

***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***

SUPPLEMENT AND UPDATE TO 2017 REPORT

TOWNSHIP OF SOUTH ORANGE VILLAGE, NEW JERSEY
TOWNSHIP OF MAPLEWOOD, NEW JERSEY

June 2021



Submitted by:

**MANITOU
INCORPORATED**

www.manitouinc.com

FINAL REPORT

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

*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*

SUPPLEMENT AND UPDATE

Prepared for

Township of South Orange Village
Township of Maplewood

MANITOU
INCORPORATED

Manitou, Inc.
1245 Park Street, Suite1A
Peekskill, New York 10566
USA
914-437-8749

June 2021

Contents

1.0 Acknowledgments	3
2.0 Executive Summary, Scope, and Overview	4
2.1 Executive Summary	4
2.2 Scope and Overview	9
3.0 Community Setting	10
3.1 South Orange	10
3.1.1 Future Development	11
3.2 Maplewood	12
3.2.1 Future Development	13
4.0 Fire Services Workload and Updates	14
4.1 South Orange	14
4.1.1 Budget	14
4.1.2 Organization and Staffing	14
4.1.3 Labor Agreement	17
4.1.4 Apparatus	17
4.1.5 Workload	17
4.1.6 Mutual Aid	20
4.2 Maplewood	22
4.2.1 Budget	22
4.2.2 Staffing and Organization	22
4.2.3 Labor Agreement	24
4.2.5 Workload	25
4.2.6 Mutual Aid	29
5.0 Fire Service Study Implementation	30
5.1 Table of Organization	30
5.2 Joint Training	30
5.3 Dispatch	30
5.4 Radio Communications	32

5.5 ISO 33

5.6 Automatic Aid 33

5.7 Mutual Aid 33

1.0 Acknowledgments

We would like to thank the staff and elected officials of South Orange and Maplewood 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, Village President	Frank McGehee, Mayor
Steve Schnall, Village Trustee	Vic DeLuca, Township Committeeman
Adam Loehner, Administrator	Jerry Giaimis, Administrator

We would also like to recognize the Fire Chiefs of South Orange and Maplewood. South Orange Chief Daniel Sullivan and Maplewood Fire Chief Mike Weber and Deputy Chief Chris Ariemma provided updated information and assisted with collecting data for the updates.

We also consulted with the labor organization presidents over the course of the study. We thank them for sharing their thoughts, opinions, and concerns:

James Jennings, FMBA Local 40

Michael Commins, FMBA Local 240

Kevin Herbert, FMBA Local 25

Project Staff

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

Charles Jennings, PhD, FIFireE, CFO -- Project Manager

Tom Vaughan, MUP -- Geographic Information System and Data Analyst

2.0 Executive Summary, Scope, and Overview

2.1 Executive Summary

In October 2017, Manitou, Inc. delivered its final report, *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*. This report was enthusiastically embraced by the respective Town’s governing bodies.

In late 2020, Manitou was again engaged to update its study, as the process of planning for a merger of the two agencies continued. In the interim, there was consultation with numerous entities at the local and State level, including the Division of Local Government Services in the New Jersey Department of Community Affairs and the Shared Service Czars appointed by Governor Phil Murphy. Our understanding is that a renewed effort to advance the findings of the 2017 study is planned, and this effort will serve as an updated fact base for deliberations, as well as documented steps taken toward implementation of its recommendations in the intervening three years.

The approach for this updated document is to only address areas where significant changes have taken place. While several initiatives have been undertaken in the intervening years, the basic structure, organization, and operation of both fire departments remains mostly unchanged. Further, the deployment recommendations in the report are now being discussed and alternatives considered among the parties. Manitou was not involved in these discussions, and is not a party to the implementation process.

The study was largely completed remotely, with the cooperation of the respective fire department administrations, and one site visit was conducted to qualitatively identify development trends in both communities.

Major recommendations (and their current implementation status) contained within the 2017 report include the following:

South Orange Fire Department

We made a number of recommendations to strengthen the SOFD. Their status is as follows:

Table 2.1: Status of Major Recommendations, SOFD

Recommendation Number	Summary	Original Report Section Reference	Implementation Status
SO-1	Review Civil Service job titles for Firefighter/EMT in light of current requirements	5.6, 5.17.1	Will be under consideration in a Joint Meeting structure.

SO-2	Administrative polices need to be comprehensively updated.	5.7	Pursuing purchase of comprehensive policies.
SO-3	Review the Department's operating budget. Current budget is small, and has not increased in several years.	5.9	Budget increased from \$76,000 to \$100,000 in FY '18 and is currently at \$168,125 for FY21.
SO-4	Develop a strategic plan for the Fire Department.	5.10	Under review.
SO-5	Existing records are insufficient, fully utilize existing software for recording key information.	5.15	In progress.
SO-6	Develop a formal health and safety program to include a fitness component using national standards as a guide.	5.18	Under review. Significant daily operational oversight in play.
SO-7	Consider hiring a part-time civilian administrative support position.	5.19	Full and part-time civilian assistant has been offered to SOFD.
SO-8	Consider creating a dedicated code enforcement position.	5.25.5	Not approved, not under consideration.
SO-9	Develop a training program and track records accordingly to comply with State, insurance industry, and national standards.	5.26	Program developed, including enhanced recordkeeping.
SO-10	Consider developing criteria for limited emergency medical support role by the SOFD.	5.27	CPR/AED annual certification in process.
SO-11	Contract for dispatch services with a specialist fire dispatch provider.	5.28	Completed.
SO-12	Begin formally recording actual response time information "on scene times."	8.2	Partial implementation.
SO-13	Consider staffing to assure two EMT-certified personnel on duty per shift.	8.3	Not under consideration as a stand alone for SOFD
SO-14	Dispose of spare apparatus stored at Crest Drive and under the railroad	9.2	Completed.

	viaduct.		
--	----------	--	--

Maplewood Fire Department

We had a limited number of significant recommendations for Maplewood, shown below.

Table 2.2: Status of Major Recommendations, MFD

Recommendation Number	Summary	Original Report Section Reference	Implementation Status
MA-1	Consider upgrading an on-duty firefighter position at headquarters to a company officer to provide direct unit-level supervision.	7.2	2 of 4 positions upgraded.

Consolidated Fire Service

The following recommendations were intended to apply to a functionally consolidated or merged agency. Although implementation remains under consideration, they are repeated here.

Table 2.3: Status of Major Recommendations, Consolidation

Recommendation Number	Summary	Original Report Section Reference	Implementation Status
CO-1	Consider automatic joint response to “Signal 9” alarms (smoke in the building); high life hazard automatic alarms	8.1	Signal 11 with one (1) Engine Company policy completed.
CO-2	Recommend that both agencies merge into a single entity.	8.1	Active
CO-3	Unify dispatch at REMCS	8.2	Completed.
CO-4	Plan for coordinated upgrade to new interoperable radio system on Statewide channels.	8.2	South Orange and Maplewood have acquired necessary radios and equipment.
CO-5	Both agencies should explore feasibility of adopting Red Alert software under a common license.	8.2	Not started
CO-6	Merge training programs	8.4	Joint training began in Fall of

			2020 and is active and ongoing.
CO-7	Consolidation staffing options	9.2	Under consideration.
CO-8	Further analyze shift staffing needs for backfill under a combined agency.	9.2	Completed.

