
COTTER STRATEGIES, LLC.

FIRE & EMERGENCY SERVICES CONSULTING



REPORT AND RECOMMENDATIONS FOR A NEW FIRE & EMS STATION FOR THE TOWNSHIP OF LAWRENCE

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Executive Summary

The Township of Lawrence engaged Cotter Strategies, LLC to provide fire station advisory services¹ as part of an evaluation by local officials for construction of a new Fire and EMS station.

The study team supports construction of a new Fire and EMS facility at the proposed location adjacent to the Lawrence Township Municipal Building that will provide important benefits to the community now and into the future. A new station will consolidate two existing fire companies, Slackwood and Lawrence Road and the Lawrence Township Emergency Medical Services. The Lawrenceville station is proposed to remain as a sub-station.

Replacing three separate buildings with one new Fire and EMS station will reduce duplication of facilities, equipment and apparatus resulting in significant cost avoidance savings. Moreover, the new station will provide improved facilities for the health and safety of personnel, integration of EMS and fire operations, further integration of career and volunteer members as part of a combination organization, co-location of the Office of Emergency Management (OEM), the Emergency Operations Center (EOC), the local 9-1-1 emergency communications center and, administrative offices for the public works director.

Engagement of both internal and external stakeholders throughout the project and the architectural firm with experience in fire station design and construction administration will be essential for the success of this project.

¹ Cotter Strategies, LLC is not an architectural or engineering firm.

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Existing Fire Stations & Need Assessment

Fire protection for Lawrence Township is provided by a combination of career (full-time) and volunteer firefighters operating from three fire stations:

- Slackwood Fire Company/Fire District No.1 (Mercer County Fire Station 21), 21 Slack Avenue in the southern portion of the township.
- Lawrence Road Fire Company Fire District No. 2 (Mercer County Fire Station 22), 1252 Lawrenceville Road in the south-central portion of the township.
- Lawrenceville Fire Company/Fire District No.3 (Mercer County Fire Station 23), 64 Philips Avenue in the central portion of the township.

The existing fire stations were constructed to accommodate the needs of the semi-independent fire companies. Traditionally, volunteer fire stations were built in areas that were adjacent to neighborhoods where the volunteers lived or worked resulting in individual fire company stations scattered among several areas of a municipality – this is the case in Lawrence Township.

