

**Follow-Up Audit:
Fire Fighting Force
Resource Allocation**

September 2000

**City Auditor's Office
City of Kansas City, Missouri**

September 6, 2000

Honorable Mayor and Members of the City Council:

This follow-up audit of fire fighting force resource allocation was initiated in accordance with the City Auditor's Office policy of assessing the implementation of previous audit recommendations. The follow-up audit focuses on assessing the city's progress in addressing problems identified and recommendations made in our April 1993 performance audit of fire fighting force resource allocation.

Our follow-up audit found that the Fire Department has made progress in improving its allocation of resources for the fire fighting force. The Fire Department reduced the number of pumpers and trucks and replaced squads with urban rescue units capable of responding to most emergencies.

Maintenance costs dropped from almost \$1.7 million in fiscal year 1996 to about \$660,000 in 2000. However, the minimum staffing level increased in 1993 from 190 to 193 per shift. The increased minimum staffing and the continued pattern of greater sick leave on weekends contribute to the department's overtime. The department developed a sick leave policy directed toward reducing excessive sick leave, but management withdrew the policy in 1997.

We also found that management has not developed performance measures and workload measures that could provide better information about the performance of the Fire Department and information to help make resource allocation decisions. We make a number of recommendations directed toward reducing excessive sick leave and improving performance information to be reported to the City Council and the public.

The draft report of this follow-up was sent to the city manager and acting fire chief on August 1, 2000. The acting fire chief's response is included as Appendix E. We appreciate the cooperation extended to us during the follow-up audit by the Fire Department. The audit team for this project was Vivien Zhi and Michael Eglinski.

Mark Funkhouser
City Auditor

Follow-up Audit: Fire Fighting Force Resource Allocation

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Introduction

Objectives

This follow-up audit of fire fighting force resource allocation was conducted pursuant to Article II, Section 13 of the Charter of Kansas City, Missouri, which establishes the Office of the City Auditor and outlines the city auditor's primary duties.

A performance audit is an objective, systematic examination of evidence to independently assess the performance of a government organization, program, activity, or function in order to provide information to improve public accountability and facilitate decision-making.¹ A follow-up audit examines the actions taken in response to the problems identified and recommendations made in a previous audit.

This follow-up audit was designed to answer the following questions:

- Has the method of staffing and equipping the fire fleet changed?
- Has the fire chief taken steps to address excessive use of sick leave and are patterns of sick leave still a concern?
- Have the fire fighters' scheduled work hours increased to meet federal standards?
- How does response time and workload vary among different areas of the city?

Scope and Methodology

This follow-up audit assesses the city's progress in addressing problems identified in the April 1993 report.² It is not intended to be another full-scale audit of fire fighting force resource allocation.

¹ Comptroller General of the United States, *Government Auditing Standards* (Washington, DC: U.S. Government Printing Office, 1994), p. 14.

² *Performance Audit of Fire Fighting Force: Resource Allocation*, Office of the City Auditor, Kansas City, Missouri, April 1993.

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We conducted this audit in accordance with generally accepted government auditing standards, except for completion of an external quality control review of the City Auditor's Office within the last three years.³ Our methods included:

- Interviewing Fire Department staff.
- Analyzing fire dispatch data and Fire Department scheduling data from April 1999 through March 2000.
- Reviewing selected provisions in the Fire Department's *Manual of Instructions*, the Fair Labor Standards Act, and the current Memorandum of Understanding between Local 42 and the city.
- Reviewing the Fire Department's organizational strategic plan *Fire Department in the 21st Century* (FD21C), and the department's master staffing schedule.
- Reviewing selected budget documents and financial information in the city's mainframe financial system.
- Reviewing the April 1993 audit, selected work papers, and Audit Report Tracking System (ARTS) Reports.
- Assessing the reliability of incidents tables we requested by reviewing work papers from our emergency medical services system audit.⁴

We did not assess the department's fleet replacement plans.

We did not follow up on the parts of the original audit that dealt with emergency medical technicians because we addressed those issues in the emergency medical services system audit.

No information was omitted from this report because it was deemed privileged or confidential.

³ Our last external review was April 1995; a review is planned for the current year.

⁴ *Performance Audit of Emergency Medical Services System*, Office of the City Auditor, City of Kansas City, Missouri, January 2000.

Background

Fire Fighting Force Activities

Kansas City fire fighters respond to different types of emergencies. In addition to fighting fires and serving as first responders on medical emergencies, the fire fighting force provides a variety of other services, including trench and tunnel rescues and fire safety education at local schools. In addition, a specialized crash/rescue unit responds to KCI Airport and a hazardous materials team responds to chemical spills and industrial fires.

Between April 1999 and March 2000, the fire fighting force responded to nearly 50,000 calls. Almost 60 percent of all calls were for emergency medical services. Fire calls comprise only about 14 percent of all calls. (See Exhibit 1.)

Exhibit 1. Fire Department Calls by Type

Type of Call	Number of Calls	Percentage
EMS	29,161	59%
Fire	6,916	14%
Other ⁵	13,293	27%
Total	49,370	100%

Source: Fire Dispatch Data (4/1/99-3/31/00).

Organization of the Fire Fighting Force

The fire fighting force is divided into seven geographic districts, each of which is administered by a battalion chief. The fire fighting force is supplemented by several supporting units, including the training academy, fire alarm and communication, fire prevention, operations support (equipment management), and administration.

The Fire Department operates 32 stations housing 50 fire suppression companies, as well as a station at KCI and the hazardous materials team. A company is a complement of fire fighters assigned to a vehicle, typically including a captain, a fire apparatus operator (driver), and one or more fire fighters. First line fire suppression apparatus include 29 pumpers, 13 trucks, and 6 urban rescue units. Additional specialized vehicles are housed at various stations. The department's minimum staffing requires crews of at least three people per pumper, four per truck, and four per rescue unit. Exhibit 2 shows the locations of fire stations and types of companies housed at each station.

⁵ Other types of calls include service calls, hazardous materials, public education, rescue, good intent, administrative, and overpressure rupture.

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Exhibit 2. Locations of Fire Stations and Types of Companies

Station No.	Location	Companies
1	15480 Hangar Road	Pumper 1
3	11101 N. Oak Trafficway	Pumper 3, Rescue 16
4	4000 NW 64th	Pumper 4
5	125 Paris	Battalion Chief 108 ARFF 91, 92, 93, 94 ARFF Battalion Chief 109
6	2600 NE Parvin Road	Pumper 6, Truck 12 Battalion Chief 103
7	616 West Pennway	Pumper 9, Truck 6
8	1517 Locust	Pumper 8 Battalion Chief 102
10	1505 E. 9th	Pumper 10, Truck 3
16	9205 NW 112th	Pumper 16
17	3401 Paseo	Pumper 17, Rescue 31, Truck 2
18	3211 Indiana	Pumper 18, Rescue 11, Truck 5
19	4012 Washington	Pumper 19, Truck 7
23	4777 Independence Ave.	Pumper 23, Rescue 12, Truck 10 Battalion Chief 104
24	2039 Hardesty	Pumper 24
25	401 E. Missouri Ave.	Pumper 25, Rescue 1
27	6600 Truman Road	HazMat 71
28	930 Red Bridge Road	Quint 28, Rescue 7
29	1414 E. 63rd	Pumper 29, Truck 11
30	7534 Prospect	Pumper 30
32	4928 Main	Pumper 32 Battalion Chief 106
33	7504 E. 67th	Pumper 33
34	4836 N. Brighton	Pumper 34
35	5005 Swope Parkway	Pumper 35, Rescue 9 Battalion Chief 105
36	9445 Holmes	Pumper 36 Battalion Chief 107
37	7708 Wornall Road	Pumper 37, Truck 8
38	8100 N. Oak Trafficway	Pumper 44
39	10003 E. 47th	Pumper 39, Truck 13
40	5200 N. Oak Trafficway	Pumper 40
41	5700 E. Bannister Road	Quint 41
42	6006 E. Red Bridge Rd.	Pumper 42
43	12900 E. 350 Highway	Pumper 43
44	7511 NW Barry Road	Quint 38
45	500 E. 131st	Pumper 45
47	5130 Deramus	Pumper 47

Source: Fire Department.

Staffing

Fire fighters are scheduled to work every third day. They are scheduled for 24 hours on duty and 48 hours off duty until they have worked eight 24-hour shifts. The ninth scheduled shift is non-working day (called an “N-day”), which results in five consecutive days off. This 27-day cycle is repeated throughout the year, resulting in 14 N-days and an average workweek of 49.5 hours.

According to the 1998-2001 Memorandum of Understanding between Local 42 of the International Association of Fire Fighters and the city, “the city administration is committed to the goal of maintaining fire suppression force at 785 for the term of the memorandum.” This agreement was modified for fiscal year 2001 to 778 positions. The force includes 753 uniformed positions in the fire fighting force and 25 uniformed positions in the hazardous materials team. The fire fighting force includes 25 positions for the crash and rescue unit at KCI.

Summary of the 1993 Audit

Our 1993 performance audit identified ways for the Fire Department to address several needs without additional staff. We found that fewer absences – both sick leave and scheduled absences – would lower overtime costs and increase effectiveness by increasing crew size. We also found that the department could increase efficiency by replacing pumpers and squads with smaller, more maneuverable vehicles that would cost less to purchase, maintain, and operate. We also reported that almost five years after being approved by the voters, two new fire stations had not been built. Finally, we found that the Fire Department’s emergency medical technicians were not assigned to areas with the highest emergency medical activity.

