An Analysis of the Operational Efficiencies of and the Feasibility of Consolidation, Merger, or Sharing of South Orange and Maplewood's Municipal Fire Protection Services

Township of South Orange Village, New Jersey

Township of Maplewood, New Jersey

October 2017

FINAL REPORT

Submitted by:

MANITOU INCORPORATED

www.manitouinc.com

F I N A L R E P O R T

Township of South Orange Village, NJ
Township of Maplewood, NJ

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Prepared for

Township of South Orange Village
Township of Maplewood

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2.0 Acknowledgments

We would like to thank the staff and elected officials who dedicated their time to supporting the study. An effort of this sort takes hours of research to identify records and spend time with the consultants.

We would like to thank those members of the Committee who oversaw the study for their guidance and support:

South Orange	Maplewood
Sheena Collum, President	Vic DeLuca, Mayor
Howard Leveson, Village Trustee	Frank McGehee, Township Committee
Barry Lewis, Administrator	Joseph Manning, Administrator

We would also like to recognize the Fire Chiefs of South Orange and Maplewood. South Orange Acting Chief Daniel Sullivan and Maplewood Fire Chief Michael Dingelstedt were very supportive of the study and they provided materials and answered questions enabling us to complete this study.

We spoke with numerous individuals over the course of the study. In addition to the dozens of firefighters and officers we spoke with, we would like to recognize the following individuals representing various organizations (affiliations current as of April 2017):

James Jennings, FMBA Local 40
Vinny Bobcheck, FMBA Local 240
Greg Giordano, FMBA Local 25
Joseph Burlew, EMS Operations Coordinator, REMCS
Robert Cimino, Chief, Maplewood Police Department
Tom Giordano and Stephen Zuchowski, Seton Hall University

Finally, and most importantly, we dedicate this report to the firefighters who faithfully deliver service through the South Orange and Maplewood Fire Departments. Their openness and concerns for the responsible delivery of service was very helpful.

While we made many recommendations, they should not detract from the overall positive dedication to serving the public, and impressive productivity of the members of both Departments.

Project Staff

Manitou, Inc. would like to acknowledge the staff who performed this analysis and contributed to the report.

Charles Jennings, PhD, FIFireE, CFO -- Project Manager
Robert McNally, MS -- Geographic Information System and Data Analyst
John Cochran, MIFireE – Analyst and Insurance Rating Analyst

3.0 Executive Summary

This study is the culmination of a one-year process initiated jointly by the elected leadership of two communities – the Townships of South Orange Village and neighboring Maplewood. The communities issued a request for proposals that resulted in the selection of Manitou, Inc., a nationally recognized management consulting firm specializing in fire and emergency services, to conduct a study of fire services in both communities.

The study, whose scope included site visits, interviews, analysis and collection of data, and thorough review of both Departments' operations. The goal of the study was to identify opportunities to improve services, increase efficiencies, and evaluate the feasibility of sharing or consolidating or merging services. The study sought to achieve these goals while: providing the highest quality of services to each Town; maintaining an appropriate level of personnel and equipment to respond to incidents in each community.

During our analysis, we found robust evidence that increased efficiency, better service, and cost savings are possible through a consolidation of the two separate fire departments into a single entity.

Our findings are clear – the communities of Maplewood and South Orange would be better served by combining their fire departments into a single entity.

Operationally, we present several options that will *enable savings in personnel*, and *increase the numbers of personnel and equipment responding* to alarms in both communities. The current fire stations serving the communities will remain in service, and both forces would fall under a common set of operational procedures and leadership, which will improve effectiveness and coordination.

Fire services are increasingly regulated, and administrative requirements are considerable. Achieving compliance in a small organization is very challenging. Economies in sharing resources and administration will save money and improve the quality of service to both communities.

The new fire services would be governed through an intermunicipal body. This builds on the history of successful shared services between South Orange and Maplewood.

These recommendations are based on our in-depth review of each fire department's administration and operational policies. Advancing the goal of an organizational merger will provide enhanced services and capabilities to *both* departments.

The study was structured to provide an independent review of each fire department, and a set of recommendations evaluating the feasibility of a merged or consolidated agency. As such we have three sets of recommendations, some of which are specific to a single department or assume that organizations remain separate. Other recommendations are directed toward the consolidation process and desired features of the resulting organization.

Major recommendations contained within the report include the following:

South Orange Fire Department

We made a number of recommendations to strengthen the SOFD, particularly with regard to administration. Many of these concerns are issues of limited resources, and have been exacerbated by a long period without a permanent Chief of Department. However, in light of our overriding recommendations for consolidation, we do not advocate any leadership changes in the near term.

Recommendation Number	Summary	Section Reference
SO-1	Review Civil Service job titles for Firefighter/EMT in light of current requirements	5.6, 5.17.1
SO-2	Administrative polices need to be comprehensively updated.	5.7
SO-3	Review the Department's operating budget. Current budget is small, and has not increased in several years.	5.9
SO-4	Develop a strategic plan for the Fire Department.	5.10
SO-5	Existing records are insufficient, fully utilize existing software for recording key information.	5.15
SO-6	Develop a formal health and safety program to include a fitness component using national standards as a guide.	5.18
SO-7	Consider hiring a part-time civilian administrative support position.	5.19
SO-8	Consider creating a dedicated code enforcement position.	5.25.5
SO-9	Develop a training program and track records accordingly to comply with State, insurance industry, and national standards.	5.26
SO-10	Consider developing criteria for limited emergency medical support role by the SOFD.	5.27
SO-11	Contract for dispatch services with a specialist fire dispatch provider.	5.28
SO-12	Begin formally recording actual response time information "on scene times."	8.2
SO-13	Consider staffing to assure two EMT-certified personnel on duty per shift.	8.3
SO-14	Dispose of spare apparatus stored at Crest Drive and under the railroad viaduct.	9.2

Maplewood Fire Department

Although we made a number of observations of the Maplewood Fire Department, many of them do not rise to the level of firm recommendations. The MFD has an administrative structure in place, supported by a small but competent staff, that achieves considerable results for the Town and its residents.

Recommendation Number	Summary	Section Reference
MA-1	Consider upgrading an on-duty firefighter position at headquarters to a company officer to provide direct unit-level supervision.	7.2

Consolidated Fire Service

The largest, and most far-reaching recommendations are found in Chapters 8 and 9, where we lay out steps necessary to further coordinate the operations of the SOFD and MFD, leading to a merger. In addition to the recommendations here, we outline a number of service delivery alternatives to achieve our high-level goals.

Recommendation Number	Summary	Section Reference
CO-1	Consider automatic joint response to “Signal 9” alarms (smoke in the building); high life hazard automatic alarms	8.1
CO-2	Recommend that both agencies merge into a single entity.	8.1
CO-3	Unify dispatch at REMCS	8.2
CO-4	Plan for coordinated upgrade to new interoperable radio system on Statewide channels.	8.2
CO-5	Both agencies should explore feasibility of adopting Red Alert software under a common license.	8.2
CO-6	Merge training programs	8.4
CO-7	Consolidation staffing options	9.2
CO-8	Further analyze shift staffing needs for backfill under a combined agency.	9.2

Additional recommendations are contained within the body of the report.

Lastly, we address the citizens of South Orange and Maplewood. We trust that you will treat this study, done in good faith, by a team of experts, objectively. We believe that the two

agencies will be stronger together, and that the improved services will be a benefit to both Towns. We also believe that a larger, merged agency can create better working conditions and professional opportunities for the firefighters and officers in both communities. Efforts to merge services are seldom easy, but your elected leadership has taken an important step by commissioning this report.

4.0. Scope and Overview

In Spring 2016, the Towns of South Orange Village and Maplewood, contiguous municipalities in Essex County, NJ, issued a Request for Proposals (RFP) entitled **An Analysis of the Operational Efficiencies of and the Feasibility of Consolidation, Merger or Sharing of South Orange and Maplewood's Municipal Fire Protection Services.**

The project was overseen by a joint Committee representing both Towns, and composed of the Chief Elected Official, Administrator, and a Council member. In late Summer 2016, Manitou, Inc. was selected after a competitive process which included a presentation and interview.

The RFP was very thorough, and will not be reproduced here. The major objectives of the study were as follows:

1. Improved effectiveness/response time
2. Increased efficiency
3. Improved productivity
4. Improved customer service
5. Enhanced or expanded services
6. Cost savings
7. Improved allocation and utilization of resources, including manpower, facilities, and equipment.
8. Cost avoidance(s)
9. Coordination and improved efficiencies in mutual aid
10. Standardization of services and programs
11. Improved and more effective training
12. Opportunities to improve ISO rating(s)
13. Additional funding sources, including future state and federal grant funding

These objectives were achieved through three major tasks.

A. **Assessments of Current Independent Operations**

Undertake and conduct assessments of the current independent operations of the South Orange and Maplewood Fire Departments, including operations, policies and regulations, personnel, equipment, and facilities.

B. **Analysis, Evaluation and Recommendations as to Opportunities for Improved Efficiencies through Merger, Consolidation or Sharing of Personnel, Equipment, Facilities, and/or Services**

Conduct an analysis and evaluation of current independent operations to identify opportunities for the Townships to meet or better meet or exceed any or all of the Objectives through merger, consolidation, or sharing of personnel, equipment, and/or services.

C. **Public Presentations of Results of Studies**

Upon completion and delivery of the Report and review by the Townships, the Townships intend to conduct a minimum of two public presentations to the residents to summarize and explain the process, the investigatory work behind the reports, and the analysis, recommendations and results of the study as set forth in the Report.

There was considerable detail under each task, including specific areas of concern, which are addressed in this report.

Overview of Methodology

Manitou, Inc. is a public safety and non-profit management consulting firm, located in the New York metropolitan area. Manitou, Inc. serves fire and emergency clients in local governments across North America. They also perform work for federal agencies in the emergency management and homeland security realms. Manitou Inc., incorporated in 1999, specializes in fire and emergency services deployment analysis using geographic information systems, and also conducts scholarly and applied policy research and evaluation in aspects of fire and emergency services. Manitou is an independent consulting firm providing advice and empirical analysis. Our Principal and the project staff have operational fire experience in addition to their academic, professional, and consulting expertise.

The project was initiated in Fall 2016 and utilized a management process applied in numerous previous studies. We began by acquiring background materials and data. Our plan included multiple site visits and interviews. We visited with fire chiefs, union officers, and on-duty crews at each station. We made our contact information available to any members who wished to speak with us and arranged phone interviews as needed. We also met with partner or supporting organizations as necessary and made observations, where possible, of daily operations.

We also made extensive use of incident reports, which were used to determine workloads, response times, where possible, and demand for service within the two Towns.

Limitation of the Study

This study did not assess legal compliance with regulations or practices in an operational setting, and relied upon interviews and review of Standard Operating procedures, where available, to review such issues from a managerial perspective. We did not directly assess operational performance.

Any statements concerning insurance industry requirements and impacts of potential changes on community ratings are made in our best professional judgment. However, the Insurance Services Office is the sole determiner of its grading schedule and its application.

5.0 South Orange

The Township of South Orange Village is located in south central Essex County, New Jersey, west of the City of Newark. It is primarily a suburban commuter community via rail and bus to New York City to the east (Figures 1 and 2).

Figure 1 South Orange Overview Area

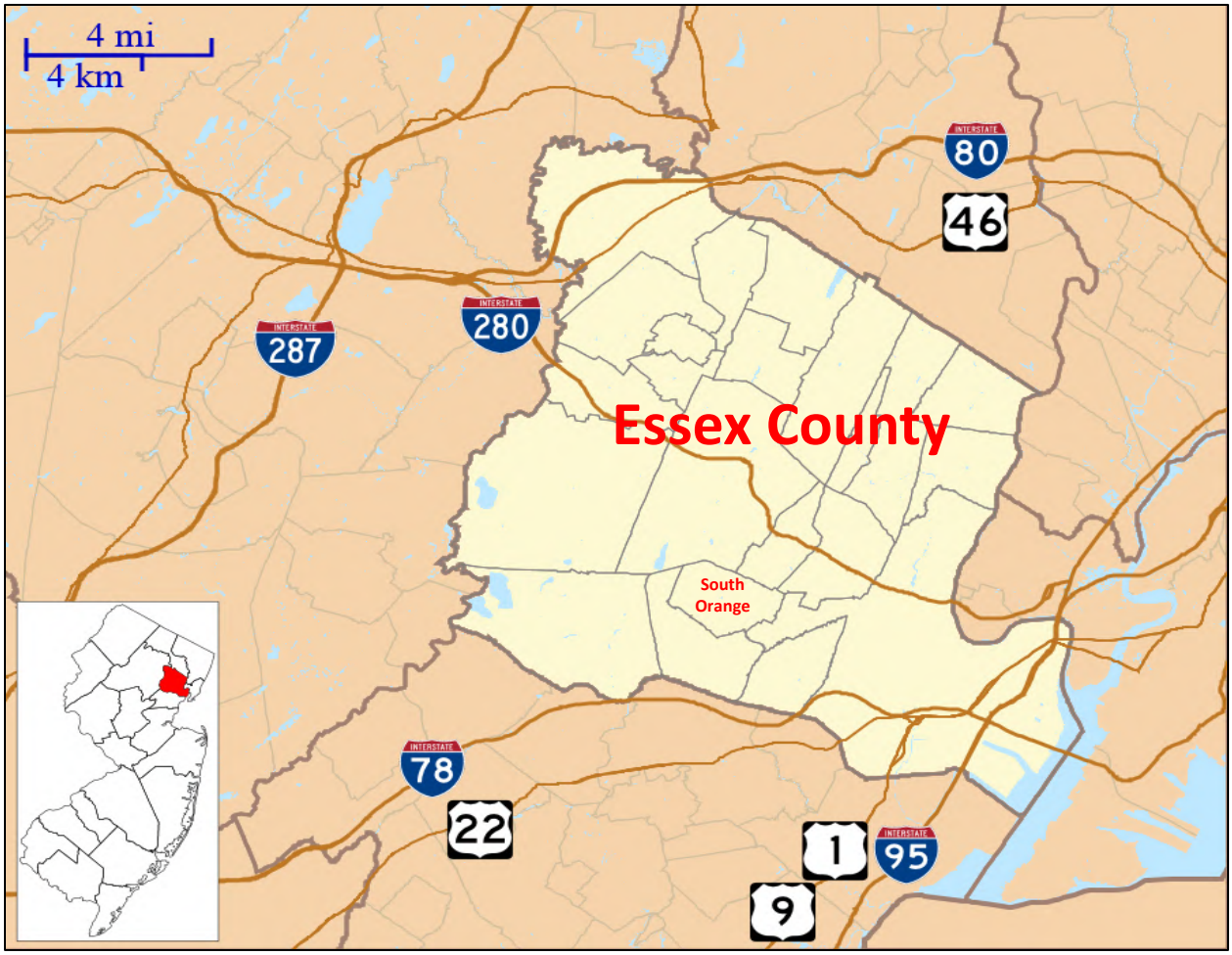
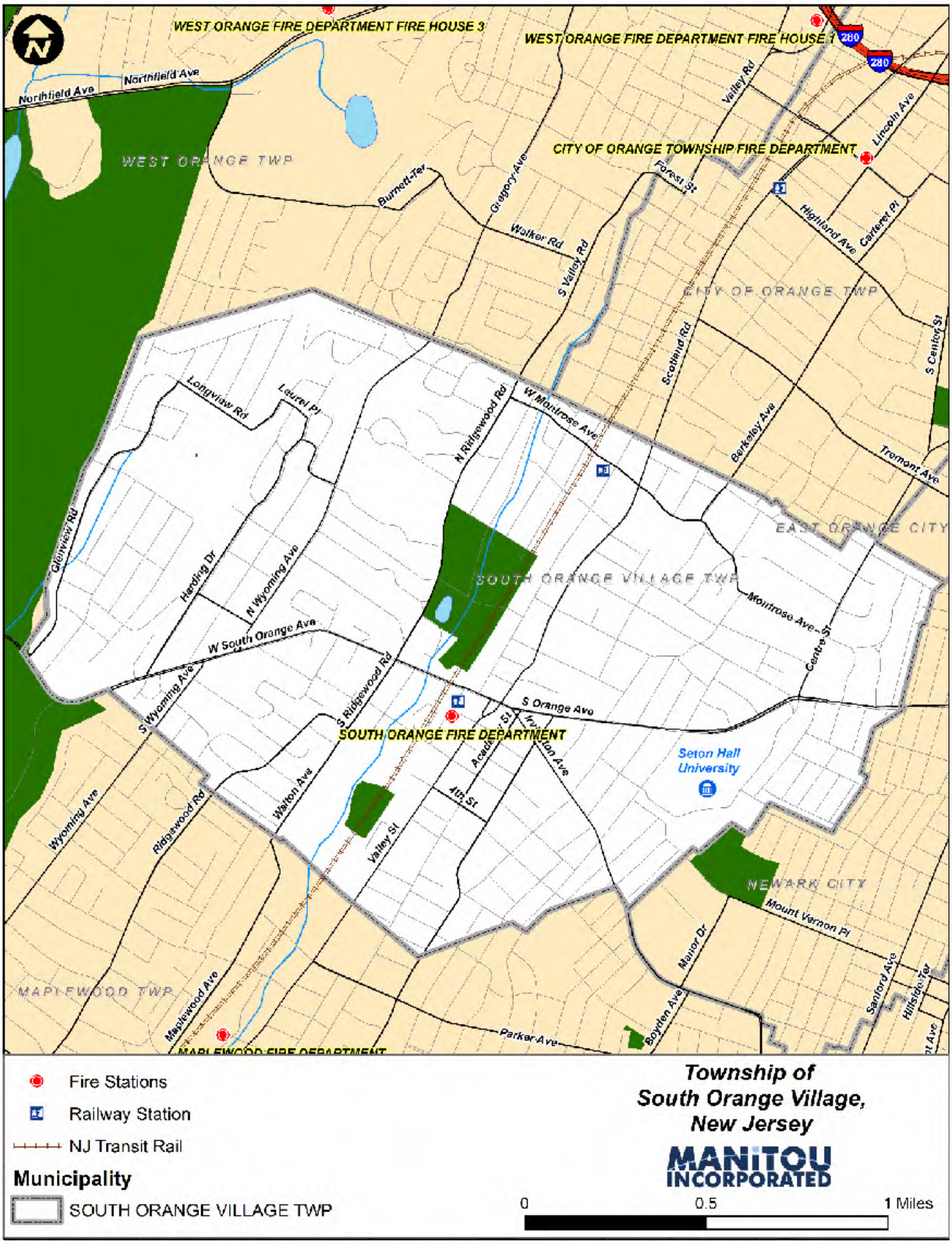


Figure 2 Township of South Orange



5.1 Community Overview

History: South Orange is considered a relatively wealthy and diverse community. The Village is part of a region of residential communities located in Essex County. The Village is known for its pre-war neighborhoods of Tudor, Colonial, and Victorian homes. The character of the community includes residential streets with old-style gaslights, spacious parks, and a business center. The Village was part of Newark until 1806, when it became part of the Orange Township. In 1836, the first rail line was created between the Village and the City of Orange. The advent of the railroad established the community as a suburb of Newark and a summer resort. In 1868, the community began its rapid transformation from a small settlement of farms and mills to an affluent railroad suburb of New York and Newark. In 1869, the New Jersey Legislature granted the South Orange Township a village charter. However, not until 1872 was it given authorization to levy taxes and borrow money. In November 1977, South Orange voters passed a new charter for the community and changed its name to The Township of South Orange Village. South Orange's full official name is the "Township of South Orange Village." This name was originally adopted in lieu of the Village of South Orange because it allowed South Orange to receive more federal aid that was directed to Townships during the 1970s. Many federal authorities were unfamiliar with the New Jersey municipal system, in which a township is not formally different from any other municipal designation.

Government: The Township's governing body is comprised of an elected Board of Trustees, consisting of six elected Trustees and an elected Village President, all seven of whom serve four-year terms without any remuneration. Three Trustees are elected biennially.

Population: At the time of the 2010 census the Township population was 16,191. Over the past 50 years the resident population has remained relatively stable (Table 1). The population has increased slightly since the 2010 census. In addition, Seton Hall University, located within the Village, has a student enrollment of 9,000. The university estimates approximately 80 percent of its freshman enrollment live in campus housing. The number of upper class and graduate students living on campus was not available. Potentially, the community can continue to expect an increase in population in the coming years due to new high-density housing near the Village train station. The new housing accommodates an increasing number of professional workers, from New York and adjacent metropolitan areas, seeking an affordable suburban life style while experiencing a relatively short daily commute.

Table 1 South Orange Population Trends 1970-2015

Census	Population	Percent
1960	16,175	6.2% †
1970	16,971	4.9%
1980	15,864	− 6.5%
1990	16,390	3.3%
2000	16,964	3.5%
2010	16,198	− 4.5%
2015 (Est.)	16,380	1.1%

* Data obtained from U.S. Census Bureau and State of New Jersey
† From previous census
Estimates do not include on campus student population of Seton Hall University

Demographics: The 2010 U.S. Census recorded 5,516 households and 3,756 families residing in the Village. The population density was 5,672.8 per square mile.

Housing and Income: The Village contained 5,815 housing units at an average density of 2,036.5 per square mile. The average household size was 2.70 and the average family size was 3.24. The median income for a household was $123,373, and the median income for a family was $147,532. The per capita income was $49,607. An estimated 7.8% of the population and 2.5% of families were below the poverty line, of which 3.4 % of those under the age of 18 and 4.5% of those 65 and older were living below the poverty line.

Physical Characteristics: The Village lies within Essex County, New Jersey and is landlocked by the neighboring municipalities of Newark, Maplewood, Orange, East Orange, and West Orange. The South Mountain Reservation also borders the Village's west side.

Area: There is a total area of 2.857 square miles, of which less than one percent is water, including the east branch of the Rahway River which runs through the community. There are approximately 48.76 miles of roadways, of which 42.88 miles are maintained by the municipality and the remaining 5.88 miles by Essex County.

Primary Thoroughfares: The Village is connected with neighboring communities by thoroughfares, including Irvington Avenue, which approaches the business center from the southeast where it converges with South Orange Avenue (County Route 510), just east of the intersection of the Scotland Avenue, and South Orange Avenue, which continues west through the center of the principle business district and onto the South Mountain Reservation, a nature reserve of the Essex County Park System. In addition to Scotland Avenue, the Village is crossed by Valley Street, Wyoming Avenue, Walton Avenue, and Centre Street. All appear to have adequate width and paving for efficient emergency response. Some regions of the community

experience on-street parking to a level that may hamper fire department emergency access to certain properties.

Rail Lines: The elevated Morristown line of the New Jersey Transit system travels north and south through the community, splitting the community at its center and adjacent to the core business district. The transit line offers daily commute to the nearby metropolitan centers of Newark and Jersey City, New Jersey, and New York City, New York. A rail overpass at Montrose Avenue and underpasses at Mead Street, South Orange Avenue, and 3rd Street allow for through passenger and commercial vehicles traffic; however, many of the passes were built prior to modern standards for the height clearance needed for modern vehicles.

Core Business Districts: The Village has two business districts, the South Orange Avenue Business Corridor and the Irvington Avenue Business Corridor. The latter is known as "the village center" with several upscale and mid-scale restaurants, cafes, and a variety of independent stores.

Neighborhoods: The Village is comprised of ten neighborhoods surrounding the principle business district. The neighborhoods of Academy Heights, South Mountain, and West Montrose surround the core business district with tree lined residential streets and single-family dwellings constructed during the early-to-mid decades of the previous century.

Parkland: There are abundant recreational facilities, most notably Meadowland Park located in the center of the community, which offers a natural fire break in the event of a major conflagration.

Development: Over 90 percent of the Village's land area is developed, with the exception of designated open parklands. The community consists of a mixture of residential and commercial properties, most of which date to pre-World War II eras. The community supports a robust principal business district, churches and civic institutions, schools, public buildings and grounds, and numerous neighborhoods of mostly single-family dwellings.

Commerce and Industry: According to City Data, the most prominent industries and businesses are professional, scientific and technical services (16%), educational services (10%), finance and insurance (10%), and health care (8%). The remaining 13 percent include foods services, publishing, and public administration.

Climate: The South Orange region has a subtropical climate with an average of 48 inches of rain per year, as compared to the US average of 39 inches. The number of days with any measurable precipitation is 81. On average, there are 205 sunny days per year. The July high is around 86 degrees and the January low is 22. The moderately humid climate reduces the severity of wildfires; however, the region can occasionally experience dry conditions resulting in moderate to severe wildfire risks. Average annual snowfall is 26 inches. During winter months, the community experiences periods where the fire department is delayed due to heavy snowfall or

ice, which often hampers emergency response. This has particularly been the case in high density areas with narrow streets and on-street parking.

Fire Risks: The threat of fire is primarily structural urban and suburban, with the center core of the Village and Seton Hall University containing most of the properties with the highest risks. Much of the high-risk properties were constructed during the decades prior to and just after the Second World War, when building and fire codes were not as comprehensive and construction methods and materials were less fire resistive. Over the years, the community has experienced significant fire incidents in high-risk properties.

Construction: Given the community's high rate of affluence, risk to the developed environment is moderate to low due to the upkeep and condition of most structures. Much of the principle business district is comprised of interconnected, older, 1 to 3 story structures of ordinary type brick and joist construction. Within the district, these structures are primarily located along South Orange Avenue between Prospect Street and North Ridgewood Road, and along Valley Street and Rockland Road. Given their age and condition, method of construction and density, these structures generally pose a higher fire risk, especially those that can easily spread fire to adjoining buildings. In some cases, these structures have been retrofitted with automatic fire sprinklers and other built-in fire and life safety systems, which greatly reduce the level of risk. Other structures that pose greater risk include multi-story structures that dot the community, such as office and apartment buildings. In recent years, the community has seen a number of high density, multi-story residential developments built near the rail station in the Village center. Modern codes have required many of these structures to be equipped with automatic fire sprinkler systems, which greatly reduce the spread of fire while automatically sounding the alarm and alerting the fire department. The remaining majority of the community is comprised of smaller structures of the frame construction type, including apartment houses and dwellings, many of which were built of older construction methods. As in most communities, fires in residential dwellings contribute to the vast majority of annual fire losses.

Occupancy: The Village is comprised of the typical assortment of occupancies including single family dwellings and multi-residential, high-density and highway commercial, light industry, restaurants, auditoriums, and other forms of assembly, middle, elementary, and private schools, and several religious and institutional facilities. Seton Hall University poses a significant risk due to the complexity of classroom, residential, administrative, and ancillary facilities.

Transportation: With a network of through highway and rail transportation systems, the Village is also exposed to the transport of hazardous materials which pose a potential fire, explosion, and hazardous material release risk.

Wildland: Another less obvious fire risk is exposure to adjacent, undeveloped open lands that at times pose a heightened threat of brush and wildfires. Section 5.4.10 of the Essex County 2015 All-Hazard Mitigation Plan describes the severity of the County's wildfire threat, including potential impact to South Orange. The plan states that historically the County has a low fuel

hazard and low fire risk, with the greatest threat being during the period of March through May. The summer and fall months can be equally severe, depending on rainfall amounts and other conditions. It further states the western and southern portions of the County, where there are tracts of undeveloped and preserved land, are more susceptible to the threat of wildfire. It is important to note that some of these areas border the South Orange neighborhood of Newstead. The following table (Table 2) is an excerpt from the plan which illustrates the approximate area of wildfire fuel hazard, ranking zones of the Village in comparison to the County at large.

Table 2 South Orange & Essex County area within wildfire fuel Hazard Ranking Zones

	Total Area (Square Miles)	Low to Moderate Fuel	% of area in the Hazard Area	High to Extreme Fuel	% of area in the Hazard Area
South Orange	3	0.39	13.6%	0.02	0.6%
Essex County	130	38.76	29.9%	2.05	1.6%

Ref. Essex County 2015 All-Hazard Mitigation Plan

A review of the wildfire threat is relevant to an assessment of the department. The increasing severity and frequency of hotter, dryer weather in the region exposes much of the western edge of the Village to the possibility of urban interface fires. These fires, with sufficient resources, could evolve into group fires consuming multiple dwellings and other structures, resulting in a potential threat to life, the community's infrastructure, and economic stability.

Topography: The western section of the Village sits on the eastern slope of South Mountain (elevation 660 feet), leveling into a small valley near the Village Center district. At the top of the slope, the western edge of the Village runs along the eastern border of South Mountain Reservation. Varying elevations within the valley include areas of gradual hills amongst expanses of relatively flat areas. The area of greatest concern regarding fire risks and fire department access is mainly in the western section of the Village, bordering South Mountain, where streets are steep, causing slower response to these areas during inclement winter weather.

The Village's water system should have sufficient water mains and fire hydrants, with adequate flow and pressures, allocated throughout the community to enable the fire department to quickly suppress serious fires within structures. Table 3 indicates that, at the time of the 2014

ISO survey, there were certain target areas of the community tested by ISO representatives that fell below estimated fire flow needs.

Table 3 2014 ISO Hydrant flow summary

Test #	Test Location	GPM * @ 20 PSI †	
		Needed	Avail.
1.0	South Orange E. of Ward Place	1750	1600
2.0	Prospect between Irvington and S. Orange	2500	10000
3.0	Valley and Arnold Terrace	1750	3100
4.0	3rd and Mews lane	1000	4500
5.0	Thorden West of Walton	2250	4000
6.0	South Orange and Wyoming Avenue	2500	1900
6.1	South Orange and Wyoming Avenue	750	1900
7.0	Glenview and Brentwood	1750	4300
7.1	Glenview and Brentwood	750	4300
8.0	Mead West of railroad bridge	3000	2000
9.0	Scotland and Montrose	2250	2100
9.3	Scotland and Montrose	750	2100

* gallons per minute
† pressure per square inch

It is beyond the scope of this report to more clearly determine the fire flow capabilities of the Village water system. Without further information, it can only be assumed most of the system is gridded with sufficiently sized mains that provide adequate flows and pressures from fire hydrants that match the flow needs of adjoining properties and associated fire risks.

5.2 Future Development

The Vision 2008-09 plan discusses the Village's foreseen evolution and directed growth over the next decade or two. The smart growth initiatives are focused primarily on the train station area, South Orange Avenue, and Irvington Avenue corridors. Pedestrian friendly streetscapes, encouragement of bicycling, and traffic calming or median divides with picturesque foliage is suggested to enhance the aesthetics of these areas.

Figure 1 Old South Orange Village Hall

There are virtually no areas within the village where new street corridors or widening of thoroughfares is possible. Infill development pressure, especially within distance of the train station, is driven by the express service to New York City.

Traffic calming devices and medians, though visually pleasing and functional, can impede the response of fire apparatus. This can be seen notably at the small traffic circle outside the fire station.

Regional Community Fire Risk: The Township's zoning code describes the allowable property development within subareas of the jurisdiction. While individual properties may vary (e.g. schools, libraries, post offices), these codes correspond with the risk that differing development poses to the community. For instance, industrial facilities can contain hazardous materials and also employ a number of people within the community. A loss due to fire can have a more significant impact upon the community as a whole than the loss of a single-family residence. While a house fire is no less tragic to the homeowner, it has a lower impact upon the community, unless it spreads to adjacent structures.

Another example is the "Town Center" type of Zoning. These zones contain some of the oldest structures with the greatest exposure factor (attached) because the area includes many mixed use or mercantile structures with upper level residential. Many consider these areas high risk due to the structure age, inferior building and fire protection systems, attached exposure, life loss potential, fire frequency, along with the cultural/heritage factor.

Using reclassifying zoning data obtained from the townships, the following table (Table 4) details the level of risk to the overall community based upon potential use of property.

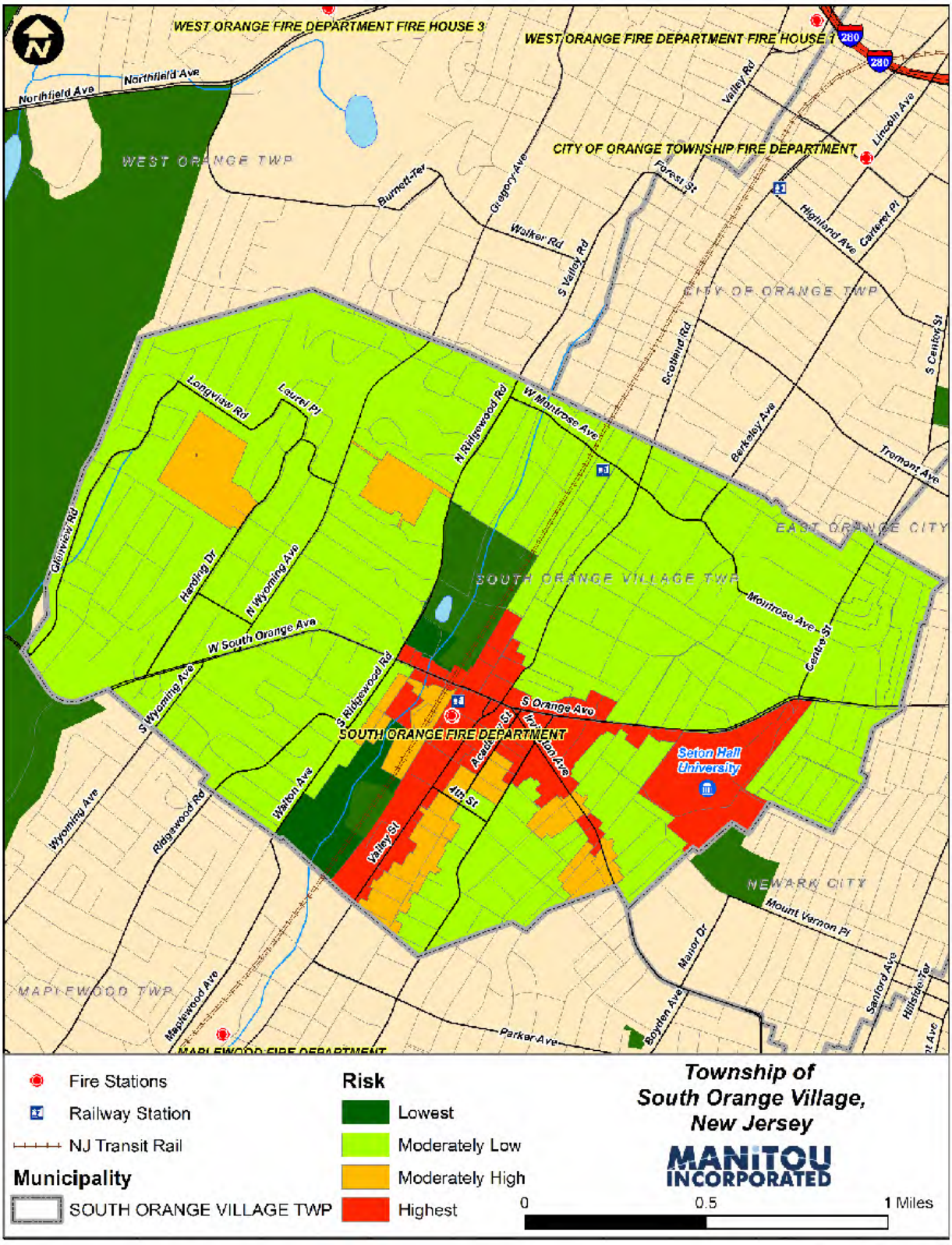
Table 4 Zoning Risk

SOV Zoning Types	Zone Name	Risk
CB-1	Commercial	Highest
CB-2	Commercial	Highest
B-3	General Business	Highest
CS-R3B	Mews High Rise Residential	Highest
RC-1	Multifamily / Office District	Highest
B-1	Primary Business	Highest
B-2	Secondary Business	Highest
RSC-1	Senior Citizen Housing	Highest
RSC-2	Senior Citizen Housing	Highest
SPECIAL DIST. A	University Dormitories	Highest
U	University Offices & Classrooms	Highest
CS-R22	Mixed Use	Moderately High
PRBC	Planned Residential Development	Moderately High
PRCA	Planned Residential Development	Moderately High
PRD	Planned Residential Development	Moderately High
R-TH	Townhomes	Moderately High
RB	Two Family	Moderately High
RA-100	Residential Min 100 x 175	Moderately Lower
RA-50	Residential Min 50 x 90	Moderately Lower
RA-60	Residential Min 60 x 110	Moderately Lower
RA-75	Residential Min 75 x 100	Moderately Lower
OS/PU	Open Space/ Public Use	Lowest

Note: There were several facility exceptions to the identified zoning designations, including schools and other aprtment buildings that are of higher risk than ranked by Zoning. These have been identified by markers on the following map.

The following map (Figure 4) portrays the general fire risk classification based upon the zoning ordinances in the study region. Note the exceptions and the school locations. It is important to point out that all the fire stations are located within areas of higher risk. This is advantageous for both communities.

Figure 2 Community Risk Map



The village has several historic and notable sites such as the old village hall, the fire station, the performing arts center, and the Baird Community Center, to name a few. There is one designated historic district, the Montrose Neighborhood, on the northeast side of the village.

In 2004, the Smart Growth Strategic Plan for the village proposed open space plans, traffic calming devices, and redevelopment by the train station. It also suggested several other neighborhoods that may be eligible for historic district designation. In the same year, the Valley Street Study reviewed suggested redevelopment and rehabilitation to the area. This study suggested the relocation of the rescue squad and construction of a multi-story parking garage in its place, along with a 215-unit residential rental complex. These projects have been completed as of the time of this study.

Earlier in 2003, the River Corridor Study suggested several ways to beautify and enhance the use of the East Branch of the Rahway River, which runs southward through the town near the train line through Floods Hill Park, Cameron Fields, and Waterlands Park.

5.3 Service area population and demographics

The following table (Table 5) details brief demographics and community development regarding the community.

Table 5 Parameter South Orange

Parameter	South Orange
Area in Square miles	2.87
Resident Population[1]	16,290
Transient/Commuters[2]	-12.9%
Median age	37.2
White Population	60.2%
Black & Ethnic	29.8%
Hispanic	6.1%
Occupied Housing	71%
Rental Housing	29%
Vacant	5.1%
Built Development[3]	100%
-Residential	90%
-Commercial	10%
-Open/Undeveloped	0

[1] US Census Bureau 2014 Estimates from 2014 American Community Survey 5 year
[2] US Census Bureau Commuter-Adjusted Daytime Population: Places 06-10 ACS 5Yr.
[3] Estimates from Town representatives

It is important to note that Seton Hall University students who live on campus would, according to the US Census bureau, be counted within the residential census; however, commuter students who live outside of South Orange or Maplewood would not be counted. Seton Hall has a total enrollment of over 10,000 students, according to its website (shu.edu/about), including students enrolled at the law school in Newark. There are six residence halls with 2,350 beds, estimated to accommodate 50% of the undergraduate population (5,800 undergrads).

Because of the built-up environment, population growth is expected to be slow and stable. Preservation of open space and neighborhood character limits the development of large scale residential or commercial properties. Scattered high density buildings are planned and under construction. The proximity to rail transit is an attractive option for maintaining population levels.

5.4 Department History and Overview

History: The South Orange Fire Department (SOFD) was organized in 1891 after a fire destroyed the Mountain House, a health spa and resort. Since its organization, the department evolved from a volunteer force to a combination paid-driver and volunteer force. Over several decades, with the attrition of volunteer firefighters, the department gradually converted to the current all-career force. During the 1950-60s, fourteen auxiliary firefighters provided support during major fires and served to assist in the event of a nuclear attack on any of the state's major metropolitan areas. Auxiliary services were gradually phased out by the late 1980s. By 1980, the department had a full-time force of forty-two, including a senior command and a staff force consisting of the fire chief, two deputy chiefs, and one captain serving as the fire marshal. The remaining four captains, four lieutenants, and thirty firefighters were divided into four platoons and worked forty-two hours a week. Sometime during the twentieth century, the force was reduced to the current staffing levels of eight members per platoon.

Organization: Currently, the department is under the direction of the South Orange Department of Public Safety and is comprised of 32 officers and members, divided among four platoon groups, under the command of the Chief of Department. There are eight personnel assigned to each of the four platoons or groups. Each platoon consists of a deputy fire chief, one captain, and 4-6 firefighters depending on granted leave time. On-duty personnel operate two frontline pumpers, one aerial ladder truck, a rescue truck, and a command vehicle. In 2016 the Village appropriated $4,022,000 for departmental salaries, wages, and operating costs. Currently, Deputy Fire Chief Daniel Sullivan serves as the interim Chief of Department.

Services: The department is a traditional organization providing emergency response to fires, auto entrapment, other physical rescues, and various emergency and nonemergency incidents. In addition to fire and rescue services, the department responds to various special incidents such as non-fire hazardous conditions or spills. Non-emergency services include fire prevention and mitigation programs and various forms of public assistance. Emergency medical response is not a primary form of service provided by the department.

The South Orange Fire Department was organized in 1891 after a fire destroyed the Mountain House, a health spa and resort that was located near Glenside Road and Ridgewood Road. Initially, the fire department was housed in the old Village Hall on South Orange Avenue. The first equipment was hand drawn reels and a hand drawn Hook and Ladder. A few years later the Village purchased a horse and hose wagon and hired a driver. The Department was partly motorized in 1914 with the purchase of a motor Hook and Ladder. In 1924 a combination pumper, hose and chemical engine of 750 gallons was put in service and in 1926 a second unit of this type was purchased. In 1929 a 500-gallon booster tank was purchased to take the place of the Hook and Ladder purchased in 1914[4].