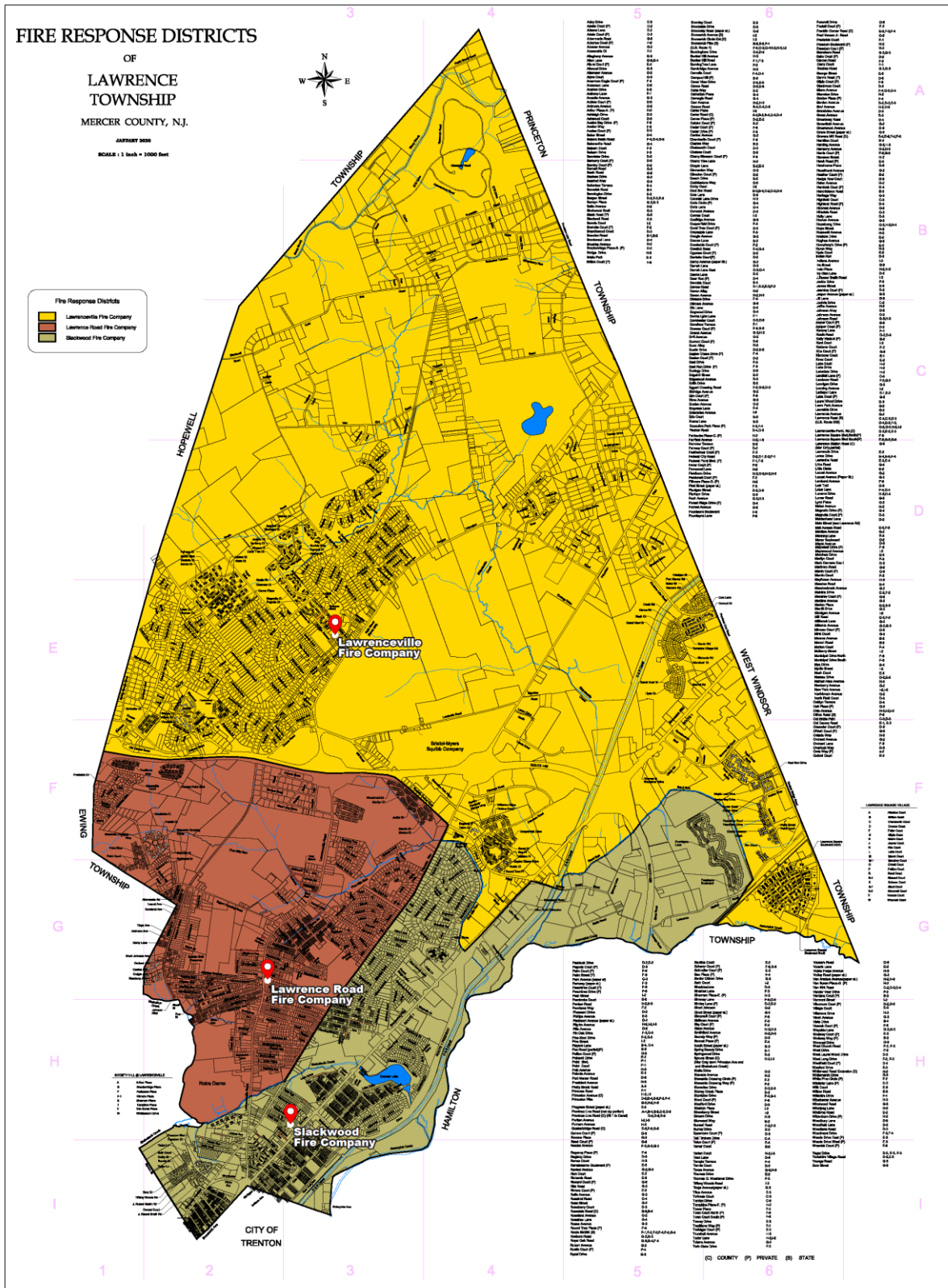
Although this model served the volunteer fire service well for many years, changing demographics and socio-economic forces have resulted in a decline in community members willing to serve as volunteer firefighters. As a result, these changes made the single company fire station system unsustainable for many communities. Often, the result has been a consolidation of multiple single companies into a centrally located station to house all the community apparatus. In addition, municipalities including Lawrence Township, began hiring career firefighters to assure adequate staffing to address the overall decline in volunteer firefighters.

Consolidating formerly separate fire companies provides certain efficiencies. Duplication of fire apparatus and equipment is minimized and personnel resources both volunteer and career can be maximized resulting in cost avoidance and improved services.

A map illustrating the location of existing stations within the Township and a description of each fire station is included on the following pages.

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The following map shows the location of existing fire stations:



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Slackwood Fire Company



The Slackwood Fire Company is located at 21 Slack Avenue in the extreme southern end of the municipality and was organized as the first township fire company in 1907. The fire station is positioned on a residential street a short distance from Brunswick Pike and occupies property that is approximately 40,000 square feet and identified as Block 1005, Lot 2.01 on the municipal tax map sheet 10. This location is near the southern residential area; however, it is remote from the central and northern portions of the township.

It is also located on a relatively narrow residential street that makes it difficult to maneuver large fire apparatus in and out of the front bay access engine room doors. The building has evolved over the years from the original 2 ½-story wood frame two-bay engine house with multiple one-story masonry additions adding several engine bays along Slack Avenue and a social hall in the rear. The building is in fair condition but lacks appropriate overnight facilities for firefighters and design features that limit the spread of potential contaminants within the facility. The station also lacks a fire protection system.

