



## **ALMONT ASSOCIATES**

We Specialize in Fire, Police, EMS & Emergency Management Assistance

Response to the Request for Proposals by the

Town of Darien to

Assist the Community in Evaluating Equipment, Replacement  
Schedule, and Funding Approaches for the Provision of  
Fire Services

July 2013



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## ALMONT ASSOCIATES

July 10, 2013

Karl F. Kilduff  
Town Administrator  
Town of Darien  
2 Renshaw Road  
Darien, CT 06820

Dear Mr. Kilduff:

Almont Associates presents this Final report of the study to assist the community of Darien in evaluating equipment, replacement schedule, and funding approaches for the provision of fire services by the Darien, Noroton and Noroton Heights Fire Departments. The staffs of the Town, and Fire Departments were professional and cooperative. They provided information that assisted us with this analysis of the current delivery system and helped guide Almont to the conclusions for an apparatus replacement program for fire service delivery into the future.

We were able to obtain a clear understanding of the community and their desires for emergency services required. This report considers the type and method of fire service delivery in the Darien community and makes recommendations with regard to that level of service.

Almont is prepared to assist the Town in selection of the best option for the community and will provide any additional aid required with this report. We would like to thank the Town of Darien for their confidence in our firm and look forward to providing future public safety assistance.

Sincerely,

*Thomas G. Weber*

Thomas G. Weber  
President

## Executive Summary

The Town of Darien provides the funding for fire apparatus purchases for the Darien, Noroton, and Noroton Heights Fire Departments. These departments have been providing firefighting services for the Town for well over 100 years. They have pride in the community and the desire to continue to serve Darien.

This report was developed to assist the Town with planning for major fire apparatus replacement. The departments have had a history of maintaining their apparatus and extending the life of these vehicles well beyond what would be considered a normal life expectancy. They have also used refurbishment of apparatus instead of replacing with new. While this is commendable there are fire engines that are 30 and 40 years old, these vehicles lack most safety features in newer vehicles.

Almont reviewed the current response and coverage practices of the department. We interviewed each Fire Chief and toured each station to inspect the fire apparatus (Section 2). We developed coverage maps from each of the fire stations (Section 3.1) and conducted an ISO classification analysis with regard to the fire departments' classifications (Section 3.2). From this investigative analysis we were able to develop three options for the Town to consider.

The three options employ the replacement schedule developed by the fire departments (Section 4.3). Almont concurs that this schedule can work but may need to be modified at times. Option 1 replaces the current fleet with like vehicles to demonstrate the schedule and cost with maintaining the fleet as is with 14 apparatus. This cost \$8,000,000 over the next 20 years (Section 4.4).

Option 2 employs a dual purpose vehicle concept. Many fire departments have experienced reductions of staff and difficulty with being able to respond all of their apparatus when needed. To overcome this situation many departments have transitioned to dual purpose apparatus such as engine/tankers and rescue/engines. This option recommends this concept and makes specific vehicle replacement choices that reduces the fleet by 3 vehicles to 11 apparatus and would cost 6,800,000 over 20 years. This plan would also require partial cooperative response between the three departments (Section 4.5).

Option 3 functionally merges the response profiles of the three fire departments and requires them to respond as one operational department. They would be required to share apparatus which would allow the Town to reduce the fleet to 10 apparatus. This would create an efficient service delivery model and cost \$5,500,000 over 20 years (Section 4.6).

Each option is accompanied with a replacement schedule and financial plan (Section 4.8).

This plan provides three defined options but these can be modified to meet the desires of the community. The goal should be for the fire departments to recognize that the current and projected future economic climate will require partnerships to be able to provide cost effective and efficient fire services. This plan supports fiscally responsible capital improvements for the Town of Darien's fire apparatus replacement program.

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## **1.0 Project Overview**

### **1.1 Study Purpose**

The Town of Darien recognized the need for a review in evaluating fire apparatus' replacement schedule, and funding approaches for the provision of services by the Darien, Noroton and Noroton Heights Volunteer Fire Departments. Current economic conditions warrant communities be cognizant of how the public's money is being spent. Planning for the future through strategic planning of capital expenses is a proactive method to providing professional services while being cost effective.

The Town of Darien recognized the financial challenges associated with the ever-increasing equipment maintenance and replacement costs necessary to efficiently and effectively sustain and deliver fire services. To that end, this analysis provides a comprehensive review of the fire departments service capabilities, and future service delivery challenges with regard to equipment needs.

### **1.2 Study Methodology**

After careful consideration of the Town of Darien's stated needs, Almont Associates understood that the Town required an objective, professional review and projections for future emergency equipment purchases. It was understood that the Town desired a master plan to provide for equipment review, need, replacement, and funding to service the community into the future. This report establishes how the current providers can meet developed goals with the most appropriate equipment in a cost efficient manner capable of meeting these and future needs.

Almont conducted a thorough analysis of the current apparatus fleet, personally interview each Department's Chief, and the Town Administrator then visually inspected all of the apparatus involved in the study. We then completed a comparative analysis of similar organization in the region and evaluated the departments against recognized industry standards to develop this plan.

### **1.3 Goals of the Study**

The Goals of the study are to complete an analysis of all aspects of fire equipment (apparatus) for condition, replacement and if there are improvements that can be made in the scheduling of replacing this equipment and options for funding. The goals also include:

- Review the status of current major fire apparatus
- Analyze needs relative to the existing conditions
- Develop a comprehensive workload analysis of fire departments' equipment demands
- Review the existing replacement schedule and make recommendations on needed modifications
- Compare the equipment types and quantity used locally with other similar communities

- Review current vehicles to assess whether equipment should be replaced or be considered for refurbishment
- Recommend best practices for maintenance
- Review historic vehicle replacement funding
- Recommend options for future financing approaches
- Consider Technology Improvements
- Consider Cooperation and Partnership Opportunities

## 2.0 Fire Departments and Equipment

### 2.1 Profile of Departments

The three Town of Darien, Connecticut fire departments; Darien Fire Department (DFD), Noroton Fire Department (NFD), and Noroton Heights Fire Department (NHFD), clearly exist to provide a cost efficient model of fire service to the community. The membership of all three departments has great pride and show real concern for the safety of the community. They have a history of strong volunteer fundraising to provide equipment and services to the Town of Darien and its citizens. These departments function as three completely separate agencies. Whereas all three departments provide the same basic fire and rescue response to the residents and visitors of Darien, each does so mostly within the confines of their own established jurisdictions. The three departments operate similar to the way in which any three contiguous towns' fire departments would operate in other parts of the state; as if jurisdictional boundaries were town lines.