Figure 3 Original South Orange Fire Station on S. Orange Avenue

5.5 Service Delivery Infrastructure

Staffing: Platoon staffing consists of one deputy fire chief, one Captain, and six firefighters for a total of eight budgeted positions with a five-person minimum staffing policy. Regular absences are due to vacation, sick leave, and other forms of leave. The officer positions are constantly staffed by either regularly assigned personnel, acting officers from the platoon's lower ranks or, in some cases, by paying overtime to off-duty officers.

Assignments: From its sole station, the department staffs one command vehicle, two pumpers, one aerial ladder truck, and one medium duty rescue truck. The Fire Chief, whose work is generally conducted during normal business hours, is also assigned a staff vehicle for response to major emergencies.

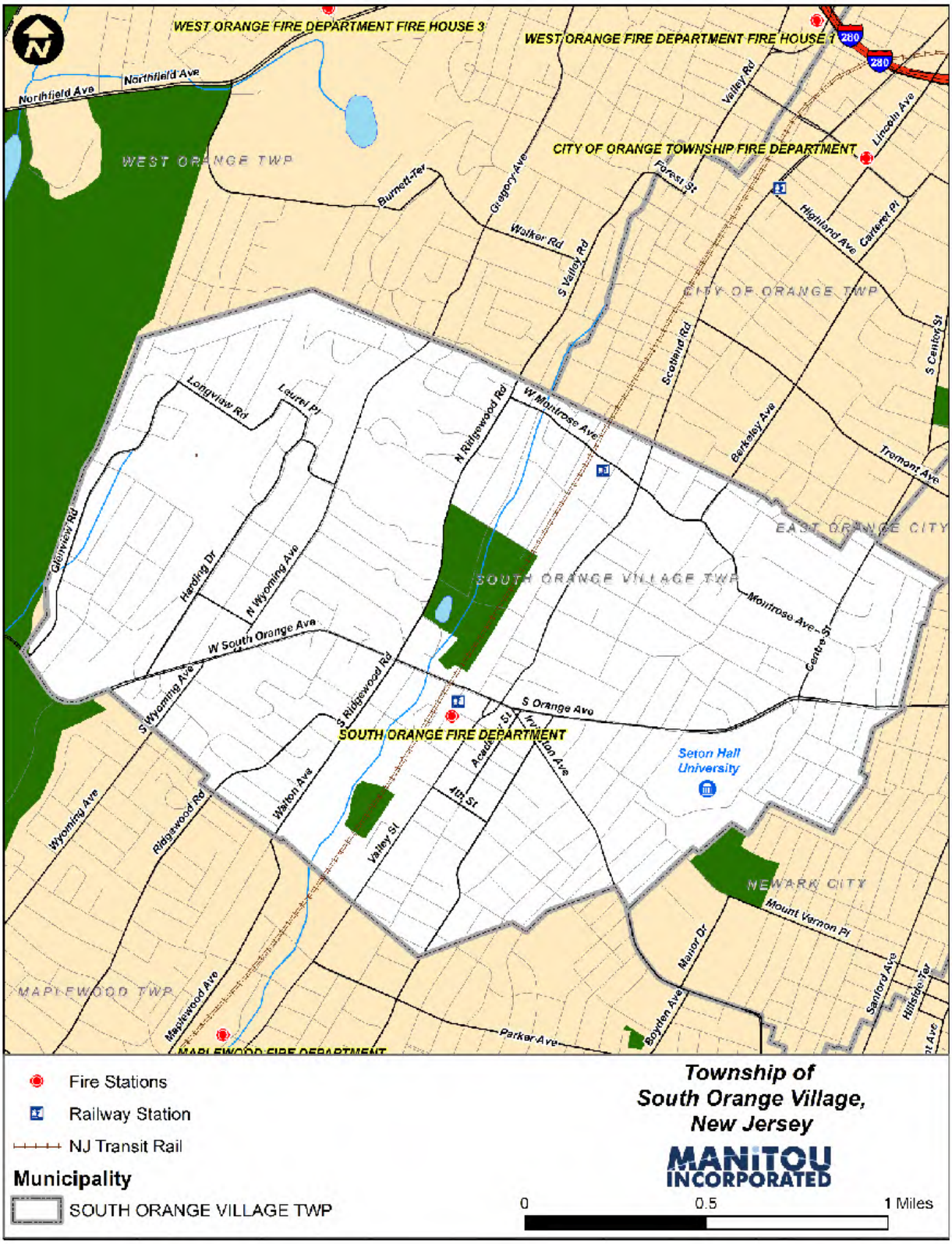
The fire department moved to its current landmark[5] fire station in 1930, after construction that began in 1925 was completed. It operates an Engine, Ladder, and the deputy chief apparatus. A rescue truck is reserved and staffed by truck personnel if needed. The fire station was renovated in 2002 after asbestos was found within. There is another fire station on Crest Drive

[4] South Orange Public Library
[5] 1998 National Register of Historic Places

that is used to house out of service apparatus and is staffed when snow makes travel west on South Orange Avenue difficult. The department provides fire suppression, inspections, and public fire education services. Currently, all of the line staff are career firefighters.

Considerations: The current minimum on-duty staffing of one deputy fire chief, one captain, and three firefighters is considerably below the recommended initial assignment for a reported structure fire or similar "multi-unit" response. Adequate staffing is critical during the first moments of the fire unit's arrival at a working structure fire or other serious incident. Without an automatic response by off-duty personnel, paid-call, volunteer firefighters, or nearby mutual-aid units, critical firefighting duties that must be conducted simultaneously are delayed, which could lead to potential negative consequences to both occupants and firefighters. The Village could upgrade the current mutual-aid arrangements to automatic-aid. This could reduce the response times for neighboring fire units arriving on the scene of a serious fire or similar emergency, especially when SOFD staffing is below seven.

Figure 4 Service Area Map



5.6 Governance

Enabling Legislation: The department is officially established as the South Orange Fire Force within the Department of Public Safety (DPS), under the provisions of ordinance 88-31 of the Village code. The department is organized into three operations consisting of a police force, fire force, and civil defense. Under the provisions of the DPS, the authorized structure of the fire force consists of the ranks of fire chief, deputy fire chief, captains, lieutenants, firefighter emergency medical technician, and firefighter, whose numbers shall be established by the Village Board of Trustees. The board is also responsible for the adoption of policies and regulations of the department.

Lines of Authority: The regulations provide a clear line of authority for the Village administrator and fire chief regarding the administration and management of the department. The fire chief is responsible for the efficient operation of the department in accordance with the policies established by the Village Board. Specific duties include administration and enforcement of policies and regulations, overseeing the functions of the fire force, prescribing, and where applicable, delegating to subordinates the duties and assignments of all personnel, and reporting to the Village administrator on the operations and activities of the fire force for the previous month.

Department Regulations: Rules and regulations provided for review were approved and implemented by the Village's Public Safety Committee and Chief of Department in January 1964. A review of the regulations revealed little or no relevance to the Department's current organization. No revisions or amendments to the regulations were provided. In addition, we were provided with various general order and standard operating procedures, with the most recent policy being issued in 2002. Policies address a variety of subjects including those related to administration, personal conduct, and use of equipment. In addition to the rules and regulations, nine general orders, three standard operating guidelines, and three standard operating procedures were provided for review.

Considerations: The governance of the department, in the creation of the agency and its lines of authority given to the Village administrator and fire chief, appears to be clear. Since the adoption of the enabling ordinance almost 30 years ago, the department has been reorganized due to budgetary and other circumstances. The agency no longer refers to itself as a fire force nor does the department, in addition to the fire chief, have staff position deputy chiefs who rotate after hour responses. Instead, only the fire chief's position works staff duty with deputy fire chiefs being assigned to platoon duty. Furthermore, the department no longer retains the rank of lieutenant since the position was eliminated during the previous reorganization. Also, consideration may be given to elimination of the rank of firefighter/EMT due to lack of any requirement or opportunity for this position, along with compensation, whether voluntary or not. Ordinances should be revised to reflect current budgeted positions.

The fire department is established under Article VII, Subsection 5.52-54 of Chapter 5, Administration of Government of the Township Ordinances. The Fire Chief answers to the Village Administrator. The Chief oversees four platoons that comprise, at minimum staffing, of a deputy chief, a captain, and four firefighters. Currently, one of the platoon's deputy chief is acting fire chief.

5.7 Foundational Policies

Ordinance 88-31: As referenced within the previous section, the department was established through the enactment of Ordinance 88-31. The most recent revision of the ordinance was in 1988. It establishes the agency, lines of authority, functions of fire protection, and organization. The primary functions include:

- Provide fire-fighting service to control, fight, and extinguish conflagrations which occur within the Village and such other service as may be necessary to protect life and property in the Village from the threat of fire.
- Investigate the cause, circumstances and origin of fires and report to the Village police and to the County Prosecutor every case of suspicion of arson.
- Inspect and test any automatic or other fire alarm system or fire-extinguishing equipment.
- Be authorized to enter upon, without fee or hindrance, all premises, grounds, structures, buildings, and passages wherever necessary in the performance of its duties.

The ordinance also authorizes the formation of volunteer fire companies who may be organized and managed independently, but shall serve under the supervision of the fire chief while on the scene of fires and other fire department responses.

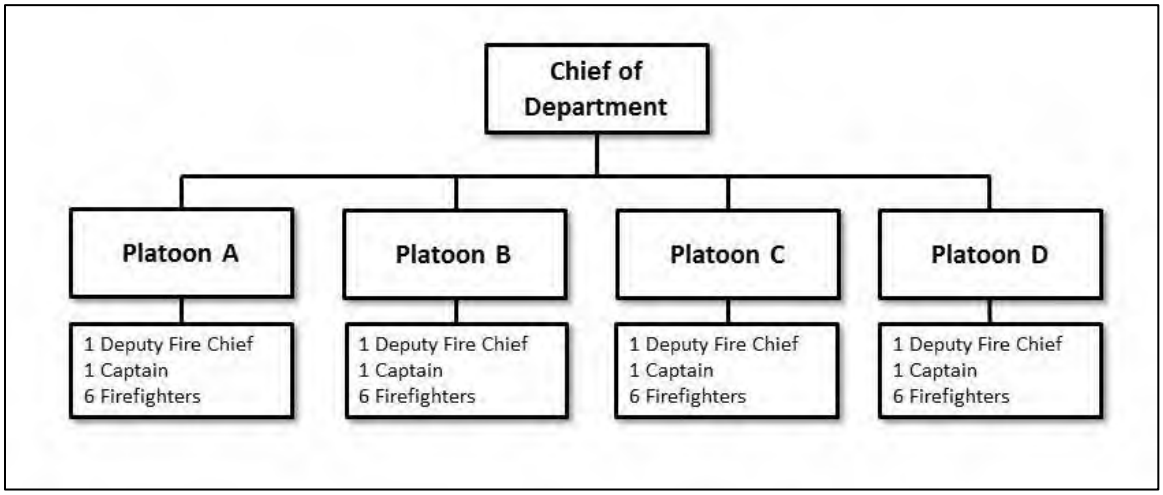
Considerations: The ordinance appears to be adequate, comprehensive, and reflective of the current scope of programs and services the department provides. It is interesting to note the provisions of a volunteer force considering their services were phased out many years ago. However, during any future revisions of the ordinance, special consideration should be given to the elimination of this provision in the event that in the future the Village deems a volunteer force necessary to supplement the limited on-duty career staff.

The Department needs a complete overhaul and expansion of administrative policies and operational procedures. It is recommended the fire chief, in conjunction with senior officers, develop new and complete policies and procedures that are, at a minimum, comprehensive in the areas of administration, personnel conduct, operations, training, and other relevant subjects.

5.8 Organizational design

The department organization consists of functional process commonly used by paramilitary organizations. The chart below (Figure 7) illustrates the Department's organization which consists of 33 authorized uniformed positions. These include the fire chief, who normally is assigned to a 40-hour workweek in line with other Village administrators, with the remaining 32 members divided evenly amongst four 24-hour platoon groups. The chief's position is currently vacant with Deputy Fire Chief Sullivan serving as temporary chief, in addition to his regular duties serving in that capacity. Each platoon is comprised of eight members, consisting of a deputy fire chief, a captain, and six firefighters. The minimum staffing is six members in the event any of the eight are absent due to vacation, illness, injury, or other forms of leave. Currently, more than one platoon position has been vacant due to extended leave for administrative reasons, thus creating a challenge to maintain adequate budgeted staffing levels while minimizing excessive overtime expenditures.

Figure 5 South Orange Fire Department Organization Chart



Considerations: The workload on a single person fulfilling the role of a shift chief and Chief of Department is unsustainable in the long term.

5.9 Budget and Finance

The department's annual budget is prepared in conjunction with the Village administrator and chief financial officer and approved by the Village President and Board of Trustees. A review of the budget was limited to related documents accessible on the Village website, which allowed for a brief, completed review of the 2015 and 2016 budget.

Annual Budget: As can be seen in Table 7, the department budget for the two years represents roughly 11 percent of the total Village's annual budget. This percentage does not appear to be out of line with fire protection appropriations for a municipality the size of South Orange Village.

Table 6 SOFD Operating Budget 2011-2016

Fiscal Year	Village	Fire Dept. *	Percent of Municipal Budget
2016	34,787,305.87	4,022,000.00	11.05
2015	33,662,107.00	3,822,000.00	11.35

* Includes Salaries and wages, operating costs and fire hydrant rental

Figure 6 SOFD Operating Budget 2011-2016

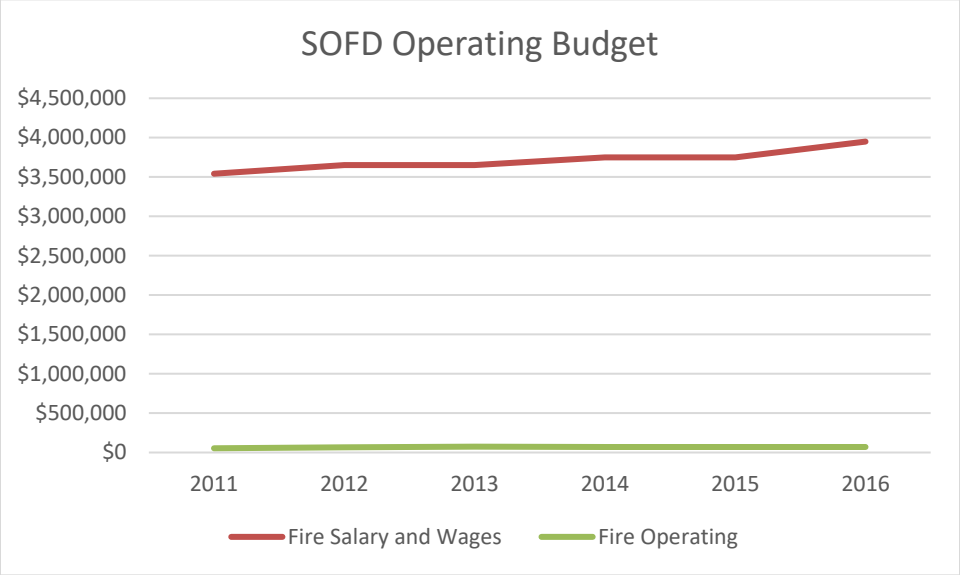


Figure 8 shows the SOFD operating budget from 2011-2016. As would be expected, salaries increased annually. Table 8, below, illustrates the department's budget for the years 2014-16. The table may not indicate total annual expenditures such as the Village's matching contributions to employee pensions, capital improvements and overruns due to minimum staffing overtime, and other unanticipated expenses. Salaries and wages were gradually increased in part, it is assumed, due to labor agreement annual cost of living increases. Operating costs remained static at $72,000 for the three years.

Table 7 Fire Department Annual Budget

Fiscal Year	Salaries & Wages	Operating
2016	3,950,000.00	72,000.00
2015	3,750,000.00	72,000.00
2014	3,650,000.00	72,000.00

The largest revenue stream for the SOFD is from Fire Code Fees. These are collected under authority of the New Jersey Fire Code.

Table 8 SOFD Fire Code Enforcement Revenue

	2011	2012	2013	2014	2015	2016
Fire Code Fees	32693	23098	17535	17500	19000	20751

Capital Expenditures: There is no capital plan for the Department. Major purchases are planned for on an ad hoc basis. No further analysis was made due to limited budget information.

Annual Salaries and Overtime Costs: No analysis was made due to limited budget information.

Considerations: At a minimum, the department's annual operating budget should be increased to keep up with inflation. Costs for material, repair, and utilities increase most years due to national inflation. The current budget is very small, although it does not capture all expenditures related to the Department.

5.10 Mission, vision, strategic planning, goals, and objectives

The department does not have any formal mission or vision statement, strategic or long-range plan, or stated goals or objectives in place.

Considerations: As a stand-alone agency and in conjunction with the Village Board of Directors, the department should have a strategic plan in place. The planning process can foster improvements in the department's culture, thus providing a clearer understanding of its purpose and role within the community while assuring accountability and measurement of program and service effectiveness to its members and the public.

5.11 Internal assessment of critical issues

At present, the SOFD appears to be operating with a near-term focus. There does not appear to be a consensus on critical issues facing the Department. We did not identify or assess any documents that provided insight into this area.

5.12 Internal assessment of future challenges

Interviews with senior officers and members revealed a number of ongoing challenges, including staffing and the ability to adequately provide programs and services; these issues stem from limited funding. A complete review of internal assessment of future challenges could not be completed due to insufficient documents and records.

5.13 Internal and external communications processes

It appears the Department utilizes conventional communication processes, including press releases to local media and outreach through community events and organizations. The

Department also has an active Facebook page with roughly 130 followers. This is an important resource.

5.14 Document control and security

Key personnel documents are held under lock and key in the Chief's Office. There is no control structure or process in place to systematically manage versions of documents, such as department orders or policies.

5.15 Reporting and Recordkeeping

The department incorporates both written and electronic recordkeeping. Much of the department's administration and management reports are paper-based, with fire incident reporting being recorded through the use of the Emergency Software Products (ESP) software system. The department does not access any form of computer-based dispatch system. In some cases, officers have developed a personal records system using electronic spreadsheets.

Reporting and recordkeeping consists of written and electronically scanned documents and data entry through commercial off the shelf software, Emergency Software Products (ESP) developed by Enforsys©. The department utilizes the program primarily for incident reporting and certain administrative related records. The program has also been used to record training and related records since January 2017. Additionally, the Village's enterprise software system is used for the management of payroll and certain personnel records. During interviews with staff it was indicated some records are managed independently by individual officers, either by rudimentary paper records or spreadsheets developed electronically.

Records: Records, including personnel, inventory, training, fire prevention, and other administrative records, are maintained either through paper forms or a software system.

Reports: Fire incident reports are recorded through the ESP records management system. Officers indicated that response and other incident times were estimates recorded on paper and later transferred to the system.

Considerations: The Department should expand the use of the ESP records management system to include the reporting and filing of the following:

- Fire incident reporting
- Personnel records
- Training records
- Vehicle records
- Inventory records
- Personnel scheduling and tracking

5.16 Information Technology Systems

See section 5.15

5.17 Human Resources

A review of personnel and human resource related policies could not be completed due to a lack of documents and records.

5.17.1 Position Descriptions

All uniformed members of the department are appointed and promoted through the civil service laws of the state of New Jersey. As part of its duty to administer entry-level and promotional tests, the New Jersey Civil Service Commission develops descriptions for state and local positions for municipalities that fall within the spectrum of the civil service system. The following (Table 10) provides excerpts from the State Commission's website of position descriptions for the four ranks within the department and the designation of fire official.

Table 9 Civil Service Position Descriptions

Firefighter	*Age*: not less than 18 or more than 35 years of age.
Description: During an assigned tour of duty, extinguishes fires; performs rescue operations; aids in emergency situations involving hazardous or toxic materials; administers emergency medical treatment; maintains all related equipment, buildings and grounds; does related work. *Education*: Graduation from high school, vocational high school, or possession of an approved high school equivalency certificate. *License/Certification*: Appointees must complete a firefighting training program approved by the New Jersey Department of Community Affairs, Division of Fire Safety, within the timeframe specified by the Appointing Authority. Appointees are not permitted to participate in firefighting activities prior to completion of this training.	
Captain	*Age*: Not less than 18 or more than 35 years of age.
Description: Under direction, has charge of a fire department company intended to assist in the extinguishing of fires; does other related duties. *Education:* Graduation from high school, vocational high school, or possession of an approved high school equivalency certificate. *License/Certification*: Appointees will be required to possess a driver's license valid in New Jersey only if the operation of a vehicle, rather than employee mobility, is necessary to perform essential duties of the position.	
Deputy Fire Chief	*Age:* Not less than 18 or more than 35 years of age.
Description: Under direction of the Fire Chief, assists in the management and discipline of the fire department designed to provide fire protection for persons and property; does other related duties as required. *Education:* Graduation from high school, vocational high school, or possession of an approved high school equivalency certificate. *License/Certification:* Must possess a valid Incident Management Level 1 certification issued by the New Jersey Division of Fire Safety, Department of Community Affairs.	
Fire Chief	*Age:* Not less than 18 or more than 35 years of age.
Description: Under direction of a designated member of the local governing body, has charge of the fire department. Manages all fire department operations to ensure their timely, thorough, and cost-effective preparation conduct; does related work. *Education*: cities or other jurisdictions with a population of over 30,000 residents: Fives (5) years of experience, three (3) years of which were in supervision of fire ground suppression activities and two (2) years of which must include managerial experience such as budget preparation and policy or procedure development. For all other jurisdictions: Five (5) years of supervisory experience involving the extinguishing of fires. *License/Certification*: Appointees will be required to possess a driver's license valid in New Jersey only if the operation of a vehicle, rather than employee mobility, is necessary to perform the essential duties of the position.	
Fire Official	*Age:* Not less than 18 years of age.
Description – Under direction administers and directs the enforcement of provisions of relevant fire safety codes and related regulations, establishes day-to-day operating routines of the code enforcement agency, coordinates and supervises activities of any fire safety specialists or other staff employed by the agency, and responds to fire alarms and participates in extinguishing fires; does related work as required. *Education:* Graduation from high school, vocational high school, or possession of an approved high school equivalency certificate. *License/Certification:* Possession of a current and valid fire official certificate issued by the New Jersey Department of Community Affairs. Appointees will be required to possess a driver's license valid in New Jersey only if the operation of a vehicle, rather than employee mobility, is necessary to perform the essential duties of the position.	

As noted on the commission's website, the detailed examples of work found in each description are for illustrative purposes only. The commission recognizes the fact that local conditions cause variances in the duties and responsibilities of the various ranks within a fire department. An example is a department that requires members to be licensed EMT's because it provides transport ambulance service, as opposed to a department, such as South Orange, that does not require EMT or higher emergency medical licensing. The commission takes into account these variances by stating, "A particular position using this title may not perform all duties listed in this job specification. Conversely, all duties performed on the job may not be listed."

Considerations: While remaining under the regulation of state civil service, the uniformed members of the department are afforded position descriptions that are relevant, comprehensive and are relatively up to date. Using verbiage provided by the civil service commission as a baseline, the Village should periodically conduct a thorough review of each position to ensure there are no additional duties and responsibilities that should be added to each description as referenced by the commission's website.

5.17.2 Salary and Compensation Programs

A review of salary, wages and related compensations could not be completed due to a lack of documents or records.

5.17.3 Bargaining Agreements

The Town recognizes the Firefighters Mutual Benevolent Association as the bargaining agent for the Fire Department. There are two bargaining units within the agency; one for firefighters (FMBA Local 40) and Captains, and another for Deputy Chiefs (FMBA Local 240). The agreement with Firefighters and Captains is in effect through December 31, 2017.

5.17.4 Appointment and Promotional Policies

Uniformed members of the department are appointed and promoted through the New Jersey civil service laws and regulations. A review of the Village policies and local civil service practices could not be completed due to a lack of documents or records.

5.18 Health, Wealth, and Safety Programs

The department provides a limited firefighter specific health or wellness program that consists of pre-appointment examinations, including baselining of preexisting conditions, annual physical examinations, and an individual wellness program for each member. The department does provide fitness equipment at the fire station for members' use during duty hours. In addition, as an employment benefit, members are offered access to private fitness centers.

Considerations: It is vital for the department to ensure all members are in optimal health and fitness. This is of the upmost importance due to the physical demands of firefighting operations, which are performed while wearing heavy gear and equipment in very hazardous conditions. Annually in the U.S., the number one cause for firefighter deaths during the performance of their duties is attributed to heart related ailments and related conditions. In view of the Village's current financial conditions, it may not be realistic for the department to adopt all of the national firefighter health and safety guidelines and best practices. However, grants are available through the U.S. Fire Administration's Assistance to Firefighters Grants (AFG) grant program. In the meantime, as part a future strategic planning process, members of the department would be well served if the department referenced the following guidelines pertaining to health, wellness, and safety initiatives.

NFPA 1500: Standard on Fire Department Occupational Safety and Health Program

NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments

NFPA 1583: Standard on Health-Related Fitness Programs for Fire Department Members

5.19 Administration and Staff Support

Administrative Staff: The fire chief serves as the only fulltime administrative staff for the department. In addition to their normal duties, on-duty deputy chiefs provide some level of administrative support to the fire chief on an as-needed basis. Prior to the 1990s, the department had only one deputy fire chief position that served as second in command and shared administrative duties with the chief. In later years, the position was abolished and the former platoon positions of captain and lieutenant were upgraded to deputy fire chief and captain, respectively.

Support Staff: There are no fulltime or part-time support staff. On-duty deputy chiefs or their designee serve as support staff.

Considerations: The department should have, at a minimum, one part-time civilian support staff to assist the fire chief in overseeing the various administrative tasks needed for an agency of 32 members. The position is warranted, at least at the part-time level, given the magnitude of recordkeeping expected of a modern fire department, including payroll, roster, personnel records, invoicing, and other administrative work. In addition, the position can be justified due to the need to manage fire incident reporting and maintain fire prevention related records. The presence of support personnel during business hours can increase the departments effectiveness by ensuring staffed business hours; someone would always be present to assist the public regarding administrative matters.

5.20 Emergency Response

The department is prepared and equipped to handle most anticipated fire and other emergencies within the Village. Firefighting operations remain the primary focus of the department's resources with an emphasis on structural fire protection. Staffing plays a vital role in the ability of the department to effectively and efficiently respond to emergencies (Table 11). Without an effective response force, an unacceptable number of fires may escalate, causing greater damage. The call back of off-duty personnel and outside mutual aid from neighboring departments is built into the department's response practices in the event of a complex or major emergency, inclement weather, or simultaneous incidents. The department's existing on-duty response force is two officers and four to six firefighters.

Table 10 Current SOFD Staffing Configuration

APPARATUS/VEHICLE	Position/Rank		
	Deputy Fire Chief	Captain	Firefighter
8 personnel on duty – maximum on duty			
Command 8-2	1		
Engine 8-4*			
Engine 8-5		1	3
Ladder 8-1			3
Rescue 8-8			
7 personnel on duty			
Command 8-2	1		
Engine 8-4*			
Engine 8-5		1	3
Ladder 8-1			2
Rescue 8-8			
6 personnel on duty			
Command 8-2	1		
Engine 8-4*			
Engine 8-5		1	2
Ladder 8-1			2
Rescue 8-8			
5 personnel on duty – minimum on duty			
Command 8-2	1		
Engine 8-4*			
Engine 8-5		1	1
Ladder 8-1			2
Rescue 8-8			

* Engine 8-4 and Rescue 8-8 are cross staffed by on-duty personnel assigned to Engine 8-5 and/or ladder 8-1. Engine 8-4 is used primarily as an out of town mutual aid engine.

Suppression: Response to fire and related emergencies, such as explosions, reflect industry protocols. The ISO and NFPA both recommend that, at a minimum, two engines, a ladder truck or equivalent, and a chief officer should respond to perform the initial assignment of all reported fires within, on, or adjacent to structures. Normally, the department responds to most reported structure fires with at least three units, consisting of Car 8-2, one engine (Engine 8-5 or 8-4) and Ladder 8-1 (Table 12). If, upon arrival, the first arriving unit reports a working fire, a Signal 11 is transmitted. At that time, the East Orange Fire Department dispatch center, which serves as the Essex County Fire Mutual Aid Dispatch Center, dispatches two additional engine companies from nearby mutual aid communities.

The department has provisions for emergency callback of off-duty personnel through various means, primarily through direct telephone calls. In recent years, the number of personnel living outside the region has made the use of off-duty personnel during major emergencies difficult.

Table 11 Emergency Response Levels (Unit Response)

	Chief	Eng.	Lad.	Res.	Other
Structure Fire – Initial	1	1-2	1-2	—	—
Structure Fire – Signal 11		2			
EMS	—	—	—	—	—
Rescue	1	1	1	1	

Automatic and mutual aid assistance is provided through a county-wide system. Unless special called, the Essex County Fire Coordinator, through the use of the County Fire Dispatch Center and other dispatch centers, will request additional resources to any department within the system. In addition, the coordinator provides on-scene assistance upon the request of the South Orange fire chief or deputy chief in command of a major fire or emergency.

Incident Management: The department utilizes the incident command system within the parameters of the County mutual aid plan. The system incorporates elements of nationally recognized fire service incident command principles.

Emergency Medical Services: The department does not formally provide any direct or indirect form of emergency medical assistance to the public. The nonprofit South Orange Volunteer Rescue Squad, whose station is located adjacent to fire headquarters on Sloan Street, serves as a primary provider of services for the Village. Backup is provided by the MONOC, a private for-profit company, or an ambulance from the Maplewood Fire Department. In previous years, some members of the department were trained and licensed as emergency medical technicians (EMT); the Village had anticipated that the department would expand its services to include emergency medical response. However, the plan never came to fruition and over time many of these members have allowed their licenses to lapse. At a minimum, as part of basic firefighting certification, all members of the department are trained as first responders, the level of training

just below that of EMT. Occasionally, members will be called upon to provide assistance to members of the public needing immediate medical attention while awaiting the arrival of nearby emergency medical personnel. Members often assist in medical care as part of their duties at vehicle accidents, including those where patients are entrapped in hazardous conditions and must be stabilized prior to extrication and similar conditions.

Rescue: The department has in service Rescue 8-8, a full service rescue truck equipped to handle most types of rescue work, the most common being auto accidents requiring victim extrication. Other forms of rescue work include industrial accidents, stuck elevators, and special or technical operations including confined space entrapment, elevated rail road and other high angle conditions, and water related rescues. Rescue 8-8 serves as an auxiliary apparatus and is cross staffed by on-duty personnel and only taken when needed.

Special Operations/Emergency Management: Special operations include response to hazardous material spills and releases, and localized or regional natural or manmade emergencies or events. Hazardous material incidents fall within a tiered response system consisting of awareness, operations, and technician. Other responses may be of an emergency nature such as planning and participating in large-scale public events. Much of the departments' preparation and response to declared large-scale incidents fall under the policies and procedures of the Village and/or County emergency response plans.

Considerations: Given the challenge of a limited on-duty force, the department does a reasonably efficient job of providing emergency response services. Onsite observations revealed a department that is resourceful in quickly organizing and deploying firefighters and equipment to fires and emergencies, with the on-duty force being able to cope with responses on most days. This may be due to the Village's current low frequency of incidents requiring a large response force. However, if not for an organized and dependable network of nearby mutual-aid departments, the department would be greatly handicapped when confronted with fires and other emergencies requiring a greater initial response force performing multiple and simultaneous tasks.

5.21 Staff Scheduling Methodology

The scheduling of platoon personnel appears to be in line with regional practices. A complete review could not be conducted due to insufficient information from supporting documentation, such as labor agreements and associated policies.

5.22 Succession Planning

The department does not have a formal succession plan in place. To some extent, this is understandable given the size of the agency and the slow turnover of senior officers. Chief Sullivan has been appointed acting fire chief while retaining his normally duties as platoon chief. This has created a strain on his time due to working a 24-hour tour of duty every fourth

day while conducting internal and external department administrative duties for the remainder of the workweek. Some weeks this can result in as much as a 56-72 hour workweek. Under these conditions, it becomes difficult for a senior manager to maintain a high degree of focus on administrative issues, such as succession planning. To some extent, state civil service regulations define succession of the lower ranks of the department via open competition examinations of qualified candidates.

Considerations: Given the current situation of the vacant fire chief position and a litany of managerial issues facing the senior officers, in conjunction with potential consolidation, it is not recommended there be any formal action taken regarding the development of a formal leadership succession plan. This is not to downplay the need for such a plan. However, it would serve the department better to use valuable time and resources to focus on further enhancing the effectiveness and efficiency of the department with regard to programs and services

5.23 Facilities

Fire Headquarters: Constructed in 1926, the three-story fire headquarters is located at the junction of First and Slone Streets in the center of the Village. Since its opening, the gothic and Tudor inspired station with its imposing tower and trademark weathervane has been regarded as an architectural gem as well as symbol of the Village's cultural and civic pride. Its proximity to the Village Center, primary thoroughfares, and the majority of developed properties, offers an ideal location for quick response to much of the Village. The facility is reflective of a time when the complexities and methods of service were much different than modern methods and standards. Beginning in 2002, the facility was closed for a period of years in order to remove asbestos while modernizing living quarters and improving safety and health features. The first floor consists of the original center three apparatus bays, flanked on both sides with shorter single bays, one of which was later expanded to two bay doors to accommodate additional apparatus. In addition to the apparatus bays, the first floor contains offices, restrooms, storage spaces, and a shop. The second floor is comprised mainly of offices and living quarters, including a combination dayroom and dining area, kitchen, sleeping quarters, locker room, and adjoining lavatory and shower. The combination dayroom/dining area also serves as a classroom. Separate sleeping quarters and lavatories are provided for chief officers assigned to platoon duty. A third floor is primarily used for firefighter fitness and storage. Originally, the ornate tower that gives the station much of its character was designed to serve as means to dry fire hose; a method that many departments now deem obsolete. The station also includes a basement that originally housed a heating plant and storage space. The station also serves as the location of Village government's computer servers.

Auxiliary Station 2: The facility located on Crest Drive is considered an auxiliary station by fire headquarters and is used primarily to store surplus apparatus and equipment. It is also used by a private ambulance service to house a two-member crew which serves the region and is utilized as a backup to the South Orange Rescue Squad. The station was originally built, in part,

to serve as a civil defense facility for the Village. During the winter months, when ice and snow make access to the hilly areas on and around West South Orange Avenue difficult, the station houses additional personnel and an Engine. The station is single story with one wide apparatus bay and adjacent living quarters for a crew of four to six personnel. Living amenities are sparse and for the most part appear to be dated. The location of the station, at the end of a dead-end street, sometimes causes increased response times. The stations remoteness requires emergency vehicles to meander approximately three quarters of a mile through a residential neighborhood before accessing the major thoroughfare of West South Orange Avenue. At the time of our assessment, the apparatus bays were used to store a trailer and a surplus ladder truck that is rendered inoperable due to mechanical issues. Because of this, the private ambulance is permanently parked on the station's front bay during all types of weather conditions.

Considerations: Despite its age, the 90-year-old fire headquarters is reasonably functional from a modern point of view. The recent renovation took advantage of the opportunity to incorporate upgrades, including diesel exhaust systems, protective clothing storage, washer-extractor with dryer, hose storage and drying, improvements in interior layout, finish and features, updated electrical and plumbing, and similar amenities. Based on interviews and onsite observations, the station appears to function fairly well. Several of the members interviewed stated they enjoy working in the facility, in spite of some shortfalls in the quality of some materials and features incorporated as part of the renovation. It is beyond the scope of this report to provide a detailed analysis of how the facility compares to the modern fire station design standards. Instead, certain key features will be highlighted for consideration. Key functionality shortfalls observed include substandard bay door width and height which limits versatility, including the type and size of modern apparatus that can be purchased by the department. Related to this is the shallow depth and ceiling height of apparatus bays which makes maneuvering and servicing apparatus difficult and less safe. Ladder 8-1, the aerial ladder apparatus currently in use, is an example of how these deficiencies impact the function of the department. The apparatus had to be special ordered, at an increased cost, due to the limited height of bay doors. A further challenge is the cramped quarters it and adjacent engine apparatus must share. Another functional issue is the location of sleeping quarters on the second floor; this is could be seen as a hazard to firefighters, particularly during after-hours when they are required to quickly access the first floor by stairs or pole (these are no longer used). Other notable challenges include a lack of adequate sleeping and bathroom facilities for female firefighters, and cramped street configuration around the station.

Station 2, though not located in the most accessible site, serves sufficiently as an auxiliary station during inclement weather. However, the station should be better maintained to ensure the apparatus bay is immediately available to house a frontline apparatus. Living quarters could be improved and better maintained for use by department personnel and the private ambulance crew being housed at the facility.

5.24 Apparatus/Vehicles

Pumper/Engines: Based on ISO's optimal fire flow of 2250 gpm, response distance criteria, and method of operation, the department should have two pumpers in service. The two pumper trucks in service are Engines 8-4 and 8-5. Both have adequate two-stage 1,500-gpm pumps and 500-gallon booster tanks. Each engine is equipped for structural service as specified in the guidelines of the NFPA and ISO. Engine 8-4, the older of the two pumpers, is generally used for in-town and mutual-aid incidents; Engine 8-5 remains in the Village at all times. Both apparatus are in good condition. Engine 8-4 was placed in service in 2005 and has served as a front-line apparatus for approximately 50 percent of the industry standard of 15-20 years. The conditions of both engines are good.

Ladder Trucks: The number of ladder trucks that should be in service is based on the criteria that built-up areas of the community, with at least five structures of three or more stories in height, should be within 2.5 road miles of an aerial apparatus. Based on this criterion, the Village should have in service at least one aerial ladder truck. The current aerial ladder truck was placed in service in 2013 and is equipped with a 100-foot ladder, a full complement of ground ladders, and assorted tools and equipment typical of a full-service city ladder truck. The apparatus is not equipped with a pump, water tank, or hose. The apparatus has been in service for less than five years and should serve the Village into the foreseeable future. The truck's condition is good.

Rescue Trucks: There is a rescue truck in service that is provided with assorted vehicle extrication and technical rescue equipment. The apparatus is not regularly staffed and serves as an auxiliary vehicle on an as need basis. Its condition is good.

Ambulances: No ambulances are included in the inventory. The department does not provide transport emergency medical services. Service is provided by the South Orange Rescue Squad.

Brush Trucks: There are no brush-type apparatus.

Command/Staff Vehicles: Command and staff personnel are provided with SUV-type vehicles. There are a sufficient number to ensure the on-duty deputy chief is provided with an appropriate vehicle in the event the regularly assigned vehicle is out of service due to servicing or repair. The vehicles conditions are good.

Reserve Apparatus: There should be at least one pumper and one ladder truck in service. Engine 8-5 serves as a de facto reserve engine. However, there is no serviceable reserve ladder apparatus. The department has within its inventory an antiquated pumper and aerial ladder truck; however, both apparatus are well-beyond their service life, not roadworthy, and therefore not considered usable reserve apparatus.

Ancillary: In addition to motorized apparatus and vehicles, the department also utilizes small trailers and other equipment for special services.

Table 12 Apparatus Staffing, Location and Equipment

Company/ Unit	Location	Members on duty †	APPARATUS		SPECIFICATIONS		
			Make and Type	Placed in Service	Pump Capacity	Tank Capacity	Aerial Device
Lad. 8-1	Headquarters - 52 Sloan Street	3	Ferrara	2013	—	—	100 ft.
Com. 8-2	Headquarters	1		2008	—	—	—
Eng. 8-4	Headquarters	*	Seagrave	2005	1,500-gpm	500	—
Eng. 8-5	Headquarters	2	Crimson	2009	1,500-gpm	500	—
Res. 8-8	Headquarters	*	Rescue One	2005	—	—	—

* Cross staffed with Engine 8-5
† Maximum on-duty staffing - 8, minimum - 6

Breathing Apparatus: There should be a sufficient number of breathing apparatus in service for use in interior firefighting and other operations where protection from harmful gases is required. Generally, each pumper should be equipped with a minimum of four breathing apparatus, with the same number of reserve bottles. Aerial ladder trucks should have six apparatus and reserve bottles.

Maintenance and Servicing: In order to maintain a constant state of readiness, all apparatus and accompanying equipment should be inspected daily, weekly, and at any other time deemed necessary. Based on onsite observations and interviews with chief officers and other personnel, there is a concerted effort to inspect and conduct preventive maintenance of all apparatus, vehicles, and equipment. Members commented on the increasing complexity of apparatus and constant need for upkeep. All apparatus appears to be in good order and condition. There were no records reviewed during the study.

Annual Pump Test: Apparatus pumps should be tested annually and the results properly recorded, in accordance with the criteria as set forth by NFPA Standard 1911. There were no records available for review.

Annual Aerial and Ground Ladder Test: All ground ladders on pumpers and aerial ladder trucks should be tested annually and the results recorded, in accordance with NFPA Standards 1914 and 1932. There were no records available for review.

Annual Hose Test: All attack and supply hoses should be tested annually and the results recorded, in accordance with NFPA Standard 1962. There were no records available for review.

Considerations: All frontline apparatus and vehicles are in good condition and adequately equipped. Apparatus, particularly aerial ladder trucks, must be specified to meet cramped bay door, weight limits, and stall depths of the fire station. In some cases, this increases the complexity of specifications and subsequent cost and manufacturing time. Engines, aerial and

ground ladders, hoses, and breathing apparatus should be tested annually, preferably by an independent third party and the results properly recorded. The department should have, in reserve status, at least one pumper that is maintained to ensure its use while front-line apparatus are out of service due to servicing or repair, and in the event of major or simultaneous emergencies.

