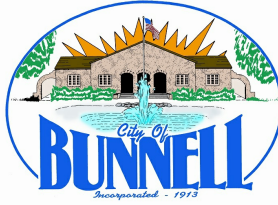


CATHERINE D. ROBINSON
MAYOR

JOHN ROGERS
VICE-MAYOR

DAN DAVIS
CITY MANAGER



Crossroads of Flagler County

COMMISSIONERS:

ELBERT TUCKER

BILL BAXLEY

JOHN SOWELL

BUNNELL CITY COMMISSION WORKSHOP

Monday, June 26, 2017

6:00 PM

201 West Moody Boulevard,
City Commission Chambers - Building 3
Bunnell, FL 32110

-
- A. Call Meeting to Order and Pledge Allegiance to the Flag**
 - B. Roll Call**
 - C. Presentation**
 - C.1. 10 Year Major Fire Department Equipment Plan**
 - D. Call for Adjournment**

This agenda is subject to change without notice. Please see posted copy at City Hall, and our website www.BunnellCity.us.

Any person requiring a special accommodation at this meeting because of a disability or physical impairment should contact the City Clerk at (386) 263-8807.

THE CITY OF BUNNELL IS AN EQUAL OPPORTUNITY SERVICE PROVIDER.

Posted by City Clerk's office on June 21, 2017



City of Bunnell, Florida

Agenda Item No. C.1.

ATTACHMENTS:

Description

10 Year Major Equipment Replacement Plan

Type

Report



Bunnell Fire Department
10 Year Major Equipment
Replacement Plan
June 2017

Table of Contents

Introduction.....	Page 3
Fire Apparatus.....	Page 5
Staff Vehicles.....	Page 8
Wildland Fire Attack Vehicles.....	Page 9
Specialized Fleet.....	Page 11
800 MHz Radio Equipment.....	Page 11
Extrication Equipment.....	Page 13
Self-Contained Breathing Apparatus.....	Page 16
Thermal Image Cameras.....	Page 19
Generators.....	Page 21
Positive Pressure Fans.....	Page 22
Summary Budget.....	Page 24

Bunnell Fire Department

10 Year Major Equipment Replacement Plan

The purpose of this program is to establish a capital equipment plan for the replacement of City Fire Department vehicles and equipment. The objective is to standardize the capital equipment replacement process to create a managed system of purchasing and funding capital equipment, thereby allowing the City to accurately plan and budget for future departmental capital equipment requirements.

The Capital Equipment Program provides for replacement intervals on an annual basis to reduce capital, operating and maintenance costs to maximize the safety and efficiency of the fleet and of the firefighters. The objective of the program is to control the overall cost of operating and maintaining the City Fire Department vehicles and equipment; to maintain vehicles and equipment in a manner that extends their useful life; to control the growth in size of the fleet; to standardize the composition of the fleet and equipment; and to accurately budget for maintenance and replacement costs.

This program consists of three plans: short term, mid-term and long range. The short-term plan which consists of the approved purchases in the current budget year and the proposed capital equipment purchases for the upcoming budget year. The mid-term, five-year plan, that rotates through each budget year and seeks to forecast upcoming short-term expenditures. The long-term, master plan, at a minimum, lists every piece of capital equipment by the purchase date, purchase price, the status, and the estimated useful life and replacement cost.

This plan was developed using recommendations and standards from: the National Fire Protection Agency (NFPA), The Occupational Safety and Health Administration (OSHA), The National Institute for Occupational Safety and Health (NIOSH), Food and Drug Administration Standards (FDA), The American Heart Association (AHA), US Army, Commission on Fire Accreditation International (CFAI), Insurance Service Office (ISO), American Public Works Association Fleet Service Committee, National Traffic and Motor Vehicle Safety Act, the Clean Air Act.

Projected costs for replacement are forecast using an increase of 4 percent per year which will represent the closest guess for pricing of items.

Fire Department Fleet

Apparatus replacement plans are vital in ensuring the desired number of apparatus is available (in working order) for deployment. The NFPA recommends reasonable life spans for engines are 10–15 years and for ladders are 15–20 years. The NFPA does not recommend any apparatus be kept in use, even as a back-up unit past 25 years.