Darien Fire Department - The DFD is the oldest of the three departments, operates out of a fire station greater than 100 years of age located at 848 Post Road in Darien. The building is a multi-bay; all-purpose fire station located on the community's main downtown roadway in the center of Darien, Connecticut. Post Road is a thoroughfare lined with boutique retail, office, and professional occupancies. It is obvious that the town has literally grown up around key facilities such as the fire house.

The location of this fire station is said to cause some issues for response. Responders are often faced with difficulties getting to the fire station to respond due to routine traffic on the main street. The chief describes how his members occasionally will park at nearby businesses and walk or run the rest of the way to the fire station due to traffic.

According to DFD Chief, the department is well managed, well-staffed and proud of its capabilities. The chief describes the membership as diverse with regard to age and experience; senior experienced members work side-by-side with younger newer members. He explains the pride that members maintain and how that pride drives response; meaning, it is important for the organization to take care of its own calls. An automatic aid protocol is in place with all three departments to differentiate response for 'daytime' calls versus 'night' calls. Calls received Monday through Friday, daytime hours, (6AM to 6PM approximate), are managed in an automatic aid manner for all three departments. Remaining hours of response and weekends are dispatched individually by department. All three departments are dispatched by the Darien Police Department.

The department maintains two Class A pumpers, an aerial device (ladder truck), a heavy rescue vehicle and a water tanker. See apparatus list for details. The chief explains that one of the

engines was purchased by Town monies and the second front line engine was purchased by the department through donations and fundraising. The chief further explains that the membership appreciates having an engine they call their own; more evidence as to the pride in the organization.

The chief states that he believes his fleet is in good shape and that he has no apparatus up for immediate replacement. He did explain at length the use of an independent mechanic for maintenance and repair of apparatus.

Noroton Heights Fire Department– The NHFD also operates out of a single fire station which is a typical New England firehouse; multi bay, all-purpose station. The station is located in a more residential area and traffic issues are less of a concern.

The chief of the department states that he believes the department is well run and well-managed; membership is consistent and reliable. He states that the members are proud of their capabilities and proud to provide service to their jurisdiction. He reports that there are no issues under the current response protocols in responding to calls; the department is able to respond to its own calls. There is pride in not having to use mutual aid from departments outside Darien. Only rarely will Norwalk Fire or Stamford Fire respond to highway incidents along Interstate 95.

The department maintains two Class A pumpers, an aerial device (ladder truck), a heavy rescue, and a water tanker. See apparatus list for details. The chief states they are in need of replacing one of their engines; a 30 year old apparatus with noticeable wear and tear from so many years of use. He also would like to replace the chassis on the tanker simultaneously.

The chief also explains his need to upgrade his vehicle extrication equipment; he feels as if his equipment is aged and in need of replacement. The department has always had low pressure hydraulic tools and they are considering moving to high pressure equipment. We discussed the need for newer hydraulic tools to extricate victims from newer, safer road vehicles of today. Communities such as Darien tend to see a higher number of newer, high-end vehicles which typically have state-of-the-art safety features and light-weight reinforced or engineered steels. These vehicles are more difficult to penetrate and older hydraulic extrication tools are failing to provide the needed power to efficiently remove patients.

Noroton Fire Department – The NFD is an independently run organization serving the area south of Interstate 95, the NFD views itself as separate from the other two departments. Its response area is defined by the shore and the department has no responsibilities to the interstate.

The chief of the organization states the department provides a good service to its residents and that the membership is consistent and reliable. Similar to the other two Town fire departments, NFD takes great pride in its ability to respond to the needs of its residents. Infrequent use of mutual aid from other departments is a goal frequently obtained by the department.

The NFD maintains two engines, an aerial device (ladder truck), a heavy rescue, and a marine unit. The chief is most concerned about the replacement of his 41 year old engine due to be replaced two years ago.

## **2.2 Relationships**

The three departments do function mostly independent of one another and whereas there is a combined Fire Commission with representation from each of the departments, only a handful of issues are dealt with collectively. The common denominator with all three departments is their daytime response profile and their collective interest in the burn building/training grounds. The Fire Commission is said to oversee the training ground.

According to the DFD Chief, the three volunteer fire departments in Darien function as three independent organizations while working fairly well together. The chief did describe a sense of 'friendly competition' between the departments. All three of the departments rely on the dispatching services provided by the Darien Police Department.

There does appear to be some consideration for one another when it comes to apparatus replacement. The three departments seem to understand that one department may be in greater need than another and often there is a bit of a 'trading' environment in place. This is especially true of Darien and Noroton Heights.

All three departments seem to have a 'make-due' attitude towards apparatus replacement. There are multiple examples of re-chassised vehicles, parts saved off older apparatus, mixed used apparatus, (old garbage truck cab and chassis with rescue box), and several vehicles in excess of 25 years of age. These older vehicles are without many of the safety features required of today's apparatus, (examples; the entire Noroton Heights Fire Department fleet – not a single apparatus seat contains a seatbelt that includes a shoulder strap, Engine 31 in the Noroton Fire Department is a 41 year old vehicle with a full open cab).

## **2.3 Current Equipment Response Capability**

### Darien Fire Department – Apparatus

The Chief describes the fleet as being in good condition with no immediate needs. He stated that his next apparatus up for replacement is the tanker which is due to be refurbished or replaced in 2022. The apparatus appeared to be well kept, organized and in working order. The chief states that the apparatus is comparatively in better shape than that of the other departments; this is attributed to more recent purchases, (a younger fleet), and the department's ability to fund raise for its own engine. These sister engines share the workload of approximately 600 calls per year.

When asked whether the three departments would benefit or would consider streamlining their purchases, the chief stated that he did not see such an effort happening. The three departments maintain varying brands of apparatus and they enjoy their independence from each other's choices.

The Darien Fire Department Chief also briefly explained that the state of the department's equipment was also good and that there were no immediate needs.

### Noroton Heights Fire Department – Apparatus

The Noroton Heights Fire Chief described the fleet as being in good shape for its age. He stated the department is in need of replacing Engine 21, a 30 year old Mack with obvious signs of age, (rusting compartments, lack of safety features such as shoulder straps on seatbelts, and lack of enclosed cab). He is also concerned for the chassis on the water tanker; he feels as if the chassis should be replaced at the same time his engine is replaced.

The Chief does have plans to replace the hydraulic tools carried as well. See previous discussion regarding low pressure hydraulic tools.

### Noroton Fire Department – Apparatus

The chief of the Noroton Fire Department is most concerned that the 1972 Maxim pumper; an open-cab vehicle used as a front line engine. The remainder of the fleet is not a concern to the chief at this time.

## **2.4 Partnership Potential**

This issue of a shared, certified mechanic needs to be explored. Two of the three departments currently use certified apparatus mechanic Scott Plank. Scott Plank is a career apparatus mechanic for the City of Norwalk Fire Department and has been maintaining DFD apparatus for several years. Mr. Plank will be retiring from Norwalk in June of 2013. He is a long-time member of the Noroton Heights Fire Department and has been offering his mechanical services without charge to his department for years. Noroton Fire Department manages their mechanical issues in-house mostly and for larger, more complex issues uses outside vendors.