5.25 Fire Prevention

Fire prevention programs and services are included in code enforcement by the fire and building departments and other municipal agencies, where applicable. Assessed services include the fire department's role in the review process for permitting of new or revised construction, inspection of existing structures, fire safety education, and similar duties. Fire prevention and mitigation services are an integral part to the Village's assessment under ISO's Public Protection Classification, under the category of community risk reduction. The category considers a community's fire code enforcement, fire safety education and fire scene investigation in terms of legislation, the number of personnel assigned to prevention duties based on the size and complexity of the community, their training and qualifications, and delivery of programs and services.

Legislation: Local and state enabling legislation exists for the enforcement of relevant building and fire code ordinances and regulations. The New Jersey Uniform Fire Safety Act authorizes the municipality to enforce state and local legislation through the creation of a bureau of fire prevention within the fire department. The Village code authorizes the fire chief to enforce the New Jersey Uniform Fire Safety Act, along with the codes and regulations adopted under it, in all buildings, structures and premises within the established boundaries of the Village, except for owner-occupied single family and two-family dwellings. The title of fire official is given to the member assigned as the overseer of fire prevention related duties, as is the custom within the state of New Jersey.

Staffing: Currently, no member of the department is assigned fulltime as the Village fire official. Instead, duties are shared between the interim fire chief and the other deputy chiefs while on duty. Chief Officers and certain other members retain certification in fire inspection under state regulations.

Fire Official: State law authorizes local municipalities to enforce local and state fire codes and standards. Ultimately, the fire chief serves in this capacity, with larger fire agencies delegating these duties to a member with the title of fire official, fire marshal, fire inspector or similar nomenclature. The fire chief serves as the fire official for the Village; however, other officers often serve in this capacity when they are delegated fire inspection and related code enforcement duties.

5.25.1 Annual Inspections and Code Enforcement

There is no concerted approach to the inspection of properties. Much of the inspection services is reactionary, with each deputy chief working independently, to some degree, on an as need basis. There appears to be some correlation and coordination between the fire department and the Village building department.

5.25.2 New Construction Inspection and Involvement

Officers of the department work closely with other Village code officials during pre-construction reviews.

5.25.3 Fire and Life-Safety Public Education

Typically, fire safety education programs are developed and delivered by on-duty personnel and are considered an integral part of their daily duties. Education programs consist of the delivery of media messages, onsite visits to secondary schools and other high-risk targeted audiences, and special messages related to certain seasons of the year, such as home fire safety during the winter months.

5.25.4 Fire Investigation

Generally, the department's role in fire scene investigation is limited to scene preservation and support, with the primary duties resting with the South Orange Police Department. Depending on the nature and complexity of the investigation, the police department may request the Essex County Prosecutor or New Jersey State Fire Marshal's office assist in investigations. Some department members maintain investigation certification but generally do not play a major role other than scene preservation and initial investigation.

5.25.5 Statistical Collection and Analysis

Review of fire prevention related statistical collection and analysis appears to be limited only to records entry by each inspector.

Considerations: In spite of limited staffing, the department manages to deliver a sizable level of fire prevention activities. Interviews with members indicate the department strives to perform these duties in the most efficient way. Due to a lack of fulltime focus, members are challenged to maintain a comprehensive approach that includes setting goals and objectives with priorities, consistency, and accountability. The community would be best served if the Village creates a fulltime fire official position. However, under current budgetary circumstances, this seems unlikely. An alternative would be, if warranted under existing labor agreements, to reassign a qualified and able member currently assigned to platoon duty. If the position is utilized in the

most effective way, its contribution to the safety of Village residents could far outweigh the loss of one member of the on-duty force. This could occur through a proactive approach to preventing and mitigating fire losses. Records should be secure and maintained through a modern records management system that is comprehensive and mirrors industry practices.

5.25.6 Seton Hall University

Seton Hall University, founded in 1856, is located in the Township. With a combined enrollment of over 10,000 students, the University is a major force in the Township and a well-known attraction for the area. Originally serving the local region, and dominated by commuter students, the University is pursuing a policy of developing more housing opportunities. Some 2,350 students reside on campus and many others live in South Orange. The campus also hosts athletic events at several facilities, which draw significant crowds to campus. Following a serious fire at Boland Hall in January 2000, the University made many improvements to fire safety and procedures. The Town and University report that they enjoy an excellent relationship.

Seton Hall University has a Department of Public Safety and Security that oversees the fire safety program on campus. This office inspects and maintains fire protection systems, provides education to the campus community and dormitory residents, conducts fire drills, and responds to all emergencies in a support role. Although the Public Safety Department maintains a 7-digit phone number for reporting on-campus incidents, the policy is that the campus community should report emergencies directly to 9-1-1 in the event of a fire or life-threatening emergency.

Fire safety is also aided through establishment of the Fire Awareness Safety Team (FAST). The FAST is a cadre of trained personnel on campus who serve as fire safety representatives for their facilities. The goal is to have “two or more FAST representatives in each administrative, service, and academic facility to ensure coverage during working hours each work day.” Residence Life staff are trained to act as Fire Safety Representatives in dormitories. FAST members receive training in fire prevention, extinguisher use, evacuation procedures, and fire causes, among other topics. Training is delivered by the Department and the SOFD.

The Department also houses the University’s Emergency Manager and is responsible for planning and preparing for all hazards that face the campus, including natural and man-made hazards. The University also maintains an alerting system for on-campus events known as PirateAlert. These alert notifications can be delivered via cellular phone calls, text messages, e-mail, and landline telephones.

All dormitories are sprinklered (including two off-campus dorms), and of the campus’ 37 structures, half are currently sprinklered. Sprinkler systems are being installed, by policy, when buildings undergo renovation. All structures are equipped with smoke detection and alarm systems that are monitored at all times.

Emergency calls coming to 9-1-1 go directly to the South Orange Police Public Safety Answering Point. The South Orange Police dispatch alerts the SOFD; the police also respond to calls. The South Orange police notify Public safety staff of such events so they can respond immediately. In the event that such an incident is reported to the campus public safety number, it is answered at a proprietary alarm monitoring facility operated by the University. Off-campus premises report alarms both to the campus facility and a separate private alarm monitoring service. The University's proprietary alarm center has telephone communication with the South Orange Police, which enables two-way communication. The Public Safety staff in the Center has the ability to listen to emergency calls in progress.

The South Orange Fire Department responds to all calls for service on campus. This includes activated alarms and odors. Campus Public Safety staff respond to all incidents, with the primary responsibility of aiding the fire department with access and information, and assisting with evacuation and crowd control. Public Safety staff does not engage in firefighting activity. Access routes are designated based on the location of an incident and, where necessary, gates are opened and emergency services are escorted onto campus.

The SOFD is deeply involved not only with inspections of campus buildings, but also witness all fire drills, are routinely on campus to monitor conditions, and support the Public Safety staff. Fire drills are strictly enforced, evacuations are timed, and buildings are searched to assure compliance. The SOFD also staff and monitor major public events. They also undertake inspections of tents and food trucks per the New Jersey State code.

5.26 Training and Certification

The Bureau of Fire Services, within the New Jersey Office of Community Affairs, Division of Fire Safety, sets most of the minimum training and certification standards for fire departments across the state. In conjunction with these requirements, since mid-2016 the department has maintained a certain level of training, consisting of weekly program announcements that define specific subjects that are, in turn, administered to each platoon. This ensures continuity of subjects and methods of instruction. Due to an absence of department standard operating procedures, some training has evolved to reflect informal procedures customarily used by the department.

Much of the development of department training was recently delegated to a Captain who has assumed the duties of training officer, the first for the department. He holds these duties in addition to his regular assignment as an officer assigned to platoon duty. A majority of the weekly training includes various subjects requiring classroom and outside drill work, with classroom instruction representing approximately 75 percent. Each deputy chief may schedule additional training on their particular platoon on an as needed basis. Most classroom instruction is conducted in the dayroom located on the second floor of the fire station. On occasion, private parking lots, Waterlands Park, and other open areas are used for hose, ladder, and other outdoor drills. Recently, the department has been allowed to conduct drills in and

around a vacant structure on Turrell Avenue that is slated for demolition. This is in addition to hands on training conducted in the fire station basement and other appropriate interior areas. No member of the department holds training officer certification per industry standards and it is not clear if outdoor training meets minimum training safety standards.

Since January of 2017, all training related records are maintained in the department's ESP records management system. The Township does not directly earmark or allocate funds within the department's budget for training and other expenditures, such as the purchase of training related materials and props. Nor does it fund attendance to any outside local or state training, education, or related workshops and conferences. There is no indication of attempts to attend mid to upper management level courses, through either resident on campus or in-state delivery, offered by the National Fire Academy in Emmitsburg, Maryland. At this time there are no training and certification prerequisites before or after members are promoted through the civil service system.

ISO Credit: The standards of the ISO 2014 edition of the Fire Suppression Rating Schedule (FSRS) can serve as a useful baseline guide and indicator of the department's training initiatives. The ISO applies the schedule during its onsite PPC surveys. Referencing the 2014 survey report, the department received less than half of the nine points available for training. The following provides a breakdown of the credit earned (Table 14):

Table 13 ISO 2014 Survey Training Credit Earned

Training categories and subjects	CREDIT AVAILABLE	CREDIT EARNED
New Appointments. Within their first year of appointment, each new recruit member should receive a minimum of 240 hours of certified structure fire related instruction and drill work in accordance with NFPA 1001.	5.00	5
Individual Monthly. For maximum credit each permanent member should receive no less than 18 hours of recorded instruction in *structure* fire related subjects as defined in NFPA 1001.	0.00	35
Company Monthly. For maximum credit each company* should receive no less than 16 hours of recorded drill work in structure fire related subjects. A portion of the drill work should include adjacent mutual aid departments as defined by NFPA 1001.	25.00	25
Officer. For maximum credit, officers (chief officers and captains) should be certified per NFPA 1201 and receive at least 12 hours of recognized annual refresher coursework.	6.00	6
New Apparatus Driver/Operator. For maximum credit, personnel assigned to drive and operate pumper and aerial ladder apparatus should be certified per NFPA 1002 and NFPA 1451 and receive at least 60 hours of recognized refresher coursework.	0.00	5
Existing Driver/Operator. For maximum credit, each existing member assigned to drive and operate pumper and aerial apparatus should receive at least 12 hours of recognized refresher course and drill work.	5.00	5
Hazardous Materials. For maximum credit, each uniformed member of the department should receive a minimum of 6 hours of recognized training for incidents involving hazardous materials per NFPA 472.	1.00	1
Fire Risk Surveys. Each commercial, industrial, institutional and other similar type of occupancies (primarily all buildings in the community with the exception of 104 family dwellings) should be conducted and properly recorded annually by company (platoon) members.	0.00	12

* Due to the department's limited staffing, the term company could be interchanged with "platoon."

As can be seen from the above table, the department received moderate or no credit for many of the items listed.

Considerations: The department could experience increased efficiency, while improving effectiveness and safety, by continuing its development of a more comprehensive training program. There should be sufficient funding to support, within reason, further enhancements

of the department's efforts to address all elements the program. Referring to the FSRS criteria as a reference, the following initiatives could assist the department in enhancing programs and services through training and education of officers and members.

Budget and Funding: Annually, the department should identify all training and certification needs and accordingly develop a training budget. South Orange should appropriate the budget within the department's annual operating budget. Pending available revenue, a minimum of $1,000 should be allocated to the purchase of training material, equipment, and training officer(s) certification. Additional funding through grants and similar sources may also assist in supporting training related initiatives.

Recruit Training: Continue the practice of requiring all new appointments to complete minimum training standards prior to appointment, including Firefighter I and II certification, in accordance with NFPA standard 1001. Ensure records are on file of each recruit's minimum standard hours, including certificates that reflect a minimum of 240 hours of training. Continue the training officer's 4-week in-house orientation program for all new recruits, to ensure there is familiarization of procedures unique to the needs of South Orange.

Training Facilities: Optimally, there should be designated training grounds of at least two acres in area, a drill tower of at least 3 stories in height, a live training structure that is suitable for interior smoke drills, and classroom facilities. However, it would not be practical for the department to be provided with these facilities. In some cases, ISO may provide partial credit for regional or neighboring facilities meeting these criteria, up to 15 miles from fire headquarters. There should be a formal agreement for shared use, and demonstration of regular use by the department for drills and related classroom activities. Another option, but with less credit, would be to formally identify suitable sites within the center of the Township, such as parking lots, parks, and other areas that offer open paved areas with direct access to fire hydrants for drill work. Formal agreements with the rightful owners should be in place and renewed annually. It is not practical for a department the size of the SOFD to maintain the construction and operating cost of a training facility with tower and burn building. However, it could be beneficial to construct relatively inexpensive training props, which the Department has done to some extent. At a minimum, the department should have access to facilities that serve as a classroom, with appropriate props and instructional equipment including a training library and audio and visual aids.

Apparatus Drills: When weather permits, each platoon should conduct no less than eight outdoor drills per year in the use of pumper and aerial ladder truck apparatus (see Table 15.). The purpose of the drills is for personnel to retain basic hands-on skills. Each member of the department should attend an average of 16 hours of classroom and/or drills per month.

Table 14 Apparatus Drills

Drill Type *	Drills Per year	Maximum Credit
Half-day (3-hour) Single Apparatus Drills	8	0.40
Half-day (3-hour) Multi-Company Drills	4	0.40
Night Drills	2	0.20
Mutual Aid Drills	4	

* Single drills may count for more than one type

Company Station Training and Resources: There should be a scheduled program for on-duty personnel including training topics reflective of the fire, rescue, and special operation programs and services that are provided. The program schedule should be available and used by all platoons to ensure consistency and may include classroom instruction and discussion as well as hands-on practice drills. Each member should receive at least 16 hours of station training per month. Practice drills referenced in the previous section may be considered as a means of earning credit for company training. Training manuals and classroom support material should be continually updated to ensure up to date information is incorporated into the training program.

Officer Training and Certification: It is important for officers of a modern fire department to have a working knowledge of the most current trends in administration, personnel management, firefighting strategy and tactics, and safe and effective emergency operations. All officers should receive training and maintain fire officer professional certification in accordance with state standards. Generally, coursework consists of 1-3 weeks' worth of classroom training and instruction. Additional certified refresher training for all officers, consisting of at least 12 hours, should occur each year.

Driver/Operator Certification: All firefighters who are subject to driving and operating pumper, aerial ladder truck, and other heavy apparatus should be certified to state standards. Inexperienced drivers should receive, at a minimum, 60 hours of initial instruction followed by at least 12 hours of refresher instruction each year.

Hazardous Material Operations: In recent decades, the urban environment has become more hazardous due, in part, to more complex chemicals and materials used for the manufacturing and transport of goods and services. Practically all structures, including dwellings, are exposed to thousands of chemicals that, when exposed to fire or spillage, create extremely hazardous conditions to the occupants and firefighters alike. All members of the department should be well-versed in the prevention and control of hazardous material spills and releases. The program should include training at the hazardous material awareness level with each member receiving a minimum of six hours per year of instruction.

Fire Risk Surveys: A fire risk survey, or pre-fire plan program, should be developed to ensure each public, educational, commercial, or healthcare building, apartment house, industrial complex, and similar properties, are surveyed "in company" annually, and recorded by platoon duty personnel. The purpose of the program is to familiarize personnel with the layout of properties, associated hazards and special considerations, and potential strategy and tactics in the event of a fire or similar incident. In order to retain good relations with property owners and property managers, surveys are not normally fire inspections associated with fire code compliance. However, some communities coordinate the two activities when there is concern of duplication of services where limited time and resources exist. At a minimum, platoon officers should be versed in building and fire code requirements if they are expected to spot violations incidental to participating in surveys. The NFPA standard 1620 can be used as a guide when developing a survey plan and recording survey results. The following table (Table 16) illustrates potential credit under the FSRS.

Table 15 Fire Risk Survey Credit

Frequency of Surveys	Credit
1 year	1.00
2 years	0.83
3 years	0.67
4 years	0.58
5 years	0.42
More than 5 years	0.00

Many communities cannot commit the time to survey every property annually. In this case, a list of priorities is made of the properties with the greatest life or economic risks. Other departments plan to survey properties on a rotating basis, such as every 2-5 years.

National Incident Management System (NIMS): All members of the department should receive NIMS training and certification, as prescribed by federal requirements and coordinated and delivered by state and county emergency management entities.

Outside Training: Opportunities should be made to allow for officers and members to attend training and education programs delivered at the county, regional, state, or national level. Attendance should be prioritized to ensure outside training is relevant to the scope of programs and services provided by the department. Our understanding is that participation in outside training is very rare.

Records: Uniform and consistent records of training hours and certifications is critical to the management of the department. Records of individual and platoon training should be maintained, preferably through the ESP software program that meets the criteria of NFPA standard 1401.

5.27 Emergency Medical Services

The department views itself as primarily a fire response agency that does not formally provide any form of direct emergency medical services or augmentation of those services. Members are trained to the first responder level, the minimum level of medical training. Some members are trained to the EMT level. This level of training is mostly due to a previous intent of the Township Board to have a gradual extension of EMS services from the Township EMS agency to the fire department; a plan that never came to fruition. Currently, most members are certified in Cardio-Pulmonary Resuscitation (CPR) and Automated External Defibrillation (AED) for immediate intervention on the fire ground and in quarters.

Primary medical services are provided by the South Orange Rescue Squad (SORS). The all-volunteer squad was formed in 1952 by a group of residents and business leaders. Today, the squad is an independent membership owned corporation located in a new facility, opened in 2016 and adjacent to the fire station. There are three licensed ambulances and a first response vehicle which respond to medical emergencies primarily within the Township, including Seton Hall University. When requested, the squad also assists neighboring Maplewood, West Orange, and other neighboring communities through a regional EMS mutual aid system. The organization does not charge for its services to local citizens.

During certain times of the week, ambulance response times are delayed primarily due to squad members not being available. In such cases, an ambulance from the Maplewood Fire Department or other mutual aid service must respond into South Orange.

Considerations: The Township, in conjunction with the SORS (and possibly the fire department as well) should consider formally adopting response time benchmarks for BLS and/or ALS service within the Village. In addition, given its limited resources, the Township is well served by the fire department's continued focus on its core mission of fire protection and rescue services. But it should also consider, when needed, augmenting the services provided by the SORS by serving as a stopgap when there is a delay in a quick ambulance response. Through this service, on a case by case basis, the citizen in need of quick medical attention can receive the quickest service possible, especially in the event of cardiac arrest or other critical condition. The department need not respond to all medical emergencies, only those that are either close by or when it is quickly determined the SORS cannot dispatch an ambulance within prescribed benchmark timeframes. By providing the service on a case by case basis and not responding to every medical call, the department can remain focused on its core mission while improving the level of service and overall quality of life of the citizens. We understand that the Township utilizes the Police for this function.

5.28 Dispatch/Communications

The South Orange Police Department serves as the 9-1-1 call center and emergency dispatch for the police services. The SOPD directs EMS calls to REMCS for dispatch, while fire calls are routed to SOFD headquarters where one firefighter is assigned to dispatch when in quarters.

The SOFD dispatch is not staffed with a dedicated position, meaning that the dispatcher also serves as a member of the on-duty crew who responds on emergencies aboard fire apparatus. It has become the custom of Village residents to bypass calling the 9-1-1 emergency number and contact the fire department, via its business telephone line, for either emergency or non-emergency assistance. If the call warrants a response of all on-duty department personnel, the SOPD dispatch center will be notified by radio or hotline, at which time the department's business line will be switched to ring at the center until placed back to normal status upon the return of the on-duty force. Also, we were unable to verify that the SOPD call center meets any of the design recommendations of NFPA 1121; the guide referenced by ISO when developing the community's PPC rating.

Essex County Mutual Aid Dispatch Center: The Center is housed within the East Orange Fire Department Emergency Dispatch Center. The Center is tasked with dispatching mutual-aid units automatically during working fires (Signal 11) and special calls for assistance.

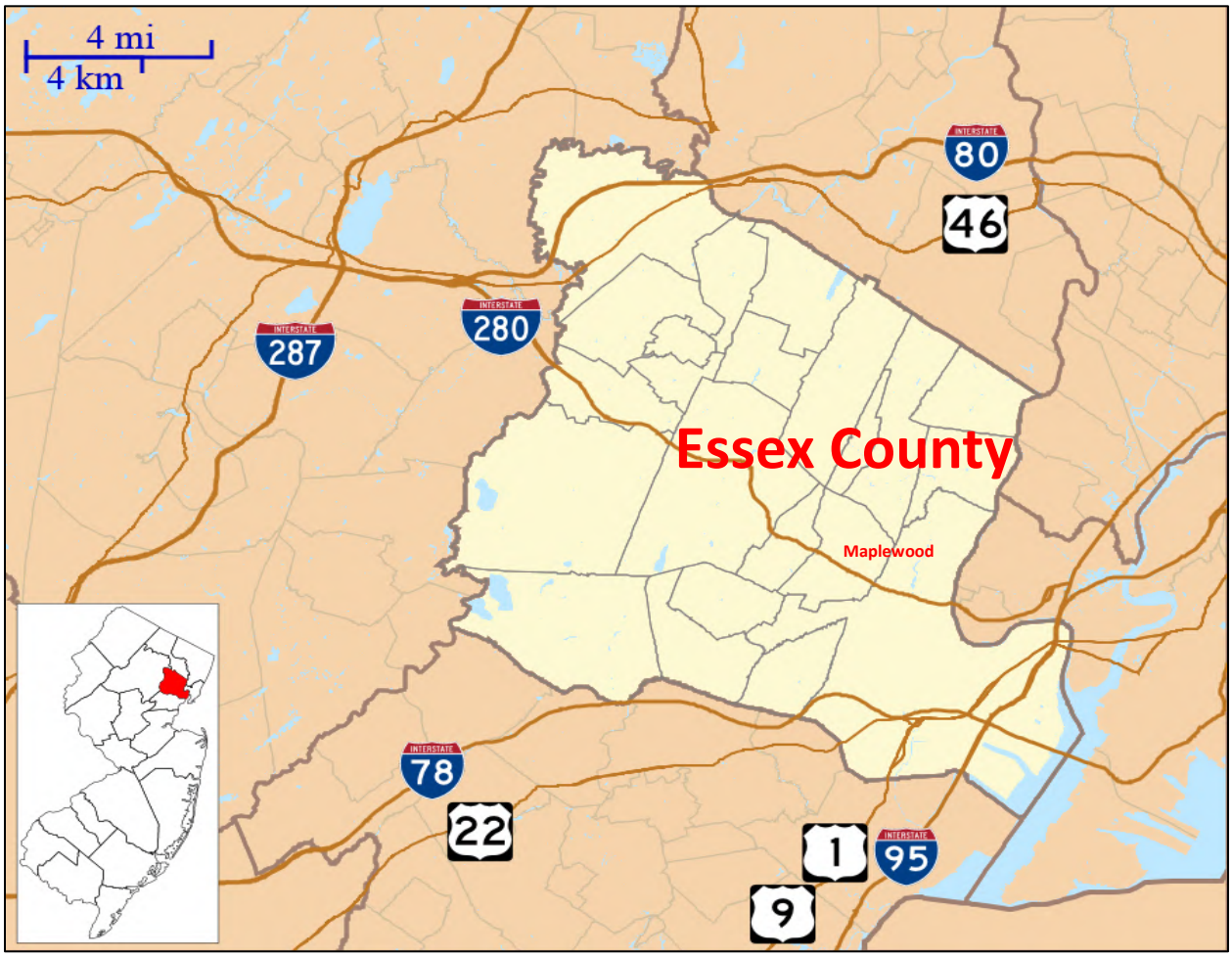
Considerations: The Township should consider utilizing nearby multi-agency fire/EMS dispatch centers. This would improve the receiving and dispatching of emergency calls to the department. Its current practice of processing calls for assistance does not reflect modern fire service dispatching protocols, including the recording and archiving of data related to dispatching procedures. Consideration should be given to replacing the current practice of emergency calls being answered by on-duty fire personnel, with a manual transfer of the emergency telephone number to the police dispatcher upon the on-duty personnel leaving quarters.

6.0 Maplewood

6.1 Community Overview

The Township of Maplewood is located in south central Essex County, New Jersey, west of the City of Newark. It is a primarily suburban commuter community via rail and bus to New York City to the east.

Figure 7: Maplewood Community Overview Map



6.2 Future Development

While there are very limited areas where new roadways could be created, several roadway improvements that involve curbing and walkways are intended. None of the plans appear to impact the current capability of fire apparatus. The following is a list of street segments slated for improvements:

- Claremont Avenue

- Lancaster Avenue
- Orchard Road
- Elmwood Avenue
- Porter Road
- Maple Terrace

In addition, several on-going new developments will increase the population of the township. The majority of these are near the fire stations, in proximity to the train station, and along Springfield Avenue, primarily on the southeast side of town. The following table (Figure 10) lists the projects.

Figure 8: Maplewood New Development

Name	Address	Use /Zone	Residential Units
Wawa Store	1515 Springfield Ave	Highway Business	N/A
Old Post Office	160 Maplewood Ave	Mixed Use	20
Winchester Gardens	333 Elmwood Ave	Renovations	-5
	99 Burnett Ave	Apartments	25
Avalon	Boyden & Springfield Aves.	PSE&G Redevelopment	235
Burger King	1833 Springfield Ave	Retail business	N/A
	97 Baker St.	Retail business	N/A
	1701 Springfield Avenue	apartments	30
255 Tuscan	305 Boyden Ave	Apartments	30
Cornbread's	1565 Springfield Ave	Restaurant	N/A
Walgreens	1633 Springfield Ave	Retail business	N/A
CVS	across from Columbia HS	Retail business	N/A
Station House	125 Dunnell Road	Apartments	50

The Master Plan for the township, written in 2004, suggested many of the development ideas listed above, especially along Springfield Avenue and within the Township adjacent to the train station. While there were no specific recommendations (Chapter 12 of Master Plan, 2004) for the fire department, any increase in population and commercial development poses new risks for protection planning. The master plan did suggest some specific partnerships with South Orange (Waterlands Park) and non-specifically with public facilities, regardless of jurisdictional ownership.

In 2013, the Township contracted to have the speed performance examined along Valley Street from Millburn Ave to Hixon Place. It was posted at 35 mph. The study found that the median speed ranged between 28 and 24 mph, with 35 mph at the 85th percentile (corresponding to 15 percent of trips). The report found an area, near the fire station, that had measured lower speeds. Perhaps the posted speed should be lowered here, but the rest were within industry

guidelines. This lower speed would improve the recognition of fire apparatus and the ability to yield required by law.

In 2007, a traffic calming needs study was conducted by the firm of Keller & Kirkpatrick of Morris Plains, NJ. They monitored and evaluated six intersections and eight roadways as suggested by the township engineer. While a multitude of solutions were discussed, most traffic calming devices and methods also work well on emergency vehicles, creating an increase in response time. The exception would be the speed cushions as discussed in the report. Traffic circles generally aid in circulation at difficult intersections, but many are 'retrofitted' and too small, causing a slowing of traffic instead of increasing flow, as can be seen at the historically massive circles such as Route 1 and Route 18 in Central Jersey.

The Township's zoning code describes the allowable property development within subareas of the jurisdiction, while individual properties may vary (e.g., schools, libraries, post offices); these codes coincide with risk that differing development poses to the community. For instance, industrial facilities can contain hazardous materials and also employ a number of people within the community. A commercial loss due to fire can have a more significant impact upon the community as a whole than the loss of a single-family residence. While a house fire is no less tragic to the homeowner, it has a lower impact upon the community, unless it spreads to adjacent structures.

Another example is the "Town Center" type of Zoning. These zones contain some of the oldest structures with the greatest exposure factor (attached), with much of it being a mixed use or mercantile structure with upper level residential. Due to the age, inferior building and fire protection systems, attached exposure, life loss potential, fire frequency, and the cultural/heritage factor, many consider these areas high risk.

The following table (Figure 11) contains reclassified data obtained from the township and details the level of risk to the overall community based upon potential use of property.

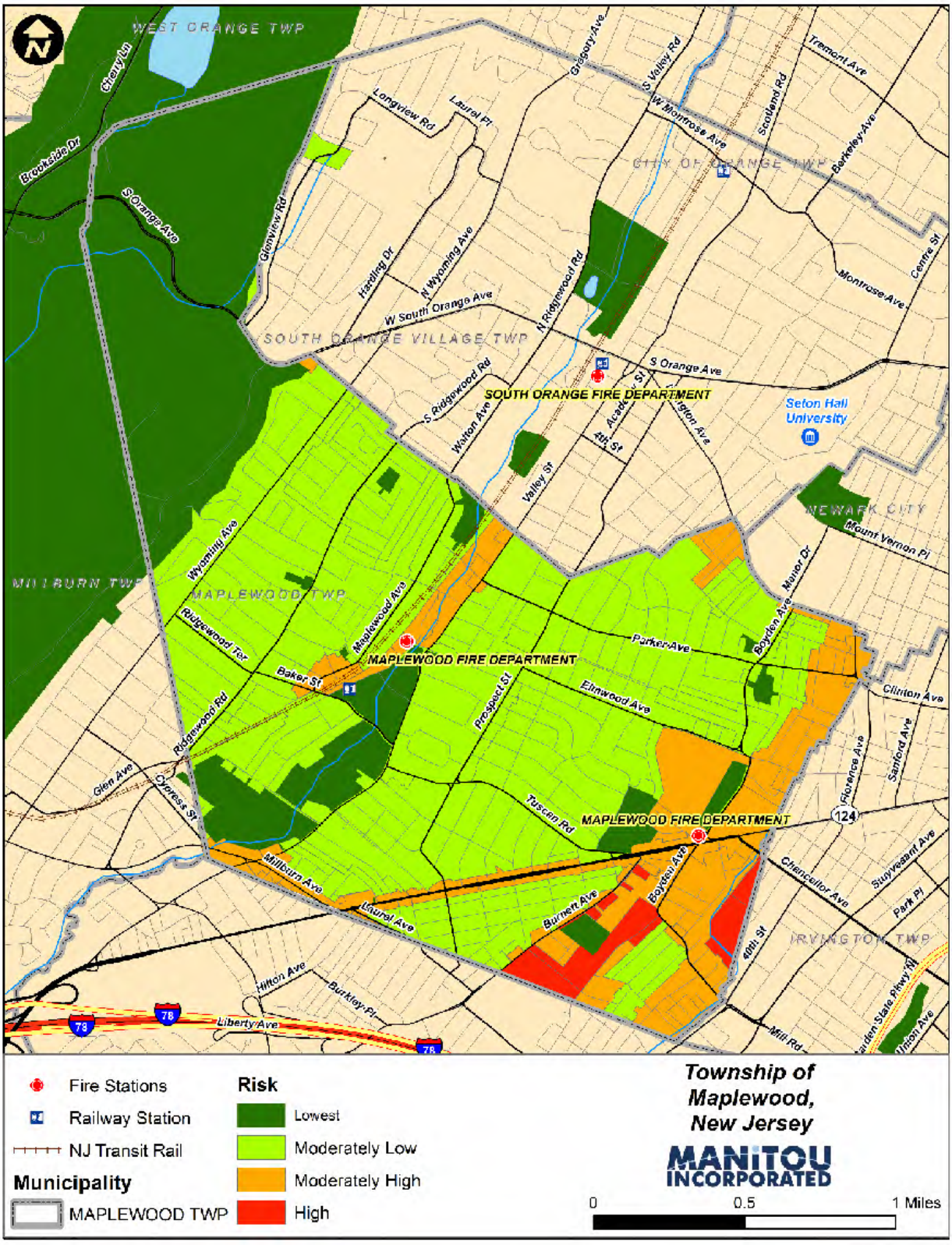
Figure 9; Community Risk Levels Maplewood

Maplewood Zoning Types	Risk
COMMERCIAL - INDUSTRIAL	Highest
SPECIAL LIGHT INDUSTRIAL	Highest
CONTINUING CARE RETIREMENT COMMUNITY	Moderately High
DUNNELL ROAD REDEVELOPMENT	Moderately High
HIGHWAY BUSINESS	Moderately High
NEIGHBORHOOD BUSINESS	Moderately High
OFFICE BUSINESS	Moderately High
PARKSIDE	Moderately High
PEDESTRIAN RETAIL BUSINESS	Moderately High
REDEVELOPMENT AREA 1	Moderately High
REDEVELOPMENT AREA 2	Moderately High
REDEVELOPMENT AREA 3	Moderately High
RESEARCH OFFICE	Moderately High
RESIDENTIAL 2 FAMILY	Moderately High
RESIDENTIAL GARDEN APARTMENTS	Moderately High
RETAIL BUSINESS	Moderately High
RESIDENTIAL 1 FAMILY 4,000 SQ. FT.	Moderately Lower
RESIDENTIAL 1 FAMILY 5,000 SQ. FT.	Moderately Lower
RESIDENTIAL 1 FAMILY 7,000 SQ. FT.	Moderately Lower

Note: There was no Open Space/Parks Zoning even though there are such elements including a golf course that does not reflect the zoning it is identified. The map that follows reflects these areas. The same holds true for "The Top" multistory apartments on South Orange Ave. that is listed as "Neighborhood Business"

The following map (Figure 12) portrays the general fire risk classification based upon the zoning ordinances in the study region. Note the exceptions and the school locations. It is important to point out that all the fire stations are located within areas of higher risk. This is advantageous for the community.

Figure 10: Maplewood Community Risk Map



Maplewood has championed a variety of specialized plans for almost a decade. Many of these plans emerged from the 2004 Master Plan, including the PSE&G redevelopment and Springfield Avenue Redevelopment Corridor, in addition to parking, open space, and riverine studies.

In 2011, the Historic Preservation Element for the Master Plan identified required elements to create a designation for properties of significance. Maplewood is home to many historic homes, some of the most notable being the Durand-Hedden House and Vaux Hall. It should also be noted that the regional Columbia High School is constructed in the Gothic style in 1927 but has had additions since that time.

Figure 11 Durand-Hedden House and Vaux Hall

6.3 Service area population and demographics

The following table (Table 17) details brief demographic and community development data for the Maplewood community

Figure 12 Maplewood Fire Headquarters

Table 16 Parameters of Maplewood

Parameter	Maplewood
Area in Square miles	3.88
Resident Population[6]	24,233
Transient/Commuters[7]	-14.6%
Median age	38.5
White Population	62.1%
Black & Ethnic	27.9%
Hispanic	9.5%
Occupied Housing	78.4%
Rental Housing	21.6%
Vacant	4.3%
Built Development[8]	67%
-Residential	72%
-Commercial	5%
-Open/Undeveloped	23%

Due to the built-up environment, population growth is expected to be slow and stable. Preservation of open space and neighborhood character limits the development of large scale residential or commercial properties in the area. Sporadic high-density buildings are planned and under construction. The proximity to rail transit is an attractive option for maintaining population levels.

6.4 History, formation, and general description of the fire agencies

The Maplewood Fire Department (MFD) has a long history of service delivery. Although it utilized Reserve (volunteer) firefighters, it has employed career staff at least since incorporation of their Firefighters Mutual Benevolent Association Chapter in 1923. The Department's reserve program was suspended well over ten years ago, and the MFD has essentially operated as a career department for long before then.

The fire department was organized in 1899. Its current headquarters station, on Dunnell Road, was built in 1921 and its second station, on Boyden Avenue near Springfield Avenue, was built in 1957. The fire department operates an Engine and tower ladder units and an ambulance from Dunnell Road; a deputy chief is stationed there. A single engine responds from the Boyden Ave. station. The department provides fire suppression, emergency medical, inspections, and

[6] US Census Bureau 2014 Estimates from 2014 American Community Survey 5 year
[7] US Census Bureau Commuter-Adjusted Daytime Population: Places 06-10 ACS 5Yr.
[8] Estimates from Town representatives

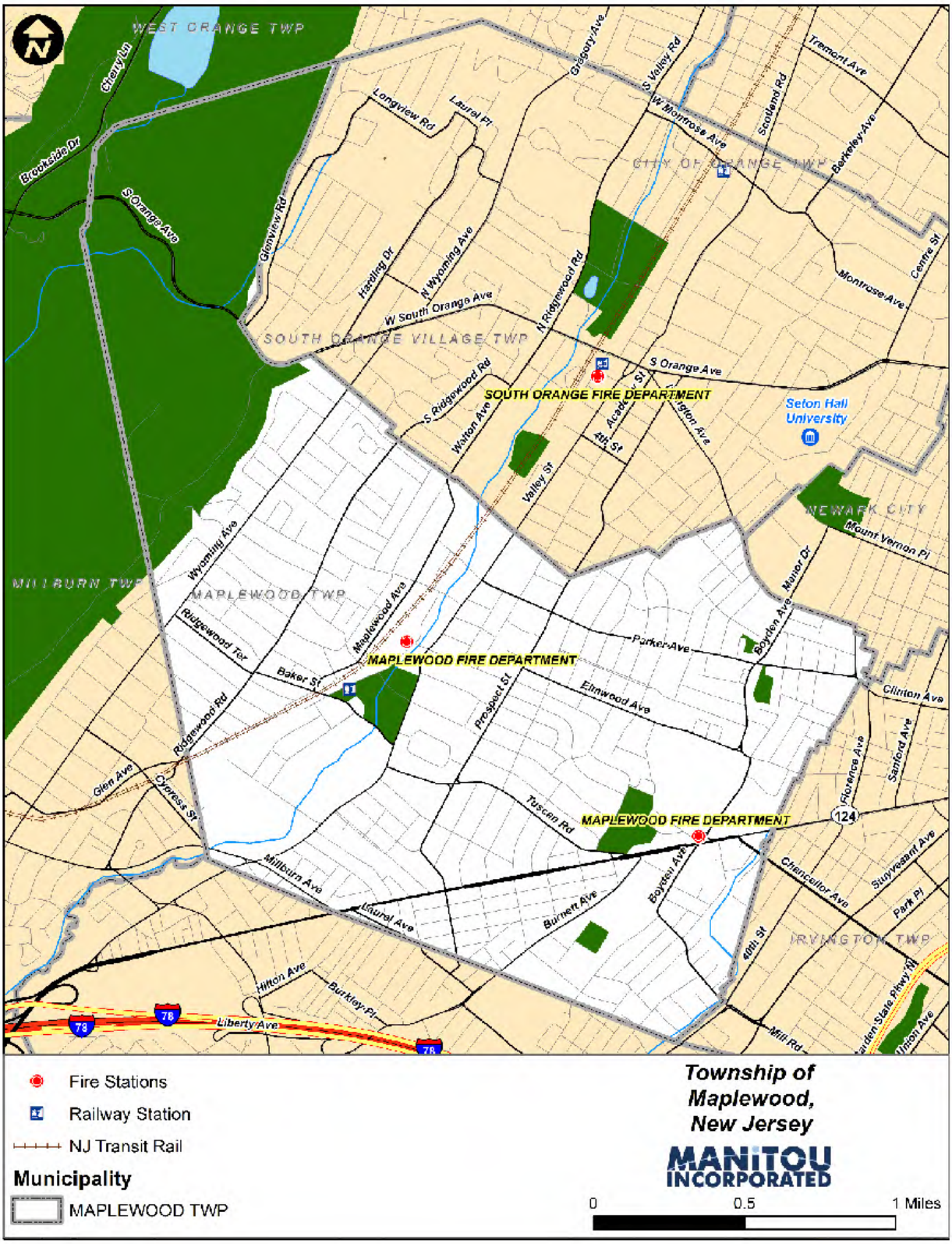
public fire education services. The provision of emergency medical services began in 1996. Currently, all the line staff are career firefighters.

6.5 Description of the current service delivery infrastructure

The Maplewood Fire Department is a career service department providing fire suppression, emergency medical services transport, fire prevention, and other services to the residents of Maplewood. The MFD operates from two stations: Headquarters at 105 Dunnell Road; and Station 2, located at 249 Boyden Avenue. Fire Headquarters personnel staff an Engine, Ladder, Ambulance, and a Chief vehicle. The ambulance is cross-staffed by the engine company crew, meaning that when the ambulance is on a call, the engine at headquarters is not in service. Station 2 staffs an engine company.

The Department consists of 36 firefighters, five Captains, five Deputy Chiefs, and a Chief of Department. There are two civilian employees: a fire inspector, and an administrative assistant to the Fire Chief. Each shift is composed of nine firefighters, one Captain (Station 2) and one Deputy Chief (located at Headquarters).

Figure 13 Fire Station Deployment



6.6 Governance and lines of authority

The Maplewood Fire Department is authorized under the Town's Code. The Code spells out high-level guidance for hiring, major personnel actions including promotion, user fees, and classification. The Code also includes position control and rank structure.

The Fire Chief reports to the Township Committee via Public Safety Committee. The day to day supervision of the Fire Department is through the Township Administrator, who serves as the Chief Administrative Officer. The Administrator enacts policy as set by the Township Committee.

The communication flow is from individual members to their supervising Deputy Chief, to the Chief, and then to the Township Administrator. This applies in both directions.

