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**Audit Report**

**AUDIT OF DEPARTMENT OF  
DALLAS FIRE-RESCUE'S  
FLEET MAINTENANCE MANAGEMENT  
(Report No. A16-002)**

**December 4, 2015**

**City Auditor**

Craig D. Kinton

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## Executive Summary

The Department of Dallas Fire-Rescue (DFR) can improve the efficiency and effectiveness of fleet maintenance for the City of Dallas' (City) 532 emergency vehicles and equipment in the DFR fleet (79 fire engines, 28 aerial trucks, 56 ambulances, and 369 other supporting vehicles and equipment). Specifically:

- The DFR Maintenance Division (Division) does not consistently perform timely Preventive Maintenance (PM) services. As a result, the Division cannot ensure DFR emergency vehicles are consistently in good condition and minimize the risk of costly repairs or that emergency vehicles will not be available for service.
- The Division does not have an efficient procurement method for parts that are not included in a master agreement with a vendor who can supply emergency vehicles' parts<sup>1</sup> timely. Consequently, out-of-service times for DFR's emergency vehicles are often excessive resulting in lower customer service satisfaction.
- The Division's mechanic supervisors do not consistently perform and document quality control procedures for PM services by preparing, signing, and retaining Preventive Maintenance Checklists for heavy-duty emergency vehicles and for Medical Intensive Care Units. Without consistently performing and documenting quality control procedures, the City's liability risk is increased because the Division cannot readily demonstrate: (1) emergency vehicles PM services were performed as recommended by the National Fire Protection Association and the manufacturers; and, (2) mechanic supervisors verified the PM services were properly performed before the emergency vehicles are released for service.
- User access to the Fleet Focus M5 (M5) software application is not properly segregated and timely updated when personnel changes occur. Without

### Background Summary

The Department of Dallas Fire-Rescue (DFR) Maintenance Division (Division) is responsible for providing preventive maintenance and repair services to the emergency vehicles for the City of Dallas' (City) 57 fire stations which includes one fire station that is under renovation. This Division also provides supplies for the fire stations and uniform clothing for DFR.

The Fiscal Year (FY) 2014 adopted budget for the Division was \$6,841,409, including \$3,674,398 for salaries and benefits; \$1,774,509 for food, laundry, and support; \$967,735 for repair tools, fuel and lube, vehicle parts, and tires and tubes; and, \$424,767 for other.

**Sources:** Office of Financial Services FY 2014 Adopted Annual Budget (unaudited) and DFR

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<sup>1</sup> According to DFR management, a master agreement is used for the ambulance maintenance parts.

proper segregation of duties the risk of errors and potential fraud is increased because one person can perform and review all transactions in the process. In addition, when user access is not timely updated, there is an increased risk that: (1) user access to the M5 software application is inappropriate; (2) emergency vehicles' parts may be misappropriated; and, (3) operational inefficiencies exist because valid users do not have appropriate access.

- The Division does not have mechanics' staffing plans to ensure an adequate number of qualified personnel are readily available to meet DFR's fleet maintenance needs. As a result, the Division may not be able to effectively sustain the fleet maintenance operation. There is also an increased risk that the Division will not perform maintenance and repair services efficiently and effectively resulting in significant downtime for emergency vehicles. Without performing optimal staffing analysis, DFR cannot ensure that staffing levels are managed efficiently.
- The lack of incentives and the DFR's compensation structure do not encourage mechanics to obtain relevant certifications, such as the Emergency Vehicle Technician (EVT) certification. The 24 DFR mechanics and two body shop specialists have the same job grade and receive about the same salary even though some mechanics possess multiple EVT certifications and years of experience that range from two to over 25 years. Without a competitive compensation structure, DFR may not attract and retain certified, experienced mechanics.
- The Division does not have formal training plans stipulating the types and frequency of training which should be received by all mechanics. In addition, the Division does not document the training subjects that mechanics received (although the training hours and individuals attending the training are recorded in the M5 software application). The lack of formal training plans and training documentation increases the risk that mechanics will not maintain the skills necessary to perform maintenance and repair services efficiently and effectively.

We recommend the DFR Fire Chief improve the efficiency and effectiveness of DFR's fleet maintenance by addressing the recommendations made in this report.

The audit objective was to evaluate the efficiency and/or effectiveness of selected aspects of DFR's fleet maintenance management. The scope of the audit included management operations from October 1, 2009 to September 30, 2014; however, certain other matters, procedures, and transactions outside that period were reviewed to understand and verify information during the audit period.

Please see Appendix IV for Management's responses to the recommendations.

# Audit Results

## Overall Conclusions

The Department of Dallas Fire-Rescue (DFR) can improve the efficiency and effectiveness of fleet maintenance for the City of Dallas' (City) 532 emergency vehicles and equipment in the DFR fleet (79 fire engines, 28 aerial trucks, 56 ambulances, and 369 other supporting vehicles and equipment). Specifically:

- The DFR Maintenance Division (Division) does not consistently perform timely Preventive Maintenance (PM) services
- The Division does not have an efficient procurement method for parts that are not included in a master agreement with a vendor who can supply emergency vehicles' parts timely
- The Division's mechanic supervisors do not consistently perform and document quality control procedures for PM services by preparing, signing, and retaining Preventive Maintenance Checklists for heavy-duty emergency vehicles and for Medical Intensive Care Units
- User access to the Fleet Focus M5 (M5) software application is not properly segregated and timely updated when personnel changes occur
- The Division does not have mechanics' staffing plans to ensure an adequate number of qualified personnel are readily available to meet DFR's fleet maintenance needs
- The lack of incentives and the DFR's compensation structure do not encourage mechanics to obtain relevant certifications, such as the Emergency Vehicle Technician (EVT) certification
- The Division does not have formal training plans stipulating the types and frequency of training which should be received by all mechanics

