



**City of Port Jervis**

**Orange County, New York**

**Fire Apparatus and Equipment Review**

**1.0 Overview:**

At the request of Mayor Russell Potter on behalf of the City Council and Chief Officers of the Port Jervis Fire Department the staff of Emergency Vehicle Response was contracted for the purpose of conducting an analysis of the fire apparatus and equipment resources of the Port Jervis Fire Department. The primary purpose of this study is to review the needed fire apparatus and equipment resources that would be required to effectively combat structural fires and other emergency incidents within the city as protected by the Port Jervis Fire Department operating from five fire stations.

Phase one of the study will review the fire department's apparatus, equipment and maintenance provisions for these units. Upon review and implementation of the recommendations outlined in this study, Phase two will consider fire station locations, apparatus response patterns, staffing and water supply issues. The overall goal is to provide the City of Port Jervis and the Fire Department with a long range plan to develop replacement strategies, financial planning and an improvement plan to insure safe operations and deployment practices to enhance fire protection.

While past practice has been to provide a modern fleet of apparatus with units assigned to each fire station financial considerations together with the ability for each fire company to staff their units on a regular basis dictates that there must be a demonstrated need for this equipment. The impact of Insurance Services Office standards with respect to fire department apparatus, equipment and operations were reviewed to assess the Fire Department's performance and impact on commercial and residential fire insurance rates. Phase two will address in greater detail recommendations for apparatus deployment and staffing models which would insure adequate fire protection for all city residents.

Prior to the start of the field analysis Emergency Vehicle Response (EVR) was requested to specifically address the age, condition and maintenance history of Ladder 827, a 1989 Pierce Arrow 105 foot rear mount aerial ladder. As this vehicle had been the subject of previous discussions and public referendums on its replacement the Fire Department desired to gain an outside, independent assessment of this vehicle. As a result of an operational and maintenance review of this piece of apparatus the recommendation was made by EVR to replace the unit with a new apparatus in light of its age, lack of safety components and increasing maintenance costs.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **1.0 Overview:**

The November, 2012 report on Ladder 827 resulted in EVR working with the Fire Department chief officers and members to develop a Request for Proposal for a new aerial ladder truck. Bids for this project were opened on March 4, 2013 with five manufacturer's submitting proposals. EVR performed a detailed analysis of each of these proposals with a report transmitted to the Fire Department for their consideration. The end result of these efforts was an affirmative vote to acquire a new aerial ladder by the community on May 7 with a contract award to KME Fire Apparatus.

During March of 2013 the staff of Emergency Vehicle Response performed several days of field work and analysis to gather information and review available records on the apparatus and maintenance provisions. Maintenance and testing records for the past three years together with on site inspections of each individual apparatus were conducted to gain information on Fire Department programs, policies and response patterns to alarms.

Emergency Vehicle Response personnel also conducted an overall review of the land area, development and structural conditions in the first due response area within the city in order to identify the apparatus and equipment requirements that would be appropriate for the area. Each piece of apparatus was thoroughly examined and evaluated with respect to operational capabilities, physical and mechanical condition as well as maintenance and repair history. This information was utilized to evaluate the suitability of the present apparatus fleet for the missions that the Port Jervis Fire Department would be expected to perform during an emergency incident.

#### **2.0 Executive Summary:**

From an overall perspective the Port Jervis Fire Department maintains an adequate number of pieces of apparatus and equipment to protect the community. The department has a long history of serving the community with the first fire company organized in 1847. Since 1954 the fire department has operated with five engine companies, one ladder company and a rescue/salvage company. The department operates from five stations located in various areas of the City with Engine 821 and Ladder 827 co-located at a station at 25 Orange Street and Engine 822 and Rescue 823 operating from a station at 22 Hammond Street. Engine 824 is assigned an engine with an articulating water tower with station facilities at 31 Owen Street. Engine 825 and the fire police unit operate from a station at 143 West Main Street with Engine 826 located in the east end of the city at 257 East Main Street.

The seven fire companies comprising the Port Jervis Fire Department have historically shared a rotating fleet replacement plan where approximately every three to four years a single piece of fire apparatus was acquired to replace a twenty to twenty one year old unit. Due to the procurement and approval process currently in place no vehicles had been placed into service since 2007 which has delayed the timely replacement for some units and in the past caused the city to purchase two engines at the same time to replace vehicles that were twenty two and twenty three years old.

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#### **2.1 Key Observations:**

Several issues have been identified in this report which will require appropriate technical and financial planning by the fire district to insure that the present level of emergency response capabilities will be maintained in the future.

1. The average age of all units in the department's fleet is 13.71 years of age, with average ages for the five engines being 10.60 years old. Five units were acquired between 1999 and 2007 with no other apparatus acquired since that time. Purchasing two vehicles at one time has complicated future replacement cycles and if the department desires to maintain a fleet of seven major pieces of apparatus, a single vehicle must be acquired and placed into service every three years.
2. The present methodology to have each fire apparatus purchase and acquisition placed before the general public for a permissive referendum needs to be revisited. Once the appropriate level of fire protection is determined and agreed to by all parties the subsequent apparatus fleet replacement program needs to be adopted with the required financial support from the community to fund the apparatus replacement program. Past experience has shown that depending upon many factors, some beyond the control of the Fire Department that the timing of requests for new apparatus may well be defeated by outside interests in the community, without regard to the needs of the department and the impact on maintenance costs and safety concerns.
3. In order to achieve a reasonable balance of want vs. need the Fire Department should form an independent apparatus replacement committee with responsible individuals including chief officers, company representatives, department mechanic and an independent outside individual with automotive and engineering experience to develop standards for future apparatus acquisitions in accordance with the recommendations outlined in this report. The individual fire companies should no longer be empowered to singularly specify fire apparatus when these units are acquired and funded by the City of Port Jervis.
4. Each of the five engine apparatus have limited capabilities with respect to their pump capacity of 1500 to 2000 gpm due to each unit carrying a limited number and size of preconnected attack lines to effectively combat structural fires. Each of the engine's are equipped with two to three preconnected 1.75 inch attack lines and some with a single preconnected 2.50 inch line, many with combination fog nozzles. As a result the engines can only supply thirty two to forty five percent of their rated capacity due to the lack of leader lines and large caliber portable appliances.

Regardless of the age of the apparatus each pumper should be outfitted with the appropriate configuration of supply and attack line hoses to provide effective fire streams at any incident. Specific recommendations are made for each piece of engine apparatus to improve the water flow delivery for these units in Section 7.0 of the report.

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5. The first due response area contains several target hazards as well as numerous large area commercial structures which require fire flows between 2500 gpm and 4000 gpm. While the present engine companies all carry 5.00 inch large diameter hose and several preconnected 1.75 inch and 2.50 inch attack lines, there is a lack of leader lines on all units which could be utilized where a line longer than 300 feet is required. Each front line engine company should be equipped with a minimum of six (6) preconnected attack lines in different diameters and lengths. In addition the engine apparatus lacks the ability to provide heavy stream capability of 500 gpm other than the mounted deck gun appliances. Specific recommendations for each engine company apparatus will be offered in section 7.0 of the report.

### **3.0 City of Port Jervis Demographics:**

The City of Port Jervis is located along the east bank of the Delaware and Neversink Rivers in the western portion of Orange County, New York. The city is approximately 2.7 square miles in size with a current population of 8,800 residents. Access to the area from Interstate 84, New York State Route 6 and Route 209 provides several heavily traveled routes for both commuter and truck traffic. Traffic patterns through the community can become moderate at times which may impact the response of volunteer personnel who must travel from their home or business location to the fire station to staff the apparatus. While there are a number of traffic light controlled intersections in the community there are no traffic preemption devices in use on the apparatus.

The water supply is generally adequate in most areas of the City with available fire flows ranging from 1500 to over 8000 gpm at 20 PSI residual pressure. During the most recent Insurance Services Office (ISO) survey conducted in May, 2011 the water supply grading achieved a total of 35.91 points of credit out of a possible 40 points, which indicated a strong water system.

Port Jervis presently maintains an Insurance Services Office (ISO) rating of Class 4. The Class 4 rating applies to those limited areas of the community that are within 1000 feet of the public fire hydrant. The Class 4 rating is also dependant upon the location of the building from the fire station. While not directly impacting fire insurance rates due to the size of the city, commercial structures must be within a three miles road distance from a fire station and single family residential structures must be within five miles road distance from the fire station.

During the most recent ISO survey the Fire Department was required to have three engine companies and one ladder company in service with a required fire flow of 3500 gpm. Recommendations offered in Sections 6.0 and 8.0 of this report should assist the fire department in strengthening and improving their operations and safety components from a practical standpoint as well as meeting the baseline requirements of the nationally recognized standards promulgated by the National Fire Protection Association.

The Fire Department achieved a total of 28.34 points of credit out of a possible 50 points with only 6.66 points of credit afforded for the engine apparatus due to the lack of proper testing procedures. The staffing and deployment portions of the evaluation achieved 9.93 points of credit out of an available 19 points.

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#### **3.0 City of Port Jervis Demographics:**

The staffing and deployment of the department's apparatus will be addressed during the second phase of the fire protection study. During the field work and inspection of the apparatus it was noted that several fire stations were in the process of constructing turnout gear lockers for each individual's protective gear. Some turnout gear was still being carried on several pieces of apparatus. It is the opinion of EVR that all protective turnout gear should be maintained at each fire station and that other than chief officers and fire police personnel that all members be required to respond to the fire station to staff the apparatus only after having all protective turnout gear in place, as well as to be seated and belted on the apparatus at all times for the safety of all riding personnel.

In comparison to other community's response areas of similar size, the City of Port Jervis has a large number of target hazards commercial and multiple occupancy residential structures that would require significant personnel and apparatus resources to safely operate at incidents in these locations. Building projects such as Waters Edge apartments Hillside apartments and the Silk Mill condominiums require effective apparatus placement and efficient engine company hose line stretches to effectively combat fires in these styles of building construction.

While the Fire Department currently operates with five engine companies there is little coordination and commonality among these units. One of the goals and objectives of this fire protection study is to determine the appropriate level of service that the community needs given the current apparatus, equipment and fire station assets in the department. Most importantly during the second phase of the study EVR will review the available staffing levels of each fire company and their ability to staff and respond the assigned apparatus to alarms when alerted to incidents. Ultimately the overall fleet replacement plan will be developed based upon several options for the city fathers and Fire Department chief officers to review and implement based upon best practices and the availability of financial resources to effectively implement the programs and recommendations offered in the study.

#### **4.0 Fire Apparatus Fleet Analysis:**

The City of Port Jervis currently operates a total of seven pieces of fire/rescue apparatus; three chiefs command units and one fire police vehicle. This report will address each major piece of apparatus, its design, frequency of use, mechanical condition, equipment and hose deployment capabilities together with a recommended time frame when the unit should be replaced in the future.

All front line engine and ladder apparatus equipped with four door enclosed cabs. Current fire department units can ride a total of fifty nine personnel safely in a seated and enclosed position on all units. Replacement strategies for individual pieces of apparatus can be based upon several factors including age, maintenance costs, need to change or update equipment and hose loads or the number of runs and associated road mileage on each unit. Fire apparatus is generally replaced after fifteen (15) to twenty (20) years of first line service and may be utilized as a reserve or spare unit for an additional three to five years, depending upon age, use, condition and adaptability to the department's current operating procedures.

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#### **4.0 Fire Apparatus Fleet Analysis:**

The National Fire Protection Association which is responsible for developing the standards for fire apparatus revises and updates the 1901 Fire Apparatus Standard every five years in order to keep pace with technology and the component manufactures in these areas. Within the past five years component technology has advanced dramatically in the areas of fire pump components and instrumentation, electronic stability controls and diesel engines all of which have had an impact on the available safety equipment and related costs of new apparatus.