Another common system for determining the reasonable life span of apparatus is a scoring system developed by the American Public Works Association Fleet Service Committee. Whatever method is used, an apparatus replacement plan must be established so that new apparatus can be ordered and received before old apparatus becomes unreliable and unusable.

Finally, when apparatus is replaced, the department must develop specifications for each new piece of apparatus. Applicable standards related to fire apparatus specifications come from the National Traffic and Motor Vehicle Safety Act, the Clean Air Act, NFPA Standards 1201, 1500, and 1901, ISO, and CFAI. In addition, most manufacturers now allow the purchaser to specify performance requirements rather than specifying components. Using performance specifications, the manufacturer can engineer the apparatus accordingly.

Bunnell Fire Department operates a wide variety of fire apparatus, specialty equipment, light support vehicles, and other motorized equipment; each requires a significant capital outlay to purchase and maintain.

The complete fleet of Bunnell Fire Department consists of 6 units. These include 2 engines, 2 staff/support vehicles, 1 Woods Truck and 1 ATV.

When a front-line apparatus is out of service, an auxiliary piece is put in its place. Bunnell Fire Department currently has 0 auxiliary engines. The NFPA recommends a ratio of 4:1 or 3:1 depending on the type of apparatus and demand levels. With one (1) auxiliary engine, Bunnell Fire Department has a 1:1 ratio of front-line to auxiliary engines. ISO requires a 4:1 ratio of front-line to auxiliary engines.

Maintaining fire apparatus past its useful service life can be expensive as well as unsafe; therefore, an accelerated apparatus replacement plan is recommended to replace older auxiliary apparatus with more reliable units.

Each piece of apparatus will be discussed specifically in this section.

Fire apparatus

Fire apparatus are operated under extreme conditions. To drive fire apparatus takes special training to operate due to the large size and weight of the vehicle. Fire apparatus is used to get somewhere in a hurry. Cold starts, hard stopping and starting, and driving in extreme conditions. Once the apparatus arrives at the scene, it is left running at high idle for extended periods of time. Fire engines carry water in a reserve tank adding to the weight and stress of the vehicle. The engine carries 750 gallons of water adding 6,262 lbs. to the weight of the vehicle, which is 25,000 lbs. and an equipment load of 2,000 lbs. (33,262 lbs.). The gvwr is 46,500.

The life expectancy of fire apparatus is a hotly debated topic. Industry experts say the unit needs to be placed in reserve after 100,000 miles. Others say once the unit no longer complies with current standards. Most say to remove the apparatus from service when the unit no longer provides a safe mode of transport or becomes unreliable.

NFPA 1901 Annex D Guidelines for first line and reserve apparatus

To maximize fire fighter capabilities and minimize risk of injuries, it is important that fire apparatus be equipped with the latest safety features and operating capabilities. In the last 10 to 15 years, much progress has been made in upgrading functional capabilities and improving the safety features of fire apparatus. Apparatus manufactured prior to 1991 usually included only a few of the safety upgrades required by the recent editions of the NFPA fire department apparatus standards or the equivalent Underwriters' Laboratories of Canada (ULC) standards. Because the changes, upgrades, and fine tuning to NFPA 1901, *Standard for Automotive Fire Apparatus*, have been truly significant, especially in the area of safety, fire departments should seriously consider the value (or risk) to fire fighters of keeping fire apparatus older than 15 years in first-line service.

It is recommended that apparatus greater than 15 years old that have been properly maintained and that are still in serviceable condition be placed in reserve status and upgraded in accordance with NFPA 1912, *Standard for Fire Apparatus Refurbishing*, to incorporate as many features as possible of the current fire apparatus standard (see Section D.3). This will ensure that, while the apparatus might not totally comply with the current edition of the automotive fire apparatus standards, many of the improvements and upgrades required by the recent versions of the standards are available to the fire fighters who use the apparatus.

Apparatus that were not manufactured to the applicable NFPA fire apparatus standards or that are over 25 years old should be replaced.

A dedicated vehicle replacement program needs to be in place to keep up with the demands for service. It is my intent to establish a replacement criteria based on mileage, years of service and downtime. Ten years would be a goal to keep a piece of apparatus with evaluation of its life done periodically.

