centers provided data at least through 6/30/2009. Data availability dictated the dates for this study, 1/1/2007 - 6/30/2009.

This 30-month date range was divided into analytical periods. Where multi-year analytical trends are required two 12-month periods were defined for comparison:

- Fiscal Year 2007-08: 7/1/2007 - 6/30/2008
- Fiscal Year 2008-09: 7/1/2008 - 6/30/2009

For single-year operational analysis the last 12-month period (Fiscal Year 2008-09) is used.

Between the study dates there were 627,547 incidents and 1,471,225 individual apparatus response records evaluated. In Citygate's direct experience and national knowledge, this is one

of, if not the largest regional response statistics analysis efforts undertaken across so many agencies and dispatch centers.

5.1.1 Call for Service Demands

Below are three tables that describe the quantity of incidents by quadrant, by the nature of the incident and the quantity by population density type:

Number of Incidents by County Quadrant

Quadrant	FY 07/08	FY 08/09	Total
NW	80,504	79,299	159,803
NE	13,387	13,545	26,932
SW	142,222	156,023	298,245
SE	5,682	6,248	11,930
No address	7,526	7,499	15,025
Total	249,321	262,614	511,935

Number of Incidents by Type for All Quadrants

Type	FY 07/08	FY 08/09	Total
EMS	199,054	205,989	405,043
Bldg Fires	4,968	4,152	9,120
Wildland Fires	1,240	1,073	2,313
Other Fires	9,672	9,333	19,005
Other Incidents	34,387	42,067	76,454
Total	249,321	262,614	511,935

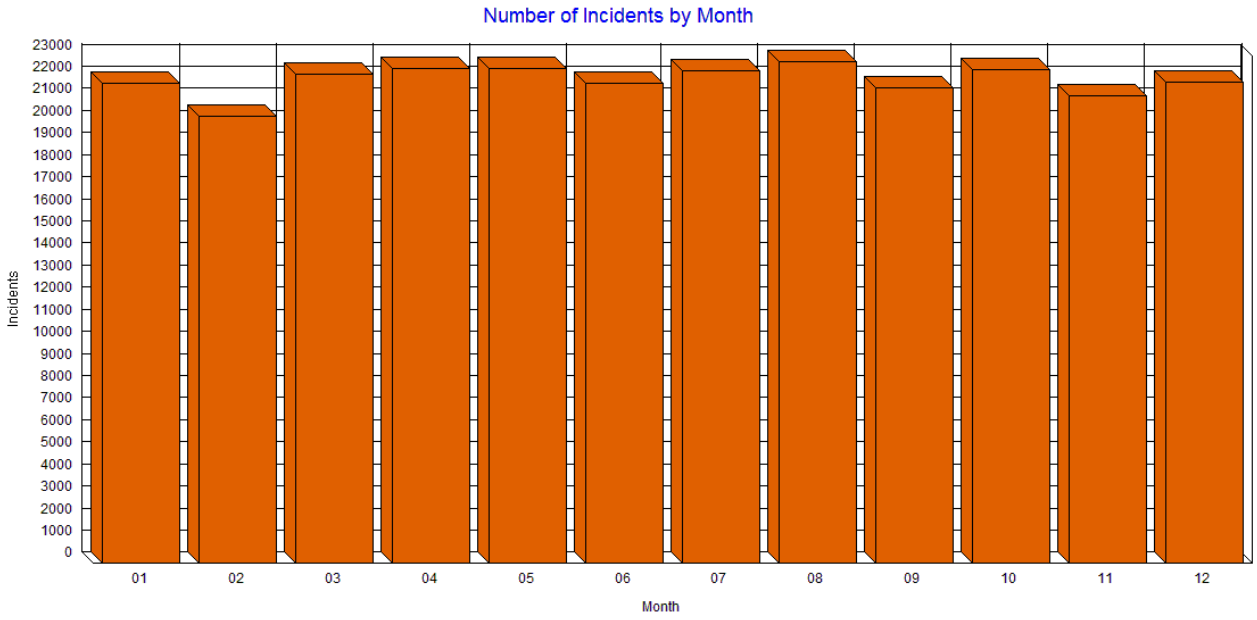
Number of Incidents by Population Density for All Quadrants

Population	FY 07/08	FY 08/09	Total
Urban	159,710	170,860	330,570
Suburban	10,611	11,204	21,815
Rural	23,140	23,565	46,705
Open	48,207	49,327	97,534
No Geocode	7,653	7,658	15,311
Total	249,321	262,614	511,935

It is apparent from these tables that the more developed western areas of the County incur the bulk of the call for service demand at 65 percent of the total and that countywide, emergency medical responses have become 79 percent of the workload, even though structure and wildland fires can cause severe economic and life losses. These figures reflect the duality of designing modern fire services – paying for the standby force that must exist to protect civilization from fires, yet is seen as too expensive to do just that, so the force is assigned multiple missions.

Another measure to note is the count of "other fires" that in many cases are building and wildland fires waiting to happen. If a trash receptacle fire next to a building or a car fire on the shoulder of a roadway is not promptly dealt with, they can and all too often do, ignite the adjoining building or wildland areas.

Given the temperate climate of the County of San Diego the emergency demand workload does not vary much by month:



However, there are swings of call for service workload by hour of day and day of week. This is due to the fact that people having accidents or problems drive much of the incident workload demands, so most of these occur during waking hours. Next is a "temporal activity map" showing incident activity by hour of day and day of the week, *countywide*. The "warmer" the color the higher the demand by hour:

Countywide Temporal Activity

	1 Mon	2 Tue	3 Wed	4 Thu	5 Fri	6 Sat	7 Sun	Total
00:00-00:59	974	881	915	899	938	1,309	1,406	7,322
01:00-01:59	913	864	824	826	894	1,348	1,321	6,990
02:00-02:59	724	731	749	718	818	1,195	1,213	6,148
03:00-03:59	698	604	611	634	644	856	960	5,007
04:00-04:59	605	634	605	589	584	720	725	4,462
05:00-05:59	652	691	608	692	725	689	768	4,825
	1 Mon	2 Tue	3 Wed	4 Thu	5 Fri	6 Sat	7 Sun	Total
06:00-06:59	988	962	937	897	987	831	783	6,385
07:00-07:59	1,436	1,420	1,417	1,321	1,326	1,120	1,018	9,058
08:00-08:59	1,786	1,747	1,657	1,728	1,665	1,382	1,367	11,332
09:00-09:59	2,032	2,035	1,926	1,906	1,890	1,776	1,619	13,184
10:00-10:59	2,220	2,138	2,150	2,037	2,086	1,980	1,840	14,451
11:00-11:59	2,223	2,250	2,173	2,068	2,169	2,072	1,915	14,870
12:00-12:59	2,224	2,231	2,136	2,094	2,291	2,085	1,943	15,004
13:00-13:59	2,186	2,192	2,142	2,064	2,150	2,205	1,915	14,854
14:00-14:59	2,189	2,198	2,123	2,264	2,253	2,098	1,860	14,985
15:00-15:59	2,244	2,382	2,093	2,102	2,187	2,043	2,006	15,057
16:00-16:59	2,190	2,196	2,212	2,128	2,220	1,939	1,989	14,874
17:00-17:59	2,021	2,201	2,155	2,059	2,211	1,978	2,011	14,636
18:00-18:59	1,900	2,100	2,040	2,029	1,940	2,008	1,995	14,012
19:00-19:59	1,872	1,807	1,907	1,848	1,844	1,867	1,877	13,022
20:00-20:59	1,651	1,744	1,786	1,710	1,837	1,964	1,767	12,459
21:00-21:59	1,439	1,487	1,488	1,548	1,809	1,863	1,655	11,289
22:00-22:59	1,298	1,363	1,306	1,274	1,680	1,566	1,374	9,861
23:00-23:59	1,084	1,098	1,096	1,104	1,464	1,544	1,137	8,527
Total	37,549	37,956	37,056	36,539	38,612	38,438	36,464	262,614

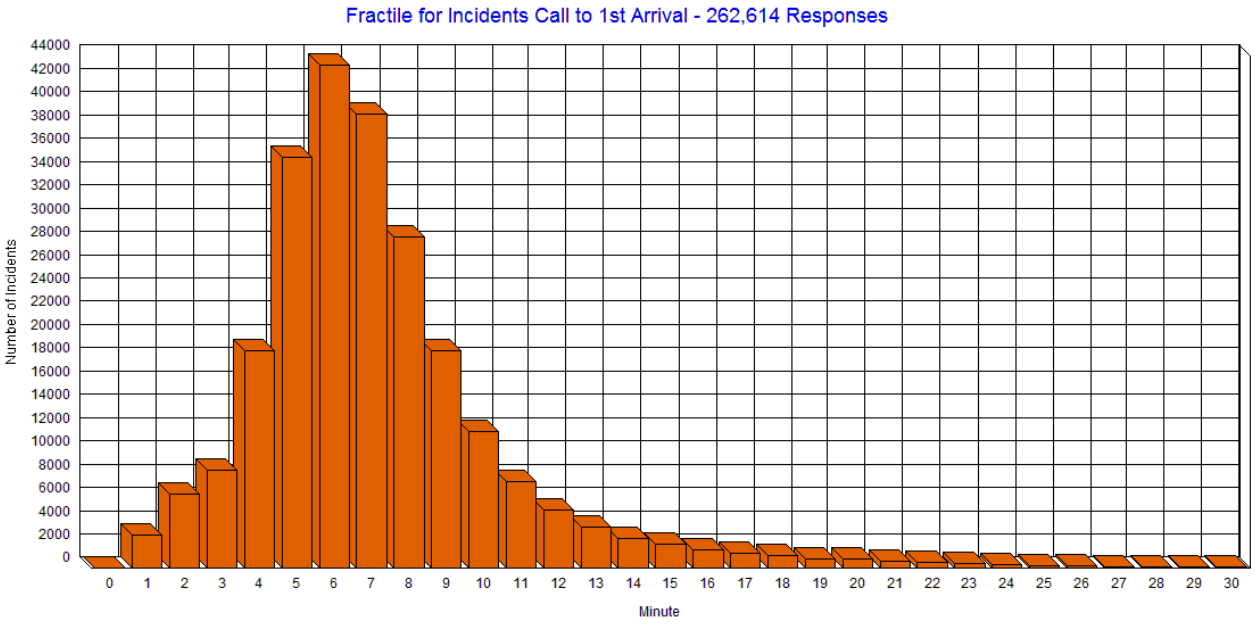
Activity is greatest from morning through early evening. In the accompanying technical appendix (**Volume 3**, separately included), other tables by quadrant show how commute or tourism patterns affect demand per hour or day, such as the rural areas seeing increases on Friday through Sunday.

5.1.2 Total Response Time – First-Due Single Units

While many fire departments track *average* response time, it is not highly regarded as a performance measurement. One of the most commonly used criteria to measure response effectiveness is fractile analysis of response time. A fractile analysis splits responses into time segments and provides a count and percentage for each progressive time segment.

The following graph illustrates total response time fractile performance for the County of San Diego. The measurement is from the time the request for assistance was received (Fire CAD

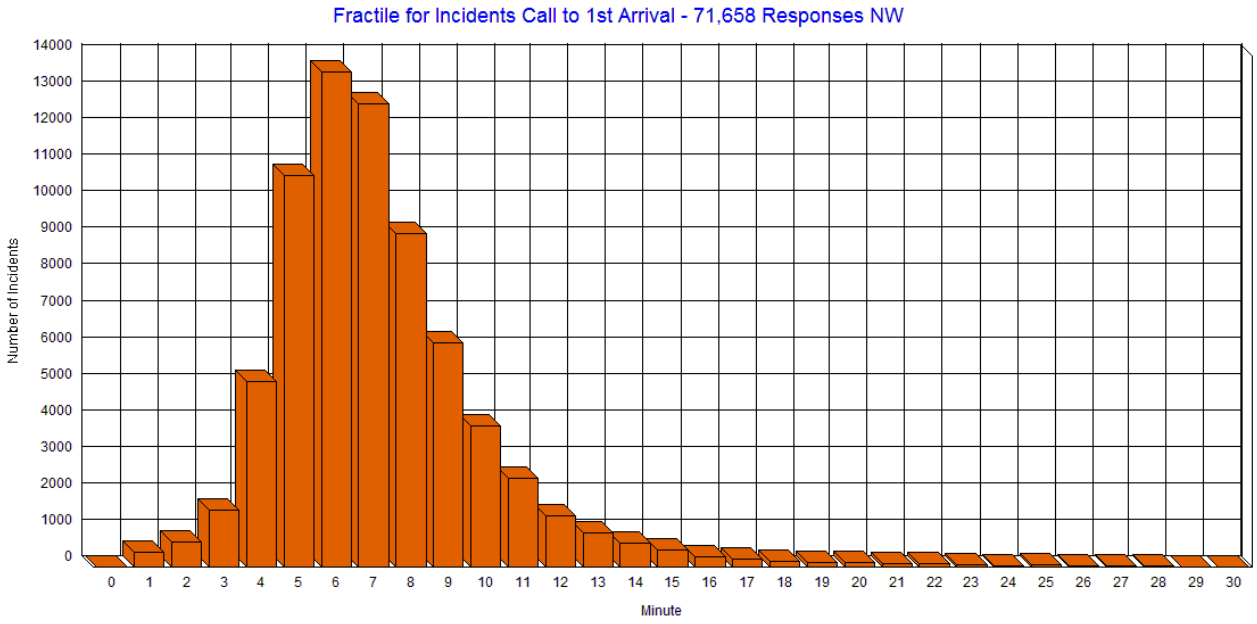
"record create") until the first apparatus arrives on the scene. Thus the following data sets include the steps of dispatch center processing as well as crew turnout time. Put differently, these measures reflect the 911 callers "customer perspective."



The data for this graph is in the statistical appendix, but it is not very useful as it "averages" response times across a vast area of different topography and agency capabilities. What the graph does show is the central tendency to respond to the vast majority of all incidents by the 10-minute, which given the shear size of the County is strong performance.

Quadrant-based data measures are more indicative of performance and are covered separately below:

Northwest



The key area to watch is the drop-off of the number of minutes after 7 minutes. The faster the drop-off the fewer the incidents experiencing delayed first apparatus arrival. Here incidents drop pretty well though 20 minutes.

Fractile Performance by Call Type NW

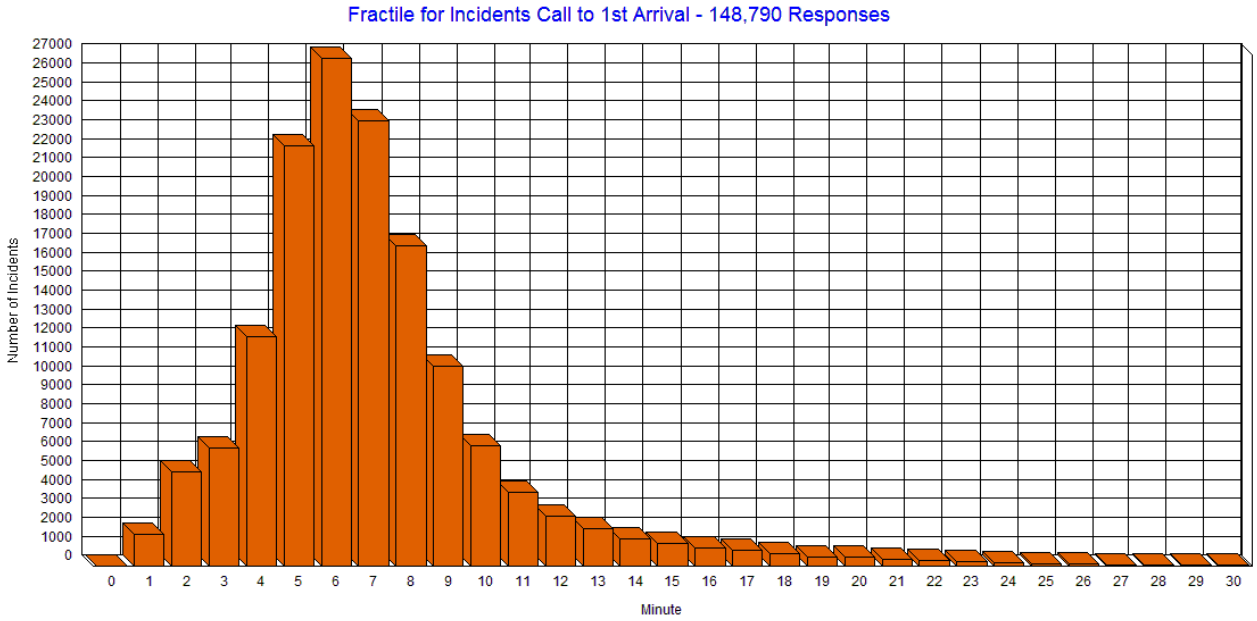
Call Type	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
EMS	52,503	09:45	65.71%	78.06%
Other	8,636	12:15	43.17%	58.09%
Other Fire	2,126	11:45	46.23%	61.14%
Building Fire	1,399	11:30	47.67%	63.04%
Wildfire	252	21:45	21.42%	30.95%

Fractile Performance by Population NW

Population	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
Urban	49,390	10:00	61.71%	75.04%
Open	17,943	09:45	66.94%	78.20%
Rural	7,675	11:45	60.56%	70.90%
Suburb	4,152	10:30	55.61%	71.66%
N/A	71	10:15	64.91%	80.70%

If a total of 3 minutes is subtracted from these times above for dispatch and turnout time, then for example, the EMS 90 percent *travel* time measure becomes 6:45 (minutes/seconds) which is consistent with the mapping analysis models.

Southwest



The Southwest Quadrant has the greatest number of incidents with large drops in incident numbers after 7 minutes.

Fractile Performance by Call Type SW

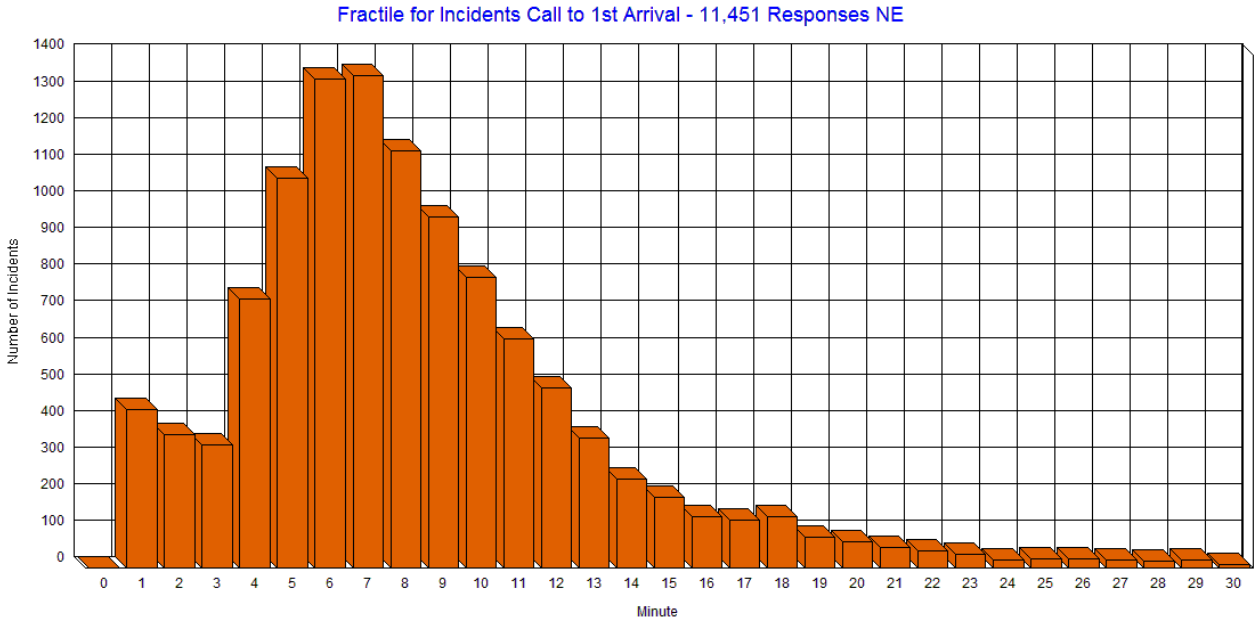
Call Type	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
EMS	128,328	10:30	67.11%	77.96%
Other	19,666	10:30	57.14%	70.92%
Other fire	5,475	10:00	58.80%	73.44%
Building Fire	2,124	08:30	70.47%	84.99%
Wildland Fire	254	12:15	42.50%	56.66%

Fractile Performance by Population SW

Population	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
Urban	117,588	10:15	66.53%	77.84%
Open	27,500	11:00	63.55%	74.81%
Rural	5,493	10:45	61.46%	73.05%
Suburb	5,212	10:15	61.94%	75.31%
N/A	128	09:45	70.33%	78.81%

As in the Northwest Quadrant, if a total of 3 minutes is subtracted from these times above for dispatch and turnout time, then for example, the EMS 90 percent *travel* time measure becomes 7:30 (minutes/seconds) which is a little worse than that consistent with the mapping analysis predictions. This "sluggish" response can be caused by rush hour traffic and simultaneous (back-to-back) incidents that cause secondary responders to arrive from further away.

Northeast



In the Northeast Quadrant we see a very gradual drop-off of incidents after 7 minutes. This is normal for a rural area and is the reason why NFPA 1720 for combination (volunteer + career) fire departments does not use urban response times, but rather recommends response times that vary by population densities. With less than 500 people per square mile, it recommends a travel time of 12 minutes.

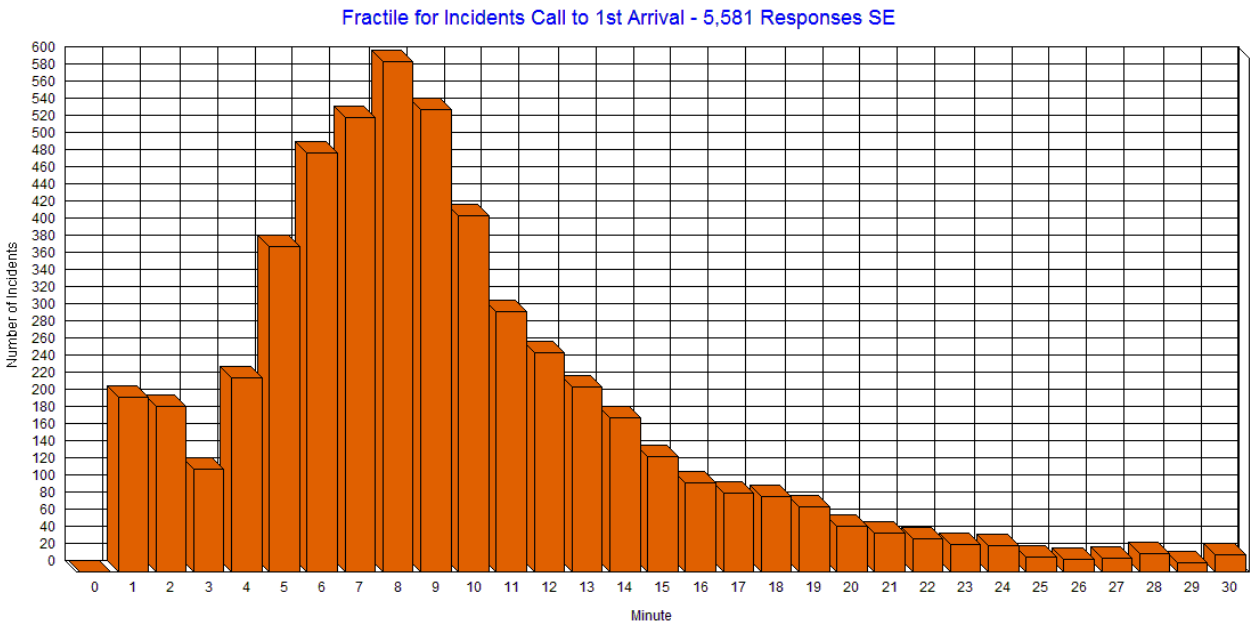
Fractile Performance by Call Type NE

Call Type	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
EMS	10,333	13:00	52.71%	63.06%
Other	2,296	19:00	35.89%	44.20%
Other Fire	617	20:15	33.25%	40.50%
Wildfire	170	23:30	16.17%	26.47%
Building Fire	84	14:00	25.86%	34.48%

Fractile Performance by Population NE

Population	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
Rural	7,162	15:45	41.06%	50.00%
Urban	3,095	10:15	63.65%	76.46%
Open	1,796	16:30	61.11%	67.42%
Suburb	1,453	12:30	41.47%	54.04%
N/A	4	08:45	66.66%	66.66%

Southeast



The Southeast has a very gradual drop from 11 minutes through 24 minutes, again indicative of a more rural area.

Fractile Performance by Call Type SE

Call Type	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
EMS	4,738	16:00	40.00%	50.87%
Other	1,071	21:45	34.92%	43.21%
Other Fire	312	19:00	28.28%	45.01%
Wildfire	66	25:15	10.60%	15.15%
Building Fire	25	19:15	50.00%	62.50%

Fractile Performance by Population SE

Population	Incidents	Mins. To 90%	% @ 7 min	% @ 8 min
Rural	3,183	18:30	33.79%	41.97%
Open	1,970	16:45	36.93%	50.82%
Urban	682	11:00	65.57%	76.06%
Suburb	379	16:00	37.24%	53.00%

If a total of 3 minutes is subtracted from these times above for dispatch and turnout time, then for example, the EMS 90 percent *travel* time measure becomes 13:00, which is a minute *better* than the Total Response Time of 14 minutes as recommended by NFPA 1720 for rural areas of less than 500 people per square mile.

5.1.3 Total Response Time – Effective Response Force (First Alarm)

In the tables below are the data for 4th apparatus arrival. For a First Alarm, the clock "stops" when the last-due unit arrives on-scene to provide enough firefighters to deal with the emerging, serious incident. These measures show then the Total Response Time needed to get four units to a serious problem.

For urban areas, a best practice goal would be a Total Response Time of 11 minutes (8 minutes travel + 1 minute dispatch + 2 minutes turnout). As can be seen, if 3 minutes were subtracted for dispatch and turnout time, then the building fire measure in the Southwest Quadrant becomes 9:45 (minutes/seconds), which exceeds the goal of 11 minutes. This is even without any of the gap area stations being added. The reason is that in the most compact, urban areas, the building fires are occurring closer to multiple stations. This cannot occur in the most spread out northwest and eastern areas.

Time in Minutes to 90 percent – Call Type

Call Type	Countywide	NW	NE	SW	SE
Building Fire	14:15	18:15	21:30	12:45	01:25:15
Wildfire	45:30	40:00	41:45	36:30	01:43:45
Other Fire	45:30	01:03:00	34:30	48:15	51:15
EMS	38:00	31:00	39:30	36:45	51:30
Other	49:00	01:07:15	37:45	01:02:30	40:00

Time in Minutes to 90 percent – Population

Population	Countywide	NW	NE	SW	SE
Urban	24:30	24:30	24:45	24:15	01:07:15
Suburb	30:30	25:15	34:00	28:30	47:00
Rural	40:15	37:15	37:00	28:00	49:30
Open	39:15	29:15	44:30	35:00	01:20:30

5.1.4 Wildland Fire Total Response Time – First-Due Single Units

Published national fire and EMS response time goals center around building fires and medical emergencies. Where wildland fires are mentioned, the recommendations are not time based, but advise agencies to build response measures consistent with risk and desired outcomes. NFPA 1710 on Career Fire Service Deployment in Section 5.7.1 states, "Wildland fire suppression operations shall be organized to ensure that the fire department's wildland fire suppression capability includes personnel, equipment, and resources to deploy wildland direct operations that can address marginal situations before they get out of control and wildland indirect fire-fighting operations that can be assembled and placed into operation against major wildland fires".

CAL FIRE's statewide goal is to contain all wild fires within the first two hours to 10 acres or less 95 percent of all fires responded. Aircraft initial response criteria have been established to deliver retardants to the fire scene on state responsibility lands within 20 minutes of dispatch and to provide follow-up aircraft as needed.