Lawrence Road Fire Company



The Lawrence Road Fire Company is located at 1252 Lawrenceville Road in the southwestern quadrant of the township. It was organized in 1914 as the second fire company in the township. The station occupies property that is approximately 37,000 square feet and is identified as Block 2403, Lots 27-30 on the municipal tax map sheet 24. The Emergency Medical Services station is housed on a separate lot at the rear of the Lawrence Road station and occupies property that is approximately 16,000 square feet and identified as Block 2403, Lot 1 on tax map 24. If combined, the lots would measure approximately 53,000 square feet.

The fire station is in an area of mixed light commercial and residential development. The facility is opposite and adjacent to small strip-mall retail establishments that include pedestrian crossings and multiple entrance and exit lanes for vehicles. The building has undergone numerous renovations and additions. The two-story brick two-bay engine house built in the 1920s was converted to office and administrative space, and a front entry-only three-bay one-story masonry and steel engine house was added in the 1980s. A one-story addition at the rear

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contains a large social hall. The building fronts on Lawrenceville Road and occupies a parcel with an adjacent parking lot between Pilla Avenue and Marlboro Road. The building is in fair condition but lacks appropriate overnight facilities for firefighters and design features that limit the spread of potential contaminants within the facility. The station also lacks a fire protection system.

The station is located only 1.5 road miles from the Slackwood fire station and 2.6 road miles from the Lawrenceville fire station.

Lawrenceville Fire Company



The Lawrenceville Fire Company is located at 64 Philips Avenue in the Lawrenceville/Main Street area in the central portion of the township. The fire company was organized in 1915 as the third fire company serving Lawrence Township. The station is located between Philips and Gordon Avenues one block west of Lawrenceville Road on a lot approximately 47,000 square feet and identified on the tax map as Block 5710, Lot 10 on sheet 57.02. The original two-story wood frame station building that faces Philips Avenue has been converted into administrative, training, and

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social hall after a large five-bay rigid frame metal engine house was added in the 1980s. Four of the engine bays now face Gordon Avenue with a generous sized concrete front ramp that allows for safe maneuvering of departing apparatus onto the residential street. The station is in very good condition and has adequate overnight facilities for firefighters. The building features a radio room, a break room, a workshop, a fully equipped physical fitness room, a ten-bed bunk room, a game room with kitchen, a meeting room, four offices, restrooms, showers, and a social hall with a commercial kitchen. The facility lacks a fire protection system and design features that limit the spread of potential contaminants within the facility.

Lawrence Township Emergency Medical Services

Lawrence Township Emergency Medical Service (LTEMS) is included in this study to create a new fire and emergency medical services facility. LTEMS currently operates from a single station located adjacent and to the rear of the Lawrence Road Fire Station providing full-time ambulance service 24 hours per day. One ambulance is always in service while a second ambulance is staffed from 0700-1900 hours. The ambulances are staffed by 11 full-time and 15 per-diem members. There is one EMS supervisor.

In the most recent three-year period, LTEMS has responded to an increasing number of incidents as illustrated in the following table:

Lawrence Township Emergency Medical Services	
Year	Number of Responses
2020	2,902
2021	3,497
2022	3,961

Delivery of emergency medical services in Lawrence Township requires a minimum of two ambulances and one reserve ambulance. The table that follows illustrates the current fleet:

Lawrence Township Emergency Medical Services Ambulance Units		
Unit Designation	Year	Vehicle Type
129-1	2016	Chevy Van Type 2 Ambulance
129-2	2016	Chevy Van Type 2 Ambulance
129-3	2021	Ford F-350 Type 1 Ambulance

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The study team recommends retaining a minimum fleet of three ambulances. The ambulances should be included in the apparatus/vehicle replacement schedule. The study team did not inspect any vehicle, review any maintenance, repair, or test documents.