Almont recommends that the Town consider developing an apparatus repair program with services provided by a single entity. This may be an effective and efficient method of providing needed professional vehicle services while maintaining costs. For liability and quality issues no department should be conducting repairs on vehicles without proper certifications. Routine maintenance and minor repairs, such as bulb replacement are acceptable but beyond that repairs must be made by a certified mechanic. The Departments must follow National Fire Protection Association (NFPA) standards for compliance with maintenance and repair of all motorized apparatus and equipment. One example would be the extremely important standard of annual testing of aerial and grounds ladders. The Chiefs must assure that compliance is being met regarding these standards. A goal of the Town and the departments should be to assure that any mechanic who works on emergency vehicles be certified as an Emergency Vehicle Technician.

### 3.0 Equipment Location by Type

#### 3.1 Use of GIS software program to demonstrate the current equipment locations

Almont conducted an analysis of the equipment at each fire department's station and the coverage areas to determine if the apparatus positioning was meeting Insurance Service Office (ISO) requirements and NFPA standards.

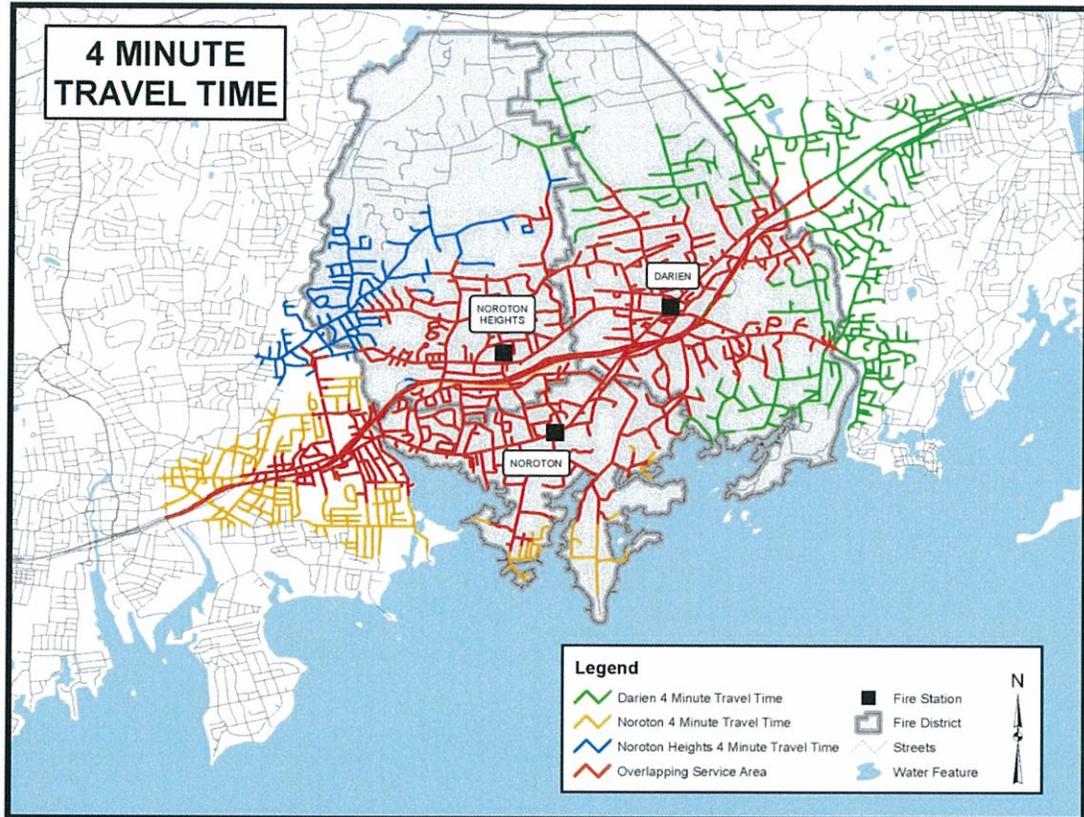
Using the ISO methodology, fire station locations are determined by plotting compass points at 1.5 miles in all directions from the fire station or stations. Hickey (1993) shows how these concepts provide the foundation for determining needed fire station locations. The 1.5-mile travel distance is plotted on a map. Areas outside of the plot are evaluated by a count of available fire hydrants within those areas. Areas that have 50% or more of the hydrants in a standard response district that are beyond 1.5 miles from an engine company require an additional engine company. Similarly, the placement of ladder companies is based on a 2.5 mile travel distance; however the availability of fire hydrants outside the primary response area is not a factor in this determination.

The National Fire Protection Association (NFPA) 1720 standard establishes minimum requirements for organizing and deploying fire suppression operations, emergency medical operations, and special operations by volunteer and combination fire departments. The following table provides an understanding of the number of needed personnel to begin initial fire suppression activities. The "demand zones" are established using the amount of population residing in a given area (per square mile) or travel distance. The establishment demand zones does not necessarily mean creating one demand zone for the entire jurisdiction, but may be different types of demand zones based upon the demographics of a given area within that jurisdiction. The department should work to establish demand zones in an effort to understand the resources need to respond to specific areas of the city.

