

AUDIT OF FIRE VEHICLE MAINTENANCE

**Report by the
Office of County Comptroller**

**Martha O. Haynie, CPA
County Comptroller**

County Audit Division

J. Carl Smith, CPA
Director

Christopher J. Dawkins, CPA
Deputy Director

Scott H. Dezort, CPA
Audit Supervisor

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June 1, 2001

Richard T. Crotty, County Chairman
And
Board of County Commissioners

We have conducted an audit of the Vehicle Maintenance Unit of the Orange County Fire Rescue Division. The audit was limited to determining if the acquisition, use and maintenance of the emergency truck fleet meets County regulations and generally accepted fire industry guidelines. The period audited was October 1, 1998 through February 29, 2000. Our audit was conducted in accordance with generally accepted government auditing standards and included such tests as we considered necessary in the circumstances.

Responses to our Recommendations for Improvement were received from the Fire Chief and are incorporated herein.

We appreciate the cooperation of the personnel of the Fire Rescue Division during the course of the audit.

Martha O. Haynie, CPA
County Comptroller

c: Ajit Lalchandani, County Administrator
Tom Hurlburt, Director of Public Safety
Carl Plaughter, Fire Chief, Fire Rescue Division

EXECUTIVE SUMMARY

Executive Summary

The Fire Rescue Division (Division) protects the public health and safety of Orange County citizens by providing fire prevention and emergency services. The Vehicle Maintenance Unit (VMU), with a budget over \$4 million, is responsible for the purchase and replacement of vehicles (tankers, pumpers, aerial and brush trucks, specialty units), vehicle equipment record keeping, and preventive maintenance and repairs. The audit objectives were to ensure the fleet's longevity meets standards and is adequately maintained. We also tested truck purchases for compliance with County purchasing policy and procedures and generally accepted business practices and generally accepted fire industry guidelines. VMU's vehicle records were also compared to the Comptroller Property Accounting Department's vehicle records. The period audited was October 1, 1998 through February 29, 2000.

Overall, we found the use and maintenance of the Division's emergency truck fleet generally met County regulations and fire industry guidelines. However, vehicles were not timely replaced when they exceeded age and use standards.

In our audit, we determined that thirty-five percent (37 of 107) of the Division's emergency truck fleet on August 31, 2000 exceeded life cycle benchmarks established by the entity. As a truck ages, the potential of mechanical breakdowns tends to increase. Further, the number of emergency calls processed by the Division increased over 40 percent from 1995 through 1999. The tenure of the fleet was, based on information from the Division, due to the Division not purchasing a new emergency fire vehicle for five consecutive years prior to the late 1990's. We recommended the County enhance its efforts to replace emergency vehicles that have exceeded life cycle benchmarks. The Division responded that, since the audit, nine new fire engines and six new rescue units were purchased while six engines and rescues each were ordered and are awaiting delivery.

Based on our inspection of eight fire stations where we found that inspections are not consistently performed and employees were uncertain how to document the inspection, we recommended the Division ensure that all employees are aware that daily inspections of emergency vehicles are required. In addition, inspection checklists should be retained in accordance with the Division's record retention policy. The Division also needs to implement a uniform procedure for documenting vehicle inspections and to ensure the content of vehicle inspections is consistent with the makeup of newer emergency vehicles and within the scope of employees' mechanical aptitude. The Division concurred with the recommendations and responded that, since the audit, they have enforced compliance with daily inspection requirements.

One additional recommendation was to reinstate the former warehouseman position to segregate parts inventory physical possession from record keeping. The Division advised the position was requested for the upcoming budget year.