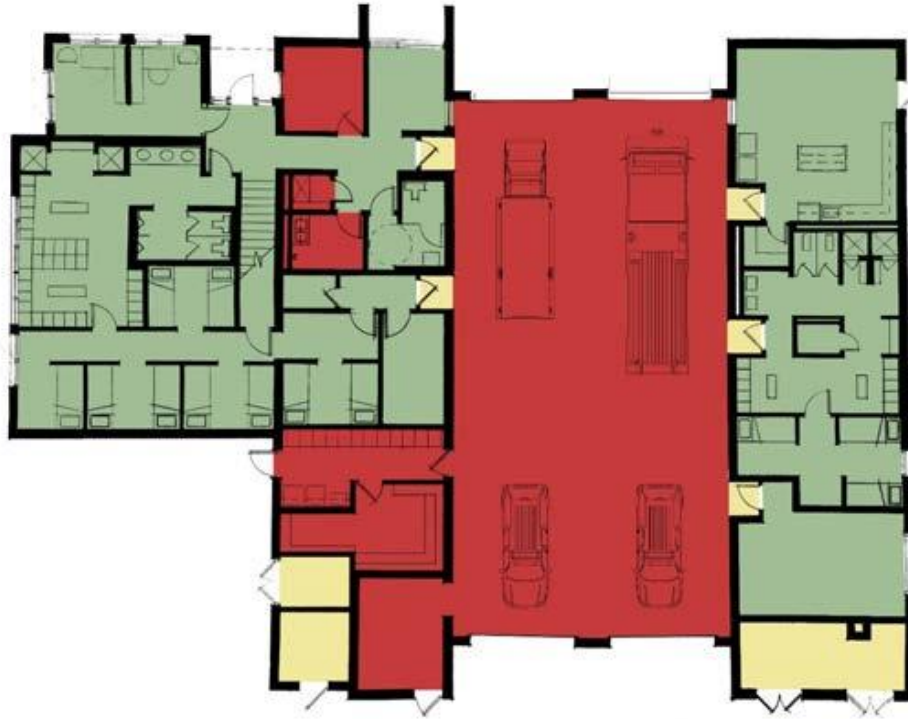
Fire Station Design Considerations

Fire stations are unique among public buildings. They must be designed for continuous operation, house large fire apparatus and equipment, provide living quarters for staff, include administrative offices, and incorporate specialized features for training firefighters.

The evolution of fire station design has followed the evolution of the fire service. With a greater number of women joining fire departments, gender has influenced the design of locker rooms, sleeping areas and bathroom facilities. Fire apparatus is larger, sometimes much larger, compared with only a generation ago. Modern fire stations require a minimum apparatus bay door opening of 14 feet in width and 16 feet in height. Among the most significant and important station design evolution relates to firefighter health and safety.

Cancer is a leading cause of occupational illness and death among members of the fire service. While exposure to carcinogens and other contaminants on the fireground and emergency incidents is a continuing risk associated with firefighting, those same toxins can be carried back via firefighting personal protective equipment and apparatus into the fire station.

The schematic that follows is an example of a fire station with design features that limit the spread of potential contaminants within the facility. Those areas in **red** (hot zone) are the spaces that may be exposed to carcinogens and other contaminants. The **yellow** areas (warm zone) are transition spaces between the contaminated areas and clean area. The **green** area designates is the clean spaces (cold zone).



The Firefighter Cancer Support Network, an organization dedicated to firefighter cancer support, noted the following in a white paper titled “Taking Action Against Cancer in the Fire Service” [taking-action-against-cancer-in-the-fire-service-pdf.pdf \(firefightercancersupport.org\)](https://firefightercancersupport.org/taking-action-against-cancer-in-the-fire-service-pdf.pdf)

The design of fire stations, whether for new construction or renovation, must include such standard design features as state-of-the-art equipment and systems for adequate air flow, removal and capture of carcinogens and particulates, appropriate location, and ventilation of storage rooms for contaminated PPE and other equipment, washer-extractor, and gear drying equipment, as well as clear separation of living quarters from the apparatus floor. In short, architects should be working to design cancer out of fire stations.

