



CITY AUDITOR'S OFFICE

Fire Department Staffing Model

January 8, 2014

AUDIT REPORT NO. 1413

CITY COUNCIL

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Suzanne Klapp
Vice Mayor Virginia Korte
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January 8, 2014

Honorable Mayor and Members of the City Council:

Enclosed is the audit report, *Fire Department Staffing Model* which was included on the Council-approved FY 2013/14 Audit Plan. The audit reviews the effectiveness of the Fire Department's staffing model including factors such as comparative workloads, response times and automatic aid.

The Fire Department uses a 4-firefighter staffing model that is supported by research and in accordance with the City's intergovernmental agreement for automatic aid. However, this audit recommends updating and submitting for Council approval the Department's related policy document, the Standards of Response Coverage. Additionally, the Fire Department's staffing calculator, which is used to estimate the cost of overtime versus additional staff, can be expanded to include more factors, such as staff turnover and recruiting and training time.

An unnoticed data error caused certain call volume activity, primarily automatic aid received, to be understated, and access to the Department's information systems can be better aligned with job responsibilities. Further, the Department paid day-assigned firefighters overtime for hours already incorporated into their hourly pay rates, and trade time is not addressed in the City's Human Resources Code.

We would like to thank Fire Department staff for the cooperation and timely assistance provided throughout this audit. If you need additional information or have any questions, please contact me at (480) 312-7867.

Sincerely,

A handwritten signature in blue ink that reads "Sharron Walker". The signature is written in a cursive, flowing style.

Sharron Walker, CPA, CFE
City Auditor

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EXECUTIVE SUMMARY

This *Fire Department Staffing Model* audit was included on the Council-approved fiscal year (FY) 2013/14 Audit Plan. The audit objective was to review the effectiveness of the Fire Department's staffing, such as comparative workloads, response times and automatic aid.

In 2005, the City of Scottsdale created its internal Fire Department after the City's contract provider opted to discontinue providing fire service. From 13 stations in 2005, Scottsdale has expanded to 15 fire stations spread throughout the City and participates in an *Automatic Aid* system along with 22 other cities, towns and fire districts through an intergovernmental agreement. The Fire Department uses a 4-firefighter staffing model that is supported by research and in accordance with the City's intergovernmental agreement for automatic aid.

First issued in April 2006, the Department's Standards of Response Coverage report (SOC) has not been updated since nor formally adopted by the City Council. The SOC identifies key factors such as high risk facilities, known hazardous materials locations and performance expectations, which are used to derive needed resources, including fire station locations, apparatus and staffing. Response time goals stated in the SOC have not been met; however, they may need to be updated. Similar goals are seldom achieved by fire departments around the country. Moreover, based on national recommendations, the goals do not reflect the City's unique circumstances, such as the code requirement for automatic fire sprinklers. As well, the Department's ability to meet its emergency response time goals may also be affected by responding to other types of calls, such as animal, bee and snake removals.

The Department uses a staffing calculator to determine staffing needs based on its preferred staffing model. However, the staffing calculator and related data integrity can be improved. For example, the staffing calculator does not incorporate significant factors such as historical turnover or rover staff availability, so a more comprehensive calculator may aid the Department in its staffing analysis. As well, an unnoticed data error caused the Department's call volume activity to be understated. Access to the Department's information systems are granted on a case by case basis rather than on the "least privilege" principle. This principle would grant user rights to only the functions needed to carry out regular job duties.

The Department pays day-assigned firefighters overtime for hours already incorporated into their hourly pay rates. When temporarily assigning a firefighter to a 40-hour/week position, the Department establishes a new pay rate based on 56-hours of straight-time pay plus a 10% increase to make up for lost half-time pay. Although 16 hours of overtime is already included in this pay rate, overtime is paid after 40 hours per week, which resulted in about \$80,000 of additional pay during the last 2 fiscal years. Alternatively, if the Department continued to pay these staff at their regular hourly rates along with overtime for each additional hour worked, the Department would have saved more than \$550,000 in the last 2 fiscal years.

Finally, two Department job descriptions posted on the City's website indicated an incorrect overtime exempt status, and the Department's trade time policy is not addressed in City Code with other human resources provisions.

BACKGROUND

In 2005, the City of Scottsdale created its internal Fire Department after Rural/Metro, the previous contractor for fire and ambulance service, opted to discontinue providing fire service. The City, which already owned the fire stations and apparatus, hired firefighters and purchased the necessary personal protective equipment and other items. From 13 stations in 2005, Scottsdale has expanded to 15 fire stations spread throughout the City. The downtown fire station, Station 602, is equipped with both an engine and a ladder truck while each of the other 14 stations has either a ladder or an engine company. In addition, the City has specialty vehicles for hazardous materials, technical rescue, and aircraft fires. Firefighters with specialty certifications operate these apparatus when required, but respond to regular calls the rest of the time.

Specialty Units	Station Location	FY 2012/13 Calls
Hazardous Materials	608 - 96 th & Cactus	216
Technical Rescue	610 – Bell & Thompson Peak	65
Aircraft	609 – Hayden & Raintree	39

Crew

Four firefighters to cover a 24-hour shift.

Company

Three crews (A, B and C shifts) that alternate to provide 24/7 coverage. Scottsdale has 16 companies for 15 fire stations.

Battalion

Group of companies. Scottsdale has 2 battalions, North and South.

The Department also has one 40-hour/week truck which assembles at Station 601, but works out of various stations for companies that are in training or otherwise supplements throughout the system where needed.

The Fire Department measures its activity by call volume, which is tracked and reported by discrete incident and by responding units. When counting discrete incidents, each incident is counted once regardless of how many companies or units responded. However, certain types of incidents, particularly actual fires, require multiple companies to respond; the count by unit represents this service level. The fire stations' daily call volumes vary, with the majority of calls occurring in the more densely populated southern area of the City and fewer calls in the northern areas. Figure 1 on page 4 shows the current locations of Scottsdale's fire stations along with their average daily calls by unit for FY 2012/13.