Wildfire Containment

Year	Count*	Acres	% Contained**
2000	485	6,578	97.9%
2001	521	4,135	96.9%
2002	693	70,795	97.1%
2003	569	266,535	97.2%
2004	396	11,008	96.5%
2005	466	6,380	94.8%
2006	397	1,729	96.2%
2007	169	350,410	89.3%
2008	178	985	92.7%
2009	148	422	96.6%
10-YR. AVG.	402	71,897	95.5%

* Fires in State Responsibility Areas (SRA).
** Fires contained to 10 acres or less in less than 2 hours.

As can be seen in the table above, CAL FIRE and the regional mutual aid system are doing an excellent job in keeping 95 percent of the wildfires to under 10 acres size in less than 2 hours from ignition. It is apparent from these measures, as well as the response time data in the next table, that the while there are a significant quantity of wildfire ignitions, only a very few due to the forces of nature become catastrophic. If only the two regional catastrophic fires in the last decade are to be counted against the total fires in State Responsibility Areas (not including all the cities) then out of 4,022 ignitions, only two became firestorms. This is an impressive result in a climate zone so conducive to wildfires.

Below are the wildfire response times by quadrant from the last 12 months of data in this study:

Wildfire Response Time Measures

Quadrant	Incidents	Mins. to 90%	Median
NW	425	28:00	10:09
SW	255	12:45	07:42
NE	178	33:30	11:21
N/A	143	44:15	09:10
SE	72	30:00	15:00

Given that many of these fires occur in off-road areas, the Total Response Times in the Southwest Quadrant are good, given the fire station gaps and canyon areas that exist in the urban

areas. In the more rural three quadrants, the 90 percent times seem long, but these can be small fires in out laying areas. In this case, the median or mid point measure is more reflective. Even in the more rural areas, half the wildfire incidents receive a first-due unit in 10-15 minutes Total Response Time.

> **Finding 5-1:** The wildfire travel time measures support the mapping findings that the fire stations are correctly placed on the rural road network. Given the rough terrain and limited roads in many areas, more fire stations are not cost-effective. Rather, the existing stations need proper staffing backed up by initial attack aerial support to keep wildfires small.

5.1.5 Response Time Component Measurements

The next step is to evaluate all response time components by breaking down "Total Reflex Time" into its three component parts of dispatch, crew turnout and travel time.

Dispatch time – Time of call until time of dispatch. Only dispatch records showing a call-handling time greater than 0 seconds and less than 5 minutes were used in this analysis. The National Fire Protection Association (NFPA) recommendations are that 90 percent of the calls should be processed to dispatch within **1-minute**, 90 percent of the time.

Time in Minutes to 90 percent – Call Type

Call Type	NW	NE	SW	SE
EMS	01:45	02:15	02:30	02:15
Other	02:15	03:00	02:15	03:00
Other Fire	02:15	03:00	02:45	03:00
Build Fire	02:15	02:15	03:00	02:45
Wildfires	03:15	03:30	03:00	03:15

Time in Minutes to 90 percent – Population

Population	NW	NE	SW	SE
Urban	01:45	02:00	02:30	01:45
Open	02:00	02:45	02:45	02:15
Rural	01:45	02:45	02:30	03:00
Suburb	01:45	02:15	02:30	02:15

As can be seen above, when the five dispatch center data sets are merged into a quadrant, for major call type categories, even for EMS, the aggregate dispatch time does not meet the 1-minute, 90 percent of the time goal point. While the highest priority calls may receive dispatch times of 1-minute, this data also suggests that some centers, at some hours of the day, could be under-staffed for the volume of calls being handled per hour at peak periods of the day.

Turnout time – Time of dispatch until time unit is responding. This is the time from company notification to donning protective clothing to getting underway. Only dispatch records showing a turnout time greater than 0 seconds and less than 20 minutes (allowing for volunteers) were used in this analysis. Older national recommendations were for turnout time to take 60-80 seconds. Over the last five years of increasing protective clothing regulations by OSHA and the NFPA, Citygate's study of over 75 client data sets have shown this to be a near impossible goal to accomplish safely. Citygate and its clients finds a more realistic goal is to complete the company notification and turnout process in **2 minutes** or less, 90 percent of the time. Attention to this critical time element can help reduce the time.

Time in Minutes to 90 percent – Call Type

Call Type	NW	NE	SW	SE
EMS	02:15	03:30	02:00	03:45
Other	02:30	04:00	02:30	04:15
Other Fire	02:15	04:15	02:15	04:30
Build Fire	02:45	03:30	02:30	03:15
Wildfires	03:45	05:45	03:45	07:45

Time in Minutes to 90 percent – Population

Population	NW	NE	SW	SE
Urban	02:15	03:15	02:15	03:15
Open	02:15	03:30	02:00	03:45
Rural	02:15	03:30	02:15	04:00
Suburb	02:15	03:30	02:30	03:45

While EMS turnout time in the Southwest Quadrant meets a Citygate recommended goal of 90 percent @ 2 minutes, other turnout times are longer for both type of call and population density area.

Travel time – Travel time is measured from the point the unit begins movement until the time it arrives at the incident. Only dispatch records showing a travel time greater than 0 seconds and less than 30 minutes were used in this analysis. Travel times greater than 30 minutes are for mutual aid or very remote wildfires and if used would skew the data set.

Time in Minutes to 90 percent – Call Type

Call Type	NW	NE	SW	SE
EMS	07:15	09:15	08:00	11:30
Other	09:00	13:00	07:30	13:30
Other Fire	08:30	14:00	07:00	13:00
Build Fire	07:45	10:15	05:15	10:45
Wildfires	11:45	13:45	07:30	18:45

Time in Minutes to 90 percent – Population

Population	NW	NE	SW	SE
Urban	07:30	06:45	07:45	07:00
Open	07:15	11:30	08:15	10:30
Rural	08:30	11:00	08:00	13:00
Suburb	08:00	09:15	07:45	11:00

The travel times above are consistent with the geographic mapping analysis that it takes 7-8 minutes to cover 90 percent of the street network from the existing fire stations.

5.1.6 Response Time Statistics Discussion

Given the above summary of Citygate's response statistics analysis, the detailed data in the comprehensive statistics analysis, combined with the findings based on the geographic mapping section, we offer the following findings:

First of all, before adding more fire stations, it is possible to reduce Total Response Times by focusing on reductions to dispatch and turnout times. If a total of 90 seconds were improved on both turnout and dispatch reflex times then the result would be:

Total Response Time in Minutes to 90 Percent

If 90 Seconds is Reduced from Dispatch and Turnout Time Combined:

Call Type	NW	NE	SW	SE
EMS	09:45	13:00	10:30	16:00
After:	08:15	11:30	9:00	14:30
Building Fire 4-Station Measure (First Alarm)	18:15	21:30	12:45	01:25:15
After:	16:45	20:00	11:15	01:23:45

While these revised aggregate measures in the urban quadrants do not get to a desirable goal point of 7 minutes at 90 percent for EMS incidents, which are the bulk of the emergency workload, the times do approach the current County EMS Agency goal of 8 minutes in the urban western areas. If the identified western gaps had additional fire stations, along with a 90-second decrease in dispatch and turnout times, then an 8-minute, 90 percent total response time goal for the EMS initial paramedic is possible in both western quadrants.

In the two eastern quadrants, if the adopted goal point were to be 14 minutes Total Response Time for rural areas as NFPA 1720 suggests, then after dispatch and turnout time reductions, the Northeast Quadrant beats the measure and the very large, even more rural Southeast Quadrant comes very close.

Finding 5-2: In the urban western quadrants for EMS incidents, the overall current station and mutual/automatic aid system is delivering the first-due unit from 9:45 to 10:30 minutes/seconds which is longer by 3 minutes than a Citygate recommended best practice Total Response Time goal point of 7 minutes, 90 percent of the time for the first-due unit.

Finding 5-3: In the rural eastern quadrants, the station system delivers the first-due unit for EMS incidents from 13-16 minutes, close to a best practice goal of 14 minutes for areas with less than 500 people per square mile.

Finding 5-4: CAL FIRE and the regional mutual aid system are meeting the state's goal in keeping the wildfires in State Responsibility Areas to under 10 acres size in less than 2 hours from ignition, meeting this goal for 95.5 percent of the SRA wildfires over the last ten years. If only the two regional catastrophic fires in the last decade are to be counted against the total fire starts in the SRA (not including all the cities) then out of 4,022 ignitions, only two became firestorms. This is an impressive result in a climate zone so conducive to wildfires.

Finding 5-5: Both the current dispatch and crew turnout times are over a Citygate recommended goal point by 3 minutes total. Focus and training on these steps can easily reduce by at least 90 seconds or one-half the combined overage and bring the western quadrants' 90 percent performance measure to 9 minutes or less without adding resources.

Finding 5-6: The response statistics assessment verifies that in the western quadrants, the fire station gap areas contribute to performance longer than that most likely desired. However, this is also due to a very hard-to-serve non-grid street system and hilly topography. Many calls are answered in 5-7 minutes total response time.

Finding 5-7: In the southwestern quadrant**,** the multiple-unit coverage to serious incidents (first alarm), delivers close to acceptable performance by delivering four stations at 12:45 min/sec 90 percent of the time.

While this is past a usual Citygate recommended goal point of 11 minutes at 90 percent, if a 90-second reduction in combined dispatch/turnout time reduction is achieved, the time falls to 11:15 minutes/seconds before any fire station gaps are closed.

Finding 5-8: The region benefits from the mutual aid regional response system. While this system cannot replace additional fire stations in the gap areas, all the agencies should continue to participate in this valuable support system for simultaneous calls for service and multiple-unit serious emergencies.

Finding 5-9: While the region has a strong mutual aid, automatic aid and somewhat centralized dispatch system, with the exception of San Diego City and CAL FIRE the fire protection system is made up of a large number of small to medium-sized fire departments, each with its own training, culture and distinct way of doing business. Despite everyone's best efforts this will always be reflected in incident response and performance. Some jurisdictions are addressing this issue and consolidating.

5.1.7 Integrated Fire Station Deployment Recommendations

While no one agency (even a metropolitan one) can stand by itself and handle everything and any possibility without help, a desirable goal is to field enough of a response force to handle a community's day-to-day responses for primary single-unit response needs equitably to all neighborhoods, as well as be able to provide an effective initial response force (first alarm) to moderately serious building fires. Given topography and station gaps in the western quadrants, the system meets these goals in some, but not all areas.

Both the geographic mapping and response statistics analysis have shown that the rural eastern quadrants have properly located fire stations. The issue in these areas is the light staffing per unit on the local government operated fire units and the inability to field enough part-time firefighters to cover all the needed shifts during the work week hours.

Citygate sees seven issues in the San Diego region's fire services fire stations and staffing deployment plan that can be improved as fiscal resources allow over time as the area comes out of the economic recession and/or growth occurs:

1. The need to formally adopt deployment measures
2. Fire Station gaps in the western County
3. Focusing on reductions in dispatch and turnout times
4. Maintaining the focus on joint closest unit responses
5. Limited staffing on local government operated rural area units
6. Maintenance of year-round 4-person staffing on wildland response companies
7. Maintaining the current level of rotary and fixed wing wildland initial fire attack capacity plus expanding the ability for safe, yet effective nighttime operations.

Discussion

Adopting deployment measures will guide elected officials with aligning the impacts of growth and fire service delivery abilities. Additional fire stations over time in the western County areas will improve first-due unit response times, both in the gap areas as well as system-wide when simultaneous calls for service occur. While lowering dispatch and turnout times will help overall customer service, these reductions by themselves cannot close the identified fire station gaps in the western County areas. What is a significant help is that most departments cooperate with their neighbors by sending the closest fire unit, which leverages all of the available resources in a sub-regional area.

In regard to wildland fires, the only way to control and suppress wildfires is with "boots on the ground." Aerial units can delay the spread of a fire, when the weather even allows them to fly, but they alone cannot extinguish the fire. While the State of California has spent additional funds to staff its CAL FIRE units at 4 firefighters year-round in the County of San Diego, plus adding more units during fire season, many of the local government stations (at least 18 identified in this study) are not even reliably staffed with 2 firefighters 24/7/365.

In order to ensure an appropriate response to fires and EMS events in the areas staffed by volunteers, the rural stations need a guaranteed and minimum level of 24/7/365 staffing. Additionally, the current year-to-year State funding for the 4th firefighter per unit and additional aircraft have to be maintained. Given that upwards of 18 volunteer-based stations have inconsistent on-duty staffing, there is a risk that a fire will occur where staffing is thin and aerial support is slowed for a variety of reasons, such as high winds.

Given the rugged terrain in much of the County of San Diego, more fire stations alone probably cannot increase the current wildfire suppression rate. This is because too many acres are just not immediately accessible to the paved road network. Sustained success in suppressing these fires

has to come from a **combined <u>and immediate</u>** attack with *<u>adequately</u>* staffed ground resources, supported by aircraft.

Based on the above analysis, Citygate's deployment system recommendations are designed to improve these issues as fiscal resources allow.

The fire deployment service levels and resultant trigger points in the table in Recommendation 5-1 are consistent with national best practices. These measures serve as *guidelines* for adding more fire stations and crews. For example, a single square mile containing 1,000 residents in an otherwise rural setting is not large enough to justify a fire station. Other factors also have to be considered such as final build-out population of the greater area, the expected total calls for service and the ability to recruit volunteer staffing.

Recommendation 5-1: Jurisdictions with land use planning responsibilities may adopt fire unit deployment performance measures based on population density zones in the table below, to direct fire station location timing and crew size planning. The more specific, measurable and consistent the policy is, the more it can be applied fairly to all uses and easily understood by a non-fire service reader. The measures should take into account a realistic crew turnout time of 2 minutes and 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. Citygate recommends these measures be:

<u>Proposed Deployment Measures for the County of San Diego</u>

By Population Density Per Square Mile

	Structure Fire Urban Area	Structure Fire Suburban Area	Structure Fire Rural Area	Structure Fire Remote Area	Wildfires Populated Areas	Wildfires Remote Areas*
	>3,000 people/sq. mi.	**1,000-3,000 people/sq. mi.**	**1,000 to 500 people/sq. mi.**	**500 to 50 people/sq. mi. ****	**Permanent open space areas**	
1st Due Travel Time	4	5	12	20	10	20***
Total Reflex Time	7	8	15	23	13	23
1st Alarm Travel Time	8	10	16	24	15	24
1st Alarm Total Reflex	11	13	19	27	18	27

* CAL FIRE or Forest Service Responsibility Lands.
** Less than 50 people per square mile there is acknowledgment that fire and EMS services are going to be substandard.
*** Includes primary attack aircraft.

5-1.1 Distribution of Fire Stations for **Initial** Response to Built-up Suburban Areas of Greater than 3,000 People per Square Mile: To treat and transport medical patients and confine small fires *to* the room of origin, the first-due unit staffed with a minimum of 2 firefighters should arrive within 7 minutes, 90 percent of the time from the receipt of the 911 call. This equates to 1-minute dispatch time, 2 minutes crew turnout time and 4 minutes travel time spacing for single units.

5-1.2 Effective Response Force (**First Alarm**) for Built-up Suburban Areas of Greater than 3,000 People per Square Mile: To treat and transport medical patients and to confine fires *near* the room of origin, a multiple-unit response of at least 15 firefighters should arrive within 11 minutes from the time of 911-call receipt, 90 percent of the time. This equates to 1-minute dispatch time, 2 minutes crew turnout time and 8 minutes travel time spacing for multiple units.

5-1.3 Suburban Areas of 1,000 to 3,000 people per square mile should have first-due fire unit *travel* time coverage of 5 minutes, 90 percent of the time; and the effective response force of at least 10 firefighters should have a *travel* time of 10 minutes with a resultant 13-minute total response time, 90 percent of the time. Fires will be contained to the building of origin to prevent a wildland fire. Medical patients salvageable upon arrival will receive appropriate care for their condition.

5-1.4 Rural Areas of less than 1,000 to 500 people per square mile should have first-due unit *travel* times of 12 minutes, 90 percent of the time. Rural areas should receive the effective response force of at least 6 firefighters within 16 minutes *travel* time with a resultant 19-minute total response time, 90 percent of the time. Fires will be contained to the building of origin to prevent a wildland fire from escaping assuming adequate defensible space and built-in construction features are provided. Medical patients salvageable upon arrival will receive appropriate care for their condition.

5-1.5 Structure Fire Remote Area of 500 to 50 people per square mile should have first-due unit *travel* times of 20 minutes, 90% of the time. Remote areas should receive the effective response force of at least 6-firefighters within 24 minutes *travel* time with a resultant 27-minute total response time, 90% of the time. Fires will be contained to the property of origin to prevent a wildland fire from escaping assuming adequate defensible space and built-in construction features are provided. Medical patients salvageable upon arrival will receive appropriate care for their condition.

5-1.6 Extreme Remote Area of less than 50 people per square mile may have travel times over 20 minutes. Because these areas are extremely remote with very little development potential, it becomes cost prohibitive to provide adequate fire and emergency medical protection services. Individuals choosing to live in these areas acknowledge that deficiencies in services exist.

5-1.7 Wildland Fires in or near populated areas should have first-due unit *travel* times of 10 minutes, 90 percent of the time; and the effective response force of at least 10 firefighters should have a *travel* time of 15 minutes with a resultant 18-minute total response time, 90 percent of the time. Fires will be contained to less than 5 acres to prevent a more serious wildfire.

5-1.8 Wildland Fires in remote areas should have first-due unit *travel* times of 20 minutes, 90 percent of the time; and the effective response force of at least 6 firefighters should have a *travel* time of 24 minutes with a resultant 27-minute total response time, 90 percent of the time; Fires will be contained to less than 10 acres to prevent a more serious wildfire.

5-1.9 Aggregate Population Definitions: Where more than one square mile is significantly populated, and/or a contiguous area with multiple zoning types, aggregates into a population "cluster," these measures from the Commission on Fire Accreditation can guide the determination of response time measures and the need for fire stations:

Area	Aggregate Population	First-Due unit Travel Time Goal
Metropolitan	> 200,000 people	4 minutes
Urban	> 30,000 people	4 minutes
Suburban	>10,000 to 30,000 people	5 minutes
Rural	1,000 to 10,000 people	12 minutes
Remote	500 -1,000 people	20 minutes
Extreme Remote	<500	> 20 minutes

Recommendation 5-2: The County Fire Authority, in order to provide a guaranteed minimum staffing of two firefighters per unit during the 40-hour work week period, should strongly consider staffing its 18 stations with a single career firefighter on a Monday through Friday 40-hour week. This position can maintain the apparatus and station, assist with volunteer training and lessen the need to hire two volunteers for this coverage.

5-2.1 The County Fire Authority should conduct a cost-benefit study as to how many more volunteers it makes sense to recruit, train and equip given annual turnover, versus staffing a few positions with career firefighters as Recommendation 2 stated.

Recommendation 5-3: The agencies in the western County areas that could benefit from closing the fire station gaps indentified in this study can complete their own internal analysis of cost-benefit and as appropriate over time, find the funding to add fire stations.

Recommendation 5-4: All of the fire department agencies in the County need to focus on reducing to the extent possible dispatch center processing times to 1 minute for 90 percent of the calls for service, and to 2 minutes, 90 percent of the time for crew turnout activities. In some cases this will take computer system work to accurately track these time segments and to provide periodic reporting back to the personnel. A "shot clock" in each apparatus bay, activated by the dispatch alert system would help crews improve their turnout times.

Recommendation 5-5:	All the fire agencies in the County need to continue and improve where needed, the dispatching of the closest available resource, regardless of political jurisdiction lines. As this study shows, when dispatch centers always send the closest available unit, good regional coverage exists in most areas. However, this is dependent on the dispatch centers sending the closest unit every time and the political boundaries not acting as barriers. Further, catastrophic emergencies absolutely require a multiple regional response that does not occur without pre-design and the policy direction to ensure it.
Recommendation 5-6:	Citygate recommends that the on-going sub-regional consolidation efforts under way continue, both in the cities and unincorporated areas. Further consolidations for both dispatching and field operations will improve response times by standardizing operations where multiple fire departments have to operate together.
Recommendation 5-7:	To maintain and improve wildfire initial ignition suppression, the current CAL FIRE enhanced staffing levels and aerial response capabilities have to be maintained, and a permanent funding source secured, rather than continuing under a situational Governor's order.

PART FOUR

Support Services Review

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SECTION 6

AERIAL FIREFIGHTER PROGRAMS REVIEW

6.1 SECTION INTENT

This section will overview the aerial firefighting programs and identify several goals that need on-going work. The primary focus of this review will be on the aerial firefighting resources provided principally by CAL FIRE alone, CAL FIRE in cooperation with the Sheriff's Department, and those fielded by San Diego City Fire Department. To a lesser extent, the Sheriff and San Diego Police have other law enforcement primary mission aerial resources with limited back-up firefighting and rescue capabilities. These *back-up firefighting*, primary law enforcement resources, will not be covered below.

6.2 BACKGROUND

Prior to and since the two recent regional firestorms, there has been considerable discussion and progress on improving aerial rotary and fixed wing aircraft for those firefighting, EMS-rescue and other technical rescue needs in the County of San Diego that are best met by rotary wing aircraft. Over the last decade, programs have expanded significantly from the historic levels provided by CAL FIRE and the San Diego County Sheriff. Several agencies in the County have expanded the quantity and capabilities for helicopter operations.

The CAL FIRE – San Diego Unit protects 1.41 million acres of State Responsibility wildland area. Much of this area is in remote locations with limited access for fire apparatus. Due to a

border with the Country of Mexico, CAL FIRE has experienced a unique problem with fires started near remote trails and with limited or no access to fire apparatus. These are human caused fires due to illegal immigrant trafficking. Due to San Diego's geographic location, it experiences a high percentage of subtropical storm activity coming from the south out of Mexico. With the predominance of these storms, the east County mountain and desert areas can experience lightning fires in remote areas where fire apparatus does not have access.

Additionally, the County of San Diego Emergency Medical Services Division contracts for advanced medical helicopter transportation with a private provider.

There are also the military assets that can be used in certain circumstances and with limitations.

Overall, there are significant firefighting aerial assets being funded in the region. However, the funding of these very expensive, technical programs is tenuous in some cases, as will be described. As with ground-based fire departments, there is administrative fragmentation and overlap due to multiple agencies being involved.

Each of the major aerial firefighting agencies will be covered in separate sub-sections below.

The use of aerial resources has to be viewed in the context that no one resource or mix of resources can replace a ground-based fire attack. Firefighting is close-up, manual labor to complete extinguishment and overhaul the damaged area to prevent the fire from re-kindling and spreading again after the initial extinguishment phase.

Aerial operations then support, enhance and buy time for ground-based firefighters to contain the spread of an emergency. Both rotary (helicopter) and fixed wing aircraft are used. Aerial resources also enhance other emergency mission needs, or perform operations otherwise impossible from the ground. Examples of the many mission types are:

- Firefighting – wildland and structural
- Technical Rescue – cliffs, water, difficult terrain, extraction of patients
- Medical transportation to regional trauma or specialty care centers, such as burn units
- Vehicle, Aircraft Accident Extrication and Rescue responses
- Mountain Search and Rescue
- Homeland Security support and tactical missions
- Aerial command and operational direction at major incidents.

6.3 CAL FIRE CURRENT AVIATION RESOURCES

CAL FIRE's statewide fire aviation program includes 23 air tankers, 11 helicopters, 14 air tactical aircraft, and contract aircraft including the DC-10, Martin Mars, and DC-7. Statewide, CAL FIRE has 13 Air Attack Bases and 9 Helitack Bases.

In the County of San Diego, CAL FIRE has one Air Attack Base in Ramona, which has one OV-10 Air Tactical Control Aircraft and two S2T fire retardant dropping Air tankers. The nearest CAL FIRE Helitack Base is located in Hemet in Riverside County. Helitack ships are helicopters that carry firefighting hand crews to remote fire ignition locations, and once the crew

has deployed on the ground, can also drop water using buckets or fixed tanks. The United States Forest Service has one Type Two Helicopter based at the CAL FIRE Ramona Air Attack Base during fire season.

CAL FIRE in San Diego has requested the addition of a funded Helitack helicopter and crew to be based in the County. This would be CAL FIRE's 10th statewide Helitack Unit and would compliment the statewide system and provide a "year-round" resource for CAL FIRE's unit with a history of the longest fire seasons. This would base two CAL FIRE helicopters in Southern California. The next two closest CAL FIRE Helicopters are located in San Benito County and Tuolumne County in Central California.

Due to the age of the current eleven UH-1H "Super Huey" helicopters, CAL FIRE is requesting replacement over the next several years with an upgraded "twin engine" helicopter. The new helicopters will have the ability to carry more water, firefighters, and transition to "night flying" capabilities for critical assignments. Adding a Helitack Unit to the San Diego Unit would require the purchase of an additional helicopter to the fleet of next generation aircraft for CAL FIRE.

A "Governor's Executive Order" to add additional fire protection throughout the state has included authorization for CAL FIRE to work with the San Diego County Sheriff's Department to provide staffing for the County's Fire Helicopters. This temporary executive order has authorized CAL FIRE to hire 23 extra firefighters during the peak season. Executive Orders are subject to cancellation year-to-year due to budget reductions or a change of Governor.

Current Fire Season daily staffing includes:

- Copter 12: Sheriff Pilot, 2 CAL FIRE Captains (crew chief and Helitack captain) and 7 CAL FIRE Firefighters.
- Copter 10: Sheriff Pilot and CAL FIRE Captain/Crew Chief.
- Ground-based mobile fuel tender operated by a CAL FIRE Engineer.

Current winter season staffing includes:

- Copter 10: Sheriff Pilot, Fire Captain/Crew Chief, and Firefighter.
- Copter 12: Sheriff Pilot, Fire Captain/Crew Chief.

CAL FIRE and County Sheriff and Forest Service Assets

In the last three years, the joint CAL FIRE and Sheriff aerial operations preformed these missions:

		State Responsibility Lands			Federal Responsibility Lands			Local Government Lands		
Year	Total all Inc. Types	# of Calls	Flight Hrs	Gallons of Agent	# of Calls	Flight Hrs	Gallons of Agent	# of Calls	Flight Hrs	Gallons of Agent
2007	202	183	948	963,507	13	114	146,004	6	19	18,300
2008	140	125	311	150,927	12	43	55,920	3	8	8,800
2009	145	127	301	126,192	18	57	56,679	0	0	0

6.4 San Diego County Sheriff - Firefighting Program

In 1971, the Sheriff's Department formed the **A**erial **S**upport **T**o **R**egional **E**nforcement **A**gencies - A.S.T.R.E.A. program. This is a regional resource provided to all cities in the County at no cost. The program began with two Bell 47 helicopters. In the 1980s, MD500

turbine aircraft were added and the Sheriff's Department began aerial firefighting with "Bambi Buckets."

After the devastating firestorm of 2003, the County of San Diego decided to purchase two Type II firefighting helicopters. The County had been funding a leased helicopter manned by San Diego City Fire personnel. The firm of Conklin and de Decker were hired to make recommendations on aircraft.

Since the County does not have a County Fire Department, a decision needed to be made about who would operate these aircraft. In the end, it was decided that the County Sheriff should operate the aircraft. The Sheriff had the infrastructure in place, hangars, maintenance personnel, experienced pilots, and experience in managing an aviation program for over 30 years.

*The flight line, three hangars and maintenance hangar, three fueling stations with 32,000 gallons of fuel underground.

Based on recommendations from Conklin & de Decker, the Bell 205A1++ was selected as the best platform for the mission. The Mission was defined as primarily daytime firefighting and rescue.

An agreement was made between the Sheriff's Department and CAL FIRE to provide Bell 205 transition and firefighting training. The County contracted for two CAL FIRE pilots to operate one aircraft and the Sheriff's Department would operate the other. CAL FIRE also provides the Helitack crew and Fire Captains. The CAL FIRE pilot contract went for about two years until enough Sheriff's pilots had been trained to fly and fight fires in the 205.

