

# **STEWARTSVILLE VOLUNTEER FIRE COMPANY**

## **APPARATUS EVALUATION**



**Prepared for:  
Mayor and Township Committee  
Greenwich Township  
New Jersey**

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## TABLE OF CONTENTS

ACKNOWLEDGMENTS .....	3
PURPOSE AND SCOPE.....	3
AUTHORIZATION.....	5
EXECUTIVE SUMMARY Part I	
The Organization .....	6
Apparatus & Response.....	10
Tanker Truck 98-71 .....	10
Aerial Platform 98-69 .....	12
NFPA Apparatus Response.....	13
Alarms by Type.....	16
Individual Apparatus evaluations	
Tanker 98-71 .....	21
Engine 98-61 .....	21
Tower 98-69.....	22
Engine 98-63 .....	22
Brush 98-82.....	22
Engine 98-62.....	22
Personnel & Recruitment.....	26
Training.....	27
Safety .....	28
EXECUTIVE SUMMARY PART II, RECOMMENDATIONS	
Introductory Statement.....	30
Recommendations	
Apparatus & Response.....	18
Personnel & Recruitment.....	23
Training.....	26
Safety .....	28
TOWNSHIP DEMOGRAPHICS .....	47
SUMMARY .....	48
NFPA 1915, <i>Standard for Fire Apparatus Preventive Maintenance</i>	
Chapter 2, Out of Service Criteria .....	49

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I greatly acknowledge the contributions of the Chief Joseph Mecsey, Assistant Chief Matthew Klouser, Captain Kevin Young, Lieutenant Ken McClain and Firefighter Phil Carlton. Each has made a significance contribution to this study by providing information and insight into the operations of the Fire Company and by demonstrating genuine concern for the safety of the community.

## PURPOSE AND SCOPE

The purpose of this report is to present the elected officials of Greenwich Township, with an overview of its fire protection services relative to apparatus response, usage and replacement, and to make recommendations for future improvements. It may be used as a planning guide to help enhance an already good organization.

What was once a rural farm area in Greenwich Township, is fast becoming part of a general urban sprawl. Numerous new developments have been built with more being planned. Corporate offices, and commercial facilities now occupy land that was previously used for farming or forest.

Every municipality seems to be facing the same issue: increased demands for basic services which out pace the current tax base. Property owners are understandably concerned with the cost of government and are voicing critical objections to any increase in taxes. Elected officials are attempting to find ways to contain costs, maintain levels of service, respond to criticism, and plan for the future.

With an eye towards efficiency, the fire company has decided to commission a study to evaluate its present level of fire apparatus, examine the organization and to make recommendations for improvement.

While change is not often easily accepted, especially in traditionally independent fire organizations, a documented course of action will help standardize the future delivery of services to the community, to the benefit of all its citizens. With extensive changes in the complexion of the community, a progressive fire department can no longer justify apparatus purchases by simply saying "we always did it that way."

The scope of this report will focus on the present level of fire and emergency services by examining the operations of the Stewartsville Volunteer Fire Company. The survey has examined the following areas:

Personnel Response

Apparatus, Condition & Maintenance

Fire Station Configuration

Water Supply

Apparatus Response

Apparatus Replacement Schedule

General Operating Safety

Demographics

All of the above areas were discussed during interviews with the Officers of the fire company, or researched using reports and records supplied by the fire company. The results of the data are included in this report.

## **AUTHORIZATION**

This study was authorized by Greenwich Township and communicated by Fire Chief Joseph Mecsey III.

## EXECUTIVE SUMMARY, PART I

This part of the report is a summary of conditions, conclusions and recommendations. Specific recommendations are explained in Part II.

### **The Organization**

Every organization, from the smallest to the largest, operates under a similar set of principles. The organization must have a purpose, one person in overall charge, a system of rules and regulations, a hierarchy of positions with a division of work or responsibility appropriate to those positions, and a pattern of accountability to insure that the work is completed and responsibilities are fulfilled.

Fire departments throughout the world are organized in a similar manner. Their purpose is twofold: first, the prevention of fire; and secondly, the protection of life and property in the event of a fire. In order to accomplish these tasks, the department is usually divided into two sections, line and staff. The line fulfills the purpose of the organization, in this case the prevention of fire and protection of life and property. The staff performs whatever functions are required to support the activities performed by the line. In the volunteer fire service, most of the staff positions are performed by line personnel, for example training, tool maintenance and clerical duties.

If there is one central theme among the personnel of the Stewartsville Fire Company, it is their willingness to serve their fellow resident. They were remarkable in their dedication, initiative and concern. The time they commit, and service they render is invaluable. The citizens of Greenwich Township should be thankful for their talents.

The department rank structure included a Chief of Department, Assistant Chief, Captain, and three Lieutenants, all of whom are elected by the membership.

Fire calls are received and dispatched by the Warren County dispatch and members are alerted by pager, text message and a back-up audible siren from 8 AM to 8 PM.

The Stewartsville Fire Company is a member of the Warren County Mutual Aid Group. Mutual aid is most often received from, and provided to Harmony Township and Bloomsbury.

The Stewartsville Volunteer Fire Company maintains one stations located at 321A Greenwich Street. The quarters are small and cramped and the apparatus bays are extremely tight. Two of the pumpers must carefully maneuver out of a single door that measured 11'-11" wide, by 11'-10" high. Current guidelines for fire station construction recommend a minimum door opening of 12' X 12' for a single unit responding straight out. The brush truck is parked behind the other units which does not facilitate a rapid or safe response when needed. In order to properly maintain the apparatus and equipment a more spacious area around the vehicles is necessary.



**Stewartsville Volunteer Fire Company Quarters**

The aerial platform apparatus is parked in a three-sided structure erected at the end of the building. From the standpoint of apparatus maintenance and longevity this is a poor situation. Apparatus stored in a harsh outdoor environment tend to deteriorate quickly. The tanker and utility truck are also parked outside the building with the tanker being moved to an indoor heated area of the Department of Public Works building in the winter. Humidity and temperature changes cause moving components such as brake parts and linkages to corrode and rust, especially on vehicles that are not used on a daily basis. There have been reports that the hydraulic fluid that circulates to raise and operate the aerial platform becomes viscous in the cold weather causing the aerial device to operate slowly until the fluid circulates sufficiently to warm up.