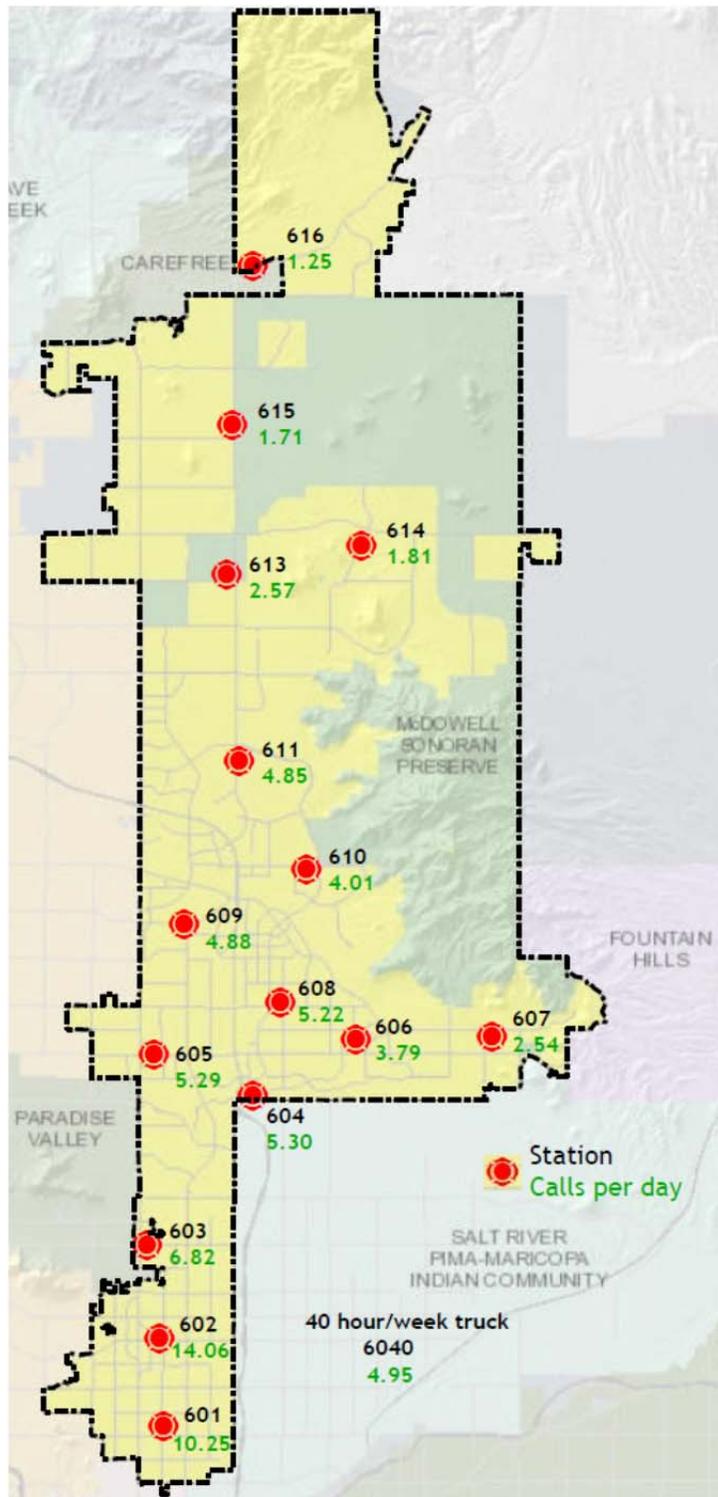
Staffing Standards

Through an intergovernmental agreement, the City of Scottsdale participates in an *Automatic Aid* system with 22 other cities, towns and fire districts. The Automatic Aid system provides that, based on proximity, any participant's staff and equipment may automatically be dispatched to a call for service in the participating cities.¹ The most recent Automatic Aid agreement, approved by the City Council in March 2013, requires participants to staff each applicable apparatus with 4 personnel.

The Scottsdale Fire Department staffing standards align with the National Institute of Standards and Technology's (NIST) and National Fire Protection Association's (NFPA) recommendations to staff fire apparatus with 4 personnel. NIST studies for both fire and emergency medical incidents conclude that critical activities are completed faster and safer with 4 person crews than with 3 or fewer personnel.

¹ Scottsdale also has a *Mutual Aid* agreement with the Salt River Pima Maricopa Indian Community (SRPMIC) and Rural Metro. Through this type of agreement, each of the parties provides aid when requested by the other party but are not automatically dispatched.

Figure 1. Fire Stations' Locations and Average Daily Call Volumes (FY 2012/13)

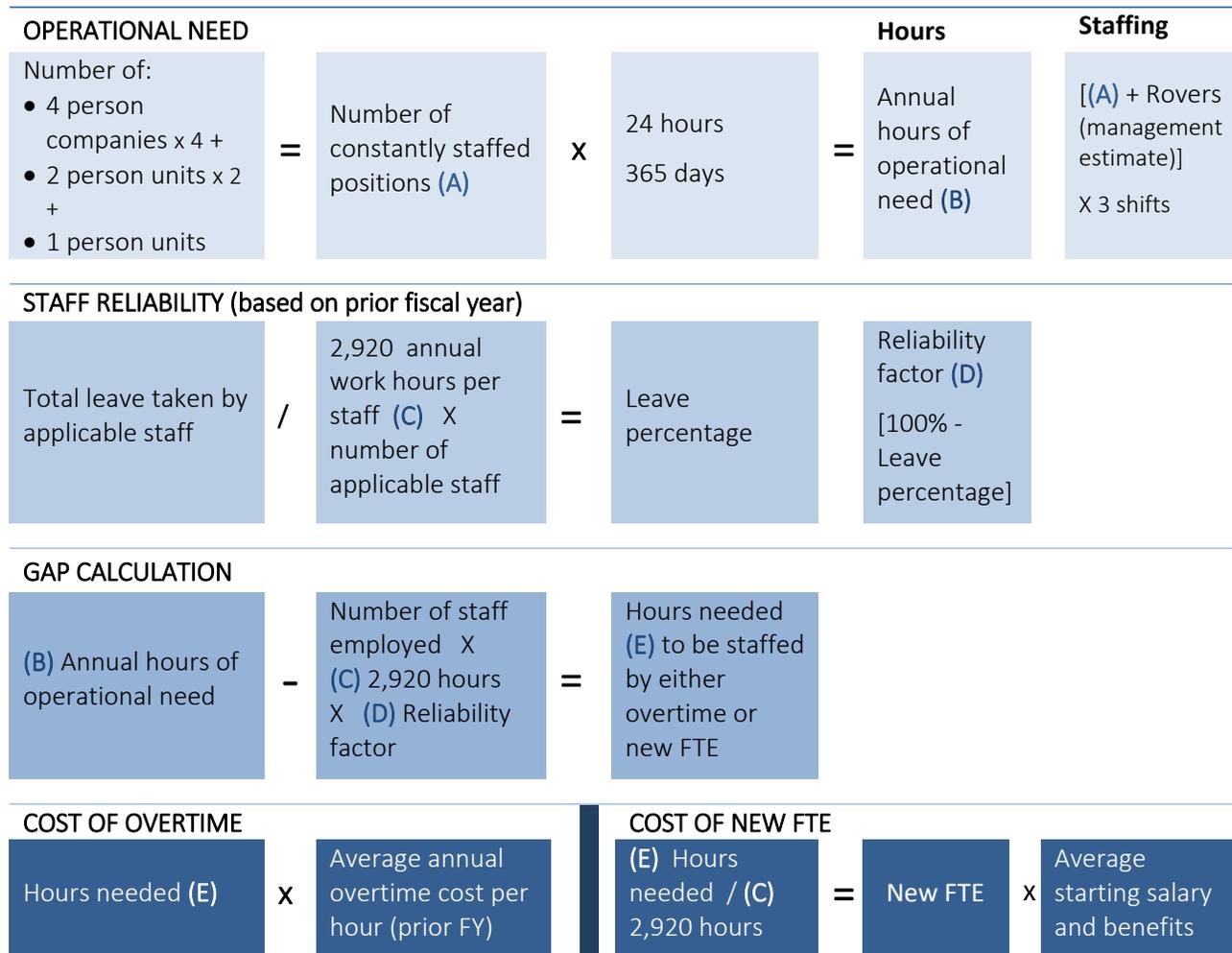


SOURCE: Auditor analysis of Firewire call data and GIS mapping of fire station locations.

Staffing Model

To determine its staffing needs based on the designated staffing standards, the Department uses a spreadsheet-based staffing calculator, which is summarized in Figure 2.

Figure 2. Staffing Calculator



SOURCE: Auditor analysis of Scottsdale Fire Department staffing calculator spreadsheet.

Data is put into this staffing calculator for the numbers of 4-person companies (based on the number of fire station companies), 2-person units (battalion chiefs) and 1-person units (airport specialty assignment). Using the number of these constantly staffed assignments and the 24-hour shift and 365 days per year requirements, the staffing model calculates the total work hours needed for the year. Fire Department management estimates the number of additional firefighters needed to cover leave vacancies based on historical leave patterns; these additional staff are called “rovers” as they fill in at various fire stations as needed. For the regular firefighters, the model calculates a “reliability” factor based on the leave used in the prior fiscal year, such as vacation, medical, and jury duty hours. After applying this reliability factor to the authorized number of positions, the available work hours are

compared to the calculated work hours needed. The additional hours needed, if any, are then used to calculate estimated overtime versus additional staff costs to meet constant staffing needs.

The Department uses a 27-day work period of 216 hours for field-assigned firefighters; those assigned to administrative positions generally work 40 hours a week. Under the 27-day work period, the federal Fair Labor Standards Act requires overtime payment at 1.5 times the regular pay rate after 204 hours worked.² Therefore, Scottsdale firefighters have 12 hours of planned overtime during each 27-day work period. As the standard 216 hours are calculated at the regular pay rate, the Department refers to the additional pay for planned overtime as “half time” pay.