Both South Orange and Maplewood have devoted considerable attention and effort to the research and planning necessary to move toward a single, merged agency. These accomplishments include both legal, procedural, research, and consultative efforts.

The Joint Exploratory Committee, consisting of elected, administrative and legal representatives from each town, held numerous meetings to discuss the management, operational and financial aspects of a consolidated fire department. The Committee continuously met with officials from the New Jersey Department of Community Affairs Division of Local Government Services and the Governor's Shared Service Czars. During this time the Division provided a critical financial analysis of consolidation scenarios. Additionally, two meetings were held with the statewide leadership of the New Jersey State Fireman’s Mutual Benevolent Association (FMBA).

In June 2019, the Joint Exploratory Committee held the first of five in-person, roundtable discussions with representatives from the Division of Local Government Services, the Shared Service Czars, South Orange FMBA Locals 40 and 240, Maplewood FMBA Local 25 and the NJ State FMBA. Subsequent roundtable discussions were held in August, September, October and December of 2019. Meetings were suspended in 2020 and 2021 due to COVID-19.

The South Orange Board of Trustees and the Maplewood Township Committee approved the following four resolutions:

July 2019: Supported the continued exploration of a “Joint Meeting, as defined in N.J.S.A. 40A:65-14.”

August 2019: Supported the establishment of a Joint Meeting and authorized the Joint Exploratory Committee to:

- prepare an ordinance and term sheet;
- establish Standard Operating Procedures;
- prepare initial merger costs and apply for financial assistance from the State’s shared services appropriations; and

- seek any and all necessary waivers from the New Jersey Civil Service Commission regarding new hires and promotions and the coordination of benefits and contractual issues.

October 2019: Approved the Fire Services Joint Meeting Agreement between South Orange and Maplewood to be known as the South Mountain Regional Fire Department

September 2020: Authorized an automatic response agreement between South Orange and Maplewood Fire Departments as an interim step to establishing the South Mountain Regional Fire Department

Additional agreements by the two municipalities:

1. Percentage of South Mountain Regional Fire Department expenses for each municipality (South Orange = 42.13% and Maplewood 57.86%)
2. Developed “South Mountain Regional Fire Department” Table of Organization
3. Agreed on selection process for “South Mountain Regional Fire Department” leadership
4. Agreed on model for Fire inspections across both communities
5. Maplewood’s retention of Emergency Medical Services at its sole cost

Other steps taken include:

1. “White Board” sessions with all three union locals to review coordination of benefits and contractual issues and transition to a unified labor agreement
2. Met with New Jersey Department of Community Affairs (DCA) and Governor’s Shared Service Czars
3. Met with municipal leaders

Manitou remains enthusiastic at the potential for both agencies to merge, which will create a higher level of service for both communities and enhance the number of personnel available on initial alarms. Both communities have taken considerable steps to enable this merger, as shown above. With this groundwork behind them, they are poised to move forward and undertake consolidation as a step toward more effective operations by both agencies.

To reiterate our findings from both reports, the advantages of combining the two Fire Departments into one include:

- Will consistently increase staffing assigned to fire incidents, increasing initial response to reported structural fires from 6-8 personnel per tour in South Orange and 8-10 personnel per tour in Maplewood to 14-17 personnel per tour in a single department

which brings the combined agencies into stronger compliance with the National Fire Protection Association (NFPA) 1710's staffing recommendations.

This will pay immediate benefits through:

- More effective initial attack to suppress the fire and make rescues
- Greater firefighter safety by having backup personnel available immediately
- Improving current response times by keeping all equipment and apparatus in service and providing immediate response from the closest station.
- Improves administration, training, and efficiency by using best practices from both agencies
- Unifies dispatch for safer, more effective operations
- Makes **no reductions** in firefighting line personnel and achieves taxpayer savings through the reduction of redundant management and supervision specifically one (1) Fire Chief and four (4) Deputy Chiefs bringing the current total of a combined department from 76 to 71 through attrition.

2.2 Scope and Overview

Manitou, Inc. completed its original report calling for a merger of the South Orange and Maplewood Fire Departments, in October 2017. In the interim, while there has been considerable discussion, the respective governing bodies wanted an “up-to-date” basis for continuing deliberations.

This updated document should be considered as a supplement to the original report, and updates only those portions of the original study most important to the ongoing merger discussions. For ease of reading and clarity, we simplified the original report outline to focus thematically on those areas most important.

3.0 Community Setting

This chapter updates population, demographic, and economic information on the communities.

3.1 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. Its population has fluctuated in recent years, but is expected to increase with new residential developments planned.

Table 3.1 South Orange Population Trends 1970-2019

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%
2019 (Est.)	16,521	2.2%

* 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 2019 U.S. Census American Community Survey (ACS) from 2015-19 recorded 5,137 households and 3,543 families residing in the Village. The population density was 5,756.4 per square mile.

Housing and Income: The Village contained 5,608 housing units at an average density of 1,954 per square mile. The average household size was 2.81 and the average family size was 3.31. The median income for a household was \$139,037, and the median income for a family was \$181,262. The per capita income was \$63,050. An estimated 9.9% of the population and 2.7% of families were below the poverty line, of which 2.6 % of those under the age of 18 and 7.4% of those 65 and older were living below the poverty line.

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 48.8 miles of roadways, of which 42.9 miles are maintained by the municipality and the remaining 5.9 miles by Essex County.

Table 3.2: South Orange Selected Characteristics

Parameter	South Orange
Area in Square miles	2.86
Resident Population ¹	16,521
Median age	34.3
Owner-Occupied Housing	71%
Rental Housing	29%
Vacant	5.1%

The population and distribution of housing has not changed significantly since the 2017 report.

3.1.1 Future Development

The Township of South Orange Village has completed a comprehensive update of its Master Plan.² The draft plan, published in November 2020, is awaiting approval from the Planning Board and calls for redevelopment, improvement and/or intensified use in several areas. Specific areas mentioned in the draft plan include:

- Village Center/Central Business District
- Church Street Redevelopment Area
- Irvington Avenue Corridor
- Valley Street Corridor

Sub-area plans call out specific sites that could be “catalytic” in terms of enhancements. The plans also call for “increased intensity” to achieve equitable transit-oriented development - advancing affordable housing options and investment in smart growth. At present, there are only a few projects currently permitted and under construction within the Village. It is expected that with completion of the Master Plan and economic recovery post-covid-19, that additional projects may be announced.

At present, there are 40 residential units under construction, 220 approved and or permitted, and over 95 units planned. Some projects in the approved or planned status do not yet have final unit counts, so these numbers should be viewed as low estimates.³

¹ US Census Bureau 2019 Estimates from 2019 American Community Survey 5 year

² South Orange Master Plan website [WEB-SOV Draft Master Plan 11.2.2020.pdf \(somasterplan.com\)](https://www.somasterplan.com/WEB-SOV_Draft_Master_Plan_11.2.2020.pdf)

³ Estimates provided by South Orange Village.

3.2 Maplewood

The Town of Maplewood is located in central Essex County, bordering South Orange to the West. The Town experienced population growth of almost 4 percent from 2010. Overall, other characteristics of the Town remained similar.