**Aerial Tower Storage Shed**



**Tanker Stored in Parking Lot**

I briefly inspected architectural drawings for a proposed new fire station on Greenwich Street (County Rt. 638) that appears to be spacious in size with adequate door dimensions to accommodate the current and almost any replacement apparatus being considered in the future. In addition, the location is near a densely populated area of the Township, the commercial zone along US route 22, and it has good roadway accessibility to all other areas of the Township.

### **Apparatus & Response**

In general, the apparatus of the Stewartsville Volunteer Fire Company appears very well maintained. As stated previously, the outside storage of the aerial platform and the tanker is having an adverse impact on the apparatus.

Specific recommendations for a structured apparatus replacement plan are offered in Part II based on national recommendations and local conditions.

Weekly checks and annual shop preventive maintenance and annual testing are faithfully performed. Any item of deficiency is reported and repaired. Careful attention to detail and initiative on the part of the firefighters and officers has provided the Township with a fire apparatus inventory which exceeds the expectations of normal wear and tear.

There are two apparatus situations in the Township that are of concern to me.

### **Tanker Truck 98-71.**

This unit is a 1979 GMC, 2200 gallon tanker that was converted from a propane

delivery vehicle to a fire tanker and placed in service in 1987. Quoting from the US Fire Administration, FEMA publication Safe Operation of Fire Tankers (p-17) *“Records show that a large percentage of serious crashes involving fire department tankers can be attributed to tankers that were crafted from non-fire service vehicles.”* It continues later on the same page stating: *“Another common practice is to develop a fire department tanker using a converted fuel oil or gasoline tanker. Even though these vehicles may be in excellent condition when the fire department acquires them, these chassis frequently are not designed for the weight of the water that will be carried on them.”* One gallon of water weighs 8.33 pounds while one gallon of propane weighs only 4.24 pounds. 2,200 gallons of water weighs almost 9,000 pounds more than 2,200 gallons of liquid propane, the commodity that the truck was originally designed to carry. Another problem with converting commercial tank trucks to fire tankers is that in many cases the liquid tanks are improperly baffled for fire department use. When the tank is partially full or the vehicle is in a “response mode” the liquid surges within the tank and can result in the truck going out of control. When I inspected this unit it had 96,764 miles on the odometer and was not compliant to the National Fire Protection Association apparatus standards.

Several areas of the Township are without the protection of fire hydrants and a public water supply. Most notably, the northeast section (above North Main Street), areas along South Main Street and the southern portion of the Township along Route 639 from border to border, including most of the side streets. Response to these areas, especially in the southern end of the Township, is long which will allow a “working fire” to become well advanced before the arrival of the fire department. It is essential that sufficient water be on

scene to mount a safe and aggressive attack in order to contain a fire.

Based on age, condition and need, I believe that the tanker unit should be replaced immediately with a modern, NFPA compliant fire tanker.



**1979 GMC Tanker**

### **Aerial Platform 98-69**

The aerial platform is a 1985 Hahn/LTI, 85 foot aerial tower apparatus. It was purchased by the Fire Company from another north Jersey fire department and after testing and repairs, placed in service the end of 2005. The unit is in good condition and has only 14,373 road miles. On the odometer.

The problem is that the purchase of this unit is in violation of N.J.A.C. 12:100-

10.15c which provides that: *“All fire apparatus purchased and/or remanufactured after January 4, 1993, shall provide enclosed seating with seatbelts for all personnel riding on the apparatus, complying with the following standards, incorporated herein by reference: NFPA 1904-1991 Aerial Ladder and Elevating Platform fire Apparatus.”* In April of 1999, the Department of Labor issued Public Safety Alert #10 in the form of a letter that stated emphatically that the law was *“inclusive of used apparatus.”*

As the apparatus is configured currently, the two rear facing seats do not comply with NFPA Standard and therefore are a violation of the New Jersey statute. Since enclosing the rear portion of the cab is difficult at best and sometimes impossible, I would remove the rear facing seats and seatbelts and issue a fire department directive that this area of the apparatus is not suitable as a riding position. To further emphasize this point, equipment such as fire extinguishers could be mounted in the area where the seats were removed. The front of the cab can legally hold the driver and two firefighters in seats with seatbelts provided.

### **NFPA Apparatus Response**

The recommended response for each type of occupancy in a community is based upon the number of firefighters and amount of equipment determined to be required at these occupancies.

According to National Fire Protection Association (NFPA) recommendations, the typical initial attack response capability, assuming interior attack and operations, are as follows:

<p><b><u>High-Hazard Occupancies</u></b> such as schools, nursing homes, high-rise buildings, and other high life hazard or large fire potential occupancies: four (4) pumpers, two (2) ladder trucks and other specialized apparatus as may be identified or available for the hazard; not less than 24 firefighters and 2 chief officers.</p>
<p><b><u>Medium-Hazard Occupancies</u></b> such as apartments, office, mercantile and industrial occupancies not normally requiring extensive rescue or firefighting capabilities: three (3) pumpers, one (1) ladder truck and other specialized apparatus as my be identified or available; not less than 16 firefighters and 1 chief officer.</p>
<p><b><u>Low Hazard Occupancies</u></b> such as one, two or three-family dwellings and scattered small businesses and industrial occupancies: two (2) pumpers and one (1) ladder truck; not less than 12 firefighters and 1 chief officer.</p>
<p><b><u>Rural</u></b>- Scattered dwellings, small businesses and farm buildings: One (1) pumper, (1) mobile water supply apparatus (tanker with a minimum capacity of 1000 gallons); at least 12 firefighters and 1 chief officer.</p>

During my interviews and personal observations while touring the community, I have concluded that Greenwich Township contains all of the above listed hazard classes in varying degrees. The importance of this information cannot be understated, as it forms the basis for the study of fire risk in the community.

In addition to the NFPA recommendations, the Insurance Services Office (ISO) indicates that all structural alarms should receive a response of at least two pumper engines and one ladder company.

While the primary focus of this report is apparatus replacement, an important part of the overall equation as to the number, type and configuration of the apparatus fleet is that the units responding must be properly manned. Fire apparatus do not extinguish fires, firefighters do. In discussions with the fire officers, it was estimated that the typical daytime response was 5 to 6 member, evening hours approximately 15 and overnight 4 to 5 with a full 15 member turn-out for a working fire.

It is understandable that during the daytime hours manpower is low as this is typically the period of time when the members leave the community to go to their place of employment. However, the mid-night to 6 AM deficit indicates that members are choosing to make a “selective response.” If the call appears to be an actual fire, they respond. If it is dispatched as an automatic alarm they may selectively choose not to respond.

