Performance Audit of the Fire-Rescue Department's Emergency Medical Dispatch Process

CHANGES TO FIRE-RESCUE DISPATCH PROCEDURES CAN REDUCE RESPONSE TIME BY UP TO ONE MINUTE

FEBRUARY 2012

Audit Report

Office of the City Auditor

City of San Diego

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THE CITY OF SAN DIEGO

February 29, 2012

Honorable Mayor, City Council, and Audit Committee Members
City of San Diego, California

Transmitted herewith is an audit report on the Fire-Rescue Department's Emergency Medical Dispatch Process. This audit found that the Fire-Rescue Department can improve its dispatching process and performance measurement, and that it would improve response time by doing so. This report is in accordance with City Charter Section 39.2.

We conducted this performance audit in accordance with the City Auditor's Fiscal Year 2012 Audit Work Plan. The Results in Brief is presented on page 1, and the Objectives, Scope, and Methodology is presented in Appendix A on page 16. The Administration's response to our audit recommendations can be found after page 24 of the report.

If you need any further information please let me know. We would like to thank staff from the Fire-Rescue Department for their cooperation and assistance during this audit. We greatly appreciate their valuable time and efforts spent on providing us with information. OCA staff that contributed to this audit report are Toufic Tabshouri, Martin Wilson, John Teevan, Kyle Elser, and Chris Constantin.

Respectfully submitted,

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Results in Brief

The City of San Diego's 911 emergency call system is one of the most critical services the City provides to its citizens. In fiscal year 2011, the 911 system processed over 100,000 incidents for emergency medical assistance in the City, which include serious vehicle accidents, heart attacks, and strokes. Time is of the essence in responding to critical calls. According to medical literature, for every one minute delay in responding to critical emergency medical calls such as cardiac arrests, the likelihood of survival decreases by up to 10 percent.

We examined the Fire-Rescue Department's current approach for responding to medical emergencies and identified a way to speed response times by an average of one minute. This can be done by changing the point in the process when a fire unit is actually dispatched. By so doing, Fire-Rescue personnel would be able to reach victims a minute sooner than in the past, potentially saving lives in the process.

An alternative approach to reduce emergency response time is currently not economically feasible because it would require increased public safety resources. [1] This would entail constructing more fire stations, adding more ambulances, hiring more dispatchers, and/or upgrading dispatch systems. However, adding resources is costly and difficult to accomplish at a time the City is facing challenging economic conditions and fiscal constraints. Absent additional resources, the most effective method to improve response time is to examine existing processes and uncover opportunities for improvement.

We provide a total of two recommendations to reduce the overall response time for medical calls and improve performance data reporting. The Fire-Rescue Department agreed with both recommendations.

[1] A consultant report commissioned by the City identified opportunities for improving the delivery of fire protection and emergency medical services, and provided cost estimates associated with these improvements. The City subsequently formed a working group to implement the consultant's recommendations, and the City Council approved an implementation plan in November 2011. Although we refer to the consultant's work in our report, we did not evaluate any of its recommendations or conclusions, nor are our recommendations meant to replace recommendations made in the consultant report.

Background

Quick Response to Medical Emergencies Saves Lives

The City of San Diego's 911 emergency call system is one of the most important services the City provides to its citizens. In fiscal year 2011, the 911 system processed over 118,000 incidents in the City. About 83,000 of these incidents resulted in a dispatch of a fire unit to a medical emergency. In San Diego, as in many communities in our nation, fire units are considered first-responders and generally arrive on location before an ambulance. This makes them critical for life-threatening emergencies. In critical medical emergencies such as heart attacks, every second counts—the sooner that a first-responder can arrive on scene, the sooner life-saving care can begin. According to medical literature, for every one minute delay in responding to certain critical emergency medical calls, the likelihood of survival decreases by up to 10 percent.

How Medical Emergency Calls Are Handled in San Diego: an Overview

In San Diego, 911 emergency calls come first to Police Headquarters. If call takers at Police Headquarters determine that the 911 call involves a fire or a medical emergency, they transfer the call to the Fire Communication Center (FCC).[2] At FCC, a Fire-Rescue Dispatch call taker obtains the location of the incident and the telephone number of the caller and determines whether the call is fire or medical in nature. The call taker then forwards the call to the dispatch queue so that an ambulance can be dispatched. The call taker then asks the caller additional questions to determine the severity of the medical emergency.[3] If the emergency is deemed to be a Priority 1—the most urgent priority—a Fire-Rescue first-responder unit is assigned to the call in order to provide an additional paramedic. Priority 1 emergencies include such situations as heart attacks, strokes, and serious vehicle accidents.

[2] If the emergency involves the need for a lifeguard, the call is transferred instead to a separate Lifeguard Services Dispatch Center. For more comprehensive background on the entire emergency response network, including Police Dispatch and Lifeguard Services Dispatch, see Appendix B.

[3] All call takers at the FCC are trained as Emergency Medical Dispatchers (EMD) and are required to ask a series of questions in order to triage the call to determine the nature and severity of a medical incident. EMD is a protocol for emergency dispatch; there are several organizations that certify dispatchers in EMD.

Audit Results

Finding 1: Changes to Fire-Rescue Dispatch Procedures Can Reduce Response Time by up to One Minute

Fire-Rescue has an opportunity to improve response time to medical calls by up to one minute at little cost. Fire Communication Center (FCC) call takers typically wait until they complete a series of questions before assigning Fire-Rescue first-responder units to a medical call, which delays response time. Over 85 percent of dispatches in San Diego are medical, and of these, approximately 82 percent result in the assignment of a fire unit in order to provide an additional paramedic to the incident.[4] Although an ambulance is dispatched as soon as the call taker verifies the address and phone number of the reporting party, a Fire-Rescue first-responder unit is not dispatched until the call taker has determined the severity of the emergency. Fire-Rescue first-responder units typically outnumber available ambulances and usually arrive to calls before an ambulance. Assigning a Fire-Rescue first-responder unit to a medical call at the same time an ambulance is assigned will allow the unit to reach the scene sooner, saving valuable seconds in an emergency situation.