When designing new fire stations for Lawrence Township, it will be important to include special consideration for features noted above.

Building for the Future

Increase in Career Staffing

Acknowledging current trends in the fire service, the design for a new fire station should include space to accommodate increasing levels of career staffing. Currently, there are nine career staff members exclusive of the chief and any administrative personnel. A facility design should include

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accommodations for as many as 15 personnel on duty. This number is intended to reflect a fully integrated combination fire and EMS agency that includes career, volunteer, and EMS personnel.

EMS Integration

Inclusion of the Lawrence Township Emergency Medical Services within a combined fire and EMS facility should include a plan to over time, have firefighters and EMS personnel fully cross trained. Space within the facility will need to accommodate three ambulance units, operational personnel as well as office space for the supervisor and any support staff.

Office of Emergency Management – Emergency Operations Center

Locating the Office of Emergency Management (OEM) and Emergency Operations Center (EOC) within a secure facility that can be self-sufficient and is easily accessed by public safety officials are important considerations. The new facility should be designed to include space for the OEM as well as for the related EOC. Certain efficiencies are gained by co-locating the OEM and EOC within the proposed facility. For example, some spaces and technology within a well-designed facility can be shared, such as a training room, kitchen as well as telephone and Information Technology infrastructure.

Emergency Communications – 9-1-1 Center

Local officials have expressed interest in locating the local emergency communications 9-1-1 center in the new fire & EMS facility. As in the case with the Office of Emergency Management, co-locating the local communications center in the fire and EMS facility provides the benefits related to shared infrastructure including Information Technology.

DPW Administration

Local officials have proposed including space in a fire and EMS facility for administrative offices for the Department of Public Works. Co-locating DPW administrators in the Fire and EMS facility is a novel and sensible approach to better coordinate emergency events that are increasingly weather related.

University Student Firefighters

Some communities with colleges and universities within their borders have created living space within fire stations for college students willing to volunteer as firefighters. Lawrence Township may wish to consider such a design feature within the new station to potentially increase volunteer staffing levels. Given the location of Ryder University, there may be an interest from the University in collaborating with the Township on the proposed Fire & EMS station.

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Training Props

A new Fire and EMS facility offers the opportunity to include training props within the station providing easy access for personnel to practice specialized skills.

Historical Display Area

The three fire companies and EMS agency have a rich legacy of service to Lawrence Township. Providing an area within the proposed fire and EMS station to display various historical items related to various organizations is an opportunity to showcase their heritage and history.

Proposed Fire Station Location

Lawrence Township has proposed that a new fire and EMS station be constructed that will consolidate two of the existing fire companies, Slackwood and Lawrence Road, as well as EMS operations. In addition, the new facility is envisioned to include the Office of Emergency Management (OEM) and the Emergency Operations Center (EOC) and the Township's 9-1-1 emergency communications center. It is anticipated that the Lawrenceville Fire Station be retained and serve as a secondary location for apparatus and equipment.

Station location is a critical component of incident response time. Fire and EMS stations are ideally located near the geographic center of the covered fire district so that travel distances to all protected structures are less than 1.5 road miles for the first-arriving engine company and 2.5 road miles for the first-arriving ladder company. These travel distances are based on recommendations from ISO and NFPA and are built on a formula that calculates drive times from each fire station to the protected occupancies that are located furthest from the station. The standards are intended to ensure that fire stations are distributed within the community so that the first due fire apparatus arrives at the scene of an emergency at all locations in the district in a timely manner.

The placement of fire and EMS stations within a community has a direct impact on the efficient operation of a fire department. The ability of the local fire agency to deliver an effective fire and rescue force in a timely and consistent manner is a hallmark of a capable emergency organization.