Besides this planned overtime, unscheduled overtime occurs periodically due to the Fire Department’s operational goal of constant staffing. Firefighter absences, whether caused by training, vacation or other reasons, with few exceptions are covered by another similarly skilled firefighter.³ As summarized in Table 1, during each of the last 4 fiscal years, the Fire Department has exceeded its budget for this unscheduled overtime.

Table 1. Comparison of Budgeted and Actual Unscheduled Overtime

Fiscal Year:	2009/10	2010/11	2011/12	2012/13
Budgeted Overtime	\$371,660	\$380,848	\$492,278	\$612,672
Actual Overtime	\$410,574	\$402,283	\$552,948	\$907,709
Actual in Excess of Budget	(\$38,914)	(\$21,435)	(\$60,670)	(\$295,037)

SOURCE: Auditor analysis of City of Scottsdale financial reports.

Workload Analysis

Over the past eight years, the Department’s fewest discrete calls generally occurred between 3 a.m. and 5 a.m. while calls peaked between 9 a.m. and noon. For example, as illustrated in Figure 3 on page 7, the Department’s 15 stations responded to 4 calls, on average, around 10 a.m. However, as shown in Figure 4, Station 602’s activity contrasts with those averages as its busiest hour of 2 a.m. occurred during the lowest activity period for all other fire stations.

² The Fair Labor Standards Act has specific provisions applicable to firefighters based on their unique work hours and environment.

³ Some firefighters have specialized skills, such as for Advanced Life Support (ALS) or Hazardous Materials or supervisory levels.

Figure 3. All Stations' Average Calls by Time of Day (FYs 2005/06 - 2012/13)

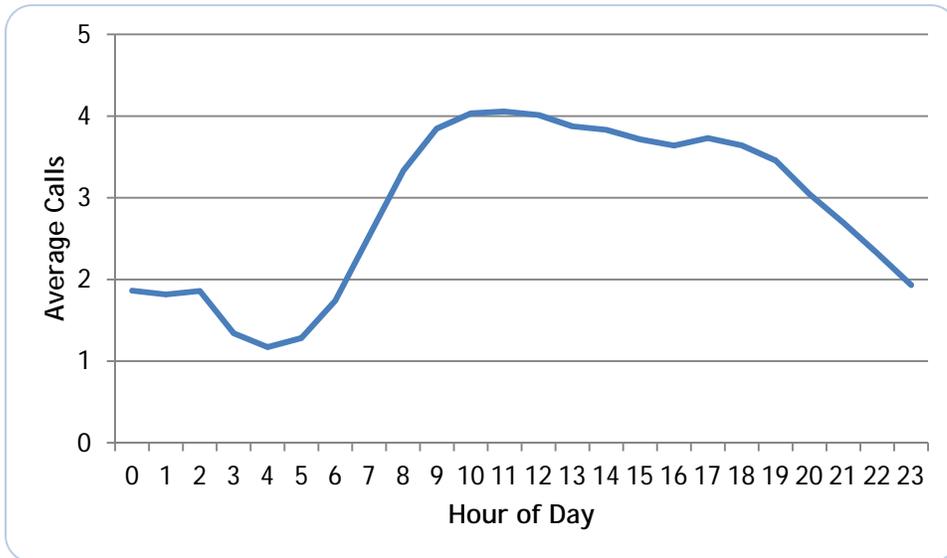
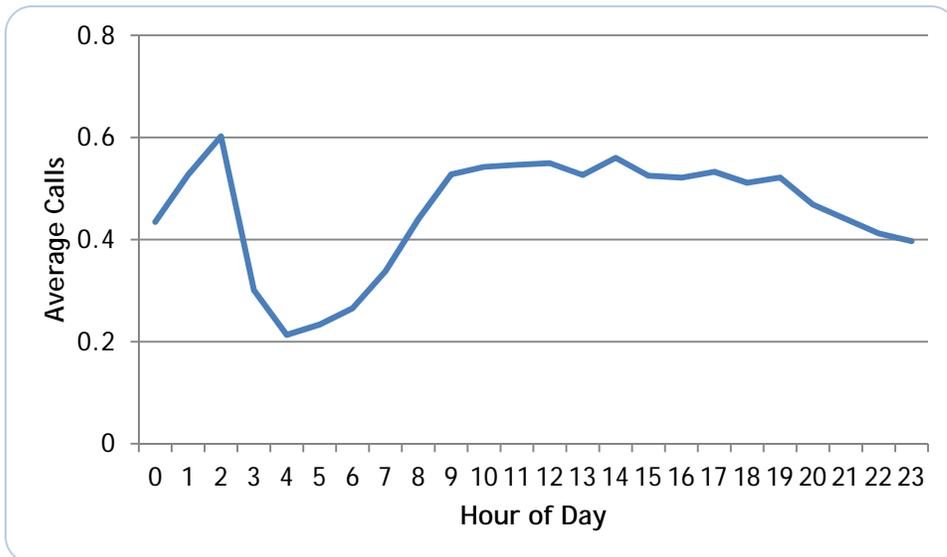


Figure 4. Station 602's Average Calls by Time of Day (FYs 2008/09 - 2012/13)