CAL FIRE provides the Helitack crews on a seasonal basis and the Fire Captains year round. The seasonal up staffing is paid out of the Governor's Executive Order. CAL FIRE provides the Captains by taking the staff "out of existing budget." The arrangement provides the state with two helicopters it would otherwise not have and the Sheriff with fire expertise it does not have. It has been an excellent partnership of which both organizations are very proud. In fact, San Diego Helitack had the most rescues of any Helitack base in the state this year.

The ASTREA Fire/Life safety program is comprised of:

- Four Deputy Sheriff/pilots
- One Sheriff's Sergeant/pilot (Supervisor)
- Four mechanics, 2 of whom drive the fuel trucks and provide on-scene support to the helicopters at fires.

The Sheriff operates both aircraft during daylight hours, 7 days a week, year round. There are two pilots on duty each day. The sergeant also serves as a relief fire pilot. The usual configuration is for one aircraft to serve as the Helitack crew ship while the other is outfitted with a hoist and serves as the rescue ship in addition to fire response.

In 2006, the Fallbrook Helibase was constructed. After that, one helicopter was stationed in Fallbrook and one at Astrea Base in El Cajon. This resulted in the ability to have a firefighting helicopter respond to any location in roughly 15 minutes. The 4,000-gallon fuel truck is positioned at Fallbrook and the 1,200-gallon truck at Gillespie Field.

6.4.1 Operations

In Fiscal Year 2008-09, the Sheriff/CAL FIRE program responded to 71 incidents where action was taken, rescued 14 people, and dropped 208,375 gallons of water on fires. The chart below gives the breakdown. "Responses" equals calls for service, although many of those were cancelled before or after takeoff. The aircraft was the "First on Scene" of the incident on 10 responses. "Action Taken" refers to either water drops or deployment of Helitack crews. "Rescues" are where persons were rescued and flight time to accomplish the rescue follows. PAX equals number of passengers transported.

Copter 10 and 12 Monthly Combined Activity Report

	Vegetation Fires						Rescues		Training	Total
Incident Totals:	Responses	First On-Scene	Action Taken	Gallons Delivered	PAX	Flight Hours	# Rescued	Flight Hours	Flight Hours	Flight Hours
Jul-08	33	2	15	44,480	109	37.6	4	2.0	10.6	68.7
Aug-08	39	4	20	47,360	39	47.3	1	1.9	8.6	78.7
Sep-08	14	0	8	23,060	0	18.0	2	1.7	16.1	59.1
Oct-08	14	1	4	7,250	0	8.7	1	0.7	15.3	44.2
Nov-08	16	2	5	6,600	6	10.4	0	0.0	12.2	32.8
Dec-08	4	0	2	740	0	2.4	0	0.0	13.0	24.7
Jan-09	2	0	0	0	0	0.3	1	0.8	20.4	28.7
Feb-09	2	0	2	6,325	0	6.8	0	0.0	13.4	22.3
Mar-09	4	0	2	7,340	0	5.2	1	1.3	30.7	39.4
Apr-09	8	1	4	3,120	0	5.8	1	1.2	28.6	36.7
May-09	15	0	8	43,900	0	26.1	1	1.4	15.2	43.0
Jun-09	22	0	1	18,200	0	13.3	2	1.6	15.6	39.5
Totals:	173	10	71	208,375	154	182	14	13	200	518

The Sheriff's current fleet of aircraft include 1 MD500D, 1 MD500E, 2 MD500F's and one Bell 407 for Law Enforcement; 2 Bell 205A1++ for firefighting and rescue. All of the Law Enforcement aircraft are equipped for video and Forward Looking Infrared (FLIR) as well as

Nightsun lighting. Three of the aircraft are equipped for video downlink; the last two are pending installation. A Homeland Security grant purchased handheld video downlink receivers for Law Enforcement and Fire to help manage critical events, especially large fires where smoke hampers situational awareness. Utilizing the FLIR to cut through the smoke should provide the incident commander with a much better perspective.

The Bell 407 is equipped and did serve as a helicopter coordination aircraft (HELCO) during red flag events in Fiscal Year 2008-09.

6.4.2 Budget / Program Cost and Funding

The ASTREA budget is broken into two organizations, ASTREA Law Enforcement 39685 and ASTREA FIRE/LIFE SAFETY 39686. The authorized budget for the Fire/Life Safe program is $2,591,491. In Fiscal Year 2008-09, actual funds spent or encumbered was $2,055,043.

Other funding to the program comes from the San Diego Service Authority for Freeway Emergencies (SAFE). SAFE annually provided $250,000 and has increased that in Fiscal Year 2009-10 to $375,000.

A contract for fire fighting on State Responsibility Areas is in place, and in 2008, $157,682 was reimbursed.

6.4.3 Sheriff and CAL FIRE Aviation Issues Deserving Further Study

Sheriffs Department Pilot Availability

The Fire program started with the Sheriff's most experienced pilots. In the near future, they face the retirement of many of these experienced pilots. A sergeant/Fire Pilot retired last year as well as a Fire Pilot/unit trainer this year. They expect one Fire Pilot to retire next year and one to leave the Sheriff's Department and go to work for CAL FIRE. They only have one pilot currently qualified and in training to fly the fire mission. The pipeline to backfill these losses does not exist. It takes about six years to gain the necessary experience and flight time required before beginning to train as a Fire Pilot. Not every pilot wants to move in that direction, and there may be other reasons for not making that transition. Recently a Sheriffs sergeant on the department that had been promoted out of ASTREA was selected to return. At this point, both Sergeants also are trained Fire Pilots. However, due to career development cycles, this is not a permanent solution. If new pilots are not put into training and/or hiring pipeline, there could be only two Sheriff's pilots with the necessary firefighting certifications available sometime in 2011.

A program is being explored to civilianize the Fire Pilot position. Doing so should stop the loss of pilots to other Fire programs for salary reasons, as it would pay a salary commensurate with other programs. It also would allow hiring of already experienced commercial fire pilots, while still allowing interested deputies to transition.

CAL FIRE Personnel Availability

The funding for the CAL FIRE personnel is not budgeted. These personnel take a career risk, by joining the program, since they pass offers for other permanent positions. When funding stops, they may have limited choice in their next assignment.

Aircraft Availability

Since CAL FIRE and the Sheriff have only two total Fire Fighting helicopters, if they lose one or both to planned or unplanned maintenance, they have no other aircraft to take their place. As the military saying goes, "one is none and two is one." So, if the County wishes to have two aircraft available at all times, the program would have to add one more helicopter as a maintenance spare and then could also provide surge capacity.

There are options for obtaining a maintenance spare helicopter. First, County Fire Authority has requested it in their budget proposals each year; yet it has not made it to the final budget request. Second, perhaps a donation could be found to provide the helicopter. Adding a third helicopter would increase operating costs about $25,000 a year.

Nighttime Operations: While the deputy sheriff/pilots have thousands of hours of night and Night Vision Goggle (NVG) experience, the Sheriff Department's Bell 205s are not NVG compatible, nor are the single engine aircraft suitable for the night firefighting mission in the terrain of the County of San Diego. If that mission is required, CAL FIRE has approved San Diego City Fire for night operations on State Responsibility Lands. If the County wanted additional capability, it would require purchase of a suitable twin-engine instrument rated helicopter with an NVG compatible lighting system.

6.5 SAN DIEGO FIRE DEPARTMENT

The SDFD Air Operations Division now encompasses two (2) medium-lift, multi-mission fire/rescue/EMS helicopters. One is a new Bell 412EP and the other a refurbished Bell 212HP.

Both aircraft are staffed on a 24/7 basis with a pilot, Fire Captain/crew chief and firefighter/paramedic. The total number of budgeted positions is nineteen (19). One (1) Air Operations Chief (battalion chief level), six (6) fire helicopter pilots, six (6) fire captain crew chiefs and six (6) firefighter paramedics. Three (3) helicopter mechanics are provided through a contract with Rotorcraft Support, Inc., based in Van Nuys, California.

Total estimated non-personnel expenses are approximately $1.4 million. Budget estimates are based on 350 hours of flight per aircraft annually.

The Bell 212HP, refurbished to "like new" condition, was procured in 2005 for approximately $4 million and was financed over a seven (7) year period. Annual payments are made from the Department's General Fund annual allocation.

The Bell 412EP was bought new in 2008 for approximately $11 million and was financed over fifteen (15) year period. Annual lease/purchase payments (government tax-exempt) are currently made from a special revenue account established through corporate contributions and philanthropy after the 2003 and 2007 firestorms. The first General Fund lease/purchase payment is expected in Fiscal Year 2013.

6.5.1 SDFD Program Capabilities

The San Diego Fire two-helicopter program is capable of 24/7 multi-mission operations (fire, rescue and medical transport). The crews and ships are Night-Vision Goggle (NVG) trained. The crew typically includes a Paramedic and crewmembers trained in Hoist/short haul rescue in daylight or darkness. The SDFD helicopters are the only funded paramedic *rescue* aircraft in the County. Mercy Air, which does the contract EMS patient transports, does not perform rescue missions.

The San Diego helicopters can provide:

- FLIR and microwave downlink capability
- Open water and swift water rescue
- Multi-engine aircraft provide added safety for overwater missions
- External load capability (sling loads/large animal rescue)
- Multi-agency deployment and retrieval
- Special Team deployment and retrieval.

6.5.2 San Diego Fire-Rescue Aviation Issues Deserving Further Study

Funding

The revenue sources are not stable. A Private/Corporate/Philanthropic support provides approximately $600,000 annually to support the Division. Due to current budget shortfall, one helicopter is fully funded for year-round operations and second helicopter is funded for 6 months annually (7/1 through 12/31). Funds are necessary for currency training for qualified relief fire captains/crew chiefs and firefighter/paramedics that have been returned to field operations. Such training must occur regularly and on an overtime basis with premium 10 percent add-on pay

included to ensure personnel safety and maintenance of skill set. For example, hoist rescue and night vision goggle training requires considerable training to maintain currency.

There is no stable way for the City helicopters to bill for EMS patient transport when they take missions countywide for which Mercy Air is either not available or cannot handle operationally. In August 2007, the City Council did approve billing patients for actual cost recovery, but multiple challenges in the complicated medical insurance provided system have arisen resulting in no fees being collected to date.

Inadequate Station and Maintenance Facility

There is no hangar and the ships are parked outdoors. Any heavy maintenance requires utilizing space at the San Diego Police hangar on the west end of Montgomery Field Airport. The Fire Department facility is a modular with multiple inadequacies:

- Inadequate storage;
- Water is provided off a nearby hangar and potable water is delivered;
- Electricity and internet connectivity provided via a private business operator and low capacity use causes circuit breakers to routinely fail when air conditioners/heaters are operating;
- There is no sewer connection; black water is pumped from a bladder multiple times a week;
- Office space is a located next to living quarters;
- The crew quarters are in a refurbished doublewide trailer that is non-ADA compliant.

Pilots

The San Diego Fire-Rescue pilots live out of state and country (Oregon, Montana, Colorado and British Columbia) and there are delays when a catastrophic emergency recall is needed. It takes all four (4) pilots to work a 14-day on/14 day off schedule to staff **both** helicopters from 7/1 through 12/31. Two (2) of the six (6) budgeted fire helicopter pilot positions are vacant.

Maintenance

Aircraft maintenance is provided by contract provider, which has proven problematic according to SDFD staff. A Helicopter maintenance contract RFP is currently being solicited.

6.6 EMERGENCY MEDICAL SERVICE

In order to provide emergency incident transportation to a hospital and hospital-to-hospital patient transfers, San Diego County EMS Division has a Memorandum of Understanding (MOU) with Mercy Air Service, Inc. for the provision of ALS service for an indefinite period and at no cost to the County (County Contract No. 35544-A). The Mercy Air service is provided via helicopters carrying a paramedic and a nurse. Mercy operates other helicopters outside of the County, and when the San Diego helicopter is unavailable, they can move in another unit.

The contract minimums are to maintain and operate at least one fully equipped, supplied and staffed Primary Response Rotorcraft unit 24/7/365, compliant with County EMS policies and staffed by a minimum of one Registered Nurse and one Paramedic.

The San Diego Fire-Rescue Department (SDFD) also has a no-cost MOU with the County that requires the City to maintain and operate at least one fully equipped, supplied and staffed Paramedic level rescue helicopter, seven days a week, 24 hours per day, consistent with the policies, procedures, and protocols established by the County and staffed with a minimum of one paramedic. SDFD's helicopters carry a paramedic (not a nurse) and have rescue lift hoists, which Mercy Air does not.

Mercy Air is the County's designated first responder for paramedic or greater level service but has greater weather-related flight restrictions than SDFD's Air Operations Unit. SDFD helicopters are dispatched when Mercy Air is unavailable or unable to fly and when Mercy Air is available but the responding agency requests the SDFD helicopter due to its closer proximity to the emergency.

SDFD's two helicopters responded to 60 medical transport calls outside of the City of San Diego in Fiscal Year 2009, and this represents 81 percent of the medical transport responses flown by SDFD.

6.7 MILITARY AVIATION[13]

When the Cedar Fire ripped through the County of San Diego, the collective fire service recognized that the local and state government mutual aid system, with all its available resources, had been pushed beyond it capacity limit. Never before employed on civilian fires in their backyard, the U.S. Navy offered H-3 helicopters to help quench the Cedar Fire. The reserve unit, then known as Helicopter Combat Support Squadron 85 (HC-85), had been regularly dropping water to control fires within the Navy's bombing ranges on San Clemente Island, sixty miles off the coast of San Diego. Though an obvious potential asset, challenges existed in the form of standardized training and procedures and limited radio connectivity. The result was a small modicum of success through integration into remote areas of the fire, where conflicts with the main thrust of the air attack plan would be avoided. However, the foundation had been laid for future cooperation and mission expansion.

The months and years following the fall siege of 2003 witnessed numerous changes to how best to integrate federal military partners into the firefight. The fact remained that the military's primary job is warfighting, not firefighting. Renamed Helicopter Sea Combat Squadron 85 (HSC-85) and armed with new H-60s, the North Island-based sailors had the helpful distinction of being a reserve unit. This made them a readily available resource, rarely deploying or changing personnel. The balance of the Navy squadrons in San Diego either train new pilots or regularly deploy overseas. Similarly, the Marine Corps was unable to train with fire agencies due to wartime commitments in Iraq and Afghanistan. Despite a desire to support, the Third Marine Aircraft Wing (3D MAW, Miramar, CA) avoided a local letter of agreement, deferring instead to the existing yet cumbersome ordering process known as the Defense Support to Civilian Authorities.

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[13] Source Material from Thomas Humann and Ray Chaney, CAL FIRE

CAL FIRE and the U.S. Forest Service worked with the Navy to formalize a Letter of Agreement, the purpose of which was to streamline the alert and activation of aircraft in the San Diego area. The Navy authorized the local commander to sign the agreement, bypassing a large amount of bureaucracy. Using the existing agreement between fire agencies and the California National Guard as a template, protocols established included an initial availability inquiry (based on predictive weather services), a detailed alert and activation process, to include not only the aircraft but also fire agency staffing.

During the 2007 firestorm, the official call was placed to Navy Region Southwest for activation. HSC-85 responded with its two H-60s. On board those helicopters were not only standard aircrews, but also agency Military Helicopter Managers (MHEMs). These MHEM fire captains brought with them fire experience and knowledge not possessed by the military aircrew. Their primary responsibilities include fire behavior and tactics, safety in the Fire Traffic Area (FTA), proper communications and fire jargon. By virtue of the existing agreement and associated training, the two Navy helicopters were immediately ordered to respond to the Rancho Bernardo area for fire suppression. The fact was that both of the military aircraft initially offered to CAL FIRE were immediately put to work.

During the 2007 firestorm, it did not take long until the Navy acquired additional buckets at North Island, growing their firefighting force to eight helicopters. Meanwhile the Marines offered a fleet of their own, a mix of CH-53E Super Stallions and CH-46E Sea Knights based out of nearby Miramar and Camp Pendleton. Two days into the siege when these assets were newly acquired, they presented a series of hurdles to overcome and little time to do so. The fire agencies had nowhere near enough MHEMs to staff the aircraft, there had been no training or prior coordination to integrate the Marines and the military radios were unable to pick up critical fire frequencies.

In order to compensate for the lack of MHEMs, the decision was made to allow helicopters to travel in pairs, with the lead aircraft carrying the experienced fire captain. The military typically flies its helicopters in flights of two to four, with the lead making radio calls and tactical decisions for the flight. This enabled them to deliver twice the amount of water with half the agency staffing. Given the extenuating circumstances, this proved sufficient for Navy aircrews that regularly fought fire on their own installations and had been cooperating with CAL FIRE for the previous four years. Many of the Marine Corps aircrews, however, had never carried a fire bucket.

In order to ensure safety, the decision was made to have each Marine helicopter tag along with a National Guard ship of a similar size: CH-46s behind CH-60s and CH-53s behind CH-47s. This allowed the aircraft to utilize appropriately sized dip sites and accounted for the lack of MHEMs. More importantly, it provided radio connectivity. By virtue of a long sought after approval from the Army, the Guard aircraft were equipped with radios capable of tuning all fire agency frequencies. Despite ongoing efforts, no such approval has been attained with the Navy or Marine Corps.

6.7.1 Defense Support to Civilian Authorities (DSCA)

When the federal military first stood up more than 200 years ago, the Founding Fathers wisely put provisions in place to protect the states. These forces cannot legally become involved within the nation's borders without being explicitly requested by the state and approved for use by the

federal government. While this has kept us all safe from military dictatorship, it has also hampered efforts to engage some very capable assets when they are needed most.

The current system by which any agency can order federal military assets is known as DSCA. In the case of a fire emergency, this request begins with the agency in need and is routed through the National Interagency Fire Center (NIFC) to the military's Northern Command (NORTHCOM), which in turn seeks out and assigns forces to the incident. This process may take up to 72 hours before the incident receives the assistance it needs. This often works well if the incident is planned (special events, law enforcement) or after emergencies involving recovery efforts (floods, tornadoes). However, wildland fires are most in need during the first few hours, while the request is meandering through the system.

There is a caveat to the DSCA process that allows local commanders to provide timely assistance in the form of Immediate Response (IR). This IR provision is how agencies establish local agreements with their military neighbors, which is what CAL FIRE did with the Navy in 2004 and the Marine Corps following the fire siege of 2007. The document may be named a Letter of Agreement, a Memorandum of Understanding, or an Operating Plan. Regardless, the idea is that detailed plans are spelled out in advance regarding the basic W's: Who? What? When? Where? Why?

So how does the Fire Incident Commander know when to order federal military assets using DSCA or via IR? The process may be complex, but the answer to this is rather simple. If the need is immediate and local, they use the local agreement. If the need is not in the immediate vicinity of the military base, begin the DSCA process and be prepared to wait. The local commander does not have the authority to deploy his forces any great distance and NORTHCOM's response will take some time.

While CAL FIRE used the military under IR during the fall siege of 2007, this did not apply during the massive lightning fire siege in Northern California during the summer of 2008. Because of the distance involved, a DSCA request was submitted. The Marines and Navy were ordered north from San Diego and operated throughout the central part of the state in support of both CAL FIRE and USFS incident commands.

U.S. military helicopter pilots are among the best in the world at what they do – warfighting. While there are certainly transferable skills to firefighting, there are many differences: pilot technique, airspace management, unique hazards, and fire lingo, to name a few. Therefore, it is essential that regular training be conducted to ensure safety, effectiveness, and efficiency. While this is important with Guard and reserve forces, it is even more so when working with active duty forces. The Southern California Marines have endured an aggressive deployment cycle since 9/11. This has meant new aircrews every six months. Whenever a squadron rotates back to the United States, CAL FIRE has to provide it with classroom and flight training based on what was used with the Guard for three decades.

6.7.2 Overcoming Challenges and Putting the Plan in Place

CAL FIRE has worked with military aviation since the mid-1970s. Lessons continue to be learned, technology continues to evolve, and policies and procedures try to keep pace.

CAL FIRE's preference is to use an MHEM on board every military helicopter, not only for the aforementioned reasons but because military aircrews often specifically request them. The

MHEM also acts as the direct liaison between the military and Air Operations Branch Director (AOBD) on the incident. However, when the number of military helicopters exceeds the number of MHEM's, assignments must be prioritized. This typically means assigning the MHEM's to Guard aircraft equipped with the proper radios, thereby taking full advantage of their capabilities over the fire.

For those aircraft that are left without MHEM's or compatible radios, CAL FIRE provides an alternate form of aerial supervision. CAL FIRE has adapted the traditional Helicopter Coordinator (HELCO) position into a dedicated role of managing only a handful of military helicopters. This Military Helicopter Coordinator (MILCO) is typically on board a light civilian helicopter leading between two and four water-dropping military ships through the FTA. The MILCO works for either the HELCO or the ATGS on the fire and often is the only communications link between them and the military aircraft. More than a radio link, the MILCO provides tactical insight, recommends dip sites, and maintains safe separation from civilian aircraft.

Inevitably, there will be large-scale incidents when there are not enough MHEM's or MILCO's to go around. When this happens, the operational theater must maintain flexibility with a constant eye on safety. Despite external pressure to utilize every available aircraft on the fire, it is the collective responsibility to ensure that the plan is sound.

When the military designed its communications system, it did not do so in order to integrate into civilian emergency support. Their focus was less on interfering with other signals in the air and more on signal strength and security. However, the military is investigating the possibility of permanently installing compatible radios into their helicopters. However, this will take time – probably years – to achieve. In the interim, NIFC has offered the use of a plug-and-play system that would enable one person per helicopter to use their handheld radio as part of the aircraft's intercom system.

6.7.3 Conclusion

The military has a surprising amount of capabilities that can assist far beyond water-dropping helicopters. In Southern California alone they have provided aerial image-sensing and mapping, retardant dropping, bulldozers, and equipment rinsing, to name a few.

Military Section Source Authors:

Thomas Humann, fire pilot for CAL FIRE, served as the department's Aviation Safety Officer and Military Program Administrator (2005-09). Prior to 2005, he was a Marine Corps major, attack helicopter pilot, and White House pilot on Marine One.

Ray Chaney, Battalion Chief for CAL FIRE, currently oversees the Ramona Air Attack Base and Gillespie Interagency Helitack program with the San Diego Sheriff's Department. Chief Chaney has 24 years of service with CAL FIRE. He serves as the Deputy Incident Commander on CAL FIRE Incident Command Team 6.

6.8 CITYGATE PERSPECTIVES

By 2010, multiple agencies in the County have found ways to enhance and add firefighting and EMS aerial response capabilities. This is the good news. However, significant operational headaches remain that require on-going study and resolution. There is overlap between the management of the programs, some have inadequate facilities, and the Sheriff and San Diego Fire operations have pilot replacement issues over time. Not all the helicopters can do all things, nor is there an integrated measure of just how many helicopters with maximum capabilities are needed full-time in the County. Each program grew somewhat in isolation and was forced to adapt to the funding and resources the parent agency could provide it.

The agencies, principally CAL FIRE, have made significant progress on solving the issues of how to integrate military assets. However, it will take continuous coordination and expense on the local agencies part to maintain this effort as military crews and aircraft rotate in and out of San Diego area bases.

Finding 6-1: Citygate believes that while aircraft are complex, expensive tools to operate, the Achilles Heel of all three programs – CAL FIRE, Sheriff and San Diego Fire – is the ability to provide trained pilots. The aircraft are worthless without pilots trained in Southern California wildfire conditions. All three programs expressed this concern to Citygate. It is most immediate in the Sheriff's Department, but the others also will face it.

Finding 6-2: Citygate sees aircraft program management overlap and logistical expense duplication due to differing approaches by multiple aircraft operators. Some have inadequate physical facilities. Some have to outsource maintenance, which is likely more expensive. As in ground-based fire services in the County of San Diego, there is program fragmentation. However, in the case of aircraft, there are so few that it fails the common sense test to have so many individual fire helicopter programs for so few ships and pilots.

Recommendation 6-1: The County of San Diego should support the San Diego CAL FIRE Unit request to place a new helicopter in the County of San Diego that would result in an additional "twin engine" helicopter with staff in the County. This would accomplish the County's goal of adding a helicopter module to the County without the need for local government funding. The new "twin engine" helicopter also meets the CAL FIRE requirement for night firefighting capabilities under the FIRESCOPE and CAL FIRE guidelines. The County would benefit by having the state purchase the helicopter ($12 million), provide required maintenance, provide a relief fire helicopter, and fund the annual CAL FIRE staffing cost ($1.5 million per year).

Recommendation 6-2: The County of San Diego also should work with the state to continue the partnership between the County Sheriffs Department Aviation Unit and CAL FIRE San Diego. The loss of the Governor's Executive Order *annual 2 million dollar* firefighter staffing for Copter 10 and 12, would seriously compromise the program. Alternative funding sources should be explored to provide permanent funding for the program. Options include County-funded CAL FIRE staffing [Schedule "A"] for the helicopter program with the County receiving reimbursement for fire response from the agency with jurisdiction. This would include reimbursement for the Schedule "A" staffing on the County helicopters. An Advanced Life Support or paramedic component of this program should be considered as an augmentation to the current helicopter rescue program. CAL FIRE Paramedics would enhance this already outstanding program.

An alternative to the above State-funded suggestions could be a long-term partnership between the County of San Diego and CAL FIRE. A partnership where the County funds the helicopter and pilot and CAL FIRE permanently funds the firefighter positions could allow the current program to continue. The County purchase of an additional "twin engine" Type Two helicopter for the Sheriff's Department could also increase the surge capacity with three firefighting helicopters plus having a helicopter available for night operations.

Recommendation 6-3: At a minimum, the helicopter agencies should establish a joint working group or formal Joint Powers Authority (JPA) to solve the issues of:

a. Training replacement pilots;

b. Providing certified helicopter mechanics at a joint price;

c. Secure the funds to maintain the CAL FIRE aerial assets now dependent on the Governor's order for funding;

d. Secure the funding to continue the training and radio equipment capability programs to integrate military assets.

Recommendation 6-4: Long-term, the helicopter agencies need to seriously consider, via contracting or through a JPA, establishing a singular, fire department managed aerial operations unit.

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SECTION 7

FIRE DISPATCH CENTER REVIEW

7.1 SECTION INTENT

Citygate was asked to take a summary or macro-level review of the region's fire dispatching system and to identify any issues or system changes that should be further assessed by the County and affected agencies.

7.2 BACKGROUND

While it is evident that someone, somewhere has to receive 911 calls and dispatch fire equipment, as with all things in public safety, even dispatching has become very technical. From dispatch computers, radios, dispatch console ergonomics, to back up power supplies and earthquake survivability, the list of technical issues that impact the adequacy of public safety dispatch is long.

In addition, there are the human issues of training and retaining qualified public safety dispatchers. For fire service dispatching, the type of training is also different from that of police or only initially answering the 911 phone lines. Fire service dispatching goes much further than just getting the right response force launched; it impacts scene incident command and safety. Dispatchers must track the units on-scene, anticipate their needs, and in a safety program, remind them of where the duration clock stands during dangerous work. When the scene Incident Commander needs a little or a lot of mutual aid, the dispatcher has to be trained in how to request and manage outside resources.

Last, but not least, is the cost benefits balance for how many dispatchers should be on-duty at different periods for expected call volumes. Determining the number of dispatchers needed on duty is difficult because last year's call volumes do not always predict this year, since emergency needs are very situational. The modern fire dispatcher is a specialized, critical safety component of Incident Command and the dispatch center needs to be adequately staffed.

All dispatching computer systems have become very complex and expensive. Today, many dispatch systems have geographic mapping components, building pre-incident planning information, integration with the phone company 911 system and the ability to push data out to mobile data terminals in fire and ambulance apparatus.

In addition to the equipment, software and training needed for dispatching firefighting and technical rescue, there are the Emergency Medical System dispatch components. Many fire and EMS communication centers today train the dispatcher to provide life saving "pre-arrival" instructions to 911 callers such as how to perform CPR. Some centers also use sophisticated medical algorithms to triage the severity of the call for service need and then differentially dispatch the most appropriate type of unit, and not always with lights and siren.