## SECTION I Dallas Fire-Rescue Maintenance Division Operations

### Preventive Maintenance Services Are Not Consistently Performed Timely and Scheduling Preventive Maintenance is a Manual Process

The Division does not consistently perform timely PM services for: (1) DFR’s heavy-duty emergency vehicles (fire engines, aerial trucks, and urban rescue and heavy-duty hazardous materials vehicles); and, (2) certain DFR’s light-duty emergency vehicles. As a result, the Division cannot ensure DFR emergency vehicles are consistently in good condition and minimize the risk of costly repairs or that emergency vehicles will not be available for service. Specifically:

- As of September 2014, the Division had not performed any PM services on two fire engines which had been in service since May 2013
- For Fiscal Years (FY) 2010 through FY 2014, PM services were delayed at least one month past the National Fire Protection Association’s (NFPA) and the manufacturers’ recommended PM dates as follows:
  - 128 of 177 fire engines, or 72 percent, PM-A services (see textbox)
  - 51 of 77 fire engines, or 66 percent, PM-B services
  - 54 of 113 aerial trucks, or 48 percent, PM-A services
  - 27 of 41 aerial trucks, or 66 percent, PM-B services

On average, the PM services for heavy-duty emergency vehicles were delayed three months past the NFPA’s and/or the manufacturers’ recommended dates as shown in Table I on the following page.

<b>Preventive Maintenance Service Types</b>
The Division provides three types of PM services:
• PM-A service is a minor maintenance service, such as oil change, filter change, and various inspections.
• PM-B service is a major maintenance service that includes all PM-A services and additional performance tests.
• PM-C service is a maintenance service for ambulances (Medical Intensive Care Units).
<b>Source:</b> DFR Maintenance Division

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**Table I  
Preventive Maintenance Average Interval  
FY 2010 to FY 2014**

Emergency Vehicle	Number of PM Performed	PM-A		PM-B or PM-C <sup>1</sup>		
		Interval in Months	Interval in Miles	Number of PM Performed	Interval in Months	Interval in Miles
Fire Engine	177	10	8,959	77	15	13,497
Aerial Truck	113	7	4,823	41	14	7,894
Urban Rescue / Heavy-duty Hazardous Materials Truck	10	14	2,291	4	14	2,010
<b>Average <sup>2</sup></b>		<b>9</b>	<b>7,179</b>		<b>15</b>	<b>11,237</b>
Ambulance / Light-Duty Hazardous Materials Truck	714	3	6,995	510	4	8,834
Booster Truck	1	30	5,212	6	21	4,383
<b>Average</b>		<b>3</b>	<b>6,993</b>		<b>4</b>	<b>8,782</b>

**Note:** <sup>1</sup> PM-B and PM-C services are not applicable to light duty and heavy duty emergency vehicles, respectively.

<sup>2</sup> The manufacturers recommend PM-A services every six months and PM-B and PM-C services every 12 months.

**Source:** DFR Fleet Focus M5 (Unaudited)

The PM services are not consistently completed timely because the Division does not use an automated PM services scheduling and monitoring process, such as the functionality available in the City’s M5 software application, to: (1) create and monitor PM schedules for all DFR emergency vehicles; and, (2) create reports to periodically evaluate when PM services are due so the PM services can be scheduled and fire station personnel are notified. In addition, the Division does not place a sticker on the emergency vehicles’ windshields so fire station personnel can also monitor when the next PM services are due. {Note: the Department of Equipment and Building Services (EBS) currently uses the M5 software application to schedule PM services for the Dallas Police Department and the Department of Park and Recreation vehicles.}

The Division uses a whiteboard to manually track and show the status of vehicles currently in the shop for maintenance. According to Division personnel, they also track PM services due dates and notify fire stations when the PM services are due. Maintenance records, however, show that 80 percent of the PM services were performed when the vehicles were brought in for repair rather than according to the manufacturers’ and NFPA’s recommended PM schedules.

The NFPA’s standard states fire departments should follow the manufacturers’ maintenance schedule and perform PM services at least once a year. The manufacturers for the sampled DFR’s emergency vehicles recommend minor PM



services every six months and major PM services every 12 months. The ambulance manufacturer recommends the following: (1) minor PM services every 7,500 miles or six months whichever comes first; and, (2) major PM services every 15,000 miles or 12 months whichever comes first.

## **Recommendation I**

We recommend the DFR Fire Chief ensures PM services are performed timely and in accordance with the NFPA's and the manufacturers' recommended schedules for all DFR emergency vehicles by:

- Using an automated PM scheduling process, such as the functionality available in M5 software application, to create and track PM schedules for all DFR emergency vehicles
- Creating reports to periodically evaluate when PM services are due so the PM services can be scheduled and fire station personnel are notified
- Placing a sticker on emergency vehicles' windshields so fire station personnel can also monitor when the next PM services are due

Please see Appendix IV for management's response to the recommendation.

## Inefficient Procurement Process for Parts Contributes to Excessive Out-of-Service Times for Emergency Vehicles

The Division does not have an efficient procurement method for parts that are not included in a master agreement (see textbox) with a vendor who can supply emergency vehicles parts<sup>2</sup> timely. Without a master agreement, the Division and/or the Department of Business Development and Procurement Services (BDPS) must obtain price quotes from at least three vendors as required by Administrative Directive 4-5, *Contracting Policy*, (AD 4-5). Consequently, out-of-service times for DFR’s emergency vehicles are often excessive resulting in lower customer service satisfaction. For example, according to the fire station captains surveyed, 47 percent are not satisfied with the time emergency vehicles are out-of-service for maintenance.

### Master Agreement

A contract for the purchase of goods by the City from a particular vendor only as needed and when needed at a fixed unit price valid for a defined term (also known as a requirements contract), and the goods are procured solely through the use of a purchase order and the specifications.