We made a number of recommendations directed toward addressing the department’s needs without adding staff. We recommended monitoring sick leave use and taking steps to reduce absences on weekends; attempting to renegotiate work hours and work schedules with Local 42; replacing four pumper companies and one squad with ladder tenders staffed by aerial companies; reassigning battalion chiefs’ aides; and using the positions made available from these changes to staff new stations in the north and south, while adding one person to each pumper crew. We also recommended giving priority for emergency medical training to companies that respond to the most emergency medical incidents, and negotiating more flexibility to assign staff with special skills.

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Appendix A lists the recommendations for the 1993 audit. The most recent Audit Report Tracking System (ARTS) Reports submitted by management is included in Appendix B.

Findings and Recommendations

Summary

Our follow-up audit found that the Fire Department has improved its allocation of fire fighting force resources. The Fire Department reduced the number of pumpers and trucks and replaced squads with urban rescue units capable of responding to most emergencies. Maintenance costs dropped from almost \$1.7 million in fiscal year 1996 to about \$660,000 in 2000. However, the increased minimum staffing and the continued pattern of greater sick leave on weekends contribute to the department's overtime. Although the department developed a sick leave policy directed toward reducing excessive sick leave, management withdrew the policy in 1997. We also found that management has not developed performance measures and workload measures that could provide better information about the performance of the Fire Department and information to help when making resource allocation decisions.

Fleet Changes Reduced Maintenance Costs

The fire department changed its fleet by reducing the number of pumpers and trucks, and replacing squads with urban rescue units. The maintenance costs dropped over 60 percent as a result of the newer and smaller fleet. However, an increase in minimum staffing levels resulted in higher overtime costs.

Fire Department Reduced Number of Apparatus

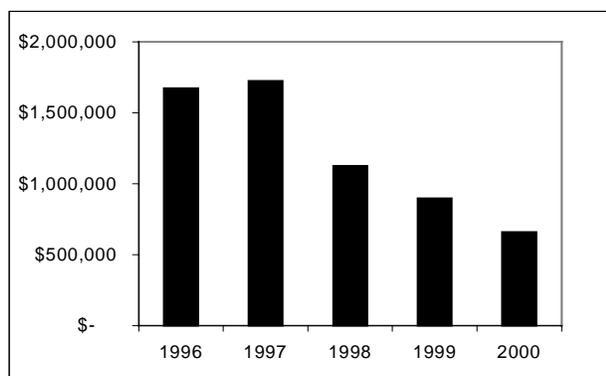
In June of 1997, the Fire Department implemented a strategic plan called *Fire Department in the 21st Century* (FD21C). One of the goals of the plan was to have more fire fighters at the scene with less equipment. The Fire Department reduced the number of pumpers and trucks and replaced the squads with urban rescue units. As a result, the first-line apparatus was decreased from 53 to 48. Our original audit recommended that the Fire Department reduce the number of pumper companies and instead deploy smaller apparatus. Rescue units are four-person emergency response units designed to respond to all service calls,

except those requiring the use of a pump, in the same fashion as a pumper unit. The units deliver more staff to the scene using fewer vehicles. According to FD21C, “response times for rescue units should be somewhat shorter than for either traditional pumper or aerial ladder apparatus because the rescue units are smaller and lighter.”⁶

Fleet Maintenance Costs Decreased

Fleet maintenance costs decreased as a result of a newer, smaller fleet. Maintenance costs of the apparatus have decreased from almost \$1.7 million in 1996 to about \$660,000 in 2000.⁷

Exhibit 3. Fire Apparatus Maintenance Costs



Source: AFN Tables.

Minimum Staffing Level Increased

The minimum staffing level increased in 1995, from 190 to 193 in order to maintain an extra company. The increase in the department’s minimum staffing level resulted in more overtime because the department uses overtime to fill the gap between the minimum and actual staffing levels.

The increase in minimum staffing level increases overtime costs by about \$110,000 each year. When fully staffed, 256 fire fighters are scheduled to work each shift. When the minimum staffing level was 190, the department could accommodate 66 absences without resorting to overtime.⁸ Increasing the minimum staffing level to 193 means that now only 63 absences can be accommodated. Based on the daily staffing data, we estimated that increased staffing level would result in about 627

⁶ *Fire Department in the 21st Century*, Kansas City, Missouri, Fire Department, p. 9.

⁷ Maintenance costs include auto equipment repair and maintenance cost, and motor vehicle repair - parts cost.

⁸ The number of staff scheduled to work must be greater than the minimum staffing level in order to accommodate absences including vacation, N-days, sick leave, injuries, light duty, and other absences.

more overtime shifts per year and cost the city about \$110,000 annually. Fire Department scheduling data indicates that minimum staffing levels are generally met during the weekdays, but overtime is used on weekends to meet staffing requirements.

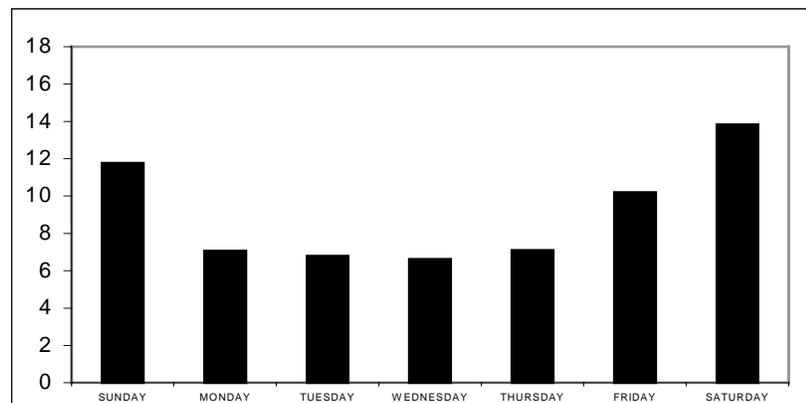
Sick Leave on Weekends and in Summer Remains High

Sick leave and overtime use are highest on weekends and during the summer. In 1993, we found the same pattern of sick leave and overtime use and recommended developing policies to reduce weekend absences that have to be covered through overtime. Although a labor-management committee studied the issue, there is currently no sick leave policy in place that would serve to decrease absences.

Sick Leave Is Higher on Weekends and in Summer

Between April 1999 and March 2000, sick leave use averaged 14 people on Saturdays and 12 on Sundays, compared to 7 on weekdays. (See Exhibit 4.) We found the same pattern of sick leave use in our 1993 audit.

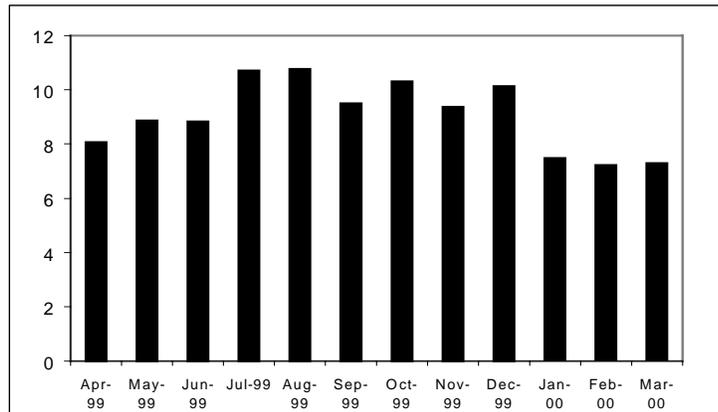
Exhibit 4. Average Number of People Using Sick Leave Per Day



Source: Fire Department Daily Staffing Schedule (4/1/99-3/31/00).

We also found that sick leave use is higher in the summer months. An average of 7 people used sick leave each day in January, February, and March, while almost 11 people used sick leave each day during July and August. (See Exhibit 5.)

Exhibit 5. Average Number of People Using Sick Leave Per Month

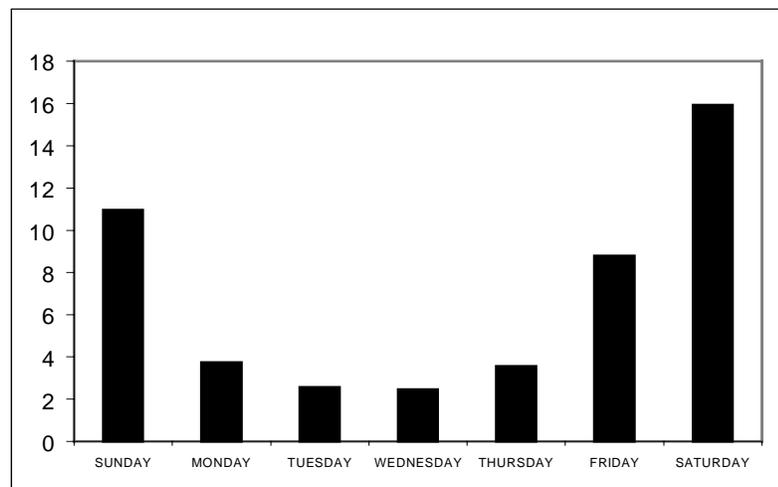


Source: Fire Department Daily Staffing Schedule (4/1/99-3/31/00).