Recent changes in engine exhaust emissions requirements by the federal Environmental Protection Agency during 2007 and 2010 have had dramatic impacts on the fire apparatus industry with respect to cab designs, engine cooling and exhaust system components. Future requirements planned to take effect between 2015 and 2016 will have a more profound impact on engine technology and cab designs which will further increase the cost of new units. Unfortunately, the fire service has lobbied unsuccessfully to exempt motor fire apparatus from the EPA engine emissions requirements the results of which have caused all manufacturers to redesign their cabs, chassis and cooling systems to accommodate this new technology.

These mandated requirements together with the most recent changes in the NFPA 1901 Standard in 2009 have caused a doubled digit annual increase in the cost of all major types of fire apparatus. Using a twenty one year life cycle for each major piece of apparatus the Fire Department would have to acquire one new apparatus every three years. In reality the actual average in between apparatus purchases has been four years, with no major pieces of apparatus acquired since 2007 with Engine 822. The average age of all units in the apparatus fleet, excluding the support units is 13.71 years of age. The average age of the front line engine apparatus is 10.60 years of age with the two special service units, aerial ladder and rescue being 21.5 years old.

There are several alternatives to replacement of each current vehicle in the apparatus fleet which will be explored in Section 5.0 of this report. From a practical perspective, while the ISO requires the department to maintain three engine companies and one ladder truck to protect the community, the overall needs of the department must be considered with respect to being able to operate, maintain and staff each piece of apparatus with each fire company in the community.

Over the past three year period the Fire Department has responded to an average of 540 incidents. These numbers include all types of alarms including structural fires, alarm activations, vehicle and outdoor fires, vehicle accidents, EMS assists and mutual aid calls to assist neighboring communities. The department's current apparatus deployment policies call for all units to respond to most incidents with the responding chief officers determining which units will be utilized for minor incidents. The departments operating procedures with respect to apparatus staffing and response protocols will be examined in detail during Phase two of the fire protection study.

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**4.0 Fire Apparatus Fleet Analysis:**

Table 4.1 lists the summary of the various types of incidents for the period 2010 through 2012:

**Table 4.1 Responses by Year-Incident Type**

| <b><u>Year</u></b> | <b><u>2010</u></b> | <b><u>2011</u></b> | <b><u>2012</u></b> |
|--------------------|--------------------|--------------------|--------------------|
| Structural Fires   | 81                 | 79                 | 61                 |
| False/Good Intent  | 125                | 131                | 184                |
| Vehicle Fires      | 6                  | 8                  | 4                  |
| Service Calls      | 72                 | 63                 | 58                 |
| EMS Calls          | 12                 | 14                 | 13                 |
| Rescue Calls       | 8                  | 10                 | 8                  |
| Mutual Aid Calls   | 123                | 130                | 60                 |
| Other Incidents    | 21                 | 244                | 26                 |
| Total              | 529                | 679                | 414                |

Due to the number of apparatus and availability of personnel staffing the Port Jervis Fire Department annually responds to a number of incidents to assist neighboring fire departments. There are several building complexes which account for a number of automatic alarms including the hospital and several multiple housing locations in the city. The actual number of rescue calls for incidents involving vehicle accidents and water rescues are fortunately very low, representing less than two percent of all alarms.

The department has in the past operated with a series of best practices guidelines with respect to apparatus placement and operations at the scene of emergency incidents. What has been lacking is any degree of standardization on the engine company apparatus with respect to hose lines, nozzle selection and tool and equipment placement which has been left to the discretion of each individual fire company officers and members.

Apparatus maintenance checks are conducted on a monthly basis by fire company drivers and officers. Tom Vicchiarriello oversees the department's apparatus maintenance program and coordinates work conducted by the City Department of Public Works garage for basic annual preventative maintenance work and with outside contractors. Hopewell Fire Equipment conducts fire pump service work as needed with all pumpers having been service tested for the first time during 2012. This partially accounts for the department's engine apparatus obtaining only 6.66 points out of a possible 10.00 points of credit during the most recent ISO survey.

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**4.0 Fire Apparatus Fleet Analysis:**

Based upon a review of available records and completed forms these maintenance reviews are generally well programmed with the overall condition of front line apparatus being good. Individual maintenance records for each piece of apparatus are kept in several locations with no master log for each vehicle, making an assessment of each unit annual maintenance costs difficult to determine.

A local heavy truck repair facility is used for chassis and engine work when required. Ground ladders and the aerial on Ladder 827 are subject to annual non-destructive testing by American Testing Company with complete records kept on this inspection work. Hose testing is conducted on an annual basis by department personnel with records to support the inventory of hose on each apparatus. Each fire company has developed their own inventory forms to track appliances, tools and equipment. The degree of accuracy and amount of detail included on these equipment inventory forms varies widely.

Based upon available records including invoices from outside vendors and repair facilities Table 4.2 indicates a summary of repair and maintenance costs for each major piece of apparatus in the Fire Departments fleet:

**Table 4.2 Annual Apparatus Maintenance Costs**

|            | <b><u>2011</u></b> | <b><u>2012</u></b> | <b><u>Hopewell 2010-2012</u></b> |
|------------|--------------------|--------------------|----------------------------------|
| Engine 821 | 1810               | 3942               | 10,942                           |
| Engine 822 | 560                | 662                | 1000                             |
| Engine 824 | 573                | 1248               | 8794                             |
| Engine 825 | 6866               | 9619               | 2380                             |
| Engine 826 | 551                | 1687               | 4007                             |
| Rescue 823 | 1667               | 697                | 835                              |
| Truck 827  | 5750               | 8396               | 1863                             |

The overall repair and maintenance costs for the fleet have while they have been within the budgeted amounts, with the exception of the ladder truck are far less than what would normally be expected to properly maintain a fleet of this size in accordance with National Fire Protection Association Standard 1911 covering the maintenance, testing and inspection of fire apparatus. Diesel engine and recent foam system repairs to Engine 825 and the ladder truck have largely accounted for most of the expenditures over the past three years.

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#### **4.0 Fire Apparatus Fleet Analysis:**

The Fire Department maintains an extensive inventory of equipment on each piece of apparatus with most all items properly mounted and located within body compartments. Due to the different manufacturers and compartment designs, there is little standardization in equipment locations. Hose loads vary from unit to unit with a variety of smooth bore, combination and automatic nozzles used on preconnected attack lines. Five inch supply line is utilized as the standard hose for all layouts and water supply operations.

During the period of March and May, 2013 the staff of Emergency Vehicle Response conducted a field survey of the apparatus of the Port Jervis Fire Department. Each piece of apparatus has been carefully analyzed for its condition and maintenance features, with projected replacement dates given for each unit. These dates reflect the year in which the replacement unit should be delivered and placed into service by the fire department. Recognizing that most fire apparatus takes approximately eight to ten months to produce once the unit goes under contract, adequate research and planning must be provided to insure that the apparatus is delivered and placed into service on a timely basis.

The City of Port Jervis and the Fire Department should adopt the fleet replacement program as outlined in Section 7.0 to insure that apparatus is replaced on a regular, programmed basis. In the future it may be necessary to have the several of the engine apparatus provide a longer period of front line service in order to space out the time frames between each major apparatus acquisition, particularly with respect to Engines 821 and 824 which were both acquired during 1999.

While the current fleet of apparatus is in mainly good condition for its age, future purchases will need to follow the developed plan with only minor deviations allowed for unanticipated repairs or accidents. One aspect of the proposed fleet replacement plan is to space out the time frame from the oldest to the newest unit, allowing for a maximum of three years in between each major apparatus acquisition, in order to fully develop the overall replacement plan. In the future the City should refrain from acquiring more than one major piece of apparatus in each calendar year.

#### **5.0 Future Fire Apparatus Requirements:**

From an overall perspective, the Port Jervis Fire Department maintains an adequate number of apparatus to safely protect the residents and property within the cities first due response area. With a total combined pump capacity of 8500 gpm with five engines this capacity is adequate to meet the needs of the department as well as the fire flow requirement of 3500 gpm as established by the Insurance Services Office of New York.

While there are small sections of the City where the public water supply is limited, three of the engine companies are equipped with 1000 gallon water tanks. Engine 824 carries a 650 gallon water tank with Engine 825 equipped with a 750 gallon water tank. The rationale for the larger water tanks is unclear, however this tank size impacts several areas of the apparatus including requiring longer wheelbase vehicles, heavier capacity rear axles, tires and suspensions and results in hose beds that 85 to 90 inches from the ground which makes the vehicles difficult to maneuver and work from when advancing attack hose lines.

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### Apparatus and Equipment Analysis

#### **5.0 Future Fire Apparatus Requirements:**

The Port Jervis Fire Department presently enjoys a relatively new fleet of units with respect to the engine company units with an average age of 10.60 years having been acquired between 1999 and 2007. This will unfortunately result will be an aging fleet during the next decade which will require additional financial support for vehicle maintenance and testing. It is imperative that moving forward that the Fire Department in cooperation with the City Council plan to space out future apparatus acquisitions to enable the department to keep pace with technology and operational changes to keep the average life cycle for each vehicle to twenty to twenty one years of age.

Dating back to the 1940's the Fire Department's engine company apparatus has largely been comprised of custom chassis units built by Mack, American LaFrance, Ward LaFrance, Maxim Motors and Sanford Fire Apparatus, many equipped with four door cabs. During the period when the department's apparatus fleet was largely comprised of Mack Fire Apparatus pumpers there was a fair amount of similarity and standardization between these units. Since that time, each fire company has largely been empowered to design and specify whatever make, model and configuration of pumper for their fire station. The result of these practices has resulted in the current pumper fleet being built by four different manufacturers with a variety of fire pump configurations, body and compartment layouts with few areas of standardization. While it is to be expected that each fire company could provide input for consideration by the department chief officers with respect to vehicle color and graphics the basic configuration of the engine apparatus including body compartments, equipment carried and hose load configurations must be standardized for all units.

The report in Section 6.0 will address some recommendations for consideration by the Fire Department to initiate the process for standardization on hose loads, nozzles, tool and equipment locations to improve safety and operational effectiveness at incidents. While the first pumper to be acquired under the fleet replacement plan is not slated to be acquired until 2019, the department should begin the process to identify areas on the current apparatus where tool and equipment mounting and identification can be implemented.

All future engine company apparatus should be designed with a short wheelbase and overall length pumper carrying 500 gallons of water and equipped with multiple attack lines and basic engine company equipment. Currently every engine apparatus is equipped with some type of Class A or combination A/B foam system with on board foam cells. Future engine apparatus should be equipped with a modest Class A foam system to support three or four hand lines with a standard pump panel arrangement for ease in training and incident operations.

The Fire Department's replacement engine apparatus should be appropriately designed in accordance with the recommendations included with this report. All future new or replacement apparatus should continue the past practices of acquiring custom chassis four door cab units with seating for seven personnel. The seating arrangement and operational assignments based upon seat position can become standardized throughout the department to enable basic company evolutions and assignments to be carried out in accordance with the departments Best Practices Guidelines.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **5.0 Future Fire Apparatus Requirements:**

It is the opinion of Emergency Vehicle Response that there would be more significant operational, training and cost efficiencies gained by having the department's engine company apparatus be designed and equipped as identical units. While the average age of the five engines is currently 10.60 years, these five vehicles were acquired over a short period of time between 1999 and 2007. In order to space out the replacement vehicles in the future it will be necessary to have the pumpers average 22.42 years of front line service, without any reduction in the overall size of the apparatus fleet.

Rescue 823 was acquired during 1994 to replace a 1973 Ward LaFrance walk in rescue with bodywork by Saulsbury Fire Apparatus. The department's first heavy rescue was acquired in 1954 when the Fowler Fire Company changed their operations from an engine company to a Rescue and Salvage Company. At that time there were no other rescue trucks operated by neighboring fire departments and this first enclosed heavy rescue truck was unique in the area. Today neighboring departments in Huguenot, Sparrowbush and Greenville in Orange County as well as Matamoras and Milford, Pennsylvania all operated heavy rescue trucks or well equipped rescue engine units.