Medical Emergency Response Times Exceed National and City-Adopted Standards

The total response time at the Fire-Rescue Department can be analyzed more carefully if it is divided into three main components, as shown in Exhibit 1:

- **Dispatch time:** starts at phone pickup and ends when emergency units are notified of the incident.
- **Turnout time**: the interval between notification and departure to the scene of an incident. It is generally the time that it takes Fire-Rescue personnel to stop whatever activity they are engaged in at the time they are notified of the emergency response, don their protective attire

[4] An agreement with the County of San Diego requires the City to provide two paramedics to the most severe medical calls. The City meets this requirement by assigning a Fire-Rescue first-responder unit staffed with at least one paramedic and an ambulance operated by Rural/Metro staffed with one paramedic and one emergency medical technician to each emergency medical call.

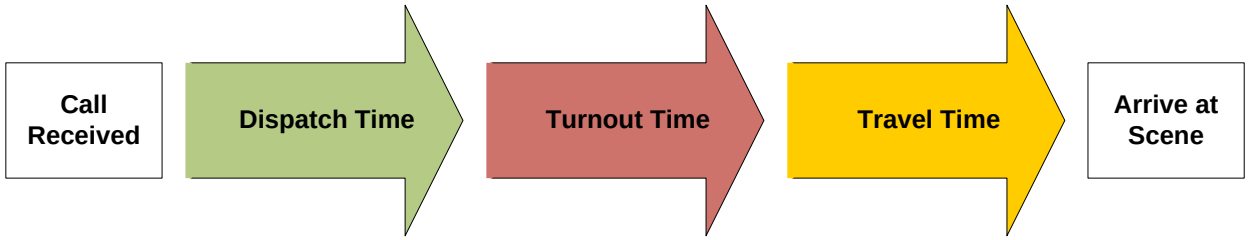
and leave the fire station or other location to begin driving to the incident.

- **Travel time:** begins when the unit departs to the scene and ends when it arrives at the incident address.

While it is important to measure and evaluate the overall response time, it is also important to measure, assess, and report each of the individual time segments and to compare them against performance standards in order to detect and investigate any poor performance.

Exhibit 1

Flow Chart of an Emergency Response



Source: Office of the City Auditor

Historically, fire departments measured performance by determining how long, on average, it took to respond to all of their calls in a given period. However, this is no longer considered best practice, since averages may not capture the variance between the calls and can often be skewed by outliers (extreme cases that can greatly affect an average). Instead, the current industry practice is to measure performance by the timeframe within which most calls (commonly 90 percent) are completed. This approach is considered to provide a better picture of how the system usually performs. For example, 90 percent of these calls took 3 minutes 1 second or less from the time the call was answered until a first-responder was dispatched, and 90 percent of these calls took 9 minutes 27 seconds or less from the time the call was answered until a first-responder unit arrived at the scene.[5]

[5] Our analysis excluded outlier calls. In statistical terms, we included only those calls within two standard deviations from the mean.

These dispatch times are significantly greater than national standards. The National Fire Protection Agency (NFPA) outlines time standards for responding to emergencies. The NFPA response time standard for Emergency Medical Services is that 90 percent of the time call processing should take no more than 1 minute, turnout time no more than 1 minute 20 seconds, and travel time no more than 4 minutes. Exhibit 2 outlines the Fire-Rescue department's performance compared to the NFPA standards.

Exhibit 2

San Diego Emergency Response Compared with NFPA Standards, Fiscal Year 2011

Measure	NFPA Standards (1)	Actual Performance (2)	Actual Time Within Which 90% of San Diego Calls Were Met
Dispatch Time: Time from Pickup to Unit Assigned	1 minute	12%	3 minutes 1 second
Turnout Time: Time from Unit Assigned to Unit Enroute	1 minute 20 seconds	85%	1 minute 28 seconds
Travel Time: Time from Unit Enroute to Unit Arrival at Medical Scene	4 minutes	56%	6 minutes 13 seconds
Overall Time: Time from Phone Pickup to Arrival On Scene	6 minutes 20 seconds	46%	9 minutes 27 seconds

Source: Office of the City Auditor analysis of dispatch data

Notes:
(1) 90 percent of calls should be completed within this time
(2) Percent of San Diego calls completed within the standard

The Fire-Rescue response times also significantly exceed the City's recently adopted new emergency response standards, which differ somewhat from the NFPA standards. In February 2011, Citygate Associates, LLC, a consulting company hired by the City of San Diego, issued a report titled *Fire Service Standards of Response Coverage Deployment Study for the City of San Diego Fire-Rescue Department*. Among its findings, the report suggested changing San Diego's medical response

performance goals to account for unique characteristics of the City. The City Council adopted these revised standards in November 2011, after a City working group issued an implementation plan for adopting the report recommendations. As Exhibit 3 shows, the adopted standards add 10 seconds to NFPA standards for turnout time, and 1 minute for travel time, for an overall increase of 1 minute 10 seconds. They retain the NFPA standard of 1 minute for dispatch time. Under these new standards, overall time compliance rises from 46 percent to 69 percent, but the low compliance in dispatch time continues to keep a significant number of calls from meeting the overall standard.