Table 3.3 Maplewood Population Trends 1970-2019

Census	Population	Percent
1960	23,977	-4.9% ...
1970	24,932	4.0%
1980	22,950	-7.9%
1990	21,652	-5.7%
2000	23,868	10.2%
2010	23,867	0.0%
2019 (Est.)	24,784	3.8%

Table 3.4: Maplewood Selected Characteristics

Parameter	Maplewood
Area in Square miles	3.88
Resident Population ⁴	24,784
Median age	38.1
Owner-Occupied Housing	68.6%
Rental Housing	31.4%
Vacant	8.4%

Demographics: The 2019 U.S. Census American Community Survey (ACS) from 2015-19 recorded 7,959 households and 6,027 families residing in the Town. The population density was 6,387.6 per square mile.

Housing and Income: The Town contained 8,340 housing units at an average density of 2,149 per square mile. The average household size was 3.1 and the average family size was 3.61. The median income for a household was \$139,081, and the median income for a family was \$174,725. The per capita income was \$60,331. An estimated 5.6% of the population and 3.4% of families were below the poverty line, of which 7.3 % of those under the age of 18 and 6.1% of those 65 and older were living below the poverty line.

Area: There is a total area of 3.88 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

⁴ US Census Bureau 2019 Estimates from 2019 American Community Survey 5 year

approximately 59 miles of roadways, of which 54.5 miles are maintained by the municipality and 4.5 miles by Essex County and the remainder (0.03) by the New Jersey Department of Transportation.

3.2.1 Future Development

Since the original study was completed, the Township has had an increase of 348 apartments at the following multi-family developments: Avalon, The Avilia, Elite on Springfield, 255 Tuscan, and Maplewood Lofts. An additional 37 apartments are under construction on Baker Street, Irvington Avenue, Millburn Avenue, Highland Place and Parker Avenue. Another 20 apartments/town homes are proposed on Springfield Avenue, Boyden Avenue and Boyden Parkway. These developments are contained in defined “business corridors” which will have little impact on response times. Of course, these new construction projects will be equipped with fire protection systems including sprinklers.

4.0 Fire Services Workload and Updates

This chapter updates basic statistics and characteristics for the two fire departments. Only those areas that experienced changes since the original study are included.

4.1 South Orange

The South Orange Fire Department continues its patterns of deployment and operation. Changes since 2017 are detailed in this section.

4.1.1 Budget

Table 4.1 shows the SOFD operating budget from 2018-2020. 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. Operating costs remained static at \$72,000 until 2017, when they increased to over \$100,000. Another increase took place in FY2020, when operating expenses increased by roughly 65 percent.

Table 4.1 SOFD Annual Budget⁵

Fiscal Year	Salaries & Wages	Operating
2020	3,833,900.00	168,125.00
2019	3,919,776.14	102,000.00
2018	3,850,000.00	100,000.00

The largest revenue stream for the SOFD is from Fire Code Fees. These are collected under authority of the New Jersey Fire Code. As more new construction is expected in the Town, these fees should continue to increase.

Table 4.2 SOFD Fire Code Enforcement Revenue

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fire Code Fees	32,693	23,098	17,535	17,500	19,000	20,751	19,776	23,851	23,000

4.1.2 Organization and Staffing

The department organization consists of a traditional structure commonly used within the industry. The chart below (Figure 4.1) illustrates the Department's organization which consists of 33 authorized uniformed positions, but the Department is currently staffed with 30 positions with new hires budgeted and appropriated. These positions include the Fire Chief, who

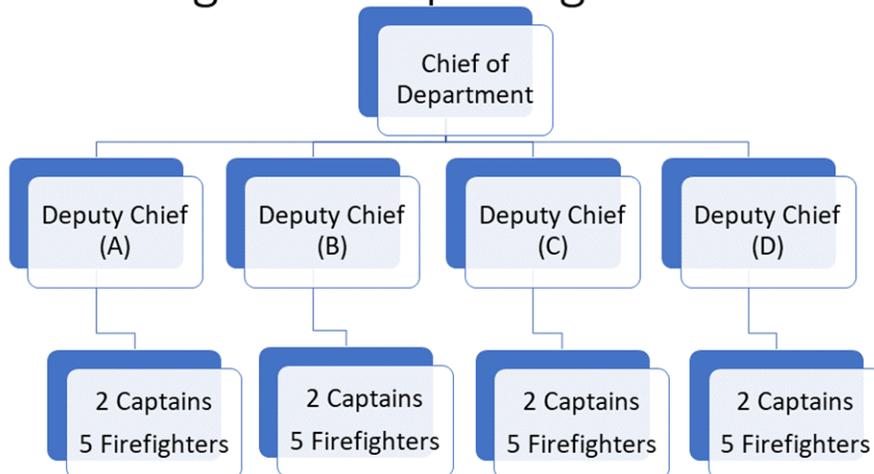
⁵ Salary figures shown here do not necessarily include all fringe benefits and pension contributions. The two communities present their budgets in slightly different formats.

normally is assigned to a 40-hour workweek in line with other Village administrators, with the remaining members divided evenly amongst four 24-hour platoon groups. Currently, each platoon is comprised of eight members, consisting of a Deputy Fire Chief, two Captains, and five 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.

The Department has had multiple vacancies caused by retirements and covid-19 related concerns. Five new hires went onto shift recently, which will help reduce this problem. However, the Department expects additional vacancies due to retirement or disability in the near future. Figure 4.1 does not reflect any current vacancies.

Figure 4.1: South Orange Fire Department Organization Chart

South Orange Fire Dept. Org Chart Jan 2021



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.

Table 4.3: SOFD Staffing Configuration

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

Alarm levels for the SOFD are essentially unchanged. Given the 6-8 person staffing, all units respond on any significant incident, and mutual aid of 2 engines is requested on any working structure fire.

Table 4.4: SOFD Unit Response Matrix

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

4.1.3 Labor Agreement

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 another for Deputy Chiefs and Captains (FMBA Local 240). The agreements with Firefighters and Captains and Deputy Chiefs are in effect through December 31, 2021.

4.1.4 Apparatus

Table 4.5 shows the apparatus complement and assigned staffing for the SOFD. When at minimum staffing, the ladder company is staffed steadily at 2 personnel, and the engine is staffed with 3. When at full staffing (8 personnel), the ladder is staffed at 3 personnel and the engine is staffed with 4. The Department received two new command vehicles and one engine since 2017. These are a 2019 Spartan engine, and 2017 and 2019 Chevrolet Tahoe used by the on-duty Deputy and the Chief of Department.

Table 4.5: SOFD Rolling Stock

Company/ Unit	Location	APPARATUS		SPECIFICATIONS		
		Make and Type	Placed in Service	Pump Capacity	Tank Capacity	Aerial Device
Lad. 8-1	Headquarters - 52 Sloan Street	Ferrara	2013	–	–	100 ft.
Com. 8-2	Headquarters	Chevrolet	2019	–	–	–
Eng. 8-3	Headquarters	Spartan	2019	1,500	500	–
Eng. 8-4	Headquarters	Seagrave	2005	1,500-gpm	500	–
Eng. 8-5	Headquarters	Crimson	2009	1,500-gpm	500	–
Res. 8-8	Headquarters	Rescue One	2005	–	–	–

4.1.5 Workload

The SOFD has experienced an increase in workload over the past two years (Figure 4.2). After remaining below 1900 incidents from 2013–2017, incidents increased to 2232 in 2018 and 2492 in 2019. The largest share of the workload was for service calls, shown in Figure 4.3. South Orange also records a large number of “Special Incident Type” calls, which are usually reserved for a locally-designated incident that is not otherwise classified. For each incident type, this figure shows the category, average number of incidents, and percentage. Table 4.6 presents these data.