These pre-arrival and type of dispatch sorting systems are very expensive and require medical oversight and annual updates. The dispatchers must be trained and certified in these systems. Their use, while saving precious resources in large systems with thousands of calls, also carries a very real impact if a mistake is made. Given this, many small suburban centers cannot afford the software and training costs to deploy pre-arrival instructions and/or differential dispatch systems.

Given the above operational needs and costs, plus the physical costs of buildings and earthquake redundancy, many suburban agencies have slowly consolidated their dispatching operations. This has been and is still occurring in the County of San Diego.

7.2.1 Command and Dispatch Center Differences

To be a *Command Center*, as opposed to a *Dispatch Center*, the facility must have a trained and experienced fire officer on duty. Usually this is a fire captain, called by various titles such as duty officer or deployment captain. While current computer aided dispatch software can do some amazing things, there are times in a busy center when key decisions must be made that the computer simply cannot do.

The fire officer on duty is authorized to make incident command decisions concerning the incident until the arrival of an on-scene incident commander. This may be to augment or reduce the number of units dispatched based on additional information; it may be to alert key logistical support personnel; and in the event of a disaster to establish area command and allocate resources.

After the arrival on-scene of the incident command officer, the fire officer in the Command Center may need to form mutual aid resources, order the move-up and cover of remaining units to balance what remains uncommitted, assist in establishing incident supply facilities, coordinate the use of incident management teams and assure an orderly demobilization process at the conclusion of a major incident.

If there is no command officer in a dispatch center, the command functions listed above are handled by officers in the field by telephone and radio without the benefit of all the displays, communications equipment and other features in a modern dispatch facility, while also having to drive to or be in command at an incident. When this occurs, not every task gets done well or in a timely enough manner.

7.3 COUNTY OF SAN DIEGO SYSTEMS

Currently for fire dispatching operations, all of the local government agencies in the County of San Diego are dispatched from five centers, four of which are sub-regional. The military bases do their own dispatching and must be coordinated with when they assist the mutual aid system.

In April 2009, a separate study of dispatch centers was conducted by the San Diego Regional Technology Center located within the San Diego State University Research Foundation via a federal Homeland Security grant. Many countywide fire leadership groups, agencies and the Unified Disaster Council supported the study effort. The summary facts about the centers below are from this study:

The five dispatch centers are:

1. CAL FIRE
2. City of Escondido (Police and Fire)
3. Heartland Communications JPA
4. North County Dispatch JPA
5. San Diego City Fire-Rescue.

7.3.1 CAL FIRE

This center is located in the eastern urban area. The United States Forest Service dispatch function is co-located in this center. In addition to CAL FIRE needs, the center provides fire dispatch services under contract to 14 local government, Tribal and volunteers agencies, mainly in the eastern County areas. Many of these departments are in the emerging San Diego Fire Authority area. The center's Fiscal Year 2008-09 *personnel* budget was $2 million and uses 20 employees. The center has certified Emergency Medical Dispatchers. The dispatch computer is fairly new and part of a statewide, CAL FIRE standardization project. This center is a ***command*** center as it staffs a fire command officer full-time to make real time decisions in support of the software programs and individual dispatchers.

The CAL FIRE Center also has the responsibility to be the countywide Fire Mutual Aid coordinator for the movement of "in and out of County" fire mutual aid resources. The CAL FIRE San Diego Unit Chief is the designated countywide mutual aid coordinator by the San Diego County Fire Chiefs Association.

7.3.2 City of Escondido (Police and Fire)

Escondido operates a communications center for police and fire functions, staffed by dispatchers supervised by the police department. There is no fire command staff function in the dispatch center. The Escondido center also dispatches for the small Rincon Del Diablo Fire Protection District adjacent to Escondido. The center does provide EMS pre-arrival instructions to 911 callers. The Fiscal Year 2008-09 budget was $377,005 and it employees a total of 19 dispatchers.

7.3.3 Heartland Communications JPA

This center is the oldest tenured sub-regional operation in the County, operated by a multi-agency Joint Powers Authority. There is no fire command staff function present in the dispatch center. The Heartland center serves 22 fire departments in the eastern and southern County, 12 of which are JPA members, with the other 10 as contract for service members. The center's Fiscal Year 2008-09 budget was $1.5 million and employs 14 personnel. The center provides

EMS Medical dispatching and also dispatches the Mercy Air helicopters in the County under contract.

7.3.4 North County Dispatch JPA

This center is also a long established Joint Powers Authority with recent growth in members. There is no fire command staff function present in the dispatch Center. The North County center is co-located with the Rancho Santa Fe Fire District headquarters. They serve a total of 18 agencies, mainly in the Northwest County. There are 8 JPA members and 5 contract for service members. In Fiscal Year 2008-09 their *personnel* budget was $1.7 million and they employ 18 personnel. The center provides EMS medical dispatching and serves as a backup to the CAL FIRE center for fire mutual aid coordination.

This center has a modern hardware/software system and is currently well into an agreement with the Heartland Center to "merge" hardware and software so that Heartland can "replace" its systems by buying into the North County systems. The two centers and JPAs will stay physically separate, but share hardware and software. However, North County is starting a process to identify a replacement building and that study will include space for Heartland, should a full JPA merger be determined feasible.

7.3.5 San Diego City Fire-Rescue

The San Diego Fire-Rescue department has always operated its own center and was a pioneer in consolidating fire dispatch via contracting. Their first contract was with the Poway Fire Department starting in 1976. Today, in addition to Poway, the center also serves Chula Vista. The San Diego City dispatch center is staffed as a *Command* center with fire officers. San Diego's center is also a back up to CAL FIRE, has served as the County's mutual aid coordinator in different periods and has a modern hardware/software system. In Fiscal Year 2008-09 their *personnel* budget was $4.2 million and they employed 33 dispatchers. Their computer system is the same as North County's so the two centers are closely linked and can offer zero lag time automatic dispatching of the closest unit in joint boundary areas.

7.4 COMMON ISSUES

Not all of the dispatch centers can afford *command* staffing levels with trained fire officers, the latest technology, have stable funding sources, or fiscal reserves for future electronic equipment or building replacement needs. All have different policies regarding the staffing to workload ratio and performance goal measures. Not all are highly earthquake redundant or have a "hot site" to an out of County/state back-up location in the event of major earthquake damage. San Diego, North County and CAL FIRE are linked to each other so if one goes down for a minor technical glitch, they can continue operations, but not if an earthquake destroys one or more centers.

It is common for public safety dispatch centers to have recruitment, training and retention issues related to issues with wages, hours and working conditions. Public safety dispatchers are not always paid on a scale similar to front line safety employees, and the training loss curve is high for new hires, as not all applicants can successfully handle the type of work and the associated

stress. Larger regional centers can be more successful due to economies of scale in managing these issues.

Escondido is the last non-regional fire dispatch center that is a joint police/fire operation. In addition to the issues stated above that most all dispatch centers encounter, Escondido additionally has to cross train and retain dispatchers for *both* police and fire skills and coordinate with other centers for fire mutual aid, which slows the mutual aid system in that section of the County. Lastly, Escondido has to pay the technology cost for a system to dispatch a modestly sized city when that same system can handle far greater call volumes.

7.5 CITYGATE PERSPECTIVES

While there are five dispatch centers serving the County of San Diego, other counties in California successfully operate countywide fire dispatch JPAs. This also occurs in other states. There are very large, singular, regional fire dispatch/command centers in the state (for example, City and County of Los Angeles, and the Orange County Fire Authority). Modern dispatch hardware and software systems are scalable and can handle tens of thousands of calls for a cost similar to what Escondido has to pay for a small suburban city system. The principal cost difference as dispatch centers become larger is the number of dispatchers/consoles and supervisors on duty. Fire dispatch centers can grow to almost any size; the art is to get the building large enough for the number of dispatch consoles needed per peak shift periods.

For comparison, below is how Los Angeles County Fire Department operates from one command/dispatch center:

> *In early 1991, a modern center was built on "base isolators" to minimize any damage from any earthquakes. Back up power is maintained at all times by two diesel generators in addition to an uninterrupted power supply. The Fire Command and Control Division, better known as "Dispatch," is one of two divisions within the Department's Special Operations Bureau, and is commanded by an Assistant Fire Chief.*
>
> *The Dispatch team is managed by three shifts of battalion chiefs and captains, plus 13 supervising fire dispatchers, four fire dispatch specialists (coordinators assigned to Training, Quality Improvement, Geo-file, and Radio Inventory), and 74 dispatchers who serve as the first point of contact each day when members of the public dial 9-1-1 for help. Last year, more than 450,000 phone calls were received at the Center, including a daily total of over 650 incidents, or* ***260,000*** *annually. It is considered to be one of the busiest centers in the nation.*
>
> *Fire Command and Control dispatchers receive calls from throughout Los Angeles County's borders, including 59 contract cities, all unincorporated areas, and the Angeles and Los Padres National Forests. Calls are received through the 9-1-1 telephone system, local area 7-digit emergency numbers, "ring-down" lines from other agencies, and/or by radio from units in the field. The Center's minimum staffing consists of two supervisors and 12 dispatchers, with maximums of three supervisors and 19 dispatchers to handle the 1,400 phone calls received daily.*

Los Angeles County FD Dispatch Center

7.5.1 Observation

As the deployment section of this study measured, in Fiscal Year 2008-09 the entire County of San Diego fielded **262,614** emergency incidents or the comparable call for service volume of the L.A. County center at 260,000 incidents. There is no technical reason that one fire dispatch center cannot handle all of the County's fire services.

As an order of magnitude comparison, the five County of San Diego dispatch centers employ 104 personnel and only two have fire command level staffing. L.A. County, including all of the command and quality assurance staffing, employs 97 people. The five San Diego centers are spending approximately $10 million annually on personnel, plus overlapping costs on independent technology systems.

Finding 7-1:	Even given this report's abbreviated review, there are clearly too many fire dispatch centers in the County of San Diego. Ideally, there would be one or at most two. The most likely two would be the City of San Diego, given its size and call volume, and one for the rest of the County, including CAL FIRE.
Finding 7-2:	Citygate broadly endorses the eight (8) recommendations of the 2009 dispatch center study to ask the parties to work through the issues in the direction of merger, and in the short-term, using technology links to eliminate lag time when requesting resources between centers.

Finding 7-3: Citygate compliments the Heartland and North County JPAs on making progress towards at least a dispatch technology merger. These efforts should be supported and encouraged to proceed to talks about a full merger of the JPAs.

Recommendation 7-1: Citygate recommends that the County and City and Fire District leadership groups empanel a task force to identify and overcome the barriers to dispatch center consolidation.

Recommendation 7-2: Citygate recommends that in the near term, at least Escondido obtain pricing from one or more centers and select one with which to consolidate its fire dispatching. If this and a full Heartland and North County merger were to occur, the centers would consolidate from five down to three large ones – CAL FIRE, San Diego City and North Comm/Heartland, whose centers are already technology interlinked.

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SECTION 8

LOGISTICAL SUPPORT REVIEW

8.1 SECTION INTENT

As part of the deployment study, Citygate was asked to undertake a high-level review of how the fire agencies handle obtaining and distributing firefighting supplies such as protective clothing, and fire apparatus. The term "logistics" refers to the process of purchasing and distributing anything from fuel to fire hoses that must be purchased to equip the firefighter and their units for duty.

8.2 BACKGROUND

8.2.1 CAL FIRE and the San Diego County Fire Authority

Logistical support is an area that required examination to see if there were easily identified efficiencies that could be applied on a wider basis than is currently done. To examine this facet of San Diego County Fire Services, Citygate met with representatives of CAL FIRE and the County Fire Authority. These agencies were chosen since they operate a service center that provides logistical support to their operations.

- The County/CAL FIRE Service Center provides 7/365 to support the field. It is staffed by two Fire Logistics Officers; one of the positions is County funded and filled by a retired annuitant. They have no clerical support.
- The service center does bulk personal protective equipment (PPE) purchases. The local government fire departments that contract with CAL FIRE do their own structural fire PPE purchases independently of the Service Center, while the wildland PPE comes from the joint service center. There is a move afoot to do a bulk purchase of all PPE, although the problem at this point is a cash flow issue of getting the agencies to be willing to contribute the money to a centralized purchase without first having possession of the property.
- The Service Center also carries hose, medical aid supplies and other items not readily available that might need to be resupplied in a hurry. They also stock all of the items to outfit new apparatus when it arrives to be put into service.

In the North Zone of the County, a number of departments also cooperate in logistical support by establishing joint purchasing specifications. They have a monthly meeting to discuss these and other issues. There is, however, no formal organization.

8.3 CURRENT SITUATION

8.3.1 Apparatus Purchase

The consolidated purchase of apparatus is an area in which there could be both direct cost savings and a savings of administrative time. Some departments do already tag onto a purchase order of another department if they like the specification that has been completed by a neighboring agency. Some larger departments (not in the County of San Diego) will make major purchases of up to 100 units at a time; although a major purchase would be any number larger than 10 or so units. When departments make larger purchases they get the advantage of economies of scale and the price per unit goes down. Other agencies, if they find that the specification meets their needs, under the California Government Code can then legally tag onto the larger purchase and take advantage of the same price as long as there are not many variations to the original specification and price.

Multi-agency purchasing of apparatus is not a widespread practice among fire departments in California because fire apparatus is all essentially custom-built to the specifications of the purchaser. Departments are, however, guided by nationally accepted standards developed by the National Fire Protection Association and these standards, when followed, ensure that a community is getting a piece of equipment that will have a safe and long service life.

Frequently, this whole concept of custom-built apparatus is questioned; however, it is important to consider that even the largest fire apparatus manufacturer's annual production is not much more than a thousand units and most manufacturers build many less than that. In addition, each community has different needs, accessibility, types and sizes of buildings, road networks and many other factors that come to play. The County has no written vehicle replacement policy. They do have a Capital Replacement Program to fund replacement of principal apparatus after 15 years of front line use. When CAL FIRE and/or San Diego County Fire Authority make an apparatus purchase they have a committee that gets collective input and develops the specifications.

In order to purchase small tools and equipment, most fire departments in the County now rely on "just-in-time" purchasing programs provided by the fire tool and equipment vendors. This saves the agencies the cost of warehousing and tying up capital. In addition, the distribution of an order to many fire stations can be done faster and at less cost by FedEx or UPS than a government employee delivering items if they were being stocked in a central warehouse operated by the Fire Authority, CAL FIRE or some other combination of local agencies. Only the largest departments have the need or economy of scale to run their own logistical operations.

8.3.2 Apparatus Maintenance

When the unit is placed in service, the County's maintenance program strives to follow CAL FIRE policies and practices; however, the County does not have certified mechanics to maintain the units. They are aware of this shortcoming and are moving to address it.

In contrast, while not all CAL FIRE Mechanics that work on CAL FIRE apparatus are certified, the fleet managers are. The fleet managers oversee the practices carried out by the CAL FIRE mechanics as well as by vendors that CAL FIRE, like all other fire departments, uses. Most of the mechanics are certified or are in the process of becoming certified. For example, when a fire agency hires a new mechanic from CAL TRANS, that person will have to go through the certification process, which takes a few years because the California Fire Mechanics Academy only runs for one week annually.

CAL FIRE maintains some equipment for local fire agencies under a contract arrangement. Each CAL FIRE cooperative agreement is different. An agency can contract for CAL FIRE to staff the local agency's fire engine without contracting for maintenance. Alternatively, an agency can contract for full maintenance, routine maintenance, use its own shops or have vendors provide the maintenance. Regardless of the situation, CAL FIRE will still use vendors to do much of the work in their shops, such as pump or engine rebuilds or bodywork. The CAL FIRE fleet manager is certified and knows which vendors to trust.

The County Fire Authority is working on constructing more County facilities geographically closer to the areas where they are needed (for example, the east side of the County). Currently, the travel times from the fire stations to the repair facilities takes the better part of a day in some cases. This means that two volunteers are tied up for a day, one in the fire apparatus and one in a chase vehicle taking the fire apparatus into the shop. When the apparatus is ready for pick-up, the process is reversed. Having a nearby repair facility would assist with this issue as would a mobile mechanic to perform small repairs at the fire stations.

The County is working on establishing just such a "mobile mechanic" program along with evaluating the best mix of sub-regional "minor" repair facilities with large County facilities and outside vendor repairs. Mobile mechanics in many instances will help in the same way that a sub-regional repair facility will help. The mobile mechanics should only work at fire stations where there are personnel, for safety reasons.

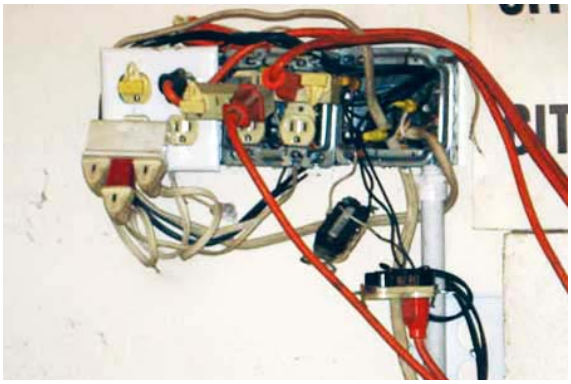
8.4 CITYGATE PERSPECTIVES

Finding 8-1: While logistical support might appear to be an area where considerable savings could be made through joint purchasing of small equipment and supplies, the general consensus is that the "just-in-time" availability of most items from vendors is more cost effective than agencies creating and operating a central warehousing and delivery operation. This outsourcing of warehousing and delivery to the vendors is a practice that is now very common among fire agencies in California, as they have measured the cost effectiveness of continuing to operate their own local "stores" operation.

Finding 8-2: As discussed in Section 14 on volunteers, development of common apparatus specifications, joint apparatus purchasing and sub-regional apparatus maintenance at maintenance centers and/or through mobile mechanics is an issue that the County needs to address aggressively. With leadership in this area it is likely that other agencies in the County of San Diego would join in on purchasing and maintenance with a cost savings and improved service for everyone involved.

Recommendation 8-1: Following current best practices from NFPA, the County and CAL FIRE need to jointly develop an apparatus procurement and maintenance plan. Part of that plan needs to include a fire apparatus maintenance training and certification program for the technicians and operators.

Recommendation 8-2: The larger agencies in the County should consider establishing a logistical support Joint Powers Authority (JPA) to publish supply specifications, issue bids and decide what goods to store locally versus direct delivery from the source to each fire station.



SECTION 9

FIRE PREVENTION REVIEW

9.1 SECTION INTENT

Even in a fire station deployment study, understanding a region's ability to control fires before they start is also important. Citygate was asked to globally review the region's fire prevention coordination and based on that assessment, form opinions as to what increased coordination might be further considered.

9.2 BACKGROUND

Citygate conducted a listening session at one of the County Fire Prevention Officers' meetings. At the meeting and subsequently via email, Citygate distributed a follow-up survey to the prevention officers, but there were an insufficient number of responses to develop significant metric measurements. The monthly Prevention Officers' discussion centered on wildland/interface prevention issues and funding.

9.3 WILDLAND / URBAN INTERFACE ISSUES

The mix of buildings and open-space areas throughout much of the inhabited County presents on-going fire prevention challenges. Building owners who now understand they live or work near wildfire threats desire weed abatement or fuel reduction programs. Many of the methods used for annual abatement where conversion to fire resistant landscaping is not practical are subject to environmental regulations and controversy over impacts to the environment.

The Fire Prevention Officers' Association feel there should be a base-level weed abatement standard countywide. The varying standards create confusion among the members of the public and require sometimes-lengthy explanations by the prevention officers when the jurisdictional boundaries abut each other. Application of the standards would become consistent, and if a community needed to deal with a particular situation, then that community could add to the base standard.

The Biological Diversity Preserves established in 1997 by the Federal Fish and Wildlife Service add another dimension to the Wildland Urban Interface (WUI) situation with which the prevention officers are struggling. These regulations limit, if not completely prevent, weed and

fuel reduction abatement programs in some habitat zones. In the County of San Diego, the U.S. Fish and Wildlife Service, under the Endangered Species Act, has interest in the following:

- The 85 sensitive plant and animal species in the County of San Diego;
- The California Gnatcatcher habitat;
- The Multiple Species Conservation Program.

9.4 County of San Diego Fire Prevention Programs

Since the two fire storms, the County has invested significantly in fire prevention. Under the Direction of the Group General Manager for the Land Use and Environment Group, within the Department of Planning and Land Use (DPLU), a fire prevention section was established. Currently, DPLU is tasked with maintaining the Fire Code for County responsibility areas, fire code building construction plans checking, watershed coordination, weed and fuel abatement, inspections and fire codes enforcement, and coordination of the County Fire Authority. In all, there are 14 County personnel assigned to these program functions.

Over the recent years, the County Fire Prevention staff has developed a set of codes and prevention practices second to none in California, in Citygate's opinion. Under the umbrella term "Code Plus" the statewide basic fire codes are enhanced to include:

- Maintenance of current, best practice building and fire codes;
- Use of fire resistive landscape with a 100-foot defensible space requirements;
- Use of residential fire sprinkler systems;
- Assurance that roads are set back from slope edges by as much as ten feet to provide safe access by fire apparatus and exit by residents;
- Requirement of adequate water supplies for firefighting;
- Where appropriate, requirement of vegetation modification around an entire community;
- Requirement of review of landscape plans to ensure they meet standards.

Since 1987 for residences in the County responsibility areas, the County has required residential fire sprinklers in new residences due to the existence of any of the following conditions: access roads less than the current standards; access road grade 15 percent or greater; canyon or rim location; response time greater than 10 minutes; hazardous brush area; inadequate water supply; structure fire flow exceeds 1,500 gpm; or other factors as determined by review, such as topographic features. The result is that by 2010 approximately 50 percent of the total numbers of dwellings in the County responsibility area are protected with interior residential fire sprinklers.

9.5 Service Delivery and Funding Issues

All the prevention programs are facing budget reduction pressure. During tight economic times, many agencies will reduce fire prevention and public education programs before they reduce emergency operations. One result of budget reduction can be to change to part-time positions (such as a half-time plan checker and a half-time inspector) or one person handling two

assignments, either of which require a high level of technical skills and for plan checking, code certifications. The result is often that the person doing two jobs is not certified in both.

The Fire Prevention Officers suggested establishing a countywide Fire Prevention Joint Powers Agreement (JPA). Communities would buy into the JPA and in return receive, as needed, personnel with the requisite skills and certifications in arson investigation, building plans checking, and building inspection services. This would ensure a larger staff capable of taking care of surges in demand, and it would ensure that skill sets were retained, as full-time specialists would handle technical specialties. Most field inspectors would be generalists. This would allow a career development track, which many small agencies cannot manage. Given that most Building and Community Development Departments now use software systems, there should not be an insurmountable problem with a central prevention office coordinating with smaller cities and fire districts. Further, a "field" level fire prevention inspector(s) could still be assigned to each local fire or building department.

9.6 Code Enforcement Concerns

According to the Prevention Officers, the Fire Code and Health and Safety Code violation sections are not in the County criminal law computers. This means that bail schedules are difficult to find for prosecutors and judges. Since these are not violations that prosecutors and judges rarely see in the normal course of criminal law, nor are their designated prosecutors assigned to this work, the workload of the prevention officers is increased when they do bring a case to court. They have to train the legal staff anew each time on the safety codes and enforcement options.

Ideally, there would be a single citation program countywide. A single countywide citation program would include citation format, citation processing, standard bail schedules, etc. and would allow a common training base for district attorney and court staffs.

9.7 Citygate Perspectives

For its responsibility areas, the County fire has made fire prevention a priority with integrations to the general plan update and land use planning. As is the case in any region with multiple agencies, the cities, the fire districts and the County do not have a comprehensive set of universally adopted polices outside of the basic fire code for issues such as fuel reduction standards and methods, weed abatement standards, residential fire sprinklers, fire resistive landscape design, etc. Some of this individuality is needed in some local situations; at other times it can complicate the application and approval for a project where the applicant does business with multiple agencies and does not understand each agency's requirements.

Recommendation 9-1:	The agencies should align as much as possible the fire prevention supplemental fire code provisions across the County. Since all agencies do adopt the basic statewide building and fire codes, they can strive for countywide common regulations on supplemental fire prevention requirements. A limited term task force with one-time, shared funding should be developed to do the integration of these requirements.
Recommendation 9-2:	To assist with the burden of providing certified and experienced fire prevention staff in all disciplines in the smaller agencies, some of the agencies and/or the County should take the lead in researching the formation of a sub-regional or countywide fire prevention Joint Powers Authority (JPA) similar to the dispatch JPAs. This JPA could jointly fund and operate centralized technical prevention activities such as plan checking, fire code violation enforcement, wildland fuel reduction and arson investigation programs to name a few.

SECTION 10

FIREFIGHTER TRAINING REVIEW

10.1 SECTION INTENT

While the County's study is focused on the deployment of resources in fire stations and fire apparatus, it is firefighters that perform the needed duties. As such, their training, the complexity of delivery and the potential or not for multi-agency cooperation is of interest to all of the agencies in the system. Given this, the County asked Citygate to conduct a high-level review of how training is provided and where opportunities for improvement might exist.

10.2 BACKGROUND

Training is a significant aspect of fire service operations. The job of a firefighter is extremely complex and the services they deliver must be delivered correctly every time. This is particularly critical for those tasks that are very hazardous or involve human victims at extreme risk. While these situations do not occur very often, when they do, there is no decision time. In risk management, these kinds of activities have the greatest potential for calamity. Standard, ongoing, realistic, verifiable training is the only way to ensure that the first responders, who must act in these situations, do it "right" every time.

In addition, most fire service emergency tasks are team tasks, so each member of the team must be trained to know what the other team members are doing, and they must work collaboratively. If fire departments are isolated from each other, how they train and the subjects on which they train has little consequence to neighboring departments. However, in the County of San Diego, virtually all departments participate in some form of mutual aid, and in most cases, automatic aid. Consequently, when operating together they need to be synchronized and collaborate; in other words, they need to train cooperatively to work cooperatively.

To address this issue, Citygate included training in its online survey instrument and conducted an in depth review of the fire training programs in the County of San Diego. This investigation consisted of interviews, a meeting with the County Training Officers Section of the County Fire Chiefs Association, a meeting with Ken Barnes the San Diego City Fire Department Training Chief, a meeting with Mike Scott the El Cajon Fire Chief and head of the Heartland Training Joint Powers Authority (JPA), a SWOT (Strengths, Weaknesses, Opportunities, Threats) Survey for the training officers, reviews of documents and follow-up phone calls and emails. The result of this effort is a composite picture of the current state of fire training countywide.

It is important to note that there are few required training standards either at the national or state level for firefighting. The Occupational Safety and Health (OSHA) programs cite themes that should be addressed, but there are very few actual requirements or minimum course hours specified. Thus, the bulk of fire service training is designed, delivered and its effectiveness measured by each fire department.

There are required training minimums for emergency medical service by the State of California, as well as State OSHA requirements for some technical rescue activities and hazardous materials response; however, except to be trained for emergency first aid, there is no legal requirement for fire departments to engage in providing services other than firefighting. Yet, if an accident occurs and CAL OSHA is required to investigate, they will want to see how the training was and if at all, to determine if the employee had been reasonably prepared for the task that injured them.

Training in the fire service has two parts: Vocational training, which teaches the skill sets necessary to do the "hands-on" type work that firefighters do, and education that teaches the knowledge necessary to do the firefighter's "mental" work.

The countywide issue in San Diego is not whether each department has an adequate training program. Citygate's study is a countywide focus; thus, the question for this report is do the departments have a regional or sub-regional focus as part of their training programs? Do they train based on common standards and practices and do they train together? The answer to that is a qualified yes. As will be seen in the information below, some activities, such as the annual wildland fire drill, have all the components of a regional training program, while the "annual" high-rise drill has yet to happen.

10.3 Common Issues

The San Diego County Training Officers Section of the County Chiefs Association Board of Directors met with Citygate on October 6 for a morning-long discussion of training in the County of San Diego.[14] The discussion focused solely on regional training issues.

The training officers identified what they call their common ground needs. These are ideas that they unanimously believe will strengthen the regional training program.