Access to major roadways is a factor that must be considered because proximity to the arterial streets in the community will allow for a timelier response of apparatus. If a fire station is located within a residential or commercial development with lengthy distances to major roadways, responses times can be expected to be longer. If possible, fire and EMS stations should be located on or very near a major thoroughfare.

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Lawrence Township has proposed that a new fire and EMS station be constructed that will consolidate two of the existing fire companies, Slackwood and Lawrence Road, as well as LTEMs operations. In addition, the new facility is envisioned to include the Office of Emergency Management (OEM) and the Emergency Operations Center (EOC) and the Township's 9-1-1 emergency communications center. Local officials may also consider including space for DPW administrative offices and university student volunteer firefighters.

A location has been proposed by local officials that is part of a municipal complex, immediately adjacent to the Lawrence Township Municipal Building on a large parcel that also includes the Lawrence Township Police Department.

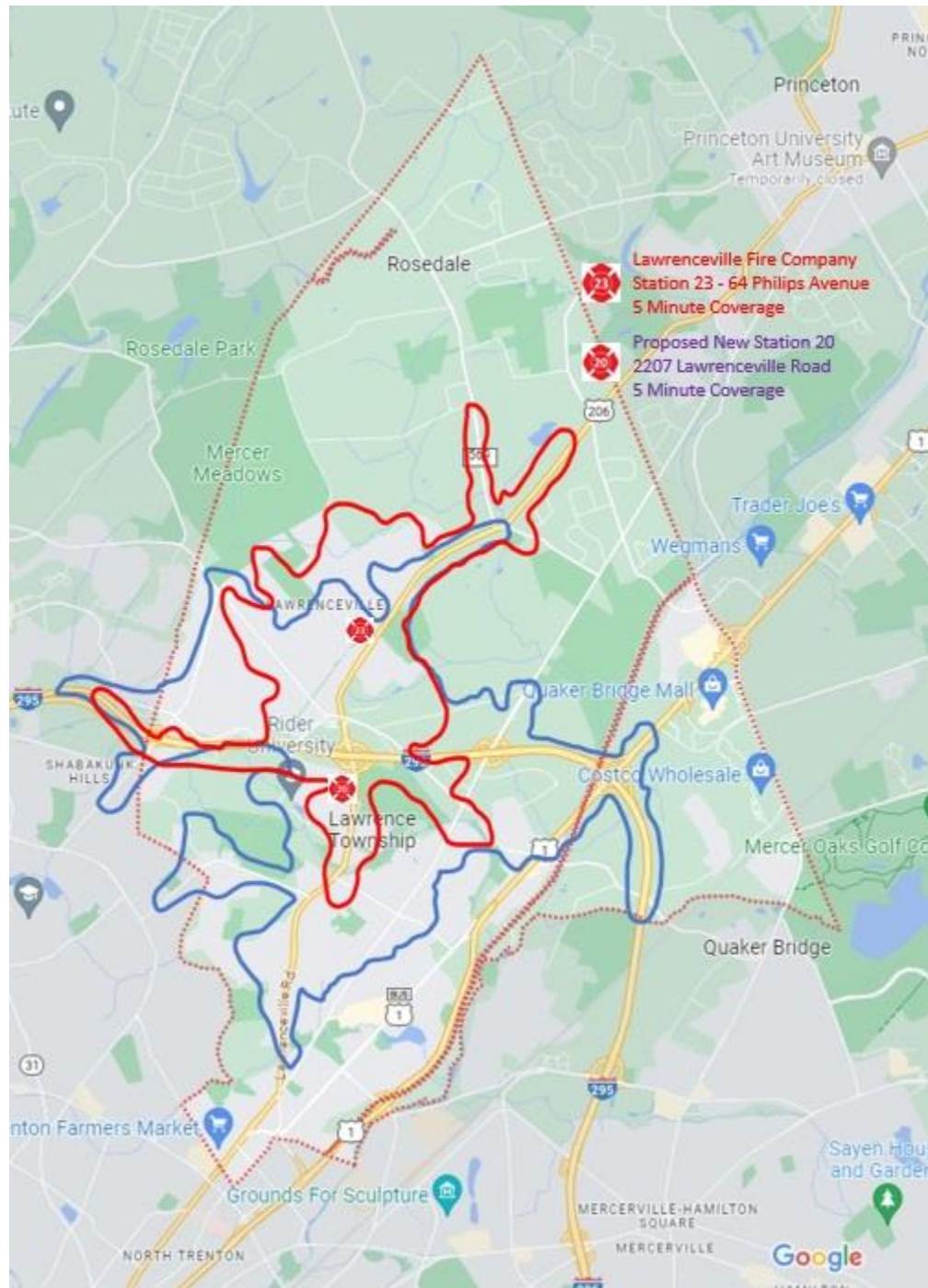
The envisioned location for the new facility is on the southeast corner of the municipal complex at 2207 Lawrenceville Road. The approximate dimensions of the parcel are 240 ft by 250 ft. At approximately 60,000 square feet, this parcel is larger than any of the existing fire station properties. It may also be possible to create additional parking outside of the immediate area.