Figure 4.2: SOFD Annual Workload

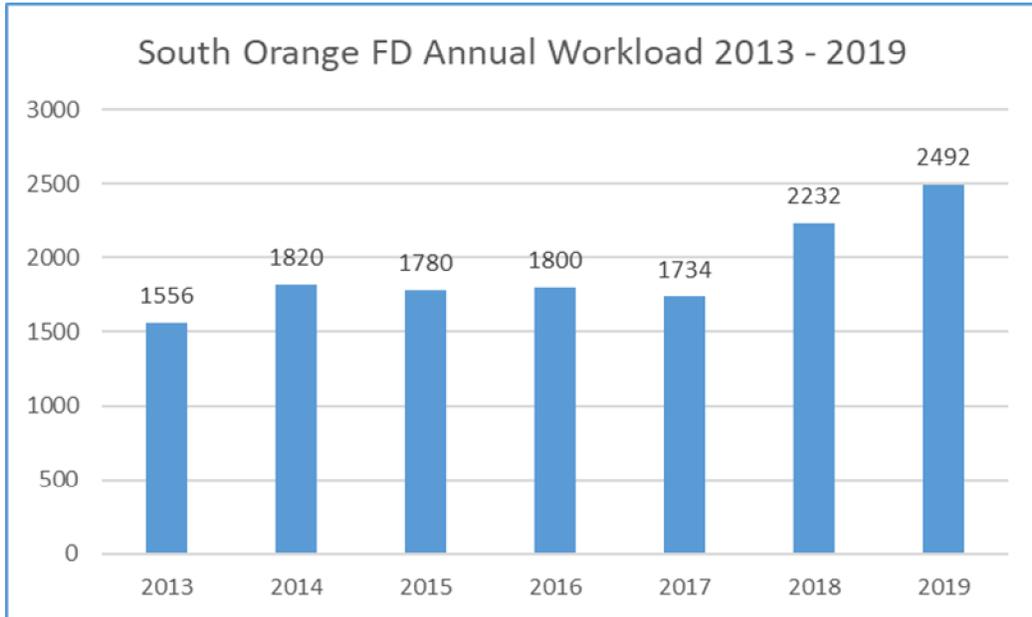


Figure 4.3: SOFD Workload by Type

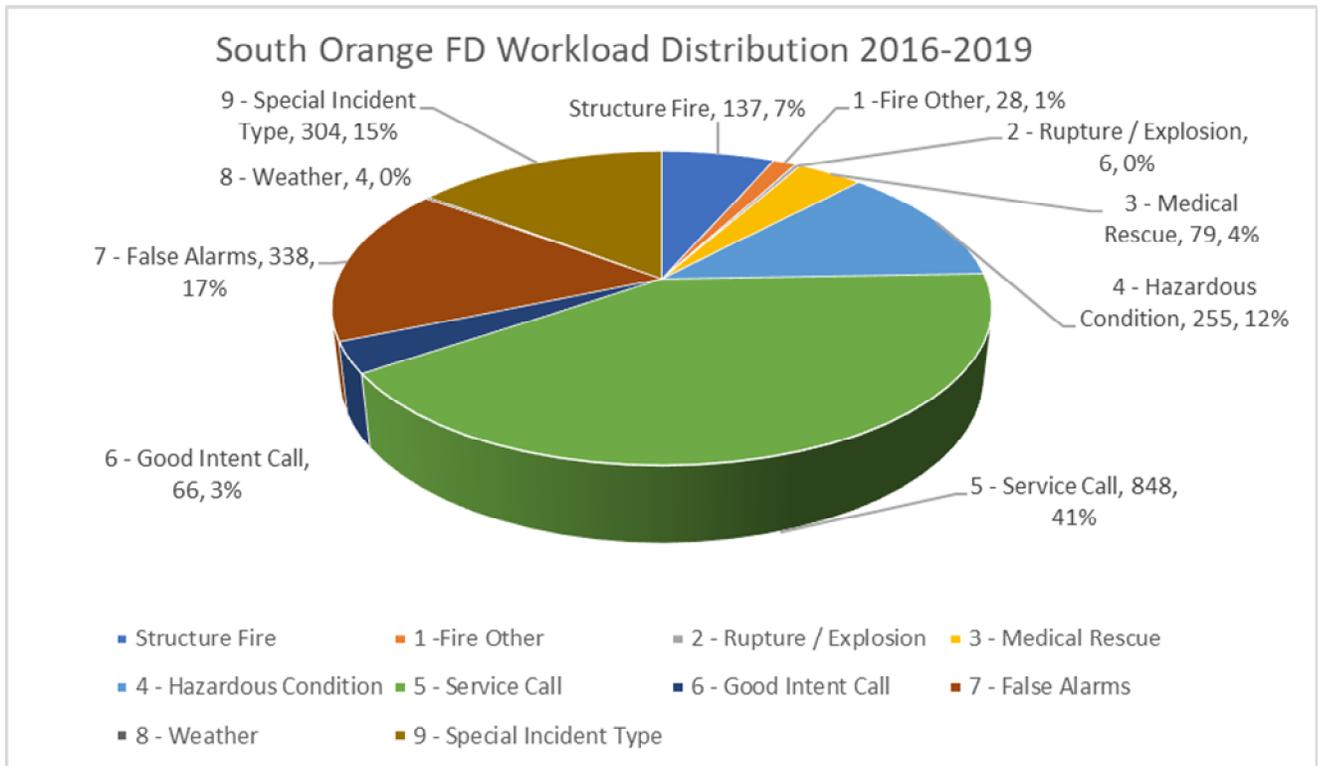
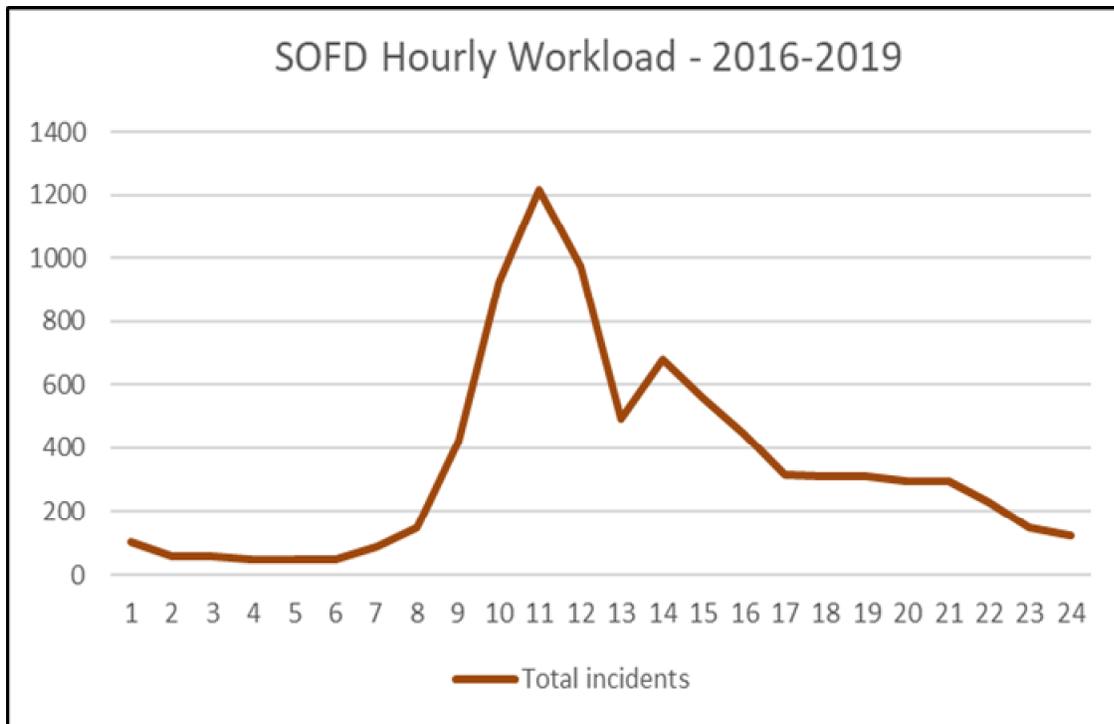