[14] Attendees included – Larry Beck, National City, Joe Bunn, Encinitas, Greg McAlpine, La Mesa, Dan Collins, CAL FIRE, Mike Blood, Coronado, Mike Stein, San Miguel (UASI), Brad Rushing, Alpine FPD

1. **The fireground operations policy needs an overhaul and a regional bias**. The operations policy needs to lead training; not vice versa. This was a problem voiced many times and appears to be one of the larger issues preventing a truly regional approach to training.

2. **The operations command chief officers regionally need to identify common fireground procedures (nomenclature, ways of doing things, orders of events).** Then the Training Officers can design programs to implement them. If there were common procedures, the training officers could train to those procedures. They are reluctant to do the procedure development themselves for two reasons: they do not have the authority to establish those procedures countywide; and if they did without multi-agency agreements, there still remain inconsistent practices that can lead to confusion when agencies operate together under the stress of emergencies. Confusion can lead to mistakes and even injury to firefighters.

3. **The departments need to give up some of their individuality for the common good.** Regional or sub-regional procedures will not occur until departments are willing to agree on common standard operating procedures at emergencies (a playbook by another name). This situation is somewhat like what occurred in the 1970s when the fire service adopted the Incident Command System. At that time, large agencies had to give ground and make significant procedural and cultural changes in order to have a common incident command system. Today, it is a model system.

4. **There is a need for easily reachable training facilities in many parts of the County.** The training officers were unanimous in their agreement that a travel time of 15 minutes or less to a training facility was ideal and a travel time of 30 minutes was the maximum they could comfortably send in-service units for scheduled training. To send units farther away means creating response time gaps in the deployment system that become too large as units are having to overlap coming and going from the training facility. This leaves the sending agency thin on resources. If the traveling units were not to overlap their driving time to training, then the training center itself would not be used as many hours per day.

10.4 TRAINING FACILITIES

Within the County, there are 14 separate training facilities. These sites have the following capabilities:

- 11 – facilities include burn-buildings where live fires can be attacked and firefighters can develop their skills under controlled conditions.
- 12 – facilities include classrooms for didactic training.
- 9 – facilities include props built for practicing roof ventilation, gas firefighting, confined space rescue, forcible entry, trench rescue, hazardous materials response or structural collapse to name a few.

- 11 – facilities include a drill tower for learning and practicing high angle rescue, ladder evolutions, use of standpipes and sprinkler systems, and firefighting skills in multi-story buildings.
- The facilities with burn-buildings, props and drill towers generally have a large paved surface that can be used for driver training and to practice apparatus placement incidents. Some of the facilities on the drawing board also include props that simulate a business district or residential area.
- 2 – facilities (Carlsbad and the second one in Heartland) are not yet built but are approved for construction and should be operational by 2012.

County of San Diego Training Facilities

Agency	Facility Type	Geographical location	Latitude/ Longitude	Notes
CAL FIRE	C-	2249 Jamacha Rd, El Cajon, 92019	Lat. 32.44908 N Long. 116.55527 W	
Carlsbad Fire Department	*B, C, P, T*	2560 Orion Way, Carlsbad, CA	Lat: 33-13-77N Long: 117.26-66W	Approved for construction-4 story commercial building with interior and exterior stairs, standpipe/sprinkler system and burn room1 story residential structure with burn room;High angle rescue prop;Vehicle fire prop; Vertical Ventilation prop;Forcible entry props
Chula Vista Fire Department	B, P, T	850 Paseo Ranchero, Chula Vista, CA	Lat. 32-38-21.58 N Long. 117-00-45.19 W	Training tower, confined space underground prop, roof prop, confined space silo prop, rubble pile prop, forcible entry prop, Denver prop, Pumping prop, Heavy objects (moveable) prop
Escondido Fire Department	B, T	310 North Quince, Escondido, CA	Lat. 30-07-12 N Long. 117-05-22 W	5 Story Training Tower by WRG. Water cistern with 2500 gpm pump, w/ splash wall. Burn Rooms on 1st and 2nd floor; simulate kitchen fire, wall fire, flashover prop, bedroom fire, and vehicle fire. 3rd, 4th, and 5th floor designed for mid-rise simulations with
Heartland JPA	B, C, P, T	1301 Marshall, El Cajon	Lat. 32.813294 N – Long. 116.975604 W	Live fire training building, 5-story tower, State Rescue Systems 2 and Confined Space Operations certified, rubble pile for urban search and rescue.
Heartland JPA	B, C, P, T	11998California 54, Spring Valley, CA 91978	Lat. 32-44-25.12 N 116-56-44.03 W	New Facility, not yet under construction

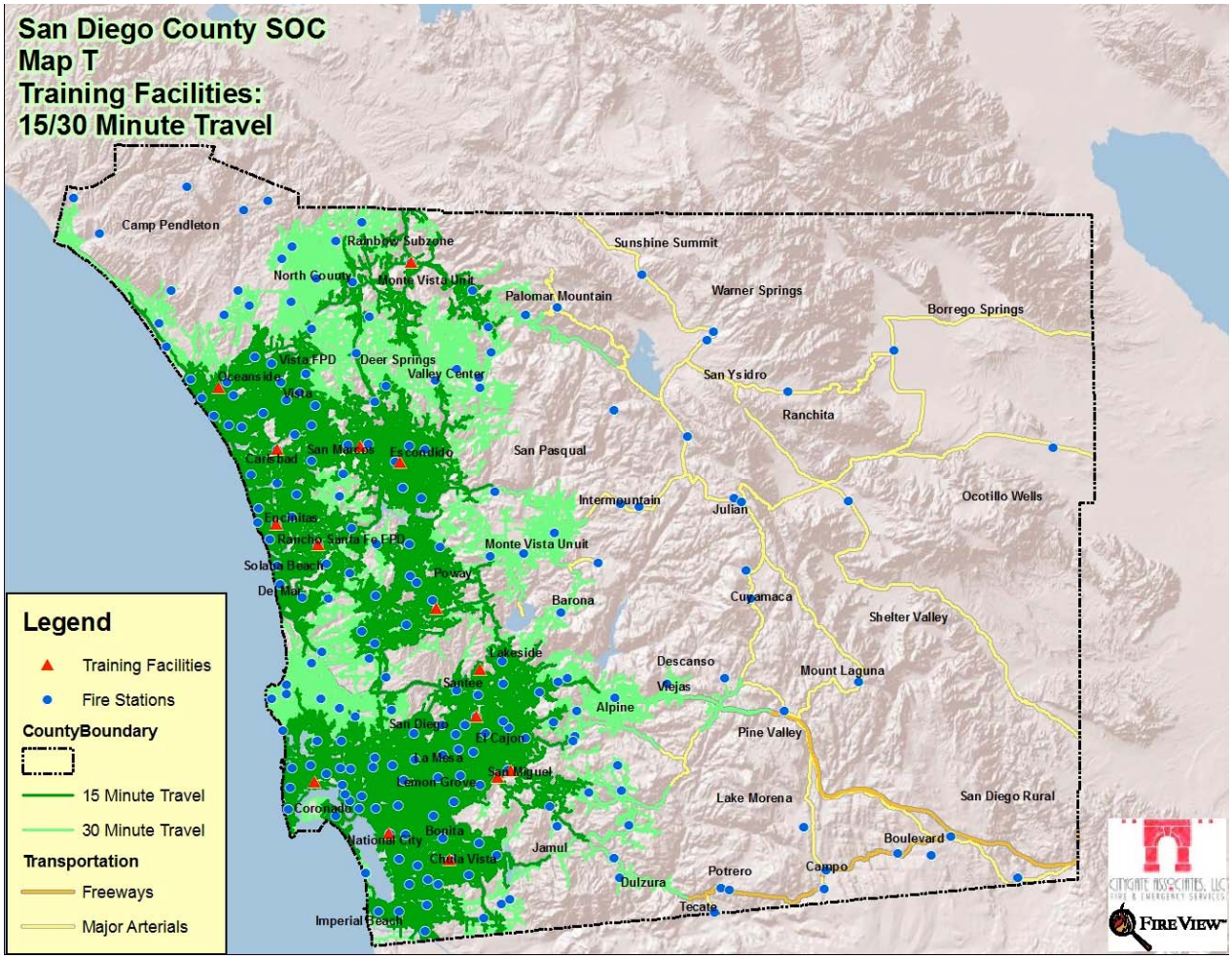
Agency	Facility Type	Geographical location	Latitude/ Longitude	Notes
National City Fire Department	C, T	343 East 16th Street, National City	Lat. 32-40-14 N Long. 117-06-04 W	5 Story Training Tower with rappel wall with anchors and outside fire escape Propane burn prop Vertical ventilation prop Wall breach prop Denver prop Forcible entry prop Confined spaced vertical rescue prop Smoke machine Fire FDC sprinkler connection and
Oceanside Fire Department	B, C, P, T	110 Jones Road, Oceanside, CA	Lat. 33-12-42.97 N Long. 117-21-13.44W	Classrooms, confined space, ventilation, tower, burn building, forcible entry prop.
Pala Fire Department	C, T	34884 Highway 76, Pala, CA 92059	33°21'50.73"N 33°21'50.73"N	Tribal Fire Department
Poway Fire Department	B, C, P, T	12325 Crosthwaite Circle, Poway, Ca 92064	Lat. 32.94385 N – Long. 117.0348 W	
Rancho Santa Fe	B, C, P, T	16936 El Fuego, *Rancho Santa Fe,* CA 92067	Lat. 33-01-11.18 N Long. 117-12-25.72 W	
San Diego Fire Department	B, C, P	Lindberg Field	Lat. 32°44'N Long. 117°10'W	Classrooms, props, large burn building, large area
San Marcos Regional Training Facility	B, C, P, T	184 Santar Place, San Marcos, CA	Lat. 33-08-28.90 Long. 117-08-48.92	
Santee Fire Department	C	10601 Magnolia Ave, Santee CA 92071	Lat. 32-52-10.70 Long. 116-58-15.61	2 Classrooms

Facility Types: B = Burn Building; C = Classroom; P = Props; T = Tower

The map below reflects in dark green the geography that is within 15 minutes travel time of a training facility, while the light green shows the 30-minute travel time area. The greatest part of the rural County area, and much of what is and will be within the County Fire Authority area, is more than 30 minutes travel time from the nearest training facility. This means that in order to use these facilities for much needed "hands-on" training, units will have to be a long response distance from their fire responsibility area, and it will require volunteers to give up additional time in order to meet training requirements. These two issues associated with travel time have together contributed to the limited use of training facilities by rural fire departments, limited the

joint training exercises, and limited the ability of training officers to develop and implement common training standards and procedures that must be practiced by different departments training together at common locations.

Training Facilities in the County of San Diego Showing 15-minute and 30-minute Travel Distances from the Facilities and the Impacted Stations



Number of San Diego County Fire Stations Within Travel Distances of Training Facilities (not including federal stations)

Travel Distance to a Training Facility	Number of Stations	Percentage of Stations
Less than 15 minutes	115 Stations	52%
Less than 30 minutes	75 Stations	33%
More than 30 minutes	34 Stations	15%
Total Stations	224 Stations	100%

Stations that are More than 30 Minutes from a Training Facility

Station Name	Station Type	Agency Name
Pine Valley Fire Station	Full-Time	Pine Valley Fire Protection District
Boulevard Volunteer Fire Station	Part-Time	Boulevard Fire and Rescue
Campo Volunteer Fire Station	Part-Time	Campo Volunteer Fire Department
Campo Reservation Fire Station	Part-Time	Campo Reservation Fire Department
San Diego Rural Tecate	Part-Time	San Diego Rural Fire Protection District
San Diego Rural Potrero	Part-Time	San Diego Rural Fire Protection District
San Diego Rural Jacumba	Part-Time	San Diego Rural Fire Protection District
San Diego Rural Descanso	Full-Time	San Diego Rural Fire Protection District
Intermountain Volunteer Fire Station	Part-Time	Intermountain Volunteer Fire & Rescue
Palomar Mountain Volunteer Fire Station	Part-Time	Palomar Mountain Volunteer Fire Department
Sunshine Summit Volunteer Fire Department	Part-Time	Sunshine Summit Volunteer Fire Department
Ranchita Volunteer Fire Station	Part-Time	Ranchita Volunteer Fire Department
Santa Ysabel Reservation Fire Station	Part-Time	North County Reservation Fire District
Ocotillo Wells Volunteer Fire Station	Part-Time	Ocotillo Wells Volunteer Fire Department
Julian-Cuyamaca Volunteer Fire Station 71	Part-Time	Julian-Cuyamaca Fire Protection District
Julian-Cuyamaca Volunteer Fire Station 74	Part-Time	Julian-Cuyamaca Fire Protection District
Shelter Valley Volunteer Fire Station	Part-Time	Shelter Valley Volunteer Fire Department
Mount Laguna Volunteer Fire Station	Part-Time	Mount Laguna Volunteer Fire Department
San Diego Rural Lake Morena	Part-Time	San Diego Rural Fire Protection District
De Luz Volunteer Fire Station	Part-Time	De Luz VFC
CAL FIRE Campo	Full-Time	CAL FIRE
CAL FIRE Cuyamaca	Full-Time	CAL FIRE
CAL FIRE DeLuz	Full-Time	CAL FIRE
CAL FIRE Potrero	Full-Time	CAL FIRE
CAL FIRE White Star	Full-Time	CAL FIRE
CAL FIRE Julian	Full-Time	CAL FIRE
CAL FIRE Warner Springs	Full-Time	CAL FIRE
CAL FIRE Witch Creek	Full-Time	CAL FIRE
Ramona Municipal Water District Fire Station 81	Full-Time	Ramona Municipal Water District
Mesa Grande Reservation Fire Station	Part-Time	Mesa Grande Indian Reservation
Borrego Springs Fire Station	Full-Time	Borrego Springs Fire Protection District
Jacumba Volunteer Fire Station	Part-Time	San Diego Rural Fire Protection District
North County Reservation Fire - Santa Ysabel	Part-Time	North County Reservation Fire District
Warner Springs Volunteer Fire Station	Part-Time	Warner Springs Volunteer Fire Department

Water contamination from runoff fire training streams is another constraining issue. Handling this water on site before discharge to storm sewers or open waterways adds to the cost and makes locating towers and doing training with water difficult. Another issue in maximizing the use of regional facilities is the need to ensure that fire companies can be "out of service" while in training rather than having to leave in order to respond to a call for service in their area of responsibility. This is particularly an issue with single station fire departments and fire districts with widely dispersed fire stations. To permit fire companies to be "out of service" would require a mutual aid system of move-up and cover or selected drawdown of an area during training hours. This entails coordination between the various dispatching systems and centers; coverage by other departments for extended periods (away from their own jurisdictions and their responsibilities such as inspections); and achieving this would require sub regional consolidated training schedules, training protocols and the associated formal agreements.

There are some areas of progress along these themes. For example:

Heartland TFA: Case study of success

2009 marked a significant year for the Heartland Training Facility Authority (HTFA). It planned for the construction of a second training facility in San Miguel and anticipates the addition of more signatures on the JPA as other departments in the area see the value of working together to provide training facilities that none of them could afford to build or operate as separate entities.

The HTFA has been a model of regional cooperation and collaboration between multiple fire agencies for 35 years. The Owen Training Center (OTC) in the City of El Cajon currently serves the HTFA. This facility was built in 1971 on 1.5 acres. It includes a classroom, drill tower, training grounds, burn building and other props for emergency services related training. It is located at 1301 Marshall Avenue, El Cajon. Organized under a joint powers agreement, the current membership of the Heartland Training Facility Authority includes the City of El Cajon, City of La Mesa, City of Santee, Lakeside Fire Protection District, San Miguel Fire Protection District, Alpine Fire Protection District and Viejas Fire Department.[15] A Board of Commissioners administers the Joint Powers Agreement. There are two ways that an agency can become a partner in the facility: either by joining the JPA and becoming a member or by contract with the JPA. Contract agencies have the same access to the facility and programs as members do, but they do not have a seat on the board. Under state law, tribal departments cannot join a JPA, so the Board of Commissioners is considering developing a Memorandum of Agreement (a contract) with the tribal partners in lieu of membership.

As the Authority has expanded memberships, the facility has simultaneously become more crowded. Eastern San Diego County's population was much smaller when the training center was designed. In addition, training requirements have changed substantially since 1971. Emergency medical response programs, especially paramedics, were in their infancy; technical rescue including crash

[15] Also see Section 11 of the report, *Tribal Fire Departments Review.*

extrication, confined space rescue and hazardous materials response was just getting started and no standards existed. Fortunately, planners in 1971 had the foresight to see the need for a facility that could provide these training in these services.

Through an agreement between the San Miguel Fire Protection District on property owned by the Otay Water District and $400,000 seed money from Indian Gaming Funds, the HTFA is embarking on a major expansion project with a new facility (estimated to cost $3.9 million) to be located at 11894-11998 California Highway 54, Spring Valley. This facility is six air miles from the current facility and about a fifteen-minute drive from the current facility. This will allow reasonable access to the facility by stations that otherwise would have been too far away to take advantage of the facility without going out of service. As it is, with two training facilities there will have to be a more elaborate move-up and cover plan than is currently in place because more agencies will be in training simultaneously.

The new facility, when completed will include the following:

- Joint Emergency Operations Center
- 5-story training tower
- 2 story residential/commercial training annex
- 4 classrooms to accommodate classes up to 30 persons each, apparatus storage building
- EMS simulator room
- Fireground command simulator
- Numerous other props for various types of rescues and fire situations
- Large training ground.

In addition to this expansion, the original site is being refurbished. After 35 years of use, it is showing signs of wear and needs to meet current codes and requirements. HTFA has also placed into service a mobile fire-training trailer that can be taken directly to remote locations allowing personnel to stay in their district.

With the exception of approximately $100,000 per year in materials, supplies and services for each site and about $135,000 per year per site for a training captain, costs of all other staff is paid through exchange for access, course fees, college support or member assessments.[16]

Revenue includes member assessments and contractual memberships at $918 per firefighter per year; course revenue, which brings in about $15,000 per year, and facility rental, which generates approximately $5,000 per year. This expansion is another example of how cooperation and collaboration pay off. To quote their business plan that supports their efforts –

[16] Heartland Training Facility, Business Expansion Plan, undated manuscript. P. 19-20

"The vision of this expanded business plan is to develop a combination of fixed facilities, mobile facilities and training programs that can serve the region and a variety of agencies well into the future. These agencies include fire services, emergency medical services and public utilities. There are many advantages to this regional approach. They include:

- Shared costs of facility construction. It is very difficult for a single agency to raise the required capital to build a facility. By sharing the costs, the facility becomes more affordable.
- Shared ongoing operational costs. Training facilities and programs have ongoing operational costs that can be shared in a cost effective manner.
- Shared training programs and staff. Agencies share the same needs to deliver mandated and new training programs. By sharing the training programs and staff duplication of effort is minimized.
- Shared training programs and facilities equal operational effectiveness. The process of training together translates into more effective operations during emergency incidents.

These advantages to a regional approach have proven to be effective for the membership of the Heartland Fire Training Authority for 33 years. With the addition of a second site and new partners, the vision can be expanded on a larger scale."

10.4.1 Facility Rental

If a department does not own a training facility or it has no access through a JPA, then it will have to rent the facility for the duration of the need. For some very small agencies, this makes sense as they can flex their schedules enough to fit in to available time slots.

Sampling of Facility Rental Costs[17]

Facility	Heartland	Poway	Rancho	San Marcos
Classroom	$150/Day	NA	$250/Day	$70/Hour
Drill Ground/Classroom	$400/Day	$400/Day	$400/Day	$40/Hour
Environmental Building	$250/Day	$200/Day	$200/Day	$100/Day
Pump Test Pit	$65	$50	$50	$25/Hour
Heavy Rescue Props	$250/Day	NA	$150/Day	NA

[17] Heartland Training Facility, Business Expansion Plan, undated manuscript, P. 12.

10.5 REGIONALIZED ENTRY LEVEL FIRE ACADEMY TRAINING

In the County of San Diego there are four academies that could qualify as regional or sub-regional: San Diego City Fire Department, CAL FIRE, Heartland and North County/Palomar College.

One of the barriers to having a truly regional training academy system using common procedures and standards is that hiring processes and policies vary from department to department based on city, district, tribal or state policies. Some agencies require pre-employment training, either an academy or an EMT or paramedic course or both. Three cities (San Diego, National City and Chula Vista) and CAL FIRE hire non-paramedics. Other departments require new hires to be certified paramedics.

There are some combined testing processes, such as the one used by the North County consortium. The Training Officers investigated a possible countywide Candidate Physical Agility Test[18] (CPAT); however, they report that the organization that owns CPAT required 100 percent countywide participation and some departments do not accept CPAT as the physical agility test. Some departments accept current CPAT cards that prospective employees have obtained on their own. One training officer observed that a problem with combined testing is that a manager is looking at a hire decision that will, in most cases, last 30 years; thus, who and how an employee is selected is an important issue for each department.

10.5.1 On-Line Training –"Target Safety"

Target Safety[19] is a private organization in Rancho Bernardo, providing an on-line Internet training program. City administrations and police departments use it as well as fire agencies. All mandated training, with the exception of field firefighting, is available. In 2002, La Mesa started using Target Safety for mandated training, and in 2005, Target marketed driver/operator requirements and confined space training to National City. Emergency Medical Technicians can now get one hundred percent of their continuing education (CE) requirements from it while paramedics can get 50 percent of the required CEs. Target also includes a records management function that training officers can use. As a tool for regional training use in specific areas, Target Safety has many users and has much to recommend it, particularly for agencies that are a long distance from training facilities where skilled trainers are more likely to be available.

10.5.2 Regional Cooperative Care Program

The Regional Cooperative Care Program (RCCP) is a partnership between the fire department and American Medical Response (AMR). The fire departments in this partnership include National City, La Mesa, San Miguel, and Bonita. Looking at possibly joining are Alpine, Coronado, and El Cajon. All of these departments use AMR for medical transports, and the program is AMR funded. This is a cooperative group to run paramedic quality assurance delivery. Among other things, it takes care of Quality Assurance requirements for the engine based paramedics.

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[18] The Candidate Physical Ability Test, administered by CFFJAC, measures the capabilities of firefighting recruits along eight job-specific areas.

[19] *Target Safety* offers online fire safety training programs for the pubic services industry.

This approach answered the need for a focal point to manage the system. One training officer commented, "The fiscal challenges facing the fire service have now made us get together to make the system work more cooperatively. Without the funding crisis, we would not be talking." Two agencies that do their own transport now want into this system. Now, the challenge is to find common ground. This model of regional training standards and delivery in the EMS field can be a similar model for fireground and specialty services training standards and delivery.

10.5.3 Chief Officer Academy

The City Manager's Association is developing a countywide Chief Officers' academy that will provide training focusing on budget preparation, council presentation, report preparation, and other areas that are unique to the fire chief's job. It will be 80 hours of training with tuition of about $1,800.

10.5.4 County Wildland Drills

The annual countywide wildland drills is one thing that all of the training officers pointed to with pride as a truly regional training effort. The drill lasts four days: the first day is on a weekend to accommodate volunteer firefighters; then 3 days during the week, one day for each, A, B, and C shifts. Participants come in strike team formation. Over 1000 participants attend each year. Instructors come from all over the county, with departments contributing the training resources they have available.

The drill is set up like an incident base with a series of training stations that the participants attend including both in-base as well as field exercises. Trainees get an opportunity to get their Incident Management System position task books signed off during the drill to assist them in achieving certification through the California Incident Command Certification System (CICCS). Like many other operations, funding is an issue. The County training officers are trying to take responsibility for a shared funding formula to cost share this and other training events like it.

10.5.5 Additional Observations and Common Issues identified by Training Officers

In addition to all the above information, the training officers had some further thoughts on training that do not fit into any particular category but provide provocative insights into their perspectives and challenges.

- It should be easier to fund training regionally than for each agency to operate its own program due to the economies of scale cost savings, particularly for small agencies.
- Continuity of training officers is a big issue. Most departments have a rotation system of one or two years and so program continuity and knowledge suffer.
- There has been a major paradigm shift in the County of San Diego among fire personnel to understand that "training isn't free." Training needs to have a dedicated funding stream. There should be some type of per capita funding.

10.6 SAN DIEGO CITY

San Diego City Fire Department (SDFD) is a very large operation in real size as well as in comparison to other fire departments in the County of San Diego. The City Fire Department, because of its size, constitutes a sub-region itself. The SDFD operates 47 fire stations and 9 permanent lifeguard stations staffed with 1,162 personnel protecting over 330 square miles and 1.3 million people. For this reason, Citygate reviewed SDFD's training program to assess its contribution to the total region.

SDFD has a large training facility adjacent to Lindberg Airport. It is a former military facility on 13.5 acres governed by a JPA. Equal partners in the JPA are the City, the County and San Diego Community College District. The college uses two buildings for teaching fire technology. The Fire Department has the northern quarter plus a number of old barracks buildings it can use until they are torn down for an Emergency Vehicle Operations Course (EVOC) course. Currently, the Police Department and the Sheriff's Office use a condemned building for SWAT training.

SDFD's facility is currently used for both Basic Academy Training as well as in-service training. Occasional special event training occurs here as well, such as two one-day seminars.

- Basic Academy—This is operated in conjunction with the San Diego Community College District for funding purposes. This requires that the courses be open to outside student enrollment. San Diego also keeps a few slots open for Rural/Metro Paramedics. Typically, this curriculum is about 15 weeks long, but may be longer for a large class in order to ensure every one makes it through training.
- In-Service Training—These are classes for the whole department. They generally are focused on developing and/or refining skill sets. They usually start with a short didactic lesson followed by a manipulative session where the skill is put into practice. Typically, it takes 6 weeks to run the entire San Diego City Fire Department through the facility for a given in-service training subject (3 shifts, over 60 companies plus chief officers). This could be a telling metric when assessing the regional training capabilities. Informally this is open to other departments in the zone. Most in-service training is driven by OSHA requirements. The OSHA training requirements and EMS in-service training comes before fire training in priority

The Department would like to expand the reach of the training, but some important policy issues need to be resolved. For example, if it was more regional, then the issue becomes one of who pays for what and how that works in practice. The second issue that has been mentioned in other contexts as well: whose training policies prevail? In the context of a number of small to medium sized departments, this can be relatively easily resolved. When a much larger organization is thrown into the mix, it becomes very problematic. A change for a six-company department is easier than a change for a sixty-company department

One of the suggestions from San Diego City is that perhaps there should be four training centers in the county:

- San Diego City
- South County (Chula Vista)

- East County (Heartland) (El Cajon)
- North County (Palomar).

Using the above metric times four, the regional capacity would be 240 companies in a six-week period. The average staffing on the staffed apparatus is 2.3 firefighters, divided into the 914 on-duty firefighters yields an average of 397 companies staffed daily. Most companies work the three-platoon system. Thus, for the purposes of analyzing the training workload, the total number of career companies would be close to 1,191. Four training centers would each be responsible for about 298 career companies. If it takes 6 weeks to train 180 companies (San Diego's 60 times three shifts), increasing the number by 60 would indicate that it would take 9 weeks to train 298 companies. This does not take into account the thirty-six departments that identify themselves as partially or wholly paid/call or volunteer firefighter staffed. The paid call and volunteer firefighters could utilize these same facilities on the weekends, which is about 28 percent of the total availability or 64 days of availability during each 9-week training cohort and should be adequate to meet their needs.

Because the City is so spread out for travel time purposes, they would also utilize the closest facility based on distance, realizing that it may not be their own. Likewise, other departments that found the Sand Diego facility closer could use it. Regional centers would be used for Basic Training and In-service Training. Specialized training would be done countywide at the facility best suited to handle that specific type of training.

Coordinating and scheduling this would be a huge undertaking and would require a great level of cooperation. In a single countywide department with one command/control system this would be easier, but still a substantial challenge. Achieving this level of cohesiveness (298 companies in 9 weeks) also presupposes few interruptions for emergencies, mechanical failures and communications breakdowns.