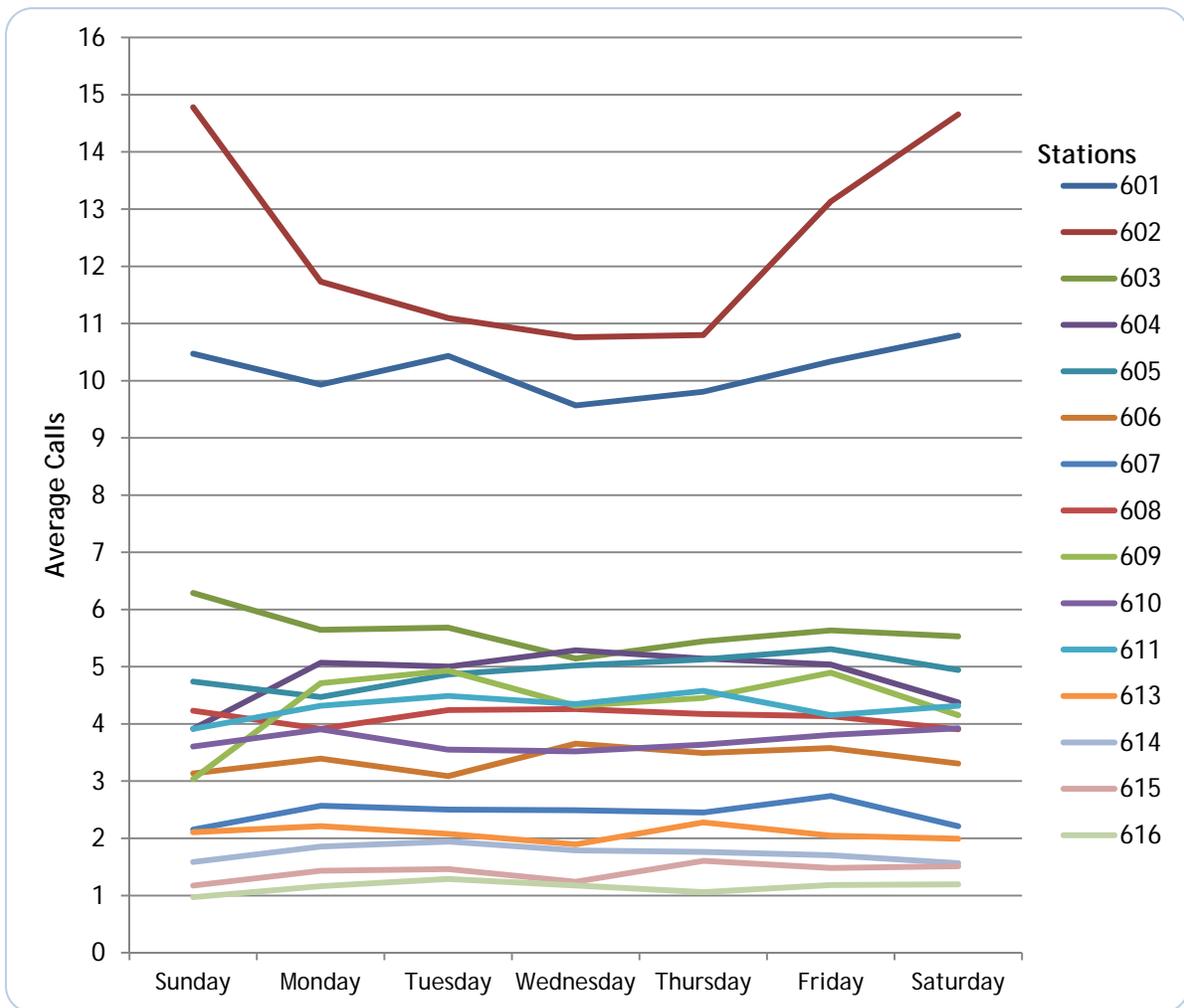


Note: Station 602 was only in operation during these 5 years of the 8-year period.

SOURCE: Auditor analysis of FireRecords data.

As Figure 5 on page 8 shows, Stations 601 and 602 daily call volumes are dramatically busier than the remaining 13 stations. Further, while daily call volumes are fairly stable for most fire stations, Station 602 experiences peak workloads on Fridays, Saturdays and Sundays.

Figure 5. Average Call Volume by Station and Day of Week (FYs 2011/12 - 2012/13)

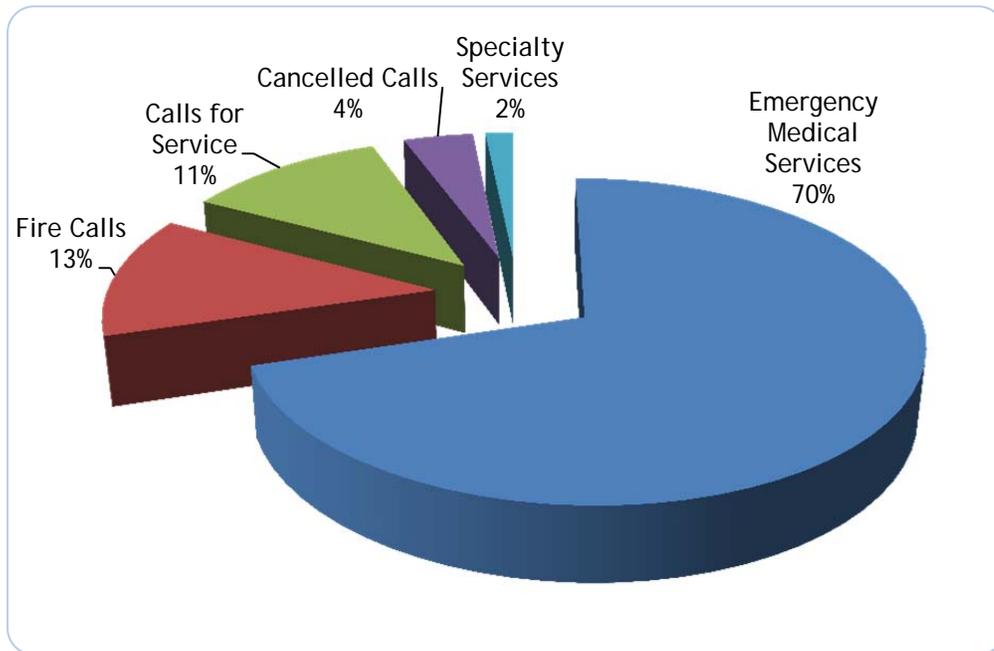


SOURCE: Auditor Analysis of FireRecords data.

Through the Automatic Aid agreement with other Valley cities, the closest available fire company responds to incidents in the participating cities. During the 8 year period, other cities' Fire Departments responded first to 4 to 5% of Scottsdale incidents, and similarly 4 to 5% of incidents responded to by the Scottsdale Fire Department were located in other cities.

As illustrated in Figure 6, since the Fire Department's inception about 70% of its calls related to medical emergencies, while 13% represented fire-related calls. The remaining calls are comprised of calls for service, which include calls for animal, bee or snake removal, car lockouts and stalled elevators; canceled calls; and specialty services, such as hazardous materials, mountain rescues or airport calls.

Figure 6. Calls by Type (FYs 2005/06 - 2012/13)



Note:

Fire Calls include false alarms.

Calls for Service include Animal/Snake removal.

Specialty Services include Hazardous Materials, Technical Rescue Team and Aircraft calls.

SOURCE: Auditor analysis of FireRecords data.

OBJECTIVES, SCOPE, AND METHODOLOGY

An audit of the *Fire Department Staffing Model* was included on the City Council-approved fiscal year 2013/14 Audit Plan. The audit objective was to review the effectiveness of the Fire Department's staffing, such as comparative workloads, response times and automatic aid.

To gain an understanding of the Fire Department's staffing model, we:

- Interviewed the Fire Chief, Executive Assistant Fire Chief, and Fire Marshal.
- Reviewed City Council reports and City Council meetings related to Fire Department staffing.
- Reviewed the Department's Standards of Response Coverage document dated April 2006 and the multi-jurisdictional Automatic Aid Agreements approved by the Scottsdale City Council in September 2004 and March 2013.
- Participated in a station tour and ride-along with Fire Department management.
- Reviewed Scottsdale City Auditor Reports *Compensation Practices & Controls* Report No 1103 and *Overtime Controls and Practices* Report No 1107.
- Reviewed industry studies including: *Fire Fighter Safety and Deployment Study: Report on EMS Field Experiments*, National Institute of Standards and Technology, September 2010 and *Report on Residential Fireground Field Experiments, NIST Technical Note 1661*, US Department of Commerce and National Institute of Standards and Technology, April 2010.

To assess the Fire Department staffing model, our audit procedures included:

- Contacting local municipal fire departments, including Phoenix, Chandler, Tempe, Mesa, Glendale, Gilbert, and Peoria to inquire about their staffing methodologies and related statistics.
- Reviewing authoritative sources for staffing models, best practices, standards, and guidance including *Managing Fire and Rescue Services*, International City/County Management Association, 2002; *Municipal Benchmarks: Assessing Local Performance and Establishing Community Standards*, by David N. Ammons, 3rd ed., 2012; and *NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2010 Edition, issued by the National Fire Protection Association.
- Evaluating the reliability of department data including incident, scheduling, and payroll information.
- Using department call data to identify trends and verify information provided to City Council.
- Analyzing the number of specialty calls and the number of staff with specialty certifications.

Our audit found that the Standards of Coverage has not been updated since FY 2005/06 nor formally adopted by the City Council. As well, the Department's staffing calculator can be expanded and related data integrity can be improved. An unnoticed data error caused the Department's call volume activity to be understated, and access to the Department's

information systems appear to be granted on a case by case basis. Furthermore, the Department paid day-assigned firefighters overtime for hours already incorporated into their hourly pay rates and could potentially realize significant savings by keeping these positions at their regular hourly pay rates. Finally, two Department job descriptions posted on the City's website indicated an incorrect exempt status and trade time is not addressed in the City's HR Code.

We conducted this audit in accordance with generally accepted government auditing standards as required by Article III, Scottsdale Revised Code §2-117 et seq. 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. Audit work took place from August through December 2013.

FINDINGS AND ANALYSIS

1. The Standards of Response Coverage has not been updated since FY 2005/06 nor formally adopted.

The Standards of Response Coverage (also referred to as Standards of Coverage, or SOC) has not been updated since 2006 although the City's environment of residential and commercial structures and its fire facilities have changed during the past 8 years. As well, the SOC has not been presented to the Council for its approval as a policy document.