Table 4.6: SOFD Workload by Type, 2016-2019

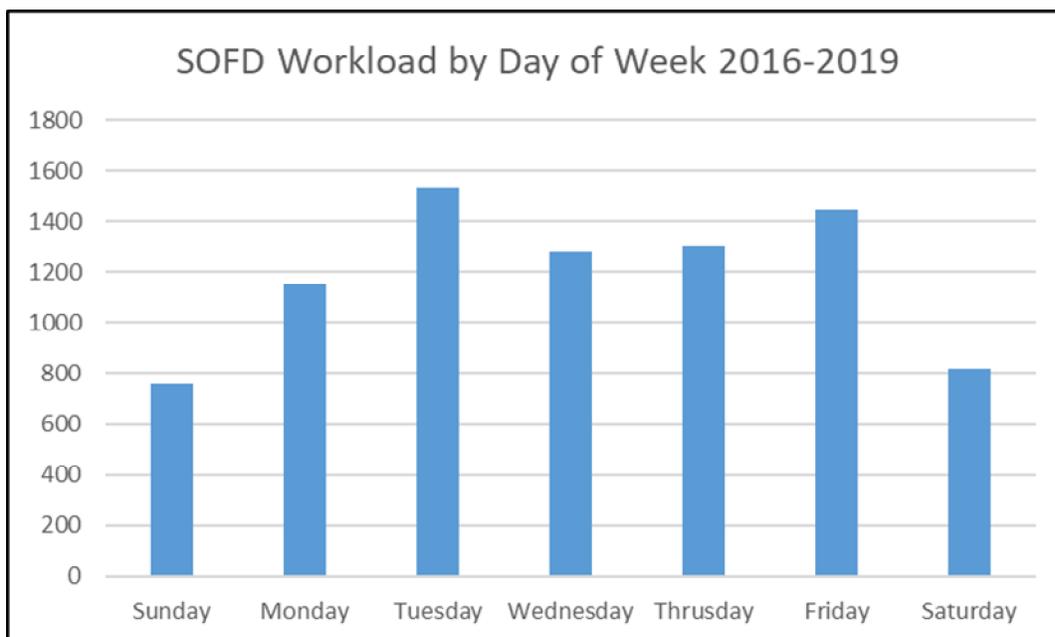
General Code	2016	2017	2018	2019	AVERAGE	PCT
Structure Fire	138	122	144	143	137	6.6%
1 -All Other Fire	20	17	41	32	28	1.3%
2 - Rupture / Explosion	8	4	7	6	6	0.3%
3 - Medical Rescue	66	93	77	80	79	3.8%
4 - Hazardous Condition	227	222	329	242	255	12.4%
5 - Service Call	848	665	880	999	848	41.1%
6 - Good Intent Call	60	65	66	73	66	3.2%
7 - False Alarms	297	320	408	326	338	16.4%
8 - Weather	3	1	7	6	4	0.2%
9 - Special Event	133	225	273	585	304	14.7%
TOTAL	1662	1612	2088	2349	2065	100.0%

Figure 4.4: SOFD Hourly Workload



Activity peaks in midday, after a sharp increase beginning at 8am (Figure 4.4). There is no clear pattern on activity by day of week, although weekends are the least busy days, corresponding to less commercial activity.

Figure 4.5: SOFD Workload by Day of Week



The fire reporting system (NFIRS) which is used across the nation has criteria for classifying incident types. Structure fires are defined as incidents within a building or other enclosed structure where “fire extends beyond a noncombustible container.”⁶ This definition is designed to exclude fires confined within a piece of equipment such as a chimney fire that did not extend outside the chimney, an oil burner misfire with no damage beyond the device, or fire within a cooking pot. Fires in combustible items such as an overstuffed chair would be classified as structure fires. Application of this rule varies considerably between agencies, with some erring consistently in either direction – overreporting structure fires, or underreporting.

South Orange reported responding to 143 structure fires in 2019. A more intuitive measure of this workload is the number of times that they requested mutual aid. As we see in the following section, in 2019 South Orange requested mutual aid assistance for 5 incidents. This means that for the vast majority of these calls for service, the on-duty staffing complement was sufficient to manage the event.

4.1.6 Mutual Aid

Lastly, we updated our analysis of mutual aid activity. The SOFD provided more mutual aid than it requested. While they used mutual aid five times in 2019, they provided mutual aid 69 times. The most frequent recipient of aid was Orange, at 18 incidents, followed by East Orange and West Orange at 15 incidents each. Maplewood requested aid 9 times (Table 4.8).

⁶ NFIRS 5.0 Self-Study Program Introduction and Overview ([fema.gov](https://www.fema.gov)), p. 14.

Table 4.7: - South Orange FD Mutual Aid Summary 2016-19

Aid Given or Received	2016	2017	2018	2019
Mutual Aid Received	1	3	2	5
Automatic Aid Received	0	0	0	0
Mutual Aid Given	45	54	51	69
Automatic Aid Given	7	5	3	1
Other Aid Given	0	0	0	0
None	1,747	1,672	2,176	2,417
Total	1,800	1,734	2,232	2,492
Pct Mutual Aid Given	2.5%	3.1%	2.3%	2.8%

Table 4.8: South Orange FD Mutual Aid Supplied by Department

Mutual/Auto Aid Given	2016	2017	2018	2019	MA Pct
Belleville FD	1	0	0	0	0.4%
Bloomfield Fire	0	0	0	0	0.0%
Cedar Grove FD	0	0	0	0	0.0%
East Orange Fire	14	12	11	15	22.1%
Irvington FD	4	8	10	8	12.8%
Livingston FD	0	0	0	0	0.0%
Maplewood FD	8	8	5	9	12.8%
Millburn FD	1	2	1	3	3.0%
Montclair Fire	1	1	0	0	0.9%
Newark FD	1	1	1	2	2.1%
Nutley FD	0	0	0	0	0.0%
Orange FD	11	15	16	18	25.5%
South Orange FD	1	0	0	0	0.4%
West Orange FD	10	12	9	15	19.6%
North Bergen FD	0	0	1	0	0.4%
Total	52	59	54	70	100.0%

4.2 Maplewood

The Maplewood Fire Department continues its patterns of deployment and operation. Changes since 2017 are detailed in this section.

4.2.1 Budget

The Maplewood Fire Department has a 2019 total operating budget of \$5.3 million, of which \$4.93 million was budgeted for salaries and wages.⁷ In terms of revenue, EMS transport is the largest source of revenue, followed by various fire inspection and permit fees.