One fire training chief added, "Although, if you build it, they will come, seems at the outset to be operative, the reality is that, yes they will come but to do their own thing, not at a consistent countywide or even regional standard training as there is no countywide or regional training standard." This is a refrain that Citygate consultants heard consistently during their assessment of the training program. A step-by-step approach was suggested.

1. Conduct a comprehensive training needs analysis. From this, determine where there is the common ground.
2. Develop base level performance expectations that are translated into training requirements that departments agree to meet. Turn these expectations into policy. Recognize that policy has costs. The higher the expectation the costlier it is to train a firefighter. Develop a countywide performance and drill manual that meets the base level performance expectations, created by a countywide cross sectional committee that the chiefs support.
3. Utilizing recognized standards, develop a minimum instructor qualification requirement to meet the varied instructor needs of the County. This would include a broad range of standards, including but not limited to, Office of State Fire Marshal course certification, field experience in the subject being taught, specialties such as confined space rescue or hazardous materials response, and subject matter experts in niche training such as ladders or salvage covers.

4. Finally, with the preceding preliminary work completed and accepted, develop funding mechanisms that support training and ensure that training dollars from a using agency actually support the training effort of the providing agency.

10.7 COUNTY OF SAN DIEGO FIRE TRAINING STANDARDS ACCEPTANCE

- All of the training officers who are members of the County Chief's Training Officers Association received a SWOT (Strengths, Weaknesses, Opportunities, Threats) survey. Out of 37 departments that have representation on the training officers group, ten were returned with data.
- The National Fire Protection Association (NFPA) has several recommended standards that apply to fire-service training. These standards have no force in law; however, they are "industry standards," and as such, can attain a legal standing if they are recognized and adopted by the community of interest, which in this case would be the County of San Diego. What is interesting is that the fire departments generally adopt those standards that apply to their needs and their ability to afford the training commitment that goes with them. This sample is about one sixth of the departments in the County of San Diego and only covers those departments that actively participate in the training officers section of the County Chief's Association. The sample is still an indicator, as these departments also represent a large number of firefighters (815 or more than one-third of all the firefighters in the County). The training officers who responded to the survey indicated the following responses on their surveys.

NFPA Training Standard Adoption Compliance

Standard	Adopted	Partially Adopted	Not Adopted	Notes
NFPA 1001 Standard for Fire Fighter Professional Qualifications	10	0	0	
NFPA 1002 Standard for Fire Apparatus Driver Operator/ professional Qualifications	6	4	0	
NFPA 1006 Standard for Rescue Technician Professional Qualifications	2	5	3	Not all departments conduct technical rescues
NFPA 1021 Standard for Fire Officer Professional Qualifications	4	6	0	
NFPA 1031 Standard for Professional Qualifications for Fire Inspector and Plan Examiner	2	7	1	This may not be in the training officer's area of responsibility
NFPA 1041 Standard for Fire Service Instructor Professional Qualifications	4	5	0	

Standard	Adopted	Partially Adopted	Not Adopted	Notes
NFPA 1401 Recommended Practice for Fire Service Training Reports and Records	3	6	1	
NFPA 1403 Standard on Live Fire Training Evolutions	9	1	0	
NFPA 1404 Standard for Fire Service Respiratory Protection Training	9	1	0	
NFPA 1451 Standard for a Fire Service Vehicle Operations Training Program	3	4	3	

10.7.1 Comments

- NFPA 1001 *Standard for Fire Fighter Professional Qualifications*—This standard establishes the basic qualifications for Firefighter I and II. All agencies reported that they have adopted this basic standard. These are the basic skill sets that all firefighters use on a regular basis and usually learn in basic training at academies.

- NFPA 1002 *Standard for Fire Apparatus Driver Operator/ Professional Qualifications*—The standard sets forth the performance objectives for driver/operators of all types of fire apparatus and emergency vehicles. All the agencies reported that they have adopted this standard at least partially. Due to the liability exposure that fire departments incur when operating fire apparatus in emergency situations, adoption, at least in part, is very important as a supplement to issues the California Vehicle Code does not cover.

- NFPA 1006 *Standard for Rescue Technician Professional Qualifications*—This standard delineates the performance objectives for firefighters who perform technical rescue. Technical rescue is a broad term covering the various kinds of specialized rescue work that fire departments often perform. All of these activities require specialized training, expensive specialized equipment, and in some cases, specialized apparatus to transport the gear and provide a base of operations.

  For some of the activities, there also are legal requirements that must be met. Because of this, not every agency takes on the task of performing technical rescues. Some agencies elect to perform some of these tasks based on their need. For example, if flooding from a nearby river is an issue for a community, that department may develop a swift-water rescue capability. Another, such as San Diego City with a large industrial base, has a Hazardous Materials Response Team. Communities with automatic aid agreements may support each other by specializing. For example, one department may do confined space rescue, while the one next door responds to high angle rescues.

- NFPA 1021 *Standard for Fire Officer Professional Qualifications*—This standard covers the four levels of fire officer progression: Fire Officer I, Fire Officer II, Fire Officer III, and Fire Officer IV. Qualified leadership is the cornerstone of effective fire departments. All of the departments that responded to the survey have adopted at least part of this standard. Unlike law enforcement with its Peace Officer Standards Training (POST) program, there is no mandate for fire officers to achieve these standards.

- NFPA 1031 *Standard for Professional Qualifications for Fire Inspector and Plan Examiner*—This standard describes the professional performances of the fire inspector and plan examiner. Both this standard and the next one focus on the qualifications of personnel assigned to specialized positions where the liability exposure is higher than in most other areas of the fire service. When fire inspectors conduct inspections, it is essential that they cite the correct codes; when they examine a plan, a serious mistake can cost a builder thousands of dollars in unneeded expense or expose the public to greater risk from fire. Likewise, the training officer, mentioned below, must be competent to drill and teach the material correctly.

- NFPA 1041 *Standard for Fire Service Instructor Professional Qualifications*—This standard guides the development of the fire-service training instructor through the three levels of advancement: Instructor I, II and III.

- NFPA 1401 *Recommended Practice for Fire Service Training Reports and Records*—This standard includes all aspects of training documentation, such as training schedules, reports, records, legal characteristics of training records, record management systems (RMS), and means to evaluate the RMS. Departments that have purchased off-the-shelf training record software are probably already in compliance with this standard. They should verify this with the software vendor.

- NFPA 1403 *Standard on Live Fire Training Evolutions*—This standard outlines the procedures required for safe live fire training. Yet, there is not better means to teach firefighting tactics that to do this in a controlled environment.

- NFPA 1404 *Standard for Fire Service Respiratory Protection Training*—This standard covers the proper use, inspection, maintenance, and program administration of Self Contained Breathing Apparatus (SCBA). The SCBA is the firefighter's lifeline when fighting fire or in any other hazardous atmosphere that is Immediately Dangerous to Life and Health (IDLH). It must work perfectly every time.

- NFPA 1451 *Standard for a Fire Service Vehicle Operations Training Program*—This standard covers the minimum requirements of a vehicle operations training program. One of the highest risk activities that the fire department engages in is operation of fire apparatus, responding to and returning from fires as well as operating on the fireground. Large, powerful and technically complex, operating fire apparatus requires extensive training and testing. Adherence to this standard ensures that apparatus operators have the basic minimum training required.

In addition to NFPA standard adoption, the questionnaire also asked about other aspects of training:

Other Aspects of Training

Activity	Yes	No	Comment
Participate in a "joint training" academy for new hires	6	2	Planning another joint academy in the north part of the county
Participate in the Office of State Fire Marshal (OSFM) certification program for the fire service California Fire Service Training and Education System (CFSTES)	9	1	
Participate in the California Incident Command Certification System CICCS	8	2	All agencies use both FSTEP and NWCG training programs
Participate in the training program offered through the National Fire Academy (NFA)	6	4	On-campus courses 4 Off-campus courses 5
The groups that participate in the NFA programs			Fire Chief 2 Chief Officers 5 Company Officers 3 Specialists 1 Prevention Officers 4
Agency has executive Fire Officer (EFO) Program Graduates	1	5	Unknown 2
The department uses Distance Learning	6	4	
The department has a Continuing Education program	10	0	
Pay or benefit incentives for training	1	9	
Department has a dedicated training facility			Classroom(s) 6 Tower 5 Burn building 6 Other props 4 Planning a facility 2
The required minimum number hours of drill per year			All reported 240 hours; this meets the ISO required minimum of 2 hours per shift; 20 hours per month

10.8 CITYGATE OBSERVATIONS

From data available, it appears that cooperation in training of new recruit firefighters is popular in the County of San Diego. In addition to the departments represented in this survey, San Diego

City trains recruits for other departments besides its own during its academies. This has the advantage of maximizing the utilization of scarce resources for what is generally regarded as a labor-intensive activity. In addition, this practice facilitates the integration of procedures between departments, which makes mutual aid easier on the fireground. It also helps break down the cultural barriers that exist between departments. As time goes on, this will permit more cooperation and more joint activities.

The limited participation of Chief Officers in the National Fire Academy's (NFA) programs was surprising. The training offered by the NFA is first-class, and the only cost to the department is the employee's time and the cost of meals while at the Academy. Of particular note is the lack of graduates of the Executive Fire Officer (EFO) program. This program, designed for fire chiefs and persons in line to become fire chiefs, is highly acclaimed and would greatly enhance the leadership of fire departments in the County of San Diego.

The County/Region also enjoys two (Miramar and Palomar Community Colleges) strong career fire technology programs and supports the Basic Fire Academies and core classes. With the recent addition of the San Diego County Fire Authority, standards for the Volunteer FD's are becoming more consistant.

All the agencies in the North Zone participate at various levels using standardized training methods to increase operational effectiveness. This improved considerably when the North Zone departments adopted a standardized training manual through multi-agency participation and cooperation. This occurred with strong leadership from the North Zone Training Chiefs. This then led to cooperation and willingness between agencies in the North Zone to develop a zone-wide Emergency Operations Manual and Administrative Manual.

Each department has its own training standard. Even those within a JPA or Zone seem to continue this practice at some level. There is a lack of consistency in opertions in the following areas where cooperation is essential – highrise, rapid intervention crews, command and communications procedures, and rescue practices. These are training areas that most departments develop and train to, but without a clear directive at the countywide level.

Funding in all its various aspects is the most important threat facing the training officers. Currently, many training programs have had to make serious budget cuts. The Federal, state, and local agencies have even cut the required 10 percent of Homeland Security matching grant money.

Throughout the County of San Diego, there is a strong commitment to training at every level. At the sub-regional level, in some cases there is significant coordination of that commitment resulting in efficiencies while presenting quality training. County of San Diego firefighters are receiving training at every level.

The various good programs exist because a firefighter or fire chief championed the idea and brought it to fruition. Citygate found no evidence, beyond the Training Officers Section of the County Chiefs Association and the annual Wildland Drill, of a countywide training effort or training standards. However, in our visits to facilities, listening sessions, and survey instruments we found many similarities that could be built upon. We also found a lot of coordination and cooperation occurring at an informal level. Some of these cooperative efforts can serve as models that could be expanded countywide or modified to fit a countywide footprint.

There is desire, especially among the training officers, to see a countywide training initiative that would result in coordination of activities both in training and at incidents, more effective use of facilities, construction of facilities, where needed, and ultimately, better training for everyone.

10.9 CITYGATE PERSPECTIVES

Based on the observations and measures discussed above in this section, Citygate makes the following findings and recommendations:

Finding 10-1: Training Centers – There are not enough regional training towers in terms of location or in sufficient number to satisfy the countywide training needs if all agencies were training to standards frequently found in suburban fire departments. Manipulative skills are the primary basis of a firefighter's job. While classrooms provide an environment where didactic training can occur, without the follow-up of manipulative training and practice the muscle memory required to function correctly during an emergency will not develop. This is why it is so critical that firefighters have ready access to training facilities. In terms of travel distance, 15 minutes from station to facility should be the goal with 30 minutes being the maximum limit in the urban areas to avoid deployment gaps and to maximize training center utilization.

Finding 10-2: Training Records – There are a number of areas in the training field that can be streamlined. For example, training records tracking is done using a number of different systems, each of which has its champions and detractors. Another area is in standardizing specifications for many items so that firefighters train on similar equipment. Finally, there is a need to develop a common field operations manual similar to that used by North County and El Cajon area agencies.

Finding 10-3: Multi-Agency Cooperation – The Heartland JPA Training business model has a lot to recommend itself for local agencies to combine their resources for the best blend of cost and quality service delivery. Only the very largest agencies can justify sole proprietorship of a very expensive training facility. Most of the fire agencies in the County of San Diego have less than eight stations. Consider that San Diego City has one training facility, albeit very large, that supports 43 stations. Based on the current locations of existing or planned facilities, it appears that in the western County the current number of existing and planned facilities is adequate.

Finding 10-4: Eastern County Training Facilities – Departments on the east side of the County of San Diego have no ready access to any training facilities, with the possible exception of classrooms in fire stations or a few mobile props towed in on trailers. This does not mean that no manipulative training or practice occurs, but there are many skills that are simply better taught and learned where the correct amenities and props are located. Because these stations are so widely dispersed, it would be economically hard to justify erecting enough facilities to meet even the 30-minute travel standard. The rural agencies will have to develop a system that employs large fixed, smaller satellite and mobile facilities to balance need versus travel time to remote centers.

Recommendation 10-1: Commit to Regional Operational Standards and Training Programs – All of the fire agencies have to commit to operating within regional operational standards from which training and other standardization can flow.

Recommendation 10-2: Expand the Informal Training Cooperation to Formal Structures – Existing and new Joint Powers Authorities (JPAs) have to be operated to provide administrative oversight, cost sharing ability and revenue sources for regional training.

Recommendation 10-3: Needs Assessment – Once the regional commitments and JPAs are in place, conduct a training needs analysis. The analysis should cover what common training exists and what common training needs have to be developed. The results of this analysis will drive the resultant need for facilities, and the shared training staff to design, deliver and monitor programs.

Recommendation 10-4: Training Facilities – Develop at least two full-fledged training facilities on the east side of the County. Given that there are a number of tribal departments along the I-8 corridor, perhaps the one on the south end could be a cooperative venture between the County and the tribal departments in that area.

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SECTION 11

TRIBAL FIRE DEPARTMENTS REVIEW

11.1 SECTION INTENT

The Tribal fire departments were invited to be part of this deployment study. Many voluntarily answered the on-line study questionnaire and agreed to participate in a meeting with Citygate. This section is a high-level review of what the Tribal Fire Departments add to the County of San Diego deployment system. Where a Tribal Fire Department answered the deployment survey, their stations and resources were measured as part of the deployment study.

11.2 BACKGROUND

The Tribal Fire Departments are unique in the matrix of fire agencies in the County. The County and local government managed fire departments clearly understand that these departments operate within a sovereign nation status that is largely internally regulated. Many of the tribes have expanded their safety services as their businesses have expanded on their reservations. Several have formed and operate very capable fire departments. Thus these fire departments can choose to participate in the regional firefighting mutual aid system and receive in kind fire mutual aid for something non-routine occurring on their reservation.

There are eighteen Indian Reservations in the County of San Diego, more than any other county in the United States. Fourteen have tribal fire departments (although three do not identify any personnel or equipment) and ten identify themselves as part of the *Indigenous Fire Chiefs Association of San Diego Tribes.* As part of Citygate's assessment of the fire services in the County of San Diego, we included the agencies that not only protect their tribal areas, but also respond within the countywide fire mutual aid system. If measured on a combined basis, these departments provide 50 on-duty staff daily and 25 fire engines, as reflected in the following table.

Table 1 in San Diego County Status of Tribal Fire Departments c. 2009

Reservation Name	Population	Land Acreage	Personnel			Apparatus		
			Daily Staffing	Total	Engines	Trucks	Water Tenders	Other*
Barona	536	5,664	5	38	4			2
Campo	351	15,336						
Capitan Grande	0	15,615						
Cuyapaipe	0	4,156						
Inja & Cosmit	0	846						
Jamul Indian Village	60	6						
La Jolla Band	390	8,798	Vol.	10	3			1
La Posta	18	3,471						
Los Coyotes	70	24,762						
Manzanita	69	3,563						
Mesa Grande	75	1,820		1	2			
Pala	1,573	12,333	10	45	3	1	2	4
Pauma and Yuima	186	5,826	5	12	1			2
Rincon	1,495	3,918	6	27	2	1		1
San Pasqual	752	1,412	7	18	5	1		3
Santa Ysabel	250	15,270		5				
Sycuan	33	632	11	49	2	1	2	8
Viejas	394	1,572	6	26	3	1		2
Totals	6,252	125,000	50	231	25	5	4	21

* Includes command vehicles, utilities and other vehicles not identified

The tribal departments are focused in two general areas, both in eastern San Diego County. Nine reservations are in southern San Diego County, essentially along the Interstate 8 corridor, and the other nine are along State Routes 76 and 79 and east of Escondido in the northeastern part of the County. The departments also are similarly split.

Citygate conducted a listening session with six of the Tribal Department Chiefs and two Assistant Chiefs. During that session, the Tribal Department Chiefs presented their views on fire services in the County of San Diego.

They were very forthcoming with their comments and they provided valuable insights into the issues they face in their distinct situation.

11.3 COMMON ISSUES

11.3.1 Agreements

The Bureau of Indian Affairs is a signatory to the 7-party wildland fire response agreement with the Governor's Office of Emergency Services (OES) (now the California Emergency Management Agency or Cal EMA). This is the agreement that covers wildland fire response "assistance by hire" agreements, where CAL FIRE or the U.S. Forest Service hire local government fire agencies to assist them with wildfires on state and federal lands.

When the San Diego County Fire Authority was formed, it could not include the reservations, The tribes enjoy and are protected by "dependent sovereignty",[20] under their treaties with the Federal Government. While local government agencies and the tribal departments often want to join in mutual aid, automatic aid and joint powers agreements, their sovereign status creates a challenge in crafting formal agreements. It is not an insurmountable barrier because there is no basic disagreement at the tribal level regarding the benefits of cooperative agreements.

The large wildland/urban interface fires of 2007 brought to light the capabilities of the tribal departments. Some are now in the process of developing more detailed mutual aid agreements. The tribal departments now have access to the County email system, which gives them access to information about what is happening in the County fire operation. They see that the County is increasing the level of operational communication with their departments.

11.3.2 Funding

Ten of the tribes have gaming operations. As a consequence, they receive requests for donations. In addition, as a part of their agreements with the state, they give the state funds under the Government Code, Indian Gaming Special Distribution Fund, which gives grants to local government agencies impacted by tribal gaming. Included in the code is a method of calculating the distribution of appropriations from the Distribution Fund, using a formula for nexus of impact.

The County of San Diego, because of the number of reservations and casinos, has a special provision in the law:

> *San Diego County*
>
> *12715.5. In San Diego County, the Indian Gaming Local Community Benefit Committee shall be comprised of seven representatives, consisting of the following:*
>
> *(a) Two representatives from the County, selected by the County board of supervisors.*
>
> *(b) One elected representative from the city located within four miles of a tribal casino in the County, selected by the County board of supervisors.*

[20] While not having full sovereignty as independent nations, the tribes were nevertheless regarded as having authority over their own relations among themselves – an "internal" or "tribal" sovereignty; right to self-government, even though it is "dependent" on the United States.

> *(c) Three representatives selected upon the recommendation of a majority of the tribes paying into the Indian Gaming Special Distribution Fund in the County.*
>
> *(d) The sheriff of San Diego County.*

According to the chiefs, some of the casinos have funded money for fire apparatus purchase to local government fire department operations as an offer of sub-regional partnership. As these partnerships develop, the chiefs would like to see enhanced participation in regional fire services delivery.

11.3.3 Operations

The tribal chiefs commented that many of the County stations located in rural areas need retrofitting and rehabilitation. They suggested that rather than rebuild stations that are near tribal stations, the affected tribe and the County could work together to avoid duplicating facilities. The tribal chiefs also suggested that they could co-staff County apparatus on those occasions when no one else is available. They would like to see a system whereby the tribal volunteer firefighters are incorporated as much as practical and legal into the County volunteer/reserve system.

All of tribal departments provide paramedic service and provide transport either directly or though contract.

11.3.4 Training

In the training arena, there is a difference between two different systems of certifications and qualifications. Because of their federal status, the tribes are under the guidance of the Bureau of Indian Affairs (BIA). The BIA recognizes the certification and qualification system of the National Wildfire Coordinating Group (NWCG). In California, most local agencies receive certification for their training and qualification of the personnel through the Office of the State Fire Marshal (OSFM) and the California Incident Command Certification System (CICCS). While loosely based on the same document for wildland fire qualifications, the PMS 310-1 Wildland Fire Qualification System Guide OSFM and CICCS are voluntary systems. They are established for local government agencies whose primary responsibility is structural firefighting, with wildland as a secondary role.

The Tribal Fire Departments would like to see a standardized system of basic qualifications. The volunteer system emphasizes wildland as part of their training since the volunteer companies are located in the eastern part of the County where the wildland fires tend to be more frequent and more damaging. Much of this issue will become a moot point in the future as the nationally recognized National Incident Management System becomes the de facto standard for all first responders, federal, state or local.

The San Pasqual Tribal Fire Department runs an OFSM-recognized basic firefighter academy. Graduates of this academy meet the California Firefighter I requirements upon graduation, and this opens up many opportunities for the graduates to get jobs in the fire service.

11.3.5 Dispatch

Two of the tribal departments are dispatched through the Heartland JPA Dispatch Center; the remaining departments are dispatched through CAL FIRE. Pala Fire Department pays an annual fee and the remainder pay a per call fee.

11.4 CITYGATE PERSPECTIVES

Finding 11-1: In many cases, the tribal fire departments have capabilities that could be more fully integrated into the regional firefighting delivery system.

Finding 11-2: Tribal sovereignty creates issues in how to develop more formal working cooperation with other departments; however, this can be overcome through appropriately written agreements.

Finding 11-3: The tribal fire departments are trying to fulfill all of the training and education requirements that their neighboring jurisdictions are also trying to fulfill.

Recommendation 11-1: The San Diego County Fire Chiefs Association and the Indigenous Fire Chiefs Association of San Diego Tribes need to further enhance their understanding of each other and each group's role. Initially this could best be done through facilitated meetings with the short-term goal of integrating operations where appropriate through automatic and mutual aid agreements. Eventually the Indigenous Fire Chiefs should be a section of the County Chiefs.

Recommendation 11-2: A small ad hoc task group consisting of attorneys and fire chiefs with appropriate backgrounds needs to research and ultimately develop a model mutual aid/automatic aid agreement that can be used between the tribal departments and the other departments in the County of San Diego.

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SECTION 12

SPECIALTY INCIDENT RESPONSE NEEDS REVIEW

12.1 SECTION INTENT

As part of the deployment study, Citygate was asked to undertake a high-level review of how the fire agencies handle staffing, training, and equipping for responses to specialized emergencies and how the agencies are organize to respond in these situations.

12.2 BACKGROUND

While this study focused on fire engines and fire station locations, there are types of emergencies that need a response by very specialized apparatus and personnel with very special certifications. Given that special apparatus and resultant crews are very expensive to maintain for a low number of responses in some agencies, it makes sense to share these costs regionally. This, in fact, already occurs in the County of San Diego.

Examples of special response needs are:

- Hazardous materials leak and spill responses
- Technical rescues like collapsed buildings and trench cave-ins
- Weapons of Mass Destruction
- Explosives
- Aircraft down on and off the airports
- Marine vessels, pleasure craft and commercial carriers
- Arson investigations and the needed follow-up to arrest and trial
- Special Rescue and Trauma Teams – paramedic support to SWAT etc.
- Mass casualty response and field care teams
- Mobile communication vehicles for command/dispatch at incidents.

In San Diego, every one of the needs above are present and are regionally provided or shared. Some of these themes have been provided for years via regional contracts or Joint Power Authorities (JPAs) demonstrating that the region's agencies do know how to cooperate on shared services.

12.3 OVERVIEW OF REGIONAL SPECIALTY SERVICES

12.3.1 Hazardous Materials; Weapons of Mass Destruction

In partnership with the San Diego County Department of Environmental Health Hazardous Materials Division and under a contract with the County of San Diego, via a Joint Powers Agreement (JPA), the Hazardous Incident Response Team (HIRT) Program provides Hazardous Materials response services to the eighteen JPA member cities in the County as well as the rural and suburban unincorporated areas of the County.

The HIRT team is capable of emergency response for hazard identification and mitigation of chemicals, biological materials, radiological and nuclear materials and explosive material (CBRNE). These hazards are often associated with Weapons of Mass Destruction (WMDs).

The HIRT Team also provides for the identification and disposal of abandoned hazardous waste on city agency property and rights of way. This service is provided by a component of the HIRT identified as the Environmental Response Team (ERT). This is a collateral duty of the cross-staffed HAZMAT Unit.

The primary staffing of the firefighter-based aspect of the team is provided by the San Diego City Fire Department Hazardous (Materials) Incident Response Team composed of two, four-person units. Each unit is crossed-staffed with one Captain, one Engineer, one Firefighter/Paramedic, and one Firefighter, who also staffs a fire suppression Engine Company and a fire suppression Truck Company. The SDFD Program is managed by a Battalion Chief assigned to Special Operations under the direction of the Operations Deputy Chief, Director of Operations. Including the Special Operations Battalion Chief, each of the three Battalion Chiefs assigned to Battalion 7 are also qualified as Hazardous Materials Technicians. The HIRT unit maintains a roster of more than thirty additional fire department personnel who are trained as Hazardous Material Technicians and serve as relief personnel for the permanently assigned personnel.

The other component of the team is provided by civilian hazardous materials inspectors/experts from the County Environmental Health Division, which oversees hazardous materials codes enforcement in many of the cities and unincorporated areas. Depending on the nature of the emergency, one or both parts of the team will respond. The relationship with the County Department of Environmental Health has always been considered a primary strength of the current program. The County provides a dedicated program manager and administrative support.

12.3.2 Explosives and Arson

Several agencies operate bomb squads in the County. The two largest that serve regionally via mutual aid are the San Diego County Sheriff's Unit and the City of San Diego Fire Department Unit. In these two agencies, there is overlap and cross training with arson investigations, which when either type of incident leads to an arrest, the bomb/arson unit partners with the appropriate law enforcement unit.

The Sheriff's unit is staffed by full-time, specially trained and equipped deputy sheriffs. They serve the suburban cities and the

unincorporated areas. They also serve as the backbone for arson investigation outside of the City of San Diego. To assist them, many suburban fire departments have certified fire investigators who respond.

The San Diego City Fire Department Arson/Bomb Squad is currently under the direction of the Operations Deputy Chief and is managed by one (1) Special Operations Battalion Chief. The technical response unit is currently staffed with ten (10) Explosive Device Technicians (EDTs). On average, the SDFD Bomb Squad responds to approximately 275 calls a year.

12.3.3 Technical Rescues (Collapsed Buildings, Trench Cave-Ins and Swiftwater Rescue, etc.)

As society got more complex, so did the situations in which people can become trapped. Today, the rescue equipment and training is very specialized, not often used, and heavily regulated by safety standards agencies such as CAL OSHA. Over time, as the Federal government provided grants to establish "heavy" Urban Search and Rescue Teams (US&R) for catastrophic natural disaster response, these teams were seeded across the Country. Where they located, they became a natural local specialized response unit and most fire departments only have to train to basic or first responder levels of ability.

In the County of San Diego, a National Urban Search & Rescue (US&R) task force (CA-TF8) is sponsored by the City of San Diego through its Fire-Rescue Department (SDFD). Established in 1992 through City of San Diego Council Resolution, the City entered into a Memorandum of Understanding with FEMA. CA-TF8 is one of 28 National US&R task forces in the United States and receives annual funding from FEMA to ensure the readiness of the task force to respond to incidents when requested by the Federal government, the State of California or San Diego County agencies.

CA-TF8 consists of personnel from *23 San Diego County Fire Agencies*. The task force consists of 19 different positions in order to safely search for and rescue entrapped victims within collapsed structures. The task force is mandated by FEMA to be capable of deploying within four hours of notification with 70 personnel plus 10 drivers with 80,000 pounds of equipment to anywhere in the continental United States or any US territory. Once at the scene of an incident, CA-TF8 can operate 24 hours a day for three days without re-supply or support. CA-TF8 is capable of working in austere disaster conditions, such as collapsed structures, terrorist events including where WMD devices have been employed, and natural events such as earth quakes, hurricanes, etc.