Exhibit 3

San Diego Adopted First-Responder Response Time Compliance

Measure	City Standard (1)	Actual Performance (2)	Actual Time Within Which 90% of San Diego Calls Were Met
Dispatch Time: Time from Pickup to Unit Assigned	1 minute	12%	3 minutes 1 second
Turnout Time: Time from Unit Assigned to Unit Enroute	1 minute 30 seconds	90%	1 minute 28 seconds
Travel Time: Time from Unit Enroute to Unit Arrival at Medical Scene	5 minutes	76%	6 minutes 13 seconds
Overall Time: Time from Phone Pickup to Arrival On Scene	7 minutes 30 seconds	69%	9 minutes 27 seconds

Source: Office of the City Auditor analysis of dispatch data

Notes:
(1) 90 percent of calls should be completed within this time
(2) Percent of San Diego calls completed within the standard

Current Dispatch Process Creates a Delay in Assigning First-Responder Units

The existing Fire-Rescue practice emphasizes the dispatch of ambulances, currently managed by San Diego Medical Services (SDMS). While an ambulance is dispatched as soon as the call taker verifies the address, a first-responder fire unit is not dispatched until the call taker asks the reporting party additional questions to determine the severity of the medical emergency. Approximately 82 percent of medical incidents in fiscal year 2011 resulted in the dispatch of a first-responder fire unit. Our analysis showed the average time to process and dispatch an ambulance is approximately 1 minute 6 seconds, while the time is 2 minutes 6 seconds for a first-responder fire unit.

Since first-responder fire units normally arrive at the scene of an emergency more quickly than ambulances do,[6] the total response time could be compressed by dispatching Fire-Rescue first-responder units while the call taker continues to obtain more information from the caller. In effect, this would reconfigure the current response procedure from a sequential process where dispatching follows call intake to a parallel process where the two tasks overlap.

The delay in assigning first-responders results in a delay in patient treatment in the case of an emergency. The unnecessary hold to assign Fire-Rescue engines and trucks results in delays and increases public safety risk. While most emergency calls do not involve imminent life-threatening incidents, one minute can be the difference between life and death in critical situations such as cardiac arrests. A February 2011 Fire-Rescue Report performed by an outside consultant group also found a need for response time improvement, stating that "The Department needs to place greater emphasis on procedures to get the first-due engine dispatched in less time, closer to the ambulance performance point."

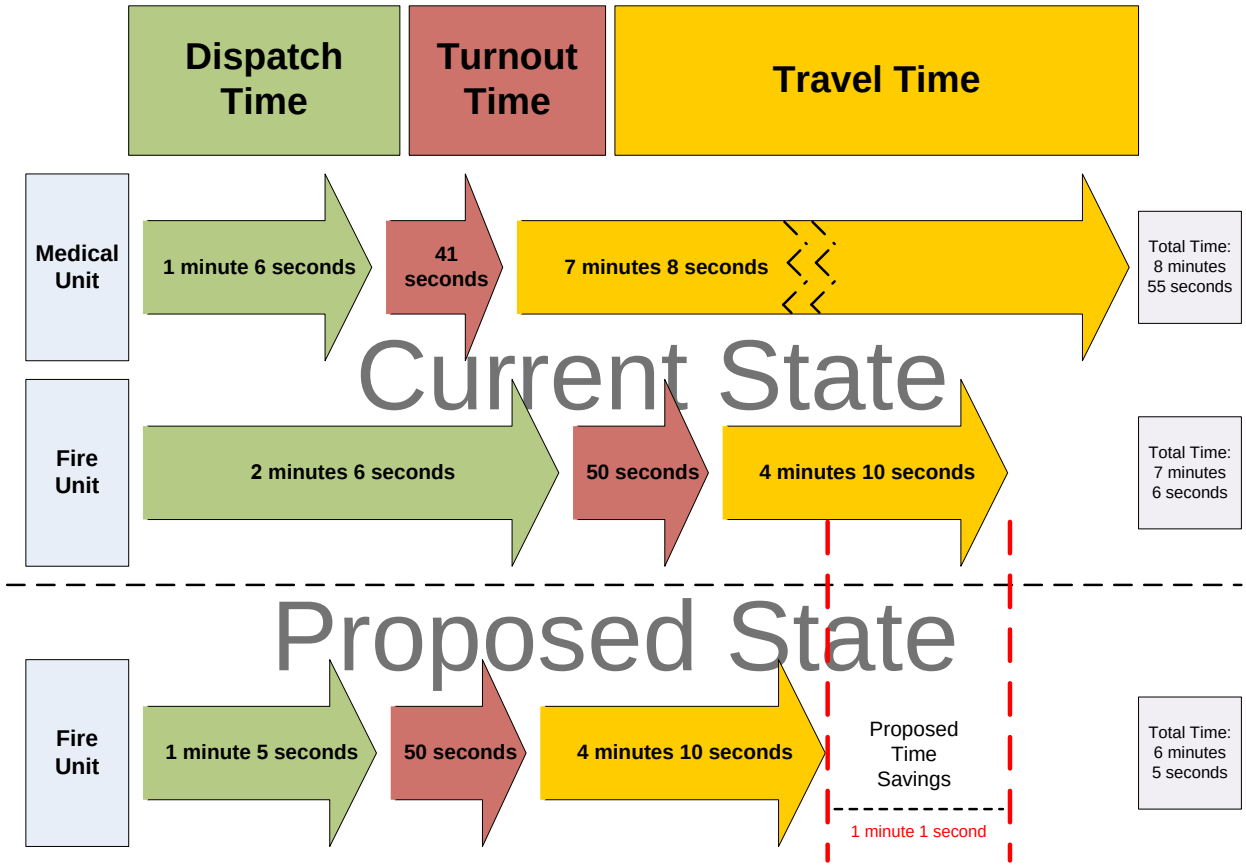
[6] Under the current system that the City has chosen to deliver emergency medical services, Fire-Rescue first-responder units are expected to arrive on scene earlier than Rural/Metro ambulances. Requiring a shorter ambulance response time would necessitate a change in the City's contract with Rural/Metro and an increase in the number of ambulances deployed.