Overtime High When Sick Leave Use Is High

The pattern of overtime use is similar to that of sick leave use. On weekdays, 3 people on average were used for overtime. Overtime increases, however, on weekends. An average of 16 and 11 people were assigned to work overtime on Saturday and Sunday, respectively. (See Exhibit 6.)

Exhibit 6. Average Number of People Used for Overtime Per Day



Source: Fire Department Daily Staffing Schedule (4/1/99-3/31/00).

Sick Leave Policy Developed But Later Withdrawn

The Fire Department does not have a sick leave policy. Our original audit recommended that the department take steps to reduce excessive use of sick leave, by monitoring sick leave use, identifying potential abuse, and identifying enforcement actions and attendance incentives. In

August 1994, the department developed a sick leave policy, but the former fire chief suspended it in May 1997. A labor/management committee was assigned to produce policies to investigate fire fighters who abuse sick leave. After meeting for several months, the committee could not agree on a policy. Currently, the Fire Department uses provisions in the Memorandum of Understanding with Local 42 regarding sick leave as the department's policy.

In order to minimize the need for overtime caused by employee absences, the department should develop a policy governing the use and repercussions for abuse of sick leave. An effective and fair absenteeism-control policy should consider:

- The definition of an absence.
- How absences will be reported and recorded.
- What constitutes excessive absenteeism.

The policy should be clearly communicated to all parties, such as employees, supervisors, and the union. Provisions of the policy should be clearly interpreted and consistently enforced.

Policies can serve as incentives for good attendance. There are two types of absenteeism-control policies that could be used, no-fault or incentive-based. Some employers use a combination of both approaches to ensure that their efforts will motivate workers who respond best to corrective action as well as those who respond well to rewards. In addition, the importance of maximum attendance is further communicated by including this trait in employee evaluations.

Types of Policies

No-fault. Employees are charged with “points” or “occurrences” each time they fail to work scheduled hours, except for recognized exceptions, such as jury duty, workers’ compensation, etc. Each employee is allowed a specific number of absences but once triggered, disciplinary penalties are progressive, ranging from counseling up to termination for continued absences. The number of occurrences usually is “erased” at the conclusion of the rating period or after a pre-determined period of maintaining good attendance.

This policy is easy to implement and is designed to achieve a uniform and consistent administration of the absenteeism-control policy. A distinct feature of this type of policy is that the reason for the employee absence is irrelevant.

Incentive-based. An incentive-based policy uses financial or other rewards to encourage good attendance. Some common examples of incentives include:

- Paying employees for some portion of unused sick leave;
- Providing monetary or merchandise awards or extra time off for 12 continuous months of exceptionally good attendance; or
- Granting special awards or public recognition through letters of commendation, bulletin board postings, or articles in employee newsletters.

This is a “positive” incentive system that rewards employees with good attendance records.

A sick leave policy is needed to reduce overtime. In order to reduce the need for overtime caused by excessive absences, particularly on weekends and during the summer months, the fire chief should develop a sick leave policy that serves to discourage excessive absences while rewarding attendance. The policy should be communicated to fire fighters, the union, and management, and consistently enforced.

Cost of N-days Should be Considered During Labor Negotiations

Although fire fighters could work up to 3.5 more hours on average per week before federal law would require overtime, the city has not attempted to renegotiate their hours. Our original audit recommended that the fire fighters’ work hours be renegotiated. The current schedule results in 14 non-working days, or “N-days” per year for each fire

fighter. The cost of N-days should be included in the calculation of the total cost when the city negotiates agreement with Local 42.

N-Days Reduce the Average Work Week

The 14 N-days for each fire fighter result in an average work week of 49.5 hours, which is below the 53-hour work week allowed under federal standards. The Fair Labor Standards Act (FLSA) specifies the maximum number of hours that fire suppression personnel may work at regular pay rates. Fire fighters could work 212 hours in a 28-day work period before the city would be required to pay overtime. That works out to a 53-hour workweek.

In our original audit we recommended that the department reduce the N-days from 14 to 7 and increase the average workweek from 49.5 hours to 53 hours. However, this recommendation was not a part of the city's negotiation package in 1994 or 1996. The city did propose elimination of the 14th N-day in 1994, but an agreement could not be reached on this issue. There was agreement that the 14th N-day would be scheduled by fire management to limit the number of fire fighters taking the extra N-day on weekends from May through September.⁹

Each N-Day Costs about \$325,000 Annually

Each N-day costs the city about \$325,000 a year because the city must employ more fire fighters. With 14 N-days scheduled, the department needs 655 fire fighters in order to meet the minimum staffing level of 193 (excluding other scheduled and unscheduled leave). If there are only 13 N-days scheduled, the department would need only 649 fire fighters to meet the staffing level. Six fewer fire fighters could save the city about \$325,000 each year. If the number of N-days decreased to seven as we originally recommended, the city could have saved over \$2 million each year.

As we recommended in our 1994 audit *Negotiations with Public Employee Unions*, the city should establish the total cost of the negotiated agreements as targets to be monitored, and should investigate innovative proposals for including productivity and cost control in the agreements. The city should also make an effort to quantify costs and

⁹ When the department initially implemented the 14 N-day schedule, each fire fighter was scheduled an N-day every ninth working shift. This resulted in some fire fighters receiving 13 N-days during the fiscal year, while others received the full 14 N-days. The union successfully filed a grievance on behalf of the fire fighters who received only 13 N-days in the fiscal year.

benefits of non-economic proposals and existing provisions, including work rules and restrictions on management rights.¹⁰

Fire Department Should Report on Response Time and Workload

While the Fire Department has goals for emergency medical services (EMS) response times, it does not have response time goals for fire calls. Without clearly stated performance measures, decisions regarding resource allocation are made without adequate information. Performance measures and workload measures, combined with public reporting, would provide citizens, the City Council, and management with better information about the performance of the Fire Department and information to help when making resource allocation decisions.

Response Time and Workload Measures Would Help When Allocating Resources

Activity and performance measures are useful tools for determining needs and monitoring performance. The goal of systematic measurement is to provide consistent information that helps management set appropriate goals, identify objectives that are most important for reaching those goals, and monitor the extent to which the department uses public resources to accomplish given objectives.

Response time is a primary measure of performance effectiveness and should be measured and reported publicly. The Fire Department does have a response time goal of four minutes for EMS calls, but not for fire calls. Currently, the Fire Department reports fractile response time for EMS calls to the MAST Board and Emergency Physicians Advisory Board (EPAB) every month, but the response time for fire calls is not reported.¹¹ Routinely measuring and reporting response time could provide better information about the performance of the Fire Department and be helpful in the decision-making process of allocating resources.

In addition to response time, tracking workload by station would also help the department in making resource allocation decisions. A certain level of activity is necessary to justify building, equipping, and staffing a station. By monitoring workload level for each station, management could consider whether it is realistic to reallocate equipment and staff to

¹⁰ *Performance Audit Negotiation with Public Employee Unions*, Office of the City Auditor, City of Kansas City, Missouri, January 1994, p. 19.

¹¹ Fractile response time is the industry term used to describe response times reported as a frequency distribution rather than an average.

a more optimal location. Other factors, such as response time, should also be considered when choosing a station location.

Response Times and Workload Vary Within the City

Generally, response times are quicker in the busier areas of the city. Our analysis of Fire Department dispatch data from April 1, 1999 to March 31, 2000, found that 10 stations with the fastest response times received almost half of the total number of calls. The 10 stations with the slowest response times received less than one fifth of the total number of calls. Stations with the quickest response times are located between the river and 63rd Street and between State Line and Topping. The stations with slower response time are located in Clay and Platte County, in the area surrounding the City of Raytown, and at Richards-Gebaur. (See Exhibit 10 in Appendix C for response times by station.)

Workload also varies among stations and companies. Some companies responded to calls almost 8 times a day on average, while other companies responded less than 2 times each day. Station 1, located at Richards-Gebaur, responded only 308 times over the year, less than one response a day. Station 43, located at 12900 E. 350 Highway, responded 455 times over the year, while the average number of responses per station was 2,339. (See Exhibit 12 in Appendix C for the daily responses by station.) Both of these stations are one-company stations with average annual personnel costs of \$500,000 to \$635,000, not including the personnel costs of the battalion chiefs and overtime.

Performance Measures and Workload Should Be Reported

Management should measure response time and establish a response time goal for fire calls and report workload. Currently, the department measures response time from the time a unit is dispatched to the time the first unit reports arrival on the scene. In our emergency medical services system audit we noted that not all components of response time are measured and reported. For a fire or EMS incident, management should measure:

- System-wide response time: from when a call was received at 911 to the time the first unit reports arrival at the scene.
- Dispatch time: from the moment of receipt of the 911 data transmission, or in case of a 7-digit access, the receipt of location, callback number, and type of incident to the time a unit is dispatched.
- Response time: from the moment a unit is dispatched to the time the first unit reports arrival at the scene.

- Fractile response time: percentage of calls responded to within an established response time goal.
- Exceptions to an established response time goal: number of incidents responded to slower than the goal and their geographic location.

The fire chief should set response time goals and report response times and exceptions to the City Council on a periodic basis.

Management should also report workload periodically and use this information combined with response time when selecting a station location or reallocating staff or equipment to a more optimal location.