**Source:** City Administrative Directive 4-5, *Contracting Policy*

As shown in Table II on the following page, on average, heavy-duty emergency vehicles were out-of-service 11 days for PM-A services and 27 days for PM-B services. Ambulances and light-duty emergency vehicles had shorter out-of-service times. Therefore, DFR must maintain reserve emergency vehicles (14 engines and seven aerial trucks) to minimize the risk that an emergency vehicle is not available when needed. The reserve vehicles are older and often are not configured and/or include the same equipment as the newer vehicles which may create operational inefficiencies.

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<sup>2</sup> According to DFR Management, a master agreement is used for the ambulance maintenance parts.

Table II

**Number of Days to Complete  
 Preventive Maintenance Services  
 FY 2010 to FY 2014**

Vehicle Type	PM-A		PM-B or PM-C <sup>1</sup>	
	Numbers of PM Services Performed	Average Days Out-of-Service	Numbers of PM Services Performed	Average Days Out-of-Service
Fire Engine	177	12	77	31
Aerial Truck	113	10	41	20
Urban Rescue / Heavy Duty Hazardous Materials Truck	10	7	4	22
<b>Average <sup>2</sup></b>		11		27
Ambulance and Light Duty Hazardous Materials Truck	714	8	510	11
Booster Truck	1	40	6	24
<b>Average</b>		8		11

**Notes:** <sup>1</sup> PM-B and PM-C services are not applicable to light duty and heavy duty emergency vehicles, respectively.

<sup>2</sup> The average days emergency vehicles were out-of-service for PM services was calculated based on the duration of the work order. Most of the PM services were performed along with other non-PM services, such as repair. Since the work order was not closed until all services were completed, the PM services completion date was the same as the repair completion day even though the PM services may have been completed earlier. Therefore, the actual emergency vehicles out-of-service days for PM services could be less than the data shown.

**Source:** DFR Fleet Focus M5 (Unaudited)

The Division does not regularly stock all emergency vehicles parts. According to DFR, it stocks more than 4,000 line items of automotive parts; however, DFR does not stock certain emergency vehicle parts due to unpredictable demand and the associated inventory costs. Instead, DFR orders non-stocked parts from various suppliers when the need arises.

A master agreement for emergency vehicles parts increases the likelihood that the Division could order and receive parts more timely because obtaining price quotes from at least three suppliers would no longer be necessary. The AD 4-5 requires that the City shall obtain three price quotes for purchases between \$1,000 and \$50,000 when there is no master agreement.

## **Recommendation II**

We recommend the DFR Fire Chief works with the Director of BDPS to establish an efficient procurement method, such as a master agreement, to readily obtain emergency vehicles' parts.

Please see Appendix IV for management's response to the recommendation.

## Quality Control for Preventive Maintenance Services Are Not Consistently Performed and Checklists Are Not Retained

The Division's mechanic supervisors do not consistently perform and document quality control procedures for PM services by preparing, signing, and retaining Preventive Maintenance Checklists for heavy-duty emergency vehicles<sup>3</sup> and for Medical Intensive Care Units<sup>4</sup>. Specifically:

- 117 out of 181, or 65 percent, of the judgmentally sampled PM-A, PM-B, and PM-C completed services do not have the checklists filed with the emergency vehicles maintenance records
- 21 out of 53, or 40 percent, of the judgmentally sampled PM-B and PM-C completed service checklists do not have mechanic supervisors' signatures (Note: currently, PM-A service checklists do not require supervisors' signatures.)

Without consistently performing and documenting quality control procedures, the City's liability risk is increased because the Division cannot readily demonstrate: (1) emergency vehicles PM services were performed as recommended by NFPA and the manufacturers; and, (2) mechanic supervisors verified the PM services were properly performed before the emergency vehicles are released for service. In addition, because the PM services checklists are not consistently retained the City does not have complete maintenance records which should be available when the emergency vehicles are sold.

The PM-B service checklist item number 75 requires the supervisor to perform a final road test and quality control. Additionally, the PM-B and PM-C service checklists have a designated area for supervisor's signature.

The NFPA Standard 1911 Annex C.5 states all maintenance records should be delivered when fire emergency vehicles are sold.

### Recommendation III

We recommend the DFR Fire Chief ensures the Division mechanic supervisors consistently perform quality control procedures for all PM services by preparing, signing, and retaining the Division's checklists.

Please see Appendix IV for management's response to the recommendation.

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<sup>3</sup> PM-A and PM-B services

<sup>4</sup> PM-C services

## Fleet Focus M5 User Access Is Not Properly Segregated and Timely Updated

User access to the M5 software application is not properly segregated and timely updated when personnel changes occur. Without proper segregation of duties, the risk of errors and potential fraud is increased because one person can perform and review all transactions in the process. In addition, when user access is not timely updated, there is an increased risk that: (1) user access to the M5 software application is inappropriate; (2) emergency vehicles' parts may be misappropriated; and, (3) operational inefficiencies exist because valid users do not have appropriate access. Specifically:

### Segregation of Duties

Segregation of duties means dividing the responsibility for recording, authorizing, and approving inventory transactions, and handling inventory.

Proper segregation of duties is fundamental to mitigating fraud risks because it reduces the possibility of one person acting alone, including management override.