ACTION PLAN

Audit of Fire Vehicle Maintenance
Action Plan

NO.	MANAGEMENT RESPONSE			IMPLEMENTATION STATUS		RECOMMENDATIONS
	CONCUR	PARTIALLY CONCUR	DO NOT CONCUR	UNDERWAY	PLANNED	
1.	X			X		We recommend the County enhances its efforts to replace emergency vehicles that have exceeded life cycle benchmarks.
2.						We recommend the Division perform the following:
A)	X			X		Ensure that all employees are aware that daily inspections of emergency vehicles are required. In addition, the checklists should be retained in accordance with the Division's record retention policy.
B)	X			X		Implement a uniform procedure for documenting vehicle inspections.
C)	X			X		Ensure the content of vehicle inspections is consistent with the makeup of newer emergency vehicles and within the scope of employees' mechanical aptitude.
3.	X				X	We recommend consideration be given to reinstating the warehouseman position.

INTRODUCTION

Background

The Fire Rescue Division (Division) protects the public health and safety of Orange County citizens by providing fire prevention and emergency services. The Division has a fiscal year 2001 budget of almost \$83,000,000 and had a fiscal year 2000 budget of \$78,000,000, with 889 and 862 authorized positions, respectively. The Vehicle Maintenance Unit, with 2001 appropriations of \$4,149,000, is responsible for the purchase and replacement of vehicles, vehicle equipment record keeping, and preventive maintenance and repairs. Vehicles serviced include tankers, pumpers, aerial trucks, brush trucks, and specialty units. During calendar year 1999 the unit's ten employees processed approximately 2,500 work orders and performed preventive maintenance on 185 units.

**Scope, Objectives,
and Methodology**

The audit was limited to determining if the acquisition, use and maintenance of the Division's emergency truck fleet meets County regulations and generally accepted fire industry guidelines. The period audited was October 1, 1998 through February 29, 2000. The audit objectives were as follows:

- A) To ensure the longevity of the emergency truck fleet is fiscally efficient and consistent with generally accepted fire industry guidelines.
- B) To ensure the emergency truck fleet is adequately and consistently maintained according to Division policy and generally accepted fire industry guidelines.
- C) To verify the Vehicle Maintenance Unit addressed repairs and service requests timely and effectively.
- D) To ensure that emergency truck purchases were made in accordance with County purchasing policy and procedures, generally accepted business practices and generally accepted fire industry guidelines.

- E) To ensure the Vehicle Maintenance Unit's vehicle records are consistent with the Comptroller Property Accounting Department's vehicle records.

To ensure the longevity of the emergency truck fleet is fiscally efficient and consistent with generally accepted fire industry guidelines we determined the quantity in years, number of miles used and amount of repair costs incurred to date for each vehicle. We then compared the data to lifecycle standards recommended by the National Fire Protection Association (NFPA), the American Public Works Association (APWA) and the Orange County Vehicle Requirements and Utilization Committee (VRUC). The number of vehicles having age, use and cost characteristics exceeding the NFPA's, APWA's and VRUC's benchmarks were determined. We also contacted other comparably sized fire departments and obtained information about life cycle requirements and limitations.

To ensure the emergency truck fleet is adequately and consistently maintained according to Division policy and generally accepted fire industry guidelines we selected a sample of vehicles and ensured that a record existed of preventive maintenance being performed at least once every six months. Further, we ensured that an annual pump test was performed on a sample of pumper trucks and an annual load test was performed on a sample of aerial trucks. We also contacted other fire departments and obtained information about preventive maintenance scheduling and procedures. The results obtained were compared to Orange County's preventive maintenance program.

To verify the Vehicle Maintenance Unit addressed repairs and service requests timely and effectively, we reviewed a sample of apparatus and station log books for documented maintenance needs. We traced each recorded need to a unit work order.

To ensure that emergency truck purchases were made in accordance with County purchasing policy and procedures, generally accepted business practices and generally accepted fire industry guidelines, we reviewed the Request

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For Proposal (RFP) initiating each purchase and ensured that the truck specifications requested were reasonable and in accordance with NFPA standards. We verified that the RFP was adequately announced to the public and examined the RFP evaluation matrix to ensure the highest rated vendor was chosen.

