Nether Providence Township
and
Swarthmore Borough, PA.

Swarthmore Fire and Protection Association Station 14
South Media Fire Company Station 51
Garden City Fire Company Station 65

Fire Apparatus Fleet Review and Assessment

March 2025

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1.0 Overview

The Nether Providence Township, at the request of Township Manager Maureen Feyas, and Swarthmore Borough, at the request of Borough Manager William Webb, engaged the services of Emergency Vehicle Response (EVR). The request was to analyze the fire apparatus fleets and maintenance provisions of the Garden City Fire Company, South Media Fire Company, and the Swarthmore Fire and Protection Association, enabling the borough and township to adopt a comprehensive fleet replacement program. This study will review the fire department apparatus, equipment, and maintenance provisions for each unit. The overall goal is to provide Nether Providence Township and Swarthmore Borough, in conjunction with the three fire departments, with a comprehensive long-range plan that includes replacement strategies, financial planning, and an improvement plan. This will ensure safe operations and deployment practices to enhance fire protection within each community.

In January 2025, EVR staff performed several days of fieldwork and analysis to gather information on the fleet and response patterns of the three fire departments within the borough and the township. With the assistance of Chief Officers and personnel from Swarthmore Volunteer Fire and Protection Association, South Media Volunteer Fire Company, and Garden City Volunteer Fire Company, EVR staff gathered apparatus and maintenance records for the fleet for the past three years. EVR staff also conducted onsite inspections of each apparatus and reviewed information on the fire department's programs, policies, and response patterns to alarms.

EVR personnel also conducted an overall review of the land area, development, and structural conditions within the Swarthmore Borough and Nether Providence Township response area. Emphasis was placed on identifying target hazards within each community to determine the appropriate apparatus and equipment requirements for the area. Each piece of apparatus was thoroughly examined and evaluated for operational capabilities, physical and mechanical condition, maintenance, and repair history. This information was utilized to evaluate the suitability of the present apparatus fleet for the missions that the three fire departments would be expected to perform during an emergency incident within the community. With the new buildings being erected or rehabilitated or in the planning phase, this will undoubtedly increase the number of emergency incidents within the response area. This will place additional burdens on the fire department's current staffing model and require changes in apparatus and deployment practices.

Each of the three Fire Departments has endeavored to provide a modern fleet of apparatus. The vehicle fleet consists mainly of older units, with an average unit age of 19 years for the nine fire apparatus. Add the two ambulances to the matrix, and the fleet's average age decreases slightly to 18.63 years. The majority of the fire apparatus was acquired between 2000 and 2008. The fire department acquired two new major pieces of equipment in 2015 and 2019, with no acquisitions since. Due to long lead times, the next new apparatus is unlikely to be introduced into the fleet before 2029. The current vehicle fleet is too large for any long purchasing voids. With nine fire apparatus, if you replace them all, there should be a new fire truck entering the community every two or three years; however, that has certainly not been the case. This lapse in purchasing will cause an acceleration of apparatus purchasing in the short term.

2.0 Executive Summary

The current staffing model for the fire department is mostly volunteer, augmented with career personnel from Swarthmore. Even with career personnel, the Swarthmore Fire Department's staffing is inadequate. The staffing model is inadequate, given the hazards and risks faced. Unfortunately, the South Media Fire Department has the same staffing issues. Garden City is the only fire department in the study that could properly staff its apparatus following the NFPA standards.

Financially, the town and the borough have done better than most. However, all three fire departments suffer from poor funding. Currently, 30% of the Garden City Fire Department budget is being supplied by fund-raising activities. It is hard enough to retain volunteer firefighters who must leave their families to train, attend meetings, and do this very dangerous job for free. To add to the workload, the municipal leaders want these same volunteers to leave their families on weekends to throw block parties, sell flowers or Christmas trees, work bingo, and host pancake breakfasts and barbecues. In most of these communities, taxpayers are paying far more for garbage removal than they are for their volunteer neighbors risking their lives to provide 24/7/365 fire and EMS services. Under the commonwealth law, it is the legal responsibility and duty of the local government to provide and properly fund emergency services, not to rely on overworked volunteer firefighters. The reality is that with the cost of a new engine reaching over a million dollars and a new ladder truck over 2 million dollars, the volunteers cannot fundraise this amount. This old and obsolete operational model is not sustainable as volunteer firefighting numbers continue to dwindle, and most new volunteer firefighters cannot afford to live in many of these communities. A day of reckoning is fast approaching, and only those municipal leaders preparing for this inevitability will have good, reliable, long-term, and affordable fire and EMS services to offer to their citizens.

Key Observations

This report has identified several issues that will require appropriate technical and financial planning by the fire departments, the borough, and the township to ensure that the current level of emergency response capabilities is maintained and improved in the future.

- Tower 14 and Utility 65 are overweight when all vehicle seating positions are filled. All overweight conditions are confined to the front axle due to apparatus engineering and the seating configuration. The fire department's current fleet has several other vehicles, Squad 65-1, Utility 51, and Ladder 65, with marginal axle capacities. Future engine and ladder apparatus seating arrangements should be designed according to the actual unit staffing rather than equipping each apparatus with the maximum seating the apparatus can accommodate.
- In the first due response area, there are places where Tower 14 and Ladder 65 cannot gain clear access to all four sides of the structure. This increases the reliance on portable ground ladders, allowing fire personnel to gain access to upper floors for access or egress from the building. Tower 14 is equipped with 160 feet of ground ladders, and Ladder 65 carries 184 feet of ground ladders. These compliments are good and are close to the compliment needed. Under this plan, the two ladders will be the first to be replaced. Each apparatus committee should strive to improve each existing ladder apparatus and portable

ladder complement, outfitting them with over 200 feet of portable ladders. More importantly, the correct type and size of ladders need to be placed on these units. Many times, Tower 14 leaves with two firefighters who cannot deploy the required portable ladders, even if the apparatus has them. There is a recommendation in this report to buy a new tower ladder, but the borough must commit to more staffing, or it would be a waste of money.

- The three fire departments do not need three multitasking rescue engines in their response areas. The height of the cross-lays and the rear hose beds make the apparatus a safety concern for firefighters to work from. Careful consideration needs to be made when specifying the new engine apparatus to make sure they are safer to work from and easier to drive and maneuver. Thought also needs to be given to who will drive the apparatus in the future. The modern fire service, particularly the volunteer fire service, can no longer expect to find and recruit drivers with Commercial Drivers Licenses (CDLs). The three fire departments need to agree on the engine design and acquire engines similar to Engine 65.
- Before any rescue-type apparatus is purchased, there need to be informed conversations about the need for a rescue, the staffing for a rescue, and the vehicle's mission. This should be done with the township's best interests in mind. Buying something bigger and longer that can hold everything is not in the township's best interest. It is important to reevaluate operations and rescue requirements for the future of Nether Providence Township. If staffing in the South Media Fire Company continues to decline, consideration should be given to equipping Garden City with a tractor-drawn aerial (TDA) Ladder that could combine the services of Rescue 51 and Ladder 65.
- The data supplied for this report was fragmented, misleading, or could not be found. It is imperative, moving forward, to have computer software capable of tracking station staffing, staffing on apparatus, and staffing at working fires. Response data should also be categorized properly by call type. The fleet must be tracked to effectively and accurately provide a cost of ownership for each vehicle. This would include the number of responses for each apparatus, staffing of each apparatus, apparatus testing, preventive maintenance cost, repair costs, and tracking out-of-service time to retain the proper number of reserve apparatus. This record-keeping and data input could be handled by an administrative assistant to the emergency vehicle technician if that is the direction chosen.
- The three fire departments have spent a higher-than-normal amount of money on maintaining the fleet of apparatus. Given the size of the fleet and the activity level, the costs should be much lower. The factors for this excess include but are not limited to, deferred apparatus purchases, purchasing apparatus that does not fit the geography and topography of the area, specifying larger apparatus to accommodate tools and equipment that are rarely or never used, purchasing some apparatus from less than ideal manufacturers, buying apparatus that had new untested technology, and specifying expensive components that are not needed and are known to fail.
- The township and the borough should consider assuming responsibility for all apparatus and vehicle maintenance. Initially, the township and the borough could seek a third-party contract with fixed pricing for all apparatus testing and preventive maintenance. This could reduce costs and downtime of equipment. In the long term, consider starting an in-

house apparatus maintenance and testing program under the auspices of an Emergency Vehicle Technician (EVT). The EVT could do or oversee the required annual maintenance and testing. This would significantly alleviate the financial and time burden on the fire companies. The cost for this position could be funded by the money that would have been paid to the private outside contractors.

3.0 Nether Providence and Swarthmore Demographics

Nether Providence Township is 4.72 square miles and serves a population of over 14,500 people. Swarthmore Borough is 1.40 square miles and serves a population of over 6,400. The coverage for the response area is provided by:

Station 14: Swarthmore Fire and Protection Assoc., 121 Park Avenue

Engine 14-1	Engine 14-2
Tower 14	Ambulance 14
Ambulance 14 A	

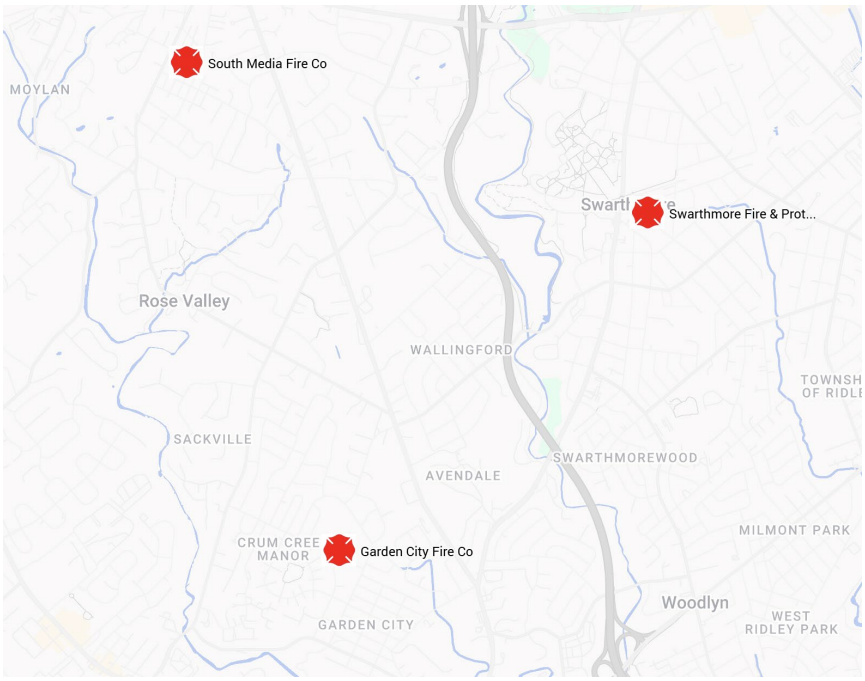
Fire Station 51: South Media Fire Company, 53 Washington Avenue

Engine 51	Utility 51
Squad 51-1	Rescue 51

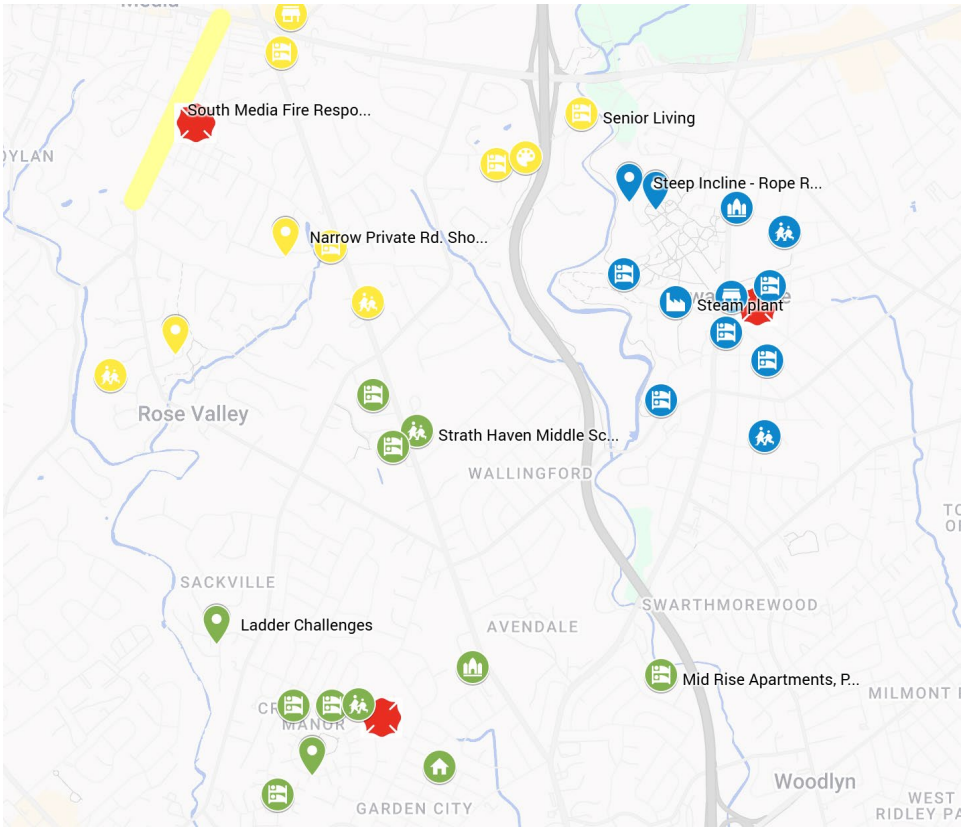
Fire Station 65: Garden City Fire Company 412 Moore Road

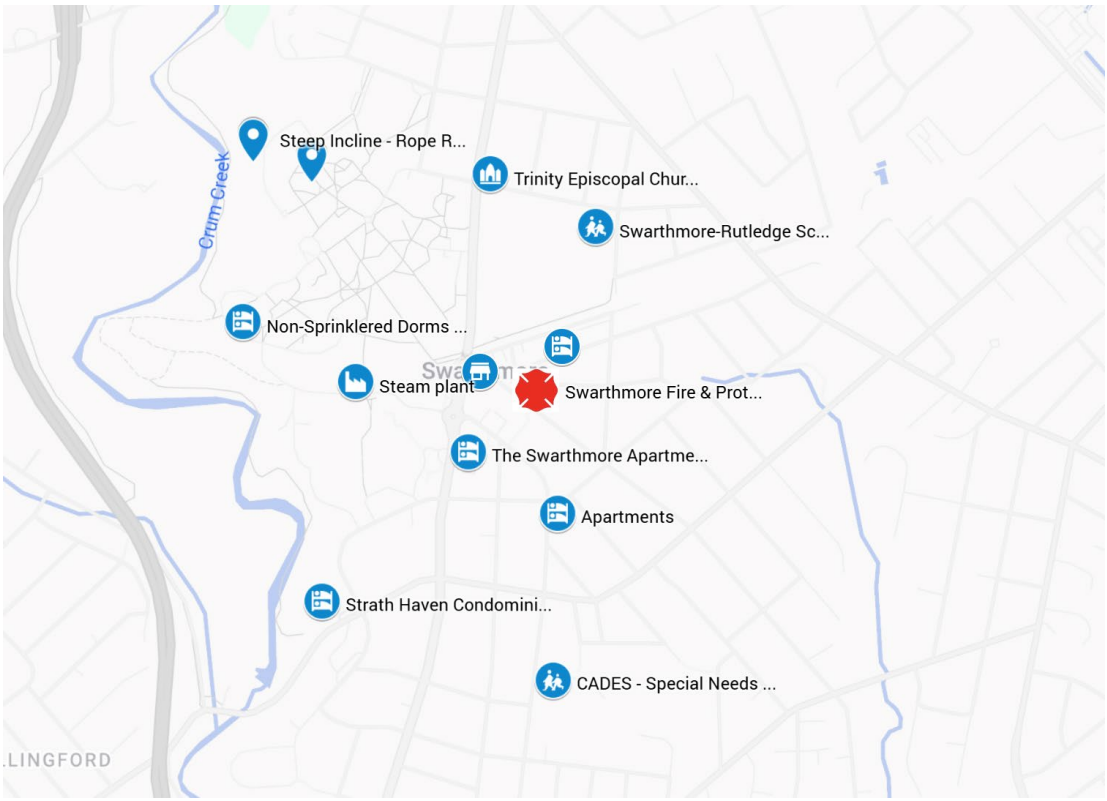
Engine 65	Squad 65-1
Ladder 65	Utility 65
Utility 65-8	

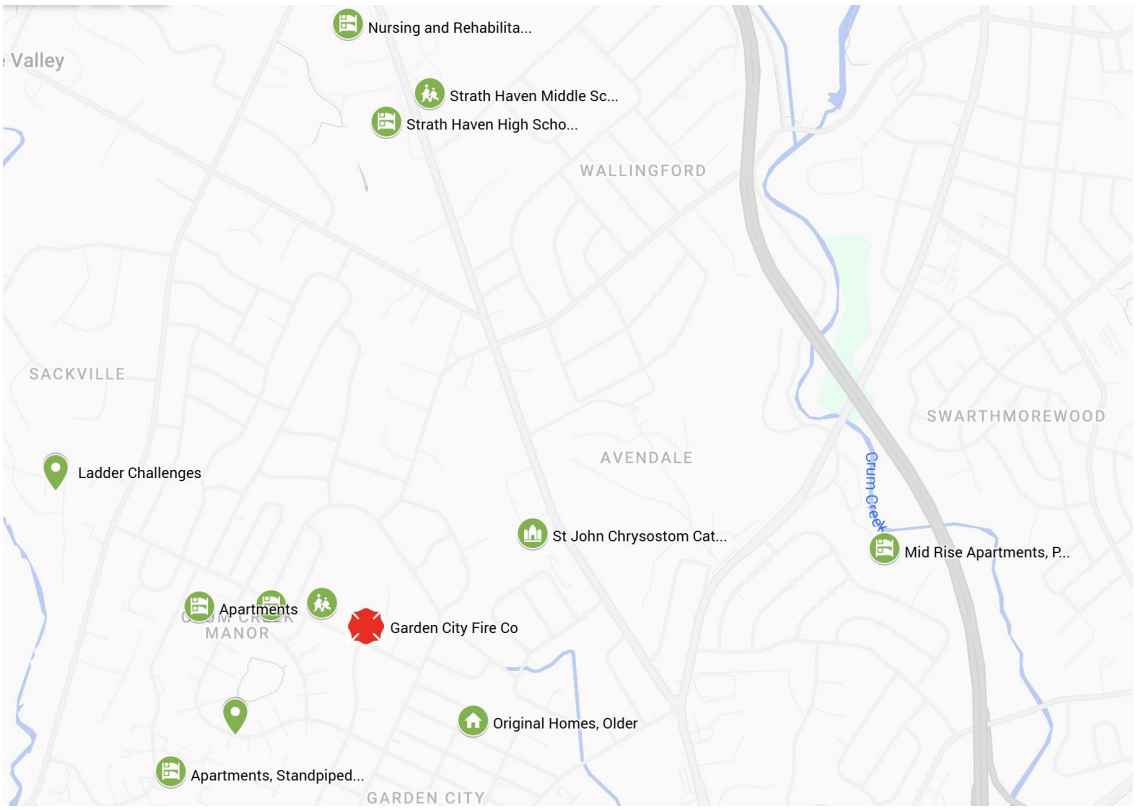
The housekeeping at Station 65 is exceptional. Housekeeping in Stations 14 and 51 is good. Fire stations are evaluated based on the number of bays, the dimensions of the bays, and their ability to accommodate staffing for the required apparatus. One of the longest fire trucks made is the tractor-drawn aerial or TDA. There is currently no station capable of housing a tractor-drawn aerial ladder. All three stations have length restrictions that prevent longer fire trucks from being housed there. Station 14 has short apparatus aprons, making training and caring for the apparatus difficult. Stations 14 and 51 have few features of modern fire stations. Station 14 is overcrowded and will become even more so as the fire company grows or adds more staffing.