A. The Standards of Coverage report documents key factors, such as high risk facilities and known hazardous materials locations, as well as performance expectations such as response times. These factors are used to derive needed resources, such as fire station locations, apparatus and staffing.

A Standards of Coverage report evaluates and defines factors such as the existing risks and hazards, distribution of resources, service level objectives, time and other performance expectations and recommended system improvements.

1. The initial SOC report used the former contract provider's data for the prior 3 years, but identified data limitations due to operational differences from how the City department was operating. The contractor did not participate in the Automatic Aid system or the regional dispatch system, did not have automatic vehicle locators, and operated with fewer firefighter companies.
2. Commercial and residential developments that have occurred in the subsequent 7 years are not reflected in the report. Many of the identified construction projects are now complete and should be included in the report's buildings inventory and assigned a risk score. For example, the City of Scottsdale/ASU SkySong project was listed as "Cleared site - no construction yet". As the SOC report states, knowing the use and location of the heaviest concentrations of buildings and facilities allows preplanning for incident mitigation. As well, the report lists population density, construction practices, and existence of built-in fire protection as factors for risk assessment.
3. Statistical information such as call volumes and response times were based on the former contractor's activities. For example, the SOC states that 61% of reported incidents were medical emergencies while they have comprised about 70% of the in-house Fire Department's incidents.⁴ In addition, at that time, projections for the City's population exceeded current estimates.
4. The Fire Department's resources have changed, including the addition of fire stations 602 and 608. With the added fire stations, engine and ladder companies have also been reorganized to one per fire station with the exception of Station 602, which has two companies. As well, all engine and ladder companies are now comprised of 4-person crews while previously some had been staffed with 3-person crews.

⁴ This statistic covers the period of FY 2005/06 through FY 2012/13.

- B. Although the SOC was presented to the Council during a September 2006 work-study session, it has not been brought back to Council for review and approval. The SOC reflects operational decisions that influence budgetary costs. These include participation in the Automatic Aid agreement; response time and other goals; and the number of fire stations, companies per station, and fire crew size. Considerations of key factors, such as whether to consolidate lower volume fire stations or establish additional fire stations or whether to increase or decrease the constant staffing level, affect capital and operating costs.

The SOC report also stated that (Fire Department) staff would annually review the department's performance and report to the Council on the outcomes. The department's annual performance measures in the City Budget may provide one avenue for carrying out this stated objective.

- C. Response time goals included in the SOC report have not been met, but the goals may need to be updated. It appears that similar goals are seldom attainable by fire departments around the country.

The National Fire Protection Association (NFPA) recommends that fire departments respond to emergencies within 5 minutes for medical incidents and within 5 minutes and 20 seconds for fire incidents, 90% of the time. However, the NFPA recommendation does not take into account preventative fire measures, such as the municipal fire sprinkler ordinance that has been in effect in Scottsdale since 1986.

The SOC report states the department's goal is to arrive at the scene of an emergency within 5 minutes 30 seconds 80% of the time. This 2006 report further noted that in its first year, the department had met the response time goal approximately 45% of the time. As shown in Table 2, for the complete FY 2005/06, the Department responded to calls in less than 6 minutes about 65% of the time. During the 7 subsequent fiscal years, the department's performance ranged from 61% to almost 67% for this target.

Table 2. Average Emergency Response Times (FYs 2005/06 - 2012/13)

	Average Response Time	% Under 6 minutes
FY 2005/06	05:20	64.67%
FY 2006/07	05:24	61.04%
FY 2007/08	05:22	62.21%
FY 2008/09	05:21	61.73%
FY 2009/10	05:27	61.34%
FY 2010/11	05:20	64.42%
FY 2011/12	05:18	66.91%
FY 2012/13	05:23	64.97%

Note: While the Department's stated goal is 5:30, its reports are based on 4, 5 and 6 minutes.

SOURCE: Auditor analysis of City of Scottsdale Response Time Report

The NFPA response time goals for fire incidents were established based on the time until a fire reaches flashover, which is the point when ordinary combustibles within the room simultaneously reach their ignition temperature. Flashover occurs, in general, between 8 and 10 minutes. For medical emergency incidents, the response

time goals were developed based on time to brain death. The American Heart Association indicates irreversible brain damage can occur after 10 minutes without oxygen.

Based upon the times until flashover and brain death, it appears that response time goals can be increased to something that is attainable. As well, Scottsdale's code requirement for automatic fire sprinklers can delay or prevent flashover. The department has not evaluated the extent to which this requirement may increase allowable response time while maintaining effectiveness. Increased effective response time goals would help control fire department resource needs and costs and maximize the cost-effectiveness of the automatic sprinkler requirement.

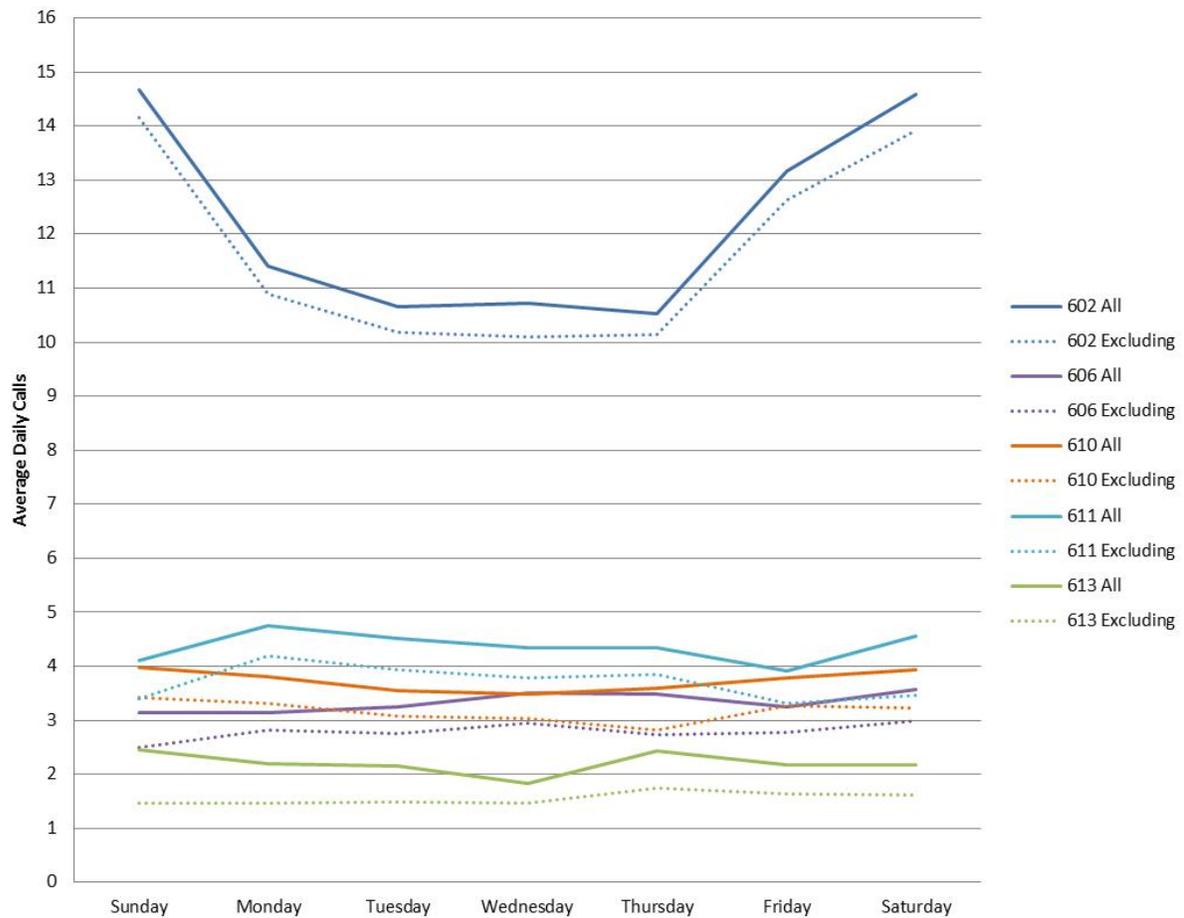
Based on limited ICMA performance measure data and a survey of Valley cities, other municipalities are also not meeting response time goals. For FY 2010/11 and FY 2011/12, the most recent ICMA data available, similarly-sized city fire departments self-reported meeting a 5 minute response time from a low of 28% to a high of 77% of the time.⁵ Further, Fire Department management indicated the NFPA and Standard of Coverage response time goals are likely unattainable. Yet these response time goals are used to support the need for additional resources.