The fire department is established under Article IX of Chapter 6, Administration of Government of the Township Ordinances. The Fire Chief answers to the Mayor, a five-member Township Committee, and the Township Administrator. The Chief has the assistance of a deputy chief executive officer, a captain and civilian fire inspectors, and a civilian administrative assistant. The Chief oversees four platoons; each consists of a deputy chief, a captain, and eight firefighters at minimum staffing. However, two firefighters cross staff the Engine and Ambulance which means that when on an emergency, the other apparatus is unstaffed and unavailable.

6.7 Foundational policy documents

The MFD is governed by two primary policy documents. The first is the Town Code. Chapter 6, Article IX: Fire Department. The Fire Department is known officially as the "Fire Department of the Township of Maplewood." The town's code also specifies the departments table of organizations and staffing levels. Incorporating documents are well-ordered, updated, and appear to be current.

The second policy document is the Department's Rules and Regulations. This document, updated most recently in 2013, serves as operating guidance for the MFD, and includes much more detailed information on topics including both administrative and operational information.

The Rules and Regulations are typically the foundational document for enforcement of conduct on the employees of the Department. They appear to be well-written and are unambiguous. Most important, they appear to be closely aligned to daily operations, indicating that they are both current and enforced.

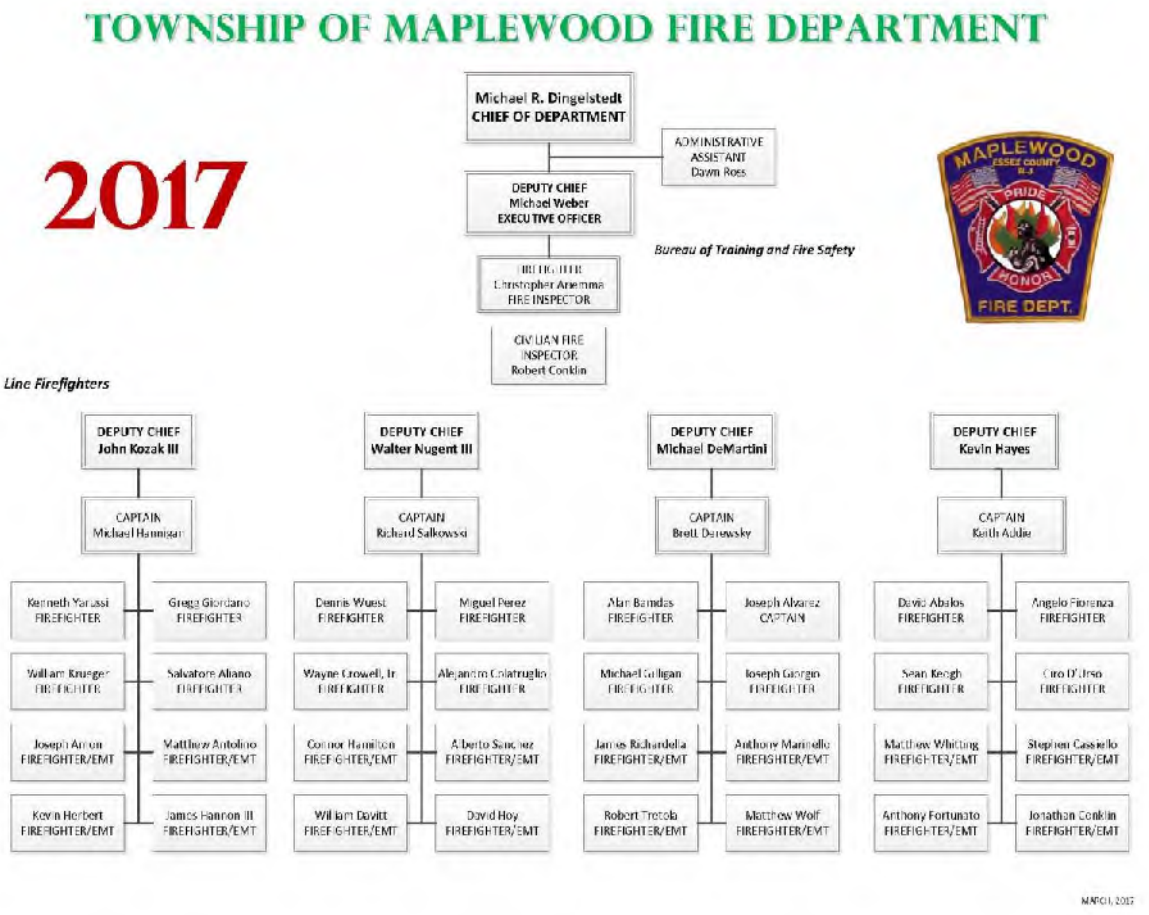
The MFD is composed of 43 uniformed employees and two civilians. All personnel are trained in both firefighting and medical care, with the majority of these employees certified as Emergency Medical Technicians.

6.8 Organizational design

The MFD has a traditional organization structure, with four shifts and a relatively small staff of weekday employees. Figure 16 presents the organization chart for the Department. The Department utilizes dedicated positions for fire inspections, including a civilian inspector position. The fire prevention and training functions fall under an administrative Deputy Chief. This Deputy Chief is primarily responsible for administration of the training program.

Other shift deputies are also assigned administrative responsibilities, in addition to their operational duties. This arrangement appears to be working well. The MFD also has a full-time administrative support position that reports directly to the Fire Chief. This position is important to the overall efficiency of the Department's operations.

Figure 14 MFD Table of Organization



6.9 Operating budget, funding, fees, taxation, and financial resources

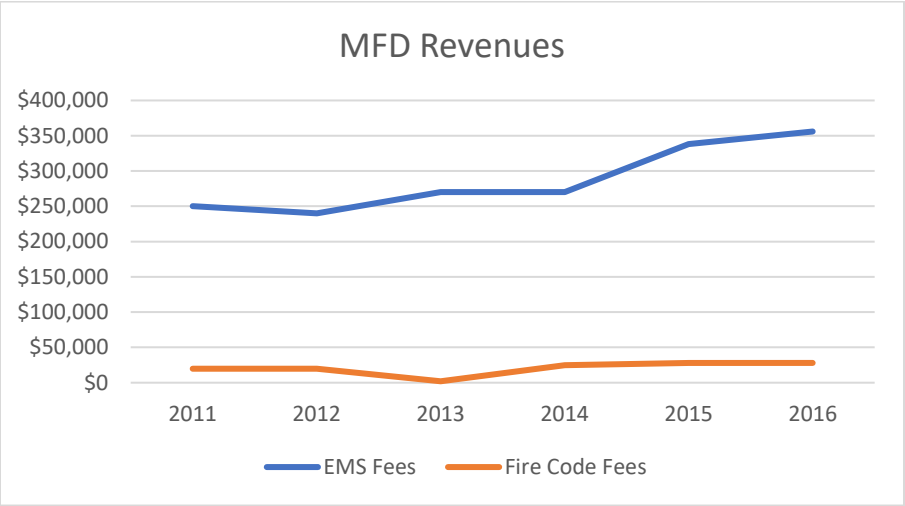
The Maplewood Fire Department has a 2016 total operating budget of $5.56 million, of which $4.87 million was budgeted for salaries and wages in 2016. An additional $300,000 was budgeted for fire overtime in 2016.

Table 17 MFD Operating Budget Overview 2011-2016

	2011	2012	2013	2014	2015	2016
Revenues						
EMS Fees	250000	240000	270000	270000	338279	356000
Fire Code Fees	20000	20000	2000	25000	27761	28000
Personnel						
Fire Salary and Wages (budgeted)	4298000	4517000	4648200	4688540	4793685	4871427
Non-Uniformed staff	58070	59239	61406	65541	80986	86038
Fire Overtime	349557	206908	340321	394756	484417	300000
Fire Operating						
Clothing Allowance	40757	41000	451000	41500	41166	45000
Stationary	2245	2540	2200	3619	2862	3000
Computer Supply/Maint/Software	7280	4368	7750	1904	6110	8000
Printing	568	1667	2113		619	1500
Uniforms	1593	1954	2221	1815	1982	4216
Fleet Repair	38678	39067	41885	48719	40009	87500
Safety Supplies/Equip	12743	14299	11184	16435	11912	12000
Public Education	107	30	0	0	361	500
SCBA	4547	4406	1741	5434	4493	4691
Medical Expenses	2264	1138	1377	3282	4813	8840
Public Relations	684	475	527	1190	589	1750
Dues, Meetings	1218	1388	1604	1148	1421	1500
Training Expenses	9500	5500	5500	5500	5500	13760
Comm Equipm Maint	12309	10810	10355	6712	11491	13861
Photocopy	5901	5256	4333	4758	4392	4500
New Equip	13576	10255	9170	8634	17634	10500
Emerg Med Supplies	13409	12039	10642	11564	24177	26500
Misc Bldg Materials	6041	6596	6160	7403	7623	8000
Tuition Reimburse	4643	3240	1687	2025	1454	6000
Office Equip	700	800	800	800	800	800
EMS Billing Fees	0	25595	25157	27704	28939	29000
Exam Fees	1500	4000	21500	100	100	15000

The Department budget (Table 18) appears to be reasonable given the services provided. No major inadequacies or lavish amounts are apparent. The overtime budget, as with similar agencies, is a function of overall staffing levels and callbacks. The organization is small enough that one major illness, injury, or leave can have an impact on the budget. To some degree, this is largely unavoidable given prevailing industry practices and agreements in place.

Figure 15 MFD Revenues



The Department also realizes additional revenues from code enforcement and Ambulance billing. Figure 17 shows the revenues from 2011-2016. EMS fees exceeded $350,000 in 2016.

6.10 Mission, vision, strategic planning, goals, and objectives

The Mission Statement of the Maplewood Fire Department is to minimize the loss of life and property threatened by fire, medical conditions, and other emergencies by providing the best professional services possible with the resources at its disposal. In support of that mission, all members of this department are expected to attain and maintain a level of professionalism consistent with the noble profession they represent. The Maplewood Fire Department shall maintain continued fire education and safety for its residents.

- Review of annual reports and its website clearly shows that each major division of the MFD has associated goals and objectives.
- Fire Protection – Provide the highest level of life and property protection from fire and other related disasters.
- Emergency Medical Services – Continue our commitment to provide exceptional medical services with the highest levels of appropriate care and transportation through safe and quick response.

- Human Resource Management – Continue to take care of yourself physically and emotionally; assist other Department members with the same.
- Physical Resource Management – Continue to provide and maintain the physical needs of fire department members, including fire stations, supplies, fire apparatus, and equipment.
- Community Services - Continue to actively participate in the community to provide for the safety and well-being of people who live in our neighborhoods.

The MFD has goals and objectives identified for its core missions. These appear to be widely accepted within the ranks, and our interviews indicated that members were aware of them. As they exist, they are well above average for similarly sized organizations. Future efforts should be directed to quantifying more of these goals and objectives, which would aid in performance management initiatives.

6.11 Internal assessment of critical issues

The MFD is very cognizant of its critical issues. The biggest concern is overall staffing. The Department acknowledges its limitations in this area, and has addressed them through reliance on mutual aid in the event of structural fires or multiple incidents. This is not uncommon for Departments serving communities of this size.

A second critical issue is the need for a supervisor to be assigned to the ladder company. At present, the headquarters station has only one officer assigned, the Deputy Chief. This means that two to three units at that station are under the supervision of the Deputy Chief. The Department policy calls for the Deputy to respond to any alarm in headquarters' district, but this requires that the Deputy Chief fulfill his role while acting as a de facto unit supervisor. The ladder company, in particular, requires a high degree of skill, independence, and decision making responsibility, which may present a challenge with a crew of two firefighters.

A final concern, related to the previous one, is the need to maintain training, and the ability to maintain training schedules, especially for newer hires who are predominantly assigned to the ambulance. Because this is the busiest unit within the Department, members assigned are frequently called away from on-duty training sessions. As an industry, the historical trend toward fewer fires and rising standards means that personnel are getting less fireground experience than their predecessors. This increases the need to emphasize training to maintain readiness and competence across the broad range of tasks that the fire department may perform.

6.12 Internal assessment of future challenges

The MFD has achieved a high level of capability within its resources. Maintaining its resource levels and quality of services is the primary challenge facing the Department.

6.13 Internal and external communications processes

As a small agency, the MFD relies on its website and public outreach events as the primary means for communicating with the public. Communications processes appear to be adequate due to close relationships with the community. Both the Department, via the Town's website, and the Union maintain active web pages.

The MFD has a Captain designated as Public Information Officer. This position deals primarily with fire prevention messaging, but also coordinates response to press inquiries in the event of newsworthy incidents.

There is also an unofficial MFD Facebook page with over 1400 "likes." This page was maintained by a now-retired member. Another active member of the Department has volunteered to take over the page, but it appears that it has not been updated since 2015. The Department should clearly mark the page as "unofficial."

6.14 Document control and security

Key personnel documents are held under lock and key in the Chief's Office.

Standard Operating Procedures are well-organized, and version controls and tracking appear on these documents.

The use of login procedures for software systems appears to impose adequate controls on most records.

6.15 Reporting and recordkeeping

Records appear to be well organized, and storage is accessible to those who use the records.

Many records are computerized, and key business processes are well-integrated. Payroll is tracked on a computerized system, and manually tabulated on forms provided by the town's payroll contractor. Reports are manually transferred to the Town for generation of paychecks.

For an organization of its size, the recordkeeping and reporting practices of the MFD are well above average.

The MFD relies on the Town's enterprise financial software from Edmunds and Associates (www.edmundsassoc.com/solutions) for purchasing.

The MFD produces an Annual Report. This document provides detailed summaries of activities, expenditures, and initiatives of the Department. The report is exemplary among agencies of its size.

6.16 Information technology systems

Both fire stations are linked by the Town's network, enabling access to application software. The number of computers appears to be adequate to the number of users.

The MFD has two primary software systems that it uses. Both systems are well-developed and users seem familiar with their use and report satisfaction with functionality. Fire prevention relies on Mobile-Eyes© software (www.mobile-eyes.us.com/inspection-and-permitting-products) for end-to-end business processes. The Department uses RedAlert© software (www.alpinesoftware.com) for records management, EMS, and fire incident reporting. The Department has mobile computers in major apparatus and mobile computers for inspectors.

Additional information on recordkeeping can be found under Section 6.30 in "Dispatch."

6.17 Human resources policies and documents

6.17.1 Position descriptions

Duties and requirements for positions are spelled out in the Rules and Regulations. The descriptions are modern and reflect current duties. Descriptions exist for promotional positions such as Captain or Deputy Chief, for appointed positions including Fire Investigator, and supplemental responsibilities including apparatus maintenance, training officer, and safety officer.

In addition, firefighters are classified into seven grades, based on their seniority. The categories range from Seventh Grade (probationary) to First Grade, with six years of service.

6.17.2 Salary and compensation programs

The salary scale for MFD employees hired prior to 2016 is as follows (Table 19):

Table 18 MFD Pay Scale, 2017

Rank	Salary (2017)
Deputy Chief	$125,897.56
Captain	$109,986.42
1st Grade Firefighter	$94,660.51
2nd Grade Firefighter	$83,451.56
3rd Grade Firefighter	$73,569.87
4th Grade Firefighter	$64,858.31
5th Grade Firefighter	$57,178.28
6th Grade Firefighter	$50,407.67
7th Grade Firefighter	$44,438.79

In addition to the base pay shown above, employees are eligible for longevity pay and holiday pay (Table 20).

For personnel hired prior to 1999, longevity pay can go as high as ten percent of base salary. Longevity pay begins with five years of service (2%) and escalates by two percent increments for every five years of service up to 25 years (10%).

For those hired after December 1999, longevity pay begins at $800 after five years of service, and increases by another $800 with each five-year increment of service for a maximum of $4,000 annually.

Lump-sum pay adjustments are provided for personnel in specialty titles or staff positions.

Table 19 Base Pay Adjustments 2017

Title	Pay Adjustment
Deputy Chief/Executive Officer	$5,560.64
Chief/Apparatus or Captain/Apparatus	$5,560.64
Captain/Inspector Deputy	$4,024.53
Firefighter/Mechanic	$4,024.53
Training Officer	$2,244.41

Acting pay is granted for personnel acting formally out of rank, on a rotating basis for all senior firefighters.

Members serving as EMTs (limited to 16 positions) are eligible for an increase in hourly pay of $3.00/hour.

First responder-certified personnel receive an annual $500 pay adjustment.

6.17.3 Bargaining Agreements

The Town recognizes Firefighters Mutual Benevolent Association (FMBA) Local 25 as the bargaining representative for its members. The agreement covers all uniformed members of the Department up through and including the rank of Deputy Chief. Practically, this means that the Chief of Department is the only uniformed member not covered by the agreement. The current agreement is in effect through December 31, 2019.

6.17.4 Appointment and promotional policies

As a non-civil service municipality in the State of New Jersey, the Township of Maplewood has considerable flexibility in appointment and promotional policies. However, the Township recognizes the FMBA Local 25 and its attendant collective bargaining agreement.

Candidates for appointment to the MFD must complete an application with the Township. This process requires candidates to personally appear at a given time when applications become

available. A limited number of applications (typically 180) are made available, and once these are distributed, the application period is closed. We understand that the application process is closely watched, with candidates lining up well before the offices open on the day of filing. If candidates are not present on that day, they are unable to apply for the positions.

Candidates are required to have their EMT certification on the date of hire. Candidates typically complete this training before the exam, or once they receive notification that they have a high score.

The MFD promotional procedures are spelled out in the Town code. As a non-civil service municipality, the Town is free to make its own rules concerning promotions. The MFD has assembled a comprehensive and well defined promotional system. The criteria include a written test, review of personnel records, and an oral interview (see Table 21.).

Table 20 MFD Promotional Criteria

Criterion	Relative Weight
Written Exam	50%
Personnel Record	30%
Oral Interview	20%

Per the Code, the written exam is developed by the New Jersey Career Fire Chief's Association. The personnel records include evaluation of higher education, attendance, seniority, disciplinary history, and personnel review by superior officers. A defined point scale is used for each item. Promotion decisions are based on the highest number of points achieved in the process, with a preference given to Maplewood residents, then seniority, in the event of a tie.

Newly promoted Captains are required to attain New Jersey licensure as a Fire Inspector/Official, and Deputy Chiefs are required to acquire NFPA 1041 Level 1 Instructor certification. These certifications are completed at the employees' own expense within one year from date of promotion.

In our interviews with officers within the MFD, the process was perceived as fair and well administered. The officers felt that the balance of criteria used to select officers led to a well-rounded and professional workforce.

6.18 Health, Wellness, and Safety Programs

The Department maintains an active health and safety program aimed primarily at compliance with federal and State regulations. These programs are addressed through SOPs and overseen by the Deputy Chief/Executive Officer. Programs include respiratory protection (fit testing, SCBA repair, and cylinder testing/replacement).

Turnout gear is inspected and repaired or replaced as necessary. NFPA's standard on turnout gear, NFPA 1851, requires replacement of this equipment after a maximum ten-year life after manufacture. This is a costly requirement.

Examples of elective programs include provision of flu shots for members assigned to ambulance duties. The Department also places safety-related premise information on each apparatus. With the planned expansion of mobile computers to front-line fire apparatus, this information will be readily available in computerized form.

In the area of fitness, the MFD maintains exercise equipment at each station for use by their members.

The MFD's experience with workplace injuries and exposures is positive. In 2015, while there were 11 injuries or exposures, these reflected no lost time incidents.

6.19 Administration and support staff

The MFD has a dedicated staff for administration. Aside from the Chief of Department, there is an Administrative Assistant. The Deputy Chief/Executive Officer oversees the Bureau of Training and Fire Safety, which is staffed by a Fire Captain and a civilian fire inspector. These assignments are reasonable, given the workload, and contribute to overall administrative effectiveness.

This staff is also responsible for EMS billing, payroll, oversight of on-shift fire prevention activities, and general coordination under the direction of the Chief of Department.

6.20 Emergency response including suppression, EMS, and rescue

The MFD has an on-duty minimum staffing of eight personnel. If no personnel are on vacation or illness, then as many as ten could be on duty. One of these positions is the Deputy Chief. The remaining seven personnel are distributed across four front-line apparatus. Table 22 shows the staffing distribution.

Most notably, the ambulance is cross-staffed with the engine (Engine 33) at the headquarters station. This means that is very common for the engine to be out of service, meaning that effectively the Department responds with one engine, one ladder, and one Chief Officer to fire emergencies.

Table 21 Current MFD Staffing Configuration

APPARATUS/VEHICLE	Position/Rank		
	Deputy Fire Chief	Captain	Firefighter
8 Personnel on Duty – Minimum on duty			
Deputy Chief	1		
Engine 33			2
Engine 32		1	2
Ladder 31			2
Rescue 67			
10 Personnel on Duty			
Deputy Chief	1		
Engine 33			2
Engine 32		1	3
Ladder 31			3
Rescue 67			

The division between the two station's first-due response areas is Prospect Street, with Engine 2 covering the area east of Prospect and Headquarters covering the west. Alarm levels are as follows (Table 23). These alarm levels correspond to the number of resources that may be necessary to respond to an incident.

Table 22 MFD Alarm Levels

Alarm Level	Typical Situation	Response	Description
Signal 5	Wires down, lockout, fluid in roadway, small outdoor fire, EMS assist, outside odor of gas	One Unit	E32 OR Ladder 31 and Deputy Chief
Signal 8	Residential alarm activation, vehicle fire, elevator vehicle accident with entrapment	E32, L31, and Deputy Chief, Rescue 36 if needed	
Signal 9	Smoke or Fire reported in a building, reported structure fire, alarm activation in life hazard or commercial occupancy, hazardous materials spill or leak, odor of gas inside a structure	E32, E33, L31, Deputy Chief	
Signal 11	Working structure fire	All units above, plus South Orange and Millburn Engines	

Suppression: Response to fire and related emergencies, such as explosions, reflect industry protocols. The ISO and NFPA both recommend that, at a minimum, two engines, a ladder truck or equivalent, and a chief officer should respond as the initial assignment of all reported fires within, on, or adjacent to structures. Normally, the department responds to most reported structure fires with three units consisting of Car HQ3, Engine 32, and Ladder 31. If upon arrival the first arriving unit reports a working fire, a Signal 11 is transmitted, at which time two engines are requested from South Orange and Millburn will respond to the scene with one engine. Maplewood initiates a recall of its personnel based on proximity to the Town.

The system in place involves an elaborate number of moves of apparatus from neighboring agencies; units are relocated to provide coverage at Maplewood's Headquarters station. Two engines and one ladder are provided.

In a second alarm, these units staged at MFD headquarters respond to the scene, and another two engines and a ladder cover MFD Headquarters.

Above the second alarm level, the Essex County Mutual Aid Coordinator responds to the scene, and the County's communications center, operated by the East Orange Fire Department, assumes control for mobilizing additional resources.

Although the Essex County Mutual Aid system is the primary framework for mutual aid, the MFD has agreements with Millburn for an immediate response in the event of a Signal 11. This

agreement permits units to respond upon monitoring the transmission of a Signal 11 over the radio, and prior to a formal dispatch by their respective dispatch centers. South Orange and Maplewood also monitor each other's frequencies and will make the same immediate response.

Automatic and mutual aid assistance is provided through a county-wide system. Unless special called, the Essex County Fire Coordinator, through the use of the County Fire Dispatch Center, will automatically send additional resources to any department within the system. In addition, the coordinator provides on-scene assistance upon the request of the Maplewood fire chief or deputy chief in command of a major fire or emergency.

The department has provisions for emergency callback of off-duty personnel through various means, primarily through direct telephone calls.

6.21 Staff Scheduling Methodology

The scheduling of platoon personnel appears to be in line with regional practices. The MFD utilizes a four-platoon system, with nine to ten personnel assigned per shift, and an eight person minimum staffing.

6.22 Succession Planning

The MFD does not have a formal succession planning effort in place, but the organizational structure offers some opportunities for development of future candidates via the Deputy Chief of Training and Fire Safety. The promotional system, which rewards college degrees, means that several officers have desirable education to complement their operational experience. The reporting systems in place expose all officers to administrative reporting and writing.

6.23 Facilities

The Headquarters station, located on Dunnell Avenue, is an older facility. It has four front-facing bays, with two additional bays facing the side of the building and offering access via the parking lot. This facility is in decent repair. In addition to apparatus, it has living quarters for on-duty crews, as well as support space for medical storage, equipment, and vehicle repairs. Office space is provided for fire prevention, the Chief, and the administrative assistant.

Station 2, located at 249 Boyden Avenue, currently holds an engine, reserve engine, and reserve ambulance. The front doorway is configured for two large apparatus and a sedan or other smaller vehicle. At present, the reserve ambulance is backed into this bay from the rear entrance, as it can't fit through the front door.

Station 2 is typical of facilities constructed in the mid-century (1956), and is in good repair. Sleeping facilities are provided for one on-duty crew of up to four personnel.

Both stations have height restrictions that require attention to ladder apparatus specification. In addition, the headquarters station is very limited in terms of length for ladder apparatus.

6.24 Apparatus/Vehicles

The MFD has a fleet of rolling stock typical of agencies of its size and function (Table 24). It operates two engine companies and one ladder company apparatus, plus a reserve engine apparatus. The apparatus appeared to be well-maintained and suitable to the service area. In addition to heavy apparatus, the Department also maintains five vehicles for administrative staff and Chiefs, and two ambulances.

Table 23 Maplewood Fire Department Apparatus

Unit Type	Designation	Description
Engine	32	2010 Pierce Arrow XLT 1500 GPM
Engine	33	2001 Luverne/Spartan 1500 GPM
Engine	34 (Reserve)	1987 Pierce Arrow 1000 GPM
Ladder	Tower Ladder 31	2010 Pierce Arrow XLT 95 Foot Tower Ladder
Ambulance	Rescue 37	2012 Chevrolet
Ambulance		
Deputy Chief's Car	HQ 5	2009 Dodge Durango
Reserve Deputy Car	HQ 4 (Car 3-2)	2009 Ford Crown Victoria
Chief's Vehicle	HQ 1	Ford Explorer
Pickup/Utility	HQ 36	2015 Ford Pickup/Utility
Bureau of Training/Fire Prevention Captain	HQ 3	2006 Dodge Durango

The MFD assigns one member of each shift to serve as a mechanic. Each of these mechanics is responsible for one or more pieces of major apparatus. These personnel, in addition to their firefighting duties, perform regular preventive maintenance and repairs in the event of a breakdown. In the case of major repairs, or specialized work, the apparatus fleet is maintained by a private vendor, and service records appear to be well-maintained.

Annual pump, hose, and ladder testing is performed by an outside contractor, and records are maintained by the Department. Testing is performed according to applicable NFPA standards. Deficiencies noted are corrected by their maintenance contractor.

6.25 Fire Prevention

The fire prevention function is housed within the Bureau of Training and Fire Safety. It is staffed by a Captain and civilian inspector and overseen by the Deputy Chief/Executive Officer. The Bureau houses numerous initiatives, including fire inspections, new construction plan

reviews, public fire education, and serves as the point of contact for social service and protective agencies.

6.25.1 Annual Inspection and Code Enforcement

The Bureau made 2,594 inspections in 2015. The MFD collected $59,308 in fees and penalties in 2015. These included some 611 non-life hazard uses and 122 life hazard occupancies. They also issued 656 certificates of inspection in 2015.

The Bureau oversees permitting for hazardous processes. These included 93 permits covering everything from fireworks to cutting and welding operations.

The Bureau also participates in municipal housing code enforcement, citing 4 violations for illegal sleeping quarters in basements in 2015.

6.25.2 New construction inspection and involvement

The Bureau participates in site plan reviews for new developments proposed within the Town. These reviews typically include issues such as fire department access routes, placement of hydrants and water supply connections, and related topics. The presence of personnel on a daytime working schedule has allowed close relationships with building officials and good coordination.

The Bureau also inspects homes for sale or lease for presence of a fire extinguishers and smoke and carbon monoxide detectors. These inspections carry a $75 fee, with a $25 reinspection fee. These inspections are also done by in-service crews. In 2015 some 408 initial inspections were performed, with 36 reinspections, raising $31,150 in revenue.

6.25.3 Fire and Life-Safety public education

The Department has an active fire prevention education program. Fire safety materials are distributed at community and neighborhood events. These materials are also available at fire stations. Presentations are made at schools and the YMCA.

In addition, their website contains numerous informational publications on various topics. The Department utilizes multilingual materials and appears to target education programs to those parts of the community at greatest risk.

In the wake of the Seton Hall fire, the MFD developed an education program on dormitory fire safety for high school seniors at Columbia High School.

The Department also owns a Fire Safety Trailer, which is stored outside at headquarters. The Bureau of Training and Fire Safety uses the trailer, with the assistance of on-duty personnel, to conduct fire safety education presentations.

6.25.4 Fire investigation

The MFD has a procedure for fire investigations (SOP FIRE 05). Normally, the officer in charge of an incident is responsible for determining the cause of any fire. The MFD Fire Investigation Team is notified in cases where one or more of the following criterion is met:

a. resulting in death or serious bodily injury, either to civilians or emergency personnel;

b. at churches, temples, synagogues or other houses of worship;

c. at facilities that are owned or leased by the County of Essex;

d. involving more than one structure;

e. that go to two or more alarms;

f. that appear incendiary or suspicious in commercial or industrial establishments;

g. that, due to their suspicious or incendiary nature or circumstances, responding emergency personnel believe warrant notification of the Prosecutor's Office; or

h. that were caused by or involved explosives or incendiary devices.

If an on-duty member is present, they may handle the investigation. If a team member is not working, then additional team members may be called in. Eight personnel are currently certified by the State of New Jersey as fire investigators. Due to the requirements for certification, many of these personnel undertake necessary training to maintain this certification on their own, and may work with other organizations performing fire investigations.

In the event of a death or serious injury, or in cases where there is a large loss or suspicious circumstances, the Essex County Prosecutor's Office is notified and participates in the investigation. The Maplewood Police Department is also involved in investigations. Detectives may be called to the scene to collect evidence, document the scene with photographs, and collect witness statements.

The fire investigation process and procedure is well-developed, and the relationships with Police and prosecutors appear to be very good.

6.25.5 Statistical collection and analysis

Using the Mobile-Eyes software, inspection and permit data is collected routinely. Reporting is eased through built-in functionality, enabling the code enforcement process to operate with minimal administrative support.

6.26 Training

Training falls under the Bureau of Training and Fire Safety. A Deputy Chief heads this combined Division, with a Captain. They oversee outside training schedules, design programs for training across shifts, and assemble training materials for use by the Shift Deputies. In 2015, over 4,832 hours of in-house training were logged. Additional classes taken by members outside the Department are not included in this total.

In recent years, topics included in training overseen by the Training Officer comprised live burn training at the Bergen County Fire Academy, and use of acquired structures for multiple-company fire ground operations.

The Training Bureau closely supports operations and there are some benefits in having training and prevention in the same unit. Awareness of new development, code compliance, and construction features is critical to both prevention and training.

Training on various mandated topics, along with refresher training on policy and procedures, are organized in conjunction with on-duty crews and overseen by the shift Deputy Chiefs.

Probationary firefighters, once hired, are sent to a Fire Academy, where they are trained in National Fire Protection Association 1001, Firefighter Level II. The Department has relied on the Essex County Public Safety Academy in recent years. The Academy, a unit of Essex County Community College, also provides training for law enforcement officers.

Probationary firefighters, once they complete the Fire Academy, are assigned to a day schedule for two weeks, where the Training Officer assigns topics to be covered on each shift. These include apparatus familiarization, comprehensive review of operational topics, and familiarization with MFD procedures and policies. Probationary firefighters are also assigned to ride as observers on the ambulance until such time as they can serve as part of the two-person ambulance crew.

ISO Credit: The criteria of the ISO 2014 edition of the Fire Suppression Rating Schedule (FSRS) can serve as a useful baseline guide and indicator of the department's training initiatives. The ISO applies the schedule during onsite surveys to determine a community's Public Protection Classification (PPC), typically referred to by public officials and laypeople as a community's fire insurance rating. Referencing the Town's 2014 PPC survey report, the department received less than half of the nine points available for training. The following provides a breakdown of the credit earned:

Maplewood Training Summary (Table 25):

Table 24 ISO 2014 Survey Training Credit Earned

TABLE. 25 — ISO 2014 SURVEY TRAINING CREDIT EARNED		
Training categories and subjects	CREDIT AVAILABLE	CREDIT EARNED
Facilities and Use. For maximum credit, each firefighter should receive 18 hours per month in structure fire related subjects as outlined in NFPA 1001.	35.00	0
Company Training. For maximum credit, each firefighter should receive 16 hours per month in structure fire related subjects as outlined in NFPA 1001.	21.48	25
Classes for Officers. For maximum credit, each officer should be certified in accordance with the general criteria of NFPA 1021. Additionally, each officer should receive 12 hours of continuing education on or off site.	6.00	12
New Driver. For maximum credit, each new driver and operator should receive 60 hours of driver/operator training per year in accordance with NFPA 1002 and NFPA 1451.	3.3	5
Existing Driver/Operator Training. For maximum credit, each existing driver and operator should receive 12 hours of driver/operator training per year in accordance with NFPA 1002 and NFPA 1451.	2.50	5
Hazardous Materials. For maximum credit, each uniformed member of the department should receive a minimum of 6 hours of recognized training for incidents involving hazardous materials per NFPA 472.	1.00	1
Recruit Training. For maximum credit, each firefighter should receive 240 hours of structure fire related training in accordance with NFPA 1001 within the first year of employment or tenure.	5.00	5
Pre-Fire Planning Inspections. Each commercial, industrial, institutional and other similar type of occupancies (primarily all buildings in the community with the exception of 1-4 family dwellings) should be conducted and properly recorded annually by company (platoon) members.	12.00	12
* Due to the department's limited staffing, the term "company" could be interchanged with "platoon."		

Overall credit for training is 5.16 points out of 9 possible

6.27 Emergency Medical Services

The Maplewood Fire Department has traditionally provided medical first responder assistance in the event of life-threatening emergencies within the Town. This assistance was provided by firefighters operating from the Department's traditional engine or ladder apparatus, in accordance with FIRE SOP #40.

A response of one (1) Engine Company or one (1) ladder company shall be dispatched automatically on a Signal 5 whenever a rescue unit is dispatched on all EMS-related calls involving CPR, respiratory arrest, cardiac arrest, unconscious, major motor vehicle accidents, multiple patients, mass casualty incidents, and calls violent in nature (stabbing or gunshots).

MFD began providing EMS transport service at the insistence of the Town, beginning in 1996, as a support to the Maplewood First Aid Squad. This practice grew from primarily weekday coverage to a 24/7 response operation. The First Aid Squad officially disbanded in 2016.

The MFD operates one front-line ambulance on a 24/7 basis. This unit provides basic life support care and responds to roughly 1,400 dispatches annually. When the ambulance is unavailable, the next call is made to the South Orange Rescue Squad (nights and weekends), or MONOC Ambulance, University Hospital EMS, Union Township EMS, then Union County EMS.

Advanced life support service is obtained from MONOC, and then Atlantic Ambulance.

Both the MFDs ambulances are inspected by the New Jersey Department of Health. In 2015, then-Rescue 36 caught fire and was heavily damaged. A loaner was obtained and the second unit was moved into primary service.

Maplewood requires EMT certification for new hires, and the majority of its personnel (36) are currently certified. Of these employees, 16 are assigned to staff the ambulance. Every firefighter in Maplewood is trained in CPR, semi-automatic external defibrillation (SAED), and emergency first aid.

The MFD charges for service and, using a private contractor, collects fees for its services that return to the Town's general fund. In 2015, the Department collected $377,733 and paid just under $29,000 in collection fees to their billing vendor. The ambulance fee schedule is $800 plus $12 per mile, calculated one way, and charged to all persons receiving emergency ambulance transport service by the Fire Department. An additional fee of $35 will be charged for oxygen administered during ambulance transport.

All MFD apparatus are equipped with SAED units, Naloxone HCL, oxygen, and emergency medical kits.

6.28 Dispatch/Communications

Within Maplewood Township, 9-1-1 calls are relayed to the Public Safety Answering Point (PSAP) at the Maplewood Police Headquarters. This facility, located on Springfield Avenue, was

completed in 2008 and has a modern dispatch facility. Once a 9-1-1- call is determined to be fire or EMS related, the call is transferred to the Regional Emergency Medical Service Communication System (REMCS). There, additional information is gathered from the caller and units are alerted.

The MFD is dispatched by REMCS, located at 65 Bergen Street, at the Newark campus of the University Hospital of New Jersey. REMCS is one of nine regional communications centers designated by the State of New Jersey Department of Health. They were originally established in 1970.

REMCS maintains a minimum of seven personnel on duty, two of whom are designated as call takers, one fire dispatch, one medevac, two EMS dispatch, and one supervisor. Additional staff can be accommodated in the event of a major event or a natural disaster. The Center dispatches for multiple agencies including the South Orange Rescue Squad, Town of Irvington, Maplewood, City of Orange, and serves as the medical screening point for the City of Newark and the New Jersey Emergency Medical Services Task Force.

All personnel are trained to minimum standards of the New Jersey Office of Emergency Telecommunications Services (OETS). All fire dispatch personnel and call-takers are trained with Associated Public-Safety Communications Officers (APCO) Fire Dispatch training. This training includes the following topics: Introduction to the Fire Service; Fire Service Apparatus and Terminology; Fire Service Communications Overview; Fire Service Call Processing; Fire Dispatch Procedures; Fire Service Incidents; The National Incident Management System and Incident Command System; Hazardous Material Incidents; and Terrorism Incidents. The training is recognized as a basis for competence nationally. All personnel also receive medevac training.

The Center also uses the APCO Communications Training Officer program, allowing it to meet the standards of APCO American National Standard 3.101.1-2013, Minimum Standards for Public Safety Communications Training Officers.

REMCS operates using RedAlert software, which enables complete integration with MFD units' mobile computer terminals in the vehicles. This software also includes a computer aided dispatch capability, which enables automated selection and recommendation of units from multiple agencies for multi-unit or agency responses. This software also supports numerous specialized modules that enable expanded capabilities, including automatic vehicle location, automatic routing to emergencies, unit to unit digital messaging, pre-incident plans, hydrant databases, and smartphone applications. These additional capabilities are individually licensed.

REMCS personnel provide pre-arrival medical instructions and are trained to elicit information on fires and other emergencies. They have the capability to remain on the line with callers, when necessary, until units arrive on scene. For fire incidents, they have defined protocols for assisting with scene operations, including personnel accountability reports and progress reports.

The RMECS facility is equipped with redundant voice, data, and computer networks to enable operation in the event of utility disruptions.

Maplewood pays $50,000 per year for dispatch services. This fee is very reasonable given the quality of service and the costs of providing the service independently.

7.0 Demand for Service and Operational Analysis: Current Operations

Overview: The history of the fire departments and current station locations has previously been discussed. This section discusses the current workload, coverage capability, response time performance, and options for delivery of cohesive fire services between both jurisdictions.

Dispatching: Dispatching services are a critical element to any emergency service. Experienced dispatchers can make a difference in the efficient and effective response of emergency assistance. Knowledge about the fire service and training in emergency medical dispatching is paramount to emergency operations.

Maplewood: The Maplewood Fire Department is dispatched by University Hospital's Regional Emergency Communications Center (REMCS). Originally established for the hospital's EMS system, they now provide Fire and EMS dispatching for the cities of Irvington, Maplewood, and Orange Fire Departments.

South Orange: The South Orange Fire Department receives dispatching calls from the police department via either radio communication or transferred calls to the firehouse. The crews also receive assistance request calls from alarm centers or directly from residents. When firefighters are not in quarters, the calls are forwarded to the police dispatch center. One limitation of this model, is that times are not tracked for apparatus response or arrival on scene. These times are approximated by the officer in charge. This is contrary to modern practice, and should be considered a major deficiency.

Demand for Services: Both departments have submitted over five years (2011 to mid-2016) of National Fire Incident Reporting System (NFIRS) data export. The data is normally submitted to the State Division of Fire Safety for analysis. Depending upon the software vendor they employ, this data is largely user input and can contain errors. It reflects what was found on the scene by firefighters rather than what was dispatched which, at times, can be different. Utilizing the address input from MFD's incident record, locations were plotted geographically. Errors inherent to manual input include:

- Misspelling (most often cited issue)
- Using an alias ("Walmart")
- Wrong or missing prefix/suffix (North, South, Place, Street)
- Lack of address number
- Lack of intersection cross street
- Use of apartment number, or ½ address numbers
- Use of acronyms ("IFO","BTWN")

Despite this, data cleaning resulting in over 90% match with a confidence average of 95% for both departments. This is a very good match rate.

Mutual/Automatic Aid: Standard incident reporting for both fire departments allows for designation of an event, if mutual or automatic aid was either received or given to another jurisdiction. This is also an area where human input error is common. Mutual aid is requested during an event or when a department's firefighting equipment or ambulance is unavailable. Automatic aid sends additional nearby assistance when dispatch criteria, such as a reported fire or an alarm in a high risk facility, is received by the dispatch center.

The Essex County Fire Coordinator (within County Emergency Management) has developed mutual aid agreements within participating county fire departments. When a structure fire is confirmed by a department, it will notify the county emergency operations center via radio communication. The county staff will then coordinate a mutual aid response to the requesting municipalities, based on a run order protocol of availability and staffing with neighboring fire departments. Separate mutual aid agreements are in place in communities such as Maplewood and Millburn, and in instances where the county mutual aid plan may not apply.