An overview of the three fire companies




Steep Incline - Rope R...
Trinity Episcopal Chur...
Swarthmore-Rutledge Sc...
Non-Sprinklered Dorms ...
Steam plant
Swarthmore Fire & Prot...
The Swarthmore Apartme...
Apartments
Strath Haven Condomini...
CADES - Special Needs ...
Crum Creek
LINGFORD


Nursing and Rehabilita...
Valley
Strath Haven Middle Sc...
Strath Haven High Scho...
WALLINGFORD
SACKVILLE
SWARTHMOREWOOD
AVENDALE
Ladder Challenges
St John Chrysostom Cat...
Crum Creek
Mid Rise Apartments, P...
Apartments
MANOR
Garden City Fire Co
Original Homes, Older
Apartments, Standpiped...
GARDEN CITY

Firefighters trapped on the upper stories in this South Meida occupancy would have little chance of survival without multiple 35-foot portable ladders.

This apartment building in Garden City requires the services of multiple ladder companies outfitted with multiple 45-foot, 35-foot, and 28-foot portable ladders, as the building is only partially sprinklered.

This apartment building fire in November of 2024 in Litz Pa. was equipped with the same sprinklers that are prevalent in apartment buildings throughout Nether Providence Township and Swarthmore Borough. Some residents were hurt and barely escaped with their lives. The township and borough must invest in a strong fire department and not rely solely on fire sprinklers as their primary means of protection.

The lack of access at Swarthmore College for fire apparatus places a greater reliance on portable ladders and requires longer hose stretches.

Older apartment buildings such as this building in South Media are not sprinklered and represent a serious fire problem and life safety risk.

There may be a need for a tractor-drawn aerial ladder, given the numerous roads and access points in Garden City's first-due response area.

Aerial apparatus positioning can be problematic in several locations in the response area.

One of several high-rises that contain large civilian occupancies.

This building in South Meida represents another high-life safety risk.

Connected buildings on the main street would necessitate a significant fire department response, including adequate staffing, large quantities of water, and a substantial number of portable ladders.

4.0 ISO Review

During the most recent ISO survey in August of 2015, the Swarthmore fire department was graded as Class 03 with apparatus requirements of two engine companies and one ladder company. ISO requires a basic fire flow of 1750 gallons per minute. Rescue and Quint apparatus are not specifically required. However, the hose, equipment, and pump capacity are all considered in the overall evaluation if equipped. In the “Fire Department” section, Swarthmore achieved 29.82 points of credit out of a possible 50 points. The ISO evaluation of the fire department was excellent, apart from the deficiency in staffing (company personnel), which only got 2.06 points of credit out of a possible 15 points. If the borough invested in more career staffing, it could result in lower fire insurance premiums, which is especially important for commercial ratepayers. Although ISO requires two engines and one ladder under the current staffing model, the borough can only reasonably staff one engine if the ambulances are in quarters. The fire protection area is protected by fire hydrants supplied by multiple municipal water systems. There are 1000 public fire hydrants within the first-due response area. Most hydrants are spaced 300 to 500 feet apart.

During the most recent ISO survey in January of 2014, the South Media fire department was graded as Class 03 with apparatus requirements of two engine companies and one ladder company. Curiously, South Media does not have a ladder, yet they have a special service, Rescue 51, and received no credit for that apparatus. ISO requires a basic fire flow of 2500 gallons per minute. Rescue and Quint apparatus are not specifically required. However, the hose, equipment, and pump capacity are all considered in the overall evaluation if equipped. In the “Fire Department” section, South Media achieved 33.05 points of credit out of a possible 50 points. The ISO evaluation of the South Media Fire Department for Staffing (Company Personnel) received a respectable 6.33 points of credit out of a possible 15 points. However, since this report was tendered in 2014, there has been a steep and steady decline in the South Media department staffing, and it will not be able to achieve another Class 3 rating when the fire department is imminently regraded. The fire protection area is protected by fire hydrants supplied by multiple municipal water systems. There are 3771 public fire hydrants within the first-due response area. Most hydrants are spaced 300 to 500 feet apart.

During the most recent ISO survey in May of 2014, the Garden City Fire Department was graded as Class 03 with apparatus requirements of two engine companies and one ladder company. ISO requires a basic fire flow of 2500 gallons per minute. Rescue and Quint apparatus are not specifically required. However, the hose, equipment, and pump capacity are all considered in the overall evaluation if equipped. In the section entitled “Fire Department,” Garden City achieved 33.05 points of credit out of a possible 50 points. The ISO evaluation of the township fire department's staffing (company personnel) was excellent, earning 6.33 points out of a possible 15 points. Unlike most departments in the country, Garden City still provides a large number of volunteer firefighters. The fire protection area is protected by fire hydrants supplied by multiple municipal water systems. There are 3772 public fire hydrants within the first-due response area. Most hydrants are spaced 300 to 500 feet apart.

It would benefit all three departments to have ISO reevaluate the fire protection area, as there appears to be incorrect or missing information in the ISO reports.

5.0 Fire Apparatus Staffing and Response Patterns:

The *NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* outlines the organization and deployment of fire suppression operations and emergency medical services for volunteer fire departments, regardless of their size or other internal department-specific structures. This document outlines the apparatus and personnel resources required to operate safely and effectively at all incidents. NFPA 1710 (Annex D) is for a fully career-staffed fire department, and the three fire departments outlined in this report do not presently fit that criterion. No entity can effectively map out a fleet replacement plan without having some knowledge of department staffing. It does little good for a community to buy a million-dollar fire truck only to have the apparatus fail to respond or be underutilized due to the lack of staffing.

The NFPA 1720 standard identifies four different types of geographic areas and the recommended minimum number of personnel that should be available for response. These categories include urban, suburban, rural, remote, and special-risk areas. From the perspective of the demographics of the three response areas, they would be considered urban/suburban. All the response area is located within hydrant protection. This decreases the number of fire ground personnel needed to support both suppression and water supply efforts, unlike conducting rural water supply operations.

NFPA 1720 Response Criteria shall be used by the AHJ to determine staffing and response time objectives for structural firefighting, based on a low-hazard occupancy such as a 2000 ft^2 (186 m^2), two-story, single-family home without basement and exposures.

Demand Zone	Demographics	Min. Staffing	Response Time
Special Risk	Determined by AHJ		
Urban	>1000 people/mi2	15	9 minutes
Suburban	500–1000 people/mi2	10	10 minutes
Rural	<500 people/mi2	6	14 minutes
Remote	Travel distance ≥ 8 mi	4	Dependent on travel distance

Special risk areas are defined as target hazards or locations where significant life safety concerns are present. The reference to AHJ (Authority Having Jurisdiction) denotes the local authority responsible for fire protection. In this case, Swarthmore, Garden City, and South Media may determine the specific benchmarks to address the perceived fire and emergency hazards at these locations. All three Fire Departments should recognize these locations and pre-determine the number of fire apparatus needed to provide additional personnel and equipment. Few fire departments can provide sufficient personnel to meet the requirements of the NFPA 1720 Standard using only their own resources, and these three departments are no exception. Most departments rely upon automatic aid agreements within a county or regionally based dispatch system to meet the standard.

Fire department response protocols should be established to determine the necessary apparatus resources based on the type of incident and the structure involved. Special hazard assignments for high-life hazard buildings such as schools, hospitals, and numerous multi-story housing units should receive additional units. Currently, a reported structural fire or auto accident in the Fire / EMS response area would alert several fire companies in addition to the response of the career engine unless they are responding to EMS calls. However, there is no organized response as anybody can bring whatever they want or whatever they are qualified to drive. This is evident in the data where the ladder apparatus in Swarthmore is not responding nearly enough, given the risk. There should be a specific organized response for Engines, Squads, and Ladders. These units would be staffed by volunteers if available.

As with most fire departments that rely on volunteer staffing for some or all of the total staffing needed to safely respond, South Media and Swarthmore are falling short of what would be acceptable norms and the NFPA standard. This is not uncommon as volunteerism continues to decline nationwide. Given the hazards faced, heavy fire loads, and the life risk within the first-due response areas, there is a need to accelerate the volunteer retention program, implement a stipend program, and/or hire more career staff. Unit staffing for the engines and the ladders needs to be considered when developing a needs assessment for the overall size of the vehicle fleet. Staffing influences the mission of the vehicle, the equipment it will carry, and its dimensions.

Summary of Swarthmore Fire Department responses to incidents for the past three years:

Type of Incident	2022	2023	2024
Fires	57	52	71
Overpressure rupture, explosion, overheat	0	0	0
Rescue/EMS	71	68	60
Hazardous Condition	64	68	58
Service Calls	14	6	8
Good Intent Calls	60	66	29
False /Automatic Alarms	129	165	183
Severe Weather/Disaster	0	0	0
Special Incident	0	0	0
Other	0	0	0
Total Incident Count	**395**	**425**	**409**

Average Personnel Response on Apparatus for Swarthmore Fire Department

	2022		2023		2024	
Unit	**Responses**	**Average Personnel**	**Responses**	**Average Personnel**	**Responses**	**Average Personnel**
Chief 14	28		59		128	
Engine 14	313	3.14	351	3.12	351	3.59
Engine 14-1	11	2.0	20	2.7	20	3.0
Tower 14	69	2.98	49	2.63	49	3.34

Ambulance 14	36	1.94	29	1.96	36	1.94
Ambulance 14 A	7	1.85	1	2.0	2	2.0

Notes:

- There is a high percentage of false alarms that should be evaluated to see what a potential remedy could be.
- There appears to be staffing for one unit at a time, with partial staffing for the second unit.
- Engine 14 went on 351 responses in 2024, and Tower 14 should have responded more than the 49 times that it did, given the number of runs that the engine did. It would appear that the tower should have responded more but could not due to the lack of staffing.

Summary of South Media Fire Department responses to incidents for the past three years:

Type of Incident	2022	2023	2024
Fires	27	20	22
Overpressure rupture, explosion, overheat	0	0	0
Rescue/EMS	91	80	100
Hazardous Condition	24	40	40
Service Calls	11	10	4
Good Intent Calls	150	160	159
False /Automatic Alarms	88	103	101
Severe Weather/Disaster	0	0	0
Special Incident	0	0	0
Other	0	0	0
Total Incident Count	**391**	**413**	**436**

Average Personnel Response on Apparatus for South Media Fire Department

	2022		2023		2024	
Unit	**Responses**	**Average Personnel**	**Responses**	**Average Personnel**	**Responses**	**Average Personnel**
Chief 51	141		111		111	
Engine 51-1	100	2.88	196	2.9	187	2.3
Squad 51-2	120	2.7	96	3.1	89	2.67
Rescue 51	100	2.99	83	2.6	81	2.20
Utility 51	58	1.96	45	1.82	50	1.82

Notes: There is a severe staffing shortage, with only two responding members on most apparatus at most times. With the fire chief driving for a significant portion of the time, this is both dangerous and unacceptable, leaving no one in command. Staffing has declined substantially from 2023 to 2024, as illustrated, and the fire company seems to be on the verge of collapse.

Summary of Garden City Fire Department responses to incidents for the past three years:

Type of Incident	2022	2023	2024
Fires	112	111	110
Overpressure rupture, explosion, overheat	0	0	0
Rescue/EMS	118	105	132
Hazardous Condition	58	60	86
Service Calls	28	19	25
Good Intent Calls	13	12	16
False /Automatic Alarms	117	143	136
Severe Weather/ Disaster	0	0	0
Special Incident	76	73	80
Other	0	0	0
Total Incident Count	**522**	**523**	**585**

Average Personnel Response on Apparatus for Garden City Fire Department

	2022		2023		2024	
Unit	**Responses**	**Average Personnel**	**Responses**	**Average Personnel**	**Responses**	**Average Personnel**
Chief 65	82		93		86	
Engine 65	192	3.58	187	4.43	248	4.95
Ladder 65	179	4.12	188	4.7	177	5.19
Squad 65	139	3.75	110	4.1	158	4.34
Utility 65	65	2.43	69	2.75	108	2.69

Notes: Whatever the fire chief is doing to attract these kinds of volunteer staffing numbers in 2024 is truly remarkable and needs to be replicated throughout. The staffing numbers for Garden City in this day and age of fire companies going out of business are outstanding and are a testament to the firefighters and the leadership in Garden City.

Overall, all three fire departments respond to an inordinate number of false alarms. This reduces the effectiveness of the fleet, and it creates firefighter burnout. Municipalities and elected officials should consider adopting a “three strikes and you’re out” law. This law would impose a monetary fine on habitual abusers of the system, providing a penalty for the first two false alarms. The third false alarm would cause the occupancy to have their fire alarm system offline. While the system is offline, the property owner must hire a fire watch guard until the system is recertified by an outside contractor for use and put back online. This initiative was implemented in the City of New York in the 1990s and led to a significant reduction in these nuisance alarms. Most of these false alarms are caused by fire detection and suppression systems that have not been properly maintained or tested by the property owners.

Response Numbers by Year and Average Personnel Per Response by Year

				Average Personnel		
Unit	2022	2023	2024	2022	2023	2024
Engine 14-1	313	351	351	3.14	3.1	3.59
Engine 14-2	11	20	20	2.0	2.7	3.0
Engine 51	100	196	187	2.88	2.9	2.3
Squad 51-2	120	96	89	2.7	3.1	2.67
Engine 65-1	192	187	248	3.58	4.42	4.95
Squad 65-2	139	110	158	3.75	4.1	4.34
Tower 14	69	49	49	2.98	2.63	3.34
Ladder 65	179	188	177	4.12	4.7	5.19
Rescue 51	100	83	81	2.99	2.6	2.2

NFPA Standards 1710 and 1720 require a minimum staffing level of four personnel on each responding fire apparatus. Those apparatus with firefighter staffing levels meeting the NFPA minimum of four are highlighted in Green.

- **Station 14** does not meet the NFPA minimum of four firefighters, but it has seen slight improvements in staffing over the last two years. The staffing at Station 14 is poor and in critical condition. This needs to be addressed immediately. It is of grave concern that Tower 14 rarely responds, and when it does, it often does not have enough firefighters available to deploy the necessary portable ladders or perform other truck company functions during the initial response. This is dangerous and unacceptable.
- **Station 65** meets the NFPA minimum of four firefighters and has experienced a staffing increase over the past three years. This is outstanding, as many volunteer firehouses have been shuttered due to insufficient staffing. The leadership at Station 65 is largely responsible for the surge in staffing and should be commended.
- **Station 51** does not meet the NFPA minimum of four firefighters and has shown a steady decrease in staffing over the last two years. The staffing at Station 51 is in critical condition and needs to be addressed immediately, or Station51 will no longer exist. It is of grave concern that it appears the Fire Chief drove the apparatus to a number of these responses in an attempt to compensate for the staffing shortfall.

6.0 Fleet Review and Evaluation

The Swarthmore, Garden City, and South Media Fire Departments operate a total of nine fire/rescue apparatus, including four front-line engines, two squads, one rescue, two aerial apparatus, and one brush truck. There are two ambulances, three command vehicles, and three support vehicles. This section will address each major piece of apparatus, including its design, frequency of use, mechanical condition, equipment, and hose deployment capabilities together with a recommended time frame, when or if the unit should be replaced in the future.

All front-line engines, rescues, and ladder apparatus are equipped with four-door enclosed cabs, each capable of seating at least six personnel safely. The Chief cars can accommodate at least four, and the utility units can accommodate two to five firefighters safely, depending on the individual unit's design. Current heavy truck units can safely transport up to sixty-four personnel in seated and enclosed positions. Tower 14 and Utility 65 each have issues with their in-service weight due to a combination of body design, seating configuration, and the equipment they carry. Additionally, Engines 14-1 and 14-2, Squad 51-1, Squad 65-2, Tower 14, Ladder 65, and Rescue 51 are affected by moderate to severe rust and corrosion on the chassis frame, suspension components, battery boxes, and air reservoirs. These conditions are somewhat normal for the age of the vehicles; however, corrosion repairs and rust mitigation will need to be conducted to achieve the necessary lifespan for each piece of apparatus.

Engines 14-2, 51-1 (Squad), and 65-1 (Squad) are considered backup units to other engine companies within the fleet. However, this is impossible as all the engine companies have varying amounts of large-diameter hose and lack uniformity. Each engine company should be able to operate independently of other engine companies within the fleet.

Some of the vehicles in the fleet do not appear to have a defined role in relation to any of the equipment on the apparatus. The Garden City Fire Department's new 2019 engine should be the benchmark for a standardized engine company within the entire fleet. The fire department needs to establish its required fire flow and outfit each engine with the same hose loads, nozzles, and equipment to meet the needs of the response area. This engine layout should be standardized across the three fire companies.

The age of the fire department's current apparatus fleet is spread out over a period of 27 years, with the oldest unit, Engine 14-2, constructed in 1992 and the newest, Engine 65, placed into service in 2019. With the average age of the nine major pieces of apparatus being 19.11 years, the current fleet is in good condition for its age. Several vehicles have rust and corrosion issues, as well as overweight conditions on the front axles of Tower 14 and Utility 65. The NFPA *1910 Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus and Marine Vessels, 2024 Edition, recommends that the AHJ of fire apparatus plan a 15-to-20-year front-line* service life and 3-to-5-year reserve use for each primary piece of firefighting apparatus. Annex D of the NFPA 1910 standard recommends that vehicles over 25 years old should be replaced.

According to NFPA 1910, Section 8.3.6, tires need to be replaced after seven years. The following Fire Apparatus need tires: Engine 14-1, Tower 14, Engine 51, Squad 51-1, Rescue 51, Engine 65, Squad 65-1, Ladder 65, Utility 65, and Utility 65-8. The recommendation is to cycle Engine 14-2 out of the fleet immediately; however, if you retain this unit, it will also need tires.

Engine 65

Engine 65 is a 2019 Pierce Enforcer 4-door enclosed cab pumper. The aluminum body pumper features an 823-gallon polyethylene water tank and a 2,000-gallon-per-minute, midship-mounted Waterous single-stage pump. A Cummins L9 Engine powers the pumper through an Allison

3000 transmission. It measures 30 feet 2 inches in length and has a 184-inch wheelbase. Engine 65 is the front-line unit that responds to all call types.

At the time of the field inspection, Engine 65 accumulated 7,897 road miles and 850 engine hours. The cab is equipped with eight seats, 7 of which contain SCBA. The apparatus has a 22,800-pound front axle and a 27,000-pound rear axle for a GVRW of 49,800 pounds. Calculating an 8-person crew with the NFPA weight of 250 pounds, based on the standard at the time of construction, with the current equipment load, the front axle carries a total weight of 14,040 pounds. The rear axle, loaded with the current equipment, carries a weight of 20,560 pounds. The axles are both well within the weight rating, with sufficient residual capacity to accommodate modifications to the equipment carried. The tires are original equipment and will need to be replaced this year as they are from 2018.