A Change to Dispatch Procedures Would Improve Emergency Response Time

Our analysis of fiscal year 2011 dispatch data indicates that, if fire units were assigned at the same time as ambulances to an incident, fire units, on average, would have arrived on scene by up to one minute earlier. Exhibit 4 summarizes this analysis. Under the fiscal year 2011 "current-state" conditions shown in the upper half of the chart, fire unit response times averaged 2 minutes 6 seconds. As the "proposed-state" scenario for the fire unit shows, dispatching the fire unit at the same time as the medical unit results in help being on scene one minute earlier.[7]

Exhibit 4

Proposed Process Improvements in Emergency Response



Source: Office of the City Auditor

[7] The times shown in the exhibit reflect overall averages for all calls handled in fiscal year 2011, including the extreme cases that are omitted when considering performance on the 90-percent basis used in the NFPA and City standards. As a result, the times shown for the various stages of the process are different from those shown in the other tables in this report. We used an average of all cases in this analysis to demonstrate that, under both approaches (averaging all cases and using the 90-percent approach), the anticipated improvement in overall response is substantial.

A similar time savings results if the analysis is based on the new City standards. These standards call for 90 percent of calls to be dispatched within 1 minute. Currently, only 12 percent of calls meet this standard. As Exhibit 5 shows, the change in the dispatch process would increase this percentage to 59 percent, and 90 percent of all calls would be dispatched within 1 minute 44 seconds. Similarly, reducing the amount of time it takes to process and dispatch a first-responder unit would reduce the overall response time of a fire unit answering a medical emergency. City standards call for 90 percent of responses to be completed within 7 minutes 30 seconds. Currently, 69 percent of calls meet this standard. The change in the dispatch process would increase this percentage to 82 percent, and 90 percent of all responses would be completed within 8 minutes 22 seconds—a savings of about one minute.

Exhibit 5

Effect of Proposed Change on Dispatch Time and Overall Time

Measure	City Standard (1)	Actual Performance (2)	Actual Time Within Which 90% of San Diego Calls Would Be Met
Dispatch Time: Time from Pickup to First-Responder Unit Assigned			
Current Practice	1 minute	12%	3 minutes 1 second
Proposed Practice	1 minute	59%	1 minute 44 seconds
Overall Time: Time from Phone Pickup to Arrival On Scene			
Current Practice	7 minutes 30 seconds	69%	9 minutes 27 seconds
Proposed Practice	7 minutes 30 seconds	82%	8 minutes 22 seconds

Source: Office of the City Auditor analysis of dispatch data

Notes:
(1) 90 percent of calls should be completed within this time
(2) Percent of San Diego calls completed within the standard

Fire-Rescue Has Two Options to Reduce Medical Response Time

We identified two potential approaches to changing dispatch procedures that can achieve a significant reduction in Fire-Rescue emergency medical response time.

1. Assigning and deploying Fire-Rescue units to all emergency medical calls when an ambulance is assigned.
2. Implementing a pre-notification and deployment order process for Fire-Rescue units.

The first option involves assigning and deploying Fire-Rescue first-responders to all emergency medical calls at the same time dispatch assigns an ambulance. Currently, approximately 82 percent of medical incidents result in the deployment of a Fire-Rescue unit. The current dispatch practice involves call takers obtaining additional information using an emergency medical dispatch protocol prior to determining whether or not to send a Fire-Rescue unit. This process is a sequential process where one activity must be completed before the next activity begins, even if the activities can occur concurrently and are independent of each other (i.e. call takers obtaining more information from a caller while fire fighters prepare to deploy). By assigning fire units earlier in the process, Fire-Rescue can reduce response time. According to Fire-Rescue, the Department considered this option and determined not to implement the change due to the operational impact associated with committing fire units to a response before it was determined they would be needed and the added risk associated with lights and siren response of units not needed.

The second option involves notifying (pre-alert) the appropriate fire units of a possible medical deployment at the time an ambulance is assigned. Dispatchers follow-up with a deployment order (deploy or cancel) after call takers complete the emergency medical dispatch protocol. This option eliminates the cost and operational impact associated with the first option, while obtaining the same dispatch time reduction. In fact, we found some proactive Fire-Rescue units implementing this type of process at the fire station level. For example, a Fire Captain used the Computer-Aided Dispatch system to monitor incoming calls which were not yet assigned

to a fire station. When the call appeared within the Captain's service area, the Captain notified the station personnel of the pending call, and the personnel began preparing to deploy. When the deployment order eventually arrived, the personnel were staffing the fire engine and ready to depart. In our opinion, the second option presents a reasonable, balanced alternative, which Fire-Rescue should consider implementing system-wide.

Finding 2: Fire-Rescue Can Improve the Measurement and Reporting of Emergency Response Times

Although the Fire-Rescue Department measures and reports on various aspects of emergency medical response, the Department is not collecting all components of response time. As a result, the Fire-Rescue Department is unable to measure and analyze the emergency response process in a sufficiently detailed manner to uncover opportunities for improvement.

In order to accurately evaluate the performance of emergency medical response, it is essential to measure, assess, and report all the individual time components of the response process. This is particularly the case because there is no standardized national or commercial measurement system that can be implemented to improve response time. Our audit research indicates that cities measure and report on emergency medical response times in widely dissimilar ways, making comparisons of performance across municipalities very difficult. Therefore, the only practical way for a city to improve the performance of its medical response is to measure and analyze every step of the process and attempt to uncover any inefficiencies or opportunities to redesign the process.

The City's current performance metrics do not capture all the components of emergency response time. Currently, the Fire-Rescue Department reports the percentage of units that arrive on the scene of an emergency within five minutes, the percentage of 911 calls answered within ten seconds, and the percentage of emergency calls processed within one and a half minutes. At a minimum, reporting can be strengthened by addressing the following identified issues:

- Capturing turnout time—the time from when a unit is assigned to when it actually departs.
- Fully measuring the total response time from phone pickup to the arrival on scene time.
- Measuring the percentage of emergency calls processed within one minute per the adopted City standard instead of the current time of one and a half minutes.

- Measuring the percentage of emergency calls processed within one and a half minutes for a first-responder unit and not just an ambulance.