Recommendations

1. The fire chief should develop and consistently enforce a sick leave policy that clearly communicates to all parties (i.e., fire fighters, management, and the union) provisions such as the definition of “absence,” the reporting and recording mechanism to be used, and a definition of “excessive” absenteeism.
2. The fire chief should set response times goals including system-wide response time, dispatch time, response time for both fire and EMS calls, and report response times and exceptions to the City Council on a periodic basis.
3. The fire chief should report workload periodically and use this information combined with response time when choosing a station location or reallocating staff or equipment to a more optimal location.

Appendix A

Prior Audit Recommendations

Prior Audit Recommendations

1. The Fire Chief should take the following steps to reduce excessive use of sick leave:
 - a. Monitor total sick leave use and patterns of use in order to identify patterns that suggest abuse;
 - b. Based on the observed patterns, develop a definition of sick leave abuse that will be used to trigger further investigation;
 - c. Enforce provisions of the Memorandum of Understanding requiring medical certificates when abuse is suspected according to the above criteria; and
 - d. Identify other enforcement actions and attendance incentives that may be warranted.
 2. The Fire Chief should not allow fire fighters to schedule their 14th N-day on weekends as long as absences remain higher on those days than on other days of the week.
 3. The Fire Chief should enforce the 8 percent limit on scheduled vacations throughout the year. This limit should not be relaxed during the summer months or on weekends.
 4. The City Manager should negotiate with the fire fighters' union for a reduction in N-days from 14 to 7 and an increase in the average workweek from 49.5 to 53 hours.
 5. The Fire Chief should investigate the use of ladder tenders to replace four pumpers and one squad.
 6. The Fire Chief should investigate the use of alternative staffing arrangements allowing one company to staff both an aerial and a ladder tender.
 7. The Fire Department should proceed with the construction of a fire station at the site at 110th and North Oak Trafficway without further delay.
 8. The Fire Department should proceed with site selection and acquisition for a station in south Kansas City without further delay.
 9. The Fire Chief should use the higher staffing levels gained from implementing recommendations 4 through 6 and from returning the [battalion] chief's aides to fire suppression companies to increase crew size on all remaining pumper companies.
 10. The Fire Chief should request sufficient funds to schedule cadet classes as often as needed to minimize vacant positions. The department should estimate the overtime savings that could be expected as a result.
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11. The Fire Chief should target the companies that most frequently respond to EMS calls for early emergency medical training.
 12. The City manager should try to negotiate changes in MOU provisions governing assignment of personnel to make it easier to assign people with special skills or training to the companies of shifts where they are most needed.
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Appendix B

Audit Report Tracking System (ARTS) Report

Follow-up Audit: Fire Fighting Force Resource Allocation

Audit Report Tracking System																																			
1.	Audit Title Fire Fighting Resource Allocation	2.	This Report Date 10/8/97																																
3.	Department Fire	4.	Last Report Date 4/9/97																																
5.	Department Head Rick Brisbin	6.	Contact Person/Phone Rick Brisbin / 274-1393																																
7.	Audit Release Date 4/26/93	8.	ARTS Number 923-023-7																																
9. Status of All Audit Recommendations																																			
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%; text-align: left;">Status</th> <th style="width: 25%; text-align: left;">Date</th> <th style="width: 25%; text-align: left;">Status</th> <th style="width: 25%; text-align: left;">Date</th> </tr> </thead> <tbody> <tr> <td>1. Implemented</td> <td>08/15/94</td> <td>8. Implemented</td> <td>08/15/97</td> </tr> <tr> <td>2. Implemented</td> <td>07/01/94</td> <td>9. Alternative Implemente</td> <td>10/08/97</td> </tr> <tr> <td>3. Implemented</td> <td>10/20/93</td> <td>10. Implemented</td> <td>04/20/95</td> </tr> <tr> <td>4. Non-Implementation</td> <td>10/08/97</td> <td>11. Implemented</td> <td>07/14/95</td> </tr> <tr> <td>5. Alternative Implemente</td> <td>10/08/97</td> <td>12. Non-Implementation</td> <td>10/08/97</td> </tr> <tr> <td>6. Alternative Implemente</td> <td>10/08/97</td> <td></td> <td></td> </tr> <tr> <td>7. Implemented</td> <td>11/10/95</td> <td></td> <td></td> </tr> </tbody> </table>				Status	Date	Status	Date	1. Implemented	08/15/94	8. Implemented	08/15/97	2. Implemented	07/01/94	9. Alternative Implemente	10/08/97	3. Implemented	10/20/93	10. Implemented	04/20/95	4. Non-Implementation	10/08/97	11. Implemented	07/14/95	5. Alternative Implemente	10/08/97	12. Non-Implementation	10/08/97	6. Alternative Implemente	10/08/97			7. Implemented	11/10/95		
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<p>Recommendation No. 1: The Fire Chief should take the following steps to reduce excessive use of sick leave:</p> <ul style="list-style-type: none"> a. Monitor total sick leave use and patterns of use in order to identify patterns that suggest abuse; b. Based on the observed patterns, develop a definition of sick leave abuse that will be used to trigger further investigation; c. Enforce provisions of the Memorandum of Understanding requiring medical certificates when abuse is suspected according to the above criteria; and d. Identify other enforcement actions and attendance incentives that may be warranted. <p>Description of Status: Implemented. On May 1, 1993, Fire management issued a policy designed to reduce excessive use of sick leave. This policy was grieved by the firefighters' union, but it was upheld by the Personnel Department at the 4th step. The policy was fully implemented on August 15, 1994.</p> <p>Recommendation No. 2: The Fire Chief should not allow fire fighters to schedule their 14th N-day on weekends as long as other absences remain higher on those days than on other days of the week.</p> <p>Description of Status: Implemented. Since July 1, 1994, 14th N-days have been scheduled by Fire management to limit the number of fire fighters</p>																																			

10. Recommendations Included in this Report

taking the extra N-day at any one time. Effective May 1, 1995, management no longer schedules any extra N-days on weekends from May 1 to September 1.

Recommendation No. 3: The Fire Chief should enforce the 8 percent limit on scheduled vacations throughout the year. This limit should not be relaxed during the summer months or on weekends.

Description of Status: Implemented. In our original response, we stated that the department's policy is to maintain the eight percent limit on scheduled vacations, but to allow Battalion Chiefs the authority to exceed the limit for bona fide reasons. We have issued written guidelines to Battalion Chiefs describing the circumstances under which exceptions to the limit may be considered.

Recommendation No. 4: The City Manager should negotiate with the fire fighters' union for a reduction in N-days from 14 to 7 and an increase in the average work week from 49.5 to 53 hours.

Description of Status: Non-implementation. This recommendation was not a part of the City's 1994 or 1996 negotiation package.

Recommendation No. 5: The Fire Chief should investigate the use of ladder tenders to replace four pumpers and one squad.

Description of Status: Alternative plan implemented. An alternative fire asset allocation model, FD21C, is currently being implemented. The City Auditor reviewed this plan, and we believe endorses its goals and concepts. FD21C was a labor/management consensus building effort that culminated in a reconstruction of the entire service delivery model. Although "ladder tenders" are not directly employed in FD21C, a new delivery vehicle, the rescue unit will be deployed. The deployment of the rescue unit will address some of the issues in this recommendation: higher staffing, lower maintenance and operating costs. Two aerials, six squads, and two to three pumpers will be replaced as the implementation of FD21C proceeds.

Recommendation No. 6: The Fire Chief should investigate the use of alternative staffing arrangements allowing one company to staff both an aerial and a ladder tender.

Description of Status: Alternative plan implemented. FD21C created a new unit, the Rescue, that can perform some of the functions of both a ladder truck and a pumper. Fire management believes that the addition of this unit will provide the flexibility needed in the delivery system without the cost of acquiring and maintaining two units (a ladder and a ladder tender) for each set of staffing.

10. Recommendations Included in this Report

Recommendation No. 7: The Fire Department should proceed with the construction of a fire station at the site of 110th and North Oak Trafficway without further delay.

Description of Status: Implemented. The Fire Department and the City Architect have begun the construction process for the north station. An architectural firm was selected and plans are completed for a two-story station. Current plans include a separate training room/community meeting rooms. Construction began in the spring of 1997 with completion projected for fall of 1997.

Recommendation No. 8: The Fire Department should proceed with site selection and acquisition for a station in south Kansas City without further delay.

Description of Status: Implemented. The fire department and the city architect's office have been working diligently for the last year and a half to secure property to relocate station 36. In August, 1997 we purchased property at 9901 Holmes for the purpose of re-engineering the existing structure for use as the new fire station. Selection of an architect is underway.

Recommendation No. 9: The Fire Chief should use the higher staffing levels gained from implementing recommendations 3 through 6 and from returning the chief's aides to fire suppression companies to increase crew size on all remaining engine companies.

Description of Status: Alternative plan implemented. Battalion Aides were re-engineered along with other pumper, squad, and ladder units. These assets and personnel were diverted to the creation of rescue units and the addition of a District Safety Officer to comport with industry standards on emergency site safety. As a result of FD21C, more personnel are delivered to an evolving emergency on a different set of vehicles. Currently, 25% of the units dispatched to a normal house fire have a minimum four person assigned strength. FD21C will increase this to 50% of the units.