There are several options for the scheduled replacement of Rescue 823 scheduled for 2017. Due to the extensive amount of time and logistics required to have the permissive referendum obtain voter approval for the aerial ladder there needs to be a determined effort by all parties including the city fathers and fire department to agree in principal on the merits of a well defined and planned fleet replacement program. The past practices of waiting for the scheduled replacement date for the apparatus to arrive, only to be put off for any number of reasons does not serve the community nor meet the needs of the department. For this reason in Section 7.0 there are two different replacement plans based upon the size of the apparatus fleet with consideration for future consolidation of services among the fire companies.

From an ideal perspective, each of the department's five engines, ladder truck and rescue truck should have a maximum of three years between each piece of apparatus. Depending upon a number of factors including the viability of unit staffing at each fire company, the number of annual incidents and actual apparatus responses it could be expected that the current units in the fleet will provide additional years of service beyond the nominal twenty year life cycle.

Engines 821, 824 and 825 were specified with stainless steel bodies which should help to insure that their extended life cycle beyond the normal 20 to 21 years can be reasonably accomplished without having to perform major body rehabilitation and corrosion work. Future new apparatus should be specified with stainless steel or all aluminum bodywork with sub-structures of similar material to insure that the vehicles will provide the needed years of front line service.

Given the present size of the apparatus fleet the planning for the seven major pieces of apparatus can be extended by several years to provide for sufficient financial resources to fund each purchase. Special units such as the fire police vehicle and command units can be acquired in between the major units depending again upon vehicle condition and maintenance, mileage, engine hours and incident responses.

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### Apparatus and Equipment Analysis

#### **5.0 Future Fire Apparatus Requirements:**

The following guidelines should be incorporated into all future engine company apparatus:

#### **5.1 Requirements for new Engine:**

1. Four door custom cab with seating for seven (7) personnel
2. Wheelbase between 180 inches and 190 inches
3. Overall length between 29 and 31 feet
4. Overall height between 116 and 120 inches
5. 450 Horsepower diesel engine with engine brake
6. Five speed automatic transmission
7. Disc brakes, 17 inch on front and rear axle
8. 1500 gpm single stage fire pump with side mount pump controls
9. Apparatus to have minimum of three (3) 2.50" rear discharges
10. 5000 gallon water tank with poly construction
11. Minimum of six (6) preconnected attack lines including:
  - a. one (1) 100 to 150 foot 1.75" trash line on front bumper
  - b. two (2) 200 foot 1.75" attack lines
  - c. one (1) 400 foot 1.75" or 2.00" attack line
  - d. one (1) 200 foot 2.50" attack line
  - e. one (1) 200 to 250 foot 3.00" leader line
12. Hose bed to accommodate a minimum of 1200 feet of 5.00" supply line
13. Hose bed to accommodate a minimum of 500 feet of 3.00" hose
14. Class A foam system with 30 gallon tank to support a minimum of three attack lines
15. Tailboard mounted portable master stream device
16. Apparatus body to be constructed of aluminum or stainless steel
17. Apparatus body to have full height compartments on left side and right side
18. Ground ladders to be mounted on hydraulic ladder rack on the right side of the body with a 24 foot extension ladder, 14 foot roof and 10 foot folding ladders
19. Provide for a five scene lights 12 volt LED powered to include a cab brow light, two mid-body and two rear body lights
20. All body compartments to be equipped with appropriate trays, shelves and tool boards with all hand tools mounted inside the compartments in a standard location
21. LED lighting should be utilized for all running and emergency lights
22. Chassis cab to provide for seating for seven (7) personnel with six (6) seats provided with SCBA equipment
23. Provide for driver's compartment mounted self contained breathing apparatus
24. 5.00" front suction with power operated valve from pump operators position to include a bumper mounted hose tray
25. All sides of the apparatus to have high visibility reflective graphics
26. Each unit to have standard department lettering and graphics with unit numbers

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#### **5.1 Requirements for new Engine:**

In addition all future apparatus acquisitions should provide for the following mechanical and safety features:

1. Full width steel reinforcement channel mounted behind the front bumper
2. Drive shaft safety guards on each section of the driveline
3. Electronic Stability Control
4. Six Group 31 batteries with a single alternator rated at 350 to 400 amps
5. Back up camera system with both rear and right side mounted cameras
6. Front windshield mounted down view mirror
7. Ready reach seat belts with orange color webbing
8. Stainless steel straps on fuel tank
9. Stainless steel battery trays and hardware

An engine apparatus as outlined above would cost in the range of \$525,000 to \$550,000 dollars in current day costs and would provide for improved attack line capabilities and would be used as the basis for standardized engine company apparatus in the future. The new apparatus should be designed to be a short and maneuverable as possible and should incorporate as many of the above listed bullet points as the basis for the initial design. The first new engine apparatus would be ordered during 2013 in accordance with the fleet replacement schedule as outlined in Section 7.0 of this report.

#### **5.2 Replacement for Rescue 823:**

The Fowler Rescue and Salvage Company #3 since 1954 have operated a heavy rescue vehicle to carry an assortment of rescue tools and equipment. The current rescue vehicle acquired in 1994 is the third generation of rescue truck and is equipped with a small 300 gpm power take off fire pump and a 200 gallon water tank. The Port Jervis Fire Department has traditionally operated with both the aerial ladder and rescue trucks with small booster pumps and tanks. The actual use of these fire pumps has been limited and unless a combination rescue/engine apparatus is desired due to a reduction in front line engine companies, the added expense of these components cannot be justified.

Rescue 823 can carry up to eight personnel within the four door cab with an additional six personnel inside of the walk in body. The walk in style body provides the capability to rehab personnel at the scene of an incident and to don water rescue gear when required. The amount of equipment currently carried on the inside of the apparatus could easily be accommodated within a non-walk in style vehicle which would provide significant additional storage space for tool and equipment placement. As the cost of rescue apparatus can easily exceed the cost of a Class A pumper some discussion is required regarding the parameters of new vehicle design for the rescue truck.

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#### **5.2 Replacement for Rescue 823:**

In the opinion of EVR there are three alternatives for consideration for a replacement rescue vehicle. Each of these concepts would impact Fire Department operations and some would provide additional deployment alternatives over the current utilization of Rescue 823. Should the Fire Department desire to replace the current Rescue 823 when scheduled in 2017 the following guidelines should be followed to design and equip the vehicle:

#### **5.3 Option #1: Requirements for new Rescue:**

1. Four door custom cab with seating for seven (7) personnel
2. Wheelbase between 200 inches and 210 inches
3. Overall length between 32 feet and 34 feet
4. Overall height between 118 inches and 124 inches
5. 450 horsepower diesel engine with engine brake
6. Five speed automatic transmission
7. Disc brakes on both front and rear axles
8. Non walk in stainless steel or aluminum body with roll up doors with a minimum of 400 cubic feet of enclosed compartment space
9. All body compartments to be equipped with appropriate trays, shelves and tool boards with all hand tools mounted inside the compartments in a standard location
10. Provide a 20.0 Kw hydraulic generator equipped with a minimum of four (4) 120 volt scene lights, light tower and two (2) electric cable reels equipped with 200 feet of 10/3 cable with junction box
11. Apparatus to be equipped with a 12,000 pound rated electric front winch
12. Provide for a five scene lights 12 volt LED powered to include a cab brow light, two side cab lights and two rear body lights
13. All body compartments to be equipped with appropriate trays, shelves and tool boards with all hand tools mounted inside the compartments in a standard location
14. LED lighting should be utilized for all running and emergency lights
15. Chassis cab to provide for seating for seven (7) personnel with six (6) seats provided with SCBA equipment
16. Provide for driver's compartment mounted self contained breathing apparatus
17. Rear body compartment to accommodate a 24 foot extension ladder, 16 foot Roof ladder, 10 foot folding ladder and utility A frame ladder
18. LED lighting should be used for all running and emergency lights
19. All sides of the apparatus to have high visibility reflective graphics
20. Apparatus to have standard department lettering and graphics with unit numbers

A rescue apparatus of this style would cost approximately \$550,000 to \$600,000 dollars in current day costs. The justification for a stand alone rescue vehicle would depend upon the number of significant rescue incidents where only Port Jervis apparatus assets were operating with adequate rescue trained personnel. Examples of New York State rescue certification programs include Accident Victim Extrication, Bus Rescue, Swift Water Rescue Technician and Ice Cold Water Rescue. Any new apparatus must be complimented with adequately trained personnel to operate the vehicle at all times.

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### Apparatus and Equipment Analysis

#### **5.4 Option #2: Requirements for new Rescue Engine:**

In the future the Fire Department may have to consider a consolidation of fire company resources resulting in a reduction of engine company assets. While the department would continue to operate with four engine companies, when outfitted and equipped in accordance with the recommendations for each vehicle listed in Section 6.0 of this report would provide adequate fire suppression capabilities for the community.

A combination rescue/engine vehicle would provide a multi-purpose apparatus which could provide a number of services for the department and enable the overall fleet to be reduced by one unit. This would simplify the apparatus replacement program with an associated reduction in equipment, maintenance and testing costs for the department. A combination apparatus should be designed using the following criteria:

1. Four door custom cab with seating for seven (7) personnel
2. Wheelbase between 190 inches and 200 inches
3. Overall length between 30 and 32 feet
4. Overall height between 124 and 128 inches
5. 450 Horsepower diesel engine with engine brake
6. Five speed automatic transmission
7. Disc brakes on front and rear axle
8. 1000 gpm single stage fire pump enclosed in body using minimum compartment space
9. 400 to 500 gallon water tank with poly construction
10. Minimum of five (5) preconnected attack lines
  - a. one (1) 100 foot 1.75" trash line
  - b. two (2) 200 foot 1.75" attack line
  - c. one (1) 300 foot 1.75" attack line
  - d. one (1) 200 foot 2.50" attack line
11. Hose bed to accommodate 800 feet of 5.00" supply line
12. Apparatus body to be constructed of aluminum or stainless steel
13. Apparatus body to have roll up shutter style doors with guards
14. Apparatus body to have safe access to upper body compartments and hose bed
15. Apparatus body to have full height and depth compartments on both sides
16. Ground ladders to be mounted on inside of body or walkway with a 28 foot extension ladder, 16 foot roof and 10 foot folding ladder
17. Minimum of 20.0 Kw hydraulic generator, two electric cable reels
18. Provide for a five scene lights 12 volt powered LED to include a cab brow light, two mid-body and two rear body lights
19. All body compartments to be equipped with appropriate trays, shelves and tool boards with all hand tools mounted inside the compartments in a standard location
20. Air reel supplied with 200 feet of low pressure hose with on board 6000 PSI bottle
21. Hydraulic hose reels supplied by electric rescue tool motor
21. LED lighting should be utilized for all running and emergency lights
22. All sides of the apparatus to have high visibility reflective graphics
23. All tools and equipment are to be mounted by the factory or dealership

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **5.4 Option #2: Requirements for new Rescue Engine:**

Each of the above rescue vehicle options should include the following mechanical and safety features:

1. Full width steel reinforcement channel mounted behind the front bumper
2. Drive shaft safety guards on each section of the driveline
3. Electronic Stability Control
4. Six Group 31 batteries with a single alternator rated at 350 to 400 amps
5. Back up camera system with both rear and right side mounted cameras
6. Front windshield mounted down view mirror
7. Ready reach seat belts with orange color webbing
8. Stainless steel straps on fuel tank
9. Stainless steel battery trays and hardware

A rescue-engine apparatus as outlined above would cost in the range of \$575,000 to \$650,000 dollars in current day costs and would provide for improved fire flow delivery and enhanced safety for the operating members. The new apparatus should be designed to be a short and maneuverable as possible and should incorporate as many of the above listed bullet points as the basis for the initial design.