- D. The Department's ability to meet its response times may be affected by type of calls to which it responds. Specifically, calls for animal, snake and bee removal, lockouts, and similar requests represented almost 9% of the Department's calls during FY 2012/13. Without these types of incidents, the station daily workload decreases more significantly for certain fire stations than for others as illustrated in Figure 7 on page 16.

(continued on next page)

⁵ Comparison cities included 3 cities within 10% of Scottsdale's population as well as Arizona cities that responded to this performance measure. All responding participants averaged 61 - 63% based on self-reported data.

Figure 7. Comparison of Selected Stations' Total Calls to Calls Excluding Animal Removal Types (FY 2012/13)



SOURCE: Auditor analysis of Fire Records data

For example, during FY 2012/13, Station 602 responded to 4,470 total calls but without animal removal-type calls would have responded to 4,277 calls. Similarly, Station 613 responded to 805 total calls but without animal removal-type calls would have responded to 569 calls.

To potentially improve its fire companies' availability and response times for emergency calls, the practice of referring citizens with animal, bee, or snake removal and similar calls to private companies or other specialty organizations for assistance could be evaluated. This type of practice should be discussed with the City Manager and Council prior to adoption and included in the SOC.

Recommendation:

The Fire Department should:

- A. Update the Standard of Response Coverage report periodically to ensure it contains up-to-date information to aid in operational decisions.
- B. Present the updated SOC for Council consideration and adoption. In addition, annually evaluate and report on department performance as stated in the SOC.

- C. Evaluate the current response time goals against past performance, including the effectiveness of the City's automatic sprinkler requirement, and develop response time goals that are meaningful and attainable.
- D. Explore the potential for referring animal, snake and bee removal and similar calls to private providers or specialty organizations. Include in the SOC how the Department will handle such calls.

2. The Department's staffing calculator and related data integrity can be improved.

The staffing calculator used since the Department's inception does not take turnover or rover staff availability into account when estimating staffing needs. As well, a data error that went unnoticed caused the Department's call volume activity to be understated.

1. In 2005 when the City formed the in-house fire department, staff began using an Excel-based staffing calculator (summarized in Figure 2 on page 5) created for another municipality to estimate staffing needs. This existing calculator also compares available staff to the calculated need and estimates the cost for overtime or additional staff.
 1. The staffing calculator allows staffing model alternatives to be considered given the City's budgetary limitations. For example, while the Fire Chief's goal is to constantly staff 2 people in the 2 Battalion Chief vehicles (12 total for the 3 shifts), the Department currently constantly staffs 1 person in each (6 total). Using the staffing calculator, the cost of 6 additional staff at the Department's average hourly firefighter cost would be approximately \$465,000. However, current staffing is sufficient when the Battalion Chief vehicle is a 1-person unit. In budget-related presentations to Council, the cost of various staffing options such as this example can be provided to assist their decision making.
 2. The staffing calculator calculates a Reliability factor, which is the percentage of time firefighters are available for work based on average leave hours taken, such as vacation, medical, jury duty, and other factors such as 40-hour day assignment duties during the prior fiscal year.
 - a. This factor is not used to determine the number of "rovers" needed per shift.⁶ Currently management estimates a viable number of rovers by reviewing vacancies throughout the year. Further, the leave percentage is not also applied to rover positions to realistically estimate their available work hours. In FY 2013/14, the department is using 6 rovers per shift. Using management's current constant staffing policies and applying the leave factor would instead result in 8 to 9 rovers per shift.
 - b. A significant part of this factor is the number of staff from constantly staffed (56-hour) positions that are used temporarily for administrative duties, such as training. As a result, the constantly staffed positions need to be covered. In FY 2012/13, battalion chiefs and captains from 56-hour positions were used for the equivalent of almost 1 full time position for administrative work; in FY 2011/12, the day assigned staff equated to more than 4 full time positions.

⁶ Rovers are additional full-time staff used to cover absences at various fire stations throughout the system.

- c. In July 2014, 174 firefighters that the City hired in July 2005 will begin earning the maximum vacation accrual of 18.8 hours per month. Currently, the Department uses 4 rover positions to allow up to 4 firefighters to take vacation leave during each 24-hour shift; the other 2 rover positions are reserved for unscheduled absences such as sick leave. Based on current leave patterns, the maximum accrual rate may result in an additional 2.3 full time equivalents to be covered with additional staff or overtime.
3. The existing staffing calculator does not account for employee turnover or the amount of time taken to recruit and train new firefighters. During the most recent four years, turnover for sworn positions averaged 4.25 positions per year, although in FY 2012/13 there were 7 sworn firefighter vacancies. Given the average number of days spent on recruiting and training new staff, the Department may spend as much as \$248,000 on unscheduled overtime per year for the average vacancy rate.
4. The existing staffing calculator does not incorporate the annual cost of personal protective equipment (PPE) into new employee costs or note the one-time cost of an Academy. In FY 2013/14, these costs were approximately \$1,545 for PPE and uniforms annually and \$9,312 for the Academy, or \$10,860 per staff. Further, the calculator did not consider fringe benefit payments associated with overtime, including payments to the retirement system, federal health insurance and long term disability. These fringe amounts total more than 6% of employee base pay and add \$2.12 to the average overtime hourly rate.

A more comprehensive staffing calculator may simplify the Department's staffing analysis. For example, Figure 8 on page 19 summarizes additional elements that should be incorporated in the calculation.

2. The Scottsdale Fire Department imports its call data from the City of Phoenix Regional Dispatch Center into its FireRecords database for analysis. This database is used to prepare operational reports, such as call volumes by unit and by incident type and response times by unit and by incident type among others.

Since FY 2010/11, approximately 10% of the per-unit data was not importing correctly into the FireRecords database. A quality control procedure was not put in place to ensure data transferred properly between the original source file and the database and to detect any errors. Therefore, 2 to 3 years of per-unit based reports, including the AutoAid report and the Call Volume per Unit report, were understating the actual level of activity. Our comparison of the Phoenix Regional Dispatch Center's data to FireRecords found that only about 2.5% of the dropped data related to Scottsdale fire units; therefore, most of the data errors were for Automatic Aid received from other cities.

In FY 2012/13, Scottsdale received 62% more Automatic Aid resources from the system than previously reported (4,085 rather than 2,042 resources). In addition, Scottsdale gave 5% more Automatic Aid resources to others in the system than was originally reported (2,138 responses rather than 2,042). Further, the errors that related to City fire units significantly underreported certain units' activity. For FY 2012/13, the 40-hour truck E6040 was reported as having 38% fewer calls than it actually had (1,030 actual versus 638) and Station 602 was reported as having 15% fewer calls (958 actual versus 819).