The body is constructed from aluminum and features seven lap-style compartments and one Gortite roll-up door. The apparatus is equipped with equipment to perform most of the functions of an Engine Company. Much of the equipment is loose in the compartments and should be mounted in NFPA 9G brackets. The body compartments are moderately dirty but generally in good condition. The underside of the apparatus is generally dirty but in good shape. It should be cleaned and treated with a rust inhibitor.

Engine 65 carries One 100-foot 1.75-inch pre-connected line deployed from the front bumper. There are three cross-lays: Two 200-foot 1.75 and one 200-foot 2.5-inch lines. The rear hosebed contains One 200-foot 1.75-inch pre-connected line, one 300-foot 2-inch pre-connected line, and One 250-foot pre-connected 2.50-inch. The rear also contains 300-foot of 2.5-inch dead-layed and 1300 feet of 5-inch supply line. Two 100-foot 2.5-inch bundles with a Combination nozzle are carried for standpipe operations. There is a master stream monitor with stacked tips and a stream shaper located above the pump panel. This apparatus has an engine complement of portable ladders, a 24-foot extension, a 14-foot roof ladder and a folding ladder. The design of this engine should be replicated throughout the fleet.

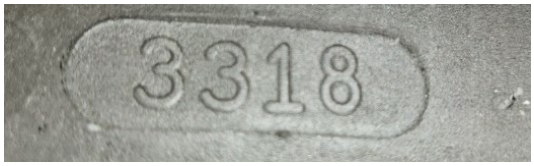
Repair the accident damage

The driver's vision is partially obstructed.

Clean and repaint hand tools.

All equipment in all compartments should be mounted.

The underside of the apparatus should be steam cleaned and have a rust inhibitor applied.



All six tires need to be replaced per the NFPA 1910.

Engine 65 Recommendations:

1. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed. Minor rust and corrosion were noted in the frame rails battery boxes and air holding tanks which should be mitigated. The chassis steam cleaning should be conducted on at least an annual basis to remove accumulated dirt, road debris, and surface rust from the chassis and other components. At that point, the fire department should have a rust inhibitor like Krown or Carwell applied by an outside vendor.
2. Per NFPA *1910 Standard for the Inspection, Maintenance, Refurbishment, Testing, and Retirement of In-Service Emergency Vehicles and Marine Firefighting Vessels, 2024 Edition, section 20.2* each apparatus in the departments fleet should be weighted annually on the front and rear axles individually as well as the entire apparatus to ensure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
3. Replace the six tires on Engine 65 per NFPA 1910 Section 8.3.6, as they are out of date.
4. Per NFPA 1910, each apparatus in the department's fleet should be service tested at least annually and after major repairs.
5. The compartments should be cleaned, and all tools should be cleaned and repainted
6. All equipment on the vehicle should be mounted per NFPA 1900.
7. Accident damage should be repaired.

8. The limited vision for the driver should not be duplicated on any other apparatus.

Engine 65 costs, on average, $2,919 per year over the last three years, based on documentation provided by the fire department**.** These costs are lower than expected for an engine type apparatus of this age, on average it should cost between five and eight thousand dollars per year to operate. This apparatus is the workhorse of the fleet and had 248 responses in 2024. This apparatus is scheduled to be replaced in 2041 after 22 years in front-line service and then be retained as a reserve until 2047, at which time it will be declared surplus and cycled out of the fleet.

Squad 65-1

Squad 65-1 is a 2005 Pierce Lance 4-door enclosed cab pumper. The aluminum body pumper has a 750-gallon poly water tank, and a 2000-gallon per minute rear-mounted Waterous single-stage pump with 217.8 pump hours. The rear mounted pump design has pushed the rear hose bed much higher in the air. Firefighters should be able to stretch a hose line without having to climb on the apparatus. The pumper is powered by a Detroit Series 60 engine rated at 475 HP and an Allison EVS 4000 transmission. It measures 33 feet 1 in long and has a 185-inch wheelbase.

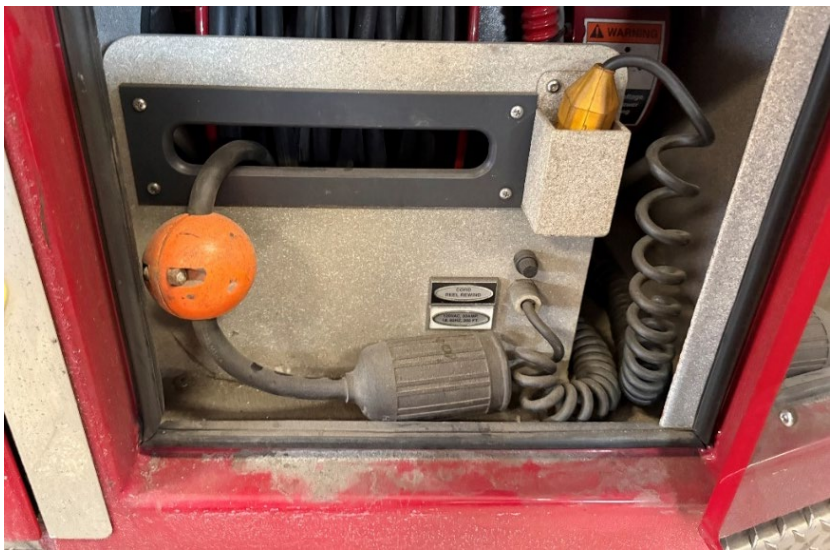
Squad 65-1 accumulated 22,603 road miles and 2346.7 hours on its engine. The cab is equipped with six seats, five of which contain SCBA. The apparatus has a 22,800-lb. front axle and a 31,000-lb. rear axle for a GVRW of 53.800 pounds Calculating a 6-person crew with the NFPA weights of 200 pounds, based on the standard at the time of construction, with the current equipment load, the front axle carries a total weight of 18,800 pounds The rear axle, loaded with the current equipment, carries a weight of 30,440 pounds The rear axle is within 560 pounds of the weight rating and only has 2% residual. The SAE (Society for Automotive Engineers) recommends at least 5 % residual on all axles. The recommendation is that no new equipment should be added to the squad unless an equal amount of weight in equipment is removed or there is a real risk in creating an overweight condition on Squad 65-1. The tires are from 2017 and have aged out. They need to be replaced per NFPA 1910.

The body is aluminum and features 14 compartments, 2 with lap-style doors, 6 Goretite roll-up style doors, and 4 coffin compartments on the top of the apparatus. The apparatus is equipped with equipment to perform most of the functions of an Engine, Truck, and Rescue apparatus. The squad is equipped with a light tower and a 20 KW Harrison Generator, which has 460 operating hours. This apparatus does a little bit of everything but nothing particularly well. The hose bed and coffin compartments are located 9 feet off the ground, which poses a safety concern when working from this truck. In the future, the apparatus committee should define the vehicle's mission and avoid the Swiss army knife approach. The body compartments are moderately dirty but generally in good shape. The unrestrained saws are causing damage to the compartment lining. Mounting brackets should be installed in this compartment to contain the saws, gas, and oil. The underside of the apparatus is generally dirty with moderate rust. The rust is heaviest on the air brake holding tank mounting brackets and around the pump house.

Squad 65-1 carries one 200-foot 2.5-inch pre-connected line deployed from the rear, with 400-foot of 2.5-inch hose dead loaded. There is 2000 feet of 5-inch LDH also deployed from the rear

hose bed. The apparatus is equipped with three cross lays, one 200-foot 2.5-inch pre-connected line, and two 200-foot 1.75-inch cross-lays. There is one 150-foot 1.5-inch pre-connected line deployed from the front bumper. There is a 0.75-inch booster line that has 200 feet of hose. All hose lines in the department are equipped with combination nozzles. This unit is also equipped with a master stream monitor over the pump panel. This, too, is equipped with a fog nozzle, which should be replaced with a set of smoothbore stacked tips and a stream shaper to provide the reach and penetration of the stream on the fire ground as it was designed to do. Ground ladder, hose, nozzle, and pump testing should be conducted annually and documented accordingly.

The Driver's view is badly obstructed. This needs to be mitigated in the next apparatus design.



Compartments need to be emptied and cleaned.

Equipment in the crew compartment should be secured in NFPA 9G rated Brackets.

Initial corrosion on the bottom of this compartment due to dissimilar metals.

The officer's seatbelt needs to be replaced.

Officers' seat cushions need to be repaired or replaced.

Gas Shocks on the front bumper compartment cover need to be replaced.

Roll-up door gaskets should be replaced to prevent dirt and moisture in the compartments.

This nozzle needs to be replaced with a set of smoothbore stacked tips.

The heat sinks on the portable ladders are out of date and have expired.

Surface rust on frame rails needs to be mitigated.

Squad 65-1 Recommendations:

1. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned, with all exposed rust and corrosion removed. Moderate rust and corrosion were noted in the frame rails, battery boxes, and air-holding tanks, which should be addressed. The chassis should be steam cleaned annually to remove accumulated dirt, road debris, and surface rust from the chassis and other components. At that point, the fire department should have a rust inhibitor like Krown or Carwell applied by an outside vendor.
2. According to NFPA 1910, Section 20.2, each apparatus in the department's fleet should be weighed annually on both the front and rear axles, individually and as a whole, to ensure that the unit's weight is within the vehicle's weight ratings as supplied by the manufacturer. This apparatus is within 560 pounds of the rear axle rating.
3. Replace the six tires on Squad 65-1 in accordance with NFPA 1910 Section 8.3.6, as they are outdated.
4. Per NFPA 1910, each apparatus in the department's fleet should be service tested at least annually and after major repairs.
5. The compartments should be cleaned, and all tools should be cleaned and repainted
6. All equipment on the vehicle must be mounted in accordance with NFPA 1900.
7. Heat sinks on portable ladders should be replaced and ladders tested.
8. All dissimilar metals must be isolated to prevent rust and corrosion.
9. All equipment carried inside the cab should be restrained and mounted in 9G certified brackets per NFPA 1900.
10. All nozzles should be tested annually.
11. The alignment of all doors should be checked and maintained, and the seals on the roll-up doors should be replaced as needed. Additionally, the lap doors should be inspected and maintained regularly.
12. The officer's and driver's seat cushions should be repaired or replaced.
13. The officer's and driver's seat belt needs to be replaced.
14. The Driver's view is obstructed and should be avoided on future apparatus purchases.
15. The master stream should be equipped with smoothbore stacked tips with a stream shaper.
16. Halyards on the 24-foot extension ladder need to be repaired or replaced.
17. Broken latch on rear access ladder on officers' side of apparatus.
18. The Actuator on the rear LDH discharge needs to be replaced.

Squad 65 costs, on average, $6,611 per year over the last three years, based on documentation provided by the fire department**.** This apparatus had 158 responses in 2024. The squad is scheduled to be replaced in 2033 with a new engine after 25 years of front-line service, and then it will be transferred to the reserve fleet. In 2035, it will be taken out of the fleet.

Engine 51

Engine 51 is a 2015 Spartan Metro Star 4-door enclosed cab with a 4 Guys stainless-steel body. This pumper features a 750-gallon poly water tank and a 2,000-gallon-per-minute midship-mounted Waterous single-stage pump. The pumper is powered by a Cummins L9 Engine and an Allison EVS 3000 transmission. It measures 29 feet 10 inches long and has a 172-inch wheelbase. Engine 51 is the first out engine run by the volunteer staff on structural fires.

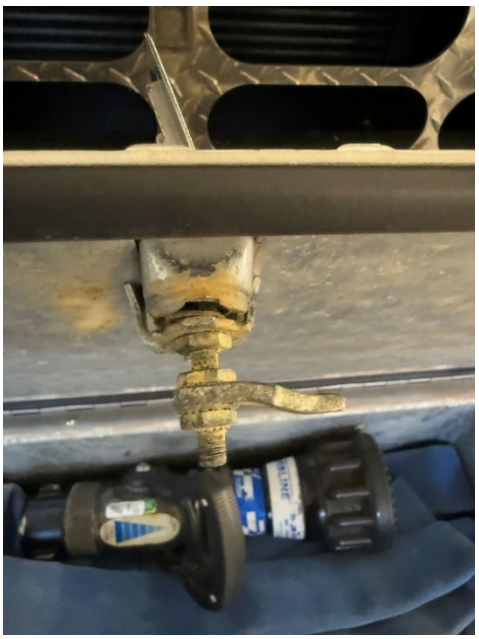
Engine 51 accumulated 10,521.6 road miles and 1370.1 hours on its engine. The cab is equipped with six seats, 5 of which contain SCBA. The apparatus has a 21,500-lb. front axle and a 27,000-lb. rear axle for a GVRW of 48,500 pounds. Calculating a 6-person crew with the NFPA weight allowance of 250 pounds, based on the standard at the time of construction, with the current equipment load, the front axle carries a total weight of 17,200 pounds. The rear axle, loaded with the current equipment, carries a weight of 23,200 pounds. The axles are both well within the weight rating, with sufficient residual capacity to accommodate modifications to the equipment carried. The tires on Engine 51 are outdated and need to be replaced in accordance with NFPA 1910. Engine 51 features an aluminum, 4-door, enclosed cab. All seats are equipped with All Belts to Seats style seatbelts, which are in good condition.

The body is constructed from stainless steel and features seven compartments, six with lap-style doors and one with roll-up-style doors. The apparatus is equipped with equipment to perform most of the functions of an Engine Company and also features basic Truck Company tools. The unit is also equipped with a light tower and an Onan Generator with 145 hours of operation. The body compartments are relatively clean and generally in good shape. The rear compartment has dirt infiltration. This is caused by the location and the failure of the rubber seal on the door. The underside of the apparatus is generally dirty, with minor rust on the bumper extension and the frame rail. The stainless-steel body is in excellent condition. The rust is heaviest on the frame rail in the area of the pump house. There appears to be a coolant leak from a coolant line in the area of the engine.

Engine 51 carries the following handlines. Two 200-foot 2-inch pre-connected lines deployed as cross lays. Both lines feature an automatic fog nozzle with a flow rating of 95-300 GPM and are pumped at 170 psi. One 200-foot 2.5-inch pre-connected line deployed as a cross-lay with an automatic fog nozzle with a flow rating of 50-350 GPM and pumped at 125 PSI, and one 150-foot 1.5-inch pre-connected line deployed from the front bumper with an automatic fog nozzle with a flow rating of 95-300 GPM and pumped at 170 PSI. From the rear hose bed is One 200-foot 1-inch pre-connected line with an automatic fog nozzle with a flow rating of 10-125 GPM, one 200-foot 2-inch line with an automatic fog nozzle with a rating of 50-350 GPM, and one 400-foot 2.5-inch dead lay line with an automatic nozzle with a flow rating of 50-350 GPM. The handline flows are automatic and will be based on the pressure being supplied. The automatic nozzles can create a misconception of the actual amount of water flowing, as the internal spring adjusts to make it appear the same despite the actual flow. This could allow the interior crew to operate in an IDLH with an insufficient flow for the hazard they are facing. The flow of a 2-inch handline should also be considered as it is excessive for the type of occupancies that the South Media and Nether Providence Fire Companies protect. With limited manpower, this excessive handline size may be increasing the workload of an understaffed response, thereby slowing access and ultimately compromising control of the hazard.

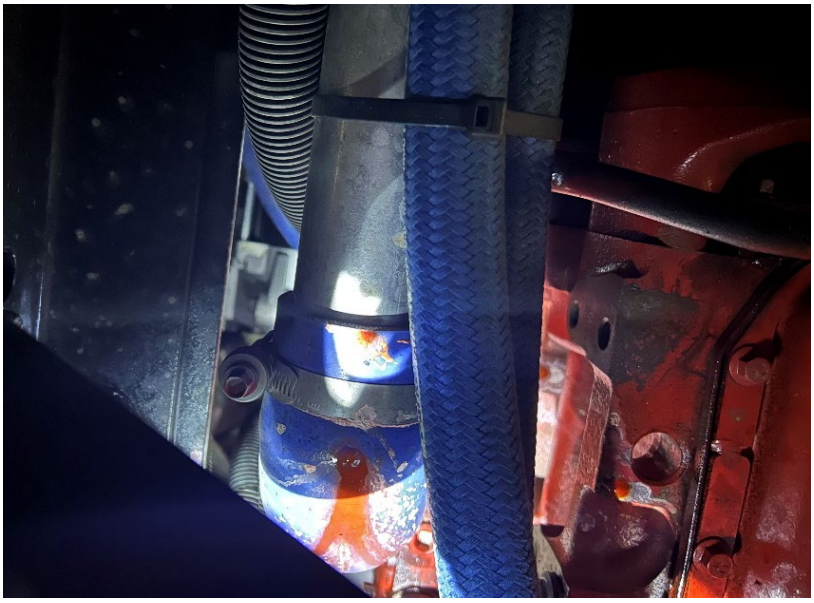
Replace or repair door rubber gaskets that are damaged.

Replace all rollup door rubber gaskets.



All corroded latches and corroded gas struts need to be replaced.

Corrosion on the officer's side frame rails needs to be mitigated as the frame rails are starting to fracture.



Repair coolant leak

Engine 51 Recommendations:

1. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned, with all exposed rust and corrosion removed. Moderate rust and corrosion were noted in the frame rails, battery boxes, and air-holding tanks, which should be mitigated. The chassis should be steam cleaned at least annually to remove accumulated dirt, road debris, and surface rust from the chassis and other components. At that point, the fire department should have a rust inhibitor like Krown or Carwell applied

by an outside vendor.

2. Per NFPA 1910 section 20.2, each apparatus in the department's fleet should be weighed annually on the front and rear axles individually as well as the entire apparatus to ensure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
3. Replace the six tires on Engine 51 per NFPA 1910 Section 8.3.6, as they are out of date.
4. Per NFPA 1910, each apparatus in the department's fleet should be service tested at least annually and after major repairs.
5. The compartments should be cleaned, and all tools should be cleaned and repainted
6. All equipment on the vehicle must be mounted in accordance with NFPA 1900.
7. Heat stickers on portable ladders should be replaced and ladders tested.
8. All dissimilar metals must be isolated to prevent rust and corrosion.
9. All equipment carried should be restrained and mounted in 9G-certified brackets, as per NFPA 1900.
10. All nozzles should be tested annually.
11. The alignment of all doors should be checked and maintained, and the seals on the roll-up door should be replaced. Additionally, the lap doors should be inspected and maintained.
12. The master stream should be equipped with smoothbore stacked tips with a stream shaper
13. Mitigate rust on the underside apparatus.
14. The fire extinguishers are outdated and require recertification.
15. The leak from the top of the coolant piping should be inspected and corrected.
16. Replace several latches and struts on the pump panel hose through compartments.
17. Evaluated the exterior paint damage and repair if deemed necessary.
18. Consider plumbing the air tank reservoir drains to the edge of the apparatus to ensure they are drained at least once a week.
19. Coordinate with Garden City and Swarthmore on the handline size, nozzle type, and pump pressures to ensure consistency across the department and potentially increase the purchasing power and discounts.

This apparatus had 187 responses in 2024. The Engine is scheduled to be replaced in 2037 after 22 years in frontline service. It will then be transferred to the reserve fleet until the delivery of the new Engine 65 in 2041. At this time, the current Engine 65 will be entered into the reserve fleet, and the current reserve Engine 51 will be declared surplus after 26 years of service.