Table 4.9: MFD Budget Summary 2011-2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Salary	4,298,000	4,517,000	4,648,200	4,688,540	4,793,685	4,871,427	4,834,209	4,736,928	4,929,400
Other	173,420	162,788	569,762	169,617	187,154	255,618	261,940	278,186	253000

Table 4.10: MFD Revenues, 2017-2019

Fee/Revenue	2017	2018	2019
Permit Fees	\$2,651	\$3,437	\$3,228
Non-Life Hazard use Inspections	\$23,710	\$21,715	\$22,200
Life Hazard Use Inspections	\$25,905	\$30,709	\$30,192
Certificate of Smoke Detector/CO/Fire Extinguisher	\$31,525	\$41,200	\$51,280
EMS Transport	\$353,117	\$346,976	\$317,495
Total	\$436,908	\$444,037	\$424,395

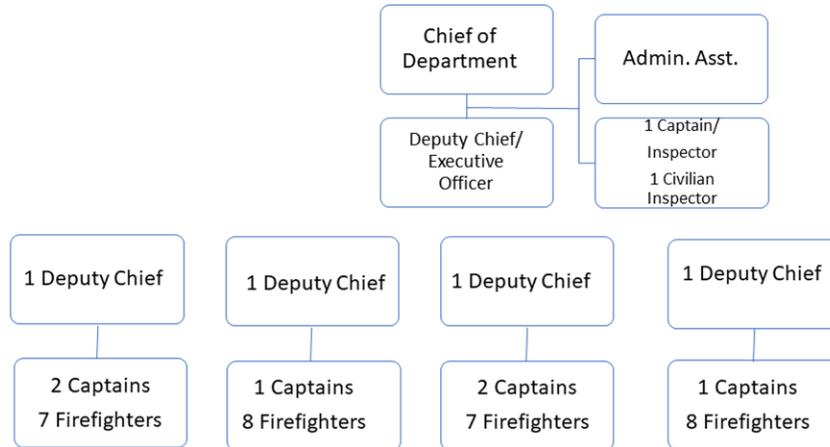
4.2.2 Staffing and Organization

The MFD organization chart is shown below in Figure 4.6. The fundamental structure of the Department is unchanged. The Chief continues to have a Deputy Chief assigned as Executive Officer, and the fire prevention bureau also remains the same. Following on the 2017 study, the Department was allowed to convert two firefighter positions to Captains to improve supervision on shifts.

⁷ Salary figures shown here do not necessarily include all fringe benefits and pension contributions. The two communities present their budgets in slightly different formats.

Figure 4.6: Maplewood Fire Dept. Organization Chart

Maplewood Fire Dept. Org Chart Jan. 2021



The staffing configuration for MFD is shown in Table 4.11, below. This alignment is similar to what was utilized earlier, but the recently-created second Captain position (shown in red), is alternately assigned as a firefighter on two shifts (assigned to Ladder 31). The cross-staffing of Rescue 36 and Engine 34 is shown explicitly on this revised chart.

Table 4.11: MFD Staffing Configuration

APPARATUS/VEHICLE	Position/Rank		
	Deputy Fire Chief	Captain	Firefighter
8 Personnel on Duty – Minimum on duty			
Deputy Chief	1		
Engine 32		1	2
Ladder 31		1 ^a	1
Rescue 36/Engine 34			2
10 Personnel on Duty			
Deputy Chief	1		
Engine 32		1	3
Ladder 31		1 ^a	2
Rescue 36/Engine 34			2

^a The positions shown in red are a firefighter on two of four shifts.

The dispatch matrix for differing incidents types has changed slightly for Maplewood. It is shown in Table 4.12 below.

Table 4.12: Alarm levels and Response for MFD

Alarm Level	Typical Situation	Response	Description
Signal 5	Wires Down, Lockout, Fluids in the Roadway, Small Outside Fire, EMS Assist, Outside Odor of Gas	One Unit	E32, L31 with DC or L31 without DC (two platoons)
Signal 8	Residential Fire Alarm Activation, Vehicle Fire, Elevator with Entrapment	Three or Four Units	DC, E32, L31 & R36/E34 if needed
Signal 9	Smoke or reported fire in a structure, Alarm Activation in a Life Hazard or Commercial Building, Hazmat, Odor of Gas Inside of a Structure	Four Units	DC, E32, L31, E34
Signal 11	Working Structure Fire or other Major Incident	All Maplewood Units	Plus Irvington (Engine & Truck), South Orange Engine, Union Engine to the Scene. Millburn Engine, Orange Engine & East Orange Truck to Maplewood Fire HQ's

4.2.3 Labor Agreement

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 MFD's current agreement with Local 25 of the FMBA is in effect through December 2023.

4.2.4 Apparatus

The MFD apparatus is shown in Table 4.13. Since the original report, the Department has acquired 3 new/used ambulances and a new command vehicle.

Table 4.13: 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 36	2016 Ford
Ambulance	Rescue 37	2017 Ford
Ambulance	Rescue 38	1996Ford
Deputy Chief's Car	HQ 35	2020 Chevrolet Tahoe
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

4.2.5 Workload

Figures 4.7 and 4.8 show that the MFD responded to 3,657 incidents in 2019. This is a decrease from the 7-year-high of 4,022 incidents in 2018. As expected, EMS incidents are the most frequent, accounting for 56 percent of incidents from 2016-2019. For each incident type, Figure 4.8 shows the category, average number of incidents, and percentage.

We can see that medical calls are decreasing year over year, as are service calls. The only other consistent pattern is an increase in “good intent” calls, which includes incidents such as “steam from a dryer vent mistaken for smoke” (Table 4.14).

Maplewood reported responding to 72 structure fires in 2019, and an average of 64 from 2016-2019. A more intuitive understanding of their workload is that the Department received fire (not EMS) mutual aid across that same time period an average of 48 times per year from 2016-2020. This equates to 4 mutual requests per month.