Recommendation No. 10: The Fire Department should request sufficient funds to schedule cadet classes as often as needed to minimize vacant positions. The department should estimate the overtime savings that could be expected as a result.

Description of Status: Implemented. In its FY 1996 budget proposal, the department requested funds for the cost of a cadet class while it is in training. The City Manager recommended and the City Council approved this proposal in the FY 1996 and 1997 Budget.

10. Recommendations Included in this Report

Recommendation No. 11. The Fire Chief should target the companies that most frequently respond to EMS calls for early emergency medical training.

Description of Status: Implemented. On July 1, 1995, the department began a new EMS/First Responder training program aimed at the 350 firefighters who were neither state-licensed EMTs nor state-certified first responders. Companies with no EMTs were given priority for this training. To date 153 employees have been certified as first responders. We plan to continue this program until all firefighters are certified. Since 1991, all new hires must become EMT's and maintain this credential throughout their career.

Recommendation No. 12. The City Manager should try to negotiate changes in the MOU provisions governing assignment of personnel to make it easier to assign people with special skills or training to the companies or shifts where they are most needed.

Description of Status: Non Implementation. This recommendation was part of the City's initial bargaining package in the spring of 1994 and again in 1996. The City and the Union were unable to reach agreement on this issue. Seniority, rather than special skills or training, governs the assignment of personnel.

Appendix C

Response Time and Workload Information of Fire Fighting Force

Response Time and Workload Information of Fire Fighting Force

This appendix provides statistical information derived from the Fire Department CAD system. The time frame of the data is from April 1, 1999 through March 31, 2000. The two tables we used are FIRS.T307IR (Incident Reporting Table) and FIRS.T307IEPA (Company Resource Reporting Table). The data in these two tables are from the fire CAD system, which is sent to the city's mainframe every night.

We made some adjustments to the database because of missing or invalid data. Cases where arrival times for the first responding unit are missing and invalid were excluded in the analysis.¹²

Exhibits 7 through 10 are based on the FIRS.T307IR, which has the first-in data. (First-in data refers to the first department unit to arrive at the scene.) Exhibits 11 and 12 are based on FIRS.T307IEPA, which has all the company runs including first in.

Ninety Percent of Incidents Responded within Seven Minutes

We analyzed response time for five types of emergency calls (fire, EMS, hazardous material, rescue, and overpressure rupture) to which the Fire Department responded. About 63 percent of incidents had response times of up to four minutes and 90 percent of incidents had response times of up to seven minutes. Almost 4 percent of the total incidents had response times greater than ten minutes. (See Exhibit 7.)

¹² There are several forms of missing and invalid arrival times in the incident reporting table. The system generates arrival times such as 12:00:00 AM of 1/1/1999, 1/1/2000 and 1/1/2099 if the arrival time is missing. In addition, the system will run a QMF script where 3 minutes will be added to the received time when the arrival time is entered as 1/1/1900.

Exhibit 7. Frequency Distribution of Response Times

Response Time	Number of Incidents ¹³	Percent of Incidents	Cumulative Percent
Within 1 Minute	1486	4.2	4.2
1-2 Minutes	3850	10.8	14.9
2-3 Minutes	8678	24.3	39.2
3-4 Minutes	8395	23.5	62.6
4-5 Minutes	5050	14.1	76.7
5-6 Minutes	2987	8.3	85.1
6-7 Minutes	1734	4.8	89.9
7-8 Minutes	1036	2.9	92.8
8-9 Minutes	707	2.0	94.8
9-10 Minutes	470	1.3	96.1
Over 10 Minutes	1386	3.9	100.0

Source: Fire Dispatch Data (4/1/99-3/31/00).

Fire Responds Faster to EMS Calls

In general, fire fighters respond to EMS calls somewhat faster than fire calls. About 67 percent of EMS calls had response times up to four minutes, but only 59 percent of the fire calls had the same response time. About 90 percent of the fire calls had response times up to seven minutes, while about 93 percent of EMS calls had the same response time. (See Exhibit 8.)

Exhibit 8. Fire and EMS Incidents Response Times

Response Time	Fire Cumulative Percent	EMS Cumulative Percent
Within 1 Minute	3.8%	4.3%
1-2 Minutes	13.8%	15.9%
2-3 Minutes	36.3%	42.1%
3-4 Minutes	59.3%	66.8%
4-5 Minutes	75.2%	80.7%
5-6 Minutes	84.0%	88.6%
6-7 Minutes	89.2%	92.9%
7-8 Minutes	92.4%	95.3%
8-9 Minutes	94.5%	96.8%
9-10 Minutes	96.0%	97.8%
Over 10 Minutes	100.0%	100.0%

Source: Fire Dispatch Data (4/1/99-3/31/00).

¹³ Number of incidents includes fire, emergency medical, hazardous material, and rescue. It also includes 16 overpressure rupture calls and 20 administrative calls.

Response Time Faster in Area with Higher Workloads

Median response times vary from under three minutes to over four minutes. The busiest battalions generally had faster response times. Battalions 102 and 106, located in downtown and the Plaza, respectively, have the fastest median response time. Battalions 105 and 108, located in east and north (Platte County), respectively, have the slowest median response time. (See Exhibit 9.)

Exhibit 9. Median Response Time and Number of Incidents by Battalion

Battalion	Number of Incidents	Percent of Incidents	Median Response Time
102	4146	11.9%	0:02:44
106	6805	19.6%	0:03:00
104	6611	19.0%	0:03:06
103	3689	10.6%	0:03:42
107	4988	14.3%	0:03:49
105	5544	15.9%	0:04:02
108	3019	8.7%	0:04:46

Source: Fire Dispatch Data (4/1/99-3/31/00).

In battalions 102, 104, and 106, median response times for all stations were less than four minutes. In battalions 103, 105, 107 and 108, median response times for most of the stations were over four minutes and four stations have response times over five minutes. In the area covered by station 43, which includes the area between Raytown and Lee's Summit, the median response time was over six minutes. The median response time for area covered by station 1 was almost six minutes. (See Exhibit 10.)

Exhibit 10. Median Response Time by Station¹⁴

Station	Median Response Time	Number of Incidents
Battalion 102		
8	0:02:28	1354
10	0:02:48	2016
7	0:03:04	776
Battalion 103		
25	0:02:56	892
6	0:04:03	627
40	0:04:07	597
47	0:04:11	218
34	0:04:32	1018
Battalion 104		
24	0:02:57	1814
23	0:03:06	2025
18	0:03:13	2772
Battalion 105		
35	0:03:23	2080
30	0:03:46	1231
33	0:04:54	889
39	0:04:57	1044
43	0:06:11	300
Battalion 106		
17	0:02:45	2445
19	0:02:49	1626
32	0:03:18	1103
29	0:03:21	1631
Battalion 107		
37	0:03:36	1146
36	0:03:43	1498
45	0:03:48	530
42	0:04:06	1766
28	0:04:07	1586
41	0:04:38	1464
1	0:05:54	47
Battalion 108		
38	0:04:29	768
3	0:04:48	961
4	0:04:49	690
16	0:05:05	583
44	0:05:49	188
27 (HazMat)	0:03:24	934

Source: Fire Dispatch Data (4/1/99-3/31/00).

¹⁴ We used the Company Resource Table for response time data for stations 28, 38, 41 since the first-in data for these stations are missing in the Incident Reporting Table.

Workload Varies Widely among Companies and Stations

Some companies (P10, P18, and P24) responded almost 8 times a day, while some companies (P1, P3, P43, P45, and P47) responded less than 2 times a day. (See Exhibit 11. The companies are designated P, R, T, or Q. P is a pumper, R is a rescue unit, T is a truck, and Q is a quint.)

Exhibit 11. Variations in Number of Responses by Company

Company	Number of Responses	Daily Average
P1	308	0.8
P43	455	1.2
P3	566	1.5
P47	687	1.9
P45	691	1.9
R16	733	2.0
P16	841	2.3
T13	918	2.5
Q28	984	2.7
T8	1010	2.8
P38	1015	2.8
T5	1023	2.8
T10	1027	2.8
P40	1034	2.8
T12	1037	2.8
P33	1056	2.9
P6	1079	2.9
T2	1197	3.3
P4	1271	3.5
Q44	1284	3.5
P25	1302	3.6
T11	1374	3.8
R1	1410	3.9
R7	1480	4.0
P9	1495	4.1
T7	1535	4.2
P34	1571	4.3
P39	1586	4.3
T6	1657	4.5
P36	1692	4.6
P30	1757	4.8
P37	1809	4.9
P32	1828	5.0
T3	1865	5.1
R12	2002	5.5
R9	2037	5.6
P42	2046	5.6
P23	2147	5.9
Q41	2185	6.0
R31	2198	6.0
P8	2275	6.2

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P29	2275	6.2
R11	2285	6.2
P35	2371	6.5
P19	2409	6.6
P17	2500	6.8
P18	2583	7.1
P10	2722	7.4
P24	2841	7.8
Average	1540	4.2

Source: Fire Dispatch Data (4/1/99-3/31/00).

Workload also varies among stations. Stations 17 and 18 responded more than 16 times a day. Both of these two stations are three-company stations. Although station 24, which is located at 2039 Hardesty, only responded about 8 times a day, it is a one-company station. Among the multi-company stations, station 3 has the lowest workload. The two-company station only responded about 4 times a day. (See Exhibit 12.)