To ensure the Vehicle Maintenance Unit's vehicle records are consistent with the Comptroller Property Accounting Department's vehicle records, we compared tangible property lists from each for completeness and accuracy.

Overall Evaluation

Based on the audit work performed, we found the use and maintenance of the Division's emergency truck fleet generally met County regulations and fire industry guidelines. However, vehicles were not timely replaced when they exceeded age and use standards. Opportunities for improvement were noted and are described herein.

RECOMMENDATIONS FOR IMPROVEMENT

**RECOMMENDATIONS
FOR IMPROVEMENT**



1. The County Should Enhance its Efforts to Replace Emergency Vehicles That Have Exceeded Life Cycle Benchmarks

Thirty-five percent (37 of 107) of the Division’s emergency truck fleet on August 31, 2000, exceeded life cycle benchmarks established by the entity. The benchmarks of mileage, age and aggregate repair cost as a percentage of current replacement value vary according to the type of apparatus as identified in the table below.

TYPE OF VEHICLE	MILEAGE	AGE (YEARS)	REPAIR COST
Aerials	125,000	15	80%
Pumpers (Engines)	125,000	10	80%
Rescue Units	100,000 (Standard Size)	8 (Standard Size)	80%
	150,000 (Mid Size)	10 (Mid Size)	80%
Tankers	100,000	15	80%
Woods	100,000	15	80%

County Audit surveyed a sample of other fire departments and found the Orange County standards were consistent with other counties and cities across the country. Moreover, they were in line with life cycle recommendations made by the NFPA and Fire Engineering, two nationally acclaimed fire research agencies.

The number of trucks exceeding at least one benchmark and the percentage of the exceptions to the population of each vehicle type within the fleet is summarized in the following table.

VEHICLE TYPE	NUMBER OF VEHICLES IN FLEET	TOTAL VEHICLES OVER AT LEAST ONE BENCHMARK	PERCENTAGE OF EXCEPTIONS TO VEHICLE TYPE POPULATION
Pumpers	48	23	48%
Rescue Units	38	9	24%
Tankers	7	5	71%

RECOMMENDATIONS FOR IMPROVEMENT

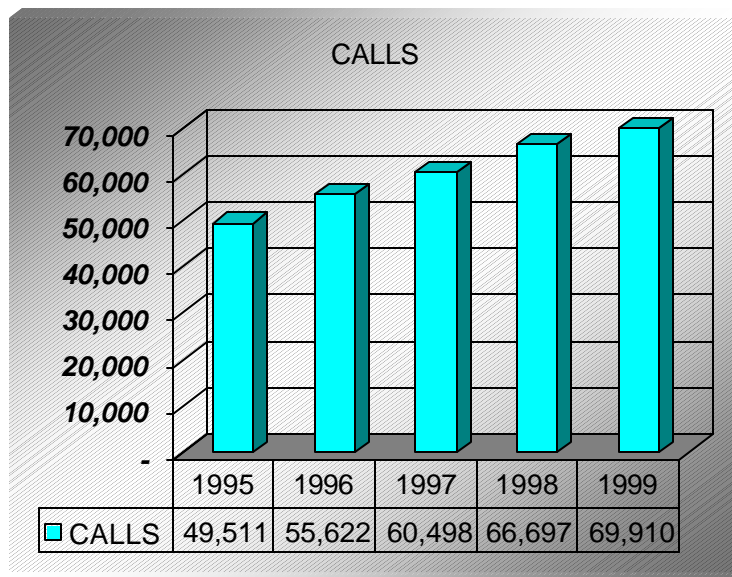


Thirty vehicles exceeded the mileage and age benchmarks while ten exceeded the repair cost standard. None of the division's five aerial trucks or nine woods trucks exceeded any of the life cycle limitations.

The average number of years over the age benchmark ranged from three years for rescue units to five years for pumpers. The average number of miles over the mileage benchmark ranged from over 6,000 miles for tankers to almost 36,000 miles for rescue units.