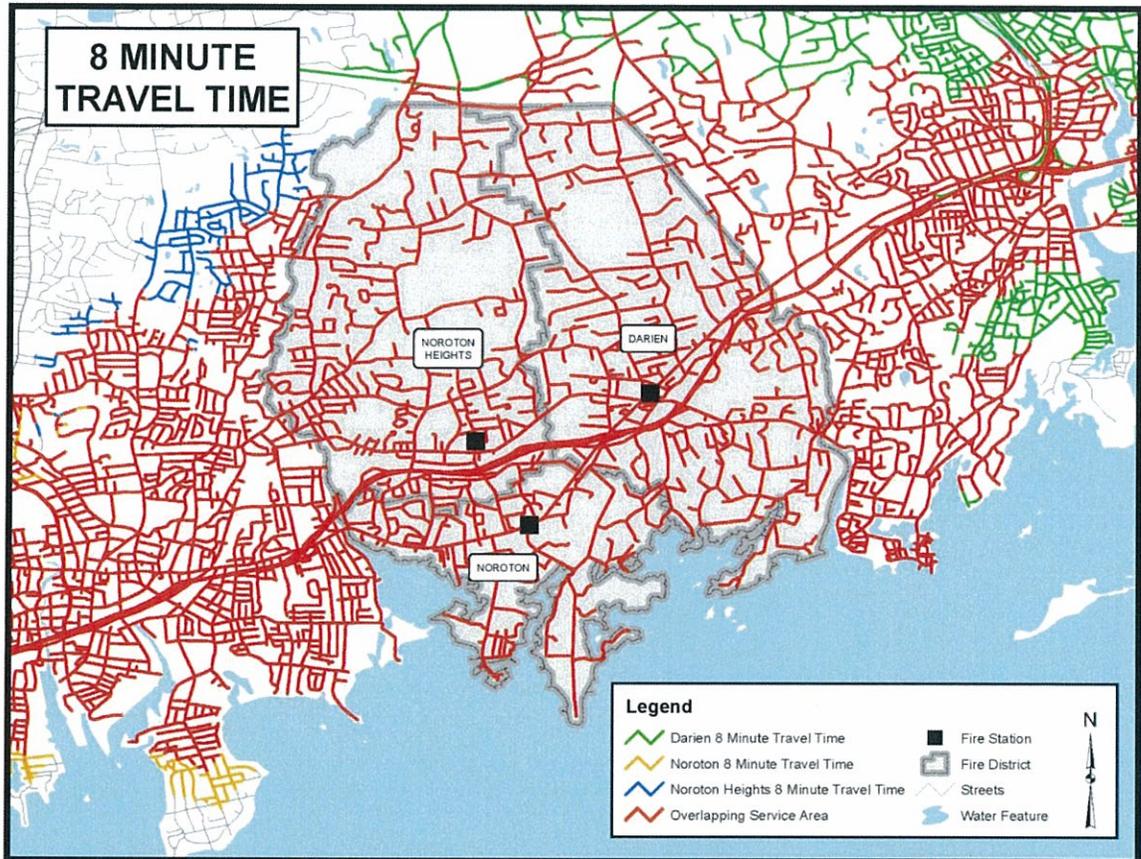
The NFPA standard 1720 defines response time goals for volunteer agencies. NFPA 1720 recommendations are listed in the chart below.

Demand Zone <sup>a</sup>	Demographics	Minimum Staff to Respond <sup>b</sup>	Response Time (minutes) <sup>c</sup>	Meets Objective (%)
Urban area	>1000 people/mi <sup>2</sup>	15	9	90
Suburban area	500–1000 people/mi <sup>2</sup>	10	10	80
Rural area	<500 people/mi <sup>2</sup>	6	14	80
Remote area	Travel distance ≥ 8 mi	4	Directly dependent on travel distance	90
Special risks	Determined by AHJ	Determined by AHJ based on risk	Determined by AHJ	90

The following map indicates the coverage provided by the fire departments for the Town of Darien within the ISO 1.5 mile standard.



The following map demonstrates the cover provided by the fire departments as compared to the NFPA 1720 standard.



While there are areas of the Town that are outside of the ISO 1.5 mile standard for engine companies, the NFPA 1720 standard appears to be met. Aerial apparatus coverage appears to meet the ISO standard.

### 3.2 Recommendations for future equipment options

We have had the opportunity to conduct a brief review and provide the following analysis with regard to the Insurance Services Offices Reports for the fire departments. The departments are rated jointly by the ISO. The apparatus portion of the ISO rating schedule for the Town is very good as demonstrated below.

## Town of Darien Fire Stations ISO Apparatus Summary

Fire Department	Points Possible	Darien
Engine Companies	10	8.51
Reserve Pumpers	1	0.71
Pumper Capacity	5	5.00
Ladder Service	5	4.77
Reserve Ladder and Service Trucks	1	0.62
Distribution	4	2.60
Total	26	22.21
<b>Community Classification</b>		<b>5/8</b>

The community does have some room within the ISO standard to consider purchasing apparatus as shared vehicles between the fire departments that could apply to the aerial trucks and heavy rescues. As long as the fire departments continue to function independently of each other, their current fleet of apparatus would need to be maintained. But if the departments functionally merge, as described in the latest ISO report they could develop economies of scale regarding emergency apparatus and equipment purchasing without negatively affecting the current ISO classification.

ISO reports are used to determine insurance rates for communities but are not used by all insurance companies. For example, State Farm Insurance Company stopped using ISO reports and developed a system by which they use actual annual property loss due to fire by zip code to establish their rates. The question has been asked, what type of impact does the classification have on the community? It has never been clear on exactly what the impact to the community is if the department is classified as Class 1 versus a Class 7. What we have been able to determine is that a Class 9 verses most other Class from a 7 to 1 has a noticeable impact on insurance rates. We have conducted an analysis using insurance brokers and had them write a policy on a 2800 square foot commercial auto repair business in an unsprinklered building. They wrote the building at a Class 3 and then a Class 5. The impact was less than a 2 percent increase in the property's fire protection premium or under \$18. The Town of Darien may be able to conduct this same analysis and determine the impact of improving their rating from a Class 5.

Below is a comparative analysis of the highest level of ISO classification verses the current classification in Darien.

### Town of Darien Fire Stations ISO Apparatus Summary

Receiving and Handling Fire Alarms	Points Possible	Current
Telephone Service	2	1.80
Operators	3	2.01
Dispatch Circuits	5	1.75
Total	10	5.56
<b>Fire Alarms Classification</b>	<b>1</b>	<b>5</b>
Fire Department	Points Possible	Current
Engine Companies	10	8.51
Reserve Pumpers	1	0.71
Pumper Capacity	5	5.00
Ladder Service	5	4.77
Reserve Ladder and Service Trucks	1	0.62
Distribution	4	2.60
Company Personnel	15	3.48
Training	9	1.98
Total	50	27.67
<b>Fire Department Classification</b>	<b>1</b>	<b>5</b>
Water Supply	Points Possible	Current
Supply System	35	23.88
Hydrants	2	2.00
Inspection and Condition	3	1.32
Total	40	27.20
<b>Water Supply Classification</b>	<b>1</b>	<b>4</b>
Divergence	Points Possible	Current
Divergence	-	-2.53
Total	-	-2.53
<b>Divergence Classification</b>		
<b>Total Credit</b>	<b>100</b>	<b>57.9</b>

The table consists of the maximum number of points available, the points received by the Town for the fire departments and the number of points that could be gained by making improvements. The column of percentage of improvement available demonstrates where the greatest weaknesses are and what could be changed to improve the rating. The least expensive category would be training. All other areas have significant cost impacts. The area of Distribution should be considered if future capital improvement of fire stations is considered. This analysis demonstrates that improvements in training and maybe just improved training record keeping could have a significantly positive effect on the Town's ISO rating.