All the required readiness activities are funded through an annual Readiness Cooperative Agreement between the City and FEMA. This funding pays for three full-time US&R staff

positions, training, new and replacement equipment for the task force. This funding allows for a cost neutral US&R program to the City of San Diego and its partner agencies in the rest of the County.

When activated by the FEMA under the Stafford Act, all costs associated with the deployment are 100 percent reimbursed by the Federal Government including all team personnel costs and backfill of the positions by the local agencies. Each of the 23 participating agencies submits an invoice to SDFD for reimbursement of the costs incurred respectively. SDFD then submits a reimbursement request to FEMA.

In addition to the US&R team, San Diego Fire Department operates one dedicated technical rescue unit, "Rescue 4," stationed downtown. They perform technical and advanced rescue assignments within the City of San Diego.

Additionally, SDFD is adding another Heavy Rescue apparatus. It is housed in Sorrento Valley, and is currently being supplied with rescue equipment in hopes of beginning its rollout in spring of 2010. It will be crossed staffed with fire station #41 personnel. Rescue 4 and future Rescue 41 will be able to function in large scale events/disasters to include but not be limited to: flooding, earthquakes, structural collapses, multiple casualty incidents, and emergency personal safety.

Some of the suburban fire departments staff smaller, light to medium rescue units. Depending on the type of incident, they can handle the response with local area mutual aid, call upon a San Diego City unit via mutual aid, or request activation of the US&R Team.

All together, this layered emergency response meets most of the region's needs cost effectively.

12.3.4 Special Trauma and Rescue Team (STAR)

When firefighters, police officers, EMTs and Paramedics go into very unusual and dangerous situations, they themselves, as well as possible victims, need paramedics inside the "hostile" area to help them immediately if they are injured during the operation. Therefore, some of the County area fire departments (especially San Diego City and the regional paramedic companies) train firefighter/paramedics to "marry up" with law enforcement or fire department specialty teams like hazardous materials to:

- Respond to emergency call outs (immediate need) for medical support during law enforcement tactical operations.
- Be available for scheduled (planned need) medical support during law enforcement tactical operations.
- "Dignitary Protection" as assigned.
- Participate as a member on the Metropolitan Medical Strike Team (MMST), assigned to the "Law Branch."
- Attend police SWAT monthly training sessions (as assigned).
- Perform paramedic functions under stressful conditions involving, but not limited to:
  - Firearms

- Explosive devices
- Chemical agents
- Communication failure.

12.3.5 Metropolitan Medical Strike Team (MMST)

The MMST is a unique response asset specifically designed to address terrorist incidents involving weapons of mass destruction. It will augment field medical, law enforcement, HAZMAT and mass decontamination operations and provide medical information and consultation to the incident response organization and hospitals within the Operational Area. The MMST focuses its efforts on:

- Agent sampling and identification
- Safe extraction and decontamination of victims
- Antidote administration
- Triage and primary care
- Forward movement of victims for further care
- Enhancing the capacity to provide definitive care
- Appropriate disposition of the deceased
- Providing advice on site recovery and decontamination issues
- Site security, evidence awareness and preservation.

The MMST is a specially trained, interdisciplinary Nuclear, Biological, Chemical (NBC) consequence management response team. When deployed, the MMST is composed of individuals, allocated into five elements: 1) Command/Management, 2) Planning and Intelligence, 3) Operations, 4) Logistics, and 5) Finance/Administration. In order to ensure availability of personnel for multiple operational periods, the MMST is made up of over 200 personnel organized into two task forces. All team members benefit from a high degree of cross training and frequent emergency mobilization and crisis rehearsal drills.

The current MMST membership is drawn from local fire assets with the approval of the San Diego County Fire Chiefs. Additional team members are from: local law enforcement agencies, including the Federal Bureau of Investigation San Diego Division the San Diego County Sheriff's Department Special Enforcement Detail (SED), Sheriff's Bomb/Arson Unit, the San Diego Police Department Critical Incident Management Unit (CIMU) and the Special Response Team (SRT), with one of the two departments acting in the role of Law Team Supervisor, local military personnel and assets, hospital emergency department personnel, County Department of Environmental Health Hazardous Incident Response Team (HIRT), and other County agencies along with the San Diego Fire-Rescue Department (94 members) including HAZMAT, SWAT paramedics and the Metro Arson Strike Team (MAST) and additional suppression personnel.

12.3.6 Mobile Communication Vehicles for Command/Dispatch at Incidents

Several of these units, of various size and abilities, are operated as mobile command posts by large and smaller agencies throughout the County. The regional fire mutual aid system knows

the inventory and locations and will send the nearest, most appropriate unit as requested. For the most part, these units and their staffing are not cost shared, and some of the units were provided via law enforcement and fire department grants.

12.3.7 Aircraft Down On-and-Off the Airports

The Federal Aviation Administration publishes standards and required levels of protection for on-airport aircraft emergencies. These levels are called "indexes." In the County of San Diego, the only airport with the highest level of response requirement is Lindberg Field. To meet the heavy fire apparatus and immediate staffing needs, the San Diego City Fire Department staffs specialized units provided and housed by the Port Authority at the side of the runway complex.

The region's smaller airports are either not required by the FAA to have any firefighting capacity, or to have it only at certain take off and landing events for the small, infrequent regional commercial carriers. When this is required, the airport typically contracts with a private vendor or a near-by fire department.

For off airport emergencies, for aircraft down or large flammable liquid fires, such as gasoline tankers, most fire departments operate pumpers with small quantities of foam on-board. When this is insufficient, they have to call for back-up foam supplies. Occasionally, a Lindberg Field based smaller unit can come off the airport, but due to FAA needs and the largest units excessive weight on freeways, this is rarely, if ever, done.

12.3.8 Marine Vessels, Pleasure Craft and Commercial Carriers

Historically, the Port of San Diego has not fielded a large capacity fireboat, nor have any of the agencies around San Diego Bay. The Coast Guard no longer does primary firefighting missions, and the Navy has their on-board systems for the most part. For smaller pleasure craft, some of the fire departments and lifeguard units that cover marina areas have small rescue boats with limited firefighting pumping capacity. These, where provided, meet the pleasure craft needs.

The gap that remains is for the risks presented by the increasingly large, commercial cargo carriers the Port has attracted, in addition to frequent, large tourist ships. There are many missions a large fireboat provides in addition to massive amounts of water and/or firefighting foam for petroleum fires. They can pump ashore during an earthquake, support EMS patient rescues, and provide a dive platform for underwater search, rescue and law enforcement missions. They can provide initial oil spill containment response.

San Diego harbor is the only large west coast harbor without a capital or NFPA Class 1 fireboat. The Ports of Long Beach, Los Angeles, San Francisco, Portland and Seattle all are covered by one or more large fireboats. In the San Pedro port complex, between two agencies there are seven (7) fireboats of various sizes and configurations. This figure does not include lifeguard size vessels.

12.4 CITYGATE PERSPECTIVES

Finding 12-1: Overall, the region's fire departments have been leaders in developing specialty response teams, sharing them, obtaining grants and using the mutual aid system to dispatch them. While any one team may need more funds from time to time for training or updated equipment, these are modest issues the regional agencies can determine how to cost share. The Hazardous Materials JPA is an excellent example of shared governance and cost sharing for the common good. It or another new JPA could operate other regional specialty teams.

Finding 12-2: Given this brief overview of specialty response systems, only two deficits stand out that warrant further review. First, is that while the regional airports may meet FAA minimums, the local fire departments are not really equipped for small and business aircraft crashes.

Second, the Port of San Diego has no significant firefighting or special operations fireboat other than limited capability on commercial tugs. The Port has grown in commercial cargo volumes and types, and in tourism cruise vessels. While incidents in these vessels are infrequent worldwide, they do occur, as do earthquakes, where water-based firefighting and pumping would be very useful.

Recommendation 12-1: Citygate recommends the Unified Port of San Diego conduct a risk and response systems review of its marine firefighting and special response needs.

Recommendation 12-2: Citygate recommends the County of San Diego, which operates the suburban airports, work with other appropriate local government agencies, the tenants and carriers to develop a revenue stream that will provide for enhanced on and off airport firefighting and EMS patient rescue.

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SECTION 13

VOLUNTEER PROGRAM REVIEW

13.1 SECTION INTENT

Volunteers are a critical component of the fire and EMS response system, particularly in the eastern portion of the County where they represent a very significant part of the response force. Countywide there are over 700 volunteers who supplement the 914 career firefighters on duty each day. This section of the report examines the role of volunteers and significant issues that have arisen in the use of volunteers in the County of San Diego.

13.2 BACKGROUND

For decades, volunteer fire departments under various forms of organization have been the primary fire services provider in many rural areas. Over time, some merged or changed their form of organization. There was not a unified approach to understanding and supporting the needs of these departments. While these agencies were always in the greater mutual aid system, their level of staffing, equipment and training could vary greatly depending on their level of funding and community support.

For several years, leadership at the County level worked on understanding and assessing the needs of the volunteer departments as the complexity of fire services was ever increasing. Each of the studies that have assessed fire services in the County over the past several years also addressed the needs and roles of the volunteer departments.

In June 2008 three County agencies (the Land Use and Environment Group, the Public Safety Group, and the Department of Planning and Land Use) provided the Board of Supervisors a re-organization plan for the unincorporated areas that lacked a local government fire services agency. This plan, known as the Hybrid Plan, included recommendations for greater integration of volunteer departments into the system of fire services provided by local and state agencies in the region.

Given the multiple fire agencies serving portions of the unincorporated areas, and their varied forms of legal organization and fiscal support, this re-organization plan was complex and had to be implemented incrementally.

The Hybrid Plan was designed to establish the County Fire Authority as the coordinating agency over the fire service providers in the CSA 135 boundaries, except the cities. The plan was to be implemented in three steps.

- Step I: Took in approximately 60 percent of the eventual 1.5 million acres of unincorporated territory. It brought six volunteer fire companies under the umbrella of the Fire Authority and provided funding to help support fire agencies, most of whom were eventually planned to be reorganized and become a part of the CSA 135 in Steps II and III.
- Step II: Would bring five County Service Areas under the Fire Authority and expand the Fire Authority's responsibility to encompass 70 percent of the ultimate planned area.
- Step III: The Pine Valley and San Diego Rural Fire Protection Districts would be merged into CSA 135. The Julian-Cuyamaca Fire Protection District reserved the right to decide to join at the time Step III is to be implemented. This reorganization combined with Steps I and II above would cover the entire target area of 1.56 million acres.

By late 2009 Step I had been implemented and many of the improvements in planning, coordination, training and equipment were made. Many of these activities are important for a smooth transition to the completion of Steps II and III.

By 2010 there are two operational "zones" or Management Groups in the Fire Authority's area of responsibility within CSA 135 boundaries. What was traditionally fire mutual aid Zone 7 is now called the CAL FIRE Management Group and what was traditionally fire mutual aid Zone 8 is now called the Julian-Cuyamaca Management Group.

The **CAL FIRE Management Group** consists of the following, which is a mix of career, reserve and volunteer staffed agencies:

- The San Diego Rural Fire Protection District (SDRFPD) has a total of 14 stations. This department is operated under a Cooperative Fire Protection Agreement with CAL FIRE. These agreements are commonly referred to as "Schedule A" agreements referring to one of three schedules that are the main components of every CAL FIRE Cooperative Agreement.[21] Under this agreement, CAL FIRE operates four combination career (state employee reimbursed by the local agency)/volunteer or reserve firefighter staffed fire stations and ten stations staffed utilizing stipend volunteers.
  - The four combination stations are Otay Mesa, Jamul, Lake Morena, and Descanso. These four SDRFPD career staffed fire stations are the hub stations and they coordinate stipend coverage at other ten stations – Tecate, Lee Valley, Jacumba, Potrero, Dulzura, Deer Horn, Lawson

[21] Schedule A is the *annual financial schedule* that spells out what the local agency will pay to the state for the state providing services to the local agency; Schedule B is the annual financial schedule that spells out what the state provides in the way of direct protection; and Schedule C is the annual financial schedule that spells out what the local agency pays directly for services, usually for supplies and support. An Amador agreement is where the local agency pays CAL FIRE the cost to keep a fire season only station open in the wintertime.

Valley/Lyons, Dehesa, and Harbison Canyon. Donovan is also an SDRFPD station but is currently staffed by California Department of Corrections and Rehabilitation using inmate firefighters. All these stations are part of what was traditionally called Zone 7 and now under the CAL FIRE umbrella. They are funded by SDRFPD with some funding via the San Diego County Fire Authority.[22]

- Valley Center Fire Protection District (VCFPD) operates under a Cooperative Fire Protection Agreement with CAL FIRE with two fire stations, staffed with career and reserve firefighters. VCFPD also funds "Amador staffing"[23] at one CAL FIRE station.
- Deer Springs Fire Protection District (DSFPD) operates under a Cooperative Fire Protection Agreement with CAL FIRE with three fire stations, all career staffed. DSFPD also funds "Amador staffing" at one CAL FIRE station.
- Pine Valley Fire Protection District operates under a Cooperative Fire Protection Agreement with CAL FIRE with one fire station, staffed with both career and reserve firefighters.
- Yuima Municipal Water District (YMWD) funds "Amador staffing" at one CAL FIRE station.
- Ramona Municipal Water District (RMWD) operates under a Cooperative Fire Protection Agreement with CAL FIRE with three fire stations, staffed with both career and reserve firefighters.
- The San Diego County Fire Authority operates through a Cooperative Fire Protection Agreement with CAL FIRE. The agreement funds three Battalion Chiefs and a Deputy Chief, as well as five Communication Operators/Dispatchers, and "Amador staffing" at five stations. The agreement also funds one structural fire engine at the Warner Springs CAL FIRE station. CAL FIRE staffs a wildland type engine at Warner Springs station as well.
- Zone 7 also includes 501(c)(3) volunteer departments[24]; Deluz, Palomar Mountain, Sunshine Summit, Intermountain, Campo, Boulevard, Ranchita (added this year), with Ocotillo Wells and Shelter Valley still pending but likely to join Zone 7 by July 1 or earlier. These departments are staffed with a combination of volunteer and reserve firefighters.

[22] Note: The SD Rural volunteer stations are not 501(c)(3) departments; they are part of SD Rural.

[23] The Amador staffing is defined in Public Resources Code Section 4143 and 4144. It allows the CAL FIRE to enter into Cooperative fire protection agreements with qualifying cities, counties and special districts to provide for the non-fire season use of CAL FIRE equipment, personnel and facilities for fire prevention and suppression.

[24] These funds are known as the 501(c)(3) funds. According to the IRS codes – Organizations described in section 501(c)(3) are commonly referred to as *charitable organizations*. The funds used to make these apparatus purchases came from donations and fundraising activities of the volunteer organizations. They continue to have this separate fund raising capability.

The **Julian Cuyamaca Management Group** includes the following:

- Included are 501(c)(3) departments San Pasqual and Mt. Laguna staffed with a combination of volunteer and reserve firefighters.
- Julian and Cuyamaca are included in the Julian/Cuyamaca Fire Protection District. It was the last agency staffed solely with community-based volunteer firefighters, but it is now in the process of adding reserve firefighters.
- Borrego Springs FPD is currently part of the Julian Cuyamaca Management Group, but with is changing over to CAL FIRE dispatch. It is likely they will switch to the CAL FIRE Management Group.
- The other two departments in this management group are Ocotillo Wells Fire/Rescue and Shelter Valley Volunteer Fire Department; both are also considering transitioning to the CAL FIRE Management Group. All the aforementioned agencies are staffed by a combination of community-based volunteer and reserve firefighters.

As staffing solely with community-based volunteer firefighters became more problematic, in San Diego County as everywhere in the United States, another classification of firefighter was developed to provide needed staffing. Under the hybrid proposal of the County staff report, the existing career staffed stations (prior to June 2008) are to be staffed with a total of two career and one volunteer or reserve firefighters per engine, 365 days of the year. The volunteer stations are to be staffed with a total of two reserve firefighters and one volunteer firefighter per engine, 365 days of the year.

Citygate conducted a listening session at one of the Zone 8 (CAL FIRE Management Group) volunteer Fire Chief meetings. As it turned out, attendance at the meeting was light. Only three of the six member agencies had representatives present.

In addition to conducting this listening session, Citygate reviewed a large volume of written records, reports and data sets about the fire services in these communities. From this review, three issues—volunteer certification, apparatus maintenance, and county/volunteer relationships—are emphasized. Other issues are also mentioned below.

13.3 VOLUNTEER CERTIFICATION

Both the CAL FIRE and the Julian-Cuyamaca Management Groups use the same training requirements for reserves and volunteers. This training plan is robust and appropriate to the needs of the volunteers. The volunteers/reserves are using the following as the basis for their certification program:

- Firefighter Level

  To be certified as a volunteer or reserve firefighter, the member has to complete the following training:

  - Office of State Fire Marshal Certified Volunteer Firefighter (± 150 hours)
  - Hazardous Materials First Responder Operational (4-6 hours)
  - Medical First Responder (24 hours) (EMT-1 is encouraged)

- Firefighting Training S-130 (36-40 hours)
- Introduction to Wildland Fire Behavior S-190 (6 hours)
- Human Factors on the Fireline L-180 (4 hours).

◆ Driver Operator

To be certified as a volunteer or reserve Driver/Operator of fire apparatus, the member has to have the above Firefighter training, a current Class B – Firefighter endorsed California Driver's License, and complete the following training:

- Use an enhanced PMS 419 (Federal wildland driver/operator) program (40 hours)
- Emergency Vehicle Operations Course (8 hours).

◆ Company Officer

To be certified as a volunteer or reserve Company Officer, the member has to have the above Driver/Operator training, a current Class B – Firefighter endorsed California Driver's License, and complete the following training:

- Engine Boss (Single Resource) S-231 modified to all risk (36 hours).

Both Management Groups use the Target Safety training record keeping system and have over 80 percent of the volunteers/reserves through the training at their appropriate level.

13.4 Apparatus Maintenance

Within the two management groups there are two classifications of fire apparatus. One class is apparatus that the County purchased for the agencies. The other class is apparatus that the volunteer companies purchased using their own funds, the aforementioned 501(c)(3) funds. This distinction is important as it influences the way that the apparatus is maintained. The volunteer fire companies own the majority of the front-line fire apparatus in the unincorporated areas covered by the two management groups.

Except for the units assigned to SDRFPD, the County maintains the County-owned apparatus in the field and in the County shops. This apparatus receives regular (90-day) routine and annual maintenance. Nevertheless, for some of the eastern companies the trip to the nearest County shop for more than minor repairs can take two hours or more each way. In addition, unless it is a quick fix, the volunteers/reserves need to follow the engine or water tender into the shop with a chase car. This ties up two members for the better part of the day and leaves the community unprotected.

The County owns sixteen engines: thirteen are Wildland/Structure (Type 2) and three are Structural Engines (Type 1). The County also has eleven water tenders in service and four more ordered as well as miscellaneous light vehicles. There is currently one mobile mechanic (they are considering adding a second mobile mechanic) and there are County shops at San Marcos, Rancho San Diego, Ramona and Kearney Mesa. The trip from Borrego Springs to Ramona (the closest shop) is 1-hour and 25 minutes by car.

The independent fire companies are required to maintain the apparatus that they own. They own sixty-eight engines, eighteen rescue units and thirteen water tenders. They maintain them using their own scarce funds.

The County is unwilling to maintain equipment it does not own (and due to risk should not).

Some volunteer departments would like to see 1-2 mobile mechanics to perform the 90-day inspections. They would also like the County to maintain the older apparatus that the companies currently own.

13.5 COUNTY–VOLUNTEER RELATIONSHIPS

There is some understandable friction attached to the relationships between the County and the volunteers during this appropriate transition phase to safe, integrated fire services. When the volunteers came under the County system, safety and health standards were imposed. This action led to the retirement or light duty status, in some cases, of a number of senior members. Many of these members started their volunteer fire "careers" more than thirty years ago. At both the Federal and state level, the rules surrounding volunteers have changed dramatically in the intervening time. Labor law specifies who can and who cannot be a volunteer; health and safety law have changed the physical fitness and training requirements; both of these have converged to create the perfect storm that makes being a volunteer firefighter much more problematic.

These changes in status to light duty or retirement were precipitated by changes that occurred in the law. In reality, some companies had not been complying with appropriate safety regulations and the County was trying to gain compliance. The simple fact is that the fire service today in California has few choices but to comply with federal and state safety regulations, regardless of past practice. Briefly, these regulatory changes were:

> "The State passed AB 1127 and SB 1207 in 2000 and 2001, respectively. These laws significantly impacted volunteer fire departments, with unprecedented new requirements forcing most of these departments to raise their level of training and professionalism.[25]
>
> "AB 1127 subjected public agencies to fines and penalties for safety and health code violations. The law eliminated the long-standing immunity held by public agencies with regard to civil and criminal liability. By failing to follow the proper safety precautions, local governments and government officials are vulnerable to fines, civil lawsuits, and even prison sentences under this piece of legislation.
>
> "SB 1207 changed the labor classification of volunteer firefighters to match that of salaried firefighters. Under the new rules, Cal-OHSA regulations regard volunteer firefighters as "employees." As such, volunteer firefighters (whether full-time or on-call) must follow the same training practices and safety requirements as paid employees. Specifically, this law sought to equalize the work conditions of volunteer fire departments and ensure that volunteers in those departments received the same equipment, training, and oversight, as did their paid counterparts. The State began to enforce this law in 2004."

[25] Vos, Carl. "The La Habra Heights Fire Department and Use of Residents On-Call Firefighters." Unpublished city staff paper. October 2009.

Many departments that have faced this issue have resorted to a tiered system that makes other use of those volunteers, who although they may not meet current health and safety requirements, can still be of assistance in other assignments even though they cannot fulfill active firefighter roles.

13.6 Other Issues

Dispatch – An integrated fire deployment system requires a strong centralized dispatch system, a strong automatic-aid/mutual aid system, and adherence to response/move-up and cover policies. The volunteer units have no problem moving into another company's response area to respond to an incident, but getting them to move into a vacant station to balance out coverage can be problematic, given the time away from their home communities.

Workers Compensation coverage – According to County Risk Management, volunteers are under workers compensation coverage when they are at the station, responding from the station, returning to the station or at the scene of an incident. They are **not** covered when they are responding from home until they either arrive at an incident or at the station. The Division of Workers Compensation (DWC) of the State Department of Industrial Relations would adjudicate this issue if a volunteer were injured in what the volunteer perceived as the course of his or her duties.

13.7 Citygate Perspectives

Finding 13-1: The volunteer fire service has to contend with unparalleled changes in the requirements to be volunteers, including: simultaneous growth in call volume; "urban service" expectations in rural areas; cultural changes in rural communities; and an increasingly aging population. All of these forces, any one of which would be difficult to absorb, have all converged simultaneously. While these changes are difficult on the volunteers, the phased integration of the volunteers into a County support and regulatory structure is necessary and should be completed.

Finding 13-2: The concern about apparatus maintenance travel time is significant and requires action. The ownership issue should be worked to closure.

Finding 13-3: It appears that consolidating the CAL FIRE Management Group and the Julian Cuyamaca Management Group into one Management Group would create efficiencies.

Recommendation 13-1: While the concept of using mobile mechanics traveling to each fire station has merit, the safety considerations of having mechanics work under vehicles on any issue more significant than a brake adjustment also should be a concern. Citygate recommends that the County explore placing a "running repair" shop in the eastern County at a suitable location.

Recommendation 13-2: It is not in Citygate's scope to ascertain the implied liability to the County of the volunteers operating apparatus that may not be properly maintained, but logically it would seem that there is some. With that in mind, the County should consider taking over the maintenance of volunteer-owned apparatus under the following conditions: (1) the apparatus maintenance be brought up to date and current for a reasonable period, say six months; (2) the apparatus meet the conditions of NFPA 1901 Standard for Automotive Fire Apparatus 1991 Edition and NFPA 1912 Standard for Fire Apparatus Refurbishing; and (3) the title be deeded to the County for a term with the proviso that at the end of its useful life the apparatus will be returned to the company for sale.

Recommendation 13-3: The County Counsel should investigate the implied liability issue of the volunteers operating apparatus that may not be properly maintained. If the County has a liability with volunteers or reserves operating apparatus that it has no control over, then either proper maintenance of it needs to be ensured or that apparatus should not be used.

PART FIVE

Fiscal Assessment

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SECTION 14

ANALYSIS OF FUNDING SOURCES AND FINANCING OPTIONS

14.1 SECTION INTENT

Against the backdrop of the current very deep recession, this section reviews the existing financial commitment to fire and EMS services, the fiscal capacity of local government agencies in the County of San Diego, the cost of service improvements, and financing options.

14.2 EXISTING SOURCES OF FUNDING

With over sixty fire response organizations in the County of San Diego, there is obviously a wide array of funding sources for fire and emergency response in the County. For many of these sources, their funding is the product of state law governing property tax allocation, voter approved special taxes, grants to their agency, or their own fund raising efforts among the public and local organizations/businesses.

LAFCO, in a 2003 document, *"Funding Fire Protection, An Overview of Funding Issues Facing Fire Protection Districts"* and then again in a 2005 document, *"Fire Protection and Emergency Medical Services Review"* did an excellent job reviewing funding sources and options. Rather than repeat that information, throughout this section Citygate makes summary observations and conclusions for which these LAFCO reports serve as the more detailed technical background. Here a cursory review will help illustrate the complexity of the funding issue.

The cities all fund fire services from their General Funds, which is a combination of revenue from sources such as Property Tax, Sales Tax, Motor Vehicle In-lieu Tax, Franchise Fees, Permit and Service Charges, and in some cases Utility User Tax. A few cities also levy a special tax or an assessment charge to support fire services. Fire Protection Districts and County Service Areas receive a portion of the property tax and many of these also have a voter-approved special tax for fire and emergency response services and receive funds from the County under contracts through the County Fire Authority. Nonprofit 501(c)(3) volunteer fire departments also receive funding from the County Fire Authority and raise funds annually from the community through a variety of fund raising activities.

In addition to all of these local funding sources, the State of California spends its General Fund resources to support a substantial CAL FIRE presence to protect the State Responsibility Areas

in the eastern County from wildfire, which also represents a force that can be called in for mutual aid as major fires occur outside of their boundary of responsibility.

While it might seem more elegant to simply reorganize at least the local government funding to come from property tax and/or special taxes, neither the County nor LAFCO have the authority under state law to decide this on their own. Also, to provide sufficient property tax revenue, especially for a fire district, may in some cases, require other non-public safety agencies to give up a share of the property tax they now receive. That raises the question about how to backfill that property tax loss. This taxation complexity is why most efforts to merge or consolidate end up as a Joint Powers Authority (inter-governmental agreement) or one agency simply contracting with another for fire services in order to not "disturb" the tax system that is already in place.

14.3 Government Funding Expended in the County of San Diego for Fire Protection and Emergency Response

In total, the State (through CAL FIRE), the County Fire Authority, cities, fire districts, County Service Areas, and volunteer fire companies spend approximately $517,000,000 per year on firefighting operations. This figure does *not* include law enforcement helicopters, EMS helicopters under contract to County EMS, Federal Forest Service expenses and military fire departments.

The greatest percentage of the expenditures is made by the City of San Diego that represents the largest population. The table below reflects the relationship between expenditures and population in the County. However, in reading the table it needs to be recognized that another important factor is the square mileage served and CAL FIRE's role in maintaining a stand-by presence to prevent wildland fires from getting out of hand and endangering the unincorporated area population, the city-based populations and commercial/industrial development.

Areas in Which Funds are Expended	Percent of a Population	Percent of Annual Funds Expended
San Diego City	43%	38%
All Other Cities	41%	39%
Unincorporated County	16%	23%

14.4 Cost of Recommended Deployment Improvements

In Section 4 of this report, Citygate made the following finding regarding the number of fire stations that it would take to improve the road mileage coverage in geographic areas as large as a fire station normal size response area.