Exhibit 12. Number of Daily Responses by Station

Station	Number of Responses	Daily Responses
1	308	0.8
43	455	1.2
47	687	1.9
45	691	1.9
16	841	2.3
38	1015	2.8
40	1034	2.8
33	1056	2.9
4	1271	3.5
44	1284	3.5
3	1299	3.5
34	1571	4.3
36	1692	4.6
27	1742	4.8
30	1757	4.8
32	1828	5.0
42	2046	5.6
6	2116	5.8
41	2185	6.0
8	2275	6.2
28	2464	6.7
39	2504	6.8
25	2712	7.4
37	2819	7.7
24	2841	7.8
7	3152	8.6
29	3649	10.0
19	3944	10.8
35	4408	12.0

10	4587	12.5
23	5176	14.1
18	5891	16.1
17	5895	16.1
Average	2339	6.4

Source: Fire Dispatch Data (4/1/99-3/31/00).

Appendix D

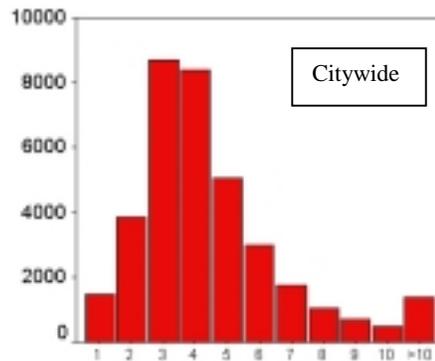
Response Time Frequency Distribution (Citywide, Battalions, Stations)

Response Time Frequency Distribution (Citywide, Battalions, Stations)

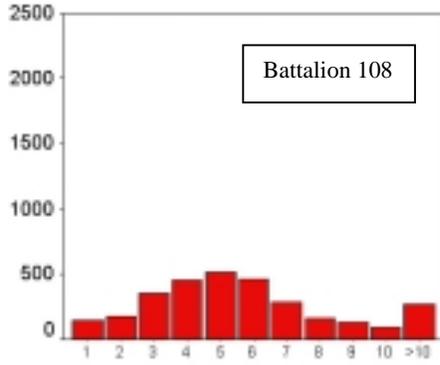
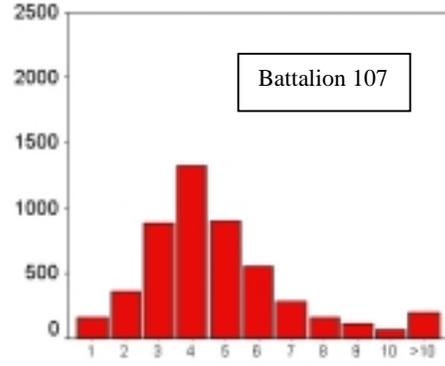
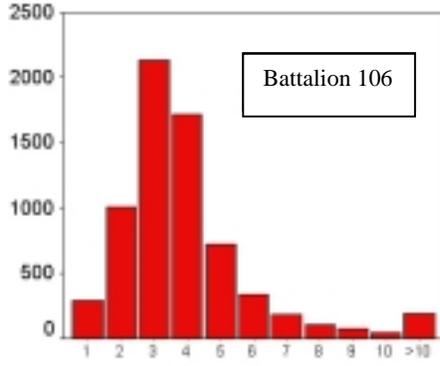
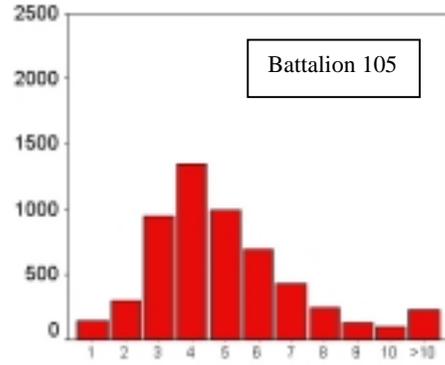
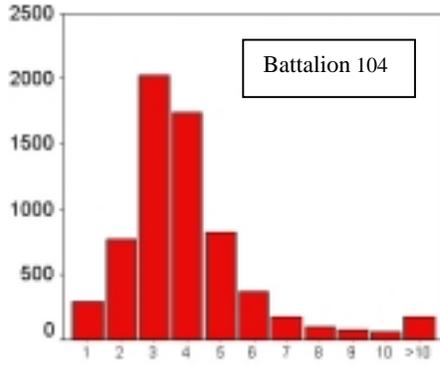
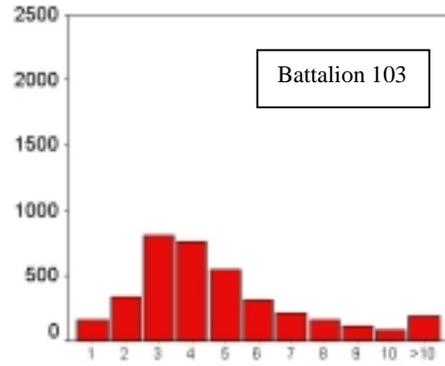
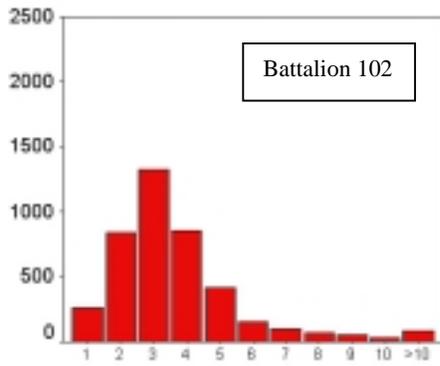
The following graphs are incident response time frequency distributions for the first-in unit from April 1, 1999 through March 31, 2000. The frequency distributions are shown citywide, by battalion and by station. The incidents include fire, emergency medical, hazardous material, and rescue calls. We used the Incident Reporting Table. Since the first-in data for stations 28, 38, and 41 are missing in the Incident Reporting Table, we used the data in the Company Resource Table for stations 28, 38, and 41, which has all the company runs including first in.

Numbers on the X-axis represent response time, and numbers on the Y-axis represent number of incidents.

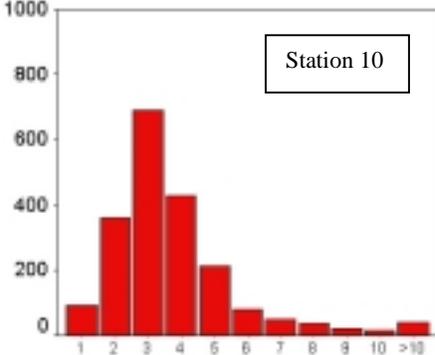
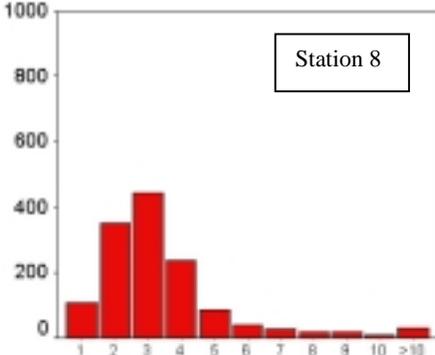
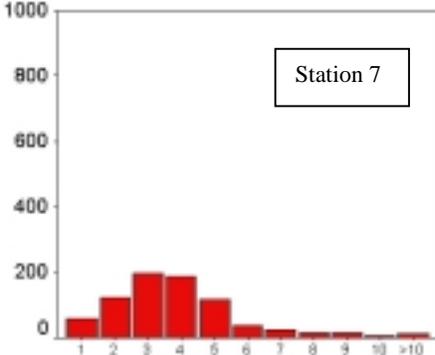
The citywide response time frequency distribution graph shows that there were about 1500 calls responded to within one minute. More calls (about 8500) were responded to between two to three minutes. About 1400 calls had a response time of over ten minutes.