## 4.0 Equipment Status and Needs

### 4.1 Current Inventory

The current inventory for the three fire departments is demonstrated in the following table

Unit ID	Name / Make	Description / Model	Year / Age	Pump Capacity	Water Tank	Condition
<b>Noroton Heights Fire Department</b>						
Engine 21	Mack	Pumper	1983 - 30	1250	750	Poor
Engine 23	Mack	Pumper	1989 - 24	1500	600	Good
Truck 20	Mack	Ladder	1988 - 25	1500	500	Good
Rescue 25	Mack	Squad	1989 - 24	N/A	N/A	Good
Tanker 22	Mack	Tanker/Tender	1974 - 39	1250	2000	Poor
<b>Noroton Fire Department</b>						
Engine 31	Maxim	Pumper	1972 - 41	1500	500	Fair
Engine 32	Marion	Pumper	2002 - 11	1500	650	Good
Ladder 30	Stuphen	Aerial	1994 - 19	N/A	N/A	Good
Rescue 33	Marion	Squad	1989 - 24	N/A	N/A	Good
Marine Unit 34	Boston Whaler	Boat	1989 - 24	750	N/A	Good
Truck 35	Ford	Utility	1996 - 17	N/A	N/A	Fair
<b>Darien Fire Department</b>						
Engine 41	Pierce	Pumper	2006 - 7	1500	750	Good
Engine 42	Pierce	Pumper	2006 - 7	1500	750	Good
Ladder 43	Seagrave/Aerialscope	Tower/Ladder	2011 - 2	N/A	N/A	New
Rescue 44	Salisbury	Squad	2004 - 9	N/A	N/A	Good
Tanker 45	Mack	Tanker/Tender	1996 - 17	750	2000	Good

## 4.2 Current Replacement Schedule

The fire departments have developed a replacement schedule for their apparatus. This report has taken their recommendations and incorporated them as the basis for the three options for future replacement schedules.

Unit ID	Name / Make	Description / Model	Year / Age	Proposed Replacement Year
<b>Noroton Heights Fire Department</b>				
Engine 21	Mack	Pumper	1983 - 30	2013
Engine 23	Mack	Pumper	1989 - 24	2020
Truck 20	Mack	Ladder	1988 - 25	2019
Rescue 25	Mack	Squad	1989 - 24	2017
Tanker 22	Mack	Tanker/Tender	1974 - 39	2016
<b>Noroton Fire Department</b>				
Engine 31	Maxim	Pumper	1972 - 41	2013
Engine 32	Marion	Pumper	2002 - 11	2021
Ladder 30	Stuphen	Aerial	1994 - 19	2018
Rescue 33	Marion	Squad	1989 - 24	2017
Marine Unit 34	Boston Whaler	Boat	1989 - 24	2013
Truck 35	Ford	Utility	1996 - 17	
<b>Darien Fire Department</b>				
Engine 41	Pierce	Pumper	2006 - 7	2026
Engine 42	Pierce	Pumper	2006 - 7	2027
Ladder 43	Seagrave/Aerialscope	Tower/Ladder	2011 - 2	
Rescue 44	Salisbury	Squad	2004 - 9	2024
Tanker 45	Mack	Tanker/Tender	1996 - 17	2022

## 4.3 Recommended Replacement Schedule

The Town of Darien requested an unbiased approach to future fire apparatus replacement. This report will provide the Town with three options. These options will be replace current vehicles with like apparatus, modify vehicle types by adding some dual functioning vehicles, and a final shared responsibility approach between the three departments. We feel that the schedule developed by the fire departments is a viable schedule that would work for the community. We have reviewed the pricing that was provided by the fire departments and find clarity is needed to determine how their cost was established. Almont employs manufacturer data to establish the prices listed in this report. The pricing structure we have used is for Custom "Program" trucks with full complements of small equipment, tools and hose. The industry standard has been an annual three percent increase in new apparatus cost. This is reflected in the pricing used below.

Replacement of fire apparatus can be determined by age, condition, use and functionality of the current equipment. We do not see fault with the current schedule as recommended by the fire departments, as it provides for a longer life expectancy than Almont would normally

recommend. There are front line apparatus over thirty and forty years old. This equipment lacks most of the new safety standards in modern fire apparatus. There are four additional apparatus over 20 years old and safety standards have changed significantly during that time period. Therefore, the twenty-five year replacement program provided by the fire departments would appear to be sound for the community. The departments have maintained a practice of rebuilding apparatus rather than replacing them. We do not recommend rebuilding any of the remaining apparatus. While rebuilding has been a common practice in the past it is not used as often. The cost usually does not provide enough of a savings over time. The community must account for the downtime and loss of use while the vehicle is out of service and maintenance becomes a problem. The departments are to be commended for their diligence in saving the Town money by making repairs, rebuilding and modifying their current apparatus. There needs to be significant cost benefit analysis conducted when choosing to rebuild and keep older trucks. While the workload on the departments' apparatus is low, there have been significant improvements in truck design and safety features. These features need to be considered when choosing to buy new or rebuild.

The last rebuild on Ladder 43 appears to good decision that should allow that vehicle to continue to serve the Town. We are concerned that it is not shown in the replacement schedule which extends out twenty years from now. Almont does not believe the aerial device will last that long and replacement should be planned for about 15 years from now or 2028. We are concerned that at some point it may become very difficult to find parts and maintain an aerial devise as old as Ladder 43's Aerialscope.

There are ways the Town can modify the apparatus replacement program and save significant funding while maintaining the proposed replacement schedule with regards to time for replacement. This will be reflected in Options 2 and 3.

#### **4.4 Option 1**

This approach would be to replace the fire departments apparatus based on the schedule provided by the fire departments. This plan will cost approximately \$8,000,000 over 20 years. The plan would replace Engine 21 and Engine 31 in 2013, Tanker 22 in 2016, Rescue 25 and Rescue 33 in 2017, Ladder 30 in 2018, Truck 20 in 2019, Engine 23 in 2020, Engine 32 in 2021, Tanker 45 in 2022, Rescue 44 in 2024, Engine 41 in 2016, Engine 42 in 2027, and Ladder 43 in 2028.

Almont acknowledges that the DFD used donations to originally purchase Engine 42 and plan the same for its replacement. We are showing the engine in the schedule because whether it is funded from the Town budget or donations it is a financial impact on the community.

One very important factor is the ability to staff the apparatus. The departments must consider that staffing is becoming more and more difficult. They should transition to dual purpose apparatus such as, Engine/Tankers, Rescue/Engines, and Quints. These types of vehicles provide multiple functions and make it easier for fewer personnel to get them to the emergency. While the cost of these dual purpose apparatus is significantly more they should be purchased with the understanding that one truck will be replacing two.

Employing a dual purpose apparatus program does not mean that costs have to grow beyond the Town's financial abilities. The Town and departments should standardize its fleet of emergency response units as much as is possible. The existing fleet consists of several different manufacturers which can prove to be problematic when repairs are needed and during daytime responses, when all three departments respond as one. The Town and the departments should consider using a manufacturers "program" truck and standardization of the fleet.