**Source:** *Standards for Internal Control in the Federal Government by the Comptroller General of the United States*

### ➤ Segregation of Duties

- The Division Manager, Fleet Section Manager, and Automotive Parts Warehouse Manager have the M5 software application MGMT role which grants full access rights to create and modify work orders, as well as assign parts to a work order. For example, the:
  - Fleet Section Manager is not responsible for managing parts; however, the MGMT role grants him access in the M5 software application to assign parts to a work order
  - Automotive Parts Warehouse Manager is not responsible for managing vehicle maintenance activity; however, the MGMT role grants him access in the M5 software application to create work orders

### ➤ User Access Updates

- As of March 2015, a former Fleet Section Manager's user account was not disabled although his separation from the Division was four years prior
- Four mechanics on the Division's organization chart do not have M5 software application user accounts

Managing user accounts is an essential part of maintaining a secure system. User accounts should be configured appropriately to ensure: (1) proper role assignment and segregation of duties; (2) unauthorized access is restricted; and, (3) permitted users have access privileges to the computer resources.

According to the *Standards for Internal Control in the Federal Government by the Comptroller General of the United States*, segregation of duties helps prevent fraud, waste, and abuse in the internal control system. Management considers the need to separate control activities related to authority, custody, and accounting of operations to achieve adequate segregation of duties. In particular, segregation of duties can address the risk of management override. Management override circumvents existing control activities and increases fraud risk.

## **Recommendation IV**

We recommend the DFR Fire Chief coordinates with the Director of EBS to:

- Segregate MGMT roles between the Fleet Section Manager and the Automotive Parts Warehouse Manager
- Disable M5 software application user accounts timely when personnel separate from the Division
- Review M5 software application user accounts periodically to ensure appropriate personnel have access to the system
- Establish M5 software application user accounts for the four mechanics currently without M5 access

Please see Appendix IV for management's response to the recommendation.

## SECTION II

### Mechanics' Staffing and Training Plans

#### The Division Does Not Have Mechanics' Staffing Plans to Meet Ongoing Operational Needs

The Division does not have mechanics' staffing plans to ensure an adequate number of qualified personnel are readily available to meet DFR's fleet maintenance needs. Specifically:

- According to DFR, more than 50 percent of the DFR pool of mechanics will be eligible for retirement in the next five to seven years. For example, the Body Shop is currently operating with two Body Repair Specialists including one who is eligible for retirement. As a result, if a significant number of retirement eligible mechanics were to leave the Division at the same time, the Division may not be able to effectively sustain the fleet maintenance operation.

#### Staffing Plans

Staff planning is a systematic process to ensure that an organization has the right number of people with the right skills to fulfill business needs. A staffing plan:

- Works to monitor and control the costs of human capital while creating an infrastructure to support effective decision-making in an organization. The plan uses relevant workload and outcome measures that can aid organizations in assessing current and future staffing needs.
- Helps organizations better plan for the future in identifying current and future staffing needs
- Assists organizations in identifying contingency plans, should a gap exist between desired staffing levels and available resources. Furthermore, an organization can better explain or defend its decisions to hire or reduce personnel based on the objective analysis and clear reasoning that a staffing plan offers.

Source: Society of Human Resource Management

- The number of DFR mechanics have not proportionately increased with the growth of the DFR fleet. Since FY 2010, the number of serviced emergency vehicles has increased from 418 to 498 (19 percent). During the same time period, the number of mechanics decreased from 30 to 27 (ten percent), and the average number of vehicles serviced per mechanic increased from 13.9 to 18.4, or 32 percent (see Table III on the following page). Therefore, there is an increased risk that the Division will not perform maintenance and repair services efficiently and effectively resulting in significant downtime for emergency vehicles as previously discussed in Section I on pages eight and nine.



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- Mechanics consistently worked significant overtime. For example, (1) the mechanics’ overtime paid as a percentage of salary were 28 percent for both FY 2012 and FY 2013; and, (2) the overtime percentage remained significant at 16 percent for FY 2014 although DFR added five more mechanics (See Table III below). Without performing optimal staffing analysis, DFR cannot ensure that staffing levels are managed efficiently.

**Table III**

**Serviced Emergency Vehicles’ Analysis  
FY 2010 through 2014**

	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Number of Mechanics <sup>1</sup>	30	26	27	22	27 <sup>2</sup>
Number of Serviced Vehicles	418	428	443	453	498
Average Number of Serviced Vehicles per Mechanic	13.9	16.5	16.4	20.6	18.4
Average Days to Complete a Work Order	11.7	12.5	13.1	12.9	13.4
Overtime Paid as a Percent of Salary <sup>3</sup>	11	14	28	28	16

**Notes:** <sup>1</sup> Each number represents the total number of mechanics who worked during the respective years and does not represent budgeted full time equivalent.

<sup>2</sup> This number includes one new hire who only worked nine hours in FY 2014.

<sup>3</sup> FY 2010 and FY 2011 overtime paid as a percent of salary were for the entire Division while FY 2012 through FY 2014 were for Equipment Maintenance Section only

**Source:** DFR Fleet Focus M5 (Unaudited)

According to the *Standards for Internal Control in the Federal Government by the Comptroller General of the United States*, management should consider how best to retain valuable employees, plan for their eventual departure and maintain the continuity of needed skills and abilities. In addition, according to Lean Six Sigma principles, staffing optimization involves balancing work volume (demand) with staffing (supply). A staffing plan is most needed when a business experiences: (1) customer complaints of slow service or response time; and, (2) increasing work volume, but has no budget for additional staff.

**Recommendation V**

We recommend the DFR Fire Chief develops mechanics’ staffing plans to reduce DFR’s fleet maintenance operational risks. These plans should include, but not be limited to, strategies to replace mechanics who retire or leave the City, anticipation of emergency vehicles’ maintenance needs, and an evaluation of the total cost of overtime versus the cost of hiring additional staff.

Please see Appendix IV for management’s response to the recommendation.

## Lack of Incentives and Compensation Structure Do Not Encourage Mechanics to Obtain Certifications

The lack of incentives and the DFR’s compensation structure do not encourage mechanics to obtain relevant certifications, such as the EVT certification. The 24 DFR mechanics and two body shop specialists have the same job grade and receive about the same salary even though some mechanics possess multiple EVT certifications and years of experience that range from two to over 25 years. Regardless of the years of experience, the average annual salary difference between the EVT certified mechanics and non-EVT certified mechanics is \$1,164, or 2.5 percent (see Table IV below).