Squad 51-2

Squad 51-2 is a 2000 Pierce Quantum 4-door enclosed cab pumper. The aluminum body pumper has a 750-gallon poly water tank and a 2000-gallon-per-minute midship-mounted Waterous single-stage pump. The pumper is powered by a Detroit Series 60 Engine and an Allison HD-

4060P transmission. It measures 31 feet 5 inches long and has a 182-inch wheelbase. Squad 51-2 is the second run engine for the members of Station 51 run by the volunteer staff on structure fires. Squad 51-2 also features a 35-foot extension ladder and a 16-foot straight ladder. This ladder complement fits the needs of the area and should be considered a positive. The availability of proper ground ladders throughout the fire department needs to be discussed as the replacement of apparatus begins.

Squad 51-2 accumulated 23,924.4 road miles and 3100.9 hours on its engine. The cab is equipped with six seats, 5 of which contain SCBA. The apparatus has a 20,800-lb. front axle and a 27,000-lb. rear axle for a GVRW of 47,800 pounds. Calculating a 6-person crew with the NFPA weights of 200 pounds, based on the standard at the time of construction, with the current equipment load, the front axle carries a total weight of 18,120 pounds. The rear axle, loaded with the current equipment, carries a weight of 23,820 pounds. The axles are both well within the weight rating, with sufficient residual capacity to accommodate modifications to the equipment carried. All six tires are out of date and need to be replaced per NFPA 1910.

Squad 51-2 features an aluminum, 2-door, forward-enclosed cab with a 4-seat, enclosed rear, and sliding rear doors. The forward seats and the outside rear seats are equipped with post-mounted seatbelts. The two center rear seats are equipped with lap belts, which are in good condition. However, the two lap belt-only seats do not provide the protection desired in today's apparatus.

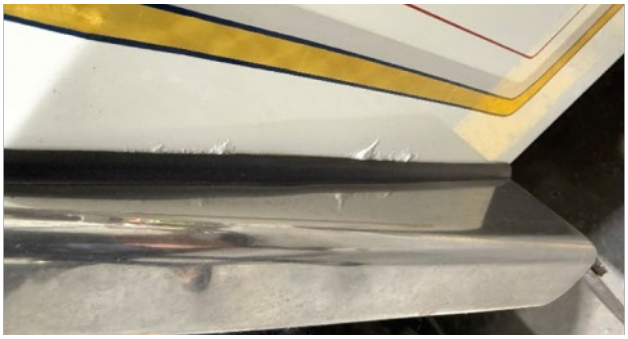
The body is constructed from aluminum and features seven compartments, all with Dover roll-up style doors. The apparatus is equipped with the necessary equipment to perform the functions of an Engine company and a basic Rescue Company. The squad is equipped with a generator with 595.8 hours of operation. The body compartments are relatively clean and generally in good shape; however, all door seals are aged and deteriorated and should be replaced.

The cab and body both have numerous areas of paint damage and corrosion-based rust, where the corrosion is occurring underneath the top layer of the paint. This is to be expected in an apparatus of this age. The underside of the apparatus is extremely dirty, with moderate rust throughout and severe rust and delamination on the frame rails. The aluminum body shows its age but is in good condition. The rust is heaviest on the frame rail in the area of the pump house. There appears to be a coolant leak as well as an oil leak from the Detroit engine, and this is evident by the oil and oil dry found under the apparatus.

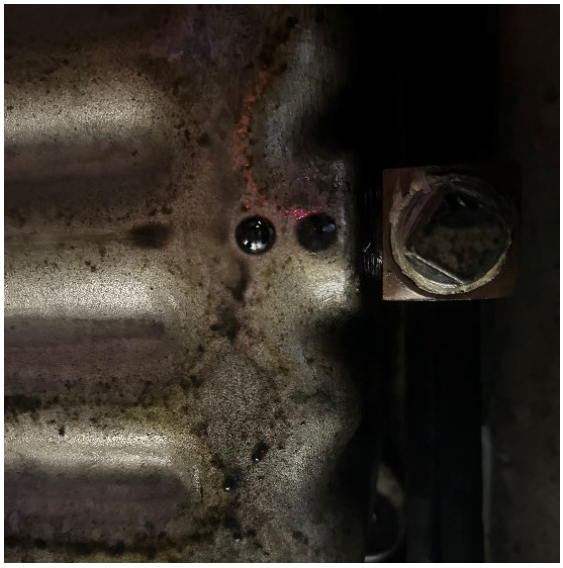
Squad 51-2 carries Two 200-foot 2-inch pre-connected lines deployed as cross lays, both with an automatic fog nozzle with a flow rating between 50-350 GPM and pumped at 150 psi. One 200-foot 2.5-inch pre-connected line deployed as a cross-lay with an automatic fog nozzle with a flow rating of 50-350 GPM and pumped at 125 PSI, and one 200-foot 1.5-inch pre-connected line deployed from the front bumper with an automatic fog nozzle with a flow rating of 70-200 GPM and pumped at 160 PSI. One 400-foot 2.5-inch dead lay line with an automatic nozzle with a flow rating of 50-350 GPM is deployed from the rear. The handline flows are automatic and will be based on the pressure being supplied. The automatic nozzles can create a misconception of the actual amount of water flowing, as the internal spring adjusts to make it appear the same despite the actual flow. This could allow the interior crew to operate in an IDLH with an insufficient flow for the hazard they are facing. The nozzles on the handlines are not similar in respect to the size of the handlines throughout the apparatus at the South Media Fire Company. The flow of a 2-inch handline should also be considered, as it is excessive for the type of occupancies that the South Media and Nether Providence Fire Companies protect. With limited

manpower, the excessive size of the handline and inconsistent handline flow may be compromising safety and increasing the workload of an understaffed response, thereby slowing access and ultimate control of the hazard.

All equipment in the cab must be secured with NFPA 9G brackets.

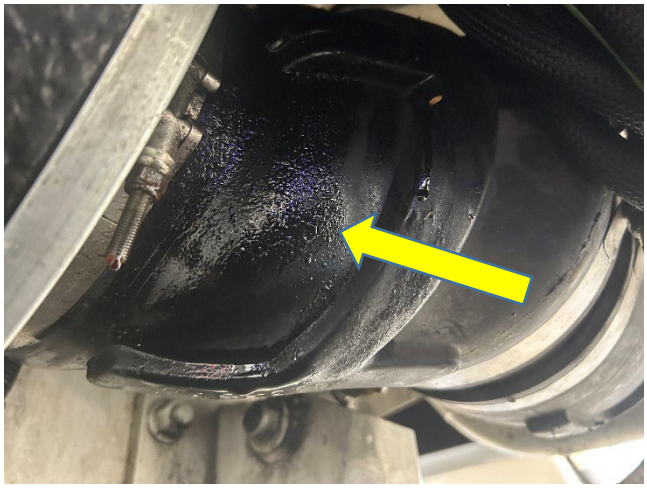


Exterior corrosion should be mitigated.



Oil leaks need to be repaired.

Major rust and corrosion must be evaluated and repaired.



The coolant leak needs to be repaired.

Replace the combination nozzle with a set of stacked tips with a smoothbore and a stream shaper to achieve reach and penetration of the stream.

The moderate rust needs to be mitigated before it gets worse.

Squad 51-2 Recommendations:

1. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed. Minor rust and corrosion were noted in the frame rails, battery boxes, and air-holding tanks, which should be mitigated. The chassis should be steam cleaned on at least an annual basis to remove accumulated dirt, road debris, and surface rust from the chassis and other components. At that point, the fire department should have a rust inhibitor like Krown or Carwell applied by an outside vendor.
2. Per NFPA 1910 section 20.2, each apparatus in the department's fleet should be weighed annually on the front and rear axles individually as well as the entire apparatus to ensure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
3. Replace the six tires on Squad 51-2 in accordance with NFPA 1910 Section 8.3.6, as they are outdated.
4. Per NFPA 1910, each apparatus in the department’s fleet should be service tested at least annually and after major repairs.
5. The compartments should be cleaned, and all tools should be cleaned and repainted
6. All equipment on the vehicle should be mounted per NFPA 1900.
7. Heat stickers on portable ladders should be replaced and ladders tested.
8. All dissimilar metals must be isolated to prevent rust and corrosion.
9. All equipment carried should be restrained and mounted in 9G certified brackets per NFPA 1900.
10. All nozzles should be tested annually.
11. The alignment of all doors should be checked and maintained, and the seals on the roll-up door should be replaced. Additionally, the lap doors should be inspected and maintained.
12. The master stream should be equipped with smoothbore stacked tips with a stream shaper

13. The fire extinguishers are outdated and require recertification.
14. Replace several latches and struts on the pump panel hose through compartments.
15. Correct the rust issues on the underside with immediate attention paid to the frame rail delamination.
16. Repair the support for the right rear compartment, which appears to have been damaged in an accident.
17. Repair the leaking oil seal on the left front axle.
18. The coolant leak should be inspected and corrected.
19. The oil leak should be inspected and corrected.
20. The brakes are spongy and require adjustment.
21. Evaluated the exterior paint damage and repaired it if deemed necessary.
22. Consider plumbing the air tank reservoir drains to the edge of the apparatus to ensure they are drained at least weekly.
23. Coordinate with Garden City and Swarthmore on the handline size, nozzle type, and pump pressures to ensure consistency across the department and potentially increase the purchasing power and discounts.

This apparatus had 82 responses in 2024. The Squad should enter the reserve fleet immediately. In 2033, once replaced by Squad 65-1, it will be removed from the fleet after 33 years of service.

Engine 14-1

Engine 14-1 is a 2008 Pierce Dash 4-door, enclosed-cab pumper. The aluminum body pumper has a 750-gallon poly water tank, a 30-gallon foam tank, and a 2000-gallon per minute top-mount Hale two-stage pump. The pumper is powered by a Detroit Series 60, 470-hp engine and an Allison EVS 4000 transmission. It measures 30 feet 9 inches in length and has a 188.50-inch wheelbase. Engine 14-1 is the first out engine that responds from the Swarthmore Station.

Engine 14-1 has accumulated 16,390 road miles and 1998.6 hours on its engine. The cab is equipped with six seats, 5 of which contain SCBA. The apparatus has a 22,800-lb. front axle and a 27,000-lb. rear axle for a GVRW of 49,800 pounds. Calculating a 6-person crew with the NFPA weights of 200 pounds, based on the standard at the time of construction, with the current equipment load, the front axle carries a total weight of 15,260 pounds. The rear axle, loaded with the current equipment, carries a weight of 24,340 pounds. The axles are both well within the stamped weight rating. Most of the tires are original tires that came with the vehicle. All tires should be replaced in accordance with NFPA 1910.

Engine 14-1 has SCBA in brackets that include a strap to secure the SCBA, meeting NFPA 9G standards. However, it does not appear that the straps are utilized. There are unrestrained items in the cab that have the potential to become projectiles in an accident. A set of irons has a broken

strap. The body is constructed from aluminum and features six compartments with lap doors and one Goretite roll-up door that requires a rubber gasket.

The underside of the apparatus exhibits minor to moderate signs of corrosion, particularly around the pump house, where the pump packing is leaking, and on the frame rails. Paint bubbling and corrosion are also present under the driver's windshield. All this rust and corrosion should be easily remediated during the rehab.

The apparatus has a good assortment of engine, truck, and rescue tools and equipment. The body compartments are structurally in good condition and should be cleaned. Engine 14-1 carries the following handlines. Two 200-foot 1.75-inch pre-connected lines deployed as cross-lays; both have combination nozzles. One 150-foot 1.75-inch pre-connected line deployed from the front bumper with a combination nozzle. The rear hose bed is equipped with 1000 feet of 5-inch LDH supply line, 400 feet of 3-inch, one 250-foot pre-connected 2.5-inch line with a combination nozzle, and 300 feet of 1.75-inch with a combination nozzle.

The door gasket needs to be repaired or replaced.

Replace the fog nozzle on the master stream with a set of stacked tips and a stream shaper to achieve full flow, thereby increasing reach and penetration of the stream.

All tools in the cab should be restrained in a 9G rated bracket. In the event of an apparatus rollover, this Halligan can become a lethal projectile.

Corrosion on the frame rails needs to be mitigated.

This tire is one of five that are original equipment and well beyond the seven-year NFPA 1910 allowance. All six tires need to be replaced immediately.

The driver has poor visibility outside of the front windshield and the officer's side mirror.

Repair the accident damage before it starts to corrode.

Bubbling paint and corrosion need to be mitigated under the front windshield.

Engine 14-1 Recommendations:

1. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed. Minor to Moderate rust and corrosion were noted in the frame rails, battery boxes, and air-holding tanks, which should be mitigated. The chassis should be steam cleaned annually to remove accumulated dirt, road debris, and surface rust from the chassis and other components. At that point, the fire department should have a rust inhibitor like Krown or Carwell applied by an outside vendor. Special attention should be placed on the radiator intake.
2. Per NFPA 1910 section 20.2, each apparatus in the department's fleet should be weighed annually on the front and rear axles individually as well as the entire apparatus to ensure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
3. Replace the six tires on Engine 14-1 per NFPA 1910 Section 8.3.6, as they are out of date.
4. Per NFPA 1910, each apparatus in the department’s fleet should be service tested at least annually and after major repairs. Testing seems to be sporadic.
5. Replace the master stream fog nozzle with a stream shaper and a set of stacked tips.
6. Secure all SCBA in NFPA-rated 9G brackets.
7. Correct issues with tool mounting brackets in the cab and ensure all items carried there are secured in a compartment or an NFPA 9G non-marring-rated bracket.
8. Clean compartments and organize the equipment.
9. Replace all defective door gaskets on the cab and the body.
10. Replace gas shocks in the crew area compartment
11. Locate the leak in the pump.
12. Irons are paired in a compartment with a broken strap.

Engine 14-1 has averaged $6,555 per year over the last five years, which is considered average. The engine had 351 responses in 2024. Engine 14-1 is in good condition for its age. It is recommended that the unit be removed from service in 2028 and sent for rehabilitation, with the intention of retaining it for an additional ten years. After 27 years of frontline service, Engine 14-1 should be replaced with a new engine in 2035. The current Engine 14-1 would be retained as a reserve. It will be removed from the fleet in 2037 after 29 years of service.

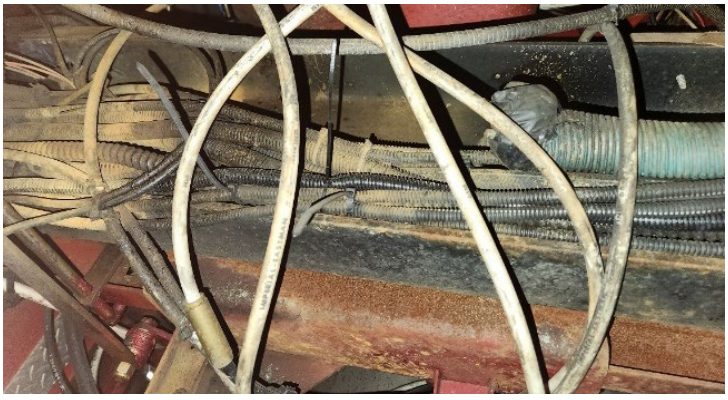
Engine 14-2

Engine 14-2 is a 1992 Spartan four-door cab pumper with an aluminum body built by Marion. This pumper features a 750-gallon water tank, a 50-gallon foam tank, and a 1,500-gallon-per-minute Hale Q-Max 150 pump. This pumper is powered by a Detroit 6V-92 TA motor through an Allison HT-740 automatic transmission. This unit measures 31 feet 4 inches long with an 184-inch wheelbase and an overall height of 9 feet 8 inches. This unit is rarely used and acts as a reserve engine.

At the time of the field inspection, Engine 14-2 had 18,699 road miles and 3,350.9 engine hours. The cab can carry eight personnel with seven seats equipped with SCBA. Engine 14-2 is equipped with an 18,000-lb. front axle and a 24,000-lb. rear axle. With eight personnel on board, using the NFPA allowance of 200 pounds per seat and loaded with equipment, the front axle weighs 17,040 pounds. The rear axle, while loaded with equipment, weighs 20,200 pounds. These weights meet the requirements of the manufacturer's data tag and the DOT.

Engine 14-2 has an aluminum body and is equipped with 13 body compartments outfitted with lap doors. Engine 14-1 is used as a spare/reserve unit and appears to be rarely used. This apparatus is equipped with an Onan 6.0 kW generator and a cord reel. The engine's exterior is in good condition for its age, but the underside has areas of rust and corrosion.

Engine 14-2 has two cross-lays, each outfitted with 200 feet of 1.75-inch hose and equipped with a combination nozzle. There are two booster reels, each with 150 feet of 1-inch hose. Off the rear is 300 feet of 3-inch hose, dead loaded, and a 200-foot 3-inch leader line. Additionally, in the rear hose bed, Engine 14-2 has 1000 feet of 5-inch supply line, 100 feet of 1.75-inch hose dead loaded, and 200 feet of 2.5-inch hose preconnected to a Blitz Fire. The front bumper contains a 25-foot 5-inch hydrant line.



The frame rails on Engine 14-2 show their age with significant surface rust.

All the tires have reached the end of their lifespan and need to be replaced.

The pump packing on Engine 14-2 is leaking.

The driver's and officer's seats both need to be repaired.

This unstrained SCBA and equipment could injure or kill a firefighter in the crew cab area during an apparatus rollover. SCBA and all equipment need to be secured.

Engine 14-2 recommendations:

Engine 14-2 has averaged $2,569 per year over the last five years. This would be considered less than what would normally have been expended on an engine of the same age. It had only 20 responses in 2024. Engine 14-2 should be immediately removed from the fleet. It is 32 years old, little used, and it is unable to be staffed.

Tower 14

Tower 14 is a 2002 Pierce Dash 100-foot rear-mount aerial tower quint with an aluminum four-door cab and bodywork. It is built on a 258-inch wheelbase, with an overall length of 47 feet 0 inches and an overall height of 11 feet 7 inches. It is powered by an ISM Cummins engine rated at 500 horsepower through an Allison HD 4060-P automatic transmission.

At the time of the field survey, the apparatus had accumulated 15,210 road miles and 2,335.3 engine hours. Tower 14 is equipped with a Tak-4 independent front suspension. The apparatus can seat seven personnel in the cab, with six seats provided with self-contained breathing apparatus. The apparatus has a front axle rating of 22,800 pounds with an in-service weight of 23,480 pounds with personnel. The Tower is 680 pounds overweight on the front axle. The rear axle is rated at 58,000 pounds and has an in-service weight of 55,860. The fire department needs to offload 680 pounds off the front axle. Overweight fire apparatus is a very serious issue that has resulted in firefighter deaths. This overweight condition needs to be remediated immediately. EVR can provide guidance once you are ready to make the apparatus road-worthy and safe again. Emergency Vehicle Response strongly recommends weighing the tower per NFPA 1910 section 20.2 2024 edition before it is placed back in service.