Program trucks allow departments to have the advantages of higher quality custom chassis (i.e. crash safety, longer vehicle life) without the higher costs of a fully custom chassis. Historically, fire truck manufacturers have built fully customized apparatus which are known for being relatively costly. These higher costs were predominantly driven by the need to essentially re-engineer each and every fire truck to meet the wants and needs of the department purchasing the apparatus. In addition, the inclusion of many bells and whistles to the fully customized apparatus increases costs substantially. In response to concerns relative to cost, many manufacturers began to build fire trucks utilizing "commercial" chassis and remove the bells and whistles. By combining the commercial chassis with a "standard" body the need for significant additional engineering was reduced.

Many departments began to utilize these commercial chassis fire trucks and experienced some level of satisfaction. However, these apparatus have proven to have their limitations. As an example, apparatus built on commercial fire chassis do not allow for a high level of flexibility in interior cab design and layout. Other concerns revolve around the ability to procure the commercial chassis as the "over the road" industry is purchasing from the same inventory pool. In addition, it is generally understood that customized fire chassis allow for larger motors and increase GVW capabilities.

The "program" truck essentially combines the benefits of using a commercial chassis with those of a customized apparatus. To accomplish this manufacturers build a standard fire truck design with very limited options for the apparatus. These trucks can generally be thought of as being built using a "cookie cutter" approach to design and construction. The engineering of the apparatus is the same from apparatus to apparatus and the purchaser has very limited ability to make any changes. In cases where changes are made the engineering of the truck cannot be affected. By doing this the manufacturers have removed one of the largest drivers of cost resulting from the need to re-engineer each truck being purchased.

Back to back purchases of similar apparatus are a method to reduce the engineer costs on vehicles and save money on the full purchase. All future aerial purchases should be Quints. The additional cost is minimal as compared to the cost of just an aerial truck and the ability to use one vehicle as both a pumper and ladder is invaluable.

The costs outlined are for manufacturer “program truck” chassis vehicles and include all new small equipment such as hose, tools, fans, and extinguishers for example. They do not include Self-Contained Breathing Apparatus (SCBA) or vehicle extrication equipment. The estimated cost does include a 3% escalation factor for future purchases which is the standard in the industry. There is a plus or minus factor based on options of \$50,000 per engine, rescue/engine, engine/tankers and rescues. The option factor for Quint/aerial is plus \$100,000.

#### Option 1 Replacement Schedule

UNIT	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Engine 21	49	49	49	49	49	49	49	49	49	49										
Engine 23								58	58	58	58	58	58	58	58	58	58			
Truck 20							112	112	112	112	112	112	112	112	112	112				
Rescue 25					46	46	46	46	46	46	46	46	46	46						
Tanker 22				21	21	21	21	21	21	21	21	21	21							
Engine 31	49	49	49	49	49	49	49	49	49											
Engine 32									60	60	60	60	60	60	60	60	60	60		
Ladder 30						112	112	112	112	112	112	112	112	112	112					
Rescue 33					46	46	46	46	46	46	46	46	46							
Engine 41														69	69	69	69	69	69	69
Engine 42															69	69	69	69	69	69
Ladder 43																162	162	162	162	162
Rescue 44												57	57	57	57	57	57	57	57	57
Tanker 45										25	25	25	25	25	25	25	25	25	25	25
TD \$ 000	98	98	98	119	211	323	435	493	553	578	480	537	537	585	562	612	500	442	382	357

Option 1								
Company	Engines	Aerial	Rescue	Tanker	Engine/ Tanker	Engine/ Rescue	Total / Dept.	
Noroton Heights	2	1	1	1	0	0	5	
Noroton	2	1	1	0	0	0	4	
Darien	2	1	1	1	0	0	5	
<b>Total</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>14</b>	

#### 4.5 Option 2

This option requires Noroton Heights and Darien Fire Departments to move to Engine/Tanker combination units and not replace their tankers. The Noroton Heights Fire Department would move to Rescue/Engine concept and not replace their rescue truck. In 2013 the NHFD would replace Engine 21 and Tanker 22 with a new 2500 gallon engine/tanker combination unit. In

2017 the NFD would replace Engine 32 and Rescue 33 with a new rescue/engine combination unit. In 2026 the DFD would replace Engine 41 and Tanker 45 with a new 2500 gallon engine/tanker combination unit.

The Tables below define which units would be replaced by these dual purpose units. This option supports the departments' efforts to continue to provide the services they do today in a cost effective and efficient manner. The departments would require less qualified fire apparatus drivers to respond multipurpose apparatus and equipment to the emergency. The cost of this option is approximately \$6,798,000 a savings over twenty years of \$1,200,000.

#### Option 2 Replacement Schedule

UNIT	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Engine 21	DNR																			
Engine 23								58	58	58	58	58	58	58	58	58	58			
Truck 20							112	112	112	112	112	112	112	112	112	112				
Rescue 25					46	46	46	46	46	46	46	46	46	46						
Tanker 22	DNR																			
New E/T	61	61	61	61	61	61	61	61	61	61	61									
Engine 31	49	49	49	49	49	49	49	49	49	49										
Engine 32					DNR															
Ladder 30						112	112	112	112	112	112	112	112	112	112					
Rescue 33					DNR															
New R/E					62	62	62	62	62	62	62	62	62	62						
Engine 41														DNR						
Engine 42															69	69	69	69	69	69
Ladder 43																162	162	162	162	162
Rescue 44												57	57	57	57	57	57	57	57	57
Tanker 45														DNR						
New E/T														86	86	86	86	86	86	86
TD \$ 000	110	110	110	110	218	330	442	500	500	500	451	447	447	447	408	458	346	288	288	288

#### Option 2

Company	Engines	Aerial	Rescue	Tanker	Engine/ Tanker	Engine/ Rescue	Total / Dept.
Noroton Heights	1	1	1	0	1	0	4
Noroton	1	1	0	0	0	1	3
Darien	1	1	1	0	1	0	4
<b>Total</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>11</b>

#### 4.6 Option 3

The Town of Darien, like communities across the state and country, has been impacted by the great recession of the last few years. One lasting effect is for communities to find a better way of providing services. Darien is extremely lucky to have a volunteer fire service that they can be proud of and have confidence in. There are some areas with regards to future apparatus purchasing that could be more efficient and cost effective. Option 3 proposes these efficiencies.