### Facts about Emergency Vehicle Technicians

- The City does not require Emergency Vehicle Technician (EVT) certification, but it is a recommended certification for DFR mechanics.
- The following cities require EVT certification: Oklahoma City, Oklahoma; Santa Fe, New Mexico (for admin only); Tucson, Arizona; Kansas City, Missouri; Colorado Springs, Colorado; and, Denver, Colorado.
- Other cities such as Austin, Texas; El Paso, Texas; Albuquerque, New Mexico; and, Reno, Nevada recommend the EVT certifications.
- The EVT one time registration fee is \$20, the regular certification exam is \$50, and the re-certification exam is \$30.

**Source:** City of Albuquerque’s Office of Internal Audit and the City of Dallas’ Office of the City Auditor

Table IV

### Average Salary of DFR Mechanics FY 2013

Average Annual Salary	Non-EVT Certified Mechanics	EVT Certified Mechanics	Difference in Amount	Difference in Percentage
All mechanics	\$ 47,280	\$ 48,444	\$ 1,164	2.5

**Source:** INFOR Lawson Human Resources Information System

Without a competitive compensation structure, DFR may not attract and retain certified, experienced mechanics. For example:

- An experienced mechanic recently resigned from DFR to accept a position with another city in the Dallas-Fort Worth Metroplex that offered a higher salary
- A lead position in the engine shop as well as two mechanic positions in the truck shop and field support have been vacant for more than a year
- Average mechanics’ turnover rate for FY 2011 through FY 2014 was approximately 13 percent

Fire departments commonly require or recommend mechanics have the EVT certification. Although DFR encourages mechanics to obtain the EVT certification, the DFR does not: (1) offer the mechanics incentives, such as paid time off to take the EVT exam; or, (2) pay or reimburse for EVT exam fees and/or travel costs. Instead, DFR mechanics pay all costs associated with obtaining the EVT certification. As a result, few DFR mechanics are motivated to pursue the EVT certification. Specifically:

- Only seven of the 24, or 29 percent, of the DFR mechanics are EVT certified
- No mechanic is certified in the aerial fire emergency vehicles which are critical to reach fires in higher places

According to the Society of Human Resource Management, salary structures are an important component of effective compensation programs and help ensure that pay levels for groups of jobs are competitive externally and equitable internally. A well-designed salary structure allows management to reward performance and skills development while controlling overall base salary costs by providing a cap on the range paid for particular jobs or locations. In addition, according to the *Standards for Internal Control in the Federal Government by the Comptroller General of the United States*, management should consider providing incentives to motivate and reinforce expected levels of performance and desired conduct, including training and credentialing as appropriate.

## **Recommendation VI**

We recommend DFR Fire Chief:

- Creates incentives to encourage mechanics to obtain relevant certifications
- Implements a compensation structure with guidance from the City’s Department of Human Resources (HR) to ensure high-performing mechanics are rewarded for their performance, years of experience, and certifications

Please see Appendix IV for management’s response to the recommendation.

## **Lack of Formal Training Plans and Training Documentation**

The Division does not have formal training plans stipulating the types and frequency of training which should be received by all mechanics. In addition, the Division does not document the training subjects that mechanics received (although the training hours and individuals attending the training are recorded in the M5 software application). While mechanics received an annual average of 16 hours of training from FY 2010 through FY 2014 most training was informal on-the-job training.

The lack of formal training plans and training documentation increases the risk that mechanics will not maintain the skills necessary to perform maintenance and repair services efficiently and effectively.

According to the *Standards for Internal Control in the Federal Government by the Comptroller General of the United States*, personnel need to possess and maintain a level of competence that allows them to accomplish their assigned responsibilities. Management should enable individuals to develop competencies appropriate for key roles, reinforce standards of conduct, and tailor training based on the needs of the role.

## **Recommendation VII**

We recommend the DFR Fire Chief:

- Develops formal training plans for the Division with annual minimum mechanic training requirements
- Retains training records to verify each mechanic has completed the minimum training requirements

Please see Appendix IV for management's response to the recommendation.

## Appendix I

### Background, Objective, Scope and Methodology

#### Background

The Department of Dallas Fire-Rescue (DFR) Maintenance Division (Division) is part of the DFR Training and Support Services Bureau. The Division is responsible for providing Preventive Maintenance (PM) services and repairs for the emergency vehicles and equipment at the City of Dallas' (City) 57 fire stations which includes one fire station that is under renovation. The Division also provides DFR uniform clothing and supplies for the fire stations.

The Division is organized into the following four sections:

- **Fleet** – Responsible for all maintenance activities of the fleet, including fire emergency vehicles, ambulances, and firefighting tools and equipment. Approximately 4,000 work orders are completed each year for PM services, repair, and inspection services. This section occupies a maintenance facility with 18 bays, a body shop, a metal fabrication shop, and an emergency vehicles' wash station.
- **Automotive Parts** – Maintains a comprehensive inventory of parts, materials, and goods to sustain fleet maintenance.
- **Clothing and Supply** – Maintains environmental supplies, personal protective ensembles, and fire station supplies. This section also manages the emergency medical supplies and pharmaceuticals.
- **Station Support** – Staffed with electricians, carpenters, overhead door, and exhaust extraction repair personnel to ensure that the City's 57 fire stations are functional and operational.