Some suggestions for recruiting and retaining volunteers as well as actions to deal with the selective response are contained in Part II.

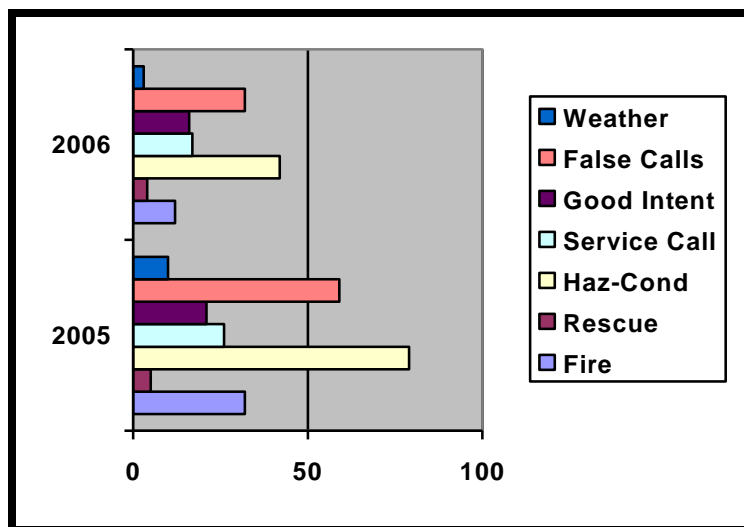
A review of the alarms that the fire company responded to are as follows:

**Stewartsville Fire Department  
Alarms by Type**

TYPE	2005	2006*
<b>Fire or Explosion</b> including structure, and other fires, auto, brush, rubbish, etc.	32	12
<b>Rescue Calls</b> including medical calls, vehicle extrication, searches, elevator extrication.	5	4
<b>Hazardous Condition</b> , spills, leaks, power line down, shorted electrical equipment, chemical emergency, Carbon Monoxide Alarm.	79	42
<b>Service Call</b> , lockout, water or smoke removal, assist police, cover assignment (Mutual Aid), Cooking smoke (no fire).	26	17
<b>Good Intent Calls</b> , smoke scare, steam leak, controlled burning, wrong location.	21	16
<b>False Calls</b> , including malicious false alarms, bomb scare, system malfunction and unintentional alarms.	59	32
<b>Severe Weather &amp; Natural Disaster</b>	10	3
*Through 7/31/06		
<b>TOTAL RESPONSES</b>	<b>232</b>	<b>126</b>



### Stewartsville Fire Department Alarms by Type



The highest average call was Hazardous Condition (approximately 34%) which includes spills, leaks, downed power lines and Carbon Monoxide alarms.

False alarms (generally of the automatic type) accounted for over 25% of the annual calls of the fire department during both periods. While these systems have been credited with saving lives and property, most of the calls are better defined as "alarm system malfunctions." Several false calls from the same occupancy amounts to "crying wolf" and the results are generally a lower than normal response, especially during night-time hours.

Constant alarm malfunctions place an unnecessary burden on the already dwindling volunteer force. Another problem of these nuisance calls is that when the alarm functions properly and a fire is discovered, less than a full compliment of firefighters might have responded. In order to rectify this situation, the fire department should vigorously enforce the penalties of the false alarm ordinance.

Analyzing the remaining call percentages shows an "average trend" in alarms with no serious areas needed to be addressed by additional apparatus. With the increasing number of dwelling units being built and an expanding population, it is likely that the number of alarms received annually will increase. Fully staffing the current fleet should be the first priority to maintain adequate fire protection.

The vast majority of the Township is in the Low and Rural Hazard Occupancy category, with some high target hazards identified include:

- Greenwich Township Elementary School,
- Stewartsville Middle School,
- Several large commercial occupancies, including
  - Staples
  - Petco
  - Target
  - Lowes
  - Home Depot

Considering this, I believe that the number of and type apparatus in the fleet are sufficient to meet the current and future needs. The reliance on automatic mutual aid is essential to fulfill the NFPA typical response requirements of 4 pumpers and 2 ladder trucks if a fire is discovered in a high hazard occupancy or 3 and 1 for medium hazards.

The primary piece of fire apparatus is the pumper, which carries the necessary water, hose and equipment to confine and extinguish a fire while effecting the rescue of the occupants. There are also several other missions that must be accomplished in order to

effectively and efficiently control a fire. Forcible entry, laddering, ventilation, elevated master stream and salvage are just a few. Generally these duties are performed by the ladder company.

While the buildings in the Township are generally not very tall, the condition of "set-back" from the road is quite evident. The new dwellings that are being built in the Township have light-weight truss roof construction. This type of building lacks a ridge pole at the peak of the roof and makes roof operations for firefighters very hazardous. Reaching the roof of an involved structure to perform ventilation by aerial ladder is considerably safer and less labor intensive than trying to raise ground ladders to perform the task. In addition, an elevated master stream can help stop the spread of fire in large, low, commercial buildings that are well involved. A ladder truck is an extremely valuable resource in the Incident Commander's arsenal which is why its response is recommended to every type of occupancy except rural.

The Insurance Services Office (ISO) provides the following specific criteria for evaluating the need for a ladder company:

Response areas with five buildings that are three stories or more in height, **OR:**

Response areas with five or more buildings that have a needed fire flow greater than 3,500 GPM (gallons-per-minute), **OR:**

Any combination of five buildings that meet the height and fire flow requirements given above.

The current tower ladder is in relatively good condition, however, as stated earlier, it should be made NFPA compliant and housed in a suitable station. This is an important component in the apparatus fleet should be properly maintained.

The fire company maintains a brush truck as part of their rolling stock of apparatus. While the number of responses for this unit are low, there are still areas of the Township that can be readily served by a smaller brush truck. It too is included in the apparatus replacement schedule, but at a lower priority than the other units.

A review of the January, 2002, Insurance Services Office, fire protection survey of the Township, which is used to determine fire insurance rates in the town, indicated that the fire department achieved a Class-5 rating (50% to 59.99%) with a score of 53% in the areas of the Township with fire hydrants.

As with all mechanical equipment, fire apparatus has a useful life span. While age alone is not the only criteria for replacement, maintaining a regular replacement schedule does, in fact, enhance firefighter safety, reduce maintenance and repair costs, and increase reliability. As the apparatus ages, routine metal fatigue, deterioration of the cab and body components and replacement parts availability become serious problems.