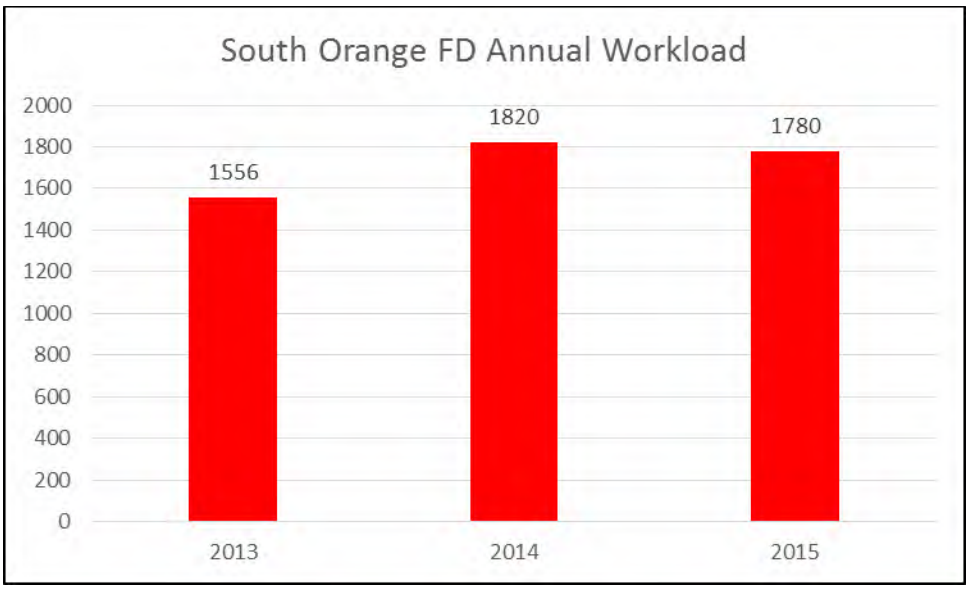
7.1 South Orange

The fire department utilizes Enforsys software to input incident data. This data is inputed by staff members rather than autopopulated by dispatch data. The data of the South Orange Fire Department was requested for the same five year time period, from 2011 to mid-2016. After a delay, the data arrived and was found to be incomplete. During the temporal analysis for monthly workload, it was determined that several months in 2011 and 2012 were without data. This analysis reflects data from 2013 to 2015, as 2016 data has not been completed at the time of this analysis.

In addition, it appears that there is a practice within SOFD of creating new incidents (using new incident code numbers) during the same timeframe or just after another incident at the same address. Most of the new incidents were coded as a disposition of a Public Service (553). These did not add up to a significant issue but resulted in a 5% inflation of total workload numbers over the study period.

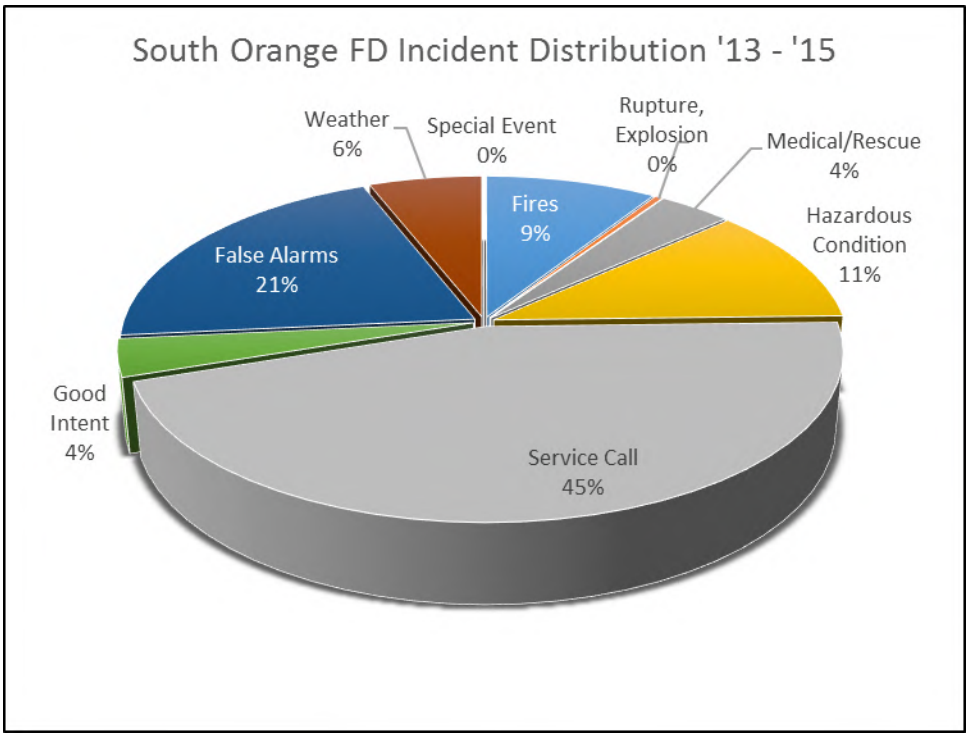
The annual workload for the South Orange FD was generally stable over the three years (Figure 18). Their workload is approximately half of the Maplewood Fire Department's annual workload levels; however, Maplewood also operates ambulance services and that accounts for the difference. Otherwise, the workload can be considered similar.

Figure 16: SOFD Annual Workload



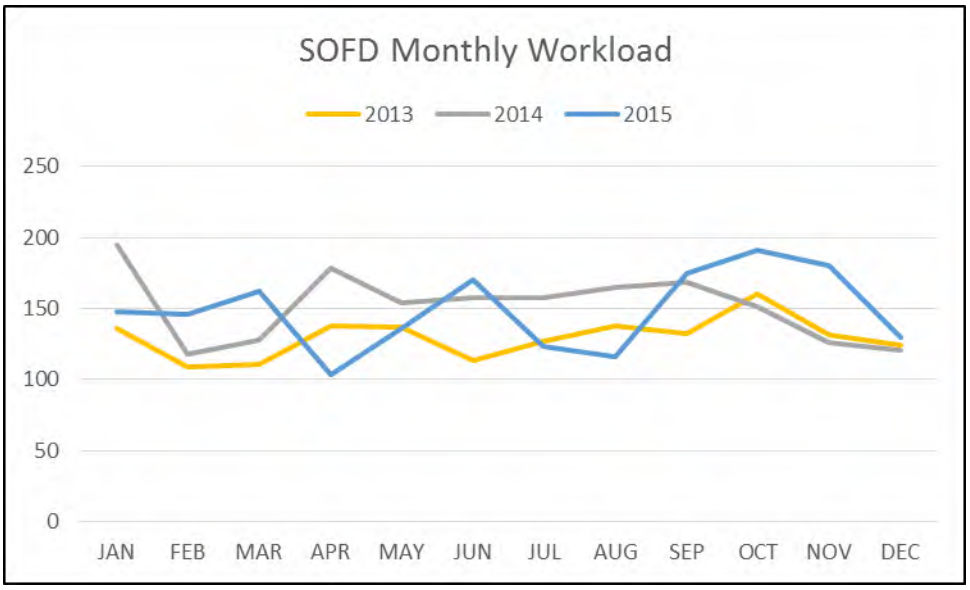
Most of the dispatches for the South Orange Fire Department have been service calls and false alarms (Figure 19). Without medical first responder incidents, which SOFD does not routinely provide, the workload is not atypical for a fire service only department.

Figure 17: SOFD Workload by Type



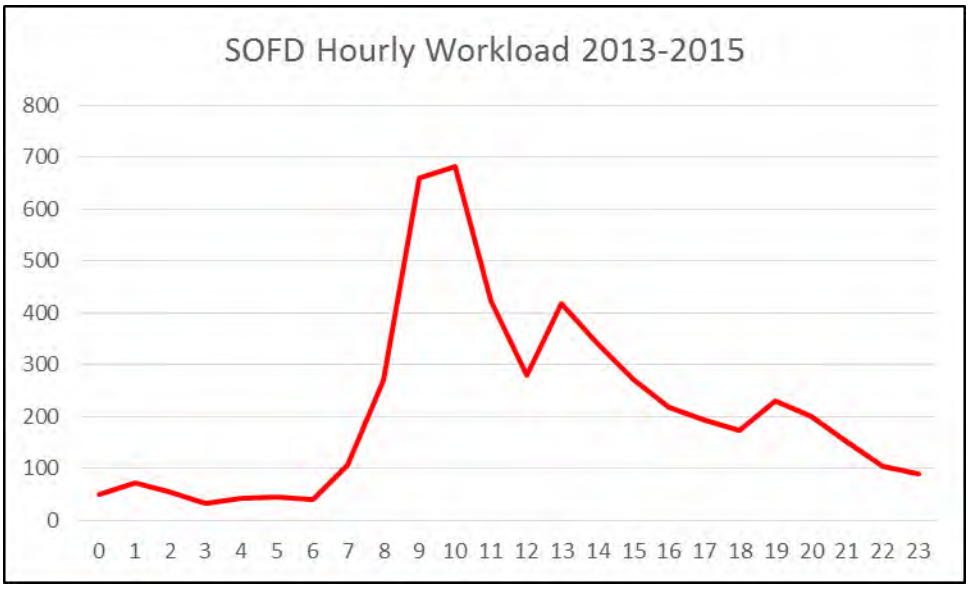
For SOFD, the monthly workload is also stable (Figure 20). Due to the data issues, the weather events of 2011 and 2012 are not reflected. Interestingly, the monthly workload does not reflect a trend of increasing with the arrival of University students in the fall or decreasing in May.

Figure 18: SOFD Monthly Workload



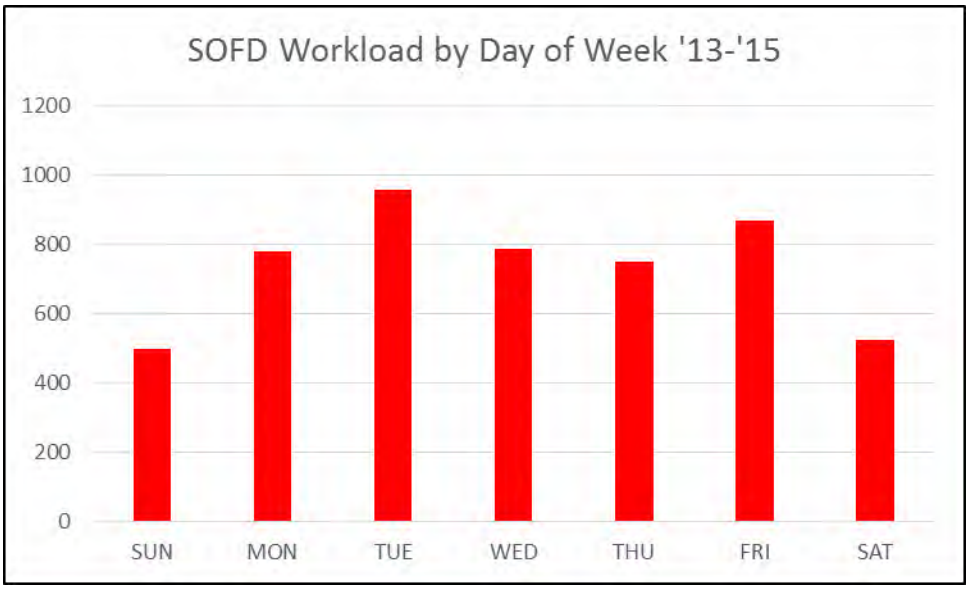
The hourly workload is atypical for many fire departments (Figure 21). The incident volume spikes during the early morning commuting rush (and coincidentally SOFD shift change), then decreases until a 1:00 p.m. spike, before gradually decreasing for the rest of the afternoon and evening. A brief volume increase at 7 PM may reflect evening commutes.

Figure 19: SOFD Hourly Workload



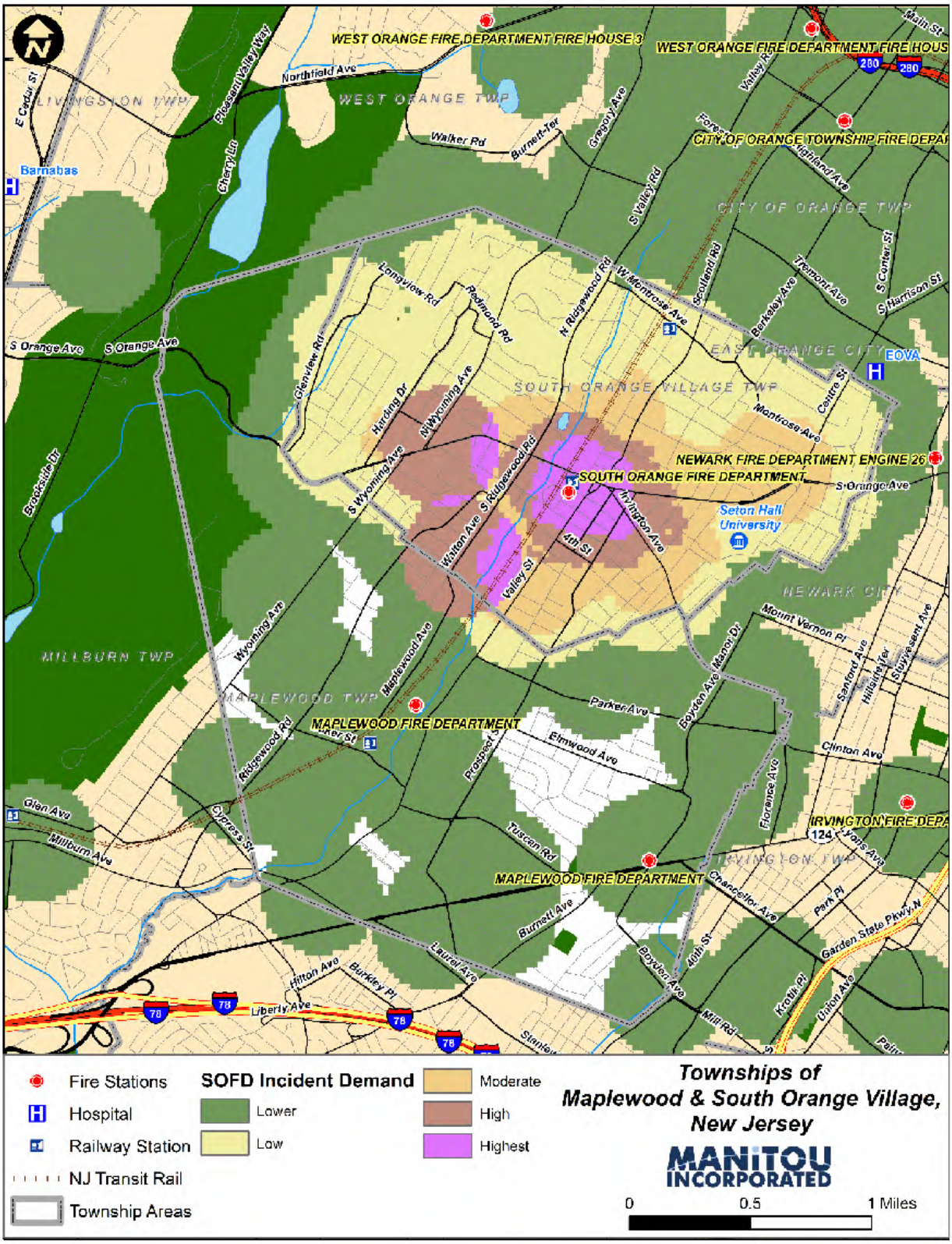
Similar to Maplewood FD, South Orange FD's workload is busier during the weekday than the weekend; Tuesdays and Fridays are the busiest days of the week (Figure 22).

Figure 20: SOFD Workload by Day of Week



The following map (Figure 23) illustrates the total workload volume for SOFD. Notice the occurences of mutual aid to Maplewood; however, the aid is mainly to the City of Orange to the northeast. Also note that the fire station is located squarely within the areas of higher demand, where new commercial and residential development is occurring.

Figure 21: SOFD Demand Density



Mutual/Automatic Aid: While most of the time no mutual aid is listed for incidents in South Orange, the fire department is a net giver of mutual aid. In 2015, 68 incidents were coded as "mutual aid given" and only four (4) as "mutual aid received". However, there were 168 cities other than South Orange listed for an address in 2015. This may be a result of postal zones that do not coincide with municipal boundaries. In the department's incident records for 2015, most incidents were listed as responding to East Orange.

When the geographically located incidents are tabulated, it can be seen that Orange, Maplewood, and West Orange received aid from SOFD, resulting in a 5% workload volume increase within South Orange (Figure 24).

Figure 22: SOFD Mutual Aid Detail

City	Incidents	MA Pct
Maplewood	17	20%
East Orange	3	3%
Irvington	10	11%
Millburn	0	0%
Newark	2	2%
Orange	42	48%
West Orange	13	15%
MA total	87	
MA vs. Overall	5%	

First Alarm Coverage: While individual fire departments may vary, the NFPA 1710 recommends that full deployment to a first alarm structure fire should include the number of apparatus and personnel that is minimally adequate for the critical tasks needed to be performed during fire operations, to suppress the original threat, provide rescue if needed, and limit the spread to neighboring or adjacent structures. This equates to ***at least*** two engines and one ladder truck. The staffing force should be ***at least*** 13-14 firefighters, including a chief officer. It assumes four firefighters on each apparatus. This force should be able to be assembled at the scene of a structure fire within an eight-minute travel time.

The current minimum staffing for SOFD is six firefighters, including a chief officer. This equals the minimum assembly of 14 personnel under NFPA 1710. The ladder truck is minimally manned with two firefighters while the Engine has three firefighters.

South Orange FD, according to its incident data, had 11 structure fires within the township (mutual aid given excluded) that indicated extinguishment (action code 11). The following table (Figure 25) indicates past apparatus and staffing of first alarm assembly.

Figure 23: SOFD ERF Performance

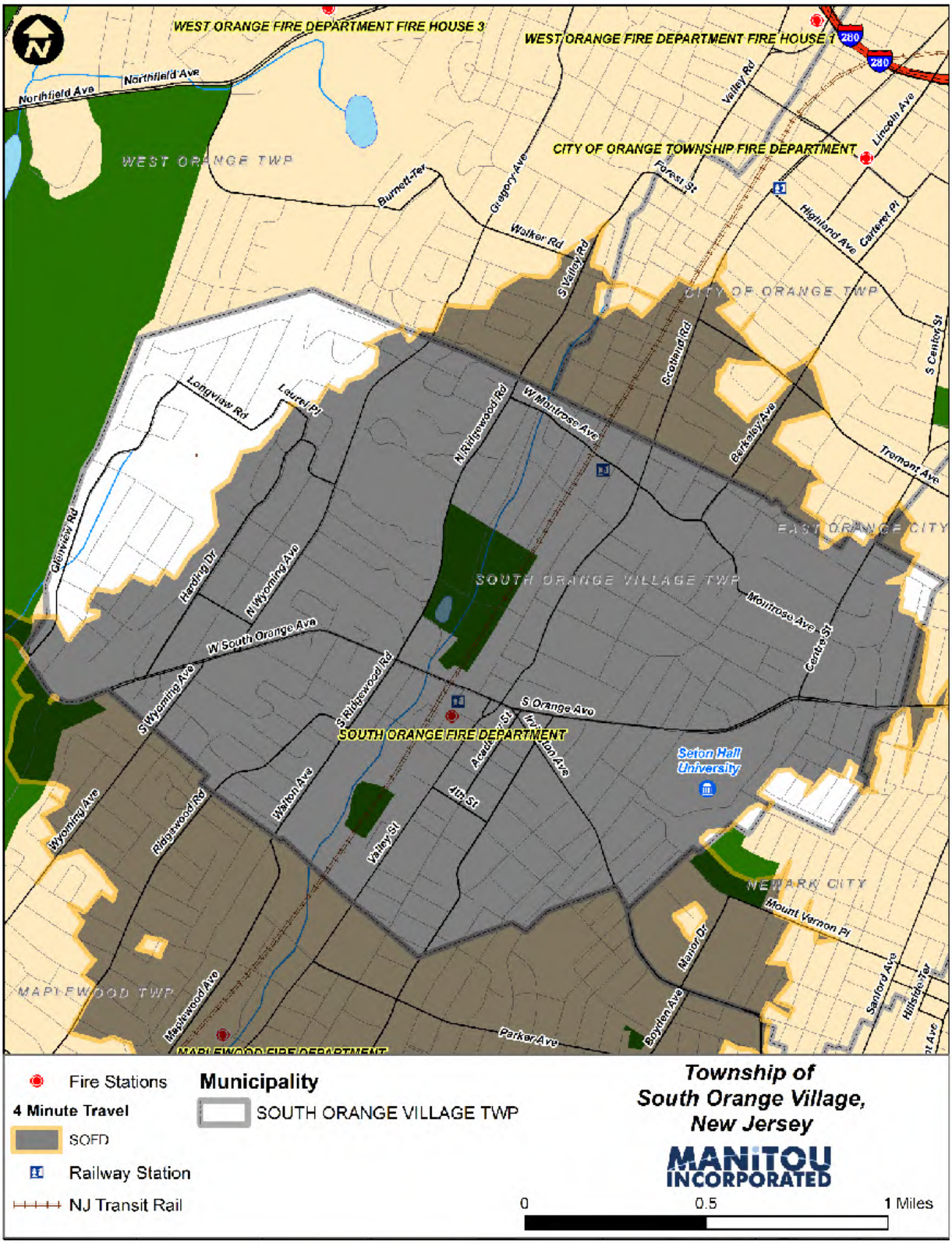
South Orange Fire Department First Alarm Assembly			
Count	**Average**	**Maximum**	**90th Percentile**
Fire Apparatus	3.4	4.0	4.0
Ambulances	0	0	0
Other units	0	0	0
Firefighters	6.55	8.00	7.00
EMTs	0	0	0
Other	0	0	0

Structure Fires (111) with Extinguishment (11), Non-MA: 2013-2015

We are unable to discuss South Orange Fire Department response performance. Their method of timestamping includes estimating arrival times and jotting down times on slips of paper. This was both admitted and witnessed. Perhaps it is no surprise that the 90th percentile performance for 2015 was five minutes.

The figure below (Figure 26) shows four-minute drive-time estimates for SOFD.

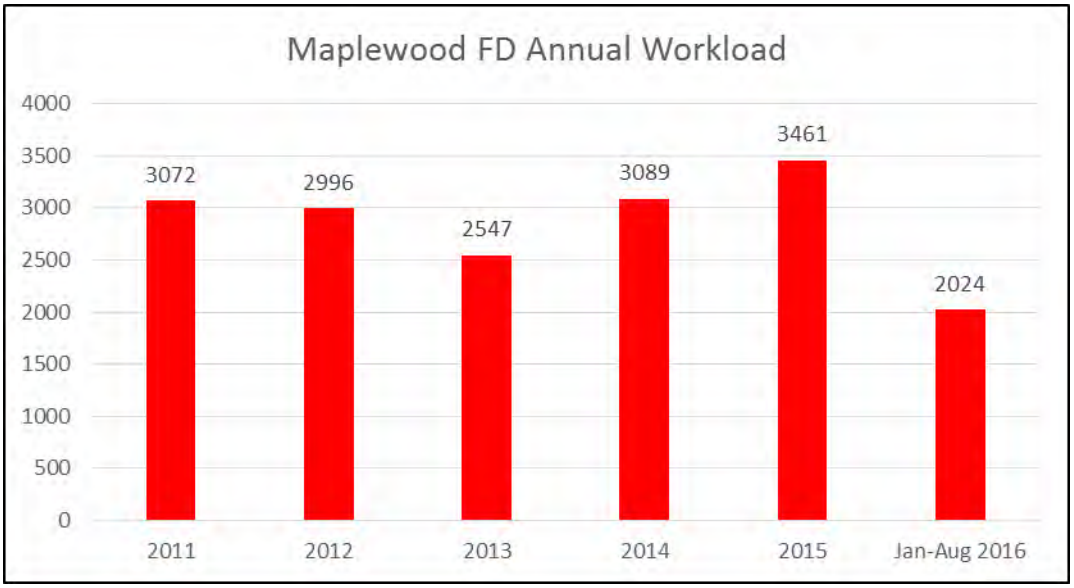
Figure 24: SOFD 4-Minute Drive Time



7.2 Maplewood

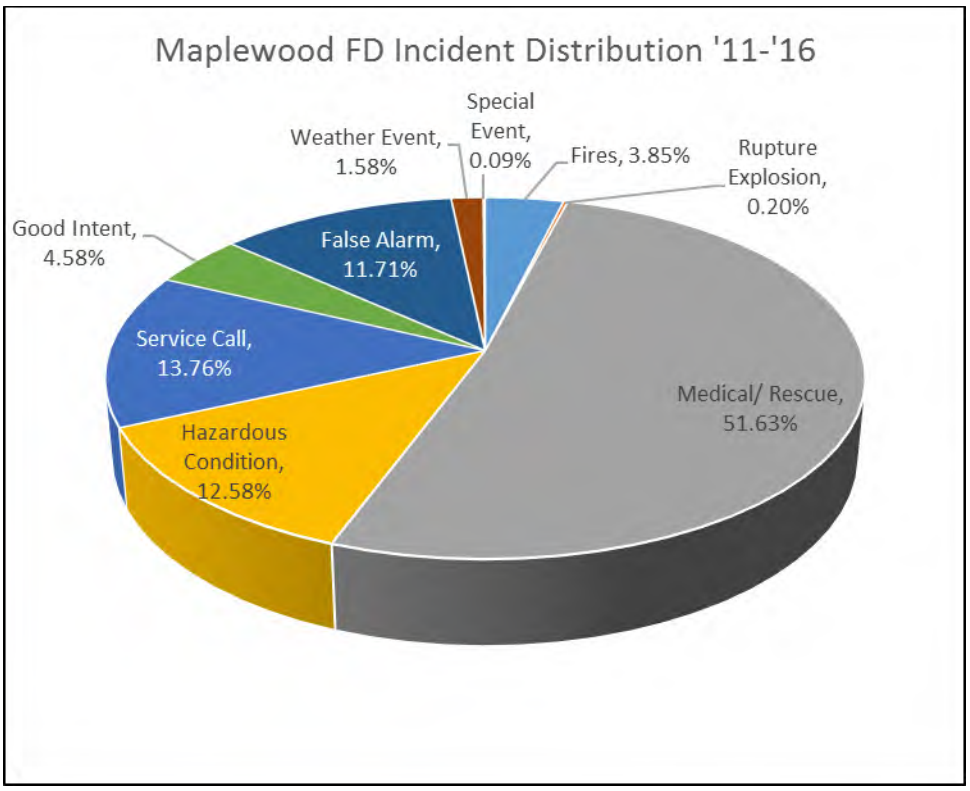
The fire department utilizes Red Alert software to input incident data. This is also utilzed by the dispatch center and, according to a deputy chief, autopopulates some information, specifically timestamps. The annual workload for the Maplewood FD had been decreasing until 2014, when it reversed that trend (Figure 27).

Figure 25: MFD Annual Workload



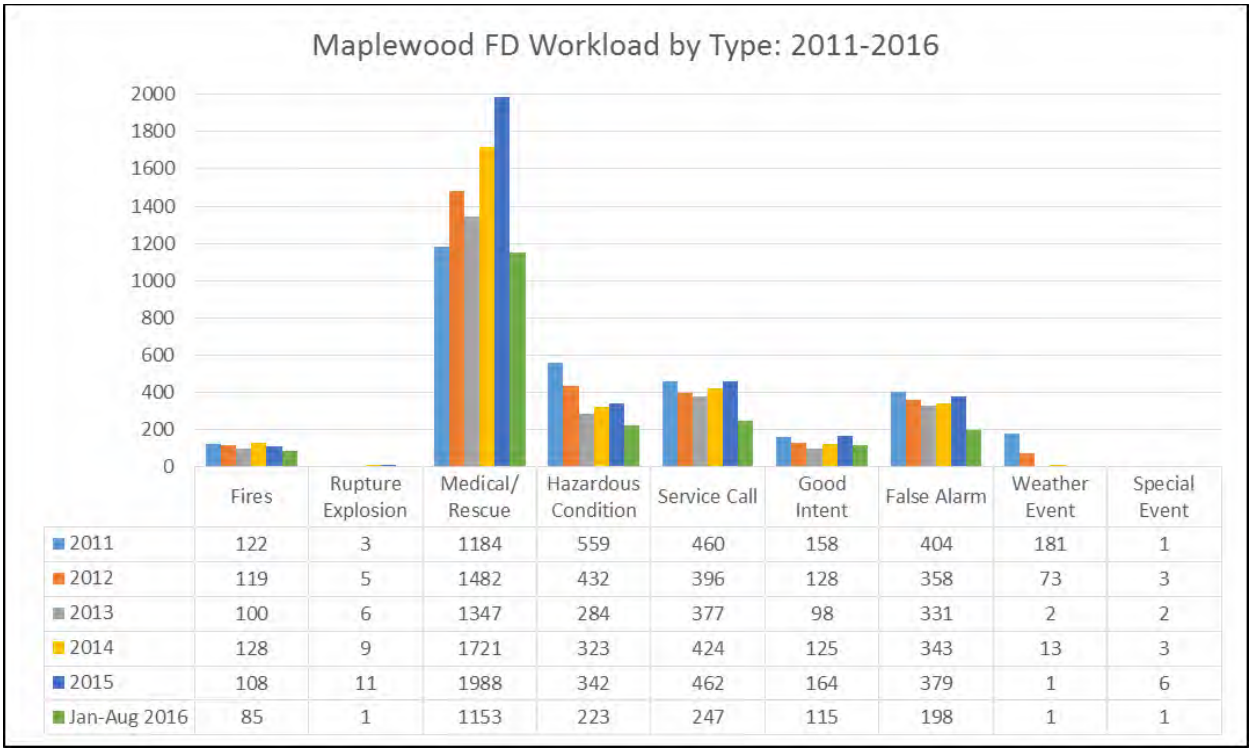
Most of the workload for MFD over the last five-plus years has been responses to medical/rescue type events (Figure 28). This is not uncommon for fire departments that provide emergency medical care on a routine basis.

Figure 26: MFD Workload by type



Medical calls increased an average of 15% per year, while other categories have remained generally stable (Figure 29). The next two highest volume call types are lock-outs at 6% (Service Calls) and wires down at 7.2% (Hazardous Condition).

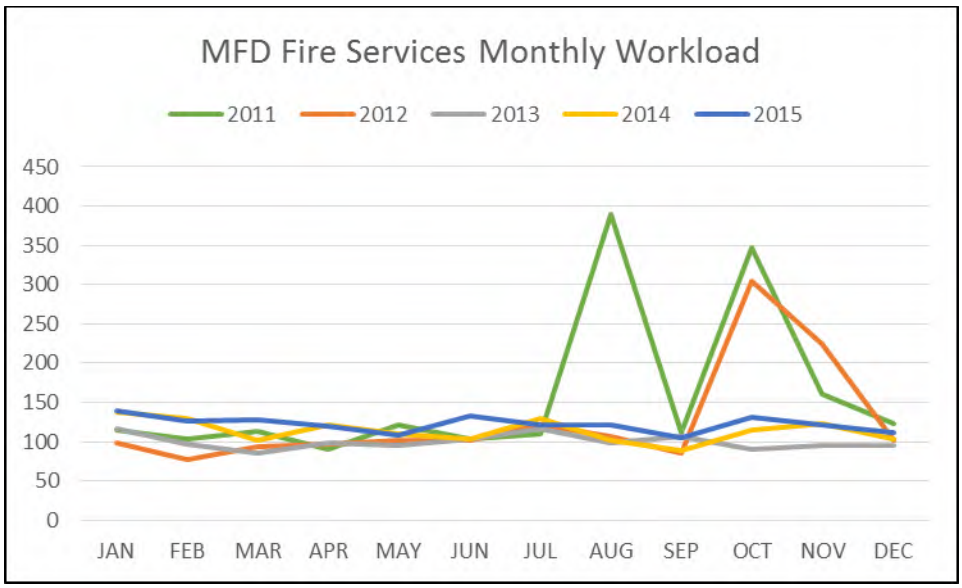
Figure 27: MFD Workload by Type Detail



	Fires	Rupture Explosion	Medical/ Rescue	Hazardous Condition	Service Call	Good Intent	False Alarm	Weather Event	Special Event
2011	122	3	1184	559	460	158	404	181	1
2012	119	5	1482	432	396	128	358	73	3
2013	100	6	1347	284	377	98	331	2	2
2014	128	9	1721	323	424	125	343	13	3
2015	108	11	1988	342	462	164	379	1	6
Jan-Aug 2016	85	1	1153	223	247	115	198	1	1

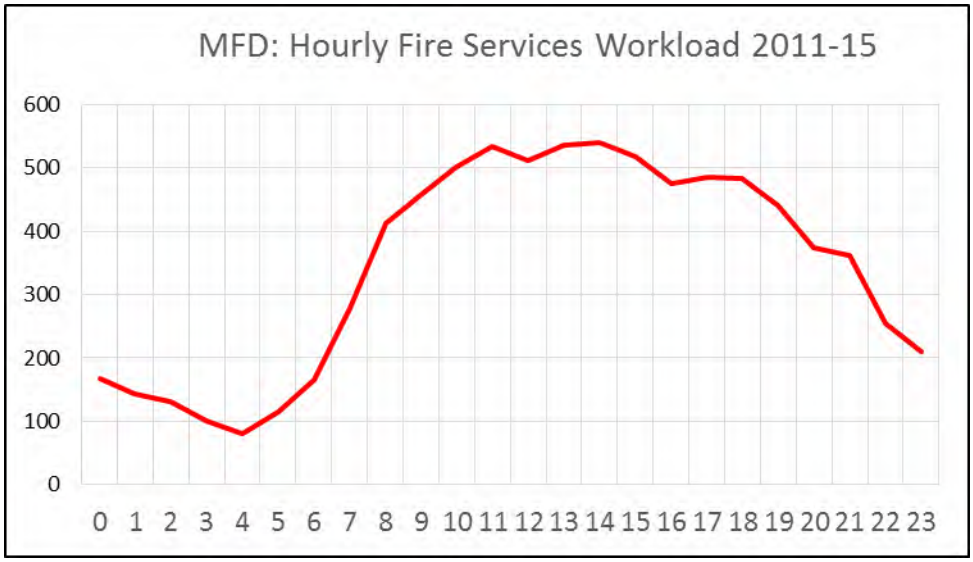
The prevalence of medical/rescue events for Maplewood FD overwhelms the statistical trends. These will be removed from the remainder of this chapter and will be discussed separately. The monthly workload is examined first (Figure 30). While there does not appear to be a seasonal trend, certain weather events created abnormal workload for the department. In August 2011, Hurricane Irene affected New Jersey and two months later, in October, a nor'easter known as the "Frankenstorm" (because it occurred near Halloween) brought a rare event that produced almost two feet of snow and power outages. In October 2012, Hurricane Sandy swept through New Jersey.

Figure 28: MFD Monthly Workload



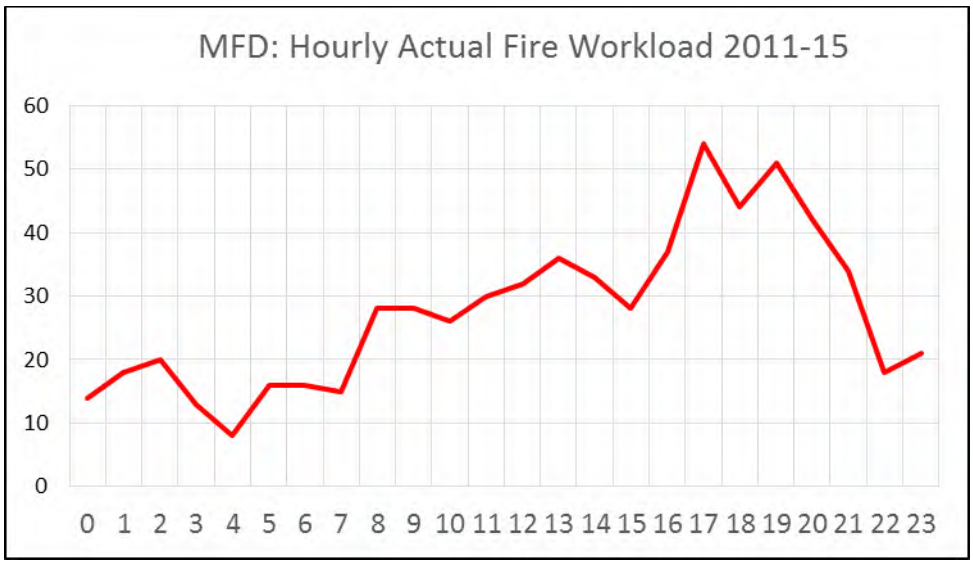
As can be seen in Figure 31, the hourly workload is typical for daytime hours.

Figure 29: MFD Hourly Workload



The most interesting trend was the hours for actual fire occurrence within the Township (Figure 32).

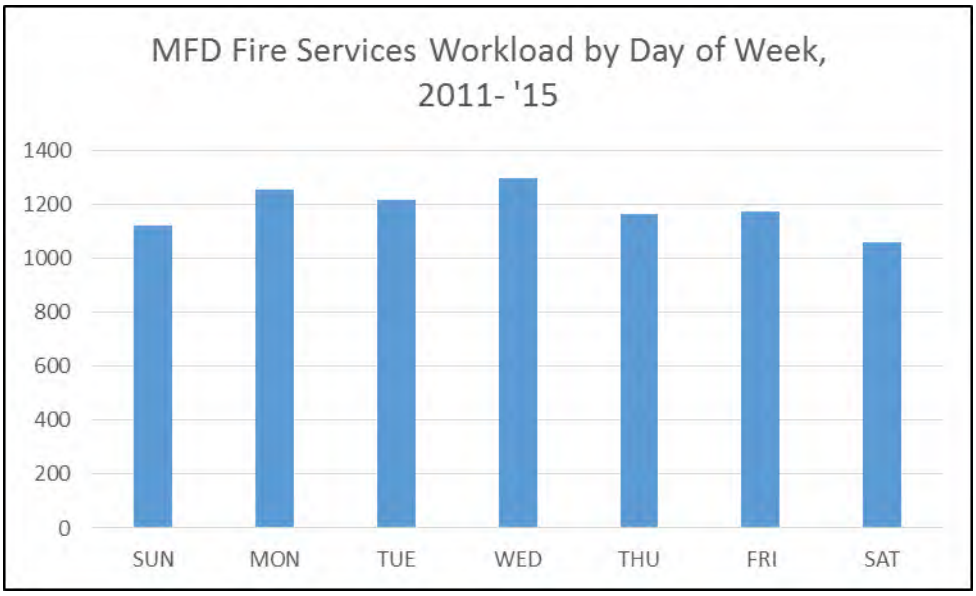
Figure 30: Actual Fire Workload by Hour



While daytime activity did cause an increase in actual fires, fires were especially numerous in the early evening hours. This includes fires due to cooking.

The day of the week workload trend is generally busier during the week most years. The exceptions are the years of extreme weather events, in 2011 and 2012 (Figure 33).

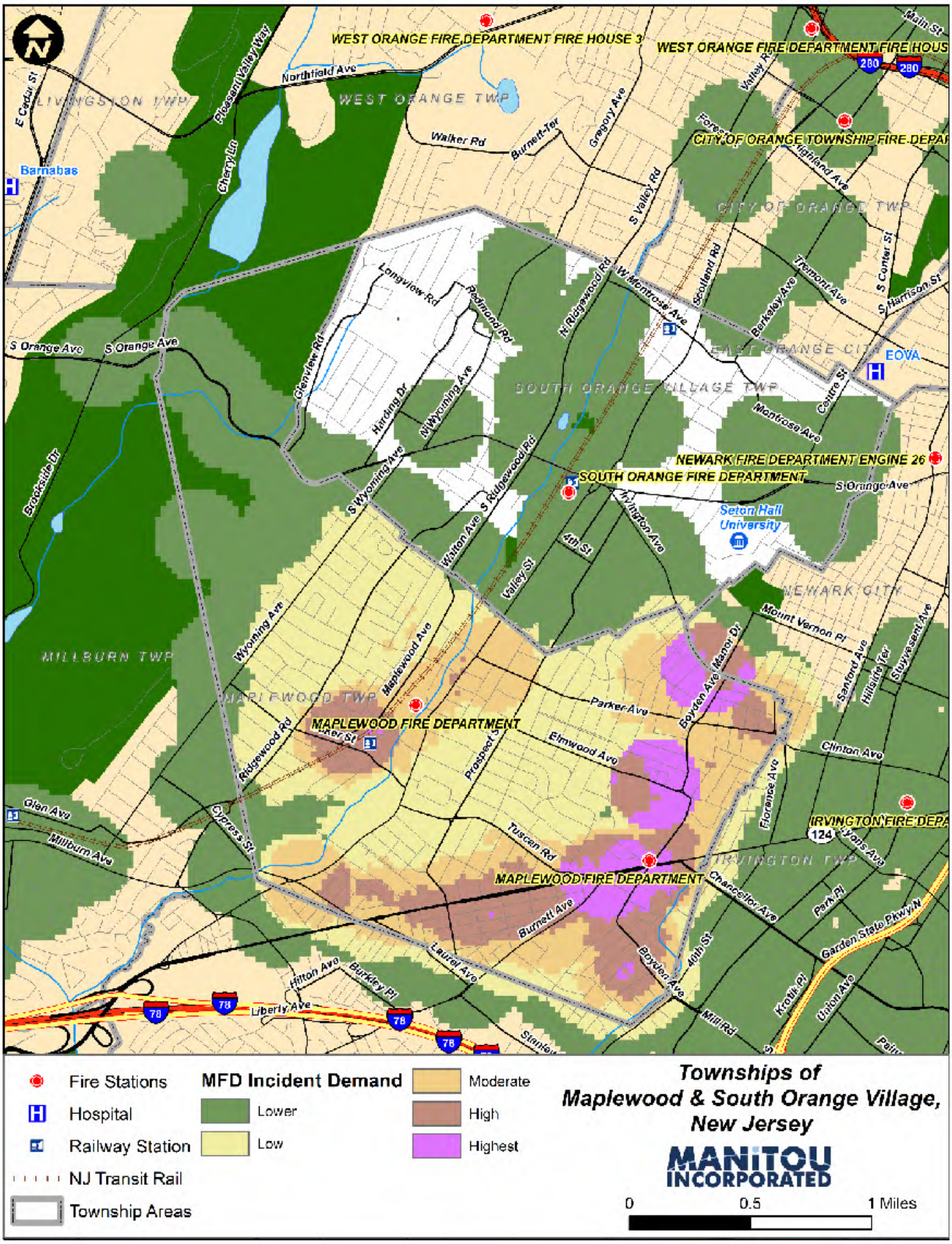
Figure 31: MFD Workload by Day of Week



The workload is not evenly allocated over time, nor is it distributed geographically. The following map (Figure 34) illustrates the total workload volume over the area. Notice the mutual aid into South Orange, Millburn, and Orange, but mainly into the City of Irvington. More

important, note that the fire stations are located squarely within the areas of higher demand and where new commercial and residential development is occurring.