Offloading weight from the front axle can be achieved by one or more of the following:

- Removing seats in the cab area
- Offloading tools and equipment from the cab area
- Loading more weight on the rear axle, which will offload weight on the front axle

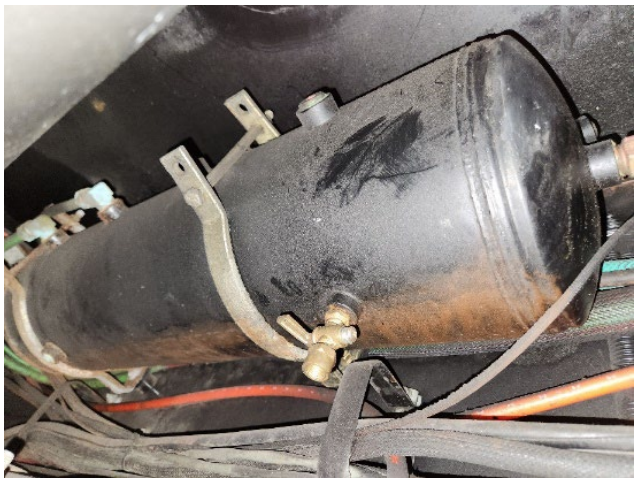
The apparatus body has eleven enclosed compartments, ten with lap doors and one with a Dover rollup door. The ladder is equipped with an assortment of truck company and rescue equipment. The unit is equipped with a 20 kW Harrison Generator. A total of 160 feet of portable ground ladders are carried on the tower, including two 35-foot, one 24-foot, and one 12-foot extension ladders, two 20-foot roof ladders, a 16-foot roof ladder, and a 10-foot attic ladder, and a Little Giant ladder. The ladder complement features two 35-foot extension ladders, which are much needed. However, the assortment and number of ladders need to be evaluated before the next ladder truck purchase. A true ground ladder needs assessment should be performed with a hazard assessment before beginning the specification process.

Tower 14 is equipped with a Hale 2000 gpm pump with 116.7 hours of operation, a 300-gallon water tank, and a 50-gallon foam tank with a Foam Pro system. There are three speedlays: two contain 200 feet of 1.75-inch hose with a combination nozzle, and one has 200 feet of 2.5-inch hose with combination nozzles. The rear hose bed has 800 feet of 5-inch supply line.

The tower is equipped with a waterway and one electric monitor with a fog nozzle, which should be replaced with smoothbore stacked tips and a stream shaper to achieve the desired reach and stream penetration. When the electric monitor breaks, it should be replaced with a manual monitor. Manual monitors are far less expensive and always work. The tower is in mainly good condition due to the prepping, priming, and painting of the underside of the apparatus, including the chassis frame rails. However, even with the frame rails being painted, they still need to be

cleaned annually and treated with a corrosion protectant, as rust and corrosion are starting to form.

This axe and bracket should be removed to remove weight, and the bracket is not an NFPA-approved 9G Bracket.



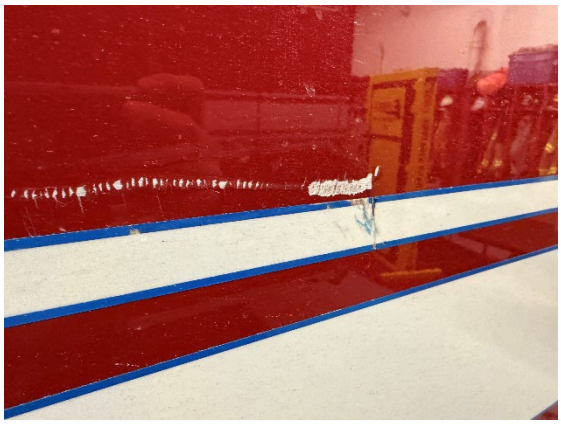
Moderate rust and corrosion are starting to form on the underside of the chassis.

All portable ladders, hose, nozzles, fire pumps, and aerial devices need to be tested annually.

The driver's vision is obscured.

All unrestrained equipment needs to be removed from this apparatus immediately.

Equipment needs to be secured and mounted in NFPA-approved brackets.



This paint damage needs to be repaired.

Tower 14 Recommendations:

1. All equipment, tools, and SCBA should be removed from the cab or secured in an NFPA 9 G-rated bracket. The boxes of chains should be removed from the cab since they have no business being stored unrestrained in the seating area. This is a serious safety issue that requires immediate attention.
2. There were no Ladder Belts or harnesses found on the apparatus. Every firefighter in the Basket needs to be tethered to the basket as per the NFPA standard. This unit should not be in service without the required safety equipment available for department personnel.
3. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned, with all exposed rust and corrosion removed. Moderate rust and corrosion were noted in the frame rails, battery boxes, and air holding tanks, which should be mitigated. Chassis steam cleaning should be conducted annually to remove accumulated dirt, road debris, and surface rust from the chassis and other components. At that point, the fire department should continue to have a rust inhibitor like Krown or Carwell applied by an outside vendor.
4. According to NFPA 1910 Section 20.2, each apparatus in the department's fleet should be weighed annually on both the front and rear axles, as well as the entire apparatus, to ensure that the unit is within the vehicle's weight ratings as supplied by the manufacturer. This unit is 680 pounds overloaded. The fire department must offload 680 pounds from the cab to make it safe and road-worthy.
5. Replace the ten tires on Tower 14 per NFPA 1910 Section 8.3.6, as they are out of date.
6. Per NFPA 1910, each apparatus in the department’s fleet should be service tested at least annually and after major repairs.
7. Replace the combination nozzle on the basket water monitor with a stream shaper with stacked smoothbore tips.
8. The apparatus interior and compartments are filthy and need to be cleaned and detailed. All equipment must be removed from the apparatus, cleaned, and, in some cases, re-painted.

9. The gas shocks in the horizontal lap doors should be replaced as needed.
10. There is a hydraulic leak that requires attention.
11. The heat sensors on the portable ladders have expired.
12. There are exterior paint issues that should be addressed.

Tower 14 has averaged $11,564 in repairs and maintenance in the last five years, which is in line with what one would expect to pay for a tower of this vintage. The apparatus had 49 responses in 2024. This is extraordinarily low, given that the department did a total of 413 runs. If the borough provides staffing, Tower 14 should be replaced with a mid-mounted aerial tower in 2029, after 27 years of frontline service.

Ladder 65

Ladder 65 is a 2008 Pierce Dash four-door cab quint apparatus equipped with a rear-mounted 105-foot aluminum aerial ladder. This unit is equipped with a Waterous single-stage fire pump rated at 2000 gpm with 129 pump hours and a 400-gallon water tank. The truck is built on a 272-inch wheelbase with an overall length of 43 feet 9 inches and an overall height of 12 feet 0 inches. The physical size of this apparatus and the length of the wheelbase are too big for the first due response area. At the time of the fieldwork, the apparatus had accumulated 21,325 miles and 2613.5 engine hours. In its 17-year existence, the pump on Ladder 65 has accumulated only 129 pump hours; many, if not most, were for drills or annual pump testing. There were 613 hours of aerial ladder operation. This presents a strong argument for the next Garden City Ladder Truck not to have a pump or a tank. If you continue to staff at your current rate, you do not need a pump, tank, or hose on your next ladder truck. The department should collect data on how many times the pump is used on emergency incidents and for how long before an engine shows up. This will be useful when specifying the next apparatus.

Ladder 65 is capable of seating ten personnel in the cab, with nine seats provided with self-contained breathing apparatus. The apparatus is equipped with a front axle rating of 24,000 pounds and has an in-service weight of 23,000 pounds, including personnel. The rear axle is rated at 54,000 pounds with an in-service weight of 52,920 pounds. With little residual on the axles, no additional equipment should be added to the apparatus. The SAE (Society for Automotive Engineers) standard requires a 5% residual on all axles. You currently have a 4% residual on the front and only a 2% residual on the rear.

The apparatus is equipped with five cross-lays: three 200-foot-long, 1.75-inch cross-lays and the other two cross-lays are equipped with 200 feet of 2.5-inch hose. All cross-lays are equipped with fog nozzles. Off the rear is a hose bed with 600 feet of 5-inch hose. The front bumper has a preconnected line with 200 feet of 2.5-inch hose with a Blitz fire.

There are eleven compartments: ten are lap doors, and one is a Goretite rollup door. Some of the compartments are poorly laid out, and this unit is poorly equipped. There is a lot of wasted compartment space, and no real mission for this apparatus was apparent. Ladder 65 can do a little bit of everything but nothing exceptionally well. It is the only ladder apparatus in the

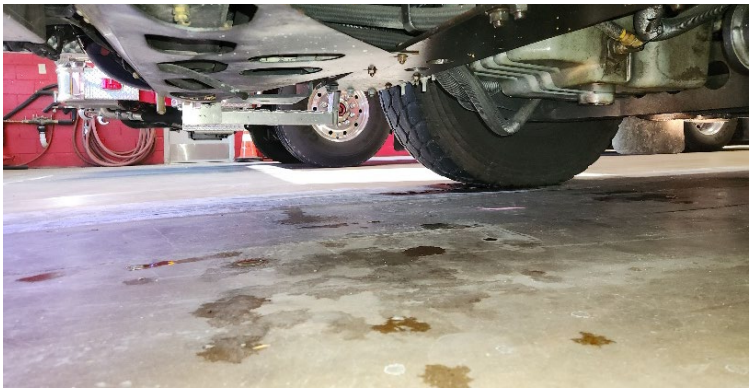
department's fleet. The ground ladder complement consists of two 35-foot, 2-section extension ladders, a 28-foot extension ladder, a 16-foot extension ladder, two 20-foot roof ladders, and a 16-foot roof ladder. This unit also carries a 10-foot attic ladder, an 8-foot attic ladder, and a Little Giant. The portable ladder complement is good at 208 feet, which is much needed given the risk in the first due area. The fire department provided the same Swiss Army Knife approach to the ladder truck as they did with the squad. Future ladder specifications should strive for more ladders and of needed sizes. A ground ladder needs assessment must be conducted prior to the next purchase.

Moderate corrosion was observed on the chassis frame rails, air reservoir brackets, and radiator cross-members. This corrosion must be addressed if the fire department wishes to achieve residual value when this apparatus is sold in 2031 as part of the fleet replacement plan. This unit is in good condition for its age; however, it could benefit from additional truck company equipment and training to operate as a much-needed truck company. Compartment space on a ladder truck represents some of the most expensive real estate in the world, and some of it on this apparatus was wasted. If the ladder truck had cost 1.2 million dollars and with 200 square feet of compartment space, that space would cost $6,000 per square foot.

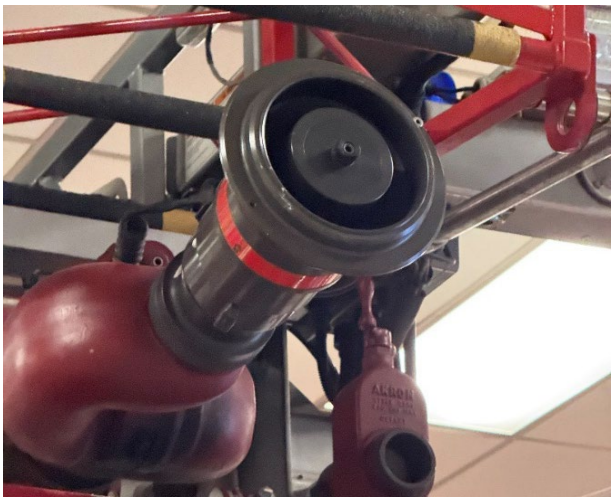
Moderate rust was noted throughout the underside of the apparatus, which needs to be mitigated.

A large number of leaves and debris have caught under the underside of the apparatus, which requires thorough steam cleaning.

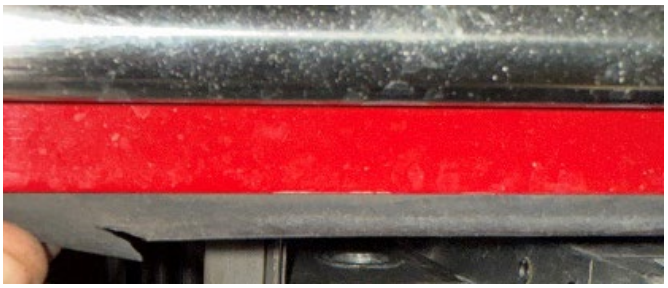
Fire Extinguishers are out of date and need to be recertified.



The Fluid leak needs to be evaluated.



The combination nozzle should be removed and replaced with a set of stacked smoothbore tips with a stream shaper.



Replace the rubber gasket on the Goretite roll-up door.

The ladder belts are expired. They need to be replaced when they are ten years old.

Ladder 65 Recommendations:

1. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned, with all exposed rust and corrosion removed. Moderate rust and corrosion were noted in the frame rails, battery boxes, and air-holding tanks, which should be mitigated. The chassis should be steam cleaned annually to remove accumulated dirt, road debris, and surface rust from the chassis and other components. At that point, the fire department should continue to have a rust inhibitor, such as Krown or Carwell, applied by an outside vendor.
2. According to NFPA 1910 Section 20.2, each apparatus in the department's fleet should be weighed annually on both the front and rear axles, as well as the entire apparatus, to ensure that the unit is within the vehicle's weight ratings supplied by the manufacturer. This unit was within two percent of the rear axle being overloaded and four percent of the front axle being overloaded. The fire department should refrain from adding additional equipment to the apparatus.
3. Replace the ten tires on Ladder 65 per NFPA 1910 Section 8.3.6, as they are out of date.
4. Per NFPA 1910, each apparatus in the department’s fleet should be service tested at least annually and after major repairs.
5. The Ladder Belts are over 10 years old, past their useful life as per the NFPA Standard, and all need to be replaced.
6. Replace the combination nozzle on the ladder water monitor with a stream shaper

featuring stacked smoothbore tips, which allows for proper water flow, stream reach, and penetration.

7. The interior of the apparatus and its compartments are dirty and require cleaning and detailing. All equipment must be removed from the apparatus, cleaned, and, in some cases, re-painted.
8. The heat sensors on the ladders have expired.
9. Replace the missing gas shock and replace the rest, as they are defective.
10. There is a fluid leak under the front axle.
11. The aerial cables are starting to rust and should be monitored.
12. The waterway brackets are loose and need to be repaired
13. The camera at the tip of the aerial needs repair.
14. The officer's seat belt needs to be replaced.
15. The Goretite roll-up door gasket is defective and needs to be replaced
16. Fire Extinguishers are out of date and need to be recertified.

Ladder 65 has incurred an average of $16,615 in repairs and maintenance over the last three years, which seems to be on the high side. An aerial ladder quint should cost between $12K and $14K a year. The apparatus had 177 responses in 2024. After 23 years of frontline service, it should be replaced with a Rear-Mounted Aerial Ladder in 2031 or a Tractor-Drawn Aerial Ladder.

Rescue 51

Rescue 51-6 is a 2005 Pierce Quantum, four-door, heavy rescue squad. The Rescue runs out of South Media, which is staffed exclusively by volunteers. The unit is powered by a Detroit Series 60 motor with an Allison EVS transmission. The rescue is 34 feet 10 inches long, with a 225-inch wheelbase, and is 10 feet 4 inches tall. This was the only standalone Rescue unit evaluated by EVR personnel in the three stations. It is responsible for vehicle accidents and various technical rescue disciplines, including rope rescue, confined space rescue, and water rescue incidents.

At the time of EVR's inspection, Rescue 51-6 had 27,163 road miles and 1813.7 engine hours. The cab can carry eight personnel, and seven seats are outfitted with SCBA. All seats are equipped with 3-point seatbelts.

The rescue is equipped with a 22,800-pound front axle and a 27,000-pound rear axle. With eight personnel on board, using the NFPA allowance of 200 pounds per seat and loaded with equipment, the front axle weighs 20,560 pounds. The rear axle, while loaded with equipment, weighs 22,760 pounds. With a Gross Vehicle Weight Rating (GVWR) of 49,800 pounds and a scaled weight of 43,320 pounds, Rescue 51 falls within the limits of its axles.

Rescue 51-6 is equipped with 8 Pierce Gortite roll-up doors and six underbelly compartments attached to the body. Rescue 51-6 is also equipped with a Winco 55kW generator with 411 hours

of use, a 3D Instruments Air Booster, and a Resolve Specialty Products cascade/SCBA fill station.

The outer body compartments are comprised mainly of tools used for vehicle extrication and fireground forceable entry. Both sides of the rescue are equipped with hydraulic extrication tools, one side being battery-powered, and the other side has tools supplied by hydraulic reels. The redundancy of these systems is understood, considering the relatively new technological improvements in battery-powered extrication tools since this unit was purchased. However, the layout of the compartments is not ideal, making it difficult for personnel to complete a vehicle rescue easily. Refer to the recommendations section for further details.

Multiple chains in the officer-side underbelly compartment were missing tags with vital information. OSHA 190.184 would be the best place for the department to start bringing this toolset into compliance with industry standards. Multiple Paratech Stabilization struts have air leaks, and an appropriate vendor should be contacted for maintenance on these tools.

The walk-in contains various tool types for very different calls, representing hazmat, confined space, water rescue, and rope rescue. With the staffing that this unit routinely has, it places a large demand on South Media Fire Company members to maintain proficiency in such a wide range of disciplines on top of their regular duties and the need for volunteer fundraising. Should the local government or authority having jurisdiction (AHJ) determine that these skills and tools are required, support and funding must be provided for South Media to attend regular training in these areas.

Of the tools in the walk-in section of the rescue, the rope equipment requires the most attention. Numerous pieces of equipment are still in their original packaging and must be removed from the plastic before use. Multiple unlabeled ropes made it difficult for personnel to accurately track their 10-year shelf life. The department should reference *NFPA 1983 Standard on Life Safety Rope and Equipment for Emergency Services* and *NFPA 1006 Standard for Technical Rescue Personnel Professional Qualifications* as a starting point for maintaining this equipment.

The body is showing signs of aging. Multiple areas of chrome trim are delaminating, and multiple screws are missing from various panels throughout the apparatus. Several rollups are not moving as smoothly as they should and need to be re-adjusted. Several seals and gaskets on the rollups exhibit signs of dry rot and tearing and should be repaired to prevent moisture from damaging the tools in the compartments.

The underside of the vehicle is showing multiple signs of wear and tear. There is a hydraulic leak at the front right of the unit and a hole in the rear underbelly compartment. There is also rust delamination on the forward frame rails and cross members, as well as, more seriously, rust on the rear suspension hanger. All the tires on the unit are approaching their 7-year NFPA expiration.

Chipped paint can allow rust to form on the body, causing damage.

Unopened gear is not ready for service.

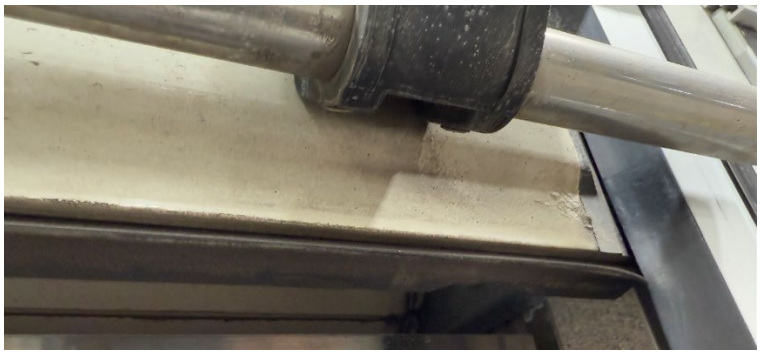
Mounting items such as fans and radios in the driver's sight line is hazardous and should be avoided.