Much of the property is currently used as a detention basin; however, engineers have indicated that the basin would be relocated or installed underground. The size of the lot, frontage on an arterial roadway, and location within a municipal complex are important advantages to this location.

Travel Time Mapping

An analysis of the travel time for responses from the proposed Fire & EMS station is illustrated on the following map. Coverage areas for responses from the proposed station are overlaid with travel time mapping from the Lawrenceville Station. The mapping shows most of the developed area of the community reachable within a five-minute travel time.

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This map illustrates five-minute travel time coverage (blue border) from the proposed new station at the municipal complex and the five-minute response time coverage (red border) from the Lawrenceville station.

Current Fire Apparatus and EMS Units

The purchase of fire apparatus is increasingly expensive, some manufacturers saw a 10% increase in 2022. To effectively budget for and appropriately pace the purchase of such costly vehicles, municipalities should develop a long-term apparatus replacement schedule. The maintenance and repairs of fire apparatus also presents a significant cost for a community. Fire service leadership should continually evaluate the repair costs of their apparatus to justify its useful life and whether it should be retained in either an active or reserve status. Consolidating and relocating fire companies into a new station is an opportunity to evaluate the current inventory of fire apparatus and the agency's overall fire apparatus requirements.

The National Fire Protection Association (NFPA) is a consensus standards making organization responsible for the creation and update of fire protection and life safety standards and codes. NFPA standard, NFPA 1911 *Standard for the Inspection, Maintenance, Testing and Retirement of In-Service Automotive Fire Apparatus* sets the minimum requirements for establishing periodic inspection, maintenance, and testing program for in-service apparatus. This standard also provides guidance on retirement of fire apparatus. While compliance with the standard is voluntary, fire industry best practices often reference the standard when analyzing fire apparatus construction and performance.

NFPA 1911 includes an appendix with the recommendation that fire apparatus be placed in reserve status after 15 years of use and replaced when 20 years old. Several factors impact the service life expectancy of a piece of fire apparatus. The quality of the manufacturer, level of training for the users of the vehicles, care and maintenance performed as well as the frequency and extent of use. NFPA standards are important references when developing an apparatus replacement schedule.

The Insurance Services Office (ISO) evaluates a community's fire protection capabilities. The Fire Suppression Rating Schedule (FSRS) developed by ISO provides credit for engine companies, ladder companies, reserve apparatus, pumping capacity, and operational considerations. The 2019 Insurance Services Office, (ISO) report for Lawrence Township was referenced as part of this study to assure that any change in the existing inventory of fire apparatus will not negatively impact the community's ISO rating.

Based on our review of the current ISO report, the revised apparatus inventory included in this report should not change the existing ISO rating.