#### Fleet Section

As of Fiscal Year (FY) 2014, the fleet section was staffed with one field support supervisor, two mechanic supervisors, and 24 mechanics as well as two automotive body repair specialists. The mechanics are assigned to one of the six maintenance shops as their primary working area. The six maintenance shops are as follows:

- **Engine Shop** – Has four service bays for fire engines. A total of 12 fire engines can be serviced at the same time.
- **Truck Shop** – Has three service bays for aerial trucks, hazardous materials trucks, communication command trucks, and airport rescue trucks. A total of six trucks can be serviced at the same time. The shop ceiling is 22 feet high which provides enough space for mechanics working on top of an aerial truck. The Truck Shop is also equipped with a five-ton crane to lift these heavy trucks.
- **Metal Fabrication Shop** – Is equipped to provide specialized services, such as bumper replacement, door replacements, or any metal repair work for emergency vehicles. This shop has metal sheet cutting machinery and industrial gas for welding.
- **Body Shop** – Has two service bays and one paint booth. The Body Shop specialists perform most of the body repairs, including structural damage. Currently, the specialists perform 100 percent of all repairs in-house if the vehicle/equipment is repairable. The paint booth can house large sized fire engines and heavy-duty trucks. The newly purchased DFR vehicles are also sent to the Body Shop to add safety features, such as a reflective-stripe and light-kit which identifies the DFR emergency vehicles.
- **Ambulance Shop** – Has the capacity of holding up to 14 ambulances at the same time. The ambulance usage is high and requires frequent maintenance. The mechanics' main responsibility is to ensure that routine PM services are performed and ambulances are repaired in a timely manner.
- **Small Engine Shop** – Is equipped to provide repairs for ancillary equipment carried on the fire trucks and also the small engine equipment stored at the fire stations for fire station's housekeeping, such as trimmers, blowers, and lawn mowers.

As of September 2014, DFR had a total of 532 emergency vehicles and equipment. The Division was responsible for the maintenance of 424 emergency vehicles and equipment. The remaining 108 administrative vehicles are serviced by the Department of Equipment Building Services (EBS). Of the 424 emergency vehicles and equipment, the auditor judgmentally selected 144 of the most critical emergency vehicles for testing. Table V on the following page shows the vehicles and equipment, number of units, and number of mechanics and supervisors as well as the number of Emergency Vehicle Technician (EVT) certified mechanics.

Table V

<b>DFR Maintenance Division Vehicles, Equipment, and Personnel</b>				
<b>Vehicles and Equipment</b>	<b>Units</b>	<b>Units Selected For Audit</b>	<b>Mechanics/ Supervisor</b>	<b>Number of EVT Mechanics</b>
Fire Engine and Booster Truck	65	60	5 / 0	1
Fire Engine - Reserve	14	0		
Aerial Truck	21	21	5 <sup>1</sup> / 1	0
Aerial Trunk - Reserve	7	0		
Rescue <sup>2</sup>	56	56	7 / 1	5
Aircraft Rescue and Fire Fighting (ARFF)	10	0	6 / 1	1
HazMat	7	4		
Urban	35	3		
Boat or Trailer	42	0		
Chief	27	0		
Emergency Medical Services (EMS) <sup>3</sup>	23	0		
Maintenance Shop	27	0		
Museum	10	0		
Training	16	0		
Miscellaneous	47	0		
Sold	17	0		
Others <sup>4</sup>	108	0		
<b>Totals</b>	<b>532</b>	<b>144</b>	<b>23 / 3</b>	<b>7</b>

Notes: <sup>1</sup> The number includes three mechanics and two body shop specialists.

<sup>2</sup> The DFR classifies ambulances under the Rescue category.

<sup>3</sup> The 23 EMS vehicles are mainly for EMS Shift Lieutenant use and community patient transport.

<sup>4</sup> 108 non-emergency vehicles serviced by EBS.

Source: DFR Maintenance Division

### **National Fire Protection Association Standards**

The National Fire Protection Association (NFPA) standards are the nationwide accepted standards for emergency response vehicles. The following four NFPA standards are directly related to the audit objective:

- 1071 – Standard for Emergency Vehicle Technician Professional Qualifications
- 1901 – Standard for Automotive Fire Apparatus

- 1911 – Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus
- 1917 – Standard for Automotive Ambulances

The 1071 Standard identifies and defines the minimum job performance requirements for a person to be considered qualified as an emergency vehicle technician. See Emergency Vehicle Technician Professional Qualifications section below for further details. The 1901, 1911 and 1917 Standards define the general requirements for each type of emergency vehicle and hardware standards, such as chassis, patient compartment, electrical system, and pump equipment.

### **Emergency Vehicle Technician Professional Qualifications**

The Emergency Vehicle Technician (EVT) certification is a commonly required or recommended certification by fire departments. The EVT Certification Program has four certification tracks: (1) fire emergency vehicles; (2) ambulance; (3) law enforcement; and, (4) Airport Rescue and Fire Fighting (ARFF) Vehicle technicians. Technicians have two EVT Certification options. Specifically:

- Option 1 – Certified in the specific test area(s) by taking only the EVT exams
- Option 2 – Attain the highest EVT Certification by combining EVT and Automotive Service Excellence exams to reach Level I, II and Master EVT Certification

Table VI on the following page shows the EVT certification tracks and the Division’s number of mechanics certified in specific area.



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**Table VI**

**EVT Certification Tracks**

<b>Level</b>	<b>EVT - Fire Emergency Vehicles Track</b>	<b>DFR Personnel EVT Certified</b>
Level I	F1 Apparatus Maintenance and Inspection	0
	F2 Design and Performance Standards and PM of Fire Apparatus	1
Level II	F3 Fire Pumps and Accessories	3
	F4 Fire Apparatus Electrical Systems	4
Master Level III	F5 Aerial Fire Apparatus (Required 32 hours of training)	1
	F6 Allison Automatic Transmissions	0
<b>Level</b>	<b>EVT - Ambulance Track</b>	
Level I	E0 Maintenance, Inspection, and Testing of Ambulances	0
	E1 Design and Performance Standards and PM of Ambulances	5
Level II	E2 Ambulance Electrical Systems	3
	E3 Ambulance Heating, Air Conditioning, and Ventilation	0
Master Level III	E4 Ambulance Cab, Chassis, and Body	0
	E5 Ambulance Inspection and Maintenance	0

Source: EVT Certification Commission, Inc. [http://www.evtcc.org/certification\\_track.htm](http://www.evtcc.org/certification_track.htm)

**DFR Maintenance and Supply Budget**

Table VII below shows the FY 2014 Adopted Annual Budget for the Division.