#### **5.5 Option #3: Requirements for used rescue:**

Another consideration would be to replace the current walk in rescue apparatus with a good quality used rescue truck. As the current rescue vehicle responds to relatively few actual incidents where technical rescue equipment is required and the number of rescue trucks that are available through mutual aid, the overall cost of the apparatus fleet could be reduced by the purchase of a well built and designed used rescue truck. The following considerations should be followed should the Fire Department initiate this option:

- Chassis and body builder are still in active operations
- Apparatus is less than 12 to 14 years old
- Apparatus is equipped with a factory built four door cab
- Seating for six personnel in an enclosed cab
- Non walk in aluminum or stainless steel body
- Detroit or Cummins Diesel engine rated at 400 horsepower
- Allison automatic transmission
- All body compartments to be equipped with slide trays, shelves and tool boards with all hand tools mounted inside of the compartments in a standard location.
- Minimum of a 20.0 Kw generator equipped with two electric rewind cable reels each with 200 feet of 10/3 cable
- Rear body compartment capable of carrying a 24 to 28 foot extension ladder, 14 to 16 foot roof ladder, 10 foot folding ladder and A-frame utility ladders
- Vehicle is equipped with LED lighting for warning lights
- Vehicle has less than 40,000 road miles
- Vehicle can pass a DOT heavy truck inspection
- Apparatus has been in service with only one fire department
- Maintenance and testing records are available for review

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### Apparatus and Equipment Analysis

#### **5.5 Option #3: Requirements for used rescue:**

A used rescue vehicle would cost approximately \$250,000 to \$300,000 dollars to acquire with an additional \$40,000 to \$60,000 dollars needed to modify and change the compartment equipment with any desired warning light and graphic upgrades. The overall cost of this option would be significantly less than either of the new vehicle options and depending upon staffing, personnel training certifications and deployment strategies could benefit both the Fire Department and City in the long run.

#### **6.0 Fleet Review and Evaluation:**

##### **6.1 Engine 821, Neversink Engine Company #1:**

This vehicle is a 1999 American LaFrance Eagle four door cab and chassis with stainless steel bodywork built by General Safety. This pumper and Engine 824 were purchased together in 1999. This apparatus is equipped with a Hale QSMG single stage 1500 gpm fire pump with a 1000 gallon water tank. The apparatus is also equipped with an Akron by pass foam system which supplies a bumper mounted 100 foot 1.50 inch attack line with a 30 gallon foam tank. Engine 821 is powered by a Detroit Series 60 diesel engine rated at 430 horsepower engine through an Allison automatic transmission. Engine 821 was built with a 198 inch wheelbase and an overall length of 32 feet.

At the time of the field inspection this unit had 29,250 road miles and 2747 engine hours accumulated. The apparatus is capable of seating eight personnel inside of the cab with seven SCBA are carried in brackets or within the individual seats. The engine is in good condition for its age with hand tools and appliances arranged well and mounted within the seven enclosed body compartments.

The chassis is equipped with a 20,000 pound rated front axle and a 27,000 pound rated rear axle and in service weights 18,680 pounds on the front and 26,380 pounds on the rear axle with eight personnel on board. The apparatus weight is within 620 pounds of the carrying capacity on the rear axle. Due to this condition no additional hose, tools or equipment should be carried on this unit. Over the past three years maintenance and repairs costs for this unit have been approximately \$16,694 dollars which far exceeds the average cost of \$10,928 dollars for the department's engine company vehicles.

Engine 821 is equipped two 1.75 inch attack lines, one 200 foot and one 250 foot in a crosslay hose bed together with 1600 feet of 5.00 inch supply line hose with a hydrant valve. The rear hose bed is outfitted with 200 feet of 3.00 inch hose, 600 feet of 2.50 inch hose and 300 feet of 1.75 inch hose. There are two rear body 2.50 inch discharges that are not utilized for preconnected lines. As currently set up the apparatus can produce only 32 percent of its rated capacity through the three preconnected hand lines. The engine is not equipped with a master stream appliance.

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The apparatus is equipped with a two section 24 foot extension ladder with a 14 foot roof and 10 foot folding ladders together with several pike poles that are enclosed inside of the body. The body is equipped with an Amps 6.0 Kw hydraulic generator and carries an assortment of fittings, appliances, hand tools, portable cable reels, smoke ejector, 1.50 inch hose packs up for standpipe work and provisions for eight spare SCBA cylinders.

#### **6.2 Engine 821 Recommendations:**

The following items are recommended to be implemented on Engine 821 to improve the safety and operational capabilities of this apparatus as well as reduce future maintenance costs:

1. The chassis frame rails, body substructure and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed.
2. Consideration should be given to removing a minimum of 400 feet of supply line from the rear hose bed in order to reduce the weight carried on the rear axle and suspension. In this regard each apparatus should continue to be weighted annually in accordance with NFPA 1911 Standard on the Inspection, Maintenance, Testing and Retirement of in Service Automotive Fire Apparatus, section 16.2.
3. The following areas in the cab are in need of repair or modifications as needed:
  - a. The left side front door is missing a positive hold open device or webbing to hold the door in the open position.
  - b. The drivers and officers front seat belts need new retractors.
  - c. The three binders and clip board on top of the engine box should be carried in a map book box or otherwise properly restrained.
  - d. Stainless steel scuff panels should be provided inside each of the four cab doors to cover the exposed ABS plastic door covering.
  - e. Reflective Scotchlite stripe material should be installed inside of each cab door panel.
4. Consideration should be given to loading a 200 foot long 2.50 inch attack line in the rear hose bed with suitable loops and a smooth bore nozzle with 1.125 inch tip, using one of the rear body 2.50 inch discharges.
4. The apparatus should be equipped with a 200 foot long 3.00 inch leader line equipped with a lightweight gated wye for use in extending hose lines in large area buildings. This line could be provided at the left rear of the body using one of the 2.50 inch discharges provided in this location.

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### Apparatus and Equipment Analysis

#### **6.2 Engine 821 Recommendations:**

5. Consideration should be given to acquiring a 500 gpm rated portable ground monitor with smooth bore tips for use in both offensive and defensive operations, similar to a Task Force Blitz Fire gun. This appliance would be supplied by the 3.00 inch leader line and could rapidly be deployed with one or two personnel.
6. The left side rear L-3 compartment door should be adjusted at the hinges as the overlap portion of these doors comes into contact causing paint damage to each door.
7. The following tools and equipment should be mounted and secured inside of the body compartments with brackets similar to those from Performance Advantage Company or Sensible Products to protect the equipment and apparatus body from damage:
  - a. Irons forcible entry tools carried in the R-3 right rear compartment.
  - b. Chain saw and disc saw carried in the R-2 right center compartment.
  - c. Brush fire equipment carried in the R-3 right rear compartment.
8. Consideration should be given to acquiring additional lightweight 1.75 inch hose for use in a standpipe pack similar to a Clemmens bag or Manhattan pack with a break apart 75 psi combination nozzle to replace the existing hose packs carried in the L-2 left side body compartment.
9. The maintenance and repair costs for this apparatus should be carefully monitored to insure that the appropriate preventative maintenance on the vehicle is being conducted. Engine 821 has required the second highest amount of funds for repairs when compared to the department's other engine apparatus. This unit should be properly maintained to insure its safe and reliable operation until the vehicle is scheduled for replacement.

#### **6.3 Summary Engine 821, Neversink Engine Company #1:**

Engine 821 should have some of the 5.00 inch supply line removed from the hose bed to alleviate a potential overloaded condition when carrying more than four personnel. Otherwise, this apparatus is in good condition for its age with most appliances, tools and equipment mounted and secured. From a water flow perspective the apparatus lacks sufficient preconnected hand lines to operate effectively and lacks any type of master stream appliance. Engine 821 would be the first new engine apparatus acquired under the adopted fleet replacement program between 2019 and 2020 and should be designed in accordance with the recommendations outlined in Section 5.1 of this report.

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### Apparatus and Equipment Analysis

#### **6.4 Engine 822, Delaware Engine Company #2:**

Engine 822 is the newest pumper in the department's fleet having been placed into service in 2007. The apparatus was built by KME with a Predator model four door raised roof cab with an enclosed top mount pump panel. The apparatus is equipped with an aluminum body and a Hale QMax single stage fire pump rated at 2000 gpm. This apparatus carries a 1000 gallon water tank and a 30 gallon foam tank supplying Foam Pro Class A foam system. Engine 822 is powered by a Caterpillar C-13 engine rated at 525 horsepower engine through an Allison automatic transmission.

This unit was built with a 202 inch wheelbase and an overall length of 32 feet 7 inches. Due to the 1000 gallon water tank and the body design the dimension from the ground to the bottom of the hose bed is 89.5 inches. Engine 822 is the only pumper in the departments fleet designed with top mount pump controls. Over a period of time this design will cause some additional maintenance and repair costs due to fire pump discharge controls and linkage to each valve.

At the time of the field inspection Engine 822 had 9241 road miles and 989 engine hours accumulated. The apparatus is capable of seating eight personnel inside of the cab with five SCBA are carried in brackets within the individual seats. This unit is the only engine in the department's fleet that has top mount pump controls and lacks any rear body discharges for use with attack lines.

The engine is in good condition for its age with hand tools and appliances generally arranged well and mounted within the seven enclosed lower body compartments. At the time of the field inspection the only equipment carried in the top body locker compartments was some brush fire hand tools. The chassis is equipped with a 21,480 pound rated front axle and a 31,000 pound rated rear axle and in service weights 20,420 pounds on the front and 25,780 pounds on the rear axle, with eight personnel on board. Over the past three years maintenance and repair costs for this unit have been nominal at approximately \$2300 dollars.

Engine 822 is equipped with a 100 foot 1.75 inch attack line on the front bumper, two 200 foot 1.75 inch and one 250 foot 2.50 inch attack lines carried in a crosslay hose bed. The rear hose is outfitted with 1100 feet of 5.00 inch hose and 400 feet of 3.00 inch hose, with 200 feet of this line attached to a hose bed discharge. The apparatus can produce 38 percent of its rated capacity through the four preconnected attack lines. The engine carries a preconnected deck gun mounted above the pump equipped with a fog nozzle. The rear body of the apparatus is provided with a 5.00 inch large diameter discharge in the upper right corner of the body.

The apparatus is equipped with a two section 24 foot extension ladder with a 14 foot roof and 10 foot folding ladders together with several pike poles that are enclosed within the body. The body is equipped with six side facing compartments carrying an assortment of fittings, appliances, hand tools, extinguishers, hinged tool boards, electric cable reel, portable generator and 7.5 Kw Fabco hydraulic generator.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.5 Engine 822 Recommendations:**

The following items are recommended to be implemented on Engine 822 to improve the safety and operational capabilities of this apparatus as well as reduce future maintenance costs:

1. The door gaskets at the bottom of all Robinson roll up shutter door at the rear body should be replaced with new gasket material to prevent dirt and road debris from entering the body compartment.
2. The chassis frame rails, body substructure and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed. Rust and corrosion was noted on the chassis air reservoirs, frame rails and fuel tank straps. The diesel fuel tank straps should be replaced with stainless steel or other non-rusting material. Straw and other debris was noted in the pump heat pan.
3. In accordance with NFPA 1911 Standard on the Inspection, Maintenance, Testing and Retirement of In Service Automotive Fire Apparatus, section 16.2 each apparatus in the departments fleet should be continue to be weighted annually on the front and rear axles individually as well as the entire apparatus to insure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
4. The chassis air reservoirs should be periodically drained to remove water and accumulated material from the chassis brake system.
5. A stream shaper and smooth bore tips should be provided on the top mounted deck gun and to improve stream reach and penetration during master stream operations.
6. The clipboard and thermal imaging camera presently carried on top of the engine box should be properly secured with 9G rated brackets and hardware.
7. The web straps and door stays for the driver's and officer's doors should be replaced to allow the doors to open close to ninety degrees to improve egress into the cab.
8. Each of the chassis air reservoirs should be fitted with manual drain valves with stainless steel pull cables extended to the side of the body to permit personnel to bleed moisture from the air brake system on a regular basis. This feature should be provided on all future apparatus.
9. All attack line should be provided with smooth bore nozzles and loaded to enable one person to stretch and advance the handline.
10. The rear 3.00 inch hose bed should be set up to provide for 200 feet of hose with a lightweight gated wye and suitable loops or webbing used to allow one person to advance the leader line from the apparatus.