The National Fire Protection Association (NFPA) Fire Protection Handbook (19<sup>th</sup> edition), indicates that the normal life expectancy of a pumper is 10 to 15 years; and in heavy use, 7 to 9 years can be expected. Aerial ladder apparatus 12 to 15 years is normal, and like pumpers in heavy use, 9 to 11 years. In departments where the aerial apparatus makes substantially fewer responses, 20 years could be normal. In almost no case should a fire department rely on apparatus beyond 25 years.

On average, I believe that the moderate number of responses in the Township could justify applying the higher end of the normal life expectancy replacement recommendations. At the present time, the following are the ages of the current apparatus:

- \$     **Engine 98-61** is 27 years old
- \$     **Engine 98-62** is 6 years old
- \$     **Engine 98-63** is 14 years old
- \$     **Aerial 98-69** is 22 years old
- \$     **Tanker 98-71** is 27 years old
- \$     **Brush 98-82** is 9 years old.

An overview of apparatus condition (in order of age) is as follows:

**Tanker-98-71:** Tanker 98-71 is a 1979 GMC commercial converted propane tank truck. and is the oldest apparatus in the fleet. It registered 96,764 road miles on the odometer. The unit is equipped with a 2200 gallon water tank and has a portable drafting pond. The unit has two riding positions in the cab. Seat belts were not visible.

This unit was converted and placed in service in July of 1987. The cab is rusting and in general, it appears that it is not in good condition. It is certainly lacking most of the required safety features of modern apparatus. For safety and efficiency reasons, this unit should be replaced.

**Engine 98-61:** Engine 98-61 is a 1979 Ford/Pierce . The unit has over 31,645 miles on the odometer. It has a 1000 GPM pump and carries 1000 gallons of water. There are four riding positions, two in the cab and two in the open crew cab.

The unit appears to be in good condition.

**Tower 98-69:** Tower 98-69 is a 1984 Hahn custom fire chassis with and 85' LTI aerial platform. This unit was purchased from a fire department in north Jersey. It registered 14,373 road miles and 3573 engine hours. The unit has five riding positions with two being under the canopy portion of the cab. As stated previously, this situation violates the New Jersey Department of Labor statutes. The truck does not have a fire pump.

Cab and body were in good condition but I believe that it will deteriorate rapidly if it is continued to be stored outdoors. The Hahn company went out of business in the 1990's which might make parts acquisition a problem.

**Engine 98-63:** Engine 98-63 is a 1992 Pierce pumper and has 19,982 road miles and 1832 engine hours. The unit is equipped with a 1500 GPM fire pump, 1000 gallon water tank and carries 4" Large Diameter Supply Hose. The unit has six riding positions in a fully enclosed cab.

The condition appears to be excellent.

**Brush 98-82:** Brush 98-82 is a 1997 Ford brush truck and has 4,508 road miles on the odometer. The unit is equipped with a 200 GPM pump, and a 260 gallon water tank. The unit has two riding positions in an enclosed cab.

**Engine 98-62:** Engine 98-62 is a 1992 Pierce pumper and has 10,599 road miles on the odometer. The unit is equipped with a 1500 GPM fire pump, 1000 gallon water tank and carries 2100 feet of 5" Large Diameter Supply Hose. The unit has six riding positions in a fully enclosed cab.

This is the department's "first due" on all calls for initial fire suppression.

Condition appears to be excellent.

NFPA 1901, *Standard for Motorized Fire Apparatus*, Annex D A Guidelines for First Line and Reserve Apparatus® essentially takes into consideration all of the operational and safety changes that have evolved over the past 24 years of updates in the apparatus Standard. Since 1991, major safety requirements have been required on all new fire apparatus. Annex D recommends that apparatus that were built prior to 1991 (to meet the 1979 or 1985 editions of the Standard) should be placed in reserve status and upgraded to incorporate as many of the post 1991 features as possible. It goes on to say that apparatus not built to NFPA standards or manufactured prior to 1979 should be considered for upgrading or replacement.

The items listed as being a minimum guide for upgrading include:

- 1 Fully enclosed seating for all members.
- 2 Warning lights that meet the current standard.
- 3 Reflective striping.
- 4 Slip resistance of walking surfaces and handrails that meet the current standard.
- 5 A load manager installed in the low-voltage electrical system if necessary.
- 6 The installation of an auxiliary braking system if the GVWR is over 36,000 lbs.
- 7 Ground and step lighting.
- 8 Reduced noise levels in the cab and crew cab.
- 9 Belts, fuel lines and filters replaced.
- 10 Brakes, brake lines and wheel seals replaced or serviced.
11. Tires and suspension in serviceable condition.

12. Horns and sirens relocated.
13. Seat belts available in all seats.
14. Signs indication And riding@ on open areas.
15. A complete weight analysis showing that the apparatus or the individual axles are not overweight.
15. The fire pump meets or exceeds the original pump rating.
16. The alternator meets its rating.
17. Water tank and baffles are not corroded or distorted.
18. A transmission shift pump interlock is present and working properly on vehicles equipped with an automatic transmission.
19. All loose equipment in the driving and crew areas is securely mounted.
- 21 The radiator has been serviced and all cooling system hoses are new or serviceable.
- 22 If equipped with a generator, it and all accessories have been tested and meet the current standard.
- 23 If equipped with an aerial device, the complete test to original specifications has been conducted and certified by a testing laboratory.

As a final note, Annex D advises that special care should be taken when evaluating the cost of refurbishing or updating an apparatus versus the cost of purchasing a new unit. In many instances, it will be found that refurbishing costs will greatly exceed the current value of similar apparatus.

Modern apparatus are constructed of rust-resistant material, and if properly maintained, rarely require refurbishment during their useful life span. Generally, it is more cost



effective to replace, whereby the cost of maintaining older apparatus is reduced, and compliance to current standards and modern technology tends to add to the safety and operating efficiency of the apparatus.

A full refurbishment can generally be expected to add 5 to 7 years to the life of a piece of apparatus. In my book, the *Fire Apparatus Purchasing Handbook*, I point out that "any refurbishment undertaken is only delaying the inevitable- the eventual replacement of the vehicle."

Delaying the purchase of fire apparatus results in paying an increased price for these necessary vehicles. Fire apparatus prices routinely increase by approximately 3% to 5% annually. Recently, due to escalating energy and raw material costs, many manufactures have had as many as three price increases in a single year. Additional diesel engine emission regulations, due to take effect in 2007, is anticipated to add \$10,000 to \$20,000 to the price of every piece of apparatus. NFPA requirements and the addition of new technology also tends to increase the price of new apparatus. It is generally not cost effective to delay the purchase of replacement apparatus.