Based on information from the Division, prior to the late 1990's, the Division did not purchase a new emergency fire vehicle for five consecutive years.

As a device ages, the potential of mechanical breakdowns tends to increase. Further, the number of emergency calls processed by the Division has increased significantly. During the period 1995 through 1999 the number of calls increased by 20,399, from 49,511 to 69,910 (41 percent).



We Recommend the County enhances its efforts to replace emergency vehicles that have exceeded life cycle benchmarks.

Management's Response:

Concur. Since the audit, we have purchased 9 new fire engines, and 6 new rescue units. We currently have ordered, and are awaiting delivery of, 6 new engines and 6 new rescues. This will put us well within the established replacement guidelines.

2. Efforts to Perform Emergency Vehicle Inspections Should be Improved

Division operating procedures require a daily and more comprehensive weekly inspection of all emergency vehicles. A checklist documenting the inspections performed is prepared and kept on file at each fire station for one year.

During surprise visits to eight fire stations to ensure that daily/weekly inspections were performed, we noted the following:

- A) Inspections at all stations are not consistently performed. Personnel at one station admitted that inspections had not been completed for the past three months. Checklists located by County Audit at other stations indicated that inspections were not performed daily.
- B) Personnel are uncertain how to document vehicle inspections. While checklists and alternately rubber stamps on hardcopy daily station logs are still used at some stations, current policy is to signify that the procedure has been performed via an entry to an online daily log.
- C) The checklists are not applicable to the newer more sophisticated emergency vehicles. Mechanical characteristics appear on the checklists that according to station personnel, are not on the newer rescue vehicles. Also, some employees question whether they should be responsible for determining

RECOMMENDATIONS FOR IMPROVEMENT



the operational capacity of a vehicle as they are not mechanics.

If vehicle inspections are not consistently performed, the potential exists that undetected minor repair needs could develop into more extensive and costly repairs. Also, since the method to record inspections is not uniform, management cannot be assured that inspections are complete or the items checked are consistent among the stations.

We Recommend the Division perform the following:

- A) Ensure that all employees are aware that daily inspections of emergency vehicles are required. In addition, the checklists should be retained in accordance with the Division's record retention policy.
- B) Implement a uniform procedure for documenting vehicle inspections.
- C) Ensure the content of vehicle inspections is consistent with the makeup of newer emergency vehicles and within the scope of employees' mechanical aptitude.

Management's Response:

Concur. Since the audit, we have enforced compliance with the daily field inspections of our emergency vehicle apparatus, along with associated documentation. Managerial oversight has been assigned to ensure completion.

3. Consideration Should be Given to Reinstating the Warehouseman Position

During our survey of the maintenance section's internal controls over inventory, we noted the following areas of concern:

RECOMMENDATIONS FOR IMPROVEMENT



- A) The Purchasing and Inventory Coordinator orders, receives and records the use of replacement/repair parts. The duties of personnel having physical possession of inventory should be separate from the responsibilities of personnel that maintain records documenting the purchase and use of inventory.

- B) The mechanics (Fire Apparatus Techs) remove parts from the inventory. They record the items used on a hard copy work order that is discarded after the repair is closed out online. An employee should be assigned the duty of dispensing inventory as needed to the technicians.

A good internal control in safeguarding assets is to separate physical possession and record keeping functions. Also, access to an asset should be restricted as much as possible.

We learned that, during the 1994-95 fiscal year, five positions within the maintenance unit were eliminated. One of those positions was the warehouseman. The warehouseman received, stocked, and dispensed inventory.

During the audit period, the Division expended approximately \$750,000 for repair and replacement parts.

We Recommend consideration be given to reinstating the warehouseman position.

Management's Response:

Concur. As part of our upcoming budget for FY 2001 – 2002, we have requested an additional Supply Clerk position for the Fleet Maintenance Bureau. This will provide a check and balance system between the ordering and receiving of parts.