Improving emergency response information is also consistent with the conclusions of the recent analysis of Fire-Rescue operations by an outside consultant group. Their report states that deployment goals can be improved by including a time measure that begins when the Fire Communications Center receives the emergency call. Further, Fire-Rescue can utilize more detailed dispatch data to analyze ongoing operations and to identify opportunities to streamline and improve.

Conclusion

In most cases, making a substantial improvement in service requires a significant commitment of financial resources. In this audit report, we recommend a change to dispatch procedures that requires little additional resources, but that could reduce response time on each medical call by an average of one minute. Attaining such an improvement would have otherwise cost millions of dollars to pay for the construction of new fire stations[8] and to recruit and train new Fire-Rescue employees. Furthermore, the potential social benefits and avoided costs that accrue from saving lives are significant.[9]

While the City faces unavoidable future costs for replacing and rehabilitating aging fire stations, it is imperative that it also conduct all its operations as efficiently as possible. To further this goal, we recommend that the Fire-Rescue Department improve its analysis and reporting of dispatch data. The Office of the City Auditor continues to emphasize the importance of timely and valid performance measurement in our audit work. On this audit, we were fortunate to find that Fire-Rescue personnel shared our enthusiasm for performance improvement and were open to our input.

[8] The cost of building a fire station varies considerably based on location and other variables, but is conservatively $6 million.

[9] While it is difficult to place a monetary value on human life, economists and government agencies commonly use the Value of a Statistical Life (VSL) approach; the median VSL for a working adult is approximately $7 million.

Recommendations

Recommendation #1 The Fire-Rescue Department should implement the pre-notification and deployment order option (option two) to reduce the overall response time for medical calls. (Priority 1)[10]

Recommendation #2 The Fire-Rescue Department should strengthen its monthly measurement and reporting of dispatch data, analyze data to identify trends, and utilize the results of the analysis to identify opportunities to streamline and improve overall performance. (Priority 2)[11]

[10] Priority 1 recommendations require immediate implementation action due to fraud or serious violations being committed, or significant fiscal or equivalent non-fiscal losses occurring. For an audit recommendation to be considered related to a significant fiscal loss, it will usually be necessary for an actual loss of $50,000 or more to be involved or for a potential loss (including unrealized revenue increases) of $100,000 to be involved. Equivalent non-fiscal losses would include, but not be limited to, omission or commission of acts by or on behalf of the City which would be likely to expose the City to adverse criticism in the eyes of its residents.

[11] Priority 2 recommendations require implementation action within six months due to a potential for incurring significant or equivalent fiscal and/or non-fiscal losses. For an audit recommendation to be considered related to a significant fiscal loss, it will usually be necessary for an actual loss of $50,000 or more to be involved or for a potential loss (including unrealized revenue increases) of $100,000 to be involved. Equivalent non-fiscal losses would include, but not be limited to, omission or commission of acts by or on behalf of the City which would be likely to expose the City to adverse criticism in the eyes of its residents.

Appendix A: Objectives, Scope, and Methodology

Our audit objective was to conduct a review of the Fire-Rescue Department's emergency call taking and dispatch processes to:

1. Determine the efficiency and effectiveness of the receipt and handling of calls and dispatching of response units, and
2. Assess the adequacy and completeness of dispatch performance reporting to the City Administration and the City Council.

To address the first part of our objective, we obtained an understanding of the roles and responsibilities of call takers, dispatchers, and other personnel involved in emergency call handling. We reviewed State and local dispatch regulations along with national emergency dispatch standards, interviewed department officials regarding their roles and responsibilities, analyzed relevant policies and procedures, and flowcharted the processing of emergency calls. We researched emergency medical dispatch protocols in the City and in various municipalities. We also obtained and analyzed Fire-Rescue dispatch data from fiscal year 2011. We performed data reliability testing of the dispatch data we used in this report.

To address the second part of our objective, we evaluated existing Fire-Rescue reporting of emergency medical response and compared its utility against the information we generated from our analysis of dispatch data. We also researched emergency medical response reporting practices in various cities, and consulted with qualified medical professionals. To observe the operational response to dispatch process, we visited fire stations and accompanied first-responders to emergencies. We also discussed the impact of any change to dispatch processes with Fire-Rescue personnel.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis

for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. The Office of the City Auditor thanks the Fire-Rescue Department for its assistance and cooperation during this audit. The valuable staff time and efforts spent on providing us information are greatly appreciated.

Appendix B: Overview of San Diego's Emergency Response Network

This audit focuses on the Fire-Rescue Department's emergency response process, which is just one part of the emergency response system in San Diego. For readers who may want a more complete overview of the entire network, this appendix discusses the various parts of the network in more detail. In addition, Exhibit B-1 at the end of the appendix presents a chart showing the entire response process, and Exhibit B-2 presents a chart showing the part of the process that occurs within the Fire-Rescue Department's Fire Communications Center.

In the City of San Diego, three dispatch centers answer, process, and communicate calls related to public safety. A major component of dispatching involves emergency calls, which are received either through 911 or a local emergency number. The Police dispatch center, located in the San Diego Police Department (Police) Headquarters, serves as the primary Public Safety Answering Point (PSAP) for the City, receiving emergency calls originating in San Diego. Police call takers determine the nature of the emergency and process the call, or transfer the call to either the Fire-Rescue Department's Fire Communications Center (FCC) or the Lifeguard Services Communications Center (LCC). The Fire Communication Center serves as the secondary PSAP[12] for all fire and medical related calls. The Lifeguard Services Dispatch Center is part of the Fire-Rescue Department but is located in a separate facility from the FCC.

