

# Fire and Rescue Department

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LOB #228:

## **APPARATUS**

### **Purpose**

The Apparatus Section is responsible for apparatus, acquisition, repair, maintenance, research and overall administrative oversight of the agency's 520 plus vehicles. The department operates two maintenance and repair facilities – West Ox Facility (North Apparatus) and Newington Facility (South Apparatus) where routine and emergency repairs are performed. This section coordinates and facilitates apparatus repairs for the 12 volunteer fire companies, repairs breathing air compressors and coordinates accident vehicle claims.

### **Description**

The Apparatus Captain II, assisted by a Lieutenant, Vehicle Coordinator and Administrative Assistant III manage the day-to day duties and long-term initiatives of the Apparatus Section to ensure the men and women of the Fire and Rescue Department have the required equipment and apparatus to effectively fulfill their emergency response mission.

This section has managerial oversight of the West Ox (North and Newington (South Apparatus) repair and maintenance facilities. Each facility is over 19,000 square feet and configured to house four repair bays, eight storage bays, several heavy duty vehicles lifts and an automotive parts storage area. West Ox (North Apparatus) facility serves as the reserve apparatus hub ensuring there is an adequate fleet of emergency response apparatus in a constant state of operational readiness to be placed in service when a frontline unit is out of commission for repairs or routine maintenance. Newington (South Apparatus) incorporates a pump test facility to certify fire apparatus with water pumping capability of 250 gallons per minute (GPM) or larger capacity to meet National Fire Protection Association (NFPA) 1901 Class A Pump rating test and Insurance Services Office (ISO) requirements for annual pump or service tests. Each facility is staffed by a Facility Supervisor, five Apparatus Mechanics, one Parts Specialist, and one Reserve Apparatus Coordinator.

It should be noted that the County's Department of Vehicle Services (DVS) is responsible for vehicle-related maintenance (engine, transmission, brakes, steering, tires, windshields, sirens, etc.), and the FRD Apparatus section is responsible for the equipment on that specific vehicle to function properly for the incident (ladders, pumps, oxygen machines, and all specialized equipment such as saws and axes). A large component of the section's responsibility is to accurately track and coordinate this work and consistently inspect the department's fleet, ensuring each vehicle remains reliable and safe at all times. Given FRD operates 24/7/365, this task is highly complicated, requiring coordination with fire station personnel, DVS, Risk Management, vendors, and the County's Radio Shop. To ensure emergency repairs are facilitated immediately, on-call personnel are on duty 24 hours per day supplying reserve vehicles or coordinating emergency repairs so the department remains operationally ready to respond to the community's emergency and non-emergency needs.

To enhance the delivery of emergency services, the section performs research on emerging trends and products as well as keeping abreast of new laws, safety recommendations and requirements regarding emergency response apparatus. Specifications for replacement apparatus are constantly reviewed, modified and developed to ensure new vehicles are the safest, most efficient and meet the needs of the response environment at the best possible price.

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## Benefits

This LOB benefits the community and the department as it ensures apparatus is in prime condition to protect the safety of responders and the community, ensures existing apparatus meets all current safety standards, is in peak mechanical condition, new apparatus specifications meet the needs of the response environment, and are acquired at the best possible price.

Through detailed and methodical data collection and analysis, the Apparatus Section can determine the costs to operate apparatus, utilize information collected in the development and update of specifications for replacement apparatus, ensure existing vehicles are operationally ready and new vehicles purchased are of the highest quality. Data such as out of service time, mileage, fuel usage, repair logs, parts and repair costs are all tracked. The analysis of this data allows the Apparatus Section to develop estimates on costs of operating vehicles, detect patterns of failures indicating mechanical defects and to determine if reoccurring malfunctions warrant early removal from service due to exorbitant repair costs or safety reasons. By monitoring work orders the Apparatus staff is able to efficiently manage workloads by distributing jobs evenly between the two maintenance facilities to expedite repairs.

By performing repairs in-house the department uses County's funds responsibly. If repairs were outsourced, estimates indicate costs could double or triple. Furthermore, managing work in-house allows FRD to minimize delays in emergency response vehicles returning to service. Specialized FRD apparatus mechanics perform and closely supervise all repairs on department apparatus ensuring repairs and maintenance meet the FRD's high quality standards. FRD would be unable to manage workflow or guarantee timely remediation of malfunctions if such functions were outsourced.

Performing preventive maintenance not only helps extend service life but also ensures apparatus is in peak working order, thus maintaining a safe working environment for personnel and providing equipment ready to respond to emergencies when needed. Certain tests and certifications, in particular, annual fire apparatus water pump testing is an important component in how the County's safety is measured. Each year pumps must be certified that they meet NFPA standard 1901 Class A Pump rating test and ISO requirements for annual pump and/or service test. ISO is an independent company that provides risk assessment services. ISO's Fire Suppression Rating Schedule (FSRS), which includes standards set by the NFPA, evaluates four primary categories of fire suppression - fire department, emergency communications, water supply, and community risk reduction to rate how effectively communities are prepared to fight fire. ISO has given Fairfax County a Public Protection Classification (PPC) of O1/1Y, the highest rating in the Commonwealth of Virginia. The annual testing and certification of pumps is integral to maintaining the County's excellent rating and may be beneficial in allowing the insurance industry to set more favorable rates for Fairfax County residents insuring property.