Chrome delamination needs to be addressed.

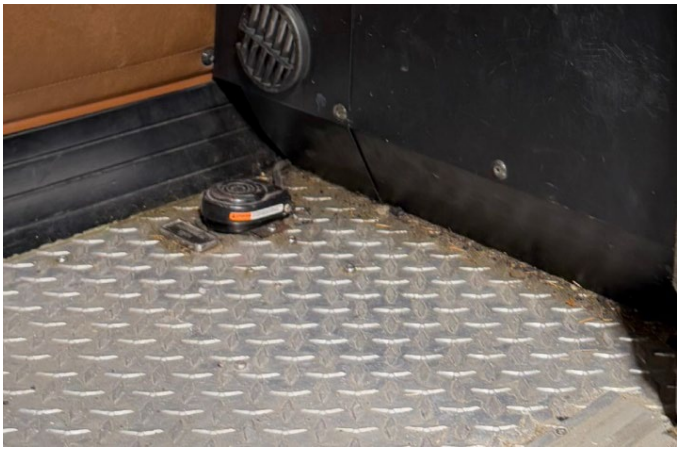
Areas were noted to be missing screws. These areas need to be identified and repaired.

The strap does not allow for tools to be easily deployed on an incident.

Dirty compartments should be cleaned.



The damaged seals on the doors need to be replaced.



The Cab is dirty and should be cleaned.

Rescue 51 Recommendations:

1. The chassis frame rails, body substructure, and exposed fire pump components should be thoroughly steam cleaned with all exposed rust and corrosion removed. The undercarriage has multiple areas with moderate to excessive rust. Delamination was found on the forward frame rails. The crossmembers and rear step hangers had rust, and the most serious rust was found on the rear suspension hanger. Steam cleaning should occur at least annually to remove dirt, debris, and surface rust. An outside vendor should apply a rust inhibitor, such as Krown or Carwell, to protect the undercarriage.
2. Per NFPA 1910 section 20.2, each apparatus in the department's fleet should be weighed annually on the front and rear axles individually and the entire apparatus to ensure that it meets the vehicle weight ratings supplied by the manufacturer.
3. Per NFPA 1910 Section 8.3.6, be prepared to replace the six tires on Rescue 51, which are out of date or nearly out of date.
4. Per NFPA 1910, each apparatus in the department’s fleet should be service tested at least annually and after major repairs.
5. For the extrication tool layout, assuming the battery-powered hydraulic tools are primary, it would make sense for the cribbing and step chocks to be in the first compartment, followed by the extrication tools with a patient access box containing a glass saw, reciprocating saw, and window punches. This would allow the personnel to complete most calls of this type by opening only two compartments. In the event of a dash displacement, personnel may have issues accessing the hydraulic rams from the driver-side underbelly compartment during the incident. The department should consider streamlining the entire vehicle extrication complement down one side of the unit.
6. Multiple Gortite roll-up doors have bad or damaged seals. These need to be repaired to prevent moisture from damaging the tools carried on the apparatus.
7. A hydraulic leak was found at the front right of the apparatus, under the officer's seat, and a source needs to be diagnosed and repaired.
8. An Engine oil leak was found and requires diagnosis and repair.
9. A hole in the rear underslung compartment needs to be repaired to prevent damage to the equipment.
10. All paratech stabilization struts had air leaks, which could indicate bad seals or O-rings. They should be inspected and repaired.
11. The chain should be inspected and tagged per OSHA 1910.184
12. Rope and associated equipment should be inspected and tagged per NFPA 1006 and 1983.
13. The gaskets on all the roll-up doors should be inspected and replaced as needed. Many gaskets were damaged, allowing dirt to enter the compartment.
14. Fire Extinguishers are out of date and need to be recertified.
15. The rescue apparatus and equipment are somewhat inconsistent and do not appear to be mission specific. There is a lot of stuff with little purpose. There is no standard for rescue service coverage nor national standard or qualifications on what makes a rescue truck a

heavy rescue. This is important to know when evaluating the rescue services in your response area. The authority having jurisdiction should conduct a hazard assessment, evaluate call volume and call type, and evaluate mutual aid capabilities. There should be an evaluation of internal staffing and personnel training. Only then can you define the vehicle's mission and acquire the apparatus required for the first due response area.

Rescue 51 has no maintenance data. The apparatus had 81 responses in 2024. Rescue 51 should be scheduled for rehabilitation as soon as possible after 20 years of frontline service, provided there is sufficient staffing available to operate it. Once Rescue 51 is returned from service, it should remain in service until 2038. At this time, the fire department and the township should evaluate the need for the apparatus and assess the available staffing. If there is still a need and the necessary staffing is available in 2038, the fire department and township should begin the process of replacing Rescue 51.

Command Vehicles

There are three command vehicles in the fleet assigned to each of the fire chiefs. The fire departments, the borough, and the township should consider leasing each fire department chief officer when funding permits, a four-wheel drive, four-door Pickup Truck, or a large SUV outfitted with radios, status and accountability boards, and other resources. These units should be acquired and placed into service to allow a safe and rapid response for the department chiefs and other trained command personnel to operate these vehicles.

Utility and Support Vehicles

The Garden City Fire Department has two utility vehicles. Utility 65 is a 2009 Ford F-450 with bodywork by Fast Lane. At the time of the field survey, Utility 65 had accumulated 14,128 road miles. Utility 65 is equipped with a 6 KW Onan Generator. The utility has a GVWR of 13,000 pounds with an in-service weight of 12,270. Utility 65 can seat five personnel in the cab. The apparatus has a front axle rating of 6,000 pounds with an in-service weight of 6,230 pounds with personnel. Utility 65 is 230 pounds overweight on the front axle. The rear axle is rated at 9,750 pounds and has an in-service weight of 6,040 pounds. The fire department needs to offload 230 pounds off the front axle. This can be achieved by removing seats in the cab area, as each seat is equivalent to approximately 200 pounds of firefighter weight, not including the seat itself. Overweight fire apparatus is a very serious issue that has resulted in firefighter deaths. This overweight condition needs to be remediated immediately. EVR can provide guidance once you are ready to make the apparatus road-worthy and safe again. EVR strongly recommends weighing the utility per NFPA 1910, Section 20.2, 2024 edition, before it is placed back in service. Utility 65 has tires from 2011; they have aged out and need to be replaced per NFPA 1910. The harnesses in the compartments are way out of date and need to be replaced.

Utility 65-8 is a 2016 Ford F-250, and it had 9,602.6 road miles during the field visit. The four tires are from 2016 and have exceeded age limitations and need to be replaced per NFPA 1910.

South Media Utility 51 2007 Ford F-350 with bodywork by Stahl. During the field visit, the utility had 41,952 road miles and 2,600 engine hours. The utility can seat five personnel in the cab. The utility has a GVWR of 11,200 pounds with an in-service weight of 10,400. The apparatus is equipped with a front axle rating of 6,000 pounds with an in-service weight of 5,840 pounds with personnel. Utility 51 is within 160 pounds of being overweight on the front axle. Nothing should be added inside the cab as it could cause an overweight condition. The rear axle is rated at 6,262 pounds and has an in-service weight of 4,560. There is a pinned Halligan in a compartment that needs to be taken out of service, as the pins are known to have broken, causing injuries to firefighters.

Utility Vehicles Recommendations:

1. Support vehicles shall have a defined mission and be given a vehicle designation based on that mission. This should be standardized across the department and the response area. All vehicles should be equipped to fit their defined mission and identified as such.
2. The fleet of support vehicles shall be evaluated to identify which support trailers they can tow, regardless of the assigned station. This will ensure that support trailers have adequate backups if a tow vehicle is out of service. Coordination and notification shall be made to ensure proper coverage of all tow vehicles.
3. Except for a brush truck or tow vehicle towing a UTV to a brush fire, support vehicles should not be the first or primary response for any fire-related emergency. Chief officers shall respond to fire-related emergencies but should not be the only vehicle to respond without calling for an adequate fire apparatus to backfill the assignment. Policies should be put in place to eliminate support vehicles responding out of any firehouse before the first heavy fire apparatus.
4. It is a concern that there are a high number of Utility Vehicle responses to calls, yet there are plenty of empty seats on fire apparatus. Generally, if this occurs, there is either a lack of policy or a shortage of qualified heavy apparatus drivers, forcing others to use utility vehicles for calls. Both issues can be easily resolved.
5. Utility and Command vehicles are replaced on off years when no major apparatus is replaced.

Ambulances

When evaluating EMS services provided to a community, it is important to know that there is no nationally recognized standard on the number or placement of units. The fire service relies on ISO to identify the number of units, types of units, and placement of those units. NFPA 1910 identifies a recommended service time for in-service and reserve fire apparatus. There are no such standards for EMS and ambulance services. If you evaluate most ambulance manufacturers' warranties, they state the box of units is covered for 10 years. Depending on the use of the vehicle, 10 years is a good ballpark for replacement. The chassis the box is placed on might not make it to the 10-year mark. This is where a yearly evaluation of use, maintenance, and mileage is important. EVR evaluates the response area, unit call volume, maintenance records, annual mileage and hours, and each unit to identify the appropriate time a unit should be replaced.

There are two options when an ambulance reaches the end of its life cycle. The first is to replace this unit with a new one and remove the old one from the fleet. The second option is to take the box, or patient compartment, off the chassis and re-chassis it. This is akin to the rehab of a firetruck. With a re-chassis, the unit will receive a new motor, frame rails, suspension, and other significant components. Unlike most fire truck rehabs, this unit will also be titled and listed with the year the chassis was purchased. Re-chassis an ambulance can have a cost avoidance of over $200,000 during the life cycle of an ambulance. The downside of a re-chassis is that the unit would be unavailable and out of service while the work is being done.

Ambulance performance must be evaluated differently than fire performance. Response times and unit location are the usual metrics for evaluating fire department performance. However, EMS should be evaluated on patient outcomes. For example, if urgent care calls an ambulance six times a day and represents 80 percent of the calls for service, you do not need to move an EMS resources closer to that one location. The urgent care staff provides a level of medical care that will stabilize and likely improve the patient's condition before the EMS unit's arrival. The patient's outcome does not necessitate the move. This is a hypothetical situation, and other factors can play into the ultimate decision to move resources, but this should paint a picture of the different strategies needed for EMS deployment. It is important to balance the staffing needed for fire delivery and the need to provide EMS when locating and staffing both resources. Since ambulances are less customized than fire apparatus and the primary mission is to transport personnel and equipment to the scene and then patients to the hospital, we evaluate the units based on mileage and maintenance history. Weight and overall condition are observed to ensure the unit has no significant defects. Most EMS units are removed from the fleet before any rust or corrosion issues due to the heavy use of these vehicles.

Swarthmore Fire Department staffs two ambulances 24/7/365. Both units are stationed and respond out of Swarthmore Station 14. One ambulance has dedicated staffing, and the second ambulance is cross-staffed by fire and EMS personnel. The ambulance fleet consists of two ambulances. In 2024, the ambulances responded to 278 EMS Dispatches, 180 Transports, and 162 Fire Calls. The total responses for the year was 620.

Ambulance Maintenance costs from 2020 to 2024

Unit	2020	2021	2022	2023	2024	Total	Average
14-7	$3,015	$2,421	$4,097	$9,114	$972	$19,619	$3,923
14-7 A	$256	$1,078	$458	$4,648	$17,669	$24,109	$4,821
TOTAL	$3,271	$3,499	$4,555	$13,762	$18,641	**$43,728**	**$8,744**

Average age of the Ambulance Fleet: 7 Years

Those costs highlighted in Red would be excessive and are a concern.

Note: Eliminating Engine 14-2 will free up bay space, allowing the fire department to provide a bay for each ambulance. This would allow the fire department to purchase heavier-duty chassis ambulances, such as a Ford F-550 or a Dodge 3500.

Ambulance 14-7
Ambulance 14-7 is a 2016 Chevy Econoline chassis ambulance. The PL Custom body was remounted on the Chevy chassis in 2016 for $115,000. This unit had accumulated 45,938 miles at the time of the inspection. Ambulance 14-7 runs out of Swarthmore Station 14. This unit is staffed 24/7 by career personnel. This unit is currently rotated with Ambulance 14-7 A. Ambulance 14-7 should be replaced with a New Ford F-550 ambulance or equivalent in 2036. As this body was already remounted, it is not a candidate for remounting.

Ambulance 14-7 A
Ambulance 14-7 A is a 2020 Ford Econoline chassis ambulance with a Horton body. At the time of the inspection, it had accumulated 24,838 miles. It runs out of Swarthmore Station 14 and is staffed 24/7 by career personnel. It is currently rotated with Ambulance 14-7. Ambulance 14-7 A should be replaced with a New Ford F-550 ambulance or equivalent in 2040.

Ambulance Replacement plan:
2036 Replace Ambulance 14-7 with a new F-450, F-550 or equivalent.
2040 Replace Ambulance 14-7 A with a new F-450, F-550 or equivalent
From this point forward:
- ❖ Ambulances would be replaced with a new unit after one re-mount.
- ❖ Ambulances should be re-mounted or a new one placed in service every ten years.

7.0 Apparatus Maintenance Evaluation

Fire Apparatus Fleet Maintenance Costs and Response Analysis

Apparatus Maintenance Costs for Swarthmore Fire Department

Unit	2022	2023	2024	TOTAL	AVERAGE
Engine 14-1	$3,106	$11,039	$911	$15,056	$5,019
Engine 14-2	$1,035	$4,391	$2,144	$7,570	$2,523
Tower 14	$2,367	$5,368	$5,979	$13,714	$4,571

Apparatus Maintenance Costs for Garden City Fire Department

Unit	2022	2023	2024	TOTAL	AVERAGE
Engine 65	$1,819	$2,439	$4,498	$8,756	$2,919
Ladder 65	$26,482	$14,330	$9,033	$49,845	$16,615
Squad 65	$2,760	$10,892	$6,181	$19,833	$6,611
TOTAL	$31,061	$27,661	$19,712	$78.434	$26,145

Maintenance costs for the major apparatus in the fleet:

Unit	2020	2021	2022	2023	2024	TOTAL	Average
Engine 65			$1,819	$2,439	$4,498	$8,756	$2,919
Engine 65-1			$2,760	$10,892	$6,181	$19,833	$6,611
Engine 51							
Squad 51-2							
Engine 14-1	$5,756	$11,970	$3,106	$11,036	$911	$32,779	$6,555
Engine 14-2	$2,286	$2,991	$1,035	$4,391	$2,144	$12,847	$2,569
Tower 14	$37,055	$7,051	$2,367	$5,368	$5,979	$57,820	$11,564
Ladder 65			$26,482	$14,330	$9,033	$49,845	$16,615
Rescue 51							
Total per year	$45,097	$22,012	$37,569	$48,456	$28,746	$181,880	$36,376

- Those costs highlighted in blue seem artificially low or lack sufficient data.
- Those blank spaces lack data for those years or apparatus.
- Those costs highlighted in red would be considered excessive and could be a cause for concern.
- The non-highlighted data would be considered correct based on the data supplied by the Fire Department.

The maintenance costs and associated information provided were lacking or incomplete. One of the benchmarks we aim to determine is the cost of ownership for each individual apparatus. On average, the cost of ownership for an engine should be $ 5,000 to $ 8,000 per year, the cost of ownership for a ladder should be $ 10,000 to $ 13,000, and a Tower should cost $ 12,000 to $ 15,000 per year.

It would be in the best interest of the three fire departments, the township, the borough, and the taxpayers to carefully follow and fund the fleet replacement plan as outlined in section 9 of this report on time as written. This will initially result in replacing two of the costliest apparatus, Tower 14 and Ladder 65.

Each piece of apparatus operated by the fire department has been carefully analyzed for its condition and maintenance features, with projected replacement dates for each unit. These dates reflect the year in which the replacement unit is expected to be delivered and placed into service by the fire department. Recognizing that most fire apparatus take approximately thirty-three to fifty-four months to produce once the unit goes under contract, adequate research and planning must be provided to ensure that the apparatus is delivered and placed into service on a timely basis.

While the current fleet of apparatus is mainly in good condition for its age, future purchases will need to follow the developed plan, with only minor deviations allowed for unanticipated repairs or accidents. Where possible, fire apparatus purchases should be spaced out with two years between each major suppression apparatus. This would mean purchasing fire trucks in odd years, for the most part, and acquiring new ambulances, remounting ambulances on new chassis, or replacing chiefs' cars and utility vehicles as needed in even years. With seven major pieces of

fire apparatus remaining in the new, reduced fleet, a new fire truck should enter service every two years, based on a twenty-year replacement cycle for engines and a thirty-year replacement cycle for ladders. Ladders are scheduled for rehabilitation at the fifteen-year mark.

Unit	Unit Age	Avg Miles per Year 2022 - 2024	Avg Maintenance Cost 2022 – 2024	Costs Per Mile
Engine 65	6	1,260	$2,919	$2.31
Engine 65-1	17	986	$6,611	$6.70
Engine 51	10			
Squad 51-2	25			
Engine 14-1	17	1,158	$6,555	$5.66
Engine 14-2	33	106	$2,569	$24.23
Tower 14	24	508	$11,564	$22.76
Ladder 65	17	5,994	$16,615	$2.77
Rescue 51	20			

- Those costs highlighted in Red would be considered excessive and would cause the removal of these vehicles from most fire fleets as soon as practical.
- Those left blank were due to the lack of data.

Each Chief is currently responsible for coordinating repairs and maintenance on their respective fire companies' apparatus. It may be beneficial for this activity to be taken over by the Borough and the Township, with program oversight by an Emergency Vehicle Technician (EVT). Apparatus maintenance checks are conducted by career personnel in Swarthmore and Volunteers in Garden City and South Media. However, it is unknown who is checking them and when. Each piece of apparatus should be subject to annual preventative maintenance conducted by outside local vendors; Glick seemed to be providing most of this service work. A program for annual pump, aerial ladder, and chassis maintenance needs to continue to occur and be funded. Annual testing of fire pumps, hoses, portable ladders, nozzles, and aerial devices should be conducted annually, as per the NFPA Standards, without fail. However, that does not appear to be true with the three fire departments. Maintenance and testing appear to be fragmented, with inadequate record-keeping. Initially, the borough and the township should bid out this work for the entire fleet, with records kept. Ultimately, this will become part of the job description for the EVT. There should be significant savings on this work when employing this approach. An administrative assistant should be hired to complete data entry on fleet repairs, order parts, and oversee parts inventory. The administrative assistant should schedule all vehicle and equipment testing in conjunction with the EVT, and the administrative assistant should keep all the records of all testing.

While the overall condition of the fleet is mainly good considering the average age of 19 years, several units, including Engine 14-1, Tower 14, Squad 51, Squad 65-2, and Ladder 65, have moderate rust and corrosion. Rescue 51 and Engine 14-2 have moderate to severe rust and corrosion. In addition, Tower 14, and Utility 65 are overweight due to the seating and require

corrective action. Ladder 65 and Squad 65-1 were almost overweight, with little residual left on the axles.