Police Dispatch

Police Dispatch is housed within the Communications Division at the Police Headquarters. The dispatch center takes calls for emergency 911 along with administrative calls. In fiscal year 2011, the dispatch unit had 147 employees, working in 10-hour shifts, organized into six different rotations for continuous coverage. The number of supervisors, lead dispatchers, radio

[12] The FCC is not a backup dispatch center for the primary PSAP; it is simply the next place that certain emergency calls are transferred.

dispatchers, and call dispatchers on hand varies at different times of the day.[13] Some call takers serve only as 911 call takers and others serve primarily as administrative call takers, supplementing 911 call takers when call volume is high. In general, there are two to three supervisors, one to three lead dispatchers, 8 to 10 radio dispatchers, and 13 to 21 call-taking dispatchers assigned to the various shifts in the dispatch center.

Fire Communication Center

Fire-Rescue Dispatch, part of the Communications Division, is housed within the Fire Communication Center (FCC) and primarily handles calls related to fire and medical incidents that are transferred from the Police. Additionally, the FCC provides medical and fire contract dispatching for the cities of Chula Vista, Poway, Imperial Beach, and San Pasqual. During the graveyard shift (11:30 PM – 06:30 AM), FCC assumes the responsibility for public works dispatching which is performed by Station 38 Dispatch during other hours of the day. The FCC also houses dispatch operations for non-emergency / general transport services performed by San Diego Medical Services (SDMS).[14]

All Fire-Rescue dispatchers are Emergency Medical Dispatch (EMD) certified and cross-trained to handle both phone and radio duties. The FCC is continuously staffed by civilian dispatchers, dispatch supervisors, and uniformed Emergency Resource Officers (ERO). Additionally, SDMS employ System Status Controllers (SSC) who maintain the strategic placement of paramedic ambulances throughout the City. Normal staffing levels include eight dispatchers, two SSCs and one supervisor per shift. Dispatchers work either 8 or 12 hour shifts depending on their quarterly seniority-based bid. SSCs work 12-hour shifts also based on a seniority-based bid system. ERO's work 24-hour shifts.

[13] Call takers receive emergency calls from the public and answer questions, while radio dispatchers assign and communicate with the field units responding to an incident.

[14] SDMS was a limited liability partnership between the City of San Diego and Rural/Metro Corporation that provided ambulance services for the City. It is now wholly owned by Rural/Metro.

Lifeguard Dispatch

Although Lifeguard Services Dispatch is part of the Fire-Rescue Department, the Lifeguard Services Dispatch Center is located separately from the FCC.[15] The dispatch center is typically staffed with one dispatcher, and is supplemented by one more as needed. Lifeguard staff rotates into the dispatch tower for two-hour shifts throughout the day, and one dispatcher staffs the night shift from midnight to 8 AM. According to the Department, up to 40 lifeguards rotate through the LCC over the course of the year. The dispatch center does not have a Computer-Aided Dispatch (CAD) system and processes calls on paper forms. Dispatchers receive 911 calls by phone and then communicate with staff using their radio. Many incidents do not originate from the 911 system and are self-generated and reported by lifeguards who witness them.

Emergency Dispatch Process

Emergency calls originating from the City of San Diego are first answered at the Police Department Dispatch Center.[16] If a call requires Police attention, the call taker obtains essential information and transfers the call over to Police radio dispatch, which deploys police units according to different police zones throughout the City. The call taker may also remain on the line to receive more information about the incident. This additional information is input to the Police CAD system and is accessible by the Police dispatch radio operator.

If the call is medical or fire related, it is transferred to the FCC so that necessary units may be dispatched. However, the call taker at the Police Department may stay on the line if the incident needs additional police presence, or if the police call taker has additional questions. Once the call is received at the FCC, the call taker obtains the location of the incident and the telephone number of the caller and determines whether the call is fire or medical in nature. When enough information is gathered and entered into the Fire-Rescue CAD system, the incident is sent to the dispatch queue. Similar to police dispatch, the call taker will remain on the line to gather additional information, and to give any necessary pre-arrival instructions.

[15] The Lifeguard Services Dispatch Center is located at Quivira Basin in Mission Bay.
[16] With the exception of cell phone calls made on Interstates which are first answered by the California Highway Patrol (CHP).

If the call requires the assistance of Lifeguard Services, the call is transferred from the Police to the Lifeguard Dispatch Center. Lifeguard Services receives these calls and dispatches the necessary resources. If medical assistance is also needed, the lifeguard dispatch may call the FCC to relay relevant information. Currently, lifeguard dispatch does not possess a CAD system and relies primarily on radio and paper to communicate and document incidents. Exhibit B-1 charts the processing of a typical emergency call in the City of San Diego.

Fire-Communication Dispatch Process

The Fire Communications Division's mission is to oversee "all internal and external emergency communication equipment and dispatch staff ensuring that equipment and personnel are able to easily communicate with the public and each other." The FCC falls under the Communication Division and is responsible for dispatching all emergency medical and fire related calls within the City of San Diego. The FCC also dispatches for other jurisdictions such as Chula Vista, Poway, San Pasqual and Imperial Beach, answers non-emergency calls, and houses dispatching for Basic Life Support (BLS) ambulances, which is currently operated by the Rural/Metro Corporation. The objective of FCC dispatching is to "quickly and safely respond to all emergencies in San Diego."