Purchasers must also take into consideration the time frame of replacing fire apparatus once funding is available. In apparatus chapter of *The Fire Chief's Handbook (5th edition)*, I point out that the research, preparation of specifications, public bid and bid evaluation takes from 6 to 12 months. Another 6 to 12 months are necessary to construct, deliver and train on the new apparatus once the contract is awarded. Realistically, the purchaser must allow 18 to 24 months to complete the purchase.

An apparatus replacement schedule is contained in section 2 of this report.

### **Personnel & Recruitment**

As previously discussed, a combination of an adequate number of fire fighters, manning the proper number of fully equipped fire apparatus provides fire protection for the community. In discussions with the fire officers about the number of personnel in the Stewartville Volunteer Fire Company, it was stated that there were approximately 36 members and 4 fire/police that handle traffic and security.

The National Fire Protection Association (NFPA) Fire Protection Handbook indicates that the minimum number of firefighters responding to an incident is as follows: High Hazard: 24 firefighters and 2 chiefs, Medium Hazard: 16 firefighters and 1 chief, Low Hazard: 12 firefighters and 1 chief and Rural: 12 firefighters and 1 chief.

Manpower shortages is a dilemma is generally being faced by most volunteer fire departments and first aid squads throughout the state. With the benefit of improved transportation, and in a quest for affordable housing in a suburban atmosphere, many former city dwellers have taken up residence in the Township. Many of them might be surprised to learn that their community doesn't have a fully paid fire department; it's just something that they've come to expect without question. Parents with young families who purchase homes costing hundreds-of-thousands of dollars generally do not readily look to volunteer their family recreational time to the dirty, time-consuming, and sometimes dangerous duty of fire fighting. The high number of fire calls, station and apparatus maintenance, training sessions and drills require a firm commitment.

The fire company has a program in place for fire cadets in the 14-15 year old range

and Junior Firefighters in the 16-17 year old range. This is an excellent way to spark interest in the youth of the community to become involved with the fire company and should be encouraged.

During the interview it was indicated that there is no financial compensation or incentive programs for the fire fighters in the Township. Many towns provide an annual stipend, clothing allowance or participation in the New Jersey LOSAP (Length of Service Awards Program). One of these programs might be considered to help retain volunteers.

As time goes on, and the current cadre of volunteers "age out", the Township should be investigating ways to provide adequate fire protection for its residents. Some areas to explore are discussed in Part II including: the establishment of an incentive program to encourage volunteering, the use of automatic mutual aid, or possibly the hiring of a minimal paid staff if the call volume increases.

## **Training**

The design of any training program is to provide the firefighter with the necessary firefighting skills, and the community with the best possible fire department response. The goal of the program is to have all members operate at an acceptable level with proper regard for life and property. It appears that this goal has generally been met and exceeded in Fire Company #1 because of the dedication of the firefighters and fire officers. Their strong sense of community and dedication serves as a model to new members, to encourage them to become the best firefighters possible.

During the interviews the Chief indicated that all members have attained a minimum certification of Firefighter I as required by State law, have completed the basic Incident Command Course (ICS 100) and the officers have taken advanced Incident Command Courses (ICS-200 & 300). The National Incident Management System (NIMS) training that was also mandated has been complied with. Driver training is completed through the company officers with a minimum requirement of 4 hours of training and qualification by the officers.

Monthly training and company drills are conducted regularly. Some recommendations to enhance the training program are contained in Part II.

### **Safety**

Life safety of both the Township residents as well as the members of the Fire Company is of the utmost importance. Value cannot be placed on human life.

While the maze of standards and regulations for the fire service may seem to be cumbersome and expensive they were generally developed from tragic lessons learned in other areas. It is the department's responsibility to ensure that the standards and recommendations of the National Fire Protection Association and New Jersey PEOSHA are followed.

The Chief indicated that the following annual testing programs are in place and must continue to ensure firefighter safety:

- Annual Self Contained Breathing Apparatus maintenance and flow test
- Hydrostatic testing of breathing air cylinders when due

**GREENWICH TWSP. RPT, WCP, 2006**

- Annual mask fit testing
- Annual aerial ladder testing
- Annual ground ladder testing
- Annual hose testing
- Respiratory Protection Plan in place

A FAST (Firefighter Assist and Search Team) is routinely called through the County when needed. A two tag system of firefighter accountability is utilized however the accountability officer could be the incident commander or a person appointed by the IC. A more focused responsible party is needed.

Some recommendations to enhance the operational safety of the fire department are contained in Part II of this report.

## **EXECUTIVE SUMMARY PART II,**

### **RECOMMENDATIONS**

#### **Introductory Statement**

The Stewartsville Volunteer Fire Company serves their community well. For years they have provided efficient, effective, and economical fire protection to the Township. The leadership of the company perform an extremely difficult task, juggling the realities of fiscal accountability with the requirements of a well trained, modern fire force. The officers and members of the department perform untold and unsung hours of dirty and dangerous work, with no compensation above the knowledge that they have helped a neighbor. A testimony to the care and concern that the members of the fire department have for their community is that the fire protection organization, pulled by increasing demands and diminished resources, has survived this long.

No one relishes outside scrutiny. There is always the concern that someone from the outside will lack the "feel" of the community or miss some quiet point that will skew the analysis. Most assuredly, there are those who feel that way about this study.

In the *Fire Chief's Handbook* (5th Edition), Dr. John Granito commented on change and the future of the fire service. Some of his comments included: "With some organizations, change, whether structural or product-oriented, is viewed as a negative." "For fire departments to receive sufficient public support they will need to change in ways that make a positive difference to those who control resources."

In spite of any opposition, the officers of Stewartsville Fire Company have seen fit to examine new ideas. New ideas are not a comment or criticism of past accomplishments,

but rather testimony to their success.

The following recommendations are based on current literature in the field of fire protection, and are grouped according to subject matter. No particular importance should be assigned to their sequence as they are written to correspond with the sequence of subject matter discussed in Part I.

### **APPARATUS AND RESPONSE**

#### **Recommendation #A-1**

**A FIRM ANNUAL PREVENTIVE MAINTENANCE SCHEDULE SHOULD CONTINUE TO BE ADMINISTERED BY THE CHIEF.**

The Fire Chief indicated that the apparatus receive shop preventive maintenance annually. This will extend the useful life of the apparatus and is the best insurance that the unit will be reliable. The schedule should ensure that all manufacturer's recommended maintenance requirements are met.