Figure 32: MFD Demand Density



The Maplewood Fire Chief submits a department annual report and within this document is a mutual aid report. EMS mutual aid will be discussed in another chapter. In 2015, Maplewood was a net giver of mutual aid. Only 19 events required outside fire agencies to respond into Maplewood. Most responders were from SOFD and Irvington FD. Maplewood provided most aid to the Irvington Fire Department. As observed in Table 26, mutual aid from outside the township does not significantly impact the Maplewood Fire Department.

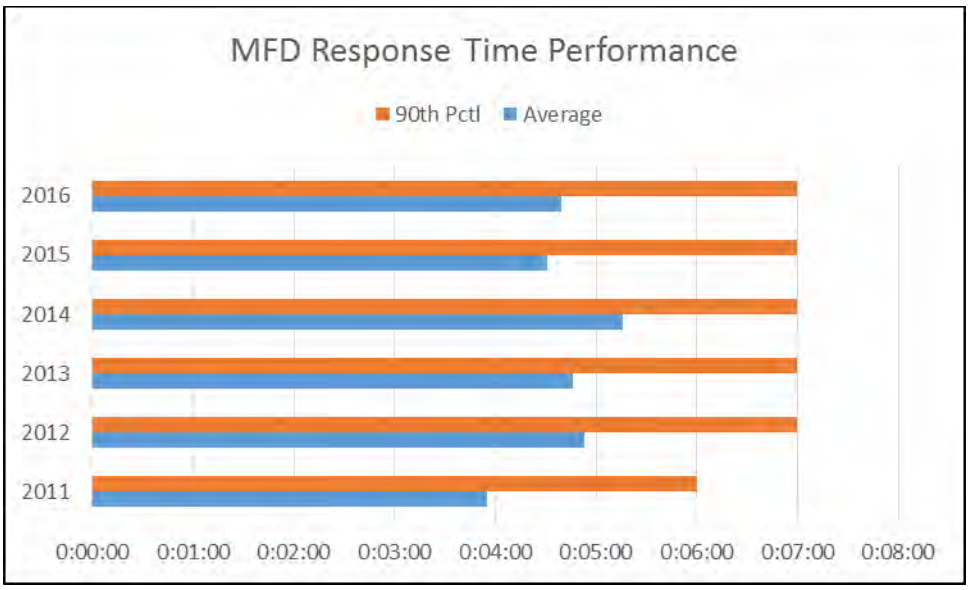
Table 25 MFD Mutual Aid Detail

City	Incidents	MA Pct
South Orange	5	6%
East Orange	2	2%
Irvington	56	62%
Millburn	15	17%
Bellville	1	1%
Orange	7	8%
West Orange	3	3%
Union	1	1%
MA total	90	
MA vs. Overall	3%	

Response Time Performance: The section reports on the response time performance in each department is based upon the submitted incident data. Mutual aid given incidents, as identified by user input, were excluded. Response time is one measure with which a department can evaluate the quality of its service to the community.

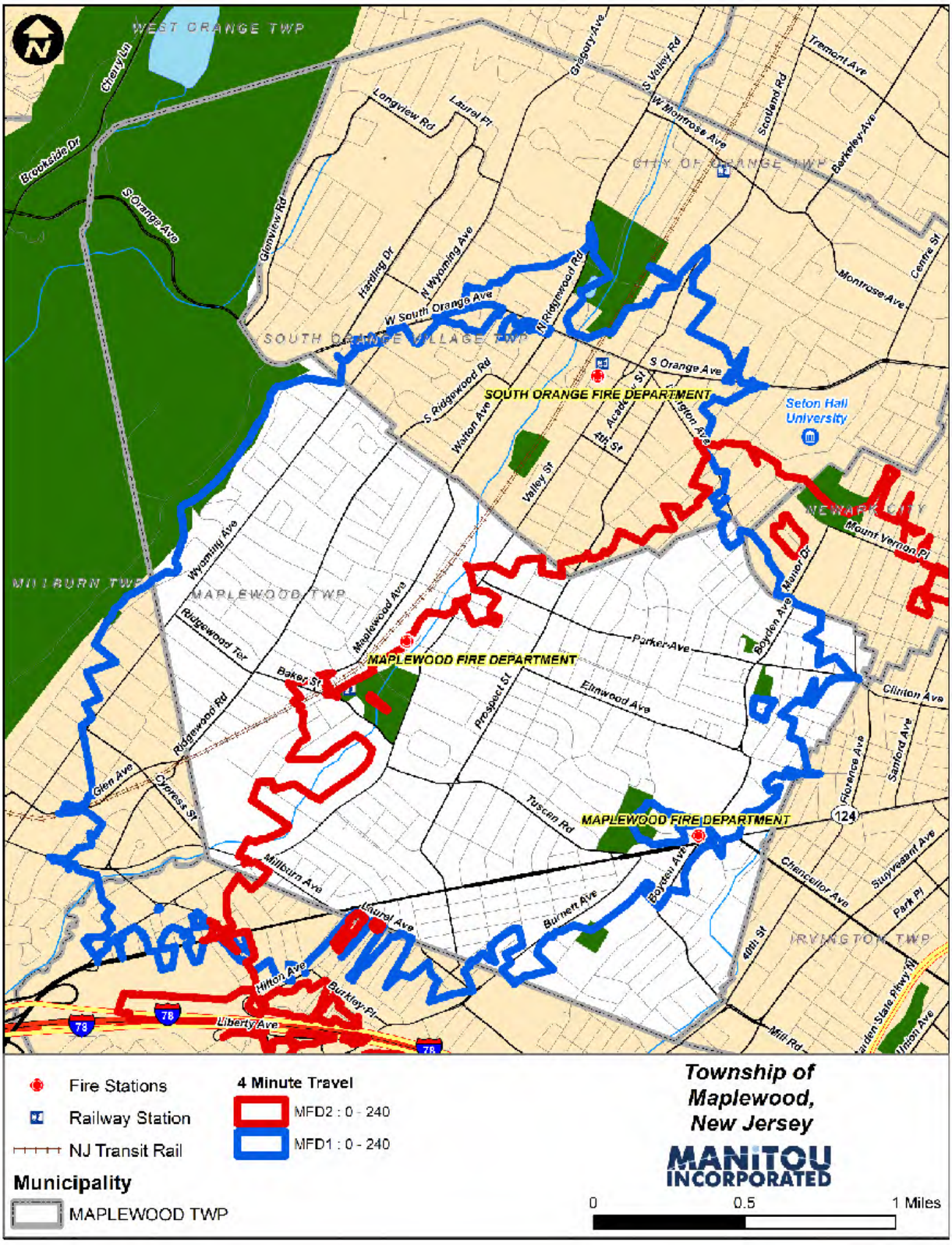
Once again, it was reported that timestamps from REMCS dispatch center auto-populates MFD's Red Alert records management system. These results (Figure 35) are for fire call types only; medical incidents will be discussed in another chapter.

Figure 33: MFD Response Time Performance



While the averages are, for the most part, within the five minute goal, the percentile marks exceed the NFPA guidelines. This is not outside the norms seen by the study team for other departments around the country. Figure 36 below shows the 4-minute drive time from the Maplewood stations.

Figure 34: MFD 4-Minute Drive Time



First Alarm Coverage: For Maplewood, a full assignment is technically eight, including a chief officer. This equals the minimum assembly of personnel under NFPA 1710 at fourteen. However, each engine is staffed with three firefighters at a minimum and, because the engine in Maplewood Station 1 is cross staffed by the ambulance crew, there are times it is unavailable when the crew is on an EMS assignment. The ladder truck is minimally manned with two firefighters.

If the ambulance crew (cross staffed from MFD Engine 1) is unencumbered, then all apparatus would be needed for a first alarm, based upon minimum staffing levels. If the ambulance crew is on an assignment, the collective assembly of firefighters from both townships would drop to twelve. This can adversely affect fire suppression and rescue activities and mutual aid request from another department would likely result.

Maplewood FD, according to its incident data, had 100 structure fires within the township (mutual aid given excluded) that indicated extinguishment (action code 11). The following table (Figure 37) indicates past apparatus and staffing first alarm assembly.

It should be noted that the Headquarters station is not staffed with a company officer. That means that the Deputy Chief is effectively tasked with supervising the crew on the ladder company, or possibly both the ladder and engine. The incremental cost of upgrading a position to an officer rank at headquarters is well worth the gain for improved supervision.

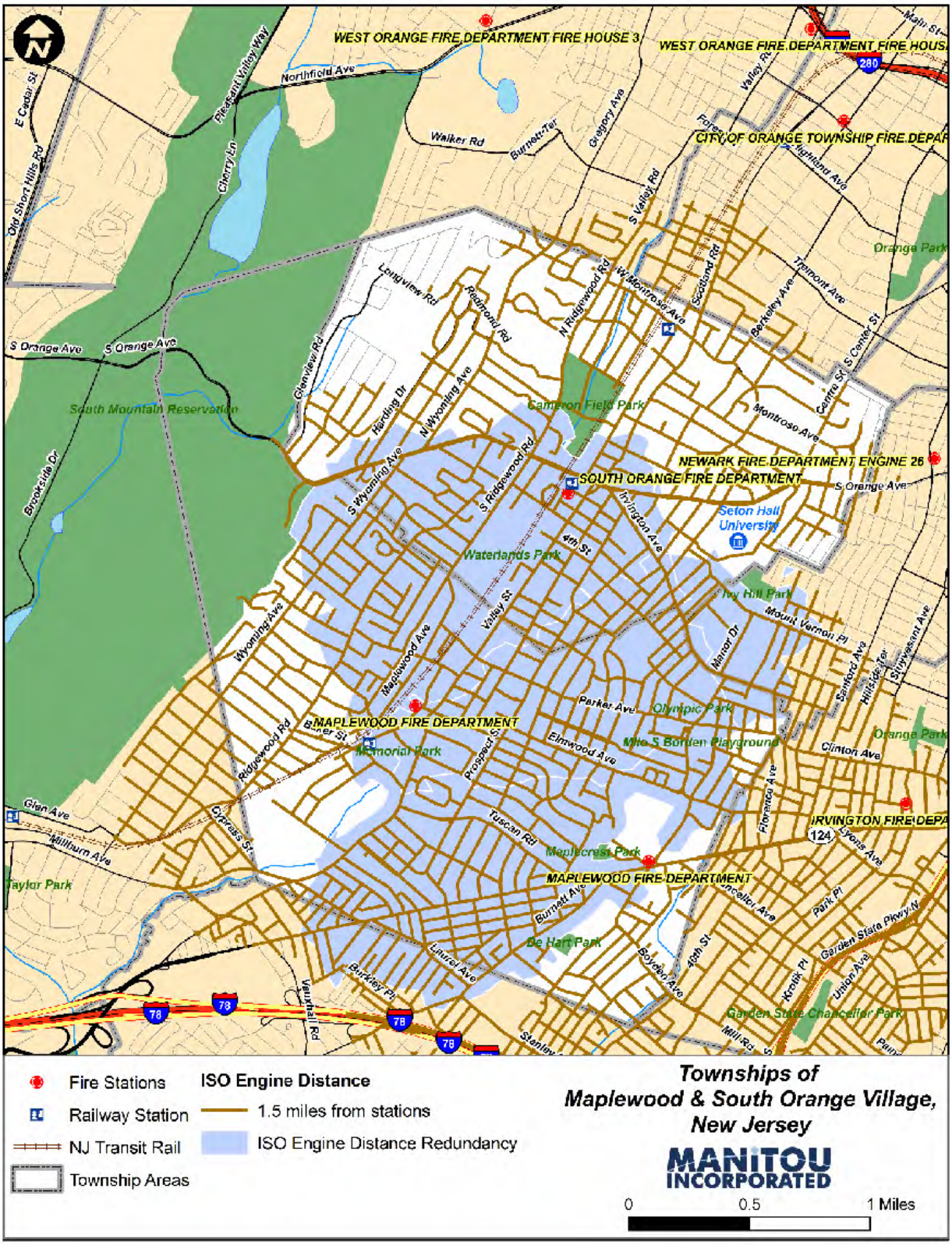
Figure 35: MFD ERF Detail

Maplewood Fire Department First Alarm Assembly			
Count	**Average**	**Maximum**	**90th Percentile**
Fire Apparatus	2.4	9	5.1
Ambulances	0.05	1	0
Other units	0.84	4	2
Firefighters	5.96	16	11
EMTs	0.1	2	0
Other	0.94	8	2
Structure Fires (111) with Extinguishment (11), Non-MA: 2011-mid 2016			

Demand & Risk Coverage: Two types of analyses were conducted in this section. One is based upon travel distance and the other based upon travel time.

Travel distance standards were set by the Insurance Services Office (ISO) many years ago and were based on a study by the RAND Corporation to determine the distance a fire apparatus can travel a level grid street network at 35 miles per hour (mph). The study equated this to a 1.5 mile distance. The ISO partially rates fire protection insurance rates for property owners based on the results of this distance coverage.

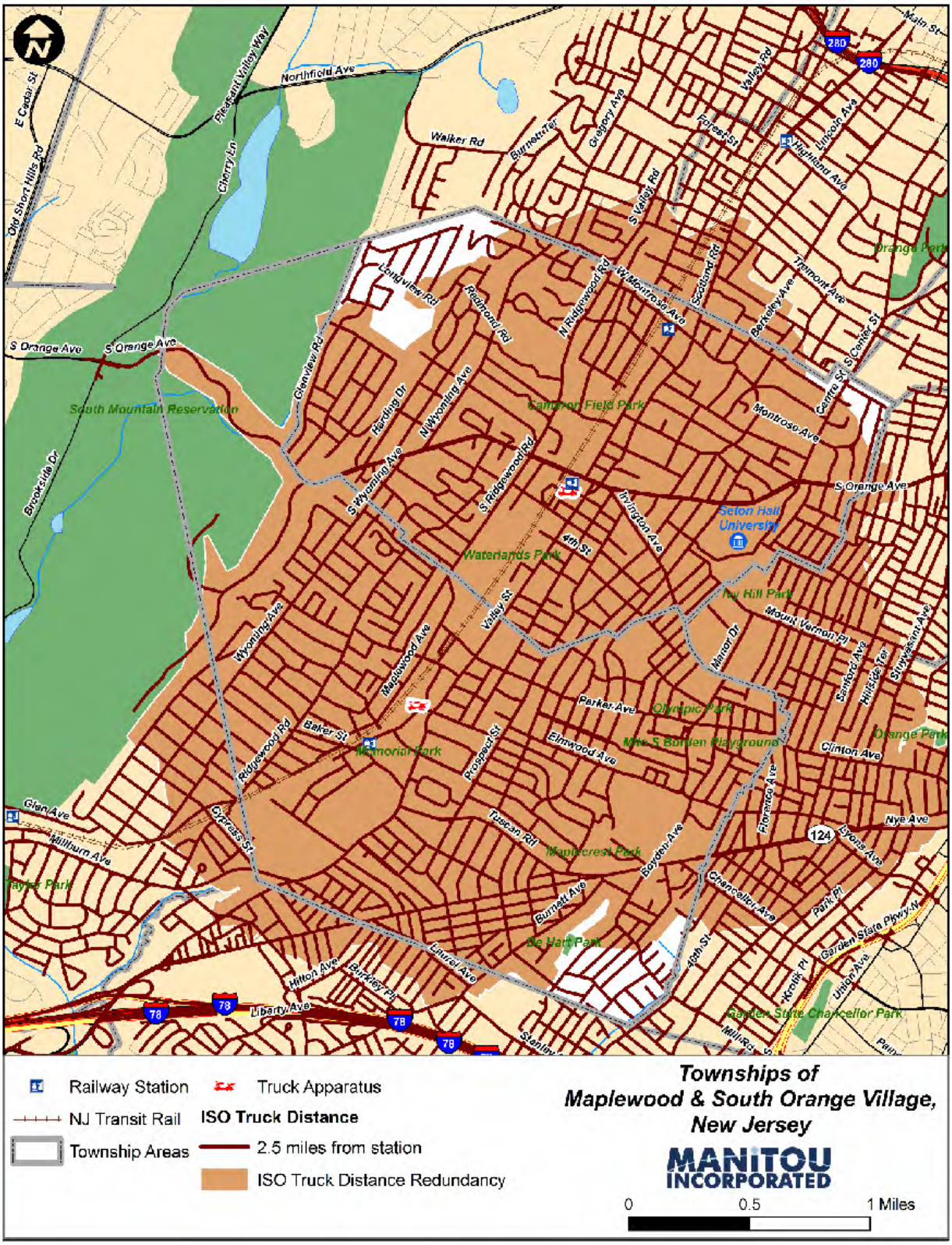
Figure 36: ISO Engine Distance Coverage



The map (Figure 38) shows the areas that are 1.5 mile distant from the South Orange and Maplewood Fire Stations. It can be seen that there is a significant area where coverages overlap. While the entire Township of Maplewood has coverage, the northwest corner of South Orange is outside this distance measure.

The ISO considers ladder trucks as specialty equipment and, because a fire department needs fewer of these than engines, they can be placed further apart. Most departments placed them in areas with multi-story (3 floors or greater) buildings and near industrial or large square footage facilities (Big Box stores). The ISO measures a 2.5 mile distance from the station that houses them. South Orange and Maplewood both have ladder fire apparatus. Maplewood FD houses its ladder apparatus in Station 1. While both Townships are covered, a significant area of redundancy is present across both Townships (see Figure 39).

Figure 37: ISO Ladder Distance Coverage



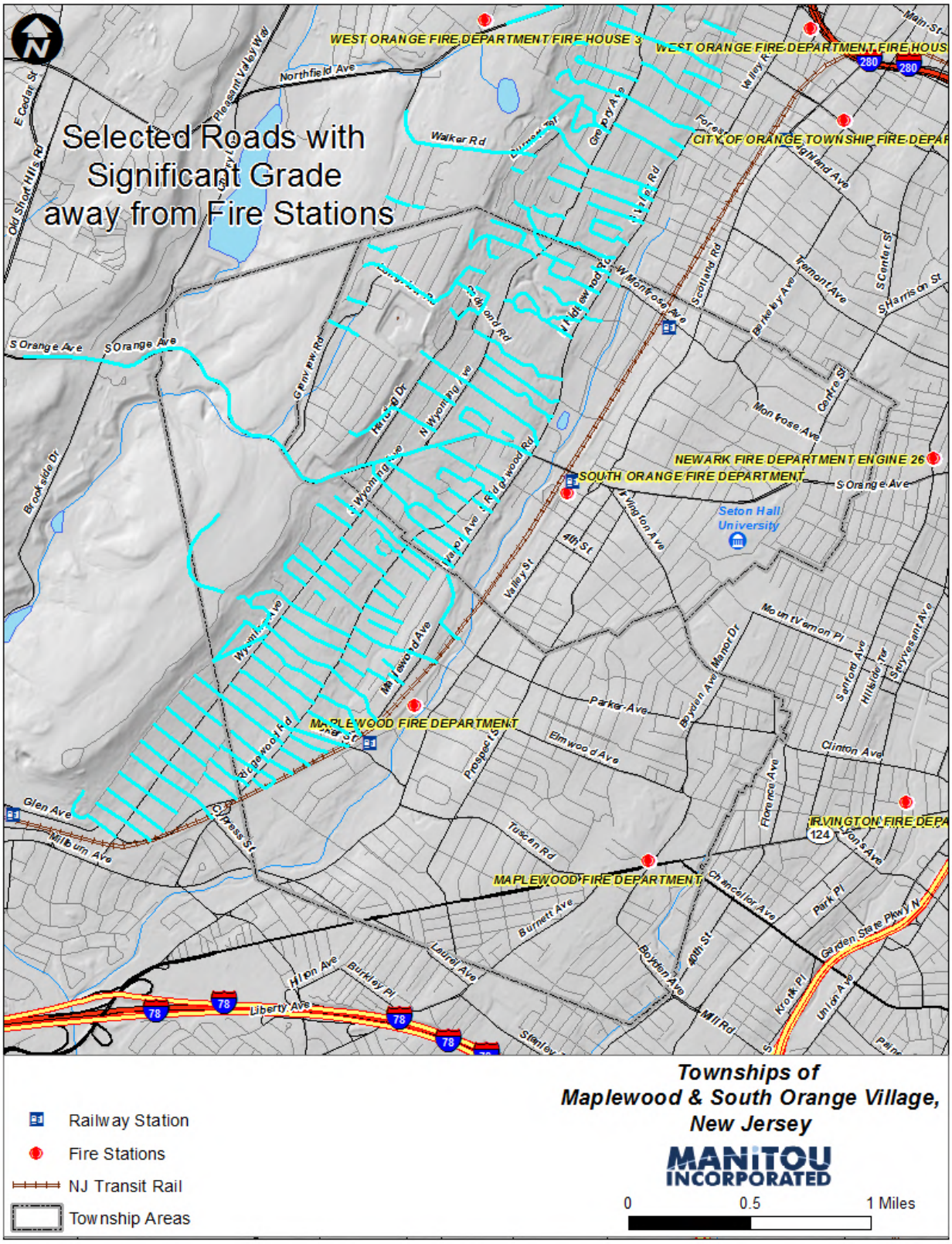
While these areas of redundant coverage do not negatively affect the ISO scoring, they don't add credit either. The ISO has recently adopted an alternate method of evaluation based upon actual, verifiable performance timestamps. In addition, ***automatic*** aid distances can be considered for coverage.

Response time performance benchmarks: The National Fire Protection Association (NFPA) has established response time performance benchmarks for fire departments response to an emergency. The NFPA Code Section 1710 is an industry standard for paid/career fire departments and describes the requirements for delivery of services, response capabilities, incident management, and strategy. This Standard includes the following benchmarks related to call receipt and processing time, turnout time, and response (travel) time:

- Call receipt and processing time (time from 9-1-1 call pick-up to dispatch of an assignment) of 30 seconds;
- Turnout time (time from dispatch to being enroute to an assignment) of 80 seconds for fire suppression calls and 60 seconds for EMS calls.
- The fire department's fire suppression resources are deployed to provide for the arrival of an engine company within a four-minute travel time, and/or the initial full alarm assignment within an eight-minute travel time, to 90 percent of the incidents.

This next section examines the coverage of jurisdictions from the respective fire stations, using the current street network and speed limits. One-way street directions were respected. Time penalties were applied to departing the station, turns, intersections, speed humps, and at-grade crossings, if present and identified to the study team. While the railroad trestles are a concern for the fire department, they have specified apparatus that meet the height requirements and, as a result, they are longer than usual and require slowing at uneven surfaces and turns. In addition, the topography of both townships' westward approaches to South Mountain is a significant grade. Speed limit information for these streets was reduced by 5 mph. This was based upon local firefighter (SOFD) knowledge of speed during hill climbs with a fire truck.

Figure 38: Significant Grades (steep hill)



This travel time modeling does not account for adverse weather, construction, detours, significant congestion, or other anomalies that occasionally impede the normal flow of traffic in the communities. The following maps (Figures 41 & 42) model the extent of travel time from the Maplewood and South Orange fire stations. It can be seen that the station locations provide excellent first-due coverage, not only for their respective townships, but can also reach parts of their neighbor's jurisdiction within the recommended timeframe.

Figure 39: Travel Time Capability Extent

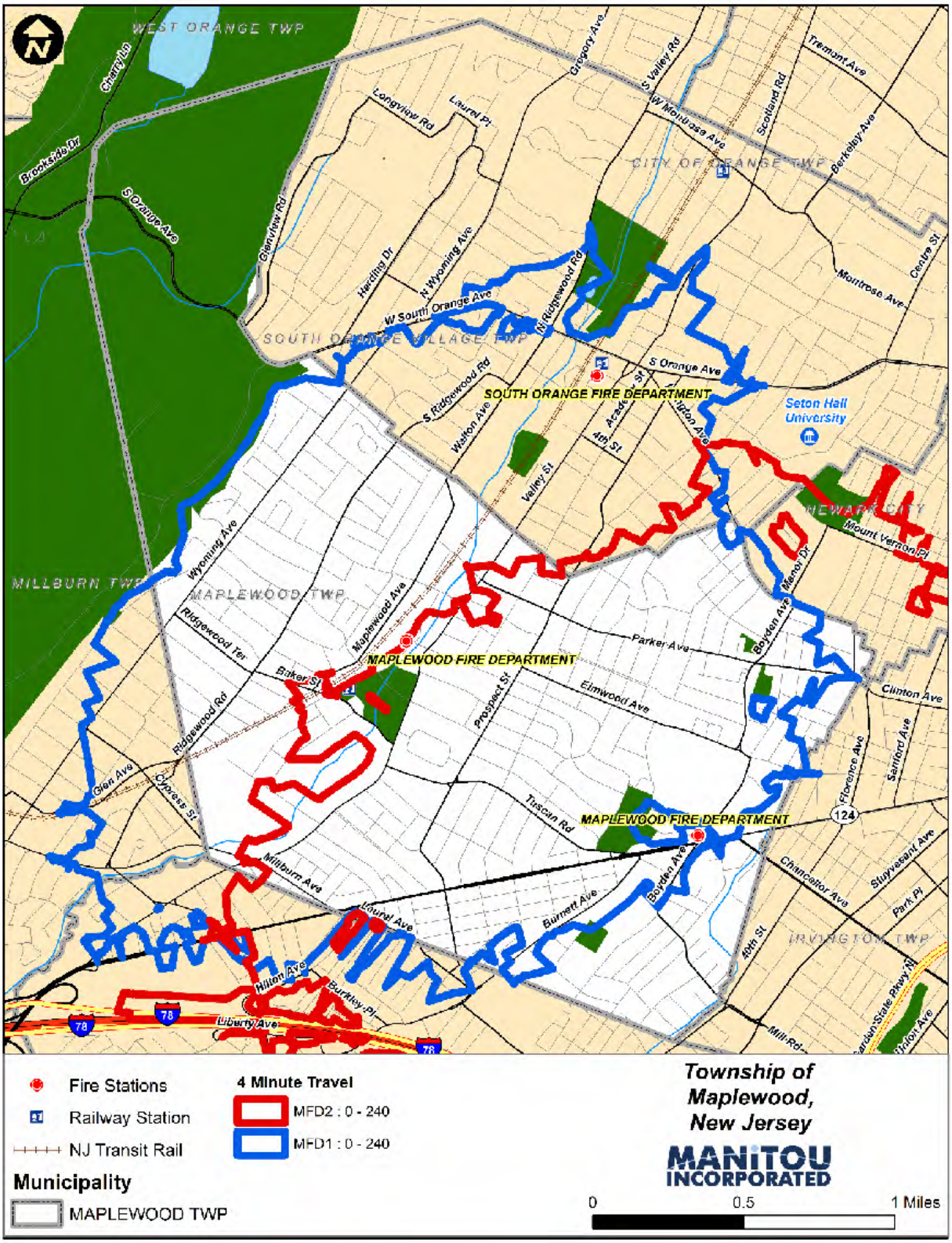
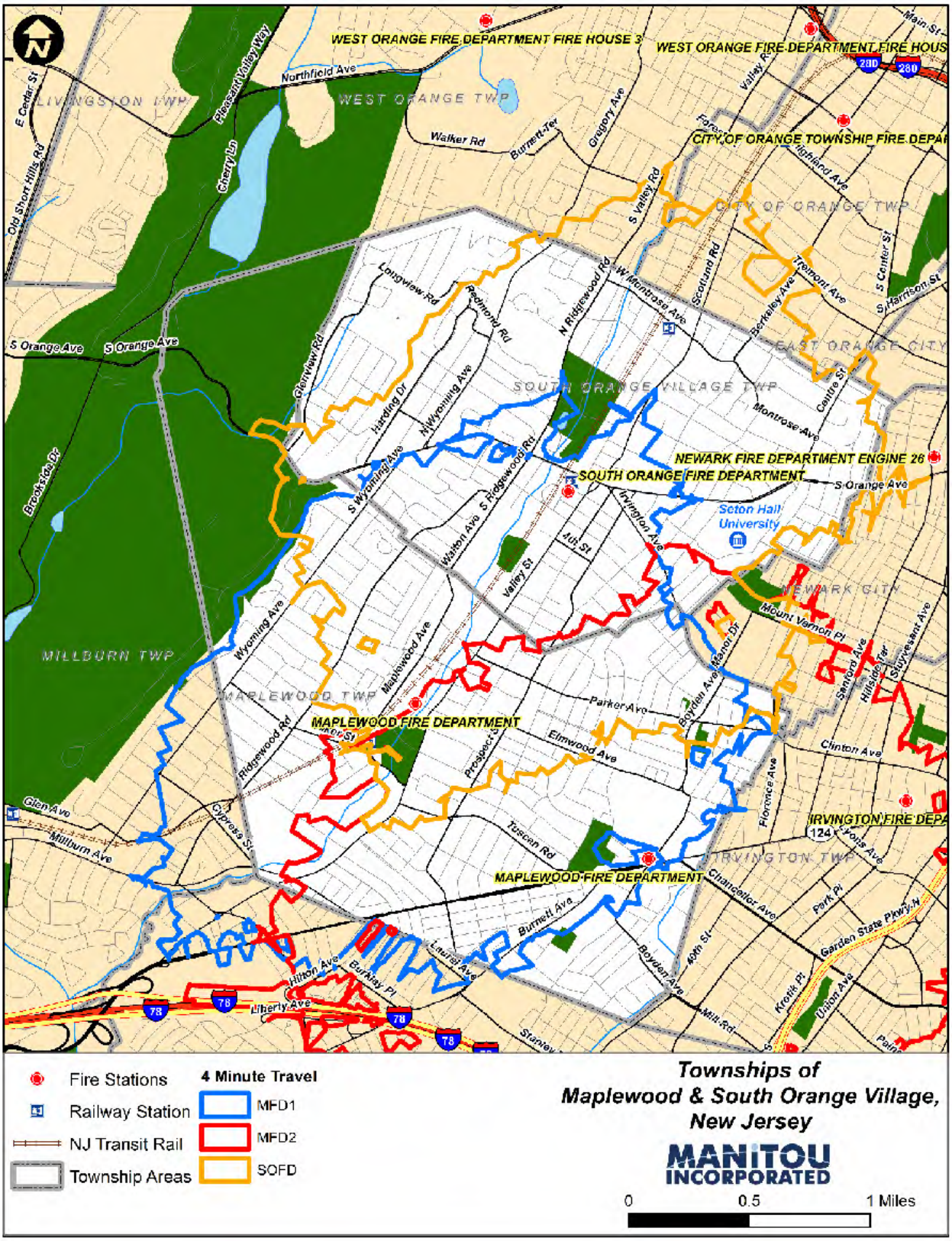


Figure 40: Travel Time Capability Extent



It is quite obvious that Maplewood Fire apparatus can reach 100% of the incident demand from its fire stations within a four-minute travel time. South Orange can reach 94% of its incident demand. Based upon this information, there is not a need for additional fire stations in either community.

While there is overlap in coverage for first-due apparatus, this is advantageous when incidents occur concurrently and neighboring unit needs to respond. Additionally, this is first-due coverage. When a structure fire occurs, multiple apparatus are needed for fire ground operations, as explained in the next section.

8.0 Areas for Operational Improvement

Previous chapters discussed each Department individually and considered workload, response times, and other components of service levels and demands. Now that we have discussed the individual operations of both the SOFD and MFD, we are prepared to make recommendations regarding areas of increased cooperation. There are numerous opportunities that will be explored in this chapter.

8.1 Emergency Response

The response to emergencies currently varies between the SOFD and MFD. Because the two entities operate independently, they respond to an emergency with their own resources. For a reported structure fire, SOFD would respond with all their on-duty resources, a minimum of six personnel on engine, ladder, and command vehicles. MFD would respond with one or two engines, a ladder, and a command vehicle, with as few as eight personnel (six if the ambulance was on a call).

On arrival, if additional support is needed, a "Signal 11" is called. The call for a "Signal 11," which brings two additional engines to the scene of an emergency, is used in both communities. However, these additional resources are not called until the presence of a working fire is confirmed by an emergency responder on the scene, or until dispatch is in receipt of multiple calls. This introduces a delay.

There are a number of recommendations we would suggest to improve the efficiency and effectiveness of services. At present, both departments operate as separate and distinct entities. We strongly recommend that, at a minimum, the two organizations undertake a program to functionally consolidate so they undertake daily operations as a single, integrated entity.

Functional consolidation can range from coordinating emergency response to integrating administrative functions. We suggest that these recommendations be pursued without regard to decisions on formal consolidation.

We will offer our recommendations in this area in ascending order, beginning with the simplest and moving progressively toward deeper levels of integration. The concept of shared services, already used between the two communities, offers a precedent that should be extended to fire services as well.

The two Departments should begin responding to each other's alarms on an automatic basis. For Signal 9's (report of smoke in a building) or high life hazard automatic alarms, South Orange should send an engine to Maplewood, and *vice versa*.

In addition, staffing could be managed jointly; that is, by managing resources collectively, the need for hiring back in the event of a mutual aid response may be reduced. For example, if one

Department went on a mutual aid call, the coverage provided by the other could potentially avoid the need for call-backs. However, for the most effective utilization of resources, the two agencies should merge and operate as a single entity. This enables maximizing cost savings and greatly increases efficiencies in operations. We will fully discuss these later in the report.

8.2 Dispatch and Communications

At present, SOFD self-dispatches, with backup provided by the SOPD. MFD is dispatched by REMCS, a third-party dispatch agency. Moving SOFD dispatch to REMCS will allow all resources to be managed from a single point and greatly enhance the support to personnel operating in the field, with a trained dispatcher dedicated to managing the incident. South Orange should contract for fire dispatch with REMCS.

In addition, REMCS provides medical pre-arrival instructions. This is the desired standard of care for medical incidents. Similarly, for fire and other emergency calls, the ability of a dispatcher to remain on the line with a caller to elicit additional information or provide instructions is standard practice. This capability is lost by relying on a firefighter, acting as a dispatcher, who must hang up the phone to respond to the call.

Lastly, the SOFD does not record response time information from actual performance (usually indicated by a unit announcing “responding” or “on scene” to a dispatcher. Because no dispatcher is at fire headquarters, these times are not captured, and personnel estimate arrival times are based on the rough distance from headquarters.

Plan to strengthen incident scene communications capabilities: This recommendation would require that South Orange and Maplewood acquire radios that would operate on a common set of frequencies. There are two options for this: in the short term, sufficient portable radios and Fire ground operations should take place on a common frequency. Additional radios could be purchased to permit all personnel to have access to all frequencies. Multi-band radios are available that would permit achievement of this capability with a single radio.

Longer-term decisions concerning retention and utilization of existing licensed frequencies could be made to permit their most effective use.

Statewide Digital Radio System: The State of New Jersey has developed an interoperable radio system utilizing digital technology. Localities are given the option of utilizing the system, but must purchase mobile and portable radios and upgrade necessary infrastructure, such as receiving sites or transmitters, that would be necessary to provide desired levels of coverage within their communities.

South Orange has a capital project in progress to purchase radio infrastructure and subscriber units to enable implementation of the New Jersey Statewide Interoperable Communications System with the Town. Among other things, the specifications call for upgrade of dispatch

positions at SOFD and SOPD. In addition, the SOFD is identified for purchase of 23 portable (hand held) radios and 10 mobile (vehicle-mounted) radios. Some of these radios will be equipped for dual-band operation, enabling them to communicate with neighboring jurisdictions on the VHF band. Importantly, the NJICS radio system utilizes digital transmission in the 700 Mhz band.

Maplewood has not identified funding for such an upgrade, but the MFD has expressed a desire to move onto the statewide system. For several years, they applied for an Assistance to Firefighters Grant from the Federal Emergency Management Agency. This was part of a three-Department effort to purchase equipment to enable migration to the statewide interoperable radio system. These grant applications were unsuccessful. Maplewood's systems are over 15 years old, which suggests that replacement should be considered.

As South Orange proceeds with its project, planning for potentially sharing infrastructure and facilitating interoperability should be incorporated. It is possible that costs of additional infrastructure could be quite reasonable, given the relatively small geographic area being covered, as existing or planned sites could possibly serve both communities.

In addition, if fire dispatch functions are delegated to REMCS, the cost of providing a new dispatch console for the SOFD can be avoided. We also understand that REMCS is upgrading equipment to operate on these channels.

South Orange should adopt Red Alert as its records system to allow full interoperability with Maplewood. This system also manages staffing.

8.3 Medical First Responder

The intent of medical first responder services is to permit rapid intervention in the case of a medical emergency. The primary advantage of providing this service is the potential for fire services to arrive more quickly than an ambulance in life-threatening cases. Provision of oxygen, CPR, bleeding control, or other interventions can begin rapidly. Additionally, having additional medically-trained personnel on the scene of an emergency permits improved treatment through the ability to initiate CPR or remove a patient more quickly. As responders to vehicle accidents and other traumatic events, firefighters are often on the scene of incidents where medical assistance is needed.

The SOFD does not provide medical first responder services. The SOPD does carry Automatic Emergency Defibrillators and are dispatched to critical incidents. The provision of EMS first responder duties is fairly common and well accepted within fire services. The tradeoff of being unavailable to provide response to fire or other emergency duties because companies are providing this service is minimal, especially given the comparatively low call volume and utilization of SOFD resources.

We believe that medical first response policy should be unified across the communities, with a goal of providing trained personnel on the scene of high acuity (life threatening) medical emergencies.

We understand that the SOFD labor agreement no longer requires that personnel maintain these Emergency Medical Technician certifications. This requirement should be reinstated to assure that a minimum of two EMT-trained firefighter personnel are on duty at all times.

8.4 Administrative Shared Services

Training and Fire Prevention are two areas where there can be gains in efficiency and effectiveness through sharing services.

Maplewood currently has a high-functioning administrative infrastructure. Consideration should be given to ways in which some administrative tasks, such as training administration and fire prevention recordkeeping, could be performed jointly.

During the course of our study, the SOFD has begun entering training records into the software owned by the Department. However, maintaining two separate training programs across the agencies is duplicative. In order to increase the effectiveness of working together, the Departments should merge their training programs. The programs should be administered by Maplewood, as they have a dedicated daytime staff position for this responsibility. The current arrangement, where a South Orange officer is assigned to training while on shift can continue, with that person serving as liaison.

8.5 Commentary on Essex County Mutual Aid System

The Essex County Mutual Aid System is organized under New Jersey law (NJSA 52:14E-14 and NJAC 5:75A-2.2). While the system could have been regarded as progressive when it was first established, its arbitrary limitation on the amount of apparatus responding from any single community delays the provision of needed resources when the closest resources are not utilized.

We understand that rationale behind this rule, as many communities incur overtime expenses whenever aid is provided to another community. However, some larger fire departments provide additional resources routinely. In fact, such practices have been very effective, and are credited with helping to control major emergencies more quickly and effectively by getting help to the scene sooner.

We should emphasize that the existing mutual aid system appears to operate effectively; however, there is room for greater integration. In particular, there should be a goal of assuring that a standard minimum complement of personnel and equipment respond to a reported structure fire. The sounding of a “Signal 11” is accepted as the initiating event for mutual aid, but the delays inherent in this threshold cause unnecessary delays in help arriving. Additionally,

the policy of small departments, to send only one piece of apparatus, means that resources that could be used on an actual incident are held back for reasons of providing coverage to their own community.

However, there are a number of impediments to this, including political resistance to "subsidizing" other communities, splintered responsibility for communications, and a lack of radio interoperability among all departments.

Although it is outside our scope, we believe that regional management of resources could produce gains in efficiency and cost savings for smaller departments.

8.6 Conclusions

As should be evident, we believe that the two fires services are good candidates for consolidation. The next chapter discusses alternatives and concerns in any consolidation scenarios.

9.0 Consolidation Options

The most ambitious means for collaboration between the two departments would be to fully consolidate into a single department. The process and options for consolidating entities from multiple municipalities is complex. While different cultures and differences in operations will pose challenges, with the continued spirit of goodwill between elected officials in the communities and careful and sustained attention to management, a consolidation is possible and can result in enhanced effectiveness and some significant cost savings.