The three fire departments have extremely proud histories which include their ability to provide services without outside help. While this is commendable it is no longer received as an essential quality but is more like a traditional belief. This traditional belief is a major driver of increased cost to provide fire services. During the difficult economic times many fire service providers have found that partnerships with their neighboring communities can actually help provide higher levels of service at reduced costs. In Darien, the three departments have expressed the very strong desire to maintain their independence. There is some status for each of them to retain community ties but they are providing services to the "Town of Darien", which should become their focus, the entire community. Each department can provide service to their immediate neighborhood and protect the Town at large without insisting that they need to function independently. Independence should not impede service delivery in the most efficient and cost effective manner. The departments have realized that they need each other during the weekday 6 AM to 6 PM, (approximate), period where staffing has become difficult. They functionally respond as one department while maintaining their independence. Almont has completed many studies during the recession where independent volunteer fire departments have found great success by functionally merging their operational side of their organizations.

The residents and businesses of the Town pay for fire service whether it is by taxes, service fees or donations. It is incumbent on the providers of these services to consider that their method of operation may be inflating the cost to provide these services. While it is commendable to desire to provide a neighbor fire service it is not fiscally responsible. The residents of Darien pay for the service town-wide, the providers must be willing to accept that and provide service town-wide. Creating a fire service that remains independent but functions as a single agency with regard to responses, apparatus and equipment purchasing will benefit the entire community. All future equipment including, apparatus, protective clothing, small tools, hose, extrication devices need to be uniform and should be purchased through a joint purchasing system. There are opportunities to establish regional purchasing systems, possibly through the regional council of governments.

Option 3 demonstrates how merging emergency response to a full time partnership could make future apparatus purchases more efficient freeing funding for other fire department and community needs.

In Option 3 the conversion to dual purpose engine/tankers and rescue/engines would also include the reduction of one aerial apparatus. This would require that the departments share responses town-wide twenty-four hours a day, seven days a week. The maps previously shown in the report, demonstrate that two Ladder/Aerial (Quints) apparatus will provide adequate coverage for the Town. This plan would call for not replacing NHFD Truck 20 when it becomes due for in 2019. The Town can choose to retain that aerial as a spare and there would be very little effect on their ISO rating; even choosing not to retain the aerial as a spare would not have

a negative impact on the ISO classification. Cooperative response between the departments would provide adequate aerial coverage. The ladder responses in the NHFD area would be covered by NFD and DFD. The same coverage would be provided for rescue responses in the NFD area when it converts to a rescue/engine apparatus, if additional rescue equipment is needed it would be provided by NHFD and DFD. The cost of this option is approximately \$5,526,000 a savings over twenty years of \$2,474,000 over option1 and \$1,272,000 over Option 2.

Option 3 would require that all Town of Darien fire departments establish response profiles that eliminate district boundaries and create town wide response profiles. The departments would continue to manage their administrative responsibilities while providing emergency service anywhere in Town as needed.

### Option 3 Replacement Schedule

UNIT	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Engine 21	DNR																			
Engine 23								58	58	58	58	58	58	58	58	58				
Truck 20							DNR													
Rescue 25							46	46	46	46	46	46	46	46						
Tanker 22	DNR																			
New E/T	61	61	61	61	61	61	61	61	61	61	61									
Engine 31	49	49	49	49	49	49	49	49	49	49										
Engine 32					DNR															
Ladder 30						112	112	112	112	112	112	112	112	112	112					
Rescue 33					DNR															
New R/E					62	62	62	62	62	62	62	62	62	62						
Engine 41														DNR						
Engine 42															69	69	69	69	69	69
Ladder 43																162	162	162	162	162
Rescue 44												57	57	57	57	57	57	57	57	57
Tanker 45														DNR						
New E/T														86	86	86	86	86	86	86
TD \$ 000	110	110	110	110	172	284	330	388	388	388	339	335	335	335	296	346	346	288	288	288

<b>Option 3</b>							
<b>Company</b>	<b>Engines</b>	<b>Aerial</b>	<b>Rescue</b>	<b>Tanker</b>	<b>Engine/ Tanker</b>	<b>Engine/ Rescue</b>	<b>Total / Dept.</b>
Noroton Heights	1	0	1	0	1	0	3
Noroton	1	1	0	0	0	1	3
Darien	1	1	1	0	1	0	4
<b>Total</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>10</b>

The table below demonstrates the apparatus type changes and difference in costs of the three options presented.

<b>Inventory and Cost per Option</b>								
<b>Option</b>	<b>Engines</b>	<b>Aerial</b>	<b>Rescue</b>	<b>Tanker</b>	<b>Engine/ Tanker</b>	<b>Engine/ Rescue</b>	<b>Total / Option</b>	<b>Cost / 20 Years</b>
Option 1	6	3	3	2	0	0	14	\$8,000,000
Option 2	4	3	3	0	2	0	12	\$6,798,000
Option 3	3	2	2	0	2	1	10	\$5,526,000

#### **4.7 Current Funding Methodologies**

The Town of Darien has historically paid for apparatus replacement on a cash basis. The Town funds a lump sum amount to a replacement program as a line item in the annual budget. The current balance is reported at \$2,119,000.

#### **4.8 Potential Funding Opportunities**

The current method of funding has been viable funding for vehicle replacement but with today's low interest rates the Town may want to consider a ten (10) year lease purchase program. Financial institutions have been willing to fund fire apparatus (capital equipment programs) for ten years and currently the interest rates to do so are at three percent. The Town could choose to continue annual funding to a reserve fund and a pay as you go approach.

The Lease payment schedule demonstrates the year, annual required funding, replacement fund balance available, required additional funding and annual balance. The schedule is associated with the replacement plan. The reserve fund schedule demonstrates the year, annual required funding, replacement fund balance available, fixed annual contribution to the reserve fund and annual balance. Both a lease purchase proposed budget and pay as you go reserve fund are demonstrated below for each option.

Option 1 Lease Payment Schedule

Replacement Year	2013	2014	2015	2016	2017	2018	2019
Required Funding	\$98	\$98	\$98	\$119	\$211	\$323	\$435
Replacement Fund	\$2,119	\$2,021	\$1,923	\$1,825	\$1,706	\$1,495	\$1,172
Additional Funding	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Balance	\$2,021	\$1,923	\$1,825	\$1,706	\$1,495	\$1,172	\$737

Replacement Year	2020	2021	2022	2023	2024	2025	2026
Required Funding	\$493	\$553	\$578	\$480	\$537	\$537	\$585
Replacement Fund	\$737	\$0	\$0	\$0	\$0	\$0	\$0
New Funding	\$55	\$553	\$578	\$480	\$537	\$537	\$585
Balance	\$299	\$0	\$0	\$0	\$0	\$0	\$0

Replacement Year	2027	2028	2029	2030	2031	2032
Required Funding	\$562	\$612	\$500	\$442	\$382	\$357
Replacement Fund	\$0	\$0	\$0	\$0	\$0	\$0
New Funding	\$562	\$612	\$500	\$442	\$382	\$357
Balance	\$0	\$0	\$0	\$0	\$0	\$0
TD \$ (000)						