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The study team is recommending retaining the following apparatus if fire suppression resources are consolidated into a single station or a single and satellite station. This is based solely on the type of apparatus and its age. The study team did not inspect any vehicle, review any maintenance, repair, or previous test documents.

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The current inventory of apparatus, ambulance and other units is illustrated in the following table:

Existing Apparatus & Ambulance Inventory	
Unit Type	Number
Engine (Pumper)	3
Rescue Engine	3
Tower Ladder	2
Squirt (Pumper with articulating boom master stream device.)	2
Utility (pickup truck)	3
Special Service Unit	1
Brush Truck	1
High Water Tactical Unit	1
Marine Unit	2
Command Vehicle	3
Ambulance	3

The following table illustrates the apparatus recommended to be retained or retired from service.

Proposed Apparatus & Ambulance Inventory			
Unit	Manufacturer	Vehicle Age (yrs.)	Recommendation
Rescue 21 – Rescue Pumper	Emergency One	3	Retain
Rescue 22 – Rescue Pumper	Emergency One	3	Retain
Rescue 23 – Rescue Pumper	Sutphen	14	Retain
Engine 21 – Pumper	American LaFrance	20	Retain
Tower 21 – Tower Ladder	Seagrave	8	Retain

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Telesquirt 23	American LaFrance	19	Retain
Telesquirt 22 ²	KME	20	Retain
Reserve 20 – Pumper	Simon	25	Retired
Engine 22 – Pumper	KME	25	Retired
Rescue 22	KME	27	Retired
Ladder Tower 23	LTI/Simon	29	Retired
Special Unit Type	Number of Units		
Utility (pickup truck)	3		Retained
Special Service Unit	1		Retained
Brush Truck	1		Retained
High Water Tactical Unit	1		Retained
Marine Unit	2		Retained
Command Vehicle	3		Retained
Ambulance	3		Retained

By consolidating the apparatus into a new fire station and one sub-station, the future cost savings to the Township will be considerable. The cost avoidance of replacing the retired apparatus is illustrated in the table below. The replacement cost is conservatively estimated, and of course, would multiply if the units were retained and replaced again in future years. Additional savings will be realized from future vehicle maintenance and repairs costs that will also be avoided.

Savings Based on Cost Avoidance	
Unit	Replacement Cost
Pumper	\$750,000
Pumper	\$750,000
Rescue	\$500,000
Tower Ladder	\$1,500,000
Total	\$3,500,000

Next Steps

The study team believes that there is a compelling case for Lawrence Township to construct a new Fire and EMS station. Local officials may use the following steps as an outline to address the next steps.

² Telesquirt 22 is registered to Lawrence Road Fire Company. All other apparatus are registered to the Township.

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Needs Assessment

Officials should determine based on the information provided in this report that a need exists for a new Fire and EMS station.

Selection of Architectural Firm

An architectural firm should be selected that has demonstrated experience in design and construction oversight of Fire and EMS facilities.

Programming Requirements

A detailed analysis and description of the programming requirements for the proposed facility should be developed by the selected architect.

Site Selection

The proposed site and any alternate sites should be fully evaluated including all environmental and land use approvals, and a decision made on final location selection for the proposed Fire and EMS station.

Construction Phases

The architectural firm should be engaged to provide services for the various phases of the construction project including: Design Development, Construction Documents, Bidding, Construction Administration and Post Construction.

Generating Community Support

Construction of a new Fire and EMS station represents an important addition to a community's emergency services infrastructure. Support, both internally to the fire and EMS agencies and externally, within the community is essential. Appropriate involvement by the internal stakeholders in various design and programming elements of the new facility will create a sense of ownership from those that will occupy the building. Similarly, including selected members of the community will provide the opportunity to better inform stakeholders and create a sense of ownership in the project among the broader community. Providing regular communication with all stakeholders throughout the project – through social media and other outlets – will be valuable in maintaining support by keeping the community informed.