We must restate that both departments are small, and they staff with prevailing industry practice for the region. This means that neither department has sufficient staffing to meet widely accepted minimum staffing for structural fire response. The next sections discuss current conditions and consolidation scenarios, along with legal issues.

Both townships enjoy the benefits of well located fire stations, given the community risk and incident demand profiles. Coverage by travel time and ISO recommended distances provide a high level of protection. Neither department is in need of additional resources in stations or apparatus.

There is redundancy in coverage within the current deployment. Options to reduce apparatus, stations, and staffing have been evaluated to create an efficient and comparable joint effort in the suppression of the fire threat that currently exists in the town and within the near future development.

The consolidation options presented in this chapter should be pursued after the recommendations in the previous chapter are in progress.

9.1 Commentary on Response Coverage

Before beginning discussion, we consider high-level issues surrounding a consolidation alternative. Several options for a joint fire agency deployment strategy are provided in an effort to provide quality, efficient coverage to the citizens of both townships, yet realize a cost saving, if possible. Some of the obvious and immediate benefits are the ability to share staff resources and cost of procurement of equipment and apparatus.

Although we discuss several alternatives, some are evaluated only for issues of completeness. We were given direction at the outset that no stations could be closed.

The first issue is the number of pieces of front-line apparatus staffed by a consolidated organization. At present, both township fire departments operate a ladder apparatus staffed with a minimum of two firefighters. It was noted that there was significant redundant coverage at the ISO 2.5 mile distance guideline, and certainly within the eight-minute travel time for a first alarm assembly. It was also noted that the NFPA recommends at least one ladder truck for a first alarm.

While either the South Orange station or Maplewood Station 1 would provide adequate coverage generally, the study team recommends Maplewood Station 1. It can reap the ISO rating benefits, through coverage of the south part of its township in 2.5 miles, which a ladder truck from South Orange cannot. This is an area of high risk properties.

While it is true that other nearby municipalities may have a ladder truck that could reach a first alarm within the study region, in 2.5 miles or an eight-minute travel time, it's unlikely that they would agree to an automatic aid agreement without remuneration in monies or similar in-kind services when needed. In addition, it is likely that multiple department agreements would be necessary due to the distance.

The spare ladder apparatus should be retained as a reserve, in case of mechanical issues, or be rotated into service to extend the life of both.

Reduce stations: It was seen in this chapter that redundant coverage exists between stations and it was also explained why, for first alarm assembly, this was not necessarily an area of concern. There is a cost to operate stations by themselves. When apparatus and staff are added, it is not insignificant. We evaluated the possibility of closing a fire station.

While it would be possible to provide reasonable response times with the elimination of one station, (Maplewood Station 2 or Station 1), we did not see this as feasible given the size of the communities and concerns about increased response times, even in relatively small geographic areas.

9.2 Consolidation Deployment Scenarios

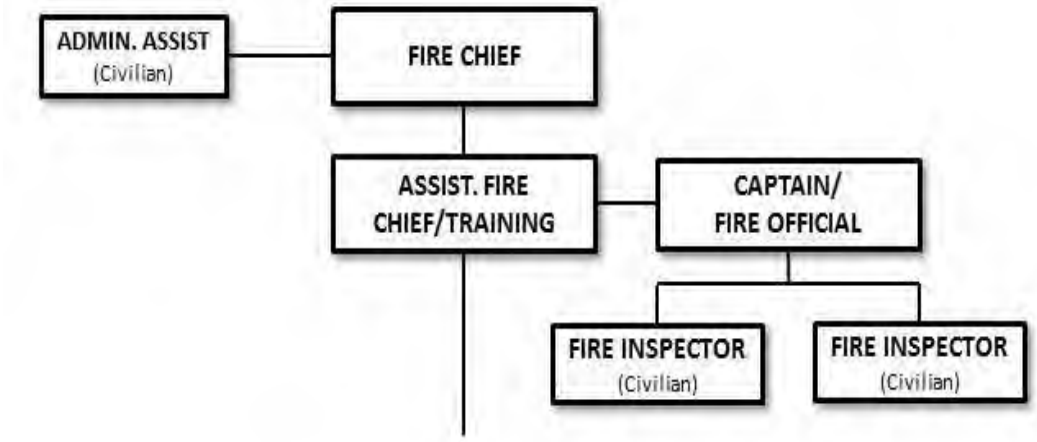
To begin discussion, we evaluated administrative and day-time staffing of a combined organization. There are important differences between the two departments, which require some change in the way training, prevention, and administration are provided. Most obviously, there would be a need for only one Fire Chief position in a combined agency.

We present three scenarios for staff deployment. These all build on the common recommendation for the administrative staffing model. This model, shown in Figure 43 below, calls for retaining one Fire Chief position, elevating the current administrative deputy chief position in Maplewood to an Assistant Chief, and retaining both a full-time Captain as Fire Inspector/Code Official and a full-time administrative assistant. The current MFD civilian fire inspector would also be retained. Fire inspection practices do not have to be integrated across the two communities, however. This is an area for continued discussion between the two communities.

If this structure were to assume responsibility for fire inspections across both Towns, then there are several options for taking up any additional workload. First, some of the personnel currently performing inspections in South Orange could continue inspectional duty in certain occupancies. Another option would be to cease shift-based fire officials in South Orange and

either give additional hours to the current inspector, or hire an additional part-time or full-time civilian inspector, based upon workload. There are multiple approaches to managing inspections – the emphasis should be on ensuring the best customer service and highest level of quality in inspections, while maintaining a unified records system and accountability.

Figure 41 Proposed Administrative Staffing Model



We would recommend that fire prevention and administration offices remain at the Maplewood Station, which has more office space, parking, and access to computer infrastructure.

In the area of operational, shift-based staffing, we had several options. It is important to remember the distinction between the number of personnel *assigned* per shift, versus the *minimum* number of personnel on-duty at a given time. That is, each shift has additional personnel assigned to account for absences due to vacation, training, illness, and injuries.

A single long-term illness, injury, or military deployment can have significant cost impacts on driving overtime. In small departments, as is the case even with a consolidated organization, this will remain true. In reality, a balance must be struck between the cost of overtime to bring personnel in to maintain minimum personnel levels, and paying to keep additional personnel assigned on each shift to avoid extensive use of overtime.

Across all the options, we built on the following assumptions:

First, each shift would have one Deputy Chief (a reduction of one position per shift across the two departments). To provide supervision on all front-line major units, we would convert the four Deputy Chief positions to Captains. This would put one Captain at each station per shift (an increase of one Captain in Maplewood Station 1). This would result in a total of four Deputy Chiefs, and 12 Captains (three per Shift). This would equate to 16 officers assigned to shift, which represents no net change from the current status.

We recommend staffing, at a minimum, three engines and one ladder company. All three current stations would remain open. The existing ladder company in South Orange would be retained as a reserve piece, and one reserve engine company would be retained. Although the South Orange Rescue would be retained and staffed by existing personnel at that station, we do not recommend that it be replaced.

Existing aged apparatus held by South Orange (Ladder apparatus at Crest Drive and Engine stored across from Headquarters) should be liquidated.

We present three scenarios for minimum staffing – these vary from 14 (the current number assigned by both agencies cumulatively, to 12, a new on-duty minimum staff reduction of two positions. We present each of the scenarios below.

Scenario 1: 14 Minimum On-Duty Positions

Scenario 1 (Table 27 below) results in no net change in the number of on-duty positions, but reassigns them to achieve greater effectiveness.

Table 26: Scenario 1 Minimum Staffing Model

Unit Type	**MFD HQ.**	**MFD #2**	**SOFD HQ.**
Command Vehicle	1 Deputy Chief		
Engine	3 Firefighter	1 Captain 2 Firefighters	1 Captain 2 Firefighters
Aerial Ladder Truck	1 Captain, 3 Firefighters		
Ambulance *	Cross-staffed		
Rescue †			Cross-staffed
Total members	8	3	3
* Ambulance cross staffed by personnel assigned to MFD HQ. engine and/or ladder † Rescue cross staffed by personnel assigned to SOFD HQ. engine			

This option realizes cost savings through the reduction of Chief Officers, and increases the number of personnel responding on alarms in both communities. It also provides a fully-staffed ladder company, which would respond on alarms throughout both communities. As stated, four positions could be eliminated due to efficiencies in shift coverage.

Scenario 2: 13 Minimum On-Duty Positions

The second scenario (Table 28) relies on a minimum on-duty staffing of 13 positions. This is a reduction of one on-duty position from current practice. In this case, the ladder company is staffed with three personnel. Other staffing remains the same.

In this option, approximately four more positions are reduced (1 per shift X 4 shifts). The redeployment of personnel and joint response will provide an increase in personnel responding on the initial alarm in both communities.

Table 27: Scenario 2 Minimum Staffing Model

Unit Type	**MFD HQ.**	**MFD #2**	**SOFD HQ.**
Command Vehicle	1 Deputy Chief		
Engine	2 Firefighter	1 Captain 2 Firefighters	1 Captain 2 Firefighters
Aerial Ladder Truck	1 Captain 2 Firefighters		
Ambulance *	Cross-Staffed		
Rescue †			Cross-staffed
Total members	7	3	3
* Ambulance cross staffed by personnel assigned to MFD HQ. engine and/or ladder † Rescue cross staffed by personnel assigned to SOFD HQ. engine			

Scenario 3: 12 Minimum On-Duty Positions

In scenario 3, we staff with 12 positions per shift (Table 29). This is a net reduction of two positions from the current level. All apparatus is maintained, although the engine at Maplewood Headquarters would be out of service when the ambulance was on a call, as it is today.[9] We do not recommend fewer than 12 personnel while maintaining ambulance operations.

This option permits reduction of additional firefighter positions -- conservatively, this could permit a reduction of eight overall positions (2 per shift X 4 shifts). The benefits of redeployment are maintained.

Table 28: Scenario 3 Minimum Staffing Model

Unit Type	**MFD HQ.**	**MFD #2**	**SOFD HQ.**
Command Vehicle	1 Deputy Chief		
Engine	2 Firefighter	1 Captain 2 Firefighters	1 Captain 2 Firefighters
Aerial Ladder Truck	1 Captain 2 Firefighters		
Ambulance *	Cross-staffed		
Rescue †			Cross-staffed
Total members	6	3	3
* Ambulance cross staffed by personnel assigned to MFD HQ. engine and/or ladder † Rescue cross staffed by personnel assigned to SOFD HQ. engine			

Staffing Factors and Headcount

One important consideration in evaluating potential cost savings of any option is the balance between assigned staff and minimum shift staffing. That is, the number of personnel assigned

[9] Assuming that it serves both Towns, it would be substantially out of service, and unable to provide reliable coverage for engine 33.

per shift reflects some balancing act between the cost of maintaining staff to account for regular leave and vacation, and the need to hire personnel back on overtime to maintain minimum staffing. That is, more personnel assigned per shift reduces the amount of overtime needed.

Under each option, we believe that a minimum of one assigned position per shift could be reduced. MFD staffs with 10 per shift, while SOFD staffs with 8, meaning that there are up to four personnel assigned per shift above the minimum. Using a larger pool to avoid overtime – vacancies in one agency can be balanced against overages in the other, can be used to reduce overtime. That is, all personnel would be pooled and distributed to accommodate vacancies as necessary. This would be result in filling 14 positions from 17 assigned per shift, allowing 3 people off per shift before incurring overtime.[10]

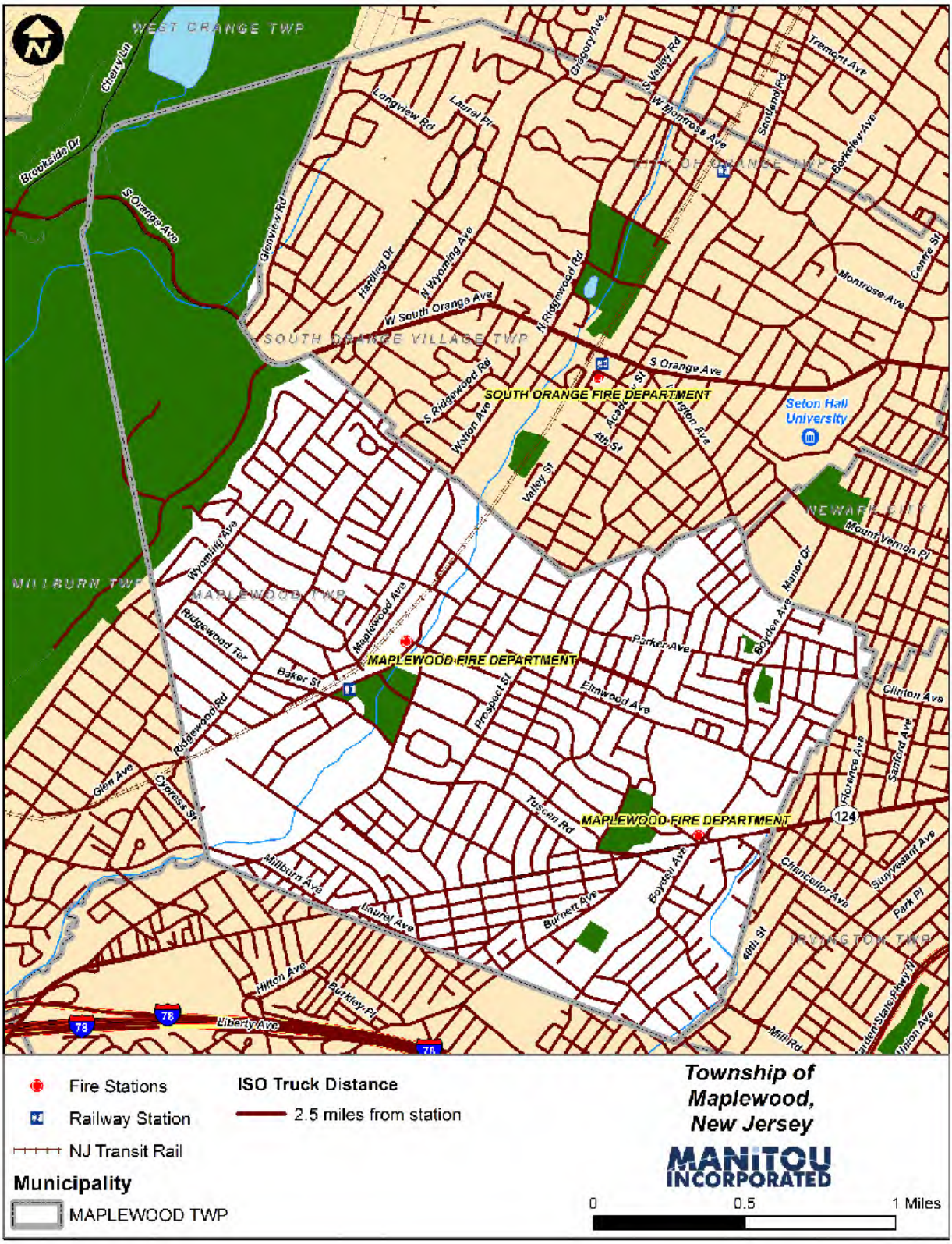
We are confident that four positions (one assigned per shift) could be eliminated without having a negative effect on overtime costs. A potential consolidation would be a good time to take a careful look at leave policy and staffing factors across both organizations to best determine desired shift staffing levels. It is possible that additional savings in this area could be realized, based on actual experience.

We did not estimate the impact of any prospective policies on call-back policies in the event of a mutual aid request. This is an area that would likely require additional consultation.

Another factor, in the long term, would be to evaluate the feasibility of reducing the number of stations in operation. While this may be a long-term option, it presumes replacement of the current engine and ladder at Maplewood headquarters with a Quint apparatus, which would reduce the number of front-line apparatus. However, because the existing stations are restricted in the height, width, and length of apparatus they can accommodate, a new facility would need to be constructed, or an addition made to an existing facility. This is not feasible for the South Orange Headquarters as a recently renovated historic landmark. Also, the cost of constructing a new facility would offset savings achieved, and present a number of challenges in terms of siting.

[10] An analysis of MFD overtime records indicated that a maximum of two personnel were off on a single shift, meaning that in the majority of cases, three additional personnel would be sufficient to avoid overtime.

Figure 42: Single Ladder Option



A fully consolidated agency of both departments will require a naming convention that represents both communities and in keeping with historic ties. A community contest can be used for this purpose.

9.3 Potential ISO Fire Insurance Rating Improvements through Consolidation

A significant benefit of consolidation may be improved fire insurance premiums for commercial properties. The Insurance Service Office (ISO) evaluates cities and towns across the U.S. in order to determine their level of public fire defenses, as they relate to preventing and mitigating potential structural and similar fire risks. Generally, communities are reevaluated every 3-5 years.

ISO uses a rating system that is applied to each community when surveying the major areas of the local fire defense system. Field representatives apply the *Fire Suppression Rating Schedule* (FSRS), a reference guide, while conducting surveys. The Schedule was revised in 2012 with updates within its three major areas of review. Subsequent to a survey, ISO publishes a community's rating, or Public Protection Classification (PPC), which is set on a scale of 1-10. The lower the rating, the lower the fire insurance premiums may be for certain property owners. Table 30 illustrates the PPC scale and points range:

Table 29 : PUBLIC PROTECTION CLASSIFICATIONS

PPC	Points
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.00
6	49.00 to 49.00
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0.00 to 9.99

Applying the Schedule, field representatives evaluate four areas of a community's fire defenses. These are the areas or components of public fire defenses that, as a whole, contribute the management and control of structural fire losses. The following table (Table 31) includes the major areas of review and their weighted score used by ISO to determine a community's PPC.

Table 30: PERCENT OF FIRE DEFENSE EVALUATION

Area	%
Emergency Communications	10
Fire Department	50
Water System	40
Community Risk Reduction	5.50
Total	105.50

A very common misconception by the public and local officials is the purpose of the PPC and what it represents. The PPC is reflective of the community's rating in terms of its ability to effectively control fire in structures – the crux of the fire insurance industry. The PPC program is not intended to serve as the sole or primary planning tool for fire departments, nor is a community's score reflective of an evaluation of all the programs and services a modern fire department provides, such as may be the case with the delivery of emergency medical care or hazardous materials response.

Each insurance company uses its own criteria for setting rates, with many of them referencing ISO's rating system. The system is used by companies to set commercial and individual fixed property fire insurance premiums. It is often the expectation and perception by property owners and public officials that the more local fire protection is improved and maintained, the lower insurance premiums. Very often this perception rests primarily with the fire department being the sole area of evaluation, with emphasis on the level and type of equipment, number of stations, and staffing levels as the only measurements of a fire defense's state of effectiveness.

Recent ISO Surveys

Both communities have been surveyed by ISO representatives in recent years. The following table (Table 32) presents an overview of the three surveys provided to us for review.

Table 31: RECENT ISO SURVEYS

	2008		**2013**		**2014**	
	PPC	Score	PPC	Score	PPC	Score
Maplewood	4	66.08	3	70.51		
South Orange					4	68.44

As listed, Maplewood was last evaluated in 2013 and can expect a reevaluation in an upcoming year. The Township's fire defenses improved enough since a 2008 survey to earn enough credits, though barely, to receive a Class 3 rating. A review of the two survey reports indicate

most improvements were in the water system and emergency communications. South Orange was last surveyed in 2014, when it received a Class 4 rating.

Table 33 provides a breakdown of both communities' credit, beginning with Maplewood's 2008 survey and ending with South Orange's 2014 survey. It is important to note that Maplewood's 2008 survey was conducted using the 1980 edition of the Schedule that utilized a 100 credit system. Beginning in 2013-14, ISO began applying the newer edition with a total available credit of 105.50. The increase in credit is primarily due to an increase in areas reviewed, from three to four, with the additional area of Community Risk Reduction. The additional area decreased credit earned in the other area's detailed criteria, as shown in the following table (Table 33).

Table 32: TOTAL PPC SCORE

Credit Detail	Available Credit *	Maplewood 2008	Maplewood 2013	South Orange 2014
Emergency Communications	10	6.93	7.41	4.50
Fire Department	50	30.57	30.20	30.95
Water Supply	40	32.71	33.56	34.29
Community Risk Reduction	5.50	N/A	4.04	3.47
Divergence		- 4.13	- 4.77	- 4.70
Total	105.50 (100)	66.08	70.51	68.44

* ( ) Total credit available was increased from 100 to 105.50 with the introduction of the revised 2014 edition of the Schedule.

Potential PPC Improvements through Consolidation

Through shared services, or complete consolidation, improvements in fire insurance rates may occur. It must be noted that only ISO can completely answer questions regarding what level of improvements may occur through shared services. This is primarily due to the FSRS, its application and inner-workings being proprietary only to ISO. The following provides some level of evaluation of available credit, an overview of each community's latest PPC, and detailed earned credit and commentary regarding potential improvements consolidation may provide with regard to the PPC.

Communications

Ten percent of a community's PPC is based on the community's designated emergency dispatch center's ability to receive, process, and dispatch emergency calls from the public. Evaluation criteria of the area include:

- Facilities
- 911 telephone service
- Dispatch processing

- Dispatcher training and certifications
- Fire station dispatch equipment

The table below (Table 34) provides an overview of the area's detail and available and earned credit. As indicated, Maplewood's emergency communications score improved during the 2013 survey. This may have occurred due to their transition from previous dispatch methods and services to the current arrangement with REMCS, which has more facilities, equipment, and trained personnel as defined by the Schedule and its referenced standards.

In contrast, South Orange's total credit was 4.50 out of a possible 10. The lesser credit earned may be attributed to the rudimentary system currently in place for receiving emergency calls and dispatching of fire units. In addition, the South Orange Police Department may not have in place the resources to ensure its dispatch center meets the criteria of a fire-based dispatch service.

Table 33: EMERGENCY COMMUNICATIONS COMPARISON OF CREDIT RECENT ISO SURVEYS

Credit Detail	Available Credit *	Maplewood 2008	Maplewood 2013	South Orange 2014
Emergency Reporting	3 (2)	1.58	2.25	1.35
Telecommunications	4 (3)	2.25	3.96	1.20
Dispatch Circuits	3 (5)	3.10	1.20	1.95
Total	10	6.93	7.41	4.50

* ( ) indicate credit from previous edition of Schedule as was applied during 2008 survey.

Consideration

Under consolidation, general performance and reliability of dispatch services may occur while improving emergency communication credit under the PPC. For additional prorated annual fees, Maplewood's current credit could be retained under a consolidated fire district.

Fire Department

The area considered by many as the most significant of a PPC is the fire department, which is reviewed by ISO field representatives with respect to its ability to prevent and control structural fires. The review consists of:

- How many engines and ladders companies are needed, based on local risks and area protected
- Condition of apparatus and equipment carried on front-line and reserve engines and ladders trucks
- Staffing available for engines, ladder trucks and other fire response units
- Training and certification of firefighters

Table 35 provides a detail of fire department credit earned. Both departments received a similar score, between 30-31 credits out of 50 available. South Orange received slightly more than Maplewood, which received less than when it was surveyed in 2008. This may be in part due to staffing previously credited as an engine company that has since been cross staffed with ambulance duty. ISO prorates credit for staffing assigned to ambulances due to the probability their being unavailable during initial response to a structure fire.

Table 34: FIRE DEPARTMENT COMPARISON OF CREDIT RECENT ISO SURVEYS

Credit Detail	Available Credit *	Maplewood 2008	Maplewood 2013	South Orange 2014
Engine Companies	6 (10)	8.34	4.74	4.02
Reserve Pumpers (Engine)	0.50 (1)	0.75	0.49	0.41
Pump Capacity	3 (5)	5.00	3.00	3.00
Ladder Companies	4 (5)	1.84	1.52	3.60
Reserve Ladders	0.50 (1)	0.00	0.00	0.18
Deployment Analysis/Station Location	10 (4)	-	7.68	7.22
Staffing	15 (15)	5.61	5.61	6.45
Training	9 (9)	5.94	5.16	4.07
Method of Operation	2(-)		2.00	2.00
Total	50	30.57	30.20	30.95

* ( ) indicates credit from previous edition of Schedule as was applied during 2008 survey.

Considerations: *Engine Companies and Reserve Pumpers*. Currently each department receives less than the maximum five credit points for engine companies and almost the maximum credit for reserve pumpers. Engine company credit may improve under the three station scenario with a total of 4-5 pumpers. Three pumpers would serve as staffed in-service engine companies, with one in each station and the remainder in reserve status.

Ladder Trucks and Reserve Ladders. Based on a combined area served, one ladder truck may suffice for the consolidated fire district. Based on ISO response distance criteria, the total recommended response distance of a ladder truck is 2.5 road miles. One of the two ladder trucks currently in service could be used as the ladder company while the other serves as a reserve unit. From the Maplewood Headquarters station, much of the newly created district could be covered with one ladder truck, with the other truck being placed in reserve and housed at the South Orange fire station.

Staffing. Additional credit could be received under the three station scenario by realignment of staffing. This could be accomplished by increasing the minimum staffing to one officer and two firefighters for each of the three engine companies in service, while improving staffing of the single ladder company. Additional staffing improvements could also be gained in fire

prevention, training, and other support duties. Staff positions may also increase credit for fire company staffing on a prorated basis.

Training. Through shared staffing and resources, training programs and certifications could be improved overall. A lack of fulltime focus and recordkeeping has challenged the effectiveness of programs, including certifications and drill work. Consolidation could improve services while increasing the amount of credit awarded for training. Additional improvements may be made through the implementation of a fire company-based pre-fire plan for evaluating commercial properties.

Water Supply

The fire defense area with the second greatest credit is the community's water supply system. A community's water system plays a major role in controlling fires. In an urbanized environment, the lack of a water system providing adequate supplies and a gridded distribution of adequate sized mains and hydrants would render the fire department and its equipment almost useless in the event of serious fires. The system is evaluated with regard to:

- The volume of water available, its distribution, and its access by the Fire Department based on the risks protected
- Fire hydrant specifications and distribution
- Inspection, servicing, and flushing of fire hydrants and related maintenance criteria

Table 36 provides an overview of each community's water supply system during the most recent PPC surveys. The table indicates both systems performed relatively well, with each receiving over 80 percent of available credit.

Fire Flows: The ISO establishes the needed fire flow, which is the amount of water (expressed in gallons per minute or gpm) available to the fire department from nearby fire hydrants for the suppression of a major developing fire, within a specific structure, for a period of two to four hours. This is based on calculations that the fire is contained to the building of origin. This worst-case scenario considers an individual building's construction type, occupancy(s) and proximity to other buildings. The minimum needed flows for a single building is 500 gpm for two hours and the maximum is 12,000 gpm for four hours. Based on ISO's survey of properties, the unsprinklered building with the fifth highest needed fire flow was determined to be the Town's "basic" fire flow, with 3500 gpm being the maximum flow for any municipality.

Table 35: WATER SUPPLY COMPARISON OF CREDIT RECENT ISO SURVEYS

Credit Detail	Available Credit *	Maplewood 2008	Maplewood 2013	South Orange 2014
Supply System	30 (35)	28.35	24.16	27.29
Hydrants	3 (2)	1.96	3.00	3.00

Hydrant Inspection	7 (3)	2.40	6.40	4.00
Total	40	32.71	33.56	34.28

* ( ) indicate credit from previous edition of Schedule as was applied during 2008 survey.

Community Risk Reduction

Recently added to the Schedule, community risk reduction evaluates programs and services in place that are devoted directly to fire prevention and mitigation and related life safety issues. Areas reviewed consist of:

- Programs and services
- Fire scene investigation
- Training and credentialing of personnel
- Code and standards
- Facilities

Table 37 indicates that, beginning in 2013 and 2014, both communities received credit for fire prevention and mitigation related services.

Table 36: COMMUNITY RISK REDUCTION COMPARISON OF CREDIT RECENT ISO SURVEYS

Credit Detail	Available Credit *	Maplewood 2008	Maplewood 2013	South Orange 2014
Fire Prevention and Code Enforcement	2.2	N/A	1.72	1.17
Public Fire Safety Education	2.2	N/A	1.38	1.65
Fire Scene investigation	1,1	N/A	0.94	0.65
Total	5.50		4.04	3.47

* ( ) indicates credit from previous edition of Schedule as was applied during 2008 survey.

When two or more fire departments consolidate ISO sometimes considers the newly formed organization as one fire "jurisdiction" when applying the *Fire Suppression Rating Schedule* during future Public Protection Classification surveys. Potential PPC benefits for consolidation where preexisting duplication exist include improved credit for various items under the category of fire department and/or communications. Often ISO will conduct a special survey of recently consolidated departments to establish a revised PPC rating for the newly created jurisdiction.

9.4 Conclusions

Given the constraints identified previously, we have identified consolidation options that maintain or improve the existing service level in both communities. It would be highly

recommended in this case to have automatic aid agreements with surrounding agencies for a reported structure fire[11] also known as a Signal 9.

It is important to consider the issue of operating ambulance services, which has an important bearing on the staffing levels recommended under these consolidation scenarios. Emergency Medical Services transport service is discussed in the next chapter.

[11] Rather than awaiting visual confirmation (Signal 11)

10.0. EMS Service Delivery

This section discusses the history, current operations, and options for future provision of emergency medical services in a joint effort to serve the citizens of both townships

10.1 Overview

New Jersey (NJ) has a proud history of volunteer medical squads providing care across the state. It is the most prominent method of EMS delivery here, unlike the rest of the nation. Since the late 1970's, the state has had a two-tier delivery system of emergency medical services. Basic Life Support (BLS) care measures are provided by emergency medical technicians (EMT), certified by training through the NJ Department of Health. These people are usually members of a local First Aid Squad or Rescue Squad and, in NJ, primarily volunteers. Advanced Life Support (ALS) Paramedics are employed by hospitals, a regional system of providing advanced medical care to more critical incidents.

Paramedics had once been exclusively in non-transport "chase" vehicles like an SUV, while the local BLS squad maintained the basic care and ambulance transportation. With the decline of volunteerism generally across the state and the conglomeration of hospital systems, EMS in NJ has changed. Today, more local jurisdictions are compensating BLS providers in a variety of ways, including employment. The hospital systems have garnered contracts with many of these jurisdictions to provide BLS services in addition to the established ALS services. However, it is not uncommon today for both to be in an ambulance.

Local History: Just as EMS has changed across New Jersey, so it has in each of the townships. The following is a brief history.

Maplewood: Since 1972, the volunteer Maplewood First Aid Squad (MFAS) provided BLS services to the township residents from their station on Boyden Avenue near Elmwood Avenue. Through the 1990's, membership declined and the requests for services were unanswered. After several attempts to muster a response; mutual aid from neighboring volunteer squads was requested. This delay, and the increased response time from a neighboring municipality, posed even more problems. One, patients were left waiting for an ambulance even if help from the police and paramedics were on the scene. Two, the town deploying the ambulance now has reduced resources. Three, many of these mutual aid squads had similar membership and response issues.

Figure 43 EMS Medical Responder

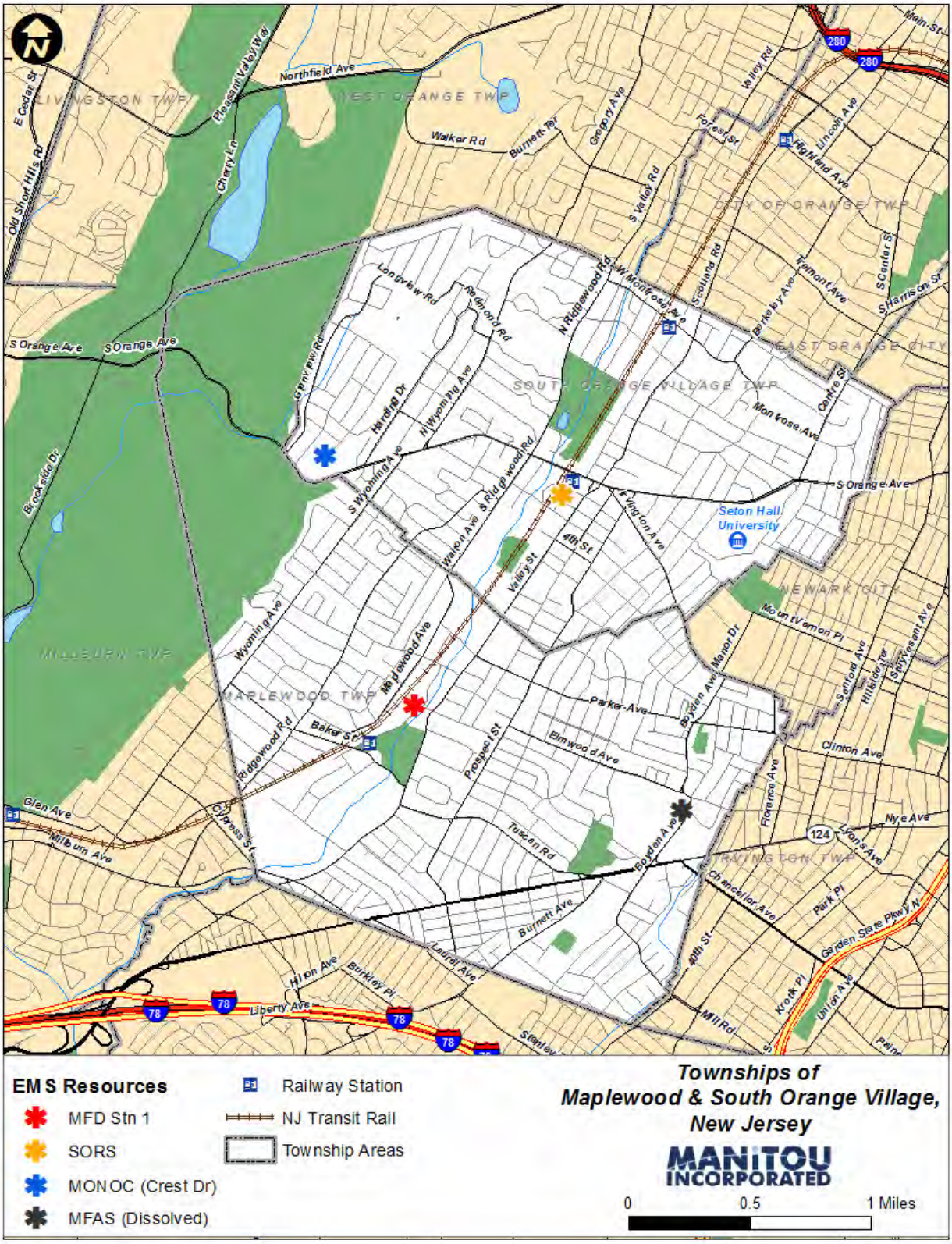
In 1996, the Maplewood Fire Department (MFD) began to train firefighters and hire personnel with EMT training. MFD began to respond as a supplement to requests for EMS, although that was still the primary responsibility of the volunteer squad. Eventually, this reversed and, in August 2016, the Maplewood First Aid Squad discontinued service. Today, the single Maplewood Fire Department EMS unit is the primary medical responder in the township. It is staffed by two Firefighter/EMTs who normally also staff the Engine in Station 1. Mutual aid contracts with neighboring first aid squads continue and, additionally, a fire apparatus will respond to a critical event, such as a reported cardiac arrest, if the EMS unit is already on an assignment.

Figure 44 South Orange Rescue Squad

South Orange: The South Orange Rescue Squad (SORS) began in 1952 and has, since inception, been an all-volunteer organization. It too has had issues with membership and struggled with responding to events. The squad has adopted a duty schedule and worked with Seton Hall University to recruit members from the college population. The squad retains primary responsibility during nights and weekend days. A career service was contracted because of the difficulty with daytime, work-week coverage due to two income families, a commuter population, and the general decline of civic volunteerism that plagues other nearby communities. A BLS ambulance is operated in the township during the day by MONOC EMS, a private contracted service that also provide services in the cities of Orange and Irvington, among others. It responds from the Crest Drive Facility of the fire department (not an active fire station), rather than near the Fire Department and Rescue Squad buildings on Sloan Street in the center of town. The fire department does not routinely provide emergency medical services.

The following figure (Figure 47) depicts the EMS resources that serve Maplewood & South Orange Townships.

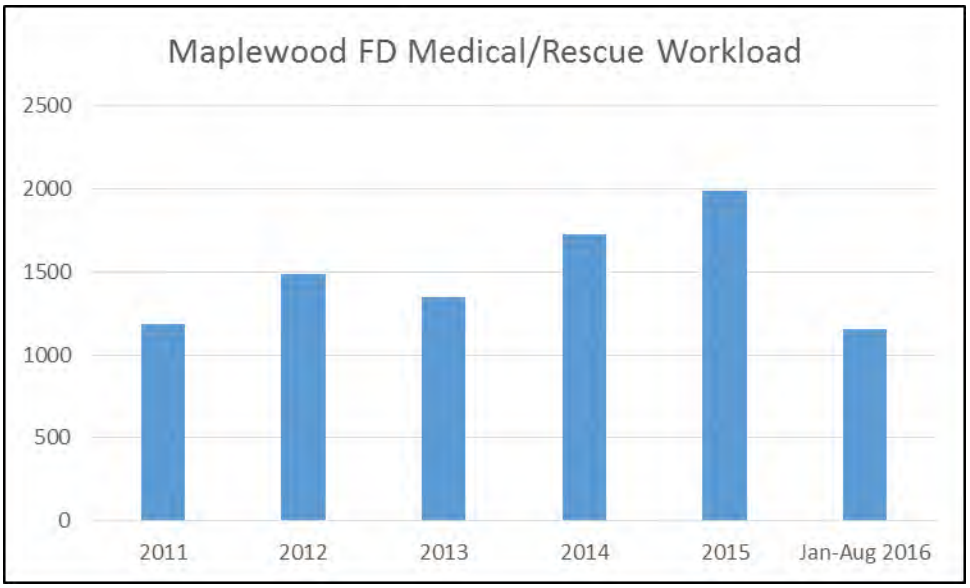
Figure 45: Ambulance Stations



10.2 Demand for Services

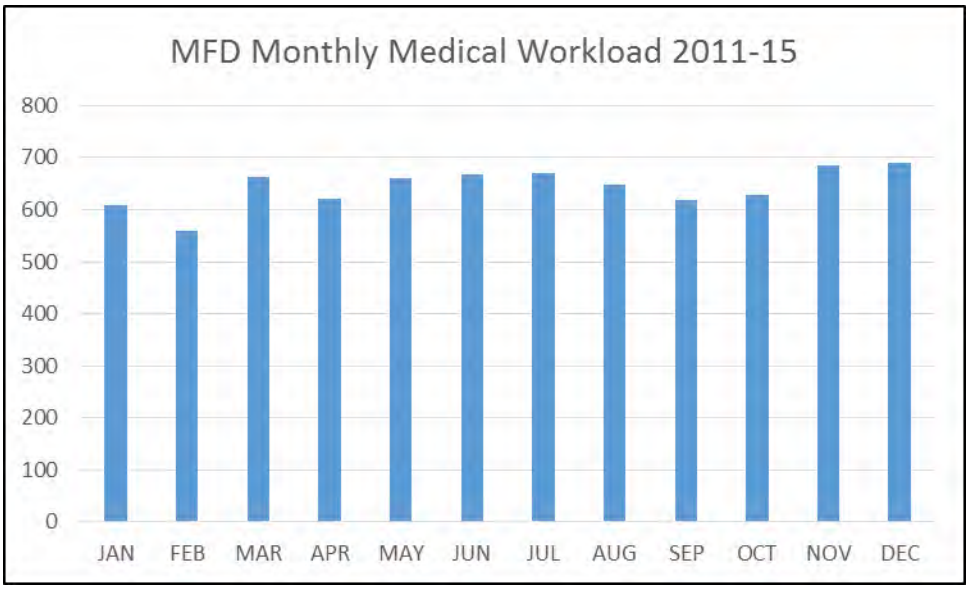
Maplewood: According to the same incident records, submitted to the state fire division and analyzed previously for fire services, the demand for services related to medical or rescue have been generally increasing since 2011 (Figure 48). These types of incidents account for 51.63% of the overall department workload since 2011, 57% over the last two years. It equates to an average of 5.45 events per day in 2015.