#### **Recommendation #A-2**

**THE FIRE DEPARTMENT MEMBERS SHOULD CONTINUE TO PERFORM ROUTINE PREVENTIVE MAINTENANCE ON A WEEKLY BASIS.**

Operator preventive maintenance should be performed by personnel who are intimately familiar with the apparatus. A "Weekly Emergency Vehicle Report" should provide a guidance and a basis for these inspections.

**Recommendation #A-3**

**ESTABLISH A FORMAL CRITERIA TO PLACE A PIECE OF APPARATUS  
OUT-OF-SERVICE.**

It is extremely important that written guidelines are available to firefighters performing maintenance that can be used to declare a unit out of service. This will enhance operational safety.

NFPA 1915, *Standard for Fire Apparatus Preventive Maintenance Program*, (Chapter 2.1) has several recommendations that should be considered for the out-of-service criteria. I have included that chapter as an Annex to this report.

**Recommendation #A-4**

**AN APPARATUS REPLACEMENT PROGRAM SHOULD BE ESTABLISHED  
AND FOLLOWED.**

Guidelines in the *NFPA Fire Protection Handbook* for apparatus replacement indicates that the normal life expectancy of pumpers and ladder trucks is 15 years and ladder trucks in light use could last 20 years. It goes on to say that under almost no circumstances should a unit remain in first line service beyond 25 years. As I said in Part I, I believe that with the number and type of call volume, the high end of the replacement scale should be applied.

Increases in safety, reliability and operating efficiency make newer apparatus more desirable. In addition, maintaining modern apparatus is more cost effective from the standpoint of increased maintenance costs of older units.



Deciding on a replacement schedule based on years of service alone is difficult as it places an undue burden on the Townships=s capital budget. In compiling the replacement schedule, I took age, configuration and usage into consideration. The year of fiscal appropriation on each is recommended and can be adjusted accordingly.

Based on typical use, condition and response pattern, the following apparatus replacement schedule should be considered.

**APPARATUS REPLACEMENT SCHEDULE**

<b>APPARATUS</b>	<b>CAPITAL YEAR</b>	<b>ACTION</b>
Tanker 98-71, 1979 GMC	2007	Replace with a 3000 gallon fire tanker with pump
Engine 98-61, 1979 Ford Pierce Pumper	2008	Replace with a 2000 gpm rescue/pumper.
Aerial 98-69, 1984 Hahn 85' Aerial Platform	2010	Replace with similar apparatus
Engine 98-63, 1992, Pierce Pumper	2018	Replace with similar apparatus
Engine 98-62, 2000, Pierce Pumper	2025	Replace with similar apparatus
Brush 98-82, 1997 Ford brush truck	As Necessary	Similar configuration if necessary in the future

**Recommendation #A-5**

**THE FIRST ITEM OF APPARATUS REPLACEMENT SHOULD BE TO  
REPLACE TANKER 98-71.**

The current tanker is a 1979 GMC converted propane tanker and is currently 27 years old. It has almost 100,000 miles on the odometer and was never designed or intended to be used hauling water under emergency conditions. I believe that this vehicle is most likely dangerous to operate as an emergency vehicle.

The Township has several sections where the tanker will be the only water supply other than the 1000 gallons carried on the initial responding attack pumper.

If funded and bid early in 2007, delivery would most likely be later in the year 2007 or early 2008.

**Recommendation #A-6**

**MODIFICATIONS TO AERIAL 98-69 SHOULD BE MADE IMMEDIATELY TO  
LIMIT THE RIDING POSITIONS TO THOSE IN THE FULLY ENCLOSED CAB.**

As pointed out earlier, having seats in the canopy cab area of the aerial platform and riding firefighters in those positions are a violation of the New Jersey Labor Laws. In order to limit the Township's liability, I would immediately remove the seats and modify the area for equipment storage. "No Ride" labels should be affixed in the area of the removed seats.

This unit should be considered for replacement in the year 2010.

**Recommendation #A-7**

**REPLACE ENGINE 98-61 WITH A MODERN RESCUE/PUMPER IN 2008.**

The Fire Company currently responds to automobile accidents throughout the Township as well as on busy Interstate 78. Vital rescue equipment such as the “Jaws of Life”, lifting air bags and vehicle stabilization equipment are all necessary for safe effective rescue operations in these situations.

The term “Rescue/Pumper” denotes a standard pumper that has additional compartments to carry rescue type equipment. It would have a fully enclosed cab to safely transport 6 to 8 firefighters and should have a generator, light tower and foam system in addition to all of the standard pumper functions and equipment.

Combining the duties of a pumper and a rescue truck results in keeping the pumper fleet up as well as providing the additional duties of a rescue truck when needed.

**Recommendation A-8**

**ANNUAL PUMP TEST SHOULD BE CONDUCTED REGULARLY IN ORDER TO RECEIVE FULL ISO CREDIT AND TO ENSURE RELIABLE SERVICE FROM THE PUMPERS.**

Annual pump tests are required by the ISO to receive full credit for each pumper and could reveal other problems like faulty relief valve or leaks. Pump testing companies are available to draft test the units from a portable drafting pool if necessary.

In the most recent ISO report, the fire department received full credit for available pump capacity and it is important to maintain this rating.

**Recommendation A-9**

**A NEW FIRE STATION SHOULD BE CONSTRUCTED.**

As previously stated, the storage facilities for the apparatus and equipment is insufficient for the number of apparatus that the Fire Company has. Storing the tanker and tower ladder out of doors decreases its safety and efficiency. In addition, in a modern fire service organization, room is needed for apparatus and equipment maintenance, storage, training and rapid availability of the personal protective equipment (coat, boots, bunker pants and helmet) that must be donned before mounting a fire apparatus for a response by State Law.

A new, modern highly visible station might also serve to encourage new volunteers.

**PERSONNEL AND RECRUITMENT**

**Recommendation #P-1**

**THE FIRE DEPARTMENT AND THE TOWNSHIP MUST JOINTLY EXPLORE METHODS TO RECRUIT AND RETAIN VOLUNTEER FIREFIGHTERS.**

It is the ultimate responsibility of the Township to provide fire protection for its citizens. A serious problem that is facing volunteer fire and rescue squads is the declining number of volunteers. In years gone by, belonging to a fire company was considered a social outlet as well as performing a community service. With the current social environment, and the task of fighting fires becoming more technical, the general population

are content to sit back and let someone else volunteer.