**Table VII**

**DFR Maintenance Division  
FY 2014 Adopted Annual Budget**

<b>Object Code</b>	<b>Description</b>	<b>Budget</b>
1000s	Salaries and Benefits	\$ 3,674,398
3000s	Food, Laundry, Support	1,774,509
2120	Minor Tools	302,915
2181	Fuel & Lube	240,000
2741	Vehicle Parts	219,803
2185	Tires & Tubes	205,017
	Others	424,767
<b>Totals</b>		<b>\$ 6,841,409</b>

Source: Office of Financial Services’ FY 2014 Adopted Annual Budget (Unaudited)

### **DFR Fleet Management Software Application**

Fleet Focus M5 (M5) is a City-wide fleet management software application developed by AssetWorks. The M5 software application supports operating activities related to the PM services and repairs for emergency vehicles including: (1) work orders; (2) repair processing; (3) expenses; and, (4) tracking emergency equipment usage. The M5 software application also provides various standard reports, such as a work order report and a labor report that are useful for monitoring these operating activities. The M5 software application allows City department personnel to access a web-based M5 software application to update fleet related data remotely.

In addition to DFR, M5 software application is used by other City departments including EBS, the Dallas Police Department, and the Department of Sanitation Services. The City has used M5 software application since September 2006.

### **Objective, Scope and Methodology**

This audit was conducted under authority of the City Charter, Chapter IX, Section 3 and in accordance with the FY 2014 Audit Plan approved by the City Council. The audit objective was to evaluate the efficiency and / or effectiveness of selected aspects of DFR’s fleet maintenance management. The scope of the audit included management operations from October 1, 2009 to September 30, 2014; however, certain other matters, procedures, and transactions outside of that period were reviewed to understand and verify information during the audit period. This performance audit was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

To achieve the audit objective, we performed the following procedures:

- Reviewed the DFR organization chart and budget information
- Interviewed the Division personnel
- Conducted walk-through meetings and observed PM services at the maintenance shops
- Reviewed the PM services work order cycle and Automotive Parts Warehouse work procedures

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- Compared manufacturers' recommended PM services items to the Division's Preventive Maintenance Checklists for heavy-duty emergency vehicles and for Medical Intensive Care Units
- Analyzed the 1,267 M5 preventive maintenance records for the selected 144 emergency vehicles
- Calculated the average number of days to complete the PM-A, PM-B, and PM-C services
- Reviewed the quality control process for the PM services
- Determined if the PM Service checklists were completed by mechanics and reviewed by supervisors
- Analyzed the FY 2010 through FY 2014 mechanics' labor hours, including working hours, overtime, and staffing levels
- Compared DFR mechanics' salaries to other cities' mechanics salaries
- Reviewed the Division's training hours data and EVT certification
- Identified the impact of staffing levels on fleet maintenance
- Conducted a survey of 56 DFR fire station captains
- Reviewed Administrative Directive 4-5, *Contracting Policy*, effective April 10, 2013 and the *Standards for Internal Control in the Federal Government by the Comptroller General of the United States*

## Appendix II

### Dallas Fire-Rescue Fleet Preventive Maintenance Survey

As part of the *Audit of the Department of Dallas Fire-Rescue's Fleet Maintenance Management*, the Office of the City Auditor (Office) conducted a survey of 56<sup>5</sup> Dallas Fire-Rescue (DFR) fire stations' captains to obtain their feedback regarding the DFR Maintenance Division's (Division) performance in the following areas:

- Overall performance
- Condition of the fleet
- Preventive maintenance (PM) services scheduling process
- Timeliness of the PM services

With the deputy chiefs' assistance, all 56 fire station captains responded to the survey. The survey results showed the captains are:

- Generally satisfied with the condition of the fleet and the work performed by the mechanics especially the field support and ambulance services. These two services show a better satisfaction level than the engine and truck maintenance services. The field support service carries parts on the service trucks and provides on-the-spot maintenance and repair services. The ambulance maintenance service uses mostly Ford parts obtained through a master agreement with a Ford dealership. Because of the master agreement with the vendor, the ambulance maintenance service can obtain parts more quickly than parts obtained for engine or truck maintenance services.
- Overall customer satisfaction is rated 3.6 on a scale of 5, which is between the neutral (rating of 3) and somewhat satisfied (rating of 4). The major causes of dissatisfaction are: (a) the lack of formal PM scheduling, (b) parts unavailability, (c) mechanic shortage, (d) the poor condition of certain reserve vehicles; and, (e) the lack of communication between the Division and the fire stations when scheduling the PM services.
- Most captains stated the Division is responsible for PM services scheduling. Some captains, however, use a watch book or log book to keep track of PM services. The PM service tracking method is not consistent for all fire stations.

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<sup>5</sup> Fire station # 27 is under renovation. As a result, 56 fire stations' captains participated in the survey.