Finding 4-2:	There is a modest station coverage deficit in the two western quadrants. Filling these service level gaps would require at least 14 additional fire stations. Eleven of the new stations would be in the Southwest Quadrant. However, the capital outlay and annual operating cost increase to achieve the resultant small improvement in coverage is very significant

Three of the fire stations would be in the Northwest Quadrant of the County and 11 would be in the Southwest.

In the Northwest, it would cost an estimated $19.8 million to construct three new fire stations and purchase the associated fire apparatus and an annual operating expense of $5.4 million to staff the three stations. This would provide an increase in the road miles traveled at the 4 minute point from the current 59.77 percent to 60.95 percent and at the 5-minute point the increase would only be from the current 82.19 percent to 83.08 percent.

In the Southwest Quadrant it would cost an estimated $72.6 million to construct eleven new fire stations and an annual operating expense of $20.1 million. This would provide an increase in the road miles traveled at the 4-minute point from the current 67.83 percent to 72.26 percent and at the 5-minute point the increase would only be from the current 87.73 percent to 90.98 percent.

Improvement in deployment in the two eastern quadrants of the County are covered in the following recommendation:

Recommendation 5-2:	The County Fire Authority, in order to provide a guaranteed minimum staffing of two firefighters per unit during the 40-hour work week period, should strongly consider staffing its 18 stations with a single career firefighter on a Monday through Friday 40-hour week. This position can maintain the apparatus and station, assist with volunteer training and lessen the need to hire two volunteers for this coverage.

The estimated annual cost of this recommended staffing is $2.1 million. This compares to the estimated cost of $500,000 to fill the same shifts with stipend firefighters who work assigned shifts at a modest pay per shift, if they are available. The stipend firefighter program has just started with County sponsorship; thus as the County evaluates the success or difficulty in filling the day time work day shifts with stipend firefighters, the County Fire Authority should conduct a cost-benefit study. This cost-benefit study should examine how many more volunteers and stipend firefighters it makes sense to recruit, train and equip given annual turnover, versus staffing a few positions with career firefighters.

14.5 FINANCING OPTIONS

Citygate's overall assessment is that the cost of the suggested near term improvements in deployment are not sufficient to warrant a separate tax measure or establishment of a countywide

assessment district to support the increase. The caveat to this assessment is that if the County, cities and districts are not able to continue supporting at least the current level of service, then the agencies might consider separately or jointly placing a revenue measure before the voters to include both support for the present services as well as the modest cost of improving current services.

Although this study is focused on deployment and the cost of deployment improvements, Citygate has assessed the financial data provided by the agencies to determine whether they can continue supporting the present level of services. An important element of that review is the change in Assessed Valuation. Throughout the County of San Diego the Assessed Valuation has shown a steady and, on occasion, remarkably high growth in the past ten years. The decline in the current year has adversely affected agencies at different rates, depending upon their reliance on the property tax as a principal source of revenue and depending upon the amount of loss of value experienced within their own borders. Throughout California some agencies obviously are suffering very high losses in property tax revenue while the more rural agencies have seen very little loss in value, although correspondingly they have not seen the sharp increases in value that have been common in much more densely constructed areas.

The change in Assessed Valuation in the County of San Diego since 1999 is shown in the table below:

Assessed Valuation in the County of San Diego

Fiscal Year	Assessed Valuation (in Billions)	Percent Change from Prior Year
2009-10	407.54	-2.2%
2008-09	416.71	4.5%
2007-08	398.72	9.4%
2006-07	364.55	11.9%
2005-06	325.87	13.1%
2004-05	288.15	10.1%
2003-04	261.74	9.8%
2002-03	238.34	8.3%
2001-02	220.16	7.9%
2000-01	204.04	10.1%
1999-00	185.39	

Another measure of fiscal health is the change in sales tax revenue for the County and cities. Between Fiscal Years 2004-05 and 2008-09 sales tax revenue for the County and cities remained fairly steady for three years and then began the slide that accompanied the recession. The loss was felt differently by various cities in over the past year. Coronado actually experienced a very small increase in sales tax revenue last year while Del Mar, El Cajon, National City, and San Marcos lost over 14 percent of their sales tax revenue in the past year. The unincorporated

County experienced a 5.7 percent drop and the average of all agencies was a loss of 8.8 percent in sales tax revenue from Fiscal Year 2007-08 to 2008-09.

Sales Tax Revenue in the County and Cities from Fiscal Years 2004-05 to 2009-10

	FY 2004-05	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	Percent Change Between 04/05-08/09	Percent Change Between 07/08-08/09
Cities and County of San Diego	358,750,867	360,285,309	360,954,157	354,437,801	323,380,884	9.9%	8.8%

Taking into account all sources of revenue, the agencies clearly fall into several broad categories of fiscal health.

Cities, as well as the County of San Diego, are in fiscal stress. Most have not only lost property tax revenue, but also sales tax and auto related revenue. For most cities these are the principal sources of revenue and sources that have been very reactive to the economy. City elected officials throughout the County are having to choose which services to reduce, with fire and police frequently experiencing reductions. The next two years are expected to be as difficult, so an increasing number of the cities in the County of San Diego may find themselves temporarily closing ("browning out") stations or individual units just as the City of San Diego has done this year already. It will be difficult for the cities to retain the current level of fire services without taking very large service reductions in other traditional city service areas, including the police departments.

A second category of agency is the fire protection districts that rely principally on property tax revenue. Most of them report having reserves that appear sufficient to provide a cushion for the next several years that will help them avoid reducing service levels until the economy recovers. Most of them also have a special tax or assessment that provides a stable source of revenue if the property tax revenue fluctuates.

The third category of agency is the remaining fire districts that have nearly half or more of their revenue coming from a special tax or assessment and thus are less exposed to the economies impact on property tax revenue and appear to have adequate revenue to maintain current service levels.

The fourth category of agency is the County Service Areas and volunteer fire departments that rely heavily on County funding to maintain current services. This County funding comes in many forms, including purchasing and maintaining large fire apparatus, paying stipends to volunteers who work shifts for the fire agencies, paying for some operating and workers compensation costs, funding that permits the agency to contract for services from CAL FIRE, plus County direct contracts between the County Fire Authority and CAL FIRE to place engines at various locations in the east County to support the fire agencies.

Finding 14-1: In summary, most cities are financially struggling. If the economy does not recover fast enough to start a substantial flow of revenue to cities within the next 24 months, most cities will find it difficult to retain current fire service levels. In the unincorporated part of the County, most fire protection districts appear to be able to retain current service levels in spite of the economic downturn, if the state has indeed reached the bottom and is about to see economic growth. Almost all of the remaining fire agencies rely on County funding to maintain their current service levels, and the County itself is struggling financially.

Finding 14-2: However, as the fire districts use some or all of their reserves, they will not have the ability to increase staffing. As the deployment sections of this study identified, many of the rural fire stations have difficulty scheduling volunteer per diem firefighters during the Monday through Friday 40-hour workweek. One way to help this would be to staff these stations with one firefighter on a 40-hour week. However, most of the smaller agencies do not currently have the revenue to do this.

As the economy recovers, how should the agencies approach the issue of funding fire and emergency response deployment and staffing improvements? This is a question of funding both one-time capital and on-going operating expenses.

14.5.1 Capital Expenses

The entire $92.4 million of capital expense to build new fire stations is the responsibility of individual cities because the new station sites and service areas are within the incorporated cities. The Southwest Quadrant alone has 11 of the 14 suggested new stations. From the perspective of the County, capital expense for new fire stations is not a problem, because none of the suggested new sites are in the unincorporated areas. For the cities, however, it may be a serious problem, depending upon whether they have sufficient capital funds set aside through AB1600 Impact Fee payments by new development or have other specialized funds such as redevelopment agency contributions that can be used.

The heart of their problem is that the station locations identified by Citygate are in areas with limited opportunities for new development, and so collecting AB1600 Impact Fee payments from limited development will only pay for a portion of the cost of the stations. Impact Fee rules require that new development only pay a "fair share" of the cost of a new fire station and associated equipment, with the balance coming from other sources. In this case it would require a city to either establish an assessment district through voter approval or contribute the balance from the very strained City General Fund. Without a dramatic improvement in the economy, the City General Fund is not likely to be a source of fire station construction money for the foreseeable future.

For all of the cities, however, any perceived need for new fire stations is not a new occurrence. The present deployment pattern and response times have been the existing service level and each

agency can choose to continue, rather than improve, the service levels they now provide if they are unable to fund the capital cost of new fire stations as well as the annual operating expense.

It should not be forgotten that constructing new fire stations, with their associated new fire engines, is only a one-time expense. Were all 14 new fire stations suggested in this report to be constructed, there would be an on-going annual operating cost of an estimated $25.5 million per year. Absent available General Fund tax revenue to support the service expansion, the cities are limited to placing some form of tax measure or creation of an assessment district before the voters.

14.5.2 Staffing Improvements

The only staffing improvement recommended by Citygate is the addition of one full-time career firefighter at each of the 18 stations in the unincorporated County area, if it continues to be difficult to schedule stipend volunteers to fill the Monday-Friday daytime period on a regular basis. Many volunteers are away on jobs and only available evenings and weekends. The need is spread across multiple fire districts and County Service Areas in the unincorporated area of the County.

If the County and the affected agencies were to decide to fund this service level improvement at an estimated annual cost of $2.1 million, compared to the $500,000 million (plus training and equipment) annual cost of stipend volunteers, there are only a limited number of funding sources. If the County General Fund were not able to afford increasing the already substantial approximately $15,000,000 net annual contribution to fire services, then the individual agencies could each act separately or they could join with the County to form an assessment district or place a special tax measure on the ballot. Across the entire unincorporated portion of the County, it would require approximately $3.50 to $4.00 per capita per year to support the net cost increase of deployment staffing improvements at 18 fire stations.

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PART SIX

Governance Review

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SECTION 15

GOVERNANCE APPROACHES TO IMPROVING FIRE SERVICES

15.1 SECTION INTENT

A number of studies over the past several years have done an excellent job of outlining the range of governance choices available to local governments seeking to improve the planning, coordination and operation of fire and EMS services in the County. In this section, Citygate will make specific governance proposals that support the recommendations made in this report.

15.2 BACKGROUND

15.2.1 Current and Planned Governance Arrangements

The core of the current governance arrangement for fire and emergency medical services in the County of San Diego was described in the 2005 LAFCO report *"Fire Protection and Emergency Medical Services Review,"* which recorded fifteen independent Fire Protection Districts, one dependent Fire Protection District, five water districts that provide fire services, and seven County Service Areas all in the unincorporated portion of the County. Added to this are tribal fire agencies, nonprofit 501(c)(3) volunteer fire departments, the cities, military installations, CAL FIRE and the U.S. Forest Service.

Each agency or organization has the independent authority to make policy without any mandatory requirement to coordinate that policy with their neighboring agencies. Each also has their own source of revenue, although the County through its Fire Authority provides funding to a number of them.

The focus of the 2005 LAFCO report was on the unincorporated area and, while acknowledging the presence of mutual aid agreements that appear to work well, noted that "There is no effective mechanism to comprehensively plan, fund, and administer an integrated system for regional fire protection and emergency medical services."

Including the 2005 LAFCO report, several studies were completed that did a very effective job of describing alternative governance approaches that would reorganize the way in which fire services are governed and policy implemented in the unincorporated portion of the County. These additional studies include the 2005 LAFCO report *"Options for Providing Structural Fire Protection and Emergency Medical Services in San Diego County"* and the 2007 LAFCO report

"Reorganization of Structural Fire Protection and Emergency Medical Services in Unincorporated San Diego County."

It is not necessary in this report to repeat the LAFCO work, but only to note that it has served as both a technical resource and reference to approaches that have been previously considered by the County and fire agencies. Since these reports, the County has subsequently implemented a plan to reorganize the fire and emergency response agencies throughout most of the unincorporated portion of the County.

The County-adopted plan, known at the time of its adoption as "The Hybrid Plan," recognized the practical difficulties of wholesale reorganization and instead proposed a three-step incremental approach.

The County used the existing County Service Area (CSA) 135 as a base for the reorganization, since it covers the unincorporated portion of the County of San Diego that is not state or federal land, and 10 of the 18 cities.

County Service Area (CSA) 135 was originally formed in 1994 to support an 800 MHz band emergency and general government communications radio system. In 2008, the County Board of Supervisors approved a plan to expand the responsibilities of CSA 135 to include fire and EMS services. With these expanded responsibilities, CSA 135 was to become the San Diego County Fire Authority.

The Authority would coordinate the fire service providers within most of the territory that is within the CSA 135 boundaries, except the cities. The plan was to be implemented in three steps.

LAFCO approved, at the request of the County, the additional authority for CSA 135 to provide structural fire protection and emergency medical services within the Step I portion of the CSA boundaries.

Step I took in approximately 60 percent of the eventual 1.5 million acres of unincorporated territory and brought six volunteer fire companies under the umbrella of the Fire Authority. All of these fire companies remained independent, but through the "funding contracts" agreed to coordinate closely with the Fire Authority. CAL FIRE actually provides the day-to-day operational coordination, which is a significant improvement over the situation described in the 2005 LAFCO report.

In order to improve the level of fire service and fire service coordination in the remaining portion of the unincorporated County, and as part of Step I, the County also provided funding to help support fire agencies, most of which were eventually planned to be reorganized and become a part of the CSA 135 in Steps II and III. This County support has provided money to contract with CAL FIRE to staff engine companies and to individual agencies and volunteer organizations to provide stipends to volunteers who work fire station shifts and so are reliably available to respond to emergencies. This again addresses directly the LAFCO report concern that agencies that relied wholly or principally on volunteers provided unpredictable service levels.

Step II is planned to be implemented in Fiscal Year 2010-11. It would bring five County Service Areas under the Fire Authority and expand the Fire Authority's responsibility to encompass 70 percent of the ultimate planned area. This would not diminish the service levels in the CSAs but would reduce the administrative duplication associated with trying to operate multiple County

Service Areas. Any special taxes or assessments would continue to be collected within their unique zone of benefit and fund services to those zones.

Step III is to reorganize the Pine Valley and San Diego Rural Fire Protection Districts by merging them into CSA 135. For both agencies, CAL FIRE already provides staffing at fire stations under contract and so has day-to-day operational coordination responsibilities. The Julian-Cuyamaca Fire Protection District reserved the right to decide to join at the time Phase III is to be implemented in Fiscal Year 2011-12, although they are now in discussions with Fire Authority staff to do so sooner.

While the County Service areas, the San Diego Rural FPD and the Julian- Cuyamaca FPD all receive substantial County financial assistance administered by the Fire Authority, they each remain as independent organizations with separate administrative organizations, fiscal and personnel records. This duplication was noted in the 2005 LAFCO report. Bringing administrative and fiscal efficiency to the fire service organization in the unincorporated County is one of the goals of the County-adopted three-step reorganization plan. In addition, all but the Julian-Cuyamaca FPD are reported as being coordinated by CAL FIRE on a day-to-day basis.

15.3 COUNTY FIRE AUTHORITY

15.3.1 Current Organization

The County Fire Authority was formed as the administrative agency to implement and operate the "Hybrid Plan." Located in the County Department of Land Use and Planning (DPLU), it was envisioned as an agency to:

- Ensure that fire perspectives were part of future County land use decisions
- Allocate funding to fire agencies in the unincorporated area
- Administer the funding contracts by ensuring that all policies, risk management issues and contract conditions are followed
- Implement the County's Fire Enhancement Program (contracts for fire safety), Fire Safety and Fuels Reduction Program (dead, dying, diseased tree removal and weed abatement) and the Fire Prevention Program (land use regulations and permits).

A Deputy County Administrator was assigned as Fire Warden to provide administrative support to CSA 135 (not operational oversight) with primary duties to include administration of contracts, oversight of building and land use issues, weed abatement and administrative problem solving between agencies.

The fire and emergency medical response portion of CSA 135 was separated into two branches: Zone 7 to be coordinated by CAL FIRE and Zone 8, largely consisting of volunteer fire departments. The County Board of Supervisors is the governing body of CSA 135.

The DPLU already had a Fire Division responsible for the Fire Enhancement, Fire Safety and Fuels Reduction Program and the Fire Prevention Program. Adding responsibility to coordinate the contracting of financial support to fire agencies was a logical step, and assigning Fire Warden

responsibility to the Deputy County Administrator already responsible for these other areas made good organizational sense for the start-up of the Fire Authority.

15.3.2 Fire Authority Successes

By first focusing on fire prevention after the regional firestorms, the County has achieved significant success in designing and implementing best practice new development and fire code requirements to lessen the severity of wildfires on people and developed property in the County responsibility areas.

These programs regulate the set back of buildings from wildfire threats, set forth fire resistant vegetation practices, control the type of exterior construction materials for buildings, require the use of residential fire sprinklers, and ensure the accessibility of developed property to fire apparatus, to just name a few. All of the County pre-development review processes have become better focused on fire safe planning. Once development is in place, there are programs such as fuel (weed) abatement to help keep areas as fire safe as practicable.

On top of these successes, the Fire Authority was formed by the County. Its principle roles and accomplishments have been to begin the integration of rural fire services, increase service delivery contracts with CAL FIRE, improve training of volunteers and provide fire apparatus to rural fire companies.

Taken together, the County has significantly re-engaged in fire services planning, prevention and emergency response enhancements in its area of responsibility, spending at present approximately $15 million from its General Fund annually.

15.4 Evaluation and Recommended Changes in the Current Organization

As with most new organizational arrangements, there are usually shortcomings that cause some redesign. In the case of the Fire Authority, it made sense to leave the fire functions in DPLU while the new responsibilities were absorbed and new working and contract arrangements were developed with the volunteer fire departments, CSAs, and fire districts. Incremental change is often best because it allows for focus and time to be spent on the new responsibilities. It also makes it easier to see the shortcomings that need to be fixed because the participants in the organization are not overwhelmed by change. As the County has implemented Step 1 of the Hybrid Plan, several issues have surfaced.

15.4.1 Operational Coordination

The Hybrid Plan did not specifically address responsibility for day-to-day coordination of fire and emergency response operations by assigning that responsibility. In fact, the plan specifically said that the Fire Warden would not have operational responsibility, which would remain with the individual local fire agencies. However, as a practical matter, CAL FIRE has assumed day-to-day coordination of fire activities through its training role, through the provision of CAL FIRE-staffed apparatus under contract to various fire agencies and the County, through its provision of Incident Command services by its on-duty Battalion Chiefs, and through its role in dispatching 15 of the fire agencies in unincorporated areas.

What has happened is that CAL FIRE has slowly assumed a lead operational role without it being planned or acknowledged as a formal County policy.

Finding 15-1: Citygate believes that CAL FIRE's role in day-to-day operational coordination is a very positive development. They have extensive operational and management depth and experience as a very large, permanent fire response presence in and around the east County fire agencies. However, their explicit authority is acknowledged informally and not as a formal County policy. Providing CAL FIRE with an acknowledged role will help address the 2005 LAFCO report concern that there needs to be an effective mechanism to administer an integrated system for regional fire protection and emergency medical services.

15.4.2 Longer-Term Planning, Policy Formulation and Implementation

The expanding role of the Fire Authority makes this organization a good location for organizing and coordinating planning and policy activities, including code development and fire plan review. The Fire Authority is already establishing training, Injury and Illness Prevention Program requirements, volunteer firefighter standards and requirements for coordination and cooperation, including participation in the Incident Command System, Mutual Aid response and inspection/testing of fire equipment by agencies receiving County funding. CAL FIRE's role will necessarily be limited to day-to-day operations because longer-term planning and policy development and implementation will remain the responsibility of the local governments. CAL FIRE or a higher level County manager (County Fire Services Director) can and should be an active participant in planning and policy.

The Fire Authority's fire services planning, fire code development and fire service operations policy responsibility should at a minimum encompass:

- Developing operating policies and procedures that unify and standardize the operational response of fire companies under the supervision of the Fire Authority;
- Ensuring formal agreements and operating guidelines for mutual aid between all fire agencies, including tribal organizations and CAL FIRE, within the unincorporated County area;
- Working with OES, CAL FIRE, the U.S. Forest Service, and other independent agencies in the unincorporated area to ensure a seamless and coordinated disaster response by all of these agencies and an appropriate interface with the cities and federal facilities;
- Developing a long-term capital improvement plan for fire related infrastructure needs in the Fire Authority area of responsibility;
- Coordinating the unincorporated areas of the Operations Committee within the Unified Disaster Council;
- Providing policy and planning advice from a fire perspective to the County Department of Planning and Land Use.

Finding 15-2: The expanding role of the Fire Authority makes this organization a good location for organizing and coordinating planning and policy activities.

Recommendation 15-1: In addition to its current responsibilities, the Fire Authority should have operations committee membership within the Unified Disaster Council to work with other unincorporated area emergency agencies to ensure a coordinated disaster response, develop a long-term capital plan for fire infrastructure needs in its responsibility area, develop standard operating policies and procedures, ensure formal mutual aid agreements, and provide a fire perspective to DPLU.

15.4.3 Fire Authority Location and Management

The Fire Authority has been initially established as part of the Fire Division of DPLU. While being a workable arrangement to get the Fire Authority set up, in the longer-term this is an unusual marriage of a planning, permitting and code enforcement organization (DPLU) with fire activities that are very unlike planning department functions. The Fire Authority and Fire Division are a combination of oversight and implementation of operational programs, establishment and monitoring of technical and operational standards, coordination of independent fire departments, funding and grant applications for operational programs, and professional independent input of a fire perspective into land use decisions.

Finding 15-3: Most of the Fire Division and Fire Authority responsibilities are not traditionally found within a government planning department like DPLU because fire service field operations and the planning for specialized emergency field operations or the fire service response to disasters are not part of the perspective and skill set of land use planning organizations.

Finding 15-4: Now that the initial organizational steps have been taken to establish the Fire Authority, fire responsibilities need to be relocated to report to the Deputy Chief Administrative Officer/General Manager of the Public Safety Group where it is more appropriately aligned with other public safety activities and has the organizational position to exercise the public safety policy, coordination and implementation responsibility that Citygate recommends be assigned to the Fire Authority.

Recommendation 15-2: The Fire Authority and most, if not all, of the Fire Division functions should be moved under the Deputy Chief Administrative Officer/General Manager of the Public Safety who is currently responsible for the County Office of Emergency Services and coordination with the County Sheriff's Department. This organization realignment will bring all County public safety functions together where they can be most effectively coordinated and where an operational function such as fire can be more appropriately managed by staff who are familiar with operational public safety and more familiar with the requirements of day-to-day safety operations. To the extent that there needs to be a daily interface between DPLU and Fire Division planning, code enforcement and permitting activities, this can be accomplished like many agencies do, by locating the appropriate Fire Prevention Division staff offices adjacent to the planning offices or in a one-stop permitting center.

Moving the fire functions will require establishing a management position to oversee the subsections of the Fire Division, including the Fire Authority. Looking back at the prior studies of fire services organization in the County, both the 2005 LAFCO reports suggested that one option was to appoint a County Fire Chief. Those reports envisioned the Fire Chief then having direct operational responsibility for all of the fire stations in the unincorporated County.

The County has already considered the option of consolidating or merging all fire districts, CSAs and volunteer departments into one unincorporated area fire department headed by a County Fire Chief. They have chosen instead to pursue an incremental three-step approach that preserves the community basis of the volunteer departments. The County approach merges into CSA 135 only those organizations that have so far agreed that this is a fiscally and operationally necessary step. Elsewhere in this report, we have noted the importance of sustaining the volunteer base as a critical component of the response force. In order to sustain the volunteer base, the County has wisely proceeded in a way that recognizes the value and need to provide some independent, direct connection between the volunteers and their communities.

Recommendation 15-3: Citygate recommends that a County Fire Services Director as manager of the County Fire Authority is an effective approach to providing leadership in the unincorporated area and management of the County direct fire functions. A County Fire Services Director would report directly to the Deputy Chief Administrative Officer/General Manager of the Public Safety Group, supervise the Fire Authority and other Fire Division employees, and through them have operational responsibility for the fire stations and staff that are merged into CSA 135.

Given the large number of fire stations and the various volunteer organizations, where appropriate, Chief Officers should continue to be responsible for fire stations and staff within appropriate zones of CSA 135, much as the fire chiefs of the various agencies do now. They would, in turn, report to the County Fire Services Director, who will set policy and operational standards. Volunteer Fire Chiefs would continue to oversee the day-to-day activities of the volunteer departments, but would be required to accept County policies and standards as they do now in their contracts as a condition of receiving County funding. In some instances, where CAL FIRE provides staffing and now has operational responsibility for a fire station, the CAL FIRE Unit Chief would look to the County Fire Services Director as the contract administrator and the person ultimately responsible for policy under which the CAL FIRE contract stations function.

Completion of the County Hybrid Plan

The County has adopted a three-step approach to implementing the Hybrid Plan. As we have observed before in this report, it is an appropriate approach to bringing most of the fire services in the unincorporated area under unified leadership.

Recommendation 15-4: Citygate recommends that the County continue implementing the Hybrid Plan on the most aggressive time schedule practical. Step II would fold five CSAs (CSA 111-Boulevard, CSA 112-Campo, CSA 109-Mt Laguna, CSA 110-Palomar, CSA 113-San Pasqual) into CSA 135 in Fiscal Year 2010-11 and Step III would bring the Pine Valley FPD and the San Diego Rural FPD into CSA 135 in Fiscal Year 2011-12.

Implementing Steps II and III will require an application to LAFCO to extend the authority of CSA 135 to provide fire and emergency medical response services throughout the remainder of the planned 1.5 million acres. In order to stay on schedule, this application should be made as soon as possible with the goal of completing the Step II mergers not later than July 1, 2011. The advantage of this latter date is that it is the beginning of a fiscal year and eases the administrative

burden by not having to begin a new set of accounting records and make budget adjustments mid-year.

15.5 COUNTYWIDE FIRE AND EMERGENCY MEDICAL SERVICE PLANNING

The County is implementing a plan to provide unity and coordination among fire agencies in the unincorporated area, and through the mechanism of the Fire Authority can develop and maintain an effective coordinated emergency response with CAL FIRE; however, there are still 18 unincorporated cities in the County that are each independent. Other than the Unified Disaster Council and semi-formal fire chief organizations, there is no "working group" that has both the delegated responsibility and the resources to plan and implement a similar level of coordination between cities and between cities and the agencies in the unincorporated area.

This gap in planning and coordination does not appear to be due to lack of willingness among the fire agencies. Citygate kept hearing among fire personnel that the various organizations would identify problems that needed to be solved, but there was little or very delayed follow through because there was no staff to research, develop draft proposals, and coordinate consideration and adoption of problem solutions. Nor once planning was done, was there a chain of approval process and/or a step of last resort that would listen to competing advice and then render a final decision for operational implementation.

Recommendation 15-5: Citygate recommends that the County Fire Authority, through a County Fire Services Director, offer to assume the "coordination" role for a formal organization of fire agencies that would be responsible to develop plans, including implementation steps, for adoption and implementation by the County fire agencies. This organization could be as informal as one created by an MOU or as formal as a Joint Powers Authority. However, there does need to be a formal working group recognized and accepted by all agencies.

The membership of the regional fire planning and decision group should include the CAL FIRE Unit Chief, U.S. Forest Service Fire Chief, three Fire Chief representatives from smaller cities, the Fire Chief of the City of San Diego, the County Fire Services Director representing the Fire Authority agencies, a Fire Chief representing the fire districts that are not part of the Fire Authority, and a Volunteer Fire Chief. The chairperson would rotate annually between the County Fire Services Director, the City of San Diego Fire Chief and the CAL FIRE Unit Chief as the largest providers. The roles and responsibilities of the group would largely mirror that of the State of California FIRESCOPE Board of Directors that manages the policies of the statewide fire mutual aid system. As California OES staffs and provides resources to FIRESCOPE, the San Diego County Fire Authority could staff and resource the board to accomplish the needed regional planning and coordination work.