Bunnell Fire Department has two (2) engines in its fleet. The age of Engine 62 is 19 years old. Engine 63 is 9 years old.

Engine 62

1998 Pierce Freightliner

750 Gal.



Engine 63
2008 Pierce International
2000 Gal.



Staff Vehicles

There is a total of 1 staff vehicle used in Bunnell Fire Department. One (1) Fire Chief / Staff Vehicle.

This vehicle is twelve (12) years old.

My plan is to replace one of these vehicles every 10 years, beginning 2019, to ensure an operational fleet and to spread the cost over ten-years.

Utility 62**2005 Ford 4X4 Crew Cab**

Woods 62
1983 5 Ton
1500 Gallons
Purchased in 2007



Specialized Vehicles

Tenders

Water tenders are used to bring large quantities of water to emergency scenes where there is no municipal water supply. Areas such as the west side of the county and areas on I-95 and US 1. The priority mission for the tenders is for use during wildfires to supply the firefighting vehicles with water. Tenders also respond to large accident scenes that require a firefighting water source on interstate 95, US 1 and any other area that does not have fire hydrants or a municipal water supply.

The tenders sit idle and unstaffed during most of the year. When in use, the tenders respond to areas most vehicles would not travel. Unpaved and unmaintained roads are used to position the tender as close to the action as possible. Bunnell Fire Department does not presently own a tender, but should consider the purchase of one in the future. We currently depend on Flagler County Fire Rescue for Tender operations.

800 MHz Communications Equipment

The portable handheld radios and the mobile car radios in use today by all municipalities and departments are the P7100, P5100 and the M7100 800 MHz radio. The mobile radios were introduced in 2003. Harris Corp discontinued making this model in 2009 and has continue to support this product until 2014. Communications International (CI) had supported the product for an additional 2 years (2016). They will still work on the equipment, but not under contract.

The portable radios were introduced in 2003. Harris Corp discontinued making this model in 2010 and has continue to support this product until 2015. CI supported the product for an additional 2 years (2017). They will still work on the equipment, but not under contract.

The fact that Harris has discontinued the product and will no longer support the product does not place us in an emergency. CI will continue to support for two years after Harris ends its support for the product. After the two years of CI supporting the product, there are no guarantees that the product can/will be serviceable. Parts may not be available to repair the products and software upgrades will not be available. The scenarios mentioned above are industry wide practices and are not exclusive to CI.

From a public safety standpoint, the products listed above needs to be replaced with a product that will be supported by both the manufacturer and the service provider or vendor. It does not mean that we need to throw the radios in the garbage at the drop-dead date, only that it will not be used as a frontline public safety radio.

All other departments are recommended to retain the products listed above to reduce the cost of replacement. The older radios can be used for non-emergency purposes and when the radio fails it can be replaced with one of the old public safety radios. In an event where multiple mutual aid companies come to assist, the older radios can be used as a cache to distribute to the outside agencies.

The radios chosen will operate on the Enhanced Digital Access Communications System (EDACS) or the P25 system so upgrading the backbone will not affect the field radios chosen.

The cost customarily increases an average of 3 to 4 percent per year taken from historical data. Bunnell Fire Department has the seven (7) M7100 or (mobile radios) in place in all its apparatus and in the fire station as a base radio. Bunnell Fire Department has one (1) P7170 portable handheld radios, Seventeen (17) P7150 portable handheld radios.



P7170

P7150

P5150



M7100

As of this date, it is still uncertain what the cost of the replacement radios will be, but starting this year there will be a \$600.00 fee per radio for up keep and system maintenance.

Vehicle and Machinery Extrication Equipment

The equipment listed in this section is used to extract victims that become entangled in vehicle accidents, industrial accidents and machinery. It is commonly known as the “Jaws of Life”. The “Jaws of Life” is made up of several components; the power unit, hydraulic hose, spreaders, cutters and rams. Vehicle manufacturers continually upgrade safety features and reinforce frames of vehicles. The upgrades each year make our extrication equipment obsolete when extricating people from newer cars. In the past, cars were made of sheet metal on a steel frame. Now cars are made of synthetic plastics mounted to reinforced cages made of stronger metals.