At the FCC, an emergency call is typically received from Police dispatch. Often the call taker at police dispatch will remain on the line to ensure that the call was transferred successfully, or to receive additional information from the reporting party. At the initial phone pickup the call taker obtains the location and call-back number of the emergency / reporting party. Afterwards, the call taker inquires about the emergency to discern whether it requires a fire or medical response. When the nature of the emergency is understood, the call taker forwards the call to the dispatch queue so that resources can be assigned to the call. If the call is a medical aid, the incident will enter the dispatch queue and will only be assigned an ambulance until the severity of the medical aid is determined. However, the system can be programmed to automatically assign both an ambulance and a fire unit. All call takers at the

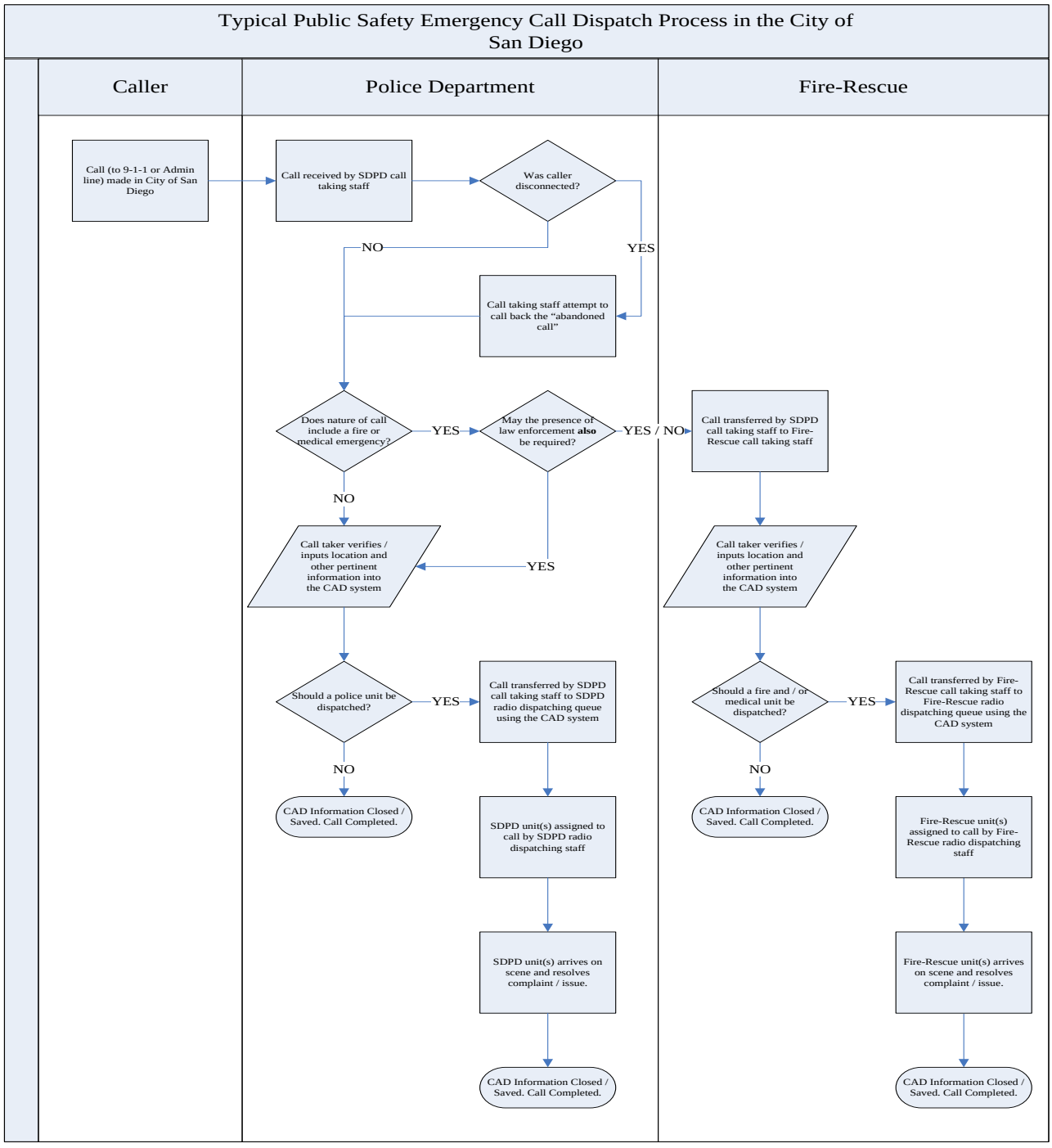
FCC are trained as Emergency Medical Dispatchers (EMD)[17] and are required to ask a series of questions in order to triage the call to determine the nature and severity of a medical incident. If the call is deemed to be a high priority, Fire-Rescue first-responder unit is assigned to the call in order to provide an additional paramedic.

Overall, the total response time for fire units includes: 1) the time it takes for the dispatcher to receive and process the caller's information and alert the responding personnel; 2) the time for units to prepare for departure, including donning any mandatory safety clothing; and 3) the time to drive safely to the location of the emergency. The sum of these three time elements commonly referred to as the dispatch, turnout, and drive times, represents the "total reflex" or total response time. Exhibit B-2 charts the processing of a typical emergency call in the FCC.

[17] EMD is a protocol for emergency dispatch; there are several organizations that certify dispatchers in EMD.