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### Apparatus and Equipment Analysis

#### **6.5 Engine 822 Recommendations:**

11. The two upper body rear compartments for the hard suction hose should have the rubber gasket material for the doors replaced to reduce the dirt and debris in these compartments.
12. The air bottle modules mounted in the cab compartments are rusted and should be replaced with poly or other non-marring modules.
13. Surface rust and corrosion in the cab compartments and rear body compartment under the slide tray should be cleaned and restored as required. The slide tray hardware should be mounted on poly material to isolate the steel components from the aluminum body.
14. The electric valves controlling the two side 6.00 inch suction inlets, deck gun and two large diameter discharges should be exercised and operated on a regular basis to insure their safe and proper operation.
15. The two flip down seats at the rear of the cab should be removed as they do not provide any back or head rest support in the event of an accident and are only equipped with lap style seat belts.

#### **6.6 Summary Engine 822, Delaware Engine Company #2:**

This engine is in mainly good condition with the exception of the noted corrosion on the chassis frame area, SCBA bottle modules and the deteriorated door seal on the roll up shutter door. This apparatus should be replaced in between 2030 and 2031 and would be the last pumper to be designed and placed into service to match the other standardized engine units in the Port Jervis Fire Department fleet.

#### **6.7 Engine 824, Howard Wheat Engine Company #4:**

Engine 824 is a 1999 American LaFrance Eagle four door cab and chassis with stainless steel bodywork built by General Safety and equipped with a 54 foot articulating water tower known as a Squirt. The vehicle is equipped with a Hale QSMG single stage 1500 gpm fire pump with a 650 gallon water tank and an Akron 95 gpm by pass foam system with a 30 gallon tank piped to the front crosslay. Engine 824 is powered by a Detroit Series 60 diesel engine rated at 430 horsepower engine through an Allison HD-4060P automatic transmission. This apparatus is built on a 208 inch wheelbase chassis with and an overall length of 34 feet.

At the time of the field inspection this unit had 25,185 road miles and 2214 engine hours accumulated. The apparatus is capable of seating eight personnel inside of the cab with seven SCBA are carried in brackets or within the individual seats. The engine is in good condition for its age with most hand tools and appliances arranged well and mounted within the six enclosed body compartments.

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### Apparatus and Equipment Analysis

#### **6.7 Engine 824, Howard Wheat Engine Company #4:**

The chassis is equipped with a 20,000 pound rated front axle and a 31,000 pound rated rear axle and in service weights 18,650 pounds on the front and 27,140 pounds on the rear axle with eight personnel on board. The weight of the Sqrut device required a heavier rear axle than Engine 821 and due to the rear mounted position of the pedestal the weight of the Sqrut offloads some of the front axle weight on the vehicle. During the past three years maintenance and repair costs have been approximately \$10,615 dollars.

Fire attack capabilities are provided by a bumper mounted 150 foot 1.75 inch trash line and two 200 foot long 1.75 inch lines in crosslay hose beds, one equipped with a smooth bore nozzle and one equipped with a variable gallonage combination nozzle. The rear hose bed is outfitted with 750 feet of 5.00 inch hose in split beds, together with a preconnected 200 foot long, 2.50 inch attack line equipped with a combination fog nozzle. Also carried in the rear hose bed is 100 feet of 3.00 inch hose and a Cleveland load of 1.75 inch hose for standpipe work. Engine 824 can produce 50 percent of its rated capacity through the four preconnected hand lines. The engine is not equipped with a portable master stream appliance other than the Sqrut which is rated for 1000 gpm.

The apparatus is equipped with a two section 24 foot extension ladder with a 14 foot roof and 10 foot folding ladders together with three pike poles that are enclosed inside of the body. The body compartments are equipped with a Honda 5000 watt generator that can power the cab and Sqrut boom mounted quartz lighting. The engine carries an assortment of appliances, hand tools, portable pump, chain saw, eight spare SCBA bottles and a hinged tool board. Electric valves are installed on the front suction, right side LDH discharge and the water tower discharge. The rear hose bed measures 83.00 inches from the ground to the bottom of the hose bed.

#### **6.8 Engine 824 Recommendations:**

The following items are recommended to be implemented on Engine 824 to improve the safety and operational capabilities of this apparatus as well as reduce future maintenance costs:

1. The chassis frame rails, body substructure and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed.
2. All apparatus in the department's fleet should continue to be weighted annually in accordance with NFPA 1911 Standard on the Inspection, Maintenance, Testing and Retirement of in Service Automotive Fire Apparatus, section 16.2.
3. The following areas in the cab are in need of repair or modifications as needed:
  - a. Positive door straps are needed on both the drivers and officers cab doors to hold the door in the open position.
  - b. The landing zone kit and box carried on the cab floor should be located and secured inside of the cab compartment.

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#### **6.8 Engine 824 Recommendations:**

- c. Stainless steel scuff panels should be provided inside each of the four cab doors to cover the exposed ABS plastic door covering.
  - d. Reflective Scotchlite stripe material should be installed inside of each cab door panel.
  - e. The flat head axe carried in the right rear R-3 body compartment should be properly secured and mounted with suitable brackets and stainless steel hardware.
4. The rear 2.50 inch attack line should be loaded with suitable loops and a smooth bore nozzle with 1.125 inch tip to enable one person to stretch and advance the hose line from the apparatus.
  5. The two 1.75 inch crosslay hose beds should be provided with smooth bore nozzles and loaded with suitable loops to enable one person to stretch and advance the line.
  6. The 5.00 inch hose carried at the left side rear of the apparatus body should be provided with webbing, short pony section and hydrant fittings to permit personnel to lay a supply line without having to climb onto the body.
  7. The 5.00 inch pony section of hose carried on the shelf in the right front R-1 body compartment should be relocated to a stainless steel hose well that should be provided at the right side pump panel.
  8. Consideration should be given to providing for either a piston intake relief valve or gated 6.00 inch x two-2.50 inch siamese for the right side pump suction inlet. This pump intake currently is only provided with a blind cap.
  9. Consideration should be given to acquiring a 500 gpm rated portable ground monitor with smooth bore tips for use in both offensive and defensive operations, similar to a Task Force Blitz Fire gun. This appliance would be supplied by the 3.00 inch leader line and could rapidly be deployed with one or two personnel.
  10. Additional reflective Scotchlite material should be provided and installed at the rear of the apparatus body across the face of the upper portion of the compartments.
  11. The electric valves controlling the front suction inlet, large diameter discharge and the Squirt water tower discharge should be exercised and operated on a regular basis to insure their safe and proper operation.
  12. The front trash line should be loaded in a manner other than a flat load to permit one person to stretch and advance the line without kinks. The hose should be secured in the well with heavy black webbing or an automotive style seat belt.

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### Apparatus and Equipment Analysis

#### **6.9 Summary Engine 824, Howard Wheat Engine Company #4:**

Engine 824 overall is in good condition, however the current attack line compliment and hose loads limits its effectiveness. Minor changes following the recommendations for this apparatus would improve the safety and operational readiness of this apparatus. The Sqrut device limits the ability to provide additional attack and leader lines in the hose bed area. While the device may have some merit with respect to exterior master stream operations this appliance is no longer being produced and therefore the eventual replacement for Engine 824 should follow the engine company design noted in Section 5.1.

For whatever reason both Engines 821 and 824 when acquired by the department was not provided with fixed or portable master stream appliances. Reliance on elevated master stream devices such as ladder pipes and water towers requires effective and efficient initial placement of the apparatus at the incident scene. Using portable monitors which can be rapidly deployed with minimum staffing up to 250 feet from the apparatus are a much more effective method of developing heavy streams during major incidents. With the close proximity of mutual aid tower ladders and aerial platforms the need for a stand alone water tower is not deemed necessary.

Future engine company apparatus should be equipped with both a fixed deck gun appliance above the fire pump as well as a portable Blitz Fire or tailboard mounted portable appliance. This vehicle should be replaced between 2022 and 2023 in accordance with either of the fleet replacement options.

#### **6.10 Engine 825, Excelsior Engine Company #5:**

Engine 825 is a 2005 Seagrave Marauder four door raised roof cab with seating for ten personnel. The cab and body are constructed of stainless steel with a two stage Waterous fire pump rated at 2000 gpm. This apparatus carries a 750 gallon water tank with two 40 gallon foam tanks supplying Foam Pro 2001 foam system. Engine 825 is powered by a Detroit Diesel Series 60 engine rated at 430 horsepower engine through an Allison automatic transmission. This unit was built with a 216 inch wheelbase and an overall length of 32 feet 9 inches. Due to the body design with full depth compartments the dimension from the ground to the bottom of the hose bed is 88 inches. At the time of the field inspection Engine 825 had 10,343 road miles and 1358 engine hours accumulated. The apparatus is capable of seating ten personnel inside of the cab with nine SCBA are carried in brackets within the individual seats each with a padded backrest panel.

The engine is in mainly good condition for its age with hand tools and appliances generally arranged well and mounted within the seven lower body compartments. The equipment carried in the left side top locker compartment was not mounted with several pieces including a chain saw, low level strainer and pike poles carried loose in this area. The Seagrave is equipped with a 21,500 pound rated front axle and a 27,000 pound rated rear axle and in service would weight 21,840 pounds on the front and 26,620 pounds on the rear axle, with ten personnel on board. This would put the apparatus into an overloaded condition on the front axle by 340 pounds with the rear axle within 380 pounds of its rated capacity.

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#### **6.10 Engine 825, Excelsior Engine Company #5:**

Engine 822 is equipped with a 100 foot 1.75 inch attack line on the front bumper, two 200 foot 1.75 inch and one 200 foot 2.50 inch attack lines carried in a crosslay hose bed that is only open on the right side of the apparatus pump panel. The rear hose is outfitted with 1000 feet of 5.00 inch hose, 300 feet of 2.50 inch hose and 300 feet of preconnected 1.75 inch hose. The apparatus can produce 47 percent of its rated capacity through the five preconnected attack lines. The engine is not equipped with a top mounted master stream appliance. A Task Force Blitz Fire portable monitor is carried inside of a body compartment without any tips or nozzle. The rear body of the apparatus is provided with a 5.00 inch large diameter discharge in the upper left hand corner of the body.

The apparatus is equipped with a two section 24 foot extension ladder with a 14 foot roof and 10 foot folding ladders together with a Little Giant utility ladder and several pike poles mounted on a right side hydraulic ladder rack. The body is equipped an assortment of fittings, appliances, hand tools, extinguishers, tool boards, electric cable reel, portable pump, 15 Kw Harrison hydraulic generator and cab roof mounted light tower.

When placed into service this apparatus was outfitted with many options including the extended raised roof cab, 5.00 inch rear intake and discharge, dual agent foam system, ten person seating and a light tower. During the past three years this vehicle has been the most expensive unit to maintain in the departments fleet at a cost of \$18,865 dollars. Additionally during May, 2013 foam system repairs completed by Hopewell Fire Apparatus Service cost \$8361 dollars on this unit.

#### **6.11 Engine 825 Recommendations:**

The following items are recommended to be implemented on Engine 825 to improve the safety and operational capabilities of this apparatus as well as to minimize future maintenance costs:

1. Two (2) of the center mounted rear facing seats should be removed from the apparatus to prevent a possible overloading condition on the front axle.
2. Due to the current weight of the apparatus no additional tools or equipment should be carried on the vehicle as the rear axle is within 380 pounds of the axle rating.
3. The chassis frame rails, body substructure and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed.
4. In accordance with NFPA 1911 Standard on the Inspection, Maintenance, Testing and Retirement of In Service Automotive Fire Apparatus, section 16.2 each apparatus in the departments fleet should be continue to be weighted annually on the front and rear axles individually as well as the entire apparatus to insure that the unit is within the vehicle weight ratings as supplied by the manufacturer.