- More than half of the captains did not know what PM services were actually performed on their emergency vehicles because the Division does not provide any paperwork when emergency vehicles receive PM services. Most captains surveyed would prefer to receive a copy of the work order at the completion of the PM services.
- The captains are not satisfied with the timeliness of the fleet PM services. Specifically:
  - Scheduling process (rated 3.1)
  - Timeliness (rated 3.1)
  - Parts availability (rated 2.4) – appears to be the major issue
  - Downtime is not reasonable (47 percent)

## Appendix III

### Major Contributors to This Report

Lee Chiang, CIA – Project Manager

Thandee Kywe, CPA, CFE, CGFM, CLEA – Audit Manager

Carol Smith, CPA, CIA, CFE, CFF – First Assistant City Auditor

Theresa Hampden, CPA – Quality Control Manager

## Management's Response

### Memorandum

RECEIVED

NOV 23 2015

City Auditor's  
Office



**DATE:** November 23, 2015  
**TO:** Craig D. Kinton, City Auditor  
**SUBJECT:** Response to Audit Report:  
Audit of Department of Dallas Fire Rescue's Fleet Maintenance Management

Our responses to the audit report recommendations are as follows:

#### Recommendation I

We recommend the DFR Fire Chief ensures PM services are performed timely and in accordance with the NFPA's and the manufacturers' recommended schedules for all DFR emergency vehicles by:

- Using an automated PM scheduling process, such as the functionality available in M5, to create and track PM schedules for all DFR emergency vehicles
- Creating reports to periodically evaluate when PM services are due so the PM services can be scheduled and fire station personnel are notified
- Placing a sticker on emergency vehicles' windshields so fire station personnel can also monitor when the next PM services are due

#### **Management Response / Corrective Action Plan**

Agree  Disagree

DFR will work with the Director of EBS to ensure that all applicable functions available from Asset Works M5 system are available to DFR, and those available functions are implemented and utilized.

Stickers will be purchased and utilized.

#### **Implementation Date**

June 2016

#### **Responsible Manager**

J.D. Travis

**Recommendation II**

We recommend the DFR Fire Chief works with the Director of BDPS to establish an efficient procurement method, such as a master agreement, to readily obtain emergency vehicles parts.

**Management Response / Corrective Action Plan**

Agree  Disagree

DFR will work with the Director of BDPS to explore and establish more efficient procurement methods to include further expanding the use of Master Agreements, P-Cards and Emergency Requisition's.

**Implementation Date**

April 2016

**Responsible Manager**

J.D. Travis

**Recommendation III**

We recommend the DFR Fire Chief ensures the Division mechanic supervisors consistently perform quality control procedures for all PM services by preparing, signing, and retaining the Division's checklists.

**Management Response / Corrective Action Plan**

Agree  Disagree

Mechanic supervisors will consistently perform quality control inspections. Check lists will be signed off by supervisors and retained.

**Implementation Date**

December 2015

**Responsible Manager**

J.D. Travis

**Recommendation IV**

We recommend the DFR Fire Chief coordinates with the Director of EBS to:

- Segregate MGMT roles between the Fleet Section Manager and the Automotive Parts Warehouse Manager
- Disable M5 user accounts timely when personnel separate from the Division

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- Review M5 user accounts periodically to ensure appropriate personnel have access to the system
- Establish M5 software application user accounts for the four mechanics currently without M5 access

**Management Response / Corrective Action Plan**

Agree  Disagree

DFR will ensure that MGMT roles are segregated between the Fleet Section Manager and the Automotive Parts Warehouse Manager.

DFR will work with the Director of EBS to ensure that all applicable functions available from Asset Works M5 system are available to DFR, and those available functions are implemented and utilized. Follow-up processes will be implemented to ensure personnel that separate from the division are removed from the system.

User accounts will be established. New employee accounts will be established as soon as email accounts are provided.

**Implementation Date**  
December 2015

**Responsible Manager**  
J.D. Travis

**Recommendation V**

We recommend the DFR Fire Chief develops mechanics' staffing plans to reduce DFR's fleet maintenance operational risks. These plans should include, but not be limited to, strategies to replace mechanics who retire or leave the City, anticipation of emergency vehicles maintenance needs, and an evaluation of the total cost of overtime versus the cost of hiring additional staff.

**Management Response / Corrective Action Plan**

Agree  Disagree

DFR will develop a staffing plan to ensure mechanics vacancies are filled in an expedient manner.

DFR Fire Chief will annually review and evaluate staffing needs and impacts to the fleet operation. Budgetary submissions will be submitted to offset any impacts to the fleet operation.

**Implementation Date**  
October 2016

**Responsible Manager**  
J.D. Travis

**Recommendation VI**

We recommend DFR Fire Chief:

- Creates incentives to encourage mechanics to obtain relevant certifications
- Implements a compensation structure with guidance from the City's Department of Human Resources (HR) to ensure high-performing mechanics are rewarded for their performance, years of experience, and certifications

**Management Response / Corrective Action Plan**

Agree  Disagree

DFR will research and seek incentives to encourage mechanic EVT certifications.

DFR will work with the Directors of Human Resources and Civil Service to develop compensation structure plan and classifications for EVT certified mechanics.

DFR will work with the Director of OFS to seek sustained funding.

**Implementation Date**  
October 2016

**Responsible Manager**  
Wanda Moreland/J.D. Travis

**Recommendation VII**

We recommend the DFR Fire Chief:

- Develops formal training plans for the Division with annual minimum mechanic training requirements
- Retains training records to verify each mechanic has completed the minimum training requirements

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Department of Dallas Fire-Rescue's Fleet Maintenance Management**

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**Management Response / Corrective Action Plan**

Agree       Disagree

DFR will develop regularly scheduled training courses, identify minimum requirements for mechanics, as well as develop and maintain training records for each mechanic.

DFR will seek additional budgetary funding to support formalized training.

**Implementation Date**

October 2016

**Responsible Manager**

J.D. Travis

Sincerely,

  
\_\_\_\_\_  
Chief Louie Bright, III  
Department of Dallas Fire Rescue

  
\_\_\_\_\_  
Eric D. Campbell  
Assistant City Manager