Figure 4.7: MFD Annual Workload

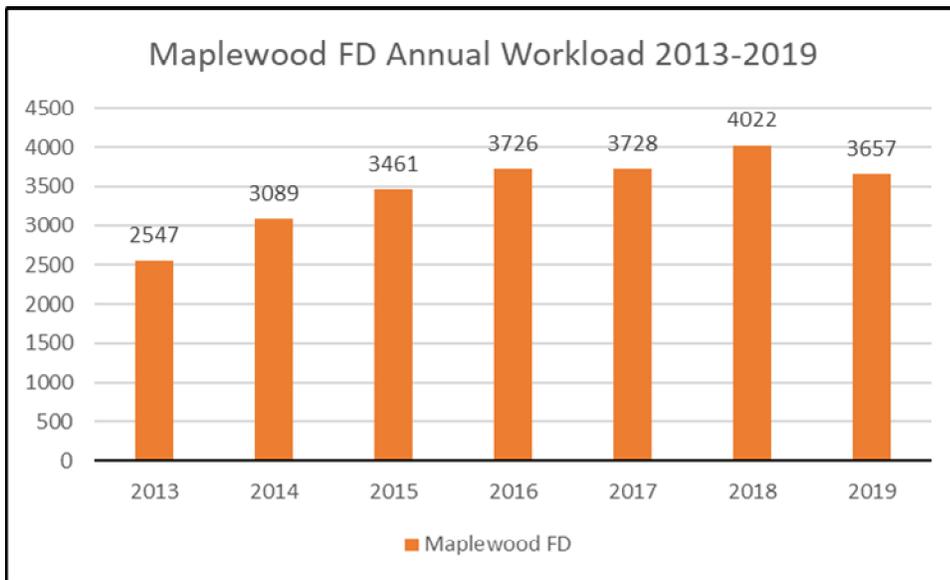


Figure 4.8: MFD Workload by type

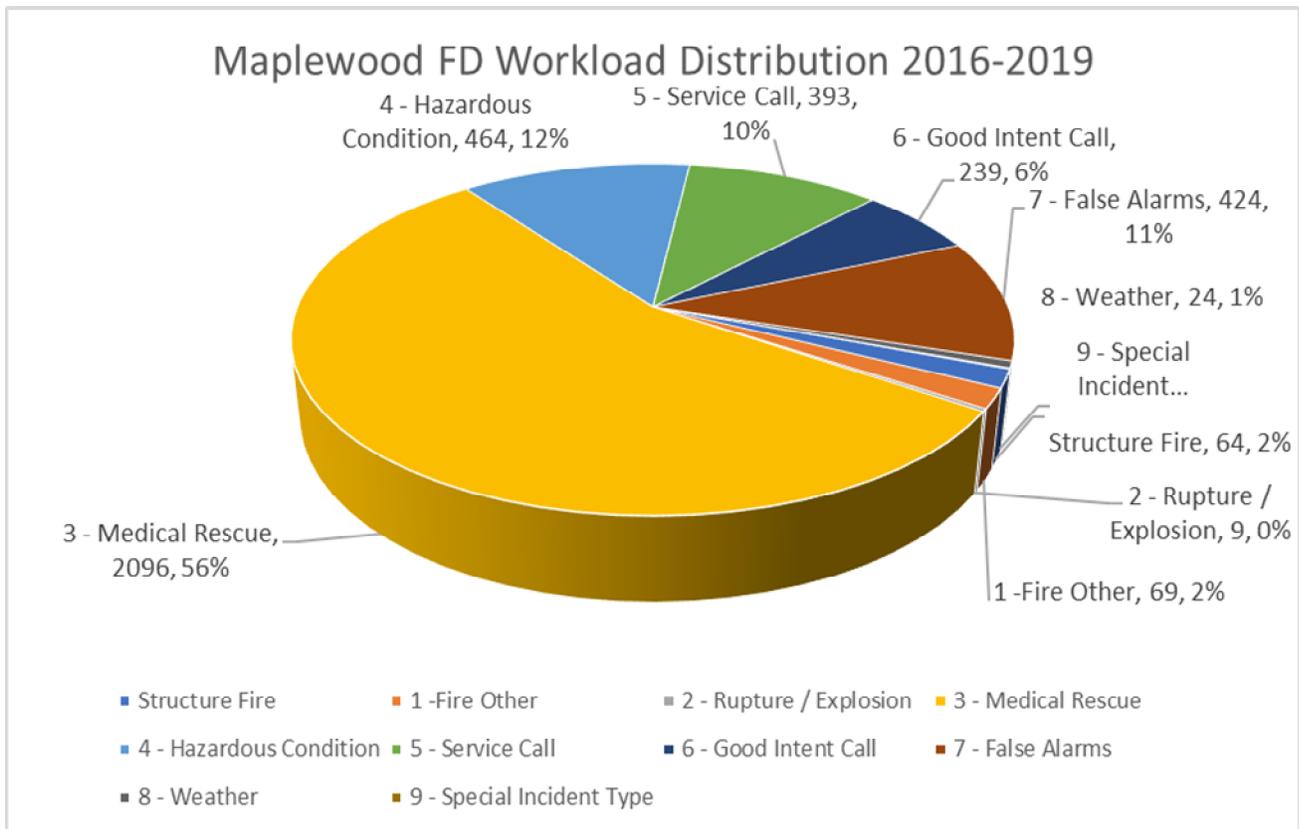


Figure 4.9: MFD Workload by Type Detail

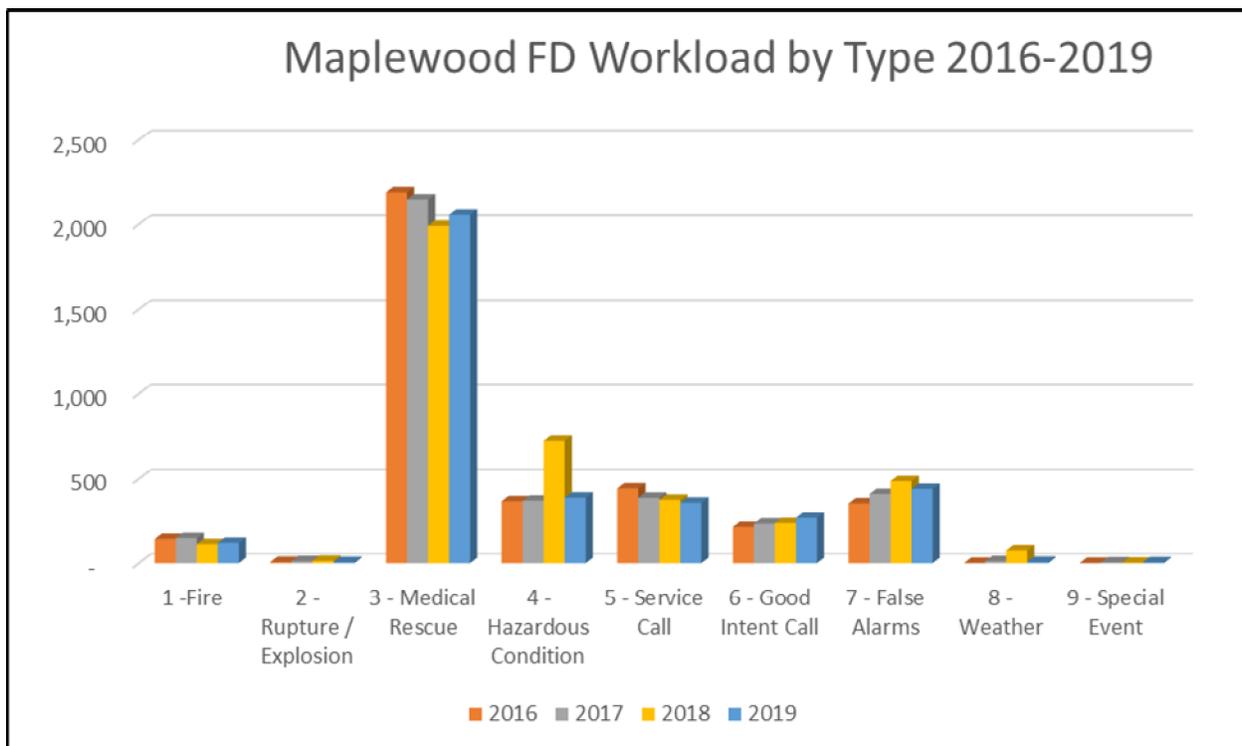


Table 4.14: Maplewood FD workload by Type 2016-2019

General Code	2016	2017	2018	2019	AVERAGE	PCT
Structure Fire	55	63	65	72	64	1.7%
1 -All Other Fire	145	150	114	122	69	1.8%
2 - Rupture / Explosion	7	11	13	6	9	0.2%
3 - Medical Rescue	2,188	2,146	1,990	2,058	2096	55.4%
4 - Hazardous Condition	369	372	725	390	464	12.3%
5 - Service Call	444	389	377	360	393	10.4%
6 - Good Intent Call	215	234	237	268	239	6.3%
7 - False Alarms	356	411	486	441	424	11.2%
8 - Weather	1	11	78	7	24	0.6%
9 - Special Event	1	4	2	5	3	0.1%
TOTAL	3,726	3,728	4,022	3,657	3,783	100.0%

Figure 4.10 shows MFD activity on an hourly basis. Incident activity is lowest in the 4-6am time frame, then increases steadily until a peak at noon. The activity remains high until 7-8pm, when it begins to slow.