Option 1 Reserve Fund Payment Schedule

Replacement Year	2013	2014	2015	2016	2017	2018	2019
Required Funding	\$98	\$98	\$98	\$119	\$211	\$323	\$435
Replacement Fund	\$2,119	\$2,317	\$2,515	\$2,713	\$2,890	\$2,975	\$2,948
Additional Funding	\$296	\$296	\$296	\$296	\$296	\$296	\$296
Balance	\$2,317	\$2,515	\$2,713	\$2,890	\$2,975	\$2,948	\$2,809

Replacement Year	2020	2021	2022	2023	2024	2025	2026
Required Funding	\$493	\$553	\$578	\$480	\$537	\$537	\$585
Replacement Fund	\$2,809	\$2,612	\$2,355	\$2,073	\$1,889	\$1,648	\$1,407
New Funding	\$296	\$296	\$296	\$296	\$296	\$296	\$296
Balance	\$2,612	\$2,355	\$2,073	\$1,889	\$1,648	\$1,407	\$1,118

Replacement Year	2027	2028	2029	2030	2031	2032
Required Funding	\$562	\$612	\$500	\$442	\$382	\$357
Replacement Fund	\$1,118	\$852	\$536	\$332	\$186	\$100
New Funding	\$296	\$296	\$296	\$296	\$296	\$296
Balance	\$852	\$536	\$332	\$186	\$100	\$39
TD \$ (000)						

Option 2 Lease Payment Schedule

Replacement Year	2013	2014	2015	2016	2017	2018	2019
Required Funding	\$110	\$110	\$110	\$110	\$218	\$330	\$442
Replacement Fund	\$2,119	\$2,009	\$1,899	\$1,789	\$1,679	\$1,461	\$1,131
Additional Funding	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Balance	\$2,009	\$1,899	\$1,789	\$1,679	\$1,461	\$1,131	\$689

Replacement Year	2020	2021	2022	2023	2024	2025	2026
Required Funding	\$500	\$500	\$500	\$451	\$447	\$447	\$447
Replacement Fund	\$689	\$0	\$0	\$0	\$0	\$0	\$0
New Funding	\$55	\$500	\$500	\$451	\$447	\$447	\$447
Balance	\$244	\$0	\$0	\$0	\$0	\$0	\$0

Replacement Year	2027	2028	2029	2030	2031	2032
Required Funding	\$408	\$458	\$346	\$288	\$288	\$288
Replacement Fund	\$0	\$0	\$0	\$0	\$0	\$0
New Funding	\$408	\$458	\$346	\$288	\$288	\$288
Balance	\$0	\$0	\$0	\$0	\$0	\$0
TD \$ (000)						

Option 2 Reserve Fund Payment Schedule

Replacement Year	2013	2014	2015	2016	2017	2018	2019
Required Funding	\$110	\$110	\$110	\$110	\$218	\$330	\$442
Replacement Fund	\$2,119	\$2,243	\$2,367	\$2,491	\$2,615	\$2,631	\$2,535
Additional Funding	\$234	\$234	\$234	\$234	\$234	\$234	\$234
Balance	\$2,243	\$2,367	\$2,491	\$2,615	\$2,631	\$2,535	\$2,327

Replacement Year	2020	2021	2022	2023	2024	2025	2026
Required Funding	\$500	\$500	\$500	\$451	\$447	\$447	\$447
Replacement Fund	\$2,327	\$2,061	\$1,795	\$1,529	\$1,312	\$1,099	\$886
New Funding	\$234	\$234	\$234	\$234	\$234	\$234	\$234
Balance	\$2,061	\$1,795	\$1,529	\$1,312	\$1,099	\$886	\$673

Replacement Year	2027	2028	2029	2030	2031	2032
Required Funding	\$408	\$458	\$346	\$288	\$288	\$288
Replacement Fund	\$673	\$499	\$275	\$163	\$109	\$55
New Funding	\$234	\$234	\$234	\$234	\$234	\$234
Balance	\$499	\$275	\$163	\$109	\$55	\$1
TD \$ (000)						

Option 3 Lease Payment Schedule

Replacement Year	2013	2014	2015	2016	2017	2018	2019
Required Funding	\$110	\$110	\$110	\$110	\$172	\$284	\$330
Replacement Fund	\$2,119	\$2,009	\$1,899	\$1,789	\$1,679	\$1,507	\$1,223
Additional Funding	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Balance	\$2,009	\$1,899	\$1,789	\$1,679	\$1,507	\$1,223	\$893

Replacement Year	2020	2021	2022	2023	2024	2025	2026
Required Funding	\$388	\$388	\$388	\$339	\$335	\$335	\$335
Replacement Fund	\$893	\$0	\$0	\$0	\$0	\$0	\$0
New Funding	\$55	\$475	\$475	\$426	\$335	\$335	\$335
Balance	\$560	\$87	\$87	\$87	\$0	\$0	\$0

Replacement Year	2027	2028	2029	2030	2031	2032
Required Funding	\$296	\$346	\$346	\$288	\$288	\$288
Replacement Fund	\$0	\$0	\$0	\$0	\$0	\$0
New Funding	\$296	\$346	\$346	\$288	\$288	\$288
Balance	\$0	\$0	\$0	\$0	\$0	\$0
TD \$ (000)						

Option 3 Reserve Fund Payment Schedule

Replacement Year	2013	2014	2015	2016	2017	2018	2019
Required Funding	\$110	\$110	\$110	\$110	\$172	\$284	\$330
Replacement Fund	\$2,119	\$2,183	\$2,247	\$2,311	\$2,375	\$2,377	\$2,267
Additional Funding	\$174	\$174	\$174	\$174	\$174	\$174	\$174
Balance	\$2,183	\$2,247	\$2,311	\$2,375	\$2,377	\$2,267	\$2,111

Replacement Year	2020	2021	2022	2023	2024	2025	2026
Required Funding	\$388	\$388	\$388	\$339	\$335	\$335	\$335
Replacement Fund	\$2,111	\$1,897	\$1,683	\$1,469	\$1,304	\$1,143	\$982
New Funding	\$174	\$174	\$174	\$174	\$174	\$174	\$174
Balance	\$1,897	\$1,683	\$1,469	\$1,304	\$1,143	\$982	\$821

Replacement Year	2027	2028	2029	2030	2031	2032
Required Funding	\$296	\$346	\$346	\$288	\$288	\$288
Replacement Fund	\$821	\$699	\$527	\$355	\$241	\$127
New Funding	\$174	\$174	\$174	\$174	\$174	\$174
Balance	\$699	\$527	\$355	\$241	\$127	\$13
TD \$ (000)						

The three options for vehicle replacement with the associated optional funding schedules are alternatives to be considered as the community moves forward with fire protection for the next 20 years. These plans are diverse and can be modified as situations dictate. This is a module plan which means the Town can select different parts of each option and develop a final plan.