The force of the extrication tools increases as the technology advances. In earlier years spreaders opened metal at 24,000 psi. Newer models operate at much higher pressures. The newer spreader operates at 57,500 psi to 121,400 psi while the cutter that used to run a 38,000 psi operates at 95,000 psi to 263,000 psi. You can see how technology drives this industry.

Cutter:

The cutter is a hydraulic tool which is designed to cut through metal — a hydraulically powered shears. It is often called a crab-cutter, owing to the shape and configuration of its blades. Sometimes specified as to its capacity to cut a solid circular steel bar, these are most commonly used to cut through a vehicle's structure in an extraction operation. Cutter blades are replaceable, and blade development progresses as vehicle technology progresses to be able to cope with the new car protection technology.



Spreader:

A spreader is a hydraulic tool designed with two arms which come together in a narrow tip, and which uses hydraulic pressure to separate or spread the arms. The tip of the tool can be inserted into a narrow gap between two vehicle panels (such as between two doors, or between a door and a fender) when the tool is operated, the arms are opened, pushing apart the metal in the panels. Spreaders may also be used to "pop" vehicle doors from their hinges.



Rams:

Rams are used far less than spreader-cutters in auto rescues; nonetheless, they serve an important purpose. There are many types and sizes, including single-piston, dual-piston and telescopic rams. Sizes commonly vary from 50.80 cm (20") to 178 cm (70") (extended). Rams use more hydraulic fluid during operation than spreader-cutters, so it is essential that the pump being used have enough capacity to allow the ram to reach full extension.



Power Unit:

The tools operate based on hydraulic fluid pressure of up to 720 bar (10,000 psi), which must be provided from a power source. The most commonly used source is a separate power unit, a small petrol (gasoline) engine connected to a hydraulic pump. The hydraulic fluid is pressurized in the pump, and conveyed in a hose under pressure to the tool.



Bunnell Fire Department has 2 complete units each assigned to frontline engines. As far as service life we can have units last 15 years or more with proper service. The latest technology makes the tools lighter, easier to use and more powerful. The units we have now were purchased pre-2008.

Self-Contained Breathing Apparatus (SCBA)

Self-Contained Breathing Apparatus (SCBA) is one of the most important safety devices the fire department owns. It can provide breathable air to a firefighter in an atmosphere that would otherwise be deadly. It is a common myth that the bottles worn by firefighters on their backs are filled with oxygen. In reality, they are filled with compressed air supplied via a regulator much like a scuba diver.

Bunnell Fire Department has 10 SCBA harnesses that meet the 2002 NFPA standards for Self-Contained Breathing Apparatus in its inventory. Once the new updates are released by NFPA Standards Committee, the manufacturer will concentrate on developing the newer models stopping production and sales of the second-year standard. Meaning that after the 2013 standard was released in July 2013, we will no longer be able to purchase the same SCBA we have now.

Bunnell Fire Department will have in its inventory the latest most up to date SCBA ensemble available today after purchasing 10 new SCBA harnesses in FY 2018. Purchasing the most up to date NFPA compliant harnesses will allow us to keep the harness in service until the next update in 2028. The harnesses include the high pressure and low-pressure regulators.

Each SCBA harness is required to have two SCBA bottles assigned per NFPA and OSHA regulations pertaining to IDLH atmospheres and breathing air. NFPA recommendations are updated to the new safety standards every 5 years. The last update pertaining to Self-Contained Breathing Apparatus was in 2007. The next update was expected July 2012 but was pushed back a year to July 2013. The next update will be in 2018.

The SCBA face pieces were updated in early 2004 to meet current standards. Updates to the face pieces happen regularly and are completed using operational funds. Bunnell Fire Department only has 10 face pieces; most fire services have a face piece for each firefighter and some spares.