Weekdays are the busiest times for incidents, with a Wednesday being the least busy day. Weekends are comparatively less busy, which fits expected patterns as businesses may be closed, and there is less intense traffic and activity (Figure 4.11).

Figure 4.10: MFD Hourly Workload

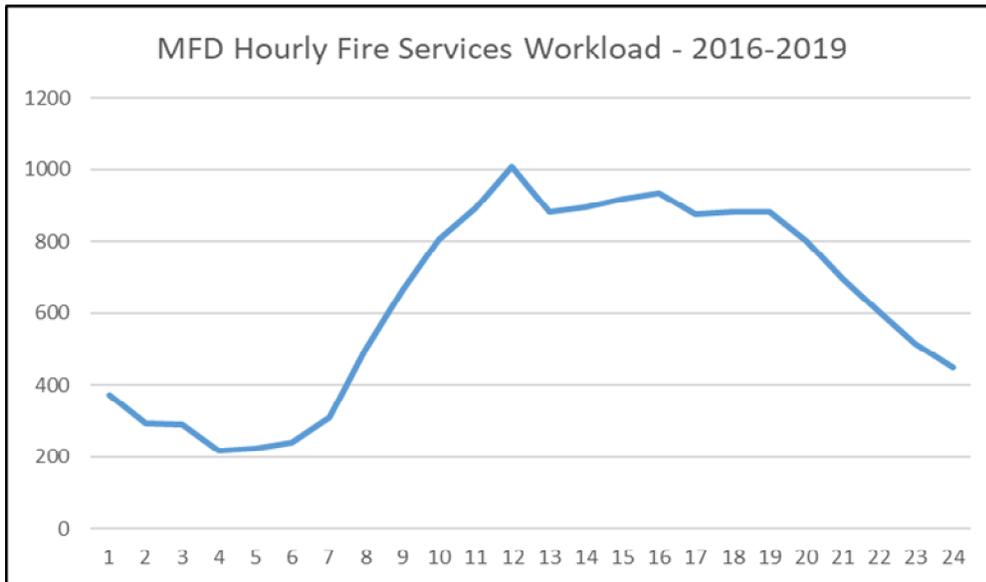
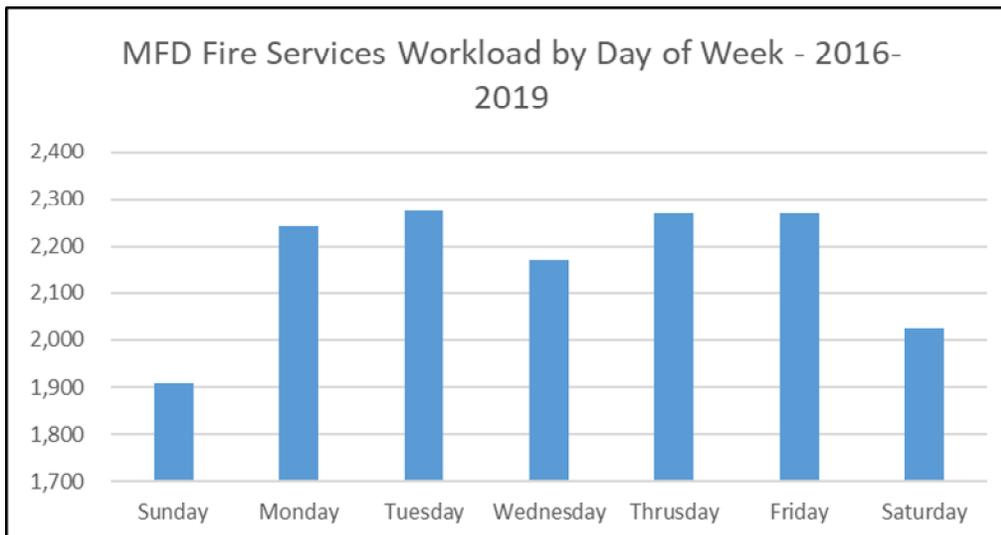


Figure 4.11: MFD Workload by Day of Week



4.2.6 Mutual Aid

Mutual aid activity is shown in Tables 4.15 and 4.16. Maplewood Fire received mutual aid 297 times in 2019, and provided aid 126 times. EMS activity is a major driver of mutual aid, as is shown in the list of agencies involved with giving or receiving mutual aid. It should be noted that Maplewood does not provide mutual aid with its ambulance, so its costs for recall are driven by fire mutual aid. Table 4.15 shows an overview of all types of mutual aid.

The most frequent agencies involved in mutual aid are South Orange Rescue Squad, followed by the Irvington Fire Department. There were 15 incidents of mutual aid given or received from South Orange Fire Department in 2019 (Table 4.16).

Table 4.15: Mutual Aid Given or Received, Maplewood FD

Year	EMS Mutual Aid Given	EMS Mutual Aid Received	Total EMS Mutual Aid	Fire Mutual Aid Given	Fire Mutual Aid Received	Total Fire Mutual Aid
2016	3	306	309	104	43	147
2017	0	289	289	103	64	167
2018	1	277	278	94	45	139
2019	0	236	236	126	66	192
2020	4	207	211	79	23	102

Table 4.16: Mutual Aid Given, Maplewood FD

Mutual/Auto Aid Given	2016	2017	2018	2019	2020
Belleville Fire Dept	0	1	1	0	0
BLS - Other	1	0	0	0	0
East Orange Fire Dept	0	1	0	0	0
Elizabeth Fire Dept	0	1	0	0	0
Irvington Fire Dept	61	60	55	61	52
Millburn Fire Dept	19	23	13	21	10
Millburn Short Hills FAS	1	0	2	0	0
Newark Fire Dept	1	0	2	4	0
Orange Fire Department	13	11	12	15	6
OTHER - FD	0	0	1	1	0
South Orange Fire Dept	1	3	3	7	1
Union Fire Dept	1	1	1	7	4
West Orange Fire Dept	8	2	6	10	6
TOTAL	107	103	97	126	78

5.0 Fire Service Study Implementation

This chapter of the report considers strategic areas of cooperation identified in the previous study. It provides an update on progress or changes since the original study.

5.1 Table of Organization

The governing bodies, using the recommendations from the 2017 report and upon consultation with affected parties and the State, has developed the following Table of Organization for a combined fire department to be known as the South Mountain Regional Fire Department (see Figure 5.1).

The Table for the combined organization includes 71 uniformed positions, and retains the civilian staff currently employed in administrative and fire prevention roles.

5.2 Joint Training

The two Departments began to schedule joint training exercises in late 2020. In November and December, a total of 8 sessions were held (2 for each shift).