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#### **6.11 Engine 825 Recommendations:**

5. All equipment including portable radios, thermal imaging gear and map books should be properly mounted and secured in the cab with 9G rated brackets.
6. The turnout gear carried inside of the crew cab and body should be removed from the apparatus and secured in the fire station to enable personnel to don all protective gear before boarding on the apparatus.
7. The padded parade panels on each of the SCBA equipped seats should be removed from the apparatus.
8. Each of the chassis air reservoirs should be fitted with manual drain valves with stainless steel pull cables extended to the side of the body to permit personnel to bleed moisture from the air brake system on a regular basis. This feature should be provided on all future apparatus.
9. All preconnected attack lines should be provided with smooth bore nozzles and loaded with suitable loops to enable one person to stretch and advance the handline without having to climb onto the apparatus body.
10. One of the rear body hose beds should be equipped with 200 feet of 3.00 inch hose with a lightweight gated wye and suitable loops or webbing used to allow one person to advance the leader line from the apparatus.
11. All equipment carried in the top body locker compartment should be properly mounted and secured with 9G rated non-marring brackets or removed from the apparatus.
12. The two Paratech halligan tools carried in the right side cab compartment should be removed from service and replaced with single piece; drop forged forcible entry tools similar to a Fire Hooks Unlimited Pro Bar.
13. Each of the side 6.00 inch pump intakes should be provided with 6.00 inch NST female x 5.00 inch storz adapters with storz cap and retainer chain to enable a supply line to be attached to these intakes.
14. All air operated and electric valves on the fire pump should be exercised and operated on a regular basis to insure their safe and proper operation.
15. Nylon spacers should be provided and installed under all floor mounted Slidemaster slide trays to isolate the steel components from the stainless steel floors on the compartment body.
16. All adapters, fittings and appliances mounted on the pull out tool boards in the left front body compartment should be labeled for their location and type of appliance.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.12 Summary Engine 825, Delaware Engine Company #2:**

This engine is in mainly good condition, however has been the source of extensive repair and maintenance costs for the past several years. The apparatus is subject to overloading due to the ten person seating and amount of equipment carried. This apparatus should be replaced in between 2027 and 2028.

#### **6.13 Engine 826, Tri-States Hose Company #6:**

The Tri-States Hose Company is assigned a 2002 Pierce Lance four door raised roof cab apparatus that operates as Engine 826. This apparatus was built with an aluminum cab and body with a Hale QMax 2000 gpm single stage fire pump, 1000 gallon water tank and 30 gallon foam tank. A Foam Pro 2001 A proportioning system is piped to the front trash line and one crosslay hose bed. The apparatus is powered by a Detroit Series 60 engine rated at 430 horsepower engine through an Allison HD-4060P automatic transmission. This unit was built on a 226 inch wheelbase and an overall length of 33 feet 6 inches making this the longest pumper in the department's fleet. Due to the 1000 gallon water tank and the rear body design the dimension from the ground to the bottom of the hose bed is 94.25 inches high making access to the this area very difficult.

The engine is equipped with several options that are rarely seen on engine company apparatus. The rear body has a 20,000 pound rated hydraulic winch which is a component occasionally seen on a heavy rescue. The apparatus carries no specific rescue equipment or shoring material which would be required when using this piece of equipment. The fire pump panel has indicator lights with switches for each of the three right side pump panel discharges and the two rear body discharges with "OK to charge line" tags. Undoubtedly this was an expensive component to provide on the apparatus and would be rarely utilized for any practical purpose.

At the time of the field inspection Engine 826 had 15,430 road miles and 1493 engine hours accumulated. The condition of the apparatus at this time indicated that it was poorly cared for at the entire vehicle was dirty to the point that the compartments with roll up shutter doors had dirt intrusion and the right rear inside dual tire was flat and not attached to the steel rim.

The apparatus is capable of seating ten personnel inside of the cab with nine SCBA are carried in brackets within the individual seats. There were four sets of loose turnout gear in the rear cab making any access to this area problematic and unsafe. Eight additional sets of turnout gear are carried in plywood modules at the left and right side middle body compartments.

Overall the apparatus is in need of through cleaning and detailing with some rust noted of the steel body sub-structure. The engine is in fair condition for its age with hand tools and appliances generally arranged well and mounted within the thirteen cab and body compartments, however the lower body compartments equipped with the roll up shutter doors are very dirty. The chassis is equipped with a 22,800 pound rated front axle and a 31,000 pound rated rear axle and in service weights 21,320 pounds on the front and 29,220 pounds on the rear axle when carrying ten personnel.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.13 Engine 826, Tri-States Hose Company #6:**

Engine 826 is equipped with an accordion loaded 100 foot 1.75 inch attack line on the front bumper, two 200 foot 1.75 inch and one 150 foot 3.00 inch attack lines carried in a crosslay hose bed. One of the 1.75 inch attack lines is equipped with a smooth bore nozzle; all other lines are equipped with a combination fog nozzle. The rear hose is outfitted with 1450 feet of 5.00 inch hose with a hydrant assist valve and two hose beds carrying 500 feet of 3.00 inch hose and 400 feet of 1.75 inch hose, each with combination fog nozzles that are not preconnected to any discharge. A right side pump panel hose well carried 100 feet of 1.00 inch forestry hose and the rear body compartment carries a 200 foot long booster reel.

With the current hose load configuration on this apparatus Engine 826 can produce 41 percent of its rated capacity through the five preconnected lines, including the forestry line. The fire pump was piped with a 3.00 inch deck gun discharge but due to the overall height of the station apparatus bay the master stream appliance cannot be mounted on the discharge. The rear body of the apparatus is provided with a 2.50 inch and a 5.00 inch large diameter discharges with neither one utilized for additional preconnected lines.

The apparatus is equipped with a two section 24 foot extension ladder with a 14 foot roof and 10 foot folding ladders together with four pike poles that are enclosed within the body. The body compartments carry an assortment of adapters, appliances, forcible entry tools, electric cable reel, smoke ejector with an Amps 6.0 Kw hydraulic cable reel.

Engine 826 is limited by the lack of sufficient preconnected attack lines and that the pumper does not carry any 2.50 inch hose for use as heavy stream lines. While unit staffing will be reviewed as a part of Phase Two of the fire protection study it is unlikely that any fire department is capable of operating with sufficient staffing to stretch and deploy 3.00 attack lines.

There are several safety issues with this apparatus beyond the physical state of readiness found in March during the field review. Carrying turnout gear inside of the cab is not only dangerous but encourages personnel to attempt to don protective gear while the apparatus is in motion. Additionally the rear body while equipped with a Back Stop safety device there are several components installed on the vertical surface of the body including tripod scene lights and the booster reel rollers. Access to the rear hose bed is problematic due to the design of the rear body compartments with series of fold down steps.

#### **6.14 Engine 826 Recommendations:**

The following items are recommended to be implemented on Engine 826 to improve the safety and operational capabilities of this apparatus as well as reduce future maintenance costs:

1. The door gaskets at the bottom of all roll up shutter doors on the left and right side lower compartments and the rear body should be replaced with new gasket material to prevent dirt and road debris from entering the body compartments.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.14 Engine 826 Recommendations:**

2. The chassis frame rails, body substructure and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed. Rust and corrosion was noted on the steel body sub-structure and chassis components.
3. In accordance with NFPA 1911 Standard on the Inspection, Maintenance, Testing and Retirement of In Service Automotive Fire Apparatus, section 16.2 each apparatus in the departments fleet should be continue to be weighted annually on the front and rear axles individually as well as the entire apparatus to insure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
4. The chassis air reservoirs should be periodically drained to remove water and accumulated material from the chassis brake system.
5. Each of the chassis air reservoirs should be fitted with manual drain valves with stainless steel pull cables extended to the side of the body to permit personnel to bleed moisture from the air brake system on a regular basis. This feature should be provided on all future apparatus.
6. The front trash line should be loaded in a manner to allow one personnel to stretch and advance the line from the apparatus without kinks.
7. All 1.75 inch crosslay attack lines should be provided with smooth bore nozzles and loaded with suitable loops to allow one person to stretch and advance the line from the apparatus.
8. The 150 feet of 3.00 inch hose carried in the crosslay bed should be replaced with 200 feet of 2.50 inch hose and 1.125 inch smooth bore nozzle with loops on each side to enable one person to stretch and advance the line from the apparatus.
9. The rear 3.00 inch hose bed should be set up to provide for 200 feet of hose with a lightweight gated wye and suitable loops or webbing used to allow one person to advance the leader line from the apparatus.
10. The turnout gear should be immediately removed from inside of the crew cab and should be maintained in gear lockers provided in the fire station to allow personnel to don all protective gear before boarding on the engine.
11. The door rubber on the three side body extinguisher compartments should be replaced and each of these storage compartments should be thoroughly cleaned.
12. The open areas in the rear wheel well area exposing the steel water tank cradle should be filled in and covered to protect this area from corrosion and salt intrusion.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.14 Engine 826 Recommendations:**

13. The Paratech halligan tool carried in the left side cab compartment should be removed and replaced with a single piece forged halligan tool similar to Pro-Bar.
14. Consideration should be given to replacing several of the rear fold down steps with aluminum tread plate fixed steps with non-slip surfaces.
15. The mounting and placement of the rear body Back Stop device should be spaced away from the body to fully protect all of the components and accessories that are mounted in this area.
16. The rear body 20,000 pound hydraulic winch on the apparatus should not be utilized under any circumstances until the chief officers of the department can verify the certified training levels and experience of members who have access to this equipment.
17. The K-tool carried with the forcible entry hand tools is missing the two key lock tools.
18. The hydrant bag carried on the rear of the apparatus does not carry any adapters or hydrant gates and at the time of the inspection had only a hydrant wrench, hose strap and spanner wrench. Fittings and adapters such as two hydrant gates, storz fittings and webbing material attached to the supply line should be carried.
19. All tools and equipment carried inside of the cab should be properly secured with 9G rated brackets or located and mounted inside of a cab or body compartment.

#### **6.15 Summary Engine 826, Tri-States Hose Company #6:**

Engine 826 is in fair condition considering that it was built in 2002 and has apparently not been properly cared for by fire company personnel. The size and configuration of this pumper does not lend itself to compliment department operations due to the lack of preconnected hand lines and master stream appliance capabilities. Depending upon the options chosen by the Fire Department for the fleet replacement plan this pumper could be slated for eventual replacement during 2025 when the current unit would be twenty three years old.

Other alternatives including a combination rescue/engine or potential reduction in the number of engine apparatus in the department's fleet will largely depend upon the detailed analysis of the individual fire apparatus responses and unit staffing which will be conducted in the near future, well in advance of any planned new, replacement vehicles.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.16 Truck 827, Maghogomock Hook and Ladder Company #1:**

Truck 827 was acquired during 1989 to replace a 1969 Maxim 100 foot midship aerial ladder. This unit is a Pierce Arrow four door tandem axle chassis equipped with a 105 rear mounted aerial ladder carrying a Waterous 300 gpm booster pump with a 200 gallon water tank. The chassis cab and body are constructed of aluminum with a wheelbase of 228.50 inches and an overall length of 40 feet 10 inches. The apparatus is powered by a Detroit Diesel 8V-92TA engine rated at 475 horsepower through an Allison HT-740 automatic transmission.

The apparatus is capable of seating seven personnel in the cab with three seats provided with self contained breathing apparatus. Truck 827 is equipped with front axle rating of 16,500 pounds with a rear axle rating of 44,000 pounds.

At the time of the field survey the apparatus had 23,273 road miles and 2888 engine hours accumulated. The aluminum body is equipped with sixteen enclosed compartments which carry an assortment of hand tools, ventilation saws, fans, salvage equipment, electric cable reel and a 6.0 Kw diesel generator. The fire pump supplies a 200 foot booster reel and no other attack lines. Three compartments were dedicated to carrying turnout gear which was partially empty at the time of the field work as new gear lockers were being constructed in the fire station. Any new apparatus should not be designed to carry personnel protective gear as members should don this equipment prior to boarding the apparatus.