NFPA 1981, 1982 and 1989

OSHA 29 CFR 1910 part 120 and part 134



SCBA budget

Part	quantity	Presure	Retail Price Ea.	Contract Price Ea.	Total
SCBA Pack	10	4500	\$6,445.00	\$4,430.94	\$44,309.40
Wrapped Bottle	20	4500	\$1,418.00	\$974.88	\$19,497.60
Face Mask	10	N/A	\$412.00	\$283.25	\$2,832.50
Battery charger	1	N/A	\$624.00	\$507.00	\$507.00
Spare Battery	1	N/A	\$343.00	\$278.69	\$278.69
RIT Conversion Kit	1	N/A	\$765.00	\$621.56	\$621.56
SCBA Total					\$68,046.75
New Cascade Sys.		6000		Verbal Quote Aprox.	\$41,000.00
SCBA Sys Complete					\$109,046.75

Thermal Image Cameras (TIC)

A Thermal Imaging Camera (colloquially known as a TIC) is a type of thermographic camera used in firefighting. By rendering infrared radiation as visible light, such cameras allow firefighters to see areas of heat through smoke, darkness, or heat-permeable barriers. They are constructed using heat- and water-resistant housings, and ruggedized to withstand the hazards of fire ground operations. Thermal imaging cameras pick up body heat, and they are normally used in cases where people are trapped where rescuers cannot find them. TIC's can also be used in hazardous material incidents to detect levels on containers and off gassing.

How they work

The heart of any TIC is its engine, that is, the technology used to covert infrared radiation waves into a visual image. Earlier generations of TICs used Barium Strontium Titanate (BST) technology as primary component of the sensor. These TICs were classified as cooled detectors because they relied on a cryogenic cooling mechanism, the cryocooler.

Those earlier cooled detectors were popular with firefighters because of their extraordinary sensitivity to infrared radiation; the cryocooler substantially reduced thermal noise, that is, the infrared radiation from sources other than the objects being observed. The downside was that cooled detectors required periodic maintenance — typically between 8,000 and 10,000 hours of operating time — because a cryocooler unit is a mechanical device with moving parts.

But advances in technology have produced a more efficient and effective engine, the microbolometer. This uncooled detector is based on microelectromechanical (MEMS) technology, as its engine. Vanadium oxide (VOx) and amorphous silicon (ASi) are the two most common materials used in microbolometers for TICs.

TICs using VOx microbolometers are currently popular with firefighters because of their improved image quality over that delivered by BST technology. The new kid on the block, TICs that use ASi in their microbolometer, are earning high marks for their improved sensitivity, resolution, thermal time constant and uniformity as well as their compact size and relatively low cost.

Bunnell Fire Department has 2 TIC's in its inventory carried on structural fire apparatus. One (1) was purchased in 2004, and one was purchased in 2009. Replacement cost is approx. \$12,000.00+ ea.



Generators

The generator is used to power electrical equipment vital to essential fire ground operations. The generators are small enough to fit in to a compartment on the engine usually on the officer (passenger) side rear compartment. The generator is powerful enough to operate lights, high volume fans and other equipment used in firefighting. The generators are fuel powered engines that operate long hours. As with any mechanical device, wear and tear can make the device unreliable.

There are three (3) generators in the Bunnell Fire Department inventory. They are at a cost of \$1,800.00 +



Positive Pressure Ventilation Fans (PPV)

Each frontline engine, ladder truck and spare engine has a PPV fan assigned to it. The PPV Fan is used to provide positive pressure ventilation during structural fires to help clear the super-heated gases and smoke from the structure.

Ventilation is one of the most important operations to be performed by firefighters and they have three basic types of ventilation at their disposal. These include vertical, horizontal, and forced ventilation. Vertical and horizontal ventilation use natural and fire generated currents to move heated gases from the structure. Forced ventilation uses fans and hose streams to mechanically move air, which allows firefighters to vastly improve both horizontal and vertical ventilation. The three basic methods of forced ventilation include hydraulic, negative pressure, and positive pressure ventilation. Of these methods of forced ventilation, positive pressure ventilation is one of the most effective at removing smoke and heated gases from a burning structure.

The PPV Fans are fuel powered engines that operate long hours. As with any mechanical device, wear and tear can make the device unreliable. Most of our PPV Fans are in fair condition. They are also replaced at a price of \$3,500.00 ea.+



summary

In summary, the apparatus and equipment replacement plan uses standards and recommendations from numerous federal and state agencies that oversee the safety aspect of firefighting equipment. We also used some logic in the development of the plan. The logic that a piece of equipment that is not past its service life and continues to be usable can be sold or traded in at a higher price than equipment that is old and unusable. The higher selling or trade in price will help offset the large expenditure needed for capital equipment.