Some methods that have been used successfully in other places include mailings with fund drive material, stories in local community newspapers and signs near the fire station seeking volunteers.

Youth programs both in the schools as well as Scouting Explorer programs have increased interest among young people.

The guidance department in the High School should be contacted as many senior students need A volunteer hours@ to fulfill college application requirements. A program could be established to introduce them to the fire service and some may stay on.

### **Recommendation P-2**

#### **EXPLORE VOLUNTEER INCENTIVE PROGRAMS**

At the present time, volunteer firefighters in Greenwich Township receive no compensation or incentive for the number of hours that they spend protecting their neighbors. If the Township intends to maintain a volunteer fire force, it should explore some form of compensation.

In some locations, a sum of money is deposited annually in an incentive fund. Active members who attend a certain percent of the meetings, drills and alarms receive a pro-rated amount of the fund proportional to their participation.

Other communities reward their volunteers with an annual "clothing allowance", generally in December, as compensation for damaged personal clothing, lost personal property and the use of personal vehicles for response to alarms, training and drills.

Citing the need to recognize emergency service volunteers, the "Emergency Services Volunteer Length of Service Award Program" (LOSAP) was signed into law by then Governor Whitman a number of years ago. This law provides a system to provide tax-deferred income benefits to active volunteer members of an emergency service organization.

If the trend of declining membership in the volunteer force is not reversed your community is not too many years away from the time when you will have to consider developing a paid staff similar to many other formerly volunteer departments.

### **Recommendation #P-3**

#### **METHODS TO OVERCOME THE ASELECTIVE RESPONSE@ PROBLEM OVERNIGHT**

Interviews show that during the sleeping hours, when typically the most manpower is available, there is a low personnel response. I am reasonably sure that this is due to false automatic alarms being considered Anuisance calls.@ Obviously the problem is when one of these alarms are received, and it results in a working fire, the backup personnel and apparatus needed to fight a fire are delayed in responding.

There are a few methods used in other areas that have met with varying degrees of success. First, don=t announce the type of call being dispatched. Have members respond to the station for the call. The problem with this is if the call volume increases, it may result in the loss of members who can=t devote that much time.

Second, have a duty crew assigned on a rotating basis, who will initially respond to

automatic alarms in unoccupied commercial structures, much like volunteer ambulance corps do. It's not the best situation but at least this would guarantee a response.

**Recommendation #P-4**

**ENFORCE THE PROVISIONS OF THE TOWNSHIP'S FALSE ALARM  
ORDINANCE TO REDUCE THE NUMBER OF AUTOMATIC ALARMS CAUSED  
BY LACK OF SYSTEM MAINTENANCE.**

Routine false alarms place a burden on the volunteer membership and contribute to declining response numbers. The Chief indicated that the Township has a false alarm ordinance in place. This should be strictly enforced in order to force building owners, especially in commercial occupancies, to properly maintain their alarm systems. This is not intended to penalize ordinary citizens and homeowners who have an occasional false alarm, but to force compliance by businesses who repeatedly sap the fire department's resources unnecessarily.

**TRAINING**

**Recommendation #T-1**

**THE FIRE DEPARTMENT SHOULD APPOINT A COMMITTEE TO DEVELOP  
TRAINING PROGRAMS FOR THE FIRE COMPANY**

At the present time, the Captain is responsible for the training of the fire company. A training committee, with the Captain as the chairman, should be established to standardize training in the Township. Quite often, involving several motivated individuals

in the planning process will stimulate ideas for innovative training subjects.

The first goal of the Training Committee should be to identify the areas of the fire company training curriculum that requires attention and coordinate the training and drills that are both interesting and informative.

### **Recommendation #T-2**

#### **A TRAINING SCHEDULE OF DATES AND SUBJECTS SHOULD BE ESTABLISHED BY THE TRAINING COMMITTEE**

Planning and scheduling the training sessions should receive adequate attention by the committee. Establishing a schedule for training permits a more comprehensive approach to learning, provides the instructor with ample opportunity to gather resource material, and permits members of the Fire Company to offer suggestions. The selection of the topics for training should be done six to twelve months in advance. These topics should be distributed to the members in the department as they are developed.

NFPA 1500 (Standard on Fire Department Occupational Safety and Health) indicates that members engaged in structural firefighting shall attend a minimum of ten monthly structural firefighting training sessions.

### **Recommendation #T-3**

#### **REGULARLY SCHEDULED DRILLS BETWEEN THE MUTUAL AID FIRE COMPANIES SHOULD BE CONDUCTED**

Mutual Aid drills will help to increase the level of familiarity and cooperation



between the firefighters of the Township and their mutual aid partners. Drills at target hazards would provide the additional benefit of making mutual aid companies aware of locations where they are likely to respond in the future.

**Recommendation #T-4**

**A POST INCIDENT CRITIQUE OF ALL SIGNIFICANT INCIDENTS SHOULD BE CONDUCTED**

The post incident critique is an excellent training tool to improve skills by highlighting strong and weak parts of the operation. By systematically analyzing an incident, solutions to unforeseen problems can be established and incorporated into standard operating procedures.

Sharing the "lessons learned" could be a valuable learning experience for not only the members who were present, but every firefighter who might encounter the same situation in the future.

**Recommendation #T-5**

**TRAINING ON STANDARD OPERATING PROCEDURES (SOP'S) FOR ALL ROUTINE OPERATIONS SHOULD BE SCHEDULED BY THE TRAINING COMMITTEE FOR ALL FIREFIGHTERS IN THE DEPARTMENT.**

The development of Standard Operating Procedures (SOP's) for the basic types of fires fought should be undertaken. The SOP's should then become an integral part of the training program.

## **SAFETY**

### **Recommendation #S-1**

**A WRITTEN SOP FOR A PERSONNEL ACCOUNTABILITY SYSTEM THAT PROVIDES FOR THE TRACKING AND INVENTORY OF ALL MEMBERS OPERATING AT AN INCIDENT NEEDS TO BE ENFORCED.**

During interviews with the company officers they stated that currently a two-tag system is in place and an accountability officer is either the incident commander or designated by the I.C. or chief when necessary. This is an important position that should be maintained at every incident where members are committed for an operation.

All members should be responsible to follow personnel accountability procedures that are established at all incidents.