A total of 181 feet of portable ground ladders are carried including one 35 foot, two 30 foot and one 24 foot extension ladders together with 14 and 16 foot roof ladders, 8 foot and a 10 foot folding ladders. One 14 foot roof ladder is carried on the fly section of the tower with an eight foot pike pole. The current aerial ladder has a rated tip load of 400 pounds with a maximum horizontal reach of 100 feet.

As previously identified in the November, 2012 ladder truck replacement report this vehicle had exceeded its useful life expectancy. Average maintenance costs for the ladder truck since 2004 have been approximately \$6446 dollars per year. Since 2010 the average maintenance costs has increased to \$16,753 dollars annually due to problems with the diesel engine, aerial hydraulic system and various electrical issues. Over the past three years the approximate total cost of this repair work has been \$50,260 dollars. Maintenance and repair costs for this vehicle for the past two years have been \$46,571 dollars with \$29,054 dollars paid during 2011.

Since that time the City of Port Jervis has awarded a contract for a new 109 foot rear mounted aerial ladder with an anticipated delivery during the first part of 2014. The current ladder truck has an established trade in value of \$25,000 dollars which is contingent upon current aerial ladder certification and maintaining the vehicle in its current operable condition. The following recommendations are offered to properly maintain the vehicle for its safe operation until the new ladder truck is delivered to the Fire Department.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.17 Truck 827 Recommendations:**

The following recommendations should be initiated immediately and be completed during the coming year to improve the safety and operational capabilities of Truck 827:

1. The aerial ladder and ground ladders should continue to be tested by an outside testing company with a current certification provided at the time of trade in of the ladder truck.
2. The chassis frame rails, body substructure and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed. Rust was noted on the underside of the body at the steel sub-structure and the radiator needs to be cleaned of road dirt and debris.
3. In accordance with NFPA 1911 Standard on the Inspection, Maintenance, Testing and Retirement of In Service Automotive Fire Apparatus, section 16.2 each apparatus in the departments fleet should be continue to be weighted annually on the front and rear axles individually as well as the entire apparatus to insure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
4. The chassis air reservoirs should be periodically drained to remove water and accumulated material from the chassis brake system.
5. The rear body ground ladder roll up door should be adjusted as it is difficult to open and close.
6. The combination fog nozzle carried on the aerial waterway should be replaced with a stream shaper and smooth bore tips.

#### **6.18 Summary Truck 827, Maghogomock Hook and Ladder Company #1:**

The ladder truck should be maintained by the Fire Department to insure its safe operation until the apparatus is traded in with the acceptance and training on the new 109 foot rear mounted ladder truck. The new apparatus will have many features and safety enhancements which will require all members to undergo extensive training on the placement and operation of the new vehicle.

#### **6.19 Rescue 823, Fowler's Rescue and Salvage Company #3:**

Rescue 893 is a 1994 Duplex D-9400 door raised roof cab and chassis with a walk in aluminum body constructed by Saulsbury. The rescue vehicle cab has the capability of carrying eight personnel with the walk in portion of the body carrying an additional six personnel on a side facing bench seat. The apparatus is powered by a Detroit Series 40 diesel engine rated at 300 horsepower though an Allison model MD-3060PR automatic transmission. The rescue truck is built with a 200 inch wheelbase with an overall length of 33 feet 5 inches.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.19 Rescue 823, Fowler's Rescue and Salvage Company #3:**

At the time of the field survey the apparatus had 23,270 road miles and 1344 engine hours accumulated. Since the unit was placed into service the rescue truck has averaged 1224 miles per year. The front axle rating on Rescue 823 is 18,000 pounds with a rear axle rating of 24,000 pounds. The current in service weights for this unit are 15,800 pounds on the front and 20,660 pounds on the rear axle without personnel. When fully loaded with personnel the vehicle would weight approximately 17,800 pounds on the front axle and 22,160 pounds on the rear axle.

With all seats filled in the cab the rescue apparatus would be within 200 pounds of the front axle rating. For this reason the two fold down seats on the rear wall of the cab should be removed. Maintenance costs for this unit, excluding tool and equipment repairs have totaled approximately \$7000 dollars over the past three years. The rescue truck has moderate rust and corrosion on the battery trays and the driver's side door jamb on the cab. The chassis frame rails, radiator and components exhibit moderate signs of rust and corrosion.

The apparatus is equipped with a Lima 24.0 Kw PTO driven generator, two electric cable reels, air reel, hydraulic reels together with an assortment of shoring blocks and front mounted 12,000 pound electric winch. Other equipment carried includes power saws, forcible entry tools, rescue struts and portable lighting. Water rescue equipment is stored inside of the body along with a stokes basket, backboards, turnout gear and some hand tools.

Like Truck 827 the rescue carries a 300 gpm booster pump with a 200 gallon water tank and also carries a six bottle air cascade, enclosed fill station with a Sierra air booster. The fire pump supplies a 200 foot booster reel and a 2.50 inch panel mounted discharge with 100 feet of 1.50 inch preconnected hand line. With the number of engine apparatus in the department's fleet there is no need to provide a booster pump and water tank on any future stand alone rescue apparatus.

There are several options for the replacement of this apparatus as detailed in Section 5.0 of this report. The eventual replacement for Rescue 823 is programmed for 2017 when the current vehicle would be twenty three years old. Future recommendations based upon fire company responses and staffing levels will assist the Fire Department in determining the appropriate course of action with respect to the next planned apparatus acquisition.

There are a number of issues with the current vehicle which should be addressed as the rescue truck will have to continue to provide several years of front line service prior to its replacement. Over the life cycle of any rescue squad or combination rescue apparatus equipment technology in the areas of hydraulic rescue tools, stabilization jacks and other technical rescue gear will change dramatically. For this reason rescue vehicles seldom wear out due to use and duty cycle, but generally become overweight with no additional room to expand the tool and equipment inventory on the apparatus. The current rescue truck is not currently equipped to operate as a heavy rescue and given the low frequency of rescue incidents the requirement for a fully outfitted rescue squad cannot be justified at this time.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.20 Rescue 823 Recommendations:**

The following items are recommended to be implemented on Rescue 823 to improve the safety and operational characteristics of this apparatus:

1. The chassis battery trays under the cab should be replaced due to heavy rust and corrosion.
2. The chassis frame rails and body sub-structure should be steam cleaned with the surface rust and corrosion removed where possible from the brake system air tanks, fuel tank and straps and other areas as needed.
3. The seat belts and retractors for both the driver's and officer's cab seats should be replaced as the current belts and components are frayed and worn.
4. In accordance with NFPA 1911 Standard on the Inspection, Maintenance, Testing and Retirement of In Service Automotive Fire Apparatus, section 16.2 each apparatus in the departments fleet should continue to be weighted annually on the front and rear axles individually as well as the entire apparatus to insure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
5. The chassis air reservoirs should be periodically drained to remove water and accumulated material from the chassis brake system.
6. Each of the chassis air reservoirs should be fitted with manual drain valves with stainless steel pull cables extended to the side of the body to permit personnel to bleed moisture from the air brake system on a regular basis. This feature should be provided on all future apparatus.
7. All tools and equipment carried in the exterior body compartments should be secured and mounted with appropriate 9G rated non-marring brackets similar to those available from Performance Advantage Company and Sensible Products. All shelves and trays should be labeled to indicate the tool type and location.
8. Inside of the rescue body the stokes basket and backboards need to be secured over the left side deck with heavy cargo netting or seat belts.
9. The three SCUBA bottles and equipment carried at the inside front of the rescue body need to be properly secured with heavy cargo netting held in place with seat belts.
10. The aluminum module at the inside front of the rescue body need to be properly secured with heavy cargo netting held in place with seat belts.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.20 Rescue 823 Recommendations:**

11. All Paratech brand halligan tools should be removed from the rescue truck and replaced with a steel, single piece forged tool similar to a Fire Hooks Unlimited Pro Bar tool.
12. All of the exterior body compartments should be thoroughly cleaned of all dirt and debris.
13. All turnout gear should be removed from the apparatus and stored in appropriate lockers in the fire station.
14. The two fold down seats at the rear wall of the Duplex cab should be removed in order to reduce the potential for overloading of the front axle weight rating.

#### **6.21 Summary Rescue 823, Fowler's Rescue and Salvage Company #3:**

This apparatus is in fairly good condition for its age with the noted rust and corrosion issues and safety related concerns on the interior of the rescue body. As needed, several compartments can be reconfigured to provide space for any additional rescue tools that may be acquired including additional shoring blocks and forcible entry tools.

#### **6.22 Support Vehicles:**

The Fire Department operates several command vehicles for each of the three chiefs with Dodge picky ups acquired in 2004 and 2012 together with a 2012 Ford Expedition assigned to Car One. A former chief's vehicle 2003 Ford Expedition is housed at Station 5 and assigned for use by the Fire Police. A 1972 twenty two foot Boston Whaler together with a smaller 2006 Rescue One jet boat are maintained and utilized by department personnel.

There are no specific recommendations for replacement of the remaining support vehicles and should be integrated into the overall fleet replacement program based upon available funding and access to vehicles using the New York State bid contracts. The cost of acquisition and maintenance of these vehicles are justified so long as they are assigned and deployed in a prudent manner to support the necessary incident responses and training activities.

The Fire Department fleet lacks any type of utility vehicle that could be utilized to support fire ground incidents, hose replacement, water rescue, standbys and as a personnel carrier. Consideration should be given to developing a multi-purpose vehicle that could also be equipped for fire police duties to replace the 2003 Ford Expedition when required. In addition the utility could be designed to tow the various boat and technical rescue trailers as needed once personnel are qualified on the driving and operation of this equipment.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **6.22 Support Vehicles:**

At the time when the fire police vehicle should be replaced, consideration could be given to replacing the vehicle with a unit having the following features:

- Current model year Ford F-550 four door cab chassis with four wheel drive
- Composite body with hinged doors, poly or fiberglass construction
- Seating for five personnel
- Minimum of six enclosed body compartments
- Carrying capability for SCBA, forcible entry tools and extinguishers with all equipment mounted and secured
- All LED warning lights
- 12 volt LED scene lighting
- High visibility graphics and stripping
- All body components and accessories to be constructed of composite, non-rusting material
- Vehicle chassis and underbody to be undercoated

The chassis and potentially the compartment body could be acquired thru the New York State contract with considerable savings to the department. The balance of the vehicle outfitting could be accomplished by a local fire apparatus repair facility whose workmanship levels would be appropriate for this type of apparatus.

#### **7.0 Fleet Replacement Overview:**

There are several strategies for the City of Port Jervis and the Fire Department to consider with respect to the apparatus replacement program. Moving forward the City must work towards a reasonable financial plan to space out the acquisition of each apparatus by allowing for an average of three years in between each major piece of equipment.

As the present fleet of engine apparatus was acquired with two units in 1999 and one pumper each during 2002, 2005 and 2007 this schedule of apparatus purchases while it provided for a modern, up to date fleet at one point in time, further complicated the future planning to allow for sufficient financial resources to be available for the new, replacement vehicles.

The past issues surrounding the purchase and acquisition of a new ladder truck which is currently twenty five years old is an example of why a standardized and planned approach to the replacement cycle for fire apparatus needs to be implemented. Based upon the current apparatus fleet a front line service life of twenty to twenty one years is appropriate. While an extended life cycle for individual vehicles may be achieved, this comes at a cost including increased maintenance and repair costs as noted with Truck 827. Since 2010 the City has expensed over fifty thousand dollars to keep the vehicle in service which more than exceeded the trade in value for the apparatus.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **7.0 Fleet Replacement Overview:**

Given the present condition and mileage on each piece of apparatus there would be a reasonable degree of confidence barring a major accident that the existing engine and rescue apparatus can provide for a twenty year life cycle required to allow the City of Port Jervis to adequately fund the apparatus replacement program. The replacement apparatus should follow one of the recommended options outlined in this report to insure that the appropriate type of apparatus, hose deployment methods and equipment will be available for training and use by the fire department.