Exhibit B-1

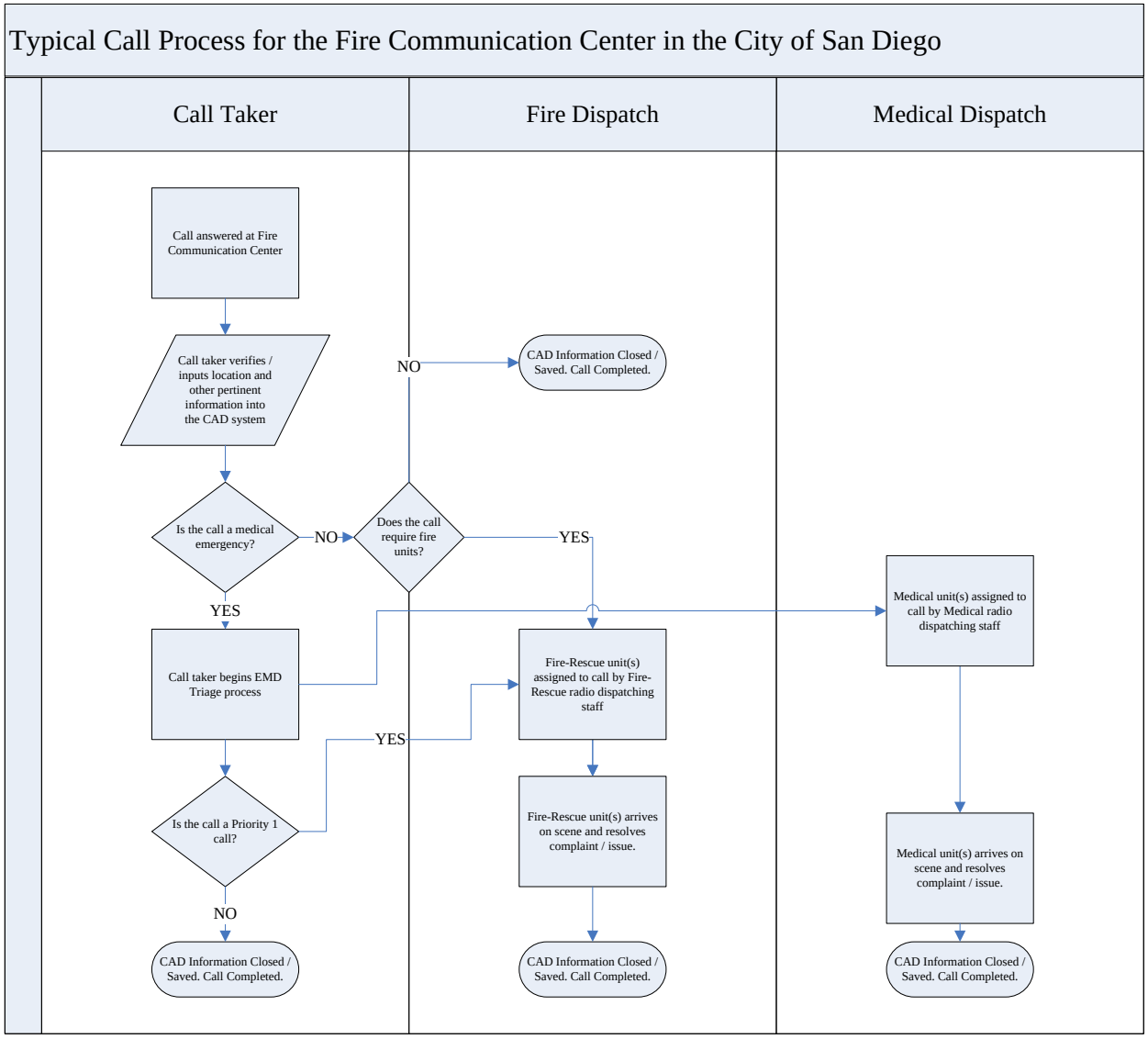
Processing an Emergency Call in the City of San Diego



Source: Office of the City Auditor

Exhibit B-2

Processing an Emergency Call in the Fire Communication Center



Source: Office of the City Auditor

THE CITY OF SAN DIEGO

M E M O R A N D U M

DATE: February 29, 2012

TO: Eduardo Luna, City Auditor

FROM: Javier Mainar, Fire Chief

SUBJECT: Management Responses to City Auditor's Performance Audit of the Fire-Rescue Department's Emergency Medical Dispatch Process

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In late 2011and early 2012, the City Auditor conducted a performance audit of the Fire-Rescue Department's emergency medical dispatch process. The final draft audit report has been reviewed by management and this memorandum reflects management's responses to the audit's findings and recommendations.

Management agrees with all of the findings and recommendations contained in the final draft audit report. Specifically, we agree that the recommendation to "pre-notify" first responder units of a request for emergency medical service while the request is still being triaged to determine which units should respond will significantly decrease first responder response times to medical emergencies while minimizing the negative safety risks associated with unnecessary lights and sirens responses. This will enhance service delivery to victims of medical emergencies while only minimally increasing operating costs associated with additional fuel consumption and added mileage on first responder vehicles. In addition, we agree that the capture, analysis and reporting of all emergency response time components is beneficial to overall emergency response analysis and have already implemented this as the result of recommendations found in the Citygate Report.

Recommendations and Management Responses

Recommendation 1: The Fire-Rescue Department should implement the pre-notification and deployment order option (option 2) to reduce overall response time for medical calls. (Priority 1)

Response: Agree. This recommendation will be targeted for implementation by July 1, 2012, but the final implementation date will ultimately be determined by completion of required discussions with the firefighter bargaining group over the impacts of this planned change.

Fire-Rescue will change its medical incident dispatch procedures to include notification or assignment of the first responder unit at the same time as the ambulance. Once notified/assigned, the first responder unit will make all preparations to begin traveling toward the medical emergency in the 60-90 seconds it takes to fully triage an incoming call to determine if the first responder will be needed. At the end of this interval, the Fire Communications Center will advise the first responder if they are to be cancelled from the response (15% of medical calls will not require a first responder). Doing so will result in a slight increase in operating costs from increased fuel consumption and first responder vehicle mileage.

Recommendation 2: Fire-Rescue should strengthen its monthly measurement and reporting of dispatch data, analyze data to identify trends, and utilize the results of the analysis to identify opportunities to streamline and improve overall performance. (Priority 2)

Response: Agree. This recommendation was implemented effective January 1, 2012.

Pursuant to City Council's adoption of recommendations made in the Citygate Standards of Response Coverage Deployment Study, Fire-Rescue changed it response time reporting practices to include all time intervals from call receipt in the Fire-Rescue Communication Center to emergency unit arrival at the incident location. This practice provides for monitoring and analysis of all response time intervals to determine performance and any needed adjustments to minimize response time to emergencies. This data is reported as an internal department measure.

We'd like to take this opportunity to thank the City Auditor and his team for undertaking this review.

J. Mainar

Javier Mainar, Fire Chief

JM/jm

cc: Jay M. Goldstone, Chief Operating Officer
Wally Hill, Assistant Chief Operating Officer