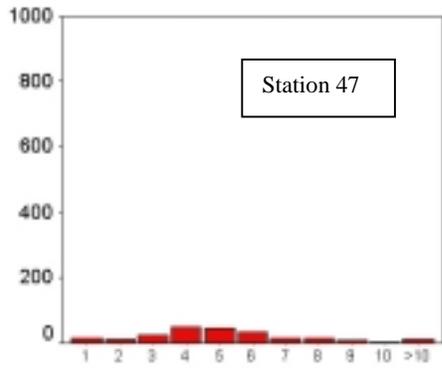
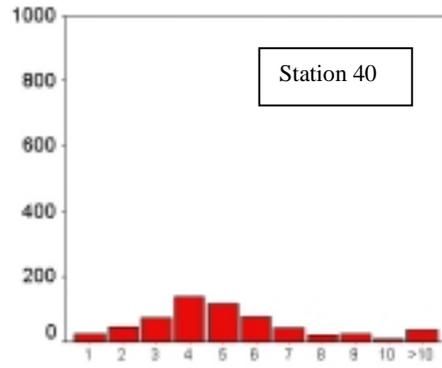
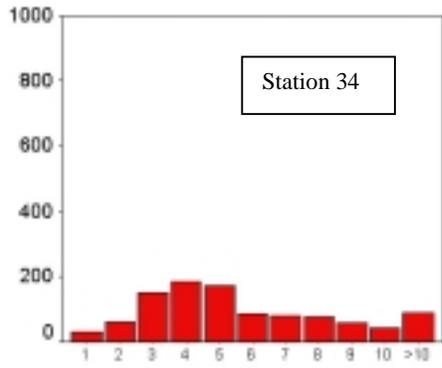
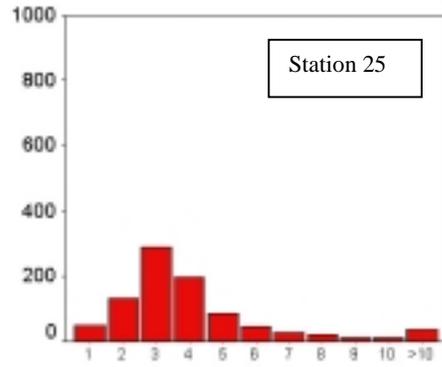
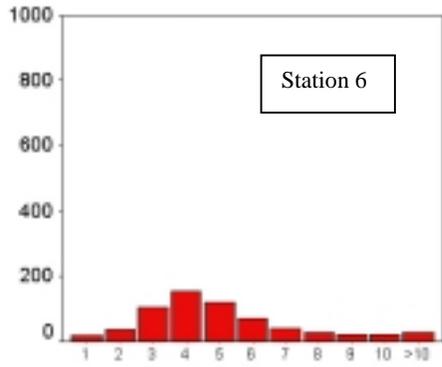
Follow-up Audit: Fire Fighting Force Resource Allocation



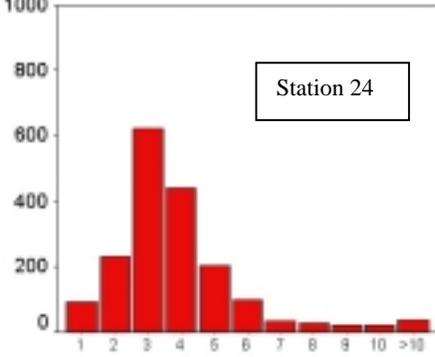
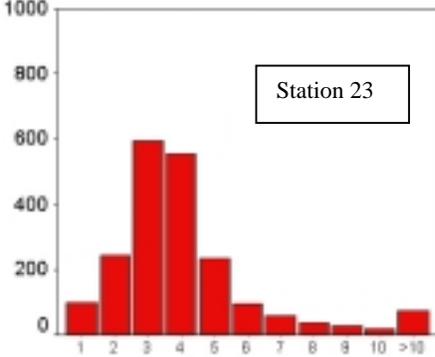
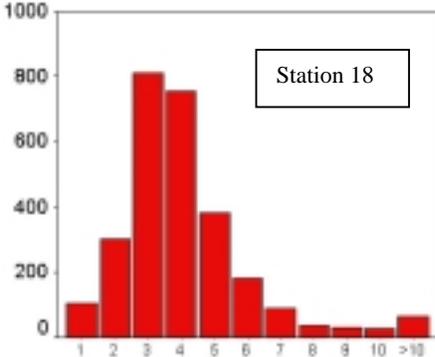
Stations in Battalion 102



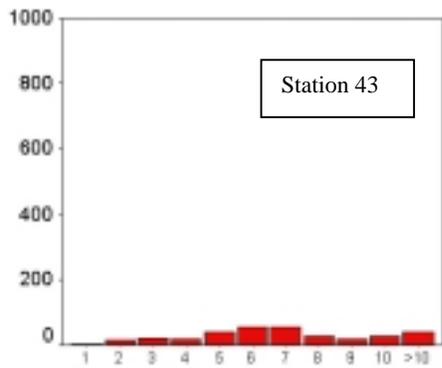
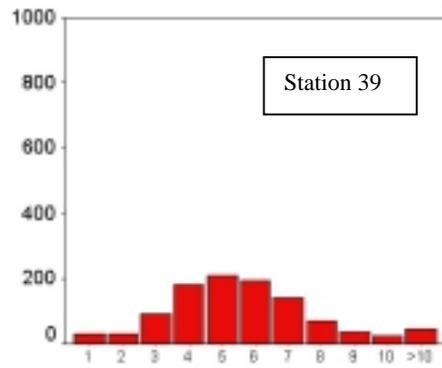
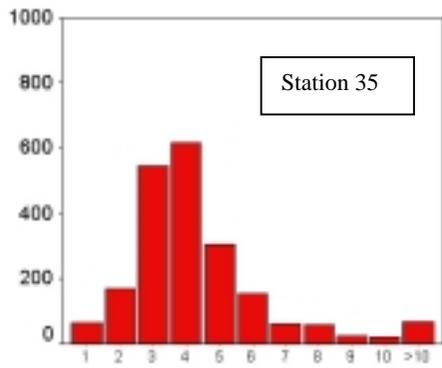
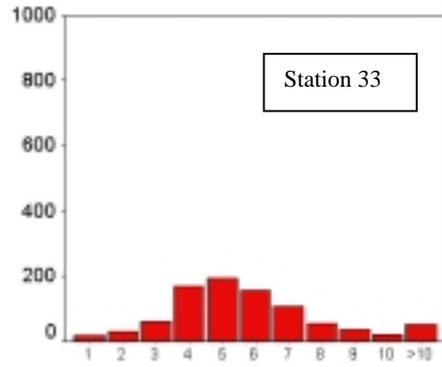
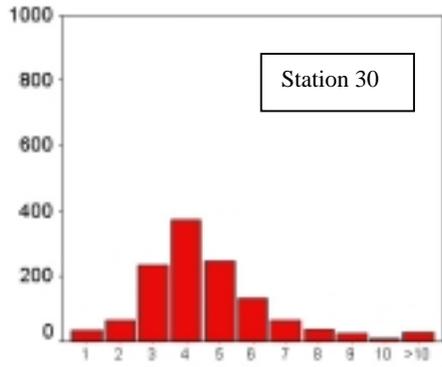
Follow-up Audit: Fire Fighting Force Resource Allocation
Stations in Battalion 103



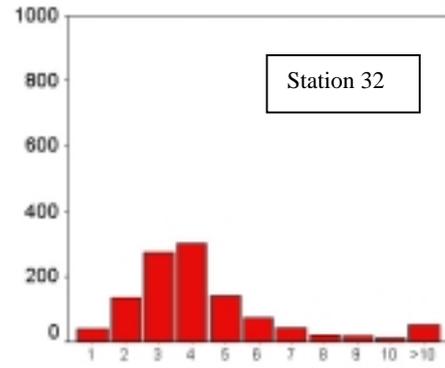
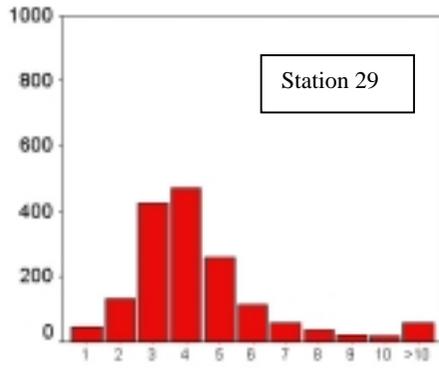
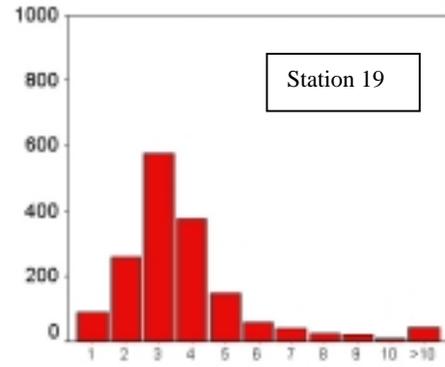
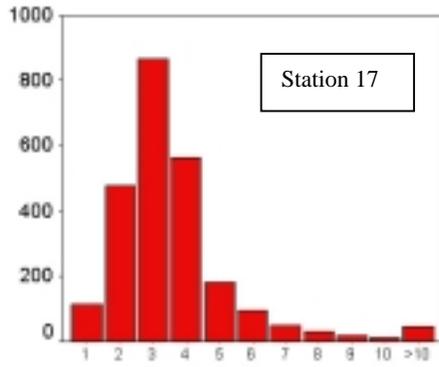
Stations in Battalion 104