#### **7.1 Fleet Replacement Schedule A:**

Under this recommendation all future apparatus acquisitions would have new pumpers being acquired in 2019, 2022, 2025, 2028 and 2031. This provides for a three year period in between each major purchase with the average age of the engine fleet being 22.8 years when replaced by a newer unit. Due to all pumpers being provided with either stainless steel bodywork (Engines 821, 824 and 835) or aluminum bodies (Engines 822 and 826) this extended front line service life should be accomplished. The increased cost of maintenance on some pumpers due to the components such as foam systems, hydraulic generators, electric valves and other equipment will create some issues along the way. The engine apparatus recommendations for design criteria listed in Section 5.1 of this report reduce the number of these expensive, seldom used components to provide an apparatus to meet the needs of the department.

The new rear mount aerial ladder slated for delivery in 2014 would be programmed for twenty year life cycle due to the complexity of this equipment. The current rescue truck would be replaced after twenty three years of service during 2017 with a vehicle as recommended in Section 5.3.

Following is a listing of each apparatus and the recommended replacement date based upon a fleet size of seven major pieces of apparatus:

Fleet replacement by unit:

Engine 821: Replace with new engine apparatus in 2019, current unit would be 20 years old

Engine 822 Replace with new engine apparatus in 2031, current unit would be 24 years old

Engine 824: Replace with new engine apparatus in 2022, current unit would be 23 years old

Engine 825 Replace with new engine apparatus in 2028, current unit would be 23 years old

Engine 826: Replace with new engine apparatus in 2025, current unit would be 23 years old

Ladder 827: Replace with new aerial ladder in 2034, current unit would be 20 years old

Rescue 823: Replace with new rescue truck in 2017, current unit would be 23 years old

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **7.1 Fleet Replacement Schedule:**

This replacement schedule would provide the following benefits for the Fire Department with future planning for other major capital projects:

1. The replacement of the first pumper, Engine 821 during 2019 would provide for a short wheelbase pumper which would improve vehicle maneuverability, safety and reduce maintenance costs experienced for the engine company fleet.
2. By modifying the age and time frames required for each major apparatus purchase to every three years between each acquisition this can provide for adequate financial resources to be in place to fund the apparatus replacement program.
3. New engine apparatus would be acquired in 2019, 2022 and then every three years providing the department with a consistent, standardized design with the latest safety and technological advances. The average age of retired units would be 22.8 years of front line service which is well within the duty cycle of current engine apparatus.
4. The fleet replacement program will provide for single pieces of apparatus to be acquired when needed which will alleviate the issues with the current units where five pieces of apparatus were acquired within an eight year period of time.

The cost of fire apparatus has in the past largely followed the Producer Price Index with respect to annual increases in the range of four to five percent each year. Due largely to mandated EPA regulations for diesel engine emissions and National Fire Protection Association Standards for fire apparatus which took effect in January, 2009 the overall cost of new apparatus has jumped dramatically over the past four years. For these reasons the approximate cost of a new apparatus has increased over fifty thousand dollars since 2007. Additional governmental regulations issued from the EPA and National Fire Protection Association is tentatively set to take effect during 2015. For this reason alone a carefully planned and programmed apparatus fleet replacement plan should be adopted in order to continue to provide well designed and safe apparatus for the fire department members working in conjunction with personnel from the City.

New apparatus should be acquired when needed in accordance with the recommendations made in Section 5.0 of this report. Particular attention should be made to acquiring apparatus that will meet the needs of the response area while maintaining a level of cost effectiveness with respect to option content on the vehicles and the inclusion of rarely used components that increase the cost of operation and maintenance over the life cycle of the unit.

#### **7.2 Fleet Replacement Schedule B:**

At some point the Port Jervis Fire Department will have to face a consolidation of services which would impact the overall size of the apparatus fleet. The most likely scenario would be a reduction in engine company resources from the current five station alignment down to four stations with the possibility of having a single larger facility to accommodate multiple companies.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **7.2 Fleet Replacement Schedule B:**

With this compliment of six major pieces of apparatus one engine apparatus would be combined with the current rescue vehicle to provide a single combination rescue/engine as addressed in Section 5.4 of this study. The new multi-purpose apparatus would be staffed with trained personnel to handle both engine and squad operations and deployed to incidents in accordance with the Fire Department's operating guidelines.

Following is a listing of each apparatus and the recommended replacement date based upon a fleet size of six apparatus comprised of four engines, one truck and one rescue/engine:

Fleet replacement by unit:

Engine 821: Replace with new engine apparatus in 2020, current unit would be 21 years old

Engine 822 Replace with new engine apparatus in 2030, current unit would be 23 years old

Engine 824: Replace with new engine apparatus in 2023, current unit would be 24 years old

Engine 825 Replace with new engine apparatus in 2027, current unit would be 23 years old

Engine 826: Replace with new rescue/engine apparatus in 2017, current unit would be 15 years old, removed from the fleet and sold

Ladder 827: Replace with new aerial ladder in 2034, current unit would be 20 years old

Rescue 823: Replace with new rescue/engine in 2017, current unit would be 23 years old

This replacement schedule would provide the following benefits for the Fire Department with future planning for other major capital projects:

1. Combining two vehicles, Rescue 823 and potentially Engine 826 provides for a new multi-purpose vehicle reducing acquisition, maintenance and testing expenses.
2. The average age of pumpers when replaced under this option would be 21 years of age, potentially reducing later year expensive maintenance repair costs.
3. Replacing a newer pumper such as Engine 826, or some engine to be determined, would provide for significant trade in and resale value to offset the cost of new apparatus acquired at that time.
4. An average of 3.16 years would be allocated in between each major apparatus purchase a slight increase over Option A.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **7.2 Fleet Replacement Schedule B:**

5. Apparatus testing and some maintenance work which in the past has been delayed due to budget constraints provides for a reallocation of these resources for other fire department programs and equipment.

New apparatus should be acquired when needed in accordance with the recommendations made in Section 5.0 of this report. Particular attention should be made to acquiring apparatus that will meet the needs of the response area while maintaining a level of cost effectiveness with respect to option content on the vehicles and the inclusion of rarely used components that increase the cost of operation and maintenance over the life cycle of the unit.

#### **7.3 Summary:**

The Fire Department operates a modern fleet of apparatus that have been generally well equipped with the latest tools and equipment for each vehicle. Several units including Engine 825 and 826 have multiple components which require extensive maintenance and due partially to the size and complexity of the apparatus. The fire department must adopt a standardized design for all engine company apparatus in order to provide some degree of operational efficiencies in pump operations, training and fire ground evolutions. With the exception of the two American LaFrance General pumpers placed into service in 1999 there is virtually no commonality in chassis drive train components, pump panel equipment, foam systems, tool and equipment locations and hose loads.

The options offered within this report present several alternatives for consideration by the City and Fire Department officers. Phase Two of the Fire Protection Study will provide additional data and analysis for review with respect to the performance and staffing capabilities of the individual fire companies and their impact on deployment strategies.

#### **8.0 Equipment Review and Maintenance Evaluation:**

Following are some recommendations that should be adopted and implemented by the Fire Department to insure the safe condition and readiness of the tools and equipment maintained by the department. Recommendations numbers 1, 2 and 3 should continue to be completed on an annual basis by the department to insure the operational readiness and safety of this equipment.

1. All fire hose should to be tested annually in accordance with NFPA 1962. Records should be kept on these tests and all repairs completed on each length of hose. This item is worth 50 points with ISO when conducted on an annual basis.
2. All ground ladders and the aerial ladder should be inspected and tested annually in accordance with NFPA 1932. Compete records should be maintained by the fire department on all tests and repairs that are conducted by the department or an outside vendor on the ground ladders. This item is worth 50 points with ISO when conducted on an annual basis.

## City of Port Jervis Fire Department

### Apparatus and Equipment Analysis

#### **8.0 Equipment Review and Maintenance Evaluation:**

3. All apparatus equipped with a fire pump should be service tested annually with complete records maintained on these tests. This item is worth 100 points with ISO when conducted on an annual basis and was not given credit during the most recent inspection. Any deficiencies noted during this testing should be repaired and corrected by a trained and certified mechanic.
4. All apparatus preventative maintenance and records should be conducted in accordance with National Fire Protection Association Standard 1911 with complete records kept on all repairs, testing and maintenance work. A log book should be provided for each piece of apparatus where all maintenance, testing and inspection work will be documented. An annual summary of the cost of repairs and all maintenance should be completed by the department to enable tracking of all related repairs and cost of ownership.
5. Each piece of apparatus including engines, aerial ladder, rescue and support units should be weighted annually on each axle, together with the total vehicle weight in accordance with NFPA 1911.
6. All tool, appliance and equipment locations should be standardized as much as possible on all engine and ladder company apparatus. Equipment locations for items such as forcible entry tools, adapters, smoke ejectors and attack line hose loads should be in common locations on each engine apparatus.
7. Each piece of apparatus should at least annually be removed from service to have the chassis frame rails steam cleaned, minor paint and corrosion issues repaired, all tools and equipment cleaned, painted and maintained in conjunction with any required outside vendor repairs and preventative maintenance work to insure the continued reliable front line service.
8. The fire department should attempt to the degree possible to standardize on the location, and length of all attack lines with each line with the exception of bumper mounted trash lines, equipped with smooth bore nozzles. Department wide standards can then be developed and implemented for attack line pump pressures and target fire flow rates.
9. The following additional tools and equipment should be provided for the various units:
  - A. Five (5) new single piece steel drop forged Halligan tools for Rescue 823, Engine's 825 and 826
  - B. Forcible entry tools for Truck 827: two (2) irons sets, two (2) flat head and two (2) pick head axes, 10# maul, hydra-ram, four (4) ladder belts, six (6) salvage covers with mounting brackets for all tools.

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**8.0 Equipment Review and Maintenance Evaluation:**

- C. Three (3) Manhattan or Clemmens Bags for Engines 821, 825 and 826.
- D. Five (5) 1.50 inch smooth bore nozzles for Engines 822, 824 and 825.
- E. Four (4) 2.50 inch smooth bore nozzles for Engines 822, 824, 825 and 826.
- F. One (1) set of smooth bore tips and stream shaper for deck gun on Engine 822.
- G. Two (2) portable ground monitors for Engines 821 and 824.
- H. 400 feet of 2.50 inch attack line hose for Engine 826.
- I. Two (2) piston intake valves for Engines 824 and 825.

Note: Some of these equipment items may be transferred from other units or from spare equipment maintained by the Fire Department.

- 10. All tools, appliances and equipment should be securely mounted inside of the compartments on each apparatus. Each piece of equipment including adapters, fittings, nozzles, hand and power tools should be secured within the body compartments. All new apparatus should have a fixed dollar amount allocated in the bid to provide tool and equipment mounting as a part of the vehicles contract.
- 11. The hydraulic rescue tools presently carried on Rescue 823 are quite old and do not meet the requirements of NFPA 1936 and available technology on modern version rescue tools. Consideration should be given to acquiring the following rescue tools to be carried on Rescue 823 or another vehicle to be determined by the fire department officers:
  - A. Electric powered simo motor
  - B. Gas powered simo motor
  - C. Spreader
  - D. "O" style cutter
  - E. Three (3) rams
  - F. Combi tool
  - G. Sufficient shoring blocks and cribbing material

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**Apparatus and Equipment Analysis**

**9.0 Summary**

We gratefully acknowledge the cooperation and assistance of the Chief Officers of the Port Jervis Fire Department who provided information on the fire department's apparatus, response policies and procedures. The summary and findings as written in this report are solely those of Emergency Vehicle Response and have not been influenced by any representative of the City or Fire Department personnel.

The staff of Emergency Vehicle Response looks forward to meeting with City officials and the Port Jervis Fire Department officers to review and discuss the findings and recommendations included in this report.

Respectfully submitted,

Michael Wilbur

Tom W. Shand