Figure 46 Maplewood FD EMS Workload



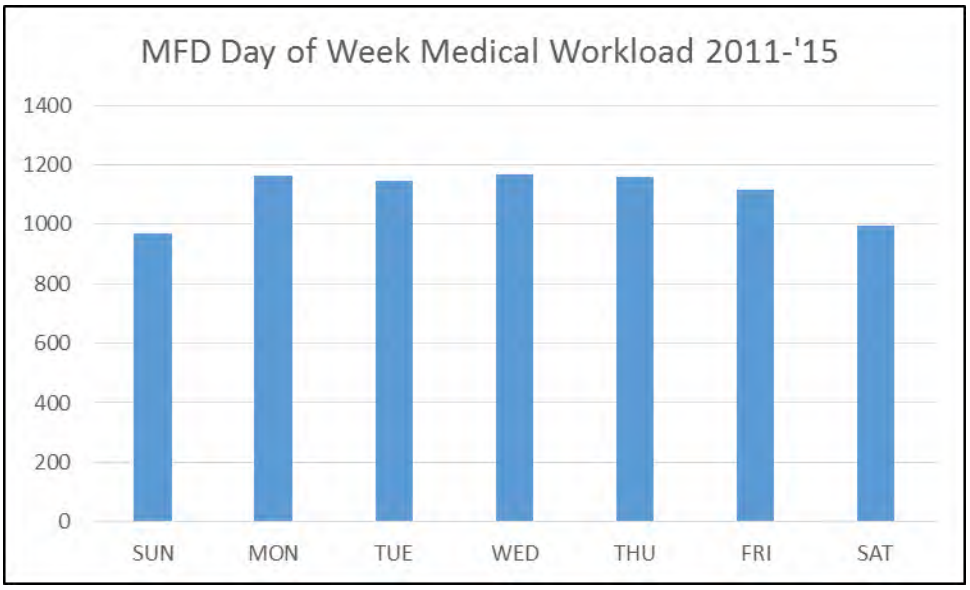
There does not appear to be the seasonality that greatly affects the medical/rescue workload, as seen in the monthly trend chart that follows (Figure 49):

Figure 47: Maplewood FD EMS Monthly Workload



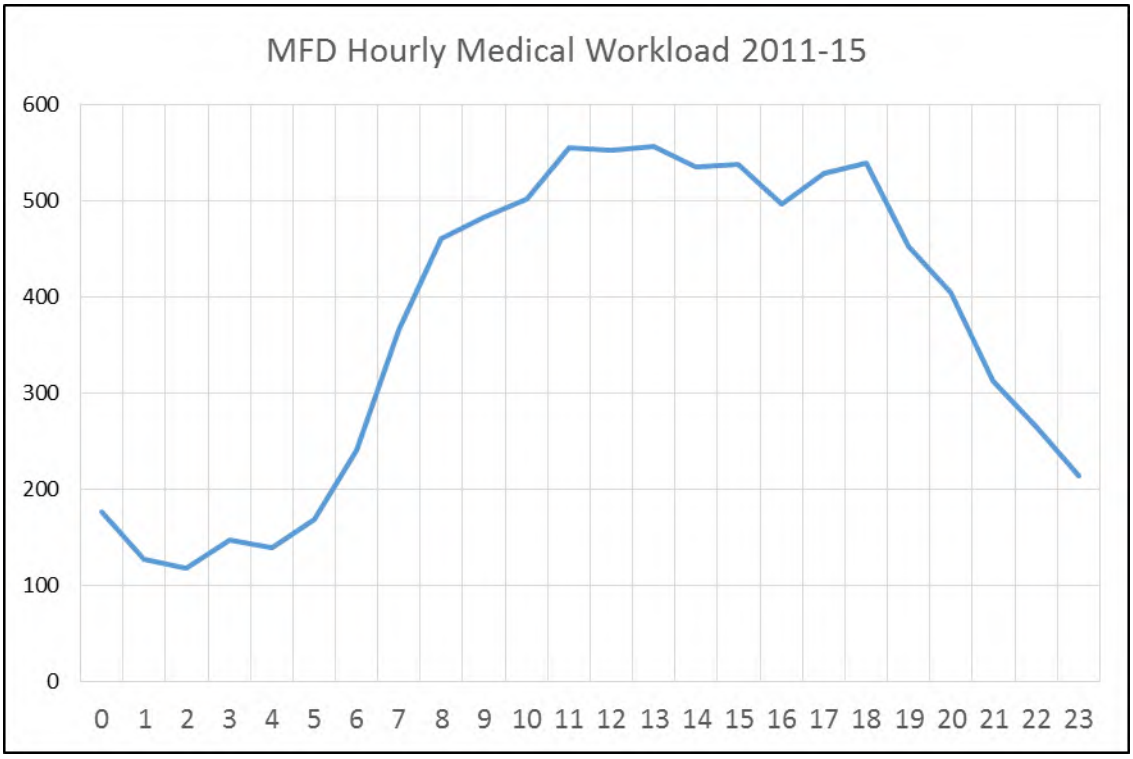
Weekdays are generally busier than weekends for medical/rescue incidents within the Township, as shown in the chart below (Figure 50).

Figure 48 Maplewood Fire EMS Day of Week Workload



The workloads for medical/rescue incidents are predominately during the daytime hours, beginning around 6:00 a.m. and continuing through 6:00 p.m. (Figure 51).

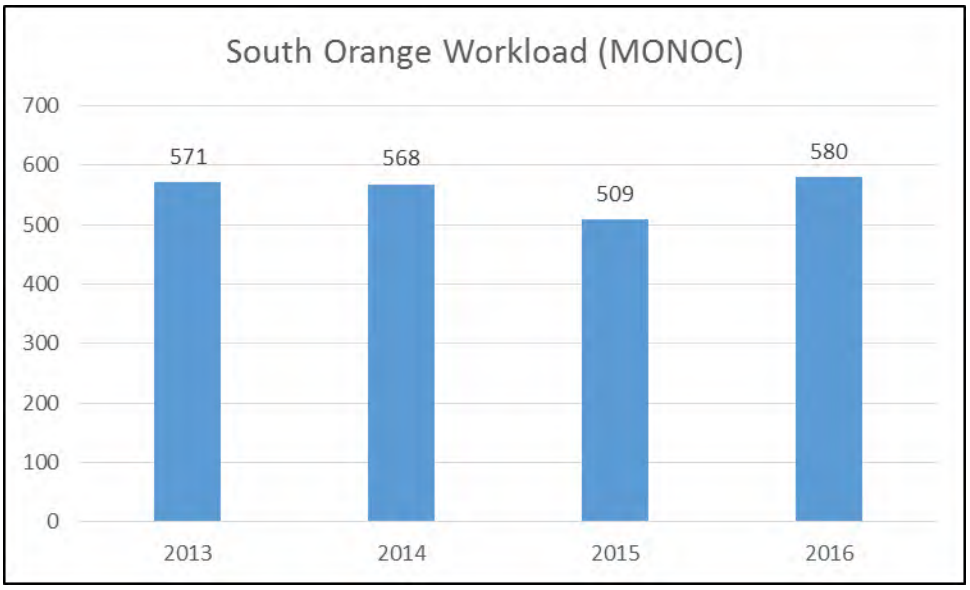
Figure 49 Maplewood FD EMS Hourly Workload



South Orange: Although it has trained members as EMTs, the fire department does not routinely provide medical care or first responder services. The historical workload is limited to walk-ins at the fire station, a flagged down event, a vehicle extrication/trapped person, or when requested by the EMS provider. For the time period of 2013- 15, SOFD responded to just 197 events.

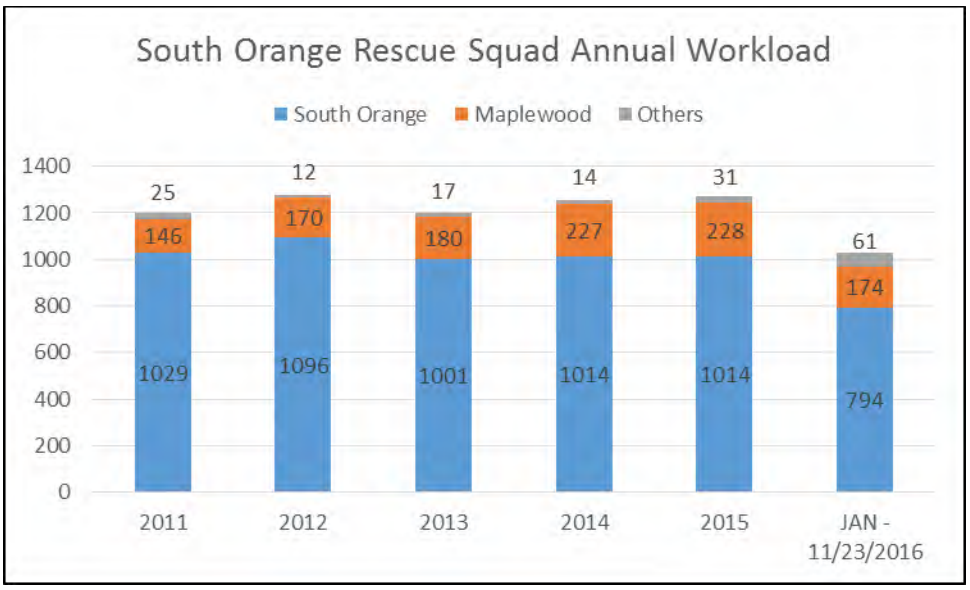
The primary responsibility of providing EMS services during weekday daytime hours is contracted to MONOC EMS.

Figure 50 South Orange Workload by MONOC



The South Orange Rescue Squad provides first response to medical events within the Township primarily during the weeknights and on weekends. This workload has been generally stable through the study period. Note that approximately 20% of its workload is within Maplewood Township (Figure 53). Altogether, EMS workload in South Orange is approximately 1,400 incidents per year.

Figure 51 South Orange Rescue Squad Workload



10.3 Mutual Aid

Maplewood: Within the workload charts for Maplewood, the above figures only account for the events to which Maplewood Fire Department has responded. There were times when, because MFD's ambulance was already on an assignment, mutual aid from neighboring jurisdictions has responded.

For example, the Maplewood Fire Department Annual Report indicated that, in 2015, ambulances from outside Maplewood responded 210 times, primarily from the South Orange Rescue Squad or MONOC[12]. Once again, these are only incidents to which MFD had also responded[13], and an unknown number of incidents may have been outside of Maplewood Township. The South Orange Rescue Squad reports that, in 2015, it responded into Maplewood 228 times.

The same 2015 MFD Annual Report indicates only three occurrences where MFD provided mutual aid to other jurisdictions for medical incidents.

South Orange: The South Orange Rescue Squad and MONOC mutually aid each other outside of their respective primary hours of responsibility. There may be sporadic times when another organization may render aid but these occurrences are not expected to be significant. Since MONOC also provides service to neighboring cities of Orange and Irvington, additional MONOC resources are likely available.

[12] Unknown if from South Orange, Irvington, or Orange.

[13] Either fire apparatus only, or a multi-patient situation, such as a motor vehicle collision.

Response time benchmarks: While not all calls for service are critical, it is recommended that the ones that are should be reached or treated within certain timeframes. The American Heart and Stroke Association recommend that such patients reach the hospital and begin treatment within an hour of the call for help. The same is true for serious trauma cases, such as a motor vehicle collision, shooting, or stabbing to vital organs. There is no national response time benchmark by EMS organizations or medical research that advocates a certain response time performance. Researchers and the American Heart Association do know that brain death begins within four to six minutes in a case of cardiac arrest without resuscitation measures.

The National Fire Protection Association (NFPA), through its 1710 guideline for career fire departments that provide EMS, stipulates that a BLS unit should arrive within a four minute travel time, allowing for a sixty second timeframe between being alerted to rolling the wheels of the ambulance, for a total response time of five minutes for critical events, 90% of the time.

10.4 Dispatching

NFPA also recommends a one minute timeframe between answering the phone and a unit being dispatched. This is known as call processing time. In South Orange and Maplewood, the police department dispatch centers initially answer 9-1-1. A request for an ambulance is handled differently in each township.

In Maplewood, the call is immediately transferred to University Hospital's Regional Emergency Communications Center (REMCS) for dispatch of the fire department ambulance. If they are busy, REMCS must notify the South Orange Police Department to alert the rescue squad, or request MONOC dispatch to send its ambulance. If neither are available, a protocol of response order is followed that may involve a University Hospital EMS unit, or Millburn, Springfield, or Union Township units.

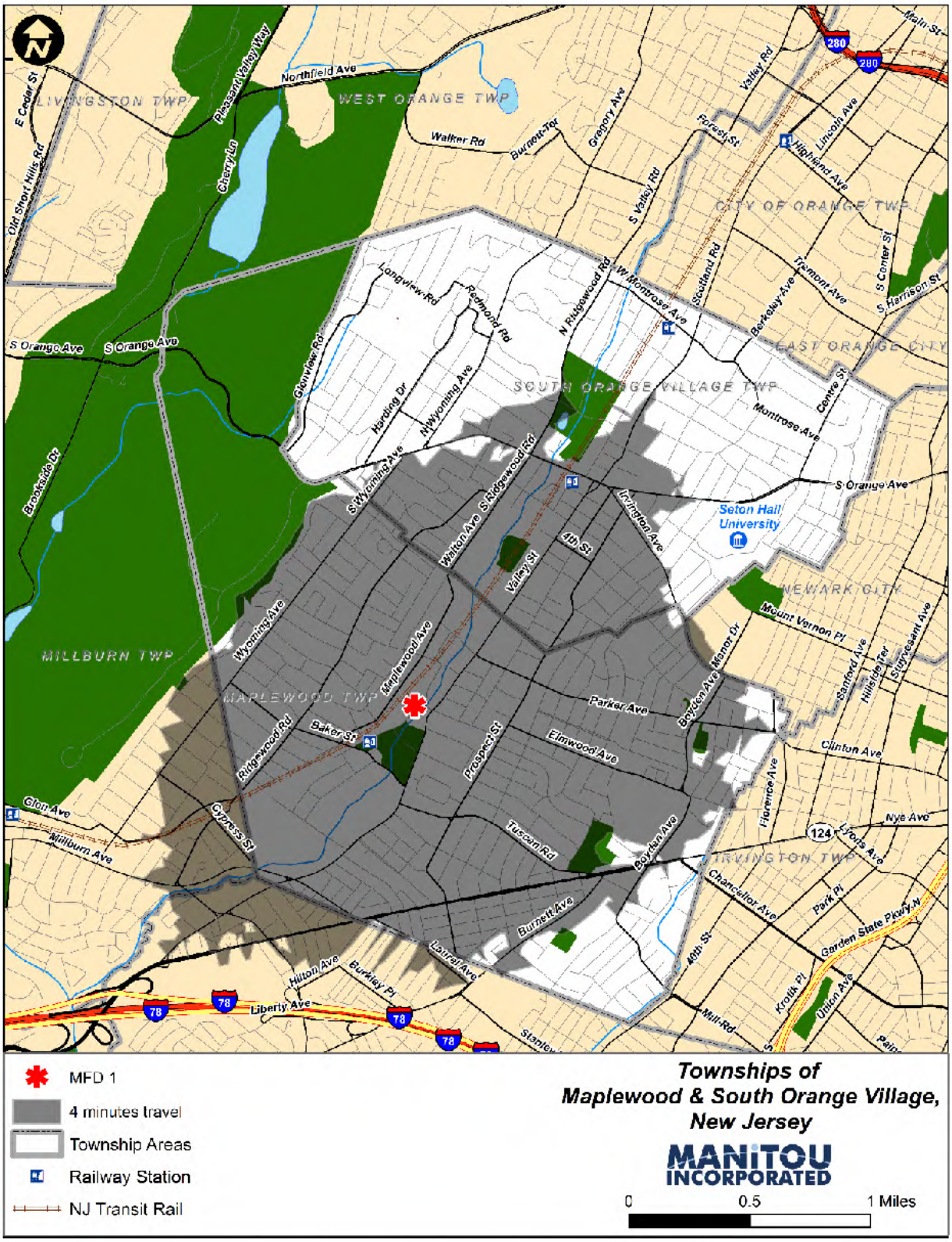
In South Orange, the police notify either the rescue squad or MONOC, depending on the day and time of primary coverage. If neither is available, a similar response order protocol is followed involving REMCS and surrounding jurisdictions of Livingston, West Orange, and East Orange.

10.5 Coverage

This section examines the coverage of the jurisdictions from the respective EMS resource stations using the same street network discussed earlier in this report.

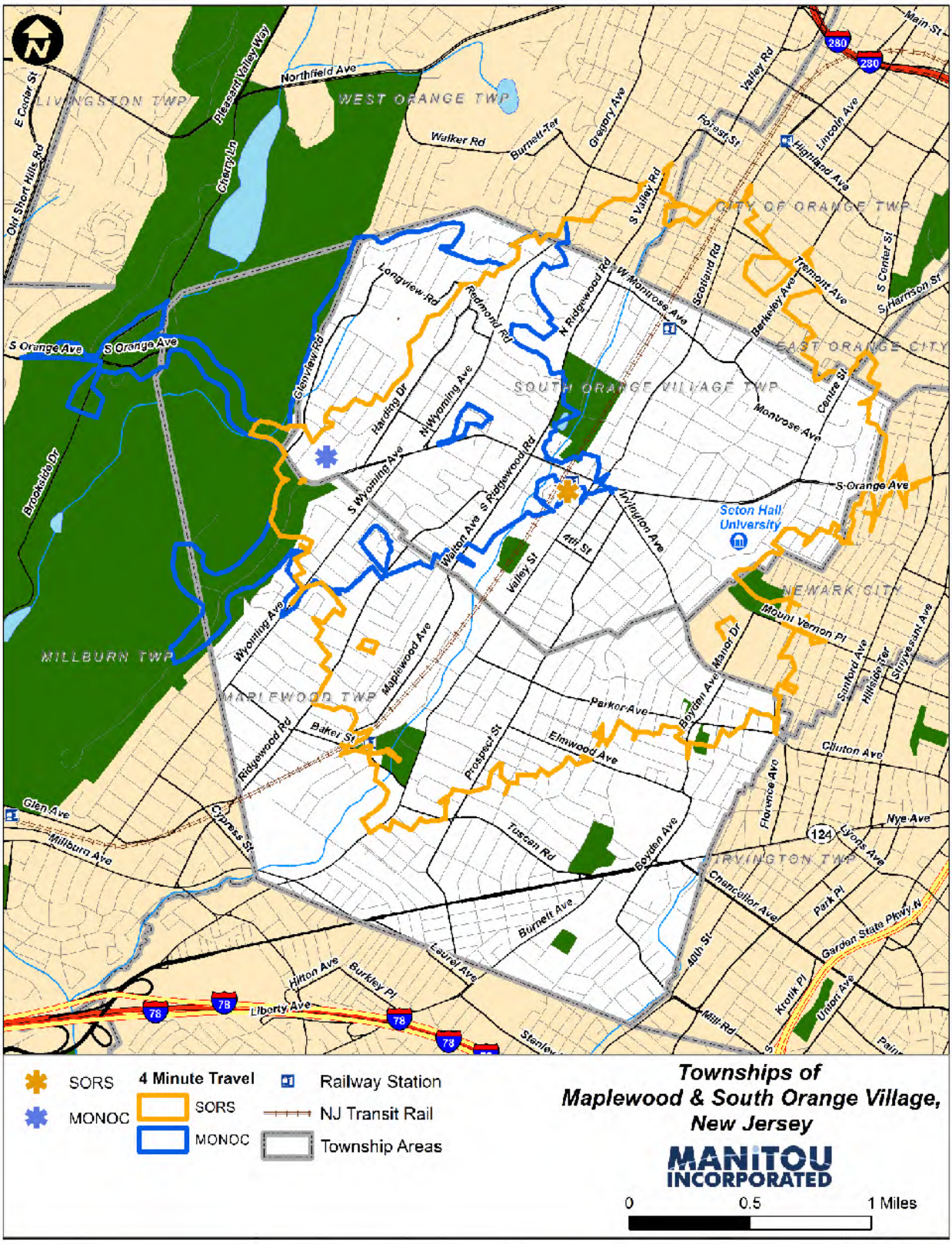
Maplewood: From the single location at Fire Station1, the ambulance can reach the majority of the Township within a four-minute travel time (Figure 54). Areas requiring additional time include the southeast side, the South Mountain Reservation, and areas of the Township along South Orange Avenue. It is important to note that the unit can also reach into the south central area of South Orange Village Township.

Figure 52 Maplewood FD EMS Travel Time



South Orange: The South Orange Rescue Squad ambulance, located next to the SOFD on Sloan Street, can reach the majority of its service area within a four minute travel time. Areas that require additional time include the northwest, the South Mountain Reservation, and areas in the extreme east. It is important to note that the unit can reach into the north central area of Maplewood (Figure 55). The MONOC ambulance is hampered by the complex route required to exit the neighborhood of Crest Drive and reach the eastside of the Township within four minutes.

Figure 53 South Orange EMS Travel Time



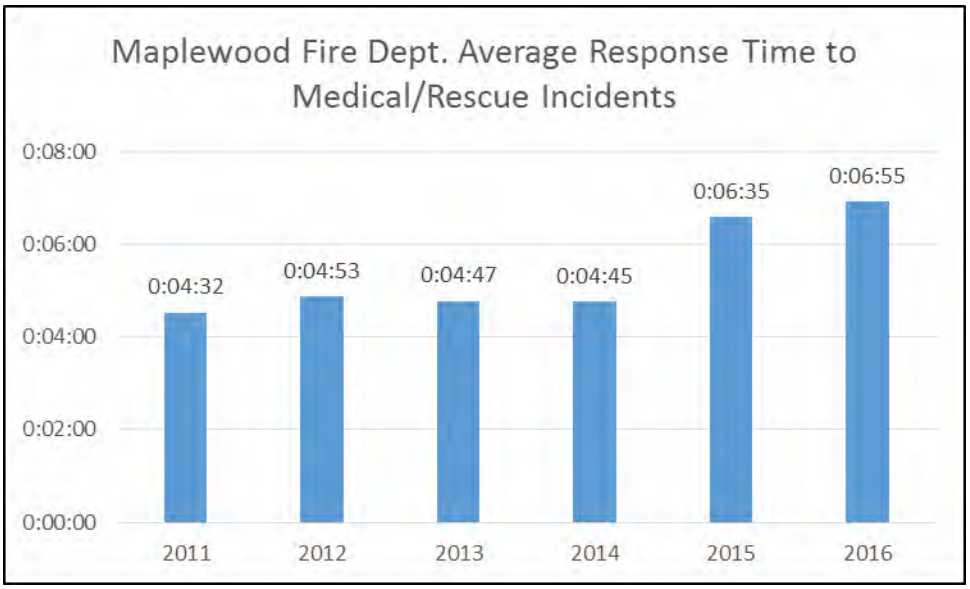
Both the Maplewood FD ambulance and the SO Rescue Squad can reach 66% of the street mileage of the study region from their stations[14] and offer acceptable coverage to their respective communities (Figure 56). MONOC's unit from Crest Drive has less coverage but can dispatch other units stationed in the City of Orange or the City of Irvington. However, both of these cities offer minimal to no coverage within a four minute travel time in the study region.

Figure 54 Street Mile Coverage

Street Mile Coverage			
Area	EMS Provider		
	Maplewood FD	**SO Rescue Sqd**	**MONOC**
Maplewood	85.5%	45.1%	10.9%
South Orange	42.9%	96.1%	46.3%
Study region	66.2%	65.9%	25.7%

Response Time Performance: This section briefly describes response time performance (Figure 57). The statistics will focus upon the Maplewood Fire Department because the South Orange Fire department does not primarily provide EMS services.

Figure 55 Maplewood FD EMS Response Times



Response time performance has increased over the last year and a half but is within a reasonable range due to the fact that not all calls are critical events. As stated previously, the

[14] EMS units may not be within their station when dispatched.

times reported are auto populated from the REMCS dispatch center into the department's records management system.

Hospital turnaround: While response times are important, so are other facets of the incident timeline. Typically, not much time is wasted on the scene of an emergency. The length of time on scene varies due to a variety of factors, including patient criticality and the degree of difficulty moving the patient to the ambulance.

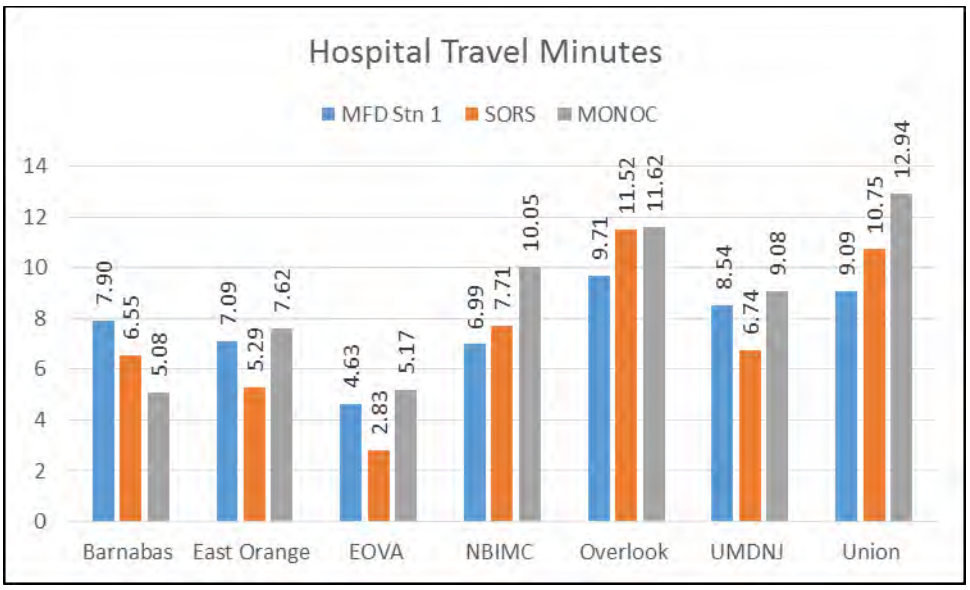
Patient choice routinely dictates the hospital to which they are transported, except in certain cases where a specialized hospital is needed, such as a trauma center (University, Newark), burn care (Barnabas, Livingston), cardiac arrest, pediatrics, and others. Nonetheless, a certain amount of travel time is consumed based upon the preferred hospital location. During interviews, it was revealed that all patients transported by Maplewood Fire ambulance are emergently transported, despite low acuity, due to the need to rapidly turnaround the service

This is also true on the return trip, after the patient has been transferred to the hospital, except that the ambulance is usually heading back to the station. This return travel time is not typically captured in dispatch records, as crews declare themselves available when leaving a hospital (Figure 58).

The transfer of the patient from the EMS crew to the hospital staff can be rapid, once the patient is given a bed assignment within the Emergency Room (ER). This time is variable as well, depending upon the patient clinical condition. The hospital does require a verbal and written report from the EMS staff. Additionally, the ambulance must be cleaned and in ready condition before departure, in case a dispatched assignment occurs during the return trip.

The use of global positioning systems (GPS) can aid in the dispatching of the closest available units by the dispatch center, if the units are equipped with such technology.

Figure 56: Hospital Return Trip Times



10.5 Options for Ambulance Service Delivery

In no particular order, the following options for delivery of ambulance transportation within a conjoined township are offered. An effort to detail the pros and cons of each strategy is discussed.

Bear in mind that the combined EMS service volume of both townships is presently 3,400 runs per year, approximately. Based upon the last full year of data for Maplewood EMS, nearly 15% of the time another medical incident occurs when one is underway. This would equate to about 195 times a year. While integrating emergency medical services between the two communities is desirable, it is not essential.

Strategy A: Status Quo

Currently, both townships have provisions for emergency medical care for citizens and visitors. They appear to be meeting the needs and expectations within their respective communities. The factors that would generate a change in methods of delivery include cost avoidance or reduction and improvement of services rendered.

South Orange Rescue Squad is a private, non-profit organization that does not receive any dedicated municipal funding but relies upon grants and contributions. It does not bill for services. While this is indeed a bargain for the Township, potential financial strain and staffing shortages can possibly create situations of extended or no emergency response. This is perhaps why MONOC has been contracted to provide services to the village primarily during weekdays. While MONOC does invoice patients for services, no monies from this billing are received by the

Township, according to its budget. Additionally, no contract fee was paid to MONOC to provide services, according to the Town's budget.

In Maplewood, there is a cost for providing ambulance service through the fire department. This includes, but is not limited to, training, vehicles, medical equipment, labor, and overtime. MFD does bill patients for services in order to offset these costs, generating revenue of $377,733 in 2015[15] (about 7% of the budget). However, MFD pays an annual fee to the billing company; the fee was nearly $29,000 in 2015[16].

Strategy B: Municipally Provided EMS

This strategy maintains the Maplewood Fire EMS, as it is known today, as the primary provider for both townships. This option would curtail the delivery of services by MONOC but not necessarily eliminate the South Orange Rescue Squad.

The almost 15 percent concurrent incident volume for EMS is not significant enough to justify an additional ambulance. The current locations of MFD HQ Station 1 or Sloan Street in South Orange can be considered adequate to provide coverage to both Townships, based upon response time guidelines for most medical events.

More important, since EMS type of incidents can and do account for the majority of service delivery volume for a consolidated fire agency, these firefighter/EMT's would not be available for firefighting duties most of the time (remember, return time from a hospital is not captured). This consolidated medical call volume would equate to an average of 11 runs in a 24 hour period.

The advantage of a municipally funded service is that citizens are funding a basic tenet of government services, and it will be funded appropriately and therefore reliable in its existence. The providers will be answerable directly to the town officials and the citizens. In the case of a fire department, dual trained firefighter/EMTs can provide both services. In theory, it reduces the need for additional firefighters. In reality, this becomes less feasible when the ambulance is too busy to be of help during fire events.

The disadvantage is that the associated costs are higher than when service is provided by a free cost option, such as a volunteer first aid squad or a contracted ambulance service provider who agrees to the arrangement in return for billing revenue.

Civilian option: Because of cross training and union labor agreements, firefighter/EMTs can be more expensive than a civilian force within the fire department. The fire department already has civilian employees performing certain job functions. These non-sworn positions have been utilized in the past, for example, by the Elizabeth Police Department's Ambulance Service Bureau. Dedicated EMS-only personnel typically earn considerably less than firefighters. While

[15] 2015 MFD Annual Report
[16] MFD Budget Info 2013-2016

there would be savings here, other costs would remain the same and the loss of use of an EMT in a firefighter role limits the pool for filling open shifts.

In addition, similar to the internal dysfunction that often occurs with combination volunteer and career departments, the same situation can be created when mixing sworn duty fire officers and civilians in the same place, however inane it may seem to the non-firefighter population. What can be agreed upon is that morale in a workplace is a tenuous but important component to a team effort. Creating a "third service" provider, the first two traditionally being police and firefighters, creates additional administrative complexity.

Strategy C: Volunteer Rescue Squad

The South Orange Rescue Squad is experiencing something of a resurgence, but it is not anticipated that they will be able to provide daytime service. This would still require reliance on other providers in daytime hours.

Strategy D: Private Contractor

MONOC is a non-profit cooperative of some of the largest hospital systems in the state. Its EMS services provide BLS ambulances staffed by EMTs and Paramedic units for many areas within New Jersey, including the neighboring communities of the City of Orange and the City of Irvington. MONOC is not the only option within the area; the Atlantic Ambulance Corporation EMS also provides contracted services, such as in nearby Livingston.

The advantages are that career employees would be available and the associated costs of service provision are borne by the contractor, not taxpayers. However, these employees may not have a sense of community to the area.

Currently, MONOC does not charge a contract fee to South Orange for provision of services in return for the right to invoice and collect user fees. This could always change at renegotiation and, depending upon the fee level, may create angst among citizens. Once under contract, there could also be a loss of control by the township administrators and elected officials.

In addition, should there be a loss of service due to financial mismanagement, the towns would be left without an immediate option. Although this would be unlikely, it recently occurred in eastern North Carolina with the closure of Johnston Ambulance Service[17], a BLS provider that served 17 counties in NC; or Transcare in New York, which abruptly ceased operations in 2016.[18]

The next issue revolves around the location of the station. These contractors have the technology to maintain a "roaming" force of units to cover areas when other units are on an

[17] http://www.jocoreport.com/2016/08/31/johnston-ambulance-service-closing-immediately-400-employees-laid-off/

[18] Dwyer, Jim. "Bankruptcy of TransCare Strains New York's Emergency Services." *New York Times*, April 14, 2016.

assignment. In such systems, “street corner posting” is the most common positioning method rather than fixed stations. University Hospital’s Regional Emergency Communications Center (REMCS) that currently dispatches Maplewood Fire Department has similar capabilities.

The jurisdictions can also dictate response time performance parameters to ensure available units are nearby to avoid fiscal penalties imposed for failure. Many times, these constraints are based upon dispatch priority and percentile time parameters. For instance, most critical dispatches need to be responded to within five minutes, 90% of the time; less critical dispatches can have a longer and/or lower percentile performance. While this is advantageous, the contractors in these cases control the dispatch and usually insist upon exceptions, such as times of severe weather or disaster.

Strategy E: Squad/First Responder Concept

This strategy can be used in conjunction with the previous options, perhaps in an effort to reduce some of the disadvantages mentioned for those options. Part of the issue with limited ambulance services is the extended unavailability during transportation, patient turnover to the hospital and returning. In addition, there is the potential loss of the community spirit and civic duty embodied by other options.

Many areas use the fire department for first responder medical services, while other agencies handle the transport option. This creates an emergency medical service that is more available than a limited ambulance service and mutual aid. This already occurs in Maplewood, on a limited basis for critical dispatches, only when the ambulance is not readily available. In other areas, residents are confused as to why a fire apparatus responds when they call for an ambulance. Admittedly, it is an expensive response vehicle when it is not needed to potentially suppress a fire event.

In addition, once patient contact is made, the apparatus is committed to the event until an EMS crew can arrive, even if a fire dispatch is announced. To resolve this issue, a sedan can be effectively deployed for this purpose. It is more efficient to operate, does not block traffic excessively, and can keep the community connection.

However, in this area and many others in New Jersey, the police perform this function quite well and therefore this is not a viable option for the municipalities. Some hospital systems use this methodology to provide continual community medical check-ins in an effort to improve health and prevent readmissions to the hospital. This helps the hospital to reduce costs, but currently the services cannot be billed directly to the patient. Some progressive hospitals will compensate municipalities for this but, given the proximity of two major hospital cooperatives, (MONOC and Atlantic) this scenario is not likely for Maplewood and South Orange.

Summary: The following table (Figure 59) summarizes the options for EMS in a shared services environment.

Figure 57 Strategy Summary

Strategy >	A: Status Quo	B: Municipally Funded	C: Volunteer Service	D: Contracted Provider	E: Squad / First Responder
Pro's	Least Disruptive	High Reliability Community Connected Salary cost reduction with civilians Financially stable Revenue Generation	Currently Free Community Connected Does not bill citizens currently. Could use MFAS Boyden Station	Currently Free Roaming units Street corner posting Performance Binders	increased availability use of more efficient vehicle Community Medicine Community Connected Use in additon to other strategies
Con's	Funding Complexity	Salary Cost Associated Expenses Third Service Administration	Reliability, Financial Risk Staffing, Availability Loss of municipal control	Reliability, Financial Risk Disassociated from community Loss of municipal control	Financially viable? Loss of Revenue? Associated Expenses Police already perform.
Viability	High	High	Low	High	Low
Costs	Current	Higher	Lower	TBD	High

The current system has disparities in funding that may create an environment of public discord, especially if it translates into unequal clinical quality, response performance, and training standards. However, we understand that South Orange is very happy with its current arrangement, and the two municipalities have endorsed an agreement recognizing the SORS's response into Maplewood.

We recommend that the communities retain the Maplewood Ambulance for primary coverage for both communities, with SORS serving as primary in South Orange on nights and weekends. SORS would serve as second responder into Maplewood when they were in service, and rely on MONOC or other providers for mutual aid at other times. However, the current arrangement of services between the two communities could continue.

11.0. Recommendations

This chapter summarizes recommendations that occur throughout the report. Where alternate scenarios are presented, they are not summarized here.

South Orange Specific Recommendations

Recommendation Number	Summary	Section Reference
SO-1	Review Civil Service job titles for Firefighter/EMT in light of current requirements	5.6, 5.17.1
SO-2	Administrative polices need to be comprehensively updated.	5.7
SO-3	Review the Department's operating budget. Current budget is small, and has not increased in several years.	5.9
SO-4	Develop a strategic plan for the Fire Department.	5.10
SO-5	Existing records are insufficient, fully utilize existing software for recording key information.	5.15
SO-6	Develop a formal health and safety program to include a fitness component using national standards as a guide.	5.18
SO-7	Consider hiring a part-time civilian administrative support position.	5.19
SO-8	Consider creating a dedicated code enforcement position.	5.25.5
SO-9	Develop a training program and track records accordingly to comply with State, insurance industry, and national standards.	5.26
SO-10	Consider developing criteria for limited emergency medical support role by the SOFD.	5.27
SO-11	Contract for dispatch services with a specialist fire dispatch provider.	5.28
SO-12	Begin formally recording actual response time information "on scene times."	8.2
SO-13	Consider staffing to assure two EMT-certified personnel on duty per shift.	8.3
SO-14	Dispose of spare apparatus stored at Crest Drive and under the railroad viaduct.	9.2

Maplewood Specific Recommendations

Recommendation Number	Summary	Section Reference
MA-1	Consider upgrading an on-duty firefighter position at headquarters to a company officer to provide direct unit-level supervision.	7.2

Consolidated Recommendations

Recommendation Number	Summary	Section Reference
CO-1	Consider automatic joint response to “Signal 9” alarms (smoke in the building); high life hazard automatic alarms	8.1
CO-2	Recommend that both agencies merge into a single entity.	8.1
CO-3	Unify dispatch at REMCS	8.2
CO-4	Plan for coordinated upgrade to new interoperable radio system on Statewide channels.	8.2
CO-5	Both agencies should explore feasibility of adopting Red Alert software under a common license.	8.2
CO-6	Merge training programs	8.4
CO-7	Consolidation staffing options	9.2
CO-8	Further analyze shift staffing needs for backfill under a combined agency.	9.2

While there are many variations and paths to achieve a consolidated fire services, we believe strongly that the potential for enhanced service, improved efficiency, and better management are evident. We hope that both communities will embrace the opportunity to move toward integrating their fire departments.

12.0. Appendices

12.1 Representative Cost Savings of Consolidation

Using information provided by the respective municipalities, we produced estimates of possible cost savings resulting from a consolidation. These are estimates only, and based on multiple assumptions. Specifically, we did not have access to detailed overtime records for South Orange, so we generalized Maplewood's experience to them.

As small agencies, unplanned absences such as a family leave, long-term injury, or military service, can be significant drivers of overtime. In addition, we did not assume that any reductions in staff would result from layoffs, should that be necessary. Further, we did not assume that any officers demoted would have their pay reduced from current levels.

These estimates are designed to present a credible range for planning purposes. It is expected that a detailed financial analysis would be done prior to implementation. For example, there is variance in pay between the two agencies, and seniority also affects pay.

We present salary and benefit savings for the three scenarios presented in the report, below.

Staffing Levels of 14 On-Duty

If current staffing levels were maintained, and one Chief position was eliminated, a savings of approximately $196,899 would be realized. If the number of Deputy Chiefs were reduced from 8 (on shift) to 4, the salary difference assuming they were "bumped" down to Captain ranks would be $44,400. These savings might be realized through attrition, meaning that the savings would accrue more slowly.

While it is reasonable to expect that a larger pool of personnel would require less overtime costs for maintaining minimum shift coverage, this may be offset by increases in training costs for South Orange members, who do not do training on overtime now. Nonetheless, by studying individual leave usage, shifts could be balanced to possible permit reductions in shift staff of one or two positions resulting in a net cost savings.

We are confident that 4 positions could be eliminated – 1 per shift – without negatively impacting overtime costs. Under this scenario, annual cost savings are estimated at $582,659.

Staffing Level of 13 On-Duty

Under a scenario of 13 people minimum staffing, and assuming 14 people assigned per shift, this would result in a reduction of 8 on-duty firefighter positions, equating to savings of $341,360. In addition, the 4 backfill positions would also be eliminated. Total savings under this scenario would be over $923,619 annually.

Staffing Level of 12 On-Duty

Under a scenario of 12 people minimum staffing, and assuming 13 people assigned per shift, this would result in a reduction of 8 on-duty firefighter positions, equating to savings of $682,720. When combined with an additional one backfill position eliminated per shift -- total savings under this scenario would be $1,606,736 annually.

Summary of Cost Savings Estimates

Staffing Scenario	Minimum 14 On Duty (17 Total)	13 On Duty (17 Total)	12 On Duty (16 Total per Shift)
Chief of Department	$196,899	$196,899	$196,899
Deputy Chiefs (salary difference)	$44,400	$44,400	$44,400
Shift Captains	No change		
Minimum Shift Firefighters	No change	$341,360	$682,720
Backfill Shift Firefighters	$341,360	$341,360	$682,720
Total	$582,659	$923,619	$1,606,736

Facility Operating costs would remain unchanged. Capital costs would be reduced going forward as a smaller fleet would be maintained.

There would be some one-time “start up” costs for radio equipment, additional software licenses, and some equipment. However, these would not be large, and would be offset by reductions in software maintenance and administrative costs of consolidating onto one set of systems rather than two.

12.2 Governance Models

Governance of a combined fire service operation between the two communities would be driven by New Jersey law on shared services. While there are several options available, specification of legal form is beyond the scope of the report.

These rules would be contained within a shared services agreement developed and approved between the Townships. Day to day oversight would rest with a Management Committee. We believe a Management Committee composed of elected or appointed officials of both communities. The four member committee would be composed of two members from each municipality, with the Fire Chief serving as a fifth non-voting member. In the event of a disagreement, the respective governing bodies would negotiate a resolution.

The Management Committee would be charged with:

- Approving internal fire department policies
- Routine budgetary oversight and performance reporting
- Determine hiring and promotional requirements
- Recommending (for approval by both Township Committees)
  - Annual budget
  - Hiring Decisions
  - Promotions
  - Purchase of major equipment and capital items
  - Approval of mutual aid or automatic aid agreements
  - Any changes to staffing or facilities
  - Developing a capital equipment plan
  - Negotiate labor agreements

Funding the combined entity could be apportioned by population, or based on assessed valuation. We recommend a formula that weighs both evenly. This captures both the ability to pay, as well as the population served in each community. In the near term, some adjustments may be necessary to share in cost savings and move from current funding levels.