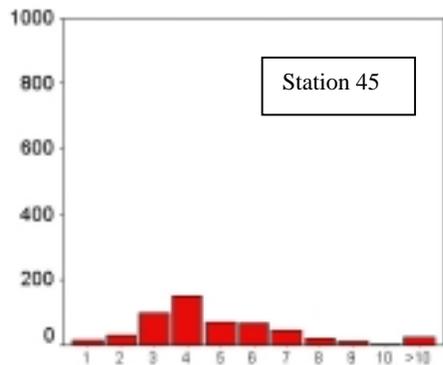
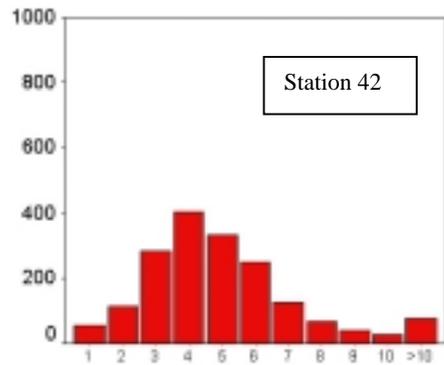
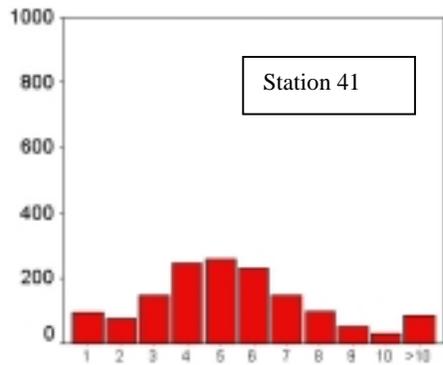
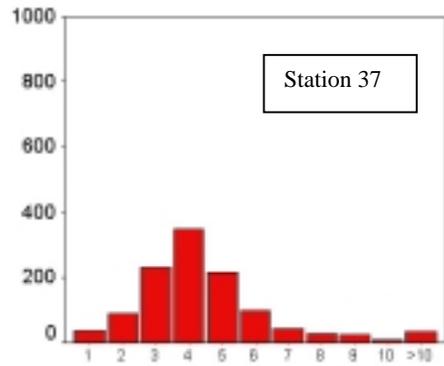
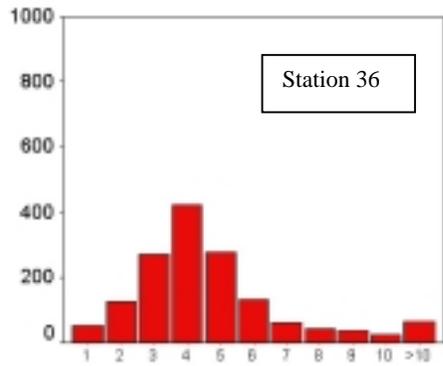
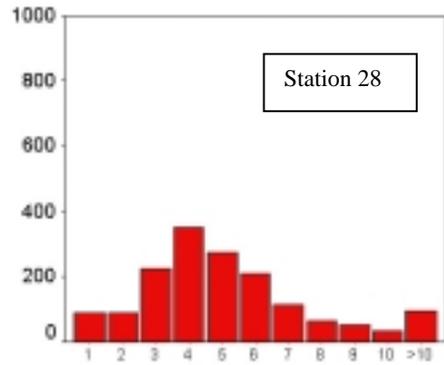
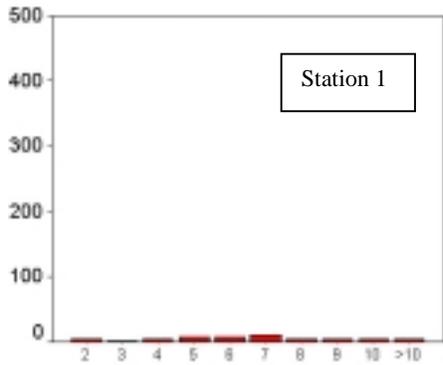
Follow-up Audit: Fire Fighting Force Resource Allocation
Stations in Battalion 105



Stations in Battalion 106

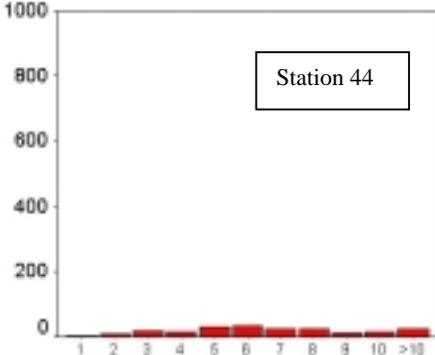
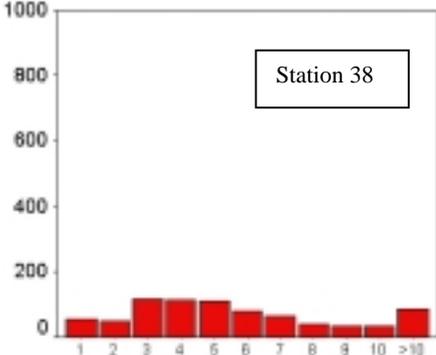
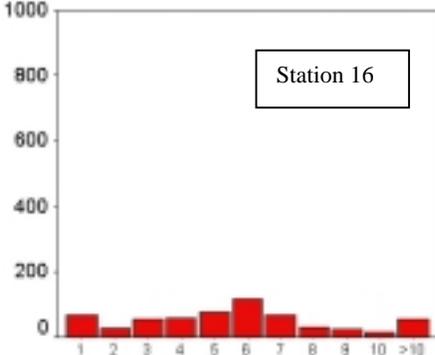
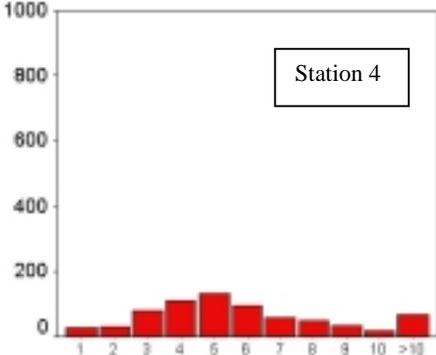
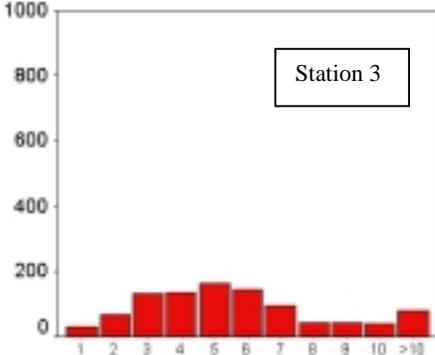


Stations in Battalion 107¹⁵



¹⁵ Because of the low number of calls responded to by Station 1, which is located at Richards-Gebaur, we used a scale of 0-500 in the graph instead of 0-1000.

Stations in Battalion 108



Appendix E

Acting Fire Chief's Response

CITY OF FOUNTAINS
HEART OF THE NATIONKANSAS CITY
MISSOURI

Office of the Fire Chief

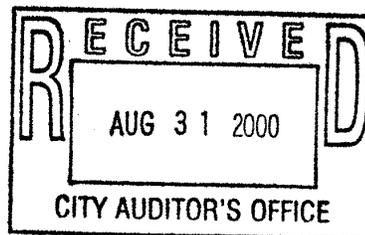
22nd Floor, City Hall
414 East 12th Street
Kansas City, Missouri 64106

(816) 513-1700

DATE: August 22, 2000

TO: Mark Funkhouser
City Auditor

FROM: *E. Weixeldorfer*
Ed Weixeldorfer
Interim Fire Chief/ Director



SUBJECT: Resource Allocation Follow-up Audit

Fire Department management has appreciated the opportunity to review the draft of this audit and to discuss with your staff our questions and concerns. We are impressed with the quality of the data developed, and are generally in agreement with the recommendations presented. We have the following comments on those recommendations, which we hope will add to their utility:

1. **The fire chief should develop and consistently enforce a sick leave policy that clearly communicates to all parties (i.e., fire fighters, management, and the union) provisions such as the definition of "absence," the reporting and recording mechanism to be used, and a definition of "excessive" absenteeism.**

Fire management has been exploring all varieties of absenteeism in an effort to identify the entire range of issues contributing to absenteeism and overtime expenditures. This examination has included patterns of utilization by individuals, districts, and days, and has also looked at modified duty, injuries, and other factors contributing to the overall problem. It is our intention to have a preliminary report and suggested plan of action within ninety days.

2. **The fire chief should set response time goals including system-wide response time, dispatch time, response time for both fire and EMS calls, and report response times and exceptions to the City Council on a periodic basis.**

Response time reporting has received increasing study and emphasis in the Fire Department with the findings of the EMS Audit and the recommendations of the EMS Special Study Committee. We are in agreement that response times represent a valuable service quality index and need to be systematically measured, tracked,

evaluated, and reported. Both our staff and the Auditor's staff have noted that the current computer assisted dispatching (CAD) system harbors a range of limitations that complicate both the entry of data and their subsequent retrieval and analysis; we are also in agreement that replacement of this system is absolutely essential both to improve these indices and to adequately monitor our efforts in that respect. Initial steps will be taken to establish goals and benchmarks in accordance with NFPA and other pertinent industry standards, and to report periodic comparison of local response times against these benchmarks. Expedited acquisition and implementation of a new CAD system, now in the specification stages, remains essential to realizing the fullest impact of this effort.

- 3. The fire chief should report workload periodically and use this information combined with response time when choosing a station location or reallocating staff or equipment to a more optimal location.**

The Auditor is very correct to note that response time and workload must be balanced in such decisions. Many other variables must also be reflected, including projected growth, specific hazards, availability and reliability of mutual aid, to name a few. The ultimate questions require balancing the *probability* of response (to wit, the workload issue) against the *criticality* of a potential call or event, including the impact of delay is response with respect to both *capacity* (the equipment and basic staffing to respond) and *capability* (the specific skills and resources necessary to address a specific hazard or event). The Fire Department carefully evaluates all such factors in its deployment decisions, and enters these data into discussions and decisions regarding station locations and resource allocation at all levels. We have invited the Auditor's staff to take an active role in assisting us to better measure and utilize these data, and look forward to the benefit such interaction will provide for the quality of these critical system decisions.