Technology will continue to drive the cost and the need for new firefighting equipment. The products produced by manufacturers that consumers purchase to drive and to place in the homes and businesses will create opportunities for the fire service to improve their response with updated equipment.

The items represented in the plan have been selected due to the cost and type of use within the structure of the service. There are many other items we replace to keep up with standards, but those items are replaced in the operating budget on a yearly basis.

The costs are calculated and spread over a five-year period to keep the overall expenditure as close to an even budget each year. Each year costs will increase due to inflation, cost increase for materials, cost increase for labor and cost increase for delivery. Costs may increase due to federal regulations such as for apparatus with diesel engines. The calculated cost increase per year used in this plan is 4% which is historically an average increase. The costs per item represented in this plan uses the estimated increase per year on top of quotes received from vendors. The actual costs will vary depending on the timeline of purchases and technological updates.

Summary Budget

Fund: 001 - GENERAL FUND			FY 2017 Current Budget	FY2018 Projected
	Expense			
001-0522-522.1200		Salary & Wage - Regular	25,414.00	24,095.41
001-0522-522.1201		Wages - Volunteers - FD	7,000.00	7,000.00
001-0522-522.2100		FICA Tax	2,481.00	2,378.80
001-0522-522.2200		Retirement Contributions	13,127.00	13,127.00
001-0522-522.2300		Medical / Life Ins Exp - Exec	2,705.00	0.00
001-0522-522.2400		Workers Comp	1,704.00	1,704.00
001-0522-522.3400		Other Contract Services	5,146.00	5,146.00
001-0522-522.4000		Travel / Per Diem	800.00	1,000.00
001-0522-522.4100		Communications Expense	3,480.00	15,480.00
001-0522-522.4200		Postage	200.00	200.00
001-0522-522.4300		Utility - Public Services	6,300.00	6,300.00
001-0522-522.4500		Insurance Expense	10,587.00	10,587.00
001-0522-522.4600		Repair / Maint - Service	3,900.00	3,900.00
001-0522-522.4610		Repair / Maint - Bldgs	-	
001-0522-522.4620		Repair / Maint - Vehicles	10,300.00	9,500.00
001-0522-522.4640		Repair/Maint - Equipment	700.00	
001-0522-522.4800		Advertising / Promo Expense	250.00	250.00
001-0522-522.5100		Office Supplies Expenses	250.00	250.00
001-0522-522.5200		Operating Supplies	1,500.00	2,390.00
001-0522-522.5210		Fuel	3,600.00	3,600.00
001-0522-522.5220		Uniforms Exp	6,800.00	9,800.00
001-0522-522.5264		Non- Capital Equipment Purchase	3,000.00	5,000.00
001-0522-522.5400		Memberships, Publications, Books, Training	100.00	100.00
001-0522-522.5500		Training	1,700.00	1,700.00
001-0522-522.6400		Machinery/Equipment Expense	5,000.00	110,246.75
			116,044.00	233,754.96

Apparatus	Year	City ID	Make/model	Purchase Cost	2018	2019	2020	2021	2022	Replacement Cost
Eng 62	1998	1002	Pierce Freightliner	\$152,501.00	\$165,000	X	\$44,500	\$44,500	\$44,500	\$330,000.00
Eng 63	2009		Pierce International	\$386,281.00	\$145,000	\$145,000	X	\$45,000		\$428,771.91
Utility 62	2005	4086	Ford F-250 4X4	\$28,469.00	\$14,000	X	\$6,500	\$6,500	\$6,500	\$32,205.00
Squad 62	2003		Aquired 2009	\$11,565.00		X				
Woods 62	1983/2007		5 Ton Military	\$39,825.00	\$22,000	X	\$4,500	\$4,500	\$4,500	\$44,604.00
ATV	2007		Polaris Ranger	SJWMD	X	\$2,000	\$2,000	\$2,000	\$2,000	aprox. \$16,000.00
FUNDING					\$365,000	\$348,000	\$202,500	\$102,500	\$102,500	