The EVR recommendations for new apparatus will emphasize a back-to-basics approach to provide the needed apparatus while incorporating proven technology to minimize the rust and corrosion issues that have surfaced on the current units. While one may expect to observe corrosion and metal deterioration on older vehicles, the present condition of chassis and body components on several pieces of apparatus will require corrosion mitigation and the annual undercoating process to achieve the desired life cycle. In some cases, units will be permanently removed from the fleet due to the lack of use and corrosion concerns. With the increased use of road de-icing chemicals, the fire department must address corrosion issues on the current units to provide at least fifteen to twenty years of reliable front-line service for the engine and ladder apparatus. The goal of the maintenance program would be to provide the repairs needed on a timely basis to enable future apparatus acquisitions to be spaced out without having to purchase two major pieces of apparatus at the same time, which is generally not warranted and unwise.

Apparatus Maintenance Recommendations

Each apparatus is generally well-outfitted with tools and equipment to perform the needed functions at incidents. Some apparatus carry too much equipment, while others have empty compartments. The following are recommendations that the fire department should adopt and implement to ensure the safety and readiness of all apparatus.

- The annual pumper service tests, aerial ladder certification, ground ladder, nozzle, and hose testing programs should be conducted with complete records for each apparatus and the associated required repairs by an administrative assistant. These tests are required annually and are not optional. If this testing is not done as described, and something breaks or goes wrong the political entity that owns the apparatus will be liable.
- All apparatus preventative maintenance and records should be conducted per NFPA 1910. Complete records of all repairs, testing, and maintenance work shall be kept. A hard copy or digital logbook should be provided for each piece of apparatus where all maintenance, testing, and inspection work will be documented. An annual summary of the cost of repairs and all maintenance should be completed by the repairs and maintenance facility to enable tracking of all related repairs and the cost of ownership of each vehicle.
- Per NFPA 1910 section 16.2, each apparatus in the department fleet should be weighed annually on the front and rear axles individually as well as the entire apparatus to ensure that the unit is within the vehicle weight ratings as supplied by the manufacturer.
- Each piece of apparatus should, at least annually, be removed from service to have the chassis frame rails steam cleaned, minor paint and corrosion issues repaired, and all tools and equipment cleaned, painted, and maintained. This can be done with any required outside vendor repairs and preventative maintenance work to ensure continued reliable front-line service. Aftermarket anti-corrosion treatments such as Krown (https://www.krown.com/en/) or Carwell (http://www.carwell.com/) should be

incorporated into the fire department's overall maintenance program. This work should be under the auspices of the EVT.

- The fleet maintenance facility should incorporate a periodic inspection of the apparatus's underside, including the chassis frame, fire pump, and associated vehicle components.
- The tank-to-pump valves on all engine apparatus and other manually and electrically controlled valves should be exercised periodically to ensure their safe and proper operation under all conditions.
- All future apparatus specifications should require finished painted chassis frame rails, cross members, and components to minimize the impact of road deicing chemicals. Where possible, any steel components that can be treated with a plating process to reduce rust and corrosion in these areas or using stainless steel components where available will help ensure safe and reliable front-line service and avoid large amounts of out-of-service time and costly repairs.
- As the fleet will shrink over the next decade, it will be advantageous to have your own EVT. It will reduce out-of-service time by eliminating units that sit idle at a repair facility, waiting for their turn in line. You will have a reserve fleet. However, it will not have the units that you do now, so unit repairs must be done as soon as possible.

8.0 Equipment Review

Overall, all front-line apparatus operated by the fire department are generally well equipped and supplied with various hand, power, and hydraulic tools for use in most fire and rescue-related incidents. As reviewed with the ladder company section, future aerial devices need to accommodate an enhanced complement of ground ladders to ensure that the first arriving ladder company has multiple 28- and 35-foot ladders and other roof and utility ladders of varying lengths.

- The fire department should take the equipment off of each apparatus, clean the compartment, clean the equipment, and assign a number from one to five, with one denoting that piece of equipment comes off of the apparatus frequently and five denoting it rarely if at all comes off of the apparatus. This exercise will help define needed equipment that is lacking and reduce little-used equipment or obsolete equipment. This will become extremely important as you replace Tower 14 and have the potential to combine the services of Rescue 51 and Ladder 65.
- The fire department should standardize the attack line nozzles on all preconnected lines to meet the department’s target GPM fire flow and pressure requirements. Based on fire pump plumbing, standard pump pressures can be established for the engine apparatus's front bumper, cross-lay, and rear hose bed attack lines. This lends itself to standardizing the design of all future engine apparatus as outlined.
- Tool and equipment inventories should be recorded and carried on each piece of apparatus and updated frequently as the equipment cache is updated or changed. The

administrative assistant should record a copy of the equipment inventory as part of the record-keeping.

- The equipment weights and payload on each apparatus should be determined at some point before acquiring any new replacement apparatus. Starting with Tower 14, which is due to be replaced first and was overloaded on the front axle. The second apparatus to be replaced is Ladder 65, which was nearly overweight. If the township is going to support Rescue 51 and South Media is going to staff this apparatus, then the current unit should be sent out for rehab to extend the apparatus's life for 10 more years. If the township is not going to support Rescue 51 and South Media cannot staff the apparatus, then consideration might be given to combining the services of Ladder 65 and Rescue 51, allowing the township fire service to continue providing these services. If this were to occur, Rescue 51 should have all loose tools and equipment stripped and laid out to determine what is actually needed on Ladder 65, and then it should be weighed on certified scales.
- For all new apparatus, the empty weight of each unit with a full tank of water and all fluids should be compared to the fully equipped in-service weight to accurately determine the equipment payload on each unit. This information will be required when designing new apparatus to reduce the possibility of creating and operating overweight vehicles.
- All remaining appliances, tools, and equipment not mounted and secured inside the body compartments on the front-line vehicles should be permanently secured with NFPA-compliant 9 G-rated, non-marring brackets in standard locations approved by the fire department.

9.0 Apparatus Fleet Replacement

The current view of the apparatus is comprised of three individual fleets. The goal of this replacement plan is to examine staffing levels and apparatus needs with one combined fleet in mind. For example, each department does not require a reserve engine. Instead, the fleet will have the needed number of reserve engine or engines.

One primary concern is the age and condition of the fleet. Apparatus purchasing has been unplanned and sporadic at best. Six of the nine heavy apparatus units were purchased in an 8-year window, and most of those apparatus are over 20 years old. Even if something were ordered today and delivered within the standard four-year timeframe, this would mean that no new apparatus would enter the fleet between 2009 and 2029. The township and the borough are now faced with the task of catching up while still spacing out vehicle purchases to permit a well-developed, affordable replacement program. The township, the borough, and the fire departments must resist the urge to purchase and equip two vehicles simultaneously. As seen in the current situation, this forces the fire departments, the township, and the borough to spend millions of dollars at once, with large voids in between. Several units have corrosion issues, and several units have overweight issues. These issues need to be addressed in the short term but will require planning and proper specification of future apparatus.

Specifying the apparatus appropriately will be difficult since the last apparatus was ordered almost two decades ago. The township, the borough, and the fire departments should consider hiring an experienced outside third party to assist them in the purchasing process. This is a service that EVR provides, helping many departments purchase a maneuverable, long-lasting apparatus. This service would help eliminate unnecessary components that increase costs and out-of-service time, as well as reduce concerns related to corrosion and overweight issues.

EVR usually recommends that major apparatus acquisitions be spaced out with a minimum of three years between each purchase. However, given the size of the fleet and information provided in this report, most apparatus would be replaced at two-year intervals. The immediate need is to catch the fleet up without compounding the purchases too close together. The first three units to be replaced would be an aerial tower, an aerial ladder (or TDA), and an engine apparatus, which could be purchased as part of a multi-year contract, which could reduce the cost.

The second apparatus to be purchased would be a rear mounted aerial ladder or a tractor-drawn aerial to replace Ladder 65. This unit will be designed as a ladder company with rescue capabilities. A rear-mounted aerial ladder, which Garden City currently operates, could be replaced, or a tractor-drawn aerial will increase equipment-carrying capability, including much-needed portable ladders. The apparatus will be able to safely negotiate and be driven on most of the streets in the response area. Once the new TDA, or rear mounted aerial ladder, is put into service, the current ladder 65 will be offered to a reputable apparatus broker and sold. There is currently a length restriction in the Garden City Station, which would have to be addressed before a Tractor Drawn Aerial Ladder could be pursued.

Fleet Replacement Strategies

Replacement strategies for fire apparatus can be based upon several factors including age, maintenance costs, the need to change or update equipment and hose loads, or the number of runs and associated road mileage on each unit. Fire apparatus is generally replaced after fifteen to twenty years of front-line service and may be utilized as a reserve or spare unit for an additional three to five years, depending upon age, use, condition, and adaptability to the department's current operating procedures. The *NFPA 1900 Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances* is updated every five years to keep pace with technology and the component manufacturers. Within the past decade, component technology has advanced dramatically in diesel engine emissions, fire pump components/instrumentation, and electronic stability controls. All of which have had an impact on vehicle design and the related costs of new apparatus.

Changes in engine exhaust emissions requirements by the Federal Environmental Protection Agency (EPA) in 2010 and 2016 have dramatically impacted the fire apparatus industry concerning cab designs, engine cooling, and exhaust system components. There are two fire apparatus in the fleet that are equipped with this emission component technology requiring diesel exhaust fluid (DEF). Future EPA requirements are planned to take effect in 2027 and then again in 2032. These requirements will further improve the fuel economy and will have a major impact

on engine technology, cab designs, and cost. This is a result of new engine technology and engineering overhead resources needed to design and test engine models, along with a complete redesign of cabs to accommodate the new engine package.
Pre-2000 model engines, regardless of manufacturer, are subject to limited or unavailable replacement parts, and at some point, it will be impossible to obtain new or rebuilt components. While custom chassis apparatus manufacturers will state that they guarantee replacement parts for twenty years, in practice, some parts become difficult to acquire within the first ten to twelve years of operation.

There are three different life cycles to consider when replacing apparatus/vehicles, each of which can impact the unit's safety, performance, and in-service time:

Service Life: When a piece of equipment can perform its needed duty. Service life is dependent on several factors which include age, mileage, wear and tear, annual testing certification, and operating capability.

Technological Life: Capability to serve in the role it was initially designed for. While able to meet original design tasks, older vehicles often cannot match the performance and safety requirements of new vehicles. New technologies such as collision avoidance systems, traction control, improved seatbelts, air bags, and rollover stability are some of the advances of newer apparatus.

Economic Life: This is the total expense for effective use over a given period. Costs include depreciation, operating costs, fuel, oil, maintenance, repairs, downtime, etc. These factors determine a vehicle's economic life and the point at which it is more expensive to maintain than replace.

A comprehensive apparatus replacement program should reference several nationally recognized standards, including NFPA 1910 and the American Public Works Association Vehicle Replacement Guide, to establish the policy for Frontline Primary Life, Maximum Service Life, and Apparatus Replacement Point System.

The replacement guidelines established below are recommended for use in conjunction with NFPA 1900 and the Replacement Point System to assist in identifying other factors that may justify a modification to the NFPA recommended schedule. Available fiscal resources, actual mechanical conditions, and technological and regulatory changes will influence these guidelines. Although NFPA 1900 makes recommendations on length of service for fire apparatus, there is no Industry Standard on the expected years of service for fire apparatus. Best practice is left to the authority having jurisdiction. (AHJ).

Fire / EMS service life guideline:

Apparatus Type	Life Guideline
Engines	25 years
Ladder	30 years
Utility Vehicles	10-12 years

Benchmarks for Replacement Consideration:

The benchmarks listed below will help to determine final replacement decisions. Once a vehicle has met the replacement criteria, it shall go through a review process by the Fire Chief and other department stakeholders to determine if the vehicle should be replaced, retained for limited use, or have its life cycle extended. The overall goal is to replace vehicles at the appropriate time using calculated criteria while maintaining the safety of department personnel and the community.

Consideration for Replacement

- Units that have met replacement criteria.
- Units with replacement deferred from prior years.
- Units that have reached maximum points or fleet replacement program criteria.
- Units that have excessive operating costs.

Excellent Condition

- Fewer than 5 years old.
- Fewer than 800 engine hours.
- Fewer than 25,000 miles.
- No known mechanical defects.
- Very short downtime and very little operating expense. Excellent parts availability.
- Very good resale value.
- Meets all present NFPA 1910 safety standards.

Very Good Condition

- More than 5 but fewer than 10 years old.
- More than 800 but fewer than 1,600 engine hours.
- More than 25,000 but fewer than 50,000 miles.
- No known mechanical or suspension defects are present.
- Short downtime and above-average operating costs.
- Good parts availability.
- Good resale value.
- Meets NFPA 1910 safety standards.

Good Condition

- More than 10 years but less than 15 years old.
- Some rust or damage to the body or cab.
- More than 1,600 but fewer than 2,400 engine hours.
- More than 50,000 but fewer than 75,000 miles
- Some existing mechanical or suspension repairs are necessary.
- Downtime and operational costs are beginning to increase.
- Parts are still available but are getting difficult to find.
- Resale value is decreasing.
- Meets all NFPA 1910 safety standards.

Fair Condition

- More than 15 but fewer than 20 years old.
- Rust, corrosion, or body damage apparent on the body or cab.
- More than 2,400 engine hours.
- More than 75,000 but fewer than 100,000 miles if not used in stationary applications.
- Existing mechanical or suspension repairs are necessary.
- Downtime is increasing, and operational costs are above the historical average.
- Parts are becoming harder to find and/or obsolete.
- Very little resale value.
- Does not meet all NFPA 1910 safety standards.

Poor Condition

- Vehicle More than 20 years old.
- Rust, corrosion, or damage to the body or cab impacting apparatus use.
- More than 2,400 engine hours or 100,000 miles.
- Existing mechanical or suspension problems affecting the apparatus operation.
- Downtime is exceeding in-service availability.
- Operational costs exceed the resale value of the apparatus.
- Parts are obsolete.

Fleet Replacement Schedule

Under this recommendation, Tower 14, Ladder 65, and Squad 65 would be purchased between 2029 and 2033, one unit every two years. Rescue 51 could be rehabbed, and other units may need rust remediation work to provide the required years of front-line service. This rebuilding and corrosion treatment must commence as soon as possible, with one vehicle taken out of service at a time. Rescue 51 should be the first unit sent out for rust abatement and other maintenance concerns. From a practical perspective, ongoing mechanical, corrosion, and vehicle upgrades will be continually implemented over the next few years.

Fleet replacement by vehicle:

Engine 14-1 - Replace with a new Engine 14-1 in 2035 after 27 years of frontline service. At this time, evaluate the current reserve Squad 65-1 against the current Engine 14-1 and retain the better of them as the reserve and the other unit should be removed from the fleet.

Engine 14-2 - Should be declared a surplus immediately, removed from the fleet and sold.

Engine 51 - Replace Engine 51 with a new engine in 2037 after 22 years of frontline service. The current Engine 51 would be retained as a reserve, and the current reserve would be removed from the fleet.

Squad 51-2 - Run the current Squad 51-2 as a reserve for all three departments until it requires a major repair or until it is replaced in 2033 when a new 65-1 enters service. The current Squad 65-1 will be retained as a reserve and replace the current reserve Squad 51-2 after 33 years of service. Reserve 51-2 would be removed from the fleet.

Engine 65 - Replace Engine 65 in 2041 when Engine 65 will be 22 years old and retain the current Engine 65 for the reserve fleet. The current reserve would be offered to a reputable apparatus broker and sold.

Squad 65-1 - Replace Squad 65-1 in 2033 with a new Engine 65-1 after 25 years of frontline service. The current Squad 65-1 should be retained as a reserve.

Tower 14 - Tower 14 is scheduled for replacement in 2029 after 27 years of frontline service. The current Tower 14 would be removed from the fleet.

Ladder 65 - Replace current Ladder 65 in 2031, after 23 years of frontline service, with a Tractor Drawn Aerial Ladder or a rear-mounted aerial ladder. The current Ladder 65 would be removed from the fleet.

Rescue 51 - In 2038, evaluate staffing and the need for a Heavy Rescue. If there is staffing and the township wants to invest in another Heavy Rescue, now would be the time to Replace Rescue 51 or relocate the needed rescue equipment to Ladder 65. If the rescue equipment is relocated to the ladder, remove the current Rescue 51 from the fleet.

Ambulance 14-7 - Replace with a Ford F-550 or equivalent in 2036 after 20 years of service cycle current 14-7 out of the fleet, to be sold.

Ambulance 14-7 A - Replace with a Ford F-550 or equivalent in 2040 after 20 years of service cycle current 14-7 A out of the fleet, to be sold.

Support vehicles - The chief's vehicles, staff vehicles, and fire department utility vehicles, should be replaced as needed in years that do not have major fire apparatus purchases occurring.

Fleet Replacement Options by Year:

Year	Action
2025	- Rehab Rescue 51 if staffing improves. - Declare Engine 14-2 surplus, remove from the fleet, and offer to a reputable apparatus broker to sell. - Order new Tower 14
2026	Open
2027	- Order new Ladder 65
2028	Open
2029	- Take delivery of new Tower 14. - Order new Engine 65-1
2030	Open
2031	- Take delivery of the new Ladder 65. - Order new Engine 14-1
2032	Open
2033	- Take delivery of the new Engine 65-1. - Order a new Engine 51
2034	Open
2035	- Take delivery of new Engine 14-1
2036	- Take delivery of new Ambulance 14-7
2037	- Take delivery of the new Engine 51. - Ordering new Engine 65
2038	- Evaluate Rescue 51
2039	Open
2040	- Take delivery of new Ambulance 14-7 A
2041	- Take delivery of new Engine 65
2042	Open
2043	- Rehab Tower 14 after 14 years of frontline service
2044	Open
2045	- Rehab Ladder 65 after 14 years of frontline service
2046	- Ambulance 14-7 to re-chassis if needed
2047	- Replace Engine 65-2 with a new engine after 16 years front line service current engine to reserve fleet
2048	Open
2049	- Replace Engine 14-1 after 14 years of front-line service retain current Engine 14-1 as a second reserve

2050	- Ambulance 14-7 A to re-chassis if needed
2051	- Replace Engine 51 with a new engine, the current engine to reserve oldest engine in reserve is declared surplus and offered to a reputable apparatus broker to be sold
2052	Open
2053	- Replace Engine 65 with a new engine current engine to reserve the oldest engine in reserve is declared surplus and offered to a reputable apparatus broker to be sold
2054	Open
2055	Open
2056	- Replace Ambulance 14-7
2057	Open
2058	- Replace Tower 14
2059	- Replace Ambulance 14-7 A
2060	- Replace Ladder 65

This replacement schedule would provide the following benefits for the Nether Providence Township, Swarthmore Borough, Swarthmore, South Media, and Garden City Fire Departments:

1. If South Media cannot properly and safely staff Rescue 51, this plan could combine the service of Ladder 65 and Rescue 51. These are two of the most expensive units to maintain in the fleet. Reducing the fleet by one unit would result in cost savings. It would also maximize available staffing within the township.
2. Engine 14-2 is not being used, does not have staffing, is obsolete, and should be declared surplus and sold to reduce the fleet by another unit.
3. If the elected officials and the fire departments agree to operate their fleets as one fleet, Squad 51-1 can be used as a reserve engine, as there is not enough staffing to operate this unit.
4. In this plan, the fire department would be purchasing a new vehicle or re-chassis an ambulance every other year. This would spread these large capital expenditures out over time. However, the costs per year will not be equal, as fire trucks cost more than ambulances. However, from a budgetary perspective, the fire departments, the borough, and the township will have a good idea of what these capital expenditures will be for several years into the future.
5. It provides enhanced ground ladder capability and body compartments to carry desired tools and rescue equipment without chassis weight and axle limitations.