Apparatus staff maintain a leadership role in local, regional and national efforts to develop innovative technologies and equipment to improve emergency service delivery. In depth analysis of collected data, extensive hands on experience, collaboration with industry leaders, research of best practices, evaluation of new technology, and excellent maintenance and repair services are essential to ensuring FRD has the emergency apparatus to perform their duties, and protect the lives and property of the community.

## Mandates

- Virginia State Laws and Codes
- National Institute for Occupational Safety and Health (NIOSH)
- Environmental Protection Agency standards
- NFPA 1901(Class A Pump Rating Test) - Engines and Tankers
- Insurance Service Office, Inc., Fire Suppression Rating Schedule (FSRS) and evaluation
- GSA purchasing specifications (Triple K)

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## Trends and Challenges

Fire apparatus is the most expensive single item purchased by the FRD and the price of apparatus continues to rise dramatically as a result of increasing emissions standards, safety regulations and material costs.

In an effort to minimize the impact of rising costs, the FRD has identified multiple strategies including eliminating several nonessential items from fire apparatus, reevaluating operational needs when replacing vehicles to result in savings, as well as extending lifecycles of some vehicles from 12 to 14 years. However, savings as a result of these initiatives have not been substantial enough to offset the rate of increase placing a strain on the vehicle replacement reserves.

Further compounding diminishing apparatus reserve funding is the volunteer fire departments inability to continue to fund many of the department's front line vehicles. Of the 106 front-line vehicles career FRD staff operates daily for emergency response 35 are owned by volunteer companies. These vehicles are not additional or extras, they are operated 24-hours a day/7 days a week with career personnel as part of the minimum staffing calculation. Without these vehicles, FRD does not have the apparatus available to provide the current level of emergency response coverage throughout the County resulting in FRD purchasing apparatus traditionally funding by volunteer fire departments.

Without additional funding, vehicle replacement reserves will be depleted in the next several years limiting the ability to replace fire apparatus.

## Resources

Category	FY 2014 Actual	FY 2015 Actual	FY 2016 Adopted
<b>LOB #228: Apparatus</b>			
<b>FUNDING</b>			
<u>Expenditures:</u>			
Compensation	\$1,341,952	\$1,403,794	\$1,499,529
Operating Expenses	1,069,976	871,036	715,834
Capital Equipment	66,158	91,781	42,000
<b>Total Expenditures</b>	<b>\$2,478,086</b>	<b>\$2,366,611</b>	<b>\$2,257,363</b>
General Fund Revenue	\$0	\$0	\$0
<b>Net Cost/(Savings) to General Fund</b>	<b>\$2,478,086</b>	<b>\$2,366,611</b>	<b>\$2,257,363</b>
<b>POSITIONS</b>			
Authorized Positions/Full-Time Equivalents (FTEs)			
<u>Positions:</u>			
Regular	17 / 17	17 / 17	17 / 17
<b>Total Positions</b>	<b>17 / 17</b>	<b>17 / 17</b>	<b>17 / 17</b>

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## Metrics

Metric Indicator	FY 2013 Actual	FY 2014 Actual	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
North Apparatus Work Orders	240	353	314	320	326
South Apparatus Work Orders	369	940	920	938	957
New Apparatus	8	11	8	8	9
Number of engines and tankers Pump Tested	19	49	47	50	50

As noted earlier, the County's Department of Vehicle Services (DVS) is responsible for vehicle-related maintenance that gets the fire apparatus from point A to point B to fight the fire and the FRD Apparatus section is responsible for the equipment on that specific vehicle to function properly for the incident (ladders, pumps, oxygen machines, and all specialized equipment such as saws and axes). The Fire and Rescue department operates two apparatus repair facilities. Mechanics at each of the repair facilities maintain specialized certifications to provide maintenance and repair services to the specialized fire apparatus. Work orders are generated by the M5 system when request for repairs are made. Work orders include repairs on valves, pumps, generators, and hydraulics.

As the numbers reflect, there is an extremely heavy workload that fluctuates year to year based on the number of vehicles in the fleet, the age of the vehicles, and frequency of items breaking. As apparatus continue to become more technologically advanced it provides the opportunity for more items to break; it is anticipated as a result of this that work order repair requests will continue to increase.

The build out process of new apparatus is one of the most complicated and time consuming process the apparatus shops perform. Apparatus mechanics design and fabricate units for the specific equipment the units are required to carry. The specialized fabrication is not something the vendor will do and there is limited opportunity to outsource this fabrication as a result of the specialization. Numbers fluctuate based on the number of vehicles replaced annually.

Pump testing is an integral and vital part of apparatus safety and maintenance and maintains compliance with NPFA 1911, Standards for Service Test of Fire Pump Systems on Fire Apparatus. Fire pumps are used to ensure an adequate water supply by increasing pressure on fire suppression units. Testing standards vary from testing that must be completed weekly, monthly and annually. While some jurisdictions use an outside contractor to perform the annual flow test, most jurisdictions perform this work in-house because it is more economical to do so.