### **Recommendation #S-2**

**ANNUAL INSPECTION AND LOAD TESTING OF THE AERIAL LADDER AND A 5 YEAR NON-DESTRUCTIVE TESTING SCHEDULE SHOULD BE FOLLOWED.**

In order to enhance operational safety and reduce liability, the Fire Company should establish a written schedule to have aerial ladder testing performed in accordance with the NFPA Standards.

NFPA 1914 indicates that all aerial devices should be inspected and load tested annually and a non-destructive test performed every 5 years. Compliance with this standard is a requirement of the New Jersey PEOSH labor laws.

**Recommendation #S-3**

**ALL HOSE USED IN THE DEPARTMENT SHOULD CONTINUE TO BE TESTED ANNUALLY**

In order to ensure the safety of the members operating at a fire and the general public, all hose used in the department should be tested annually in accordance with NFPA 1962 (Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles). This testing could be performed either by the department members (possibly as a drill) or an outside testing agency could remove, test and repack the hose for a fee.

**Recommendation #S-4**

**ALL PORTABLE GROUND LADDERS USED IN THE DEPARTMENT SHOULD CONTINUE TO BE INSPECTED AND TESTED ANNUALLY.**

NFPA 1932, *Fire Department Ground Ladders*, indicates that all portable ladders should be inspected and tested annually. This is another important procedure to increase safety and reduce liability.

**Recommendation #S-5**

**ROUTINELY UPDATE THE RESPIRATORY PROTECTION PLAN.**

NJAC 12:100-10.10 (e) requires a respiratory protection program to be established. Weekly inspections of all SCBA as well as a more extensive monthly inspection are required. Written records of the inspection results must be maintained.

The names of the responsible parties in the respiratory protection plan need to remain current.

**Recommendation #S-6**

**A AFAST TEAM@ (FIREFIGHTER ASSIST AND SEARCH TEAM) SHOULD BE STAFFED AT EVERY WORKING FIRE OR INCIDENT WHERE THE MEMBERS ARE EXPOSED TO DANGER.**

During my interviews, it was indicated that a AFAST@ team is called from the County mutual aid units “as needed”. For the protection of the members, this important safety team should be staffed at every working fire or dangerous operation.

Recently, the City of Englewood in Bergen County was cited by the Department of Labor for failing to have a Rapid Intervention Team available when a fire fighter was in distress at a house fire and seriously injured.

**Recommendation #S-7**

**CONTINUE TO CONDUCT ANNUAL MASK FIT TESTS, AND MAINTAIN ACCURATE RECORDS.**

The New Jersey State Labor Law in Subchapter 10, *Standards for Firefighters*, requires an annual mask fit test of all personnel qualified to wear an SCBA. This should be accomplished and accurate records of the results maintained.

The fire officers indicated that most personnel have individual face pieces and various sizes of masks are available and fit testing is performed.

**Recommendation #S-8**

**APPLY THE PROVISIONS OF THE *NJ STANDARD FOR FIREFIGHTERS*, FOR SCBA TRAINING AND INSPECTIONS.**

NJAC 12:100-10.10 requires a respiratory protection program be established. The respiratory protection plan should call for annual SCBA training and annual mask fit test. The plan should also call for an inspection of all SCBA immediately after use or at least monthly. Written records of the annual SCBA training and inspection results must be maintained by the company and available for inspection.

**Recommendation #S-9**

**PERSONAL PROTECTIVE EQUIPMENT (PPE) SHOULD BE PERIODICALLY SENT OUT FOR PROFESSIONAL CLEANING AND INSPECTION.**

Personal protective equipment (turnout gear) should be cleaned periodically to remove hydrocarbons and other contaminants from the garments. Agencies that perform cleaning can also inspect the gear for safety compliance and make minor repairs, replace reflective material etc. to ensure safety compliance.

**Recommendation #S-10**

**IN THE FUTURE, EXPLORE THE POSSIBILITY OF INSTALLING EXHAUST REMOVAL EQUIPMENT IN THE FIRE STATION.**

Particulate matter in diesel exhaust contain known carcinogens. Exhaust capture

equipment would remove the diesel exhaust from the station reducing it's adverse health effects on the fire fighters. Many fire departments have been successful in obtaining grants for this purpose from the FIRE ACT grant program. At this point, I don't believe that there is enough room to install the necessary equipment in the current station but it should be included as part of the new construction.

## **TOWNSHIP DEMOGRAPHICS**

Greenwich Township is comprised primarily of detached single-family homes, with a some attached duplex houses and some rural farm areas. Some densely packed structures occupy Greenwich Chase and Windham Farms developments.

Scattered small businesses and light industrial occupancies are located throughout the Township with a cluster of large commercial stores along US Route 22.

There are several Atarget hazards@ (property that could result in large loss of property of life in event of fire), including the elementary school, and middle school as well as the previously mentioned large commercial “big-box” stores.

According to the fire department, the Township currently has a population of approximately 5,300 citizens and the Township occupies 11.3 square miles in Warren County. It is bordered by Franklin Township to the East, Bloomsbury (Hunterdon County) to the South, Pohatcong Township to the West and Lopatcong Township to the North.

In discussions of the Township’s future development with the fire department personnel, they indicated that there were several building projects being pursued. In addition to some changes in the size, configuration and use of commercial properties, the Mansion at Allamuchy housing development has 35 acres of open space, and the Worship Community is applying for a variance to construct 21 single family homes, a Worship Place and children’s facility on New Village road.

As we toured the community, it was observed that there were several areas that were without the services of a municipal water supply and fire hydrants. Many of the streets in the Northeast corner of the Township, much of south main street, Interstate Route

78, and the southern area of the Township are all tanker response areas.

Narrow roads and grades make response difficult in some areas of the Township.

Transportation hazard considerations for the fire company includes Interstate 78, part of US Route 22, and NJ Route 57 which all passes through the Township bringing the potential for motor vehicle accidents and the requirements for Haz-Mat (Hazardous Materials) and rescue services response. Two railroad freight line runs through the Township as well.

### **SUMMARY**

This report contains a number of changes that can have a positive effect on the health, safety and efficiency of the Stewartsville Volunteer Fire Company.

The Township's elected officials and the fire company officers should keep an open mind when evaluating these recommendations. Implementation is not intended to take place overnight but to be phased in over a period of time.

I believe that the net result will be increased efficiency by making the best use of the available resources, apparatus and manpower, which will benefit not only the members of the fire company, but the citizens that they protect.



**NFPA 1915,**  
***STANDARD FOR FIRE APPARATUS***  
***PREVENTIVE MAINTENANCE PROGRAM***  
**Chapter 2, AOut-of service criteria@**