6. The new Tower 14 could be specified to house the rescue equipment of Engine 14-1, thereby allowing Swarthmore to avoid purchasing another rescue engine, opting instead for a short-wheelbase engine.
7. According to the recommendations in this report, a new apparatus should be acquired as listed. Particular attention should be paid to acquiring apparatus that will meet the needs of the response area while maintaining a level of cost-effectiveness with respect to the option content on the vehicles.

Generally, in this section, we would typically offer Option B, which is less aggressive; however, given the current state of the fleet, this is not a viable option. Being less aggressive would require the present fleet, with an average age of 19 years, to be in service even longer. By kicking the can down the road, so to speak, it will result in an increase in acquisition costs over time and place more stress on the fleet. Also, keep in mind that as the area continues to grow, there will be a natural progression for the Fire Department's call volume to increase, resulting in more wear and tear on the fleet.

Fleet Replacement Summary:

The size of the fleet could be reduced by two units by 2035 following the recommendations contained in this report. As volunteer staffing continues to dwindle nationally, regionally, and locally, the fire department, the borough, and the township will have to fill this void. In short, the number of fire trucks and the amount of equipment do not equal the staffing models for Swarthmore or South Media. The fleet in 2035 should consist of four engines, one tower, one tractor-drawn aerial ladder, and a reserve engine, or alternatively, four engines, one rescue vehicle, one tower, one ladder, and a reserve engine if all can be staffed. Ideally, three or four of those units should be staffed by career personnel.

The goal of the fleet replacement plan is to have a defined schedule for new replacement apparatus supported by available funding. Fleet planning and replacement requires a prudent and programmed approach to future fire apparatus and equipment purchases, which will be designed to meet the needs of the response area with enhanced maintenance capabilities. While there can always be a desire to have new vehicles in every fire station, there must be a logical approach to the long-term investments made by the fire departments, the borough and the township to best meet and serve the needs of the community. The recommendations put forth in this report should assist the Swarthmore, South Meida, and Garden fire departments, Swarthmore Borough and Nether Providence Township in meeting that goal.

New Mid-Mounted Aerial Tower Design Criteria

Emergency Vehicle Response recommends the following criteria and components that should be incorporated into the overall design of any new mid-mounted aerial tower for the Swarthmore Fire Department:

1. Four-door flat roof cab with seating for six (6) personnel
2. Mid-mount aerial tower with a minimum vertical reach of 95 feet
3. Mid-mount aerial tower with a minimum horizontal reach of 90 feet
4. Wheelbase between 246 and 262 inches
5. Overall height between 130 and 140 inches
6. Overall length between 42 feet and 44 feet 6 inches
7. Minimum of 500 horsepower engine
8. Allison five-speed automatic transmission
9. Telma driveline retarder or Jacobs engine brake
10. Vogel chassis and aerial lubrication system
11. 17-inch disc brakes on front and rear axles
12. Reinforced steel front bumper with angled corners
13. 340-amp Niehoff alternator
14. Six (6) group 31 batteries with stainless steel trays
15. Minimum 55-gallon fuel tank with stainless steel straps
16. Drive shaft drop guards for each section of the drive line.
17. Front windshield down view mirror
18. Rear backup camera with right side camera.
19. Aerial device, chassis, and body to be built by one manufacturer.
20. Platform to have a rated capacity of 1000 pounds
21. Outrigger system to be capable of short jack operations.
22. Platform to have a single manual monitor equipped with smooth bore tips.
23. Ground ladder compliment to include the following:
    a. Two (2) 35-foot two-section extension ladders
    b. Two (2) 28-foot two-section extension ladders
    c. Two (2) 16-foot two-section ladders
    d. Three (3) 16-foot roof ladders
    e. One (1) 14-foot roof ladder carried in the fly section of the tower.
    f. One (1) 10-foot folding ladder
    g. One (1) 17-foot Little Giant ladder
24. Onan or Harrison hydraulic generator sized to operational requirements if needed.
25. Two (2) electric rewind cable reels equipped with 200 feet of 10/3 cable.
26. Seven (7) cab and body-mounted 12-volt LED-style scene lights.
27. All cab, body, and aerial running and warning lights to be LED style.
28. All body compartments are equipped with appropriate trays, shelves, and tool boards.

In addition to the above items, the following safety and reduced maintenance components should be incorporated into the final vehicle specifications:

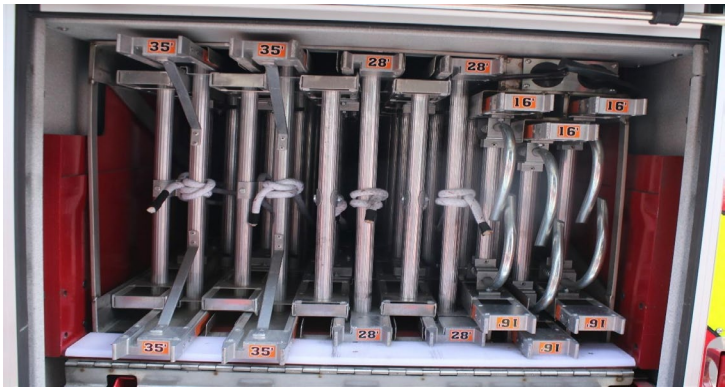
- Finish painted chassis frame rails, cross members, body sub-frame, and components.
- Electronic stability control
- Stainless steel straps on diesel fuel tank and all air reservoirs
- Stainless steel pull cables for each air reservoir with remote-mounted drain valves

- IMMI Reach Ready orange color seat belts with extended female stalks.
- Chassis frame rails, cross members, body sub-frame, and components should be treated with available rust and corrosion coating to inhibit frame damage.
- Equipped with Frontal Airbags and Side Roll Over Protection

A mid-mount aerial tower apparatus, as outlined above, would cost between $2.2 and $2.4 million in current costs and would provide for an improved tower scrub area, ground ladder capabilities, and enhanced safety for operating members. The new apparatus should be designed to be as short and maneuverable as possible, incorporating as many of the above-listed bullet points as the basis for the vehicle's design. Depending upon the fire department's planning and resources, the apparatus should be placed on order during the first half of 2025, with the anticipated delivery in 2029. EVR strongly recommends a tandem axle mid-mount aerial tower/tower ladder with sufficient ground ladders, enabling personnel to safely and effectively ladder three or four sides of a large residential building.

The concept is to keep the focus on truck company tools and equipment, ground ladders, jacking stance, and overall vehicle size. The Swarthmore Fire Department is fortunate to have access to mutual aid aerial ladder apparatus, recognizing that aerials excel in certain areas that towers do not. Most aerial towers, whether mid-mount or rear-mount design, have limitations. The number of ground ladders carried is limited by the overall travel height, compartment configuration, and the location of the tower's waterway and hydraulic components.

An example of a Mid-Mounted Aerial Tower that would meet the needs of Swarthmore.



The Ladder tunnel has a good complement of ground ladders that are needed.

Rear-Mount Aerial Ladder Criteria

This option would provide for a new rear-mounted aerial ladder with all new chassis and body components for Garden City. Any replacement aerial device should be designed to carry the required tools, equipment, and, most importantly, ground ladders to complement the equipment already carried and maintained on the department's two frontline engine company units.

There is no requirement for the replacement aerial ladder to be outfitted with a fire pump, water tank, or hose bed. Due to the restricted overall travel height, the compartment sizes will be limited, and the introduction of a water tank and hose bed further impairs the vehicle's ability to carry sufficient ground ladders and rescue equipment. Also, a pump, tank, and hose would dramatically increase the vehicle's weight. The 40.00 to 46.00 inches of space taken by the fire pump and associated plumbing may be more effectively utilized to provide a partial transverse compartment to carry longer tools and could also be used to reduce the vehicles' wheelbase. Depending on the components and equipment, the estimated cost would be approximately $1.7 million to $1.9 million.

New Aerial Ladder Design Features:

The following guidelines should be incorporated into the overall design of any new rear-mounted aerial ladder apparatus:

1. Four-door flat roof aluminum or stainless-steel cab with seating for six (6) personnel
2. Rear-mounted Aerial Ladder with minimum vertical reach of 100
3. Rear-mounted Aerial Ladder with a minimum horizontal reach of 90
4. Wheelbase between 212 inches and 230 inches
5. Overall height between 130 and 138 inches
6. Overall length is no more than 42 feet
7. Minimum of 500 horsepower engine
8. Allison five-speed automatic transmission
9. Jacob's engine brake or Telma Driveline Retarder
10. Vogel chassis and aerial lubrication system
11. Unit to have stainless steel body
12. Aerial device, chassis, and body to be built by one manufacturer
13. Aerial ladder to have a minimum rated capacity of 500-lb. tip load
14. Ground ladder compliment to include a minimum of the following:
    - One (1) 45-or 50-foot three-section extension ladder
    - Two (2) 35-foot two-section extension ladders
    - Two (2) 28-foot two-section extension ladders
    - One (1) 18-foot roof ladder
    - Two (2) 16-foot roof ladders
    - One (1) 14-foot roof ladder carried in the fly section of aerial
    - One (1) 10-foot folding ladder
    - One (1) 17-foot Little Giant ladder
15. 15 Kw Onan or Harrison hydraulic generator
16. Two (2) electric rewind cable reels equipped with 200 feet of 10/3 cable
17. Seven (7) cab and body-mounted 12-volt LED-style scene lights
18. All body and running lights to be LED-style
19. All warning lights on cab, body, and platform to be LED style

20. All body compartments are to be equipped with appropriate trays, shelves, and tool boards, with all hand tools mounted inside the compartments.
21. All sides of the apparatus have high-visibility graphics

In addition, the aerial ladder apparatus should provide for the following mechanical and safety features:

- Full-width steel reinforcement channel mounted behind the front bumper
- Drive shaft safety guards on each section of the driveline
- Electronic Stability Control
- Six Group 31 batteries with a single alternator rated at 360 amps
- All air reservoirs to have manual drains with stainless steel pull cables
- All seating positions to be provided with IMMI Reach Ready Orange three-point seat belts
- Stainless steel straps should be provided for all air reservoirs and diesel fuel tank
- Stainless steel battery trays and hardware should be provided for these components
- Frontal and Side Roll protection.

The weight of the loose equipment from the current Truck must be identified before the pre-construction conference for this unit's replacement.

Example of a Rear Mounted Aerial Ladder that would fit the needs of the Garden City Fire Company: This apparatus is equipped with 214 feet of ground ladders on a Chassis that has a wheelbase of 238.5 inches. It has an Overall Height of 11 feet 8 inches and an Overall Length of 40 feet 1 inches.

Example of a Rear-Mounted Aerial Ladder that would meet the needs of the Garden City Fire Department: This apparatus is equipped with 279 feet of ground ladders on a chassis with a wheelbase of 224 inches. It has an Overall Height of 140 inches and an Overall Length of 40 feet

New Tractor Drawn Aerial Ladder Design Criteria

Emergency Vehicle Response recommends the following criteria and components that should be incorporated into the overall design of any new tractor-drawn aerial ladder for the Garden City Fire Department.

1. Four-door flat roof cab with seating for six (6) personnel
2. Tractor Drawn Aerial Ladder with a minimum vertical reach of 100
3. Tractor Drawn Aerial Ladder with a minimum horizontal reach of 92
4. Wheelbase between 145 inches and 162 inches
5. Overall height between 132 inches and 138 inches
6. Overall length between 56 feet and 60 feet
7. Minimum of 500 horsepower engine
8. Vogel chassis and aerial lubrication system
9. Reinforced steel front bumper with angled corners
10. 340-amp Niehoff alternator
11. Six (6) group 31 batteries with stainless steel trays
12. Drive shaft drop guards for each section of the drive line
13. Front windshield down view mirror
14. The unit to have an aluminum body with a similar sub-structure
15. Aerial device, chassis, and body to be built by one manufacturer
16. Aerial Ladder to have a single monitor equipped with smooth bore tips
17. Ground ladder compliment, at a minimum, should include the following:
    a. One (1) 45-foot two-section extension ladder
    b. Two (2) 35-foot two-section extension ladders
    c. Two (2) 28-foot two-section extension ladders
    d. Two (2) 16-foot two-section extension ladders
    e. Three (3) 16-foot roof ladders
    f. One (1) 14-foot roof ladder carried in the fly section of the aerial
    g. One (1) 10-foot folding ladder
    h. One (1) 17-foot Little Giant ladder
18. All body compartments are to be equipped with appropriate trays, shelves, and toolboards
19. Finish painted chassis frame rails, cross members, body sub-frame, and components
20. Electronic stability control, Frontal and Side Roll protection and airbags.
21. Stainless steel straps on diesel fuel tank and all air reservoirs
22. Stainless steel pull cables for each air reservoir with remote-mounted drain valves
23. IMMI Reach Ready orange color seat belts with extended female stalks
24. Chassis frame rails, cross members, body sub-frame, and components should be treated with any available rust and corrosion coating to inhibit frame damage.

A TDA ladder apparatus, as outlined above, would cost in the range of $2.4 to $2.6 million and would provide for improved reliability, added ground ladder capabilities, and enhanced safety for the operating members. The new apparatus should be designed to be as maneuverable as possible and should incorporate as many of the above-listed bullet points as the basis for the design of the vehicle.

This tractor-drawn aerial ladder is equipped with 463' of ground ladders.

Example of a Tractor Drawn Aerial Ladder that would fit the needs of the Garden City Fire Department. The overall length is 61'3". The Garden City Station is 56 feet long, so this unit would not fit. The Shortest Tractor Aerial Ladder that EVR is aware of is 55 feet 8 inches, which still would not fit; therefore, alterations to the station would be necessary if this is the direction the fire department and the township take.

Engine Design Criteria

The concept of the new engine apparatus design is to provide a short-wheelbase engine equipped with multiple attack lines of various sizes and lengths, along with a complement of standard engine company equipment. The engines should be designed with low cross-lays and rear hose bed to permit personnel to stretch and advance attack and leader lines without climbing onto the vehicle. This engine design would replace the squad design and mimic the current design of Garden City Engine 65.

The following design criteria should be adopted by the fire department for any new engine company units:

1. Four-door custom cab with seating for six (6) personnel
2. Overall length between 29 and 30 feet, 6 inches
3. Overall height between 120 and 126 inches
4. Wheelbase between 174 inches and 185 inches
5. 500 Horsepower diesel engine with Jacob's engine brake
6. Disc brakes, 17-inch on the front and rear axles
7. 1500 gpm single-stage fire pump with side mount pump controls
8. Apparatus to have a minimum of three (3) 2.5" rear discharges
9. 500-gallon to 750-gallon low-profile water tank with poly construction
10. Minimum of six (6) preconnected attack lines including:
    a. One (1) 100 to 150-foot 1.75-inch trash line on front bumper
    b. Two (2) 1.75-inch attack lines, one (1) 200 foot, one (1) 300 foot
    c. One (1) 1.75-inch 400-foot attack line
    d. One (1) 200-foot 2.5-inch attack line with a smooth bore nozzle
    e. One (1) 150 to 200-foot 3-inch line with a Blitz Fire monitor
11. Hose bed to accommodate a minimum of 1000 feet of 5" supply line
12. Hose bed to accommodate a minimum of 300-500 feet of 3" hose
13. Hose bed and cross-lays to be not more than 66.00 inches from the ground
14. All pump panel valves to be manually controlled
15. Apparatus body to be constructed of aluminum or stainless steel with similar substructure
16. Apparatus body to have full height compartments on the left side, low side on the right side
17. Ground ladders to be mounted on the right side of the body with a 24-foot extension ladder, 14-foot roof, and 10-foot folding ladders
18. Provide for six 12-volt LED scene lights to include a cab brow light, two mid-body lights on each side, and one rear body light
19. All body compartments are to be equipped with appropriate trays, shelves, and tool boards with all hand tools mounted inside the compartments in a standard location
20. Front suction inlet and one side inlet with a power-operated intake valve and manual override
21. Full-width steel reinforcement channel mounted behind the front bumper
22. Drive shaft safety guards on each section of the driveline
23. Six Group 31 batteries on stainless steel trays with a minimum of 340-amp Niehoff alternator
24. Front windshield down view mirror
25. Air-operated pump primer

26. Electronic stability control, Frontal airbags, and side roll protection
27. Stainless steel straps on diesel fuel tank and all air reservoirs
28. Stainless steel pull cables for each air reservoir with remote-mounted drain valves
29. Stainless steel trays and hardware for the battery boxes
30. IMMI Reach Ready orange color seat belts with extended female stalks
31. Finish painted chassis frame rails, cross member, body sub-frame, and components
32. Chassis frame rails, cross members, body sub-frame, and components should be treated with any available rust and corrosion coating to inhibit frame damage.

An engine apparatus, as outlined above, would cost between $ 1.2 million and $ 1.3 million and would provide for improved fire flow delivery and enhanced safety for the operating personnel. It will be used as the basis for a standardized engine company apparatus in the future. The new apparatus should be designed to be as short and maneuverable as possible, incorporating as many of the above-listed bullet points as the basis for the initial design.

Example of low rear hose bed with 750-gallon water tank.

An example of a short wheelbase engine with a 750-gallon water tank.

10.0 Summary

We gratefully acknowledge the cooperation and assistance of Chief Patrick O'Rourke of the Garden City Fire Company, Chief Colen Booth of the Swarthmore Fire and Protection Association, and Chief Michael Hopkins of the South Media Fire Company for providing information on the apparatus, response policies and procedures, fire incident responses, and other records that were made available for review by the staff of Emergency Vehicle Response.

The summary, findings, and recommendations developed in this report are solely those of Emergency Vehicle Response and have not been influenced by any representatives of any of the fire departments, elected officials, or any outside parties. The information and statistics listed within the report were gathered from each fire department's records and information supplied for our review by the three fire departments.

The staff of Emergency Vehicle Response looks forward to meeting with the Officers and Members of the Swarthmore Fire and Protection Association, the South Media Fire Company, the Garden City Fire Company, Swarthmore Borough Officials, and Nether Providence Township officials to review and discuss the findings and recommendations included in this report.

Respectfully submitted,

Win Slauch
Alex Moody
Michael Wilbur

11.0 Appendix

Fire Apparatus Manufacturer's Association: FAMA.org

NFPA 1900 Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus and Automotive Ambulances 2024 Edition.
National Fire Protection Association, 1 Batterymarch Park, Quincy MA 02169.

NFPA 1910 Standard for the Inspection, Maintenance, Refurbishment, Testing and Retirement of In-Service Emergency Vehicles and Marine Firefighting Vessels, 2024 Edition.
National Fire Protection Association, 1 Batterymarch Park, Quincy MA 02169.

NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations to the Public by Career Fire Departments, 2020 Edition.
National Fire Protection Association, 1 Batterymarch Park, Quincy MA 02169.

NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations to the Public by Volunteer Fire Departments, 2020 Edition.
National Fire Protection Association, 1 Batterymarch Park, Quincy MA 02169.

ISO Insurance Service Office, 2014 Edition
Insurance Services Office, Inc., 1000 Bishops Gate Blvd., Ste. 300, P.O. Box 5404, Mt. Laurel, New Jersey 08054-5404