Figure 8. Expanded Staffing Calculator

OPERATIONAL NEED

Number of: <ul style="list-style-type: none"> • 4 person companies (x 4 staff) + • 2 person units (x 2 staff) + • 1 person units 	×	3 shifts	+	4 staff for part-time (40 hour) company	=	Number of staff required for Constant Staffing (A)
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STAFF RELIABILITY (based on prior fiscal year)

Leave hours taken by applicable staff	/	2,920 work hours per staff (B) X number of applicable staff	=	Leave percentage (C)
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ROVER CALCULATION

(C) Leave percentage X (A) Constant Staffing	×	3 shifts	=	Rovers (E)
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GAP CALCULATION

(A) Constant staffing + (E) Rovers	-	Number of staff employed	=	Staffing gap	×	(B) 2,920 work hours per staff	=	Hours needed to be staffed (F)
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OVERTIME or NEW STAFF

COST OF OVERTIME

(F) Hours needed to be staffed	×	Average overtime hourly rate (G)
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COST OF NEW FTE

(F) Hours needed to be staffed	×	Average hourly pay rate (include benefits & PPE)	+	Academy (one-time cost)
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Cost of Overtime – Cost of New FTE = Difference

PLUS ADDITIONAL OVERTIME FOR TURNOVER/ROVER LEAVE

(E) Rovers X (B) 2,920 work hours per staff X (C) Leave percentage	+	Average annual turnover X Avg recruiting/training days X 24 hours	×	(G) Average overtime hourly rate	+	Staffing Hours Overtime (if New Staff option not chosen)	=	Total Unscheduled Overtime Costs
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Source: Auditor analysis of Scottsdale Fire Department’s staffing model.

3. Access to the Department's information systems appears to be granted on a case by case basis without ensuring the rights are based on an individual's regular job responsibilities.

1. While most Department staff has limited access to the TeleStaff timekeeping system, 9 users currently have the powerful System Administrator authority. In addition to 3 Public Safety technology staff, 4 Chiefs, an Administrative Secretary, and the TeleStaff vendor have this broad authority to make system changes. Although the Public Safety System Administrators' access may be necessary, the other staff appear have a higher level of authority than needed to perform their day-to-day job duties.

In addition, there are two Battalion Chief levels of access, but Department staff was not sure why. The first level has been granted to Battalion Chiefs, Fire Captains who sometimes act as Battalion Chiefs, 2 Division Chiefs, and a Safety and Wellness Coordinator. The second level, which has additional access authority, was granted to a Battalion Chief, a Deputy Chief, and a Division Chief. Again, it is not clear whether these levels of system authority are consistent with regular job duties.

2. There are currently 7 users with the powerful System Administrator authority in the FireRecords system. These include 3 Public Safety technology staff, 2 Department Chiefs, and 2 user accounts for the vendor. Also, 18 users at the Chief level have access to edit fire incident data in the system. Further, these include 3 former Department employees who are still authorized users in the FireRecords system.

Information system access should be granted based on an individual's regular job duties and the least privilege access principle, which refers to providing only the access necessary to perform one's job duties. The Fire Department has not developed such a standard for granting or revoking user access to its systems, so access is granted on a case by case basis. Therefore, some users have access to beyond what their day-to-day job duties require and access is not timely revoked when system users leave City employment. This increases the risk of unauthorized access to confidential information as well as unapproved changes, whether intentional or unintentional, being made in the system.

Recommendation:

The Fire Department should:

- A. Enhance the staffing calculator to determine rover need using historical leave information and to also estimate unscheduled overtime based on historical turnover and any significant trends that develop.
- B. Determine the cause of the dropped data so that the data import issue can be fixed. In addition, establish a method to validate the data import to enhance data integrity on an ongoing basis.
- C. Develop written guidance and provide system access based on employee's job duties and the "least privilege" principle. In addition, Fire Department management should revoke former employees' access upon termination and regularly review access authority for any needed changes.

3. The Department pays 40-hour firefighters overtime for hours already incorporated into their hourly pay rates.

Increasing 40-hour/day assigned firefighters’ hourly pay rates by about 50% and making them eligible for overtime after 40 hours worked, has increased the Department’s costs by \$80,000 to \$550,000 for the two most recent fiscal years.

A. The Department pays firefighters assigned to 40-hour or “day assigned” positions for overtime for any hour worked beyond 40 hours in a work week. However, the day-assignment/40-hour pay rate is already based on 56-hour work week pay plus a 10% increase.

When temporarily assigning firefighters to a 40-hour/week position, the Department continues to pay them the equivalent of 56-hour straight-time pay plus a 10% increase to make up for lost half-time pay. The Department stated this practice is to encourage firefighters to take 40-hour assignments. As a result, a 40-hour firefighter earns an hourly rate that is more than 50% higher than a 56-hour firefighter’s hourly rate, as shown in the following example.

Example:	Hourly Rate	Increased Rate	Hours Worked	Pay Total
Fire Captain A - 56 hour duty assignment	\$25.51	-	112	\$2,857.12
Fire Captain A - 40 hour duty assignment	\$39.29	54.02%	80	\$3,143.20

If a day-assigned/40-hour firefighter then works more than 40 hours in a week, the Department pays for each additional hour at 1.5 times this increased hourly rate. Therefore, a 40-hour firefighter would be paid \$58.94 per hour beyond 40 hours in a 7-day period while the 56-hour firefighter would be paid \$38.27 per hour beyond the 204 regular hours in a 27-day period.⁷ For day-assigned battalion chiefs, overtime pay is calculated at straight time, but overtime hours are based on 40 hours in a week rather than 204 hours in a 27-day period.⁸ In FY 2011/12 and FY 2012/13, this practice resulted in the Department paying about \$84,000 to day assignment/40-hour staff who had not yet worked the 32 hours of overtime that is already incorporated into their hourly pay rates.

Alternatively, if these firefighters retained their regular hourly rates (in the Example, \$25.51 per hour) for their 40-hour assignments and were paid overtime for each additional hour worked, the Department would have saved more than \$550,000 in the last two fiscal years. As shown in Table 3 on page 22, which summarizes the potential savings by pay type, specialty pay for certifications or technical training would not have been affected.

⁷ In compliance with Fair Labor Standards Act requirements, 204 hours is paid straight time while the additional 12 hours regularly scheduled in the 27-day pay period are paid at the 1.5 overtime rate.

⁸ Battalion chiefs are normally considered overtime-exempt, but the Fire Chief and City Manager have approved an annual override for these positions to be overtime eligible.

Table 3. Summary of Potential Savings by Pay Type

Pay Type	40-Hour Rate	56-Hour Rate	Potential Savings
FY 2011/12			
Straight pay	\$741,076	481,218	259,858
Overtime	39,474	25,632	13,842
Specialty pay	15,612	15,612	0
Benefits	184,152	120,846	63,306
Total	\$980,314	643,308	337,006
FY 2012/13			
Straight pay	\$468,912	304,488	164,424
Overtime	35,050	22,760	12,290
Specialty pay	11,216	11,216	0
Benefits	119,160	78,287	40,873
Total	\$634,338	416,751	217,587
Potential Savings for 2 fiscal years			\$554,593

Source: Auditor analysis of payroll records.

This pay practice is not incorporated into City policy and has not been approved by the Council.

Recommendation:

The Department should discontinue or seek approval of its practice of paying overtime for day assignment/40-hour staff whose hourly pay rate is already based on 56 hours of work. Alternatively, the Department could continue to pay their regular hourly rate plus overtime for each additional hour worked.

4. Job descriptions on the City's website were not correct, and trade time is not addressed in the City's HR Code.

The job descriptions for two Fire Department positions did not correctly indicate that they were non-exempt positions. Also, the Department's policy to allow "trade" time has not been formally approved and incorporated into City Code.

- A. Job descriptions posted on the City's website indicated two Fire Department positions were exempt from overtime pay although they were not treated as exempt. These positions included the Firefighter (56-hour) position and Senior Deputy Fire Marshal. The Firefighter position description error would likely have been apparent to anyone referencing the document as firefighters are consistently considered non-exempt

(overtime-eligible). However, the other would not have been as apparent as some Valley cities classify the position as exempt, while others consider it to be non-exempt.

After auditor inquiries, the Public Safety Human Resources team and the City Human Resources Division reviewed and corrected these two position descriptions. Although the positions descriptions were incorrect, the positions were classified as intended in the City's payroll system and the employees received overtime payments for additional hours reported as worked.

- B. Chapter 14 in City Code, *Human Resources Management*, does not provide shift trade guidance. Shift trades occur when a firefighter trades a shift with another firefighter to be able to take time off. The first firefighter will still get paid for the shift, and the firefighter who worked the traded shift will not get paid. Instead, the first firefighter will work a future shift for the second firefighter, who will then be taking the time off with pay.

Scottsdale Fire Department Staffing Policy 100-C identifies which employees are eligible to substitute scheduled work hours and states that trade time can only be used by mutual agreement and supervisory approval is required; these requirements are consistent with Fair Labor Standards Act (FLSA) provisions. However, the policy has not been formally approved and incorporated into City Code as other FLSA requirements have been.

Recommendation:

The Department should:

- A. Periodically review its online job descriptions to ensure they are accurate.
- B. Work with Human Resources to develop a trade time policy recommendation for adoption into City Code.

MANAGEMENT ACTION PLAN

1. The Standards of Response Coverage has not been updated since FY 2005/06 nor formally adopted.

Recommendations:

The Fire Department should:

- A. Update the Standard of Response Coverage report periodically to ensure it contains up-to-date information to aid in operational decisions.
- B. Present the updated SOC for Council consideration and adoption. In addition, annually evaluate and report on department performance as stated in the SOC.
- C. Evaluate the current response time goals against past performance, including the effectiveness of the City's automatic sprinkler requirement, and develop response time goals that are meaningful and attainable.
- D. Explore the potential for referring animal, snake and bee removal and similar calls to private providers or specialty organizations. Include in the SOC how the Department will handle such calls.

MANAGEMENT RESPONSE: Agree, with changes to recommendation

- A. Fire Department agrees that the Standard of Coverage (SOC) report needs to be updated against the original report developed in 2005/2006 and that components of the Standard of Coverage will need up-to date information to aid in operational decisions.
- B. Fire Department agrees that the updated SOC report needs to be presented to City Council and that a 'Fire Department SOC Annual Report' should be presented to City Council.
- C. Fire Department agrees that we need to develop new response time goals and service level objectives that are specific, measureable, assignable, realistic, and time-related based on the past performance our department.
- D. Fire Department has emergency response and dispatch protocols developed specific to hazardous situations that involve animals such as snake and bee removals and agrees to include these procedures in the updated SOC. The Fire Department and the Phoenix Regional Dispatch Center do not refer callers to private businesses. If the information given to the dispatchers by the caller describes a hazardous situation, then emergency units are dispatched. If the information given to dispatchers does not meet those requirements of a hazardous situation, the caller is re-directed to the yellow pages to find a business that provides that type of service. Snake removal is a unique hazard to the City of Scottsdale and the citizens have come accustomed to this type of value added service. The City of Scottsdale does not have a contract with anyone who provides this type of service and it would be a conflict of interest for the Fire Department to arbitrarily refer citizens to a private business.

PROPOSED RESOLUTION:

- A. The Fire Department will begin the update of the SOC after this official Audit Report is presented to the Audit Committee by assigning applicable pieces to Fire Department Chief Officers and/or outsourcing the work to the Center for Public Safety Excellence (CPSE). There is a cost associated to outsourcing this work to CPSE that will need to be evaluated and funds identified.
- B. The Fire Department will work closely with the City Clerk's Office to present the updated 'Fire Department Standard of Coverage' report on a future City Council agenda.
- C. The Fire Department, as part of the updating of the SOC, will develop new response time goals and service level objectives based on a 3-year regression analysis of the current data, fire service industry best practices, and City Council priorities.
- D. The Fire Department will continue to respond to animal removals that create a hazardous situation to citizens and visitors.

RESPONSIBLE PARTY: Fire Department

COMPLETED BY: 2/1/2015

2. The Department's staffing calculator and related data integrity can be improved.

Recommendations:

The Fire Department should:

- A. Enhance the staffing calculator to determine rover need using historical leave information and to also estimate unscheduled overtime based on historical turnover and any significant trends that develop.
- B. Determine the cause of the dropped data so that the data import issue can be fixed. In addition, establish a method to validate the data import to enhance data integrity on an ongoing basis.
- C. Develop written guidance and provide system access based on employee's job duties and the "least privilege" principle. In addition, Fire Department management should revoke former employees' access upon termination and regularly review access authority for any needed changes.

MANAGEMENT RESPONSE: Agree

- A. Fire Department agrees to enhance the staffing calculator to determine the rover need using historical leave information and estimate unscheduled overtime need based on historical turnover and or significant trends.
- B. Fire Department agrees to determine and fix the cause of dropped data into our records management system and to establish a method to regularly validate and enhance data integrity.
- C. Fire Department agrees to develop written guidance on access and revocation of rights

to the key Fire Department software systems; TeleStaff and FireRecords.

PROPOSED RESOLUTION:

- A. The Fire Department will adopt the 'enhanced staffing calculator' developed during this audit and found on page 19 of this report. Fire Department will work closely with the Audit Team to understand the formulas and rationale used to update the original staffing calculator. The Fire Department will use the 'enhanced staffing calculator' and work closely with Finance
- B. The Fire Department will work closely with Information Technology to determine and fix the cause of dropped data into our records management system and to establish a method to regularly validate and enhance data integrity.
- C. The Fire Department will work closely with Information Technology to develop written guidance on access and revocation of rights to the key Fire Department software systems; TeleStaff and FireRecords.

RESPONSIBLE PARTY: Fire Department, Finance, and Information Technology

COMPLETED BY: 2/1/2015

3. The Department pays 40-hour firefighters overtime for hours already incorporated into their hourly pay rates.

Recommendation:

The Department should discontinue or seek approval of its practice of paying overtime for day assignment/40-hour staff whose hourly pay rate is already based on 56 hours of work. Alternatively, the Department could continue to pay their regular hourly rate plus overtime for each additional hour worked.

MANAGEMENT RESPONSE: Agree

The Fire Department has experienced substantial decreases in administrative staff since the formation of the department in 2005. Previously staffed exempt positions were eliminated as a result of reductions in work force specifically in the Training and EMS Divisions. The department utilized sworn non-exempt personnel to fill the remaining positions. The department agrees that it would be more effective to re-establish exempt dedicated administrative staff rather than utilize sworn personnel who are subject to redeployment to the field in times of operational need.

PROPOSED RESOLUTION:

The Fire Department will work closely with Human Resources to establish an approved comprehensive classification and pay plan that clearly articulates the practices of our department in accordance with City Code and submit our plan to be approved through the applicable City of Scottsdale process. Any approved changes that have an impact on City Code would need to be submitted for updating.

RESPONSIBLE PARTY: Fire Department and Human Resources

COMPLETED BY: 2/1/2015

4. Job descriptions on the City's website were not correct, and trade time is not addressed in the City's HR Code.

Recommendations:

The Department should:

- A. Periodically review its online job descriptions to ensure they are accurate.
- B. Work with Human Resources to develop a trade time policy recommendation for adoption into City Code.

MANAGEMENT RESPONSE: Agree

- A. Fire Department agrees to review its online job descriptions to ensure they are accurate
- B. Fire Department agrees to work with Human Resources to develop a trade time policy recommendation for adoption into City Code.

PROPOSED RESOLUTION:

- A. Fire Department will work with Human Resources to review the current online job descriptions for accuracy. Those found to be inaccurate or no longer needed will be identified and submitted to Human Resources for editing or de-activation. In addition, the Fire Department will schedule an annual 'Fire Department Job Description Review' in our Master Activity Calendar to be facilitated by a Fire Department Chief Officer.
- B. Fire Department will work with Human Resources to develop a trade time policy as part of the Fire Department's comprehensive pay plan. Any approved changes that have an impact on City Code would need to be submitted for updating.

RESPONSIBLE PARTY: Fire Department and Human Resources

COMPLETED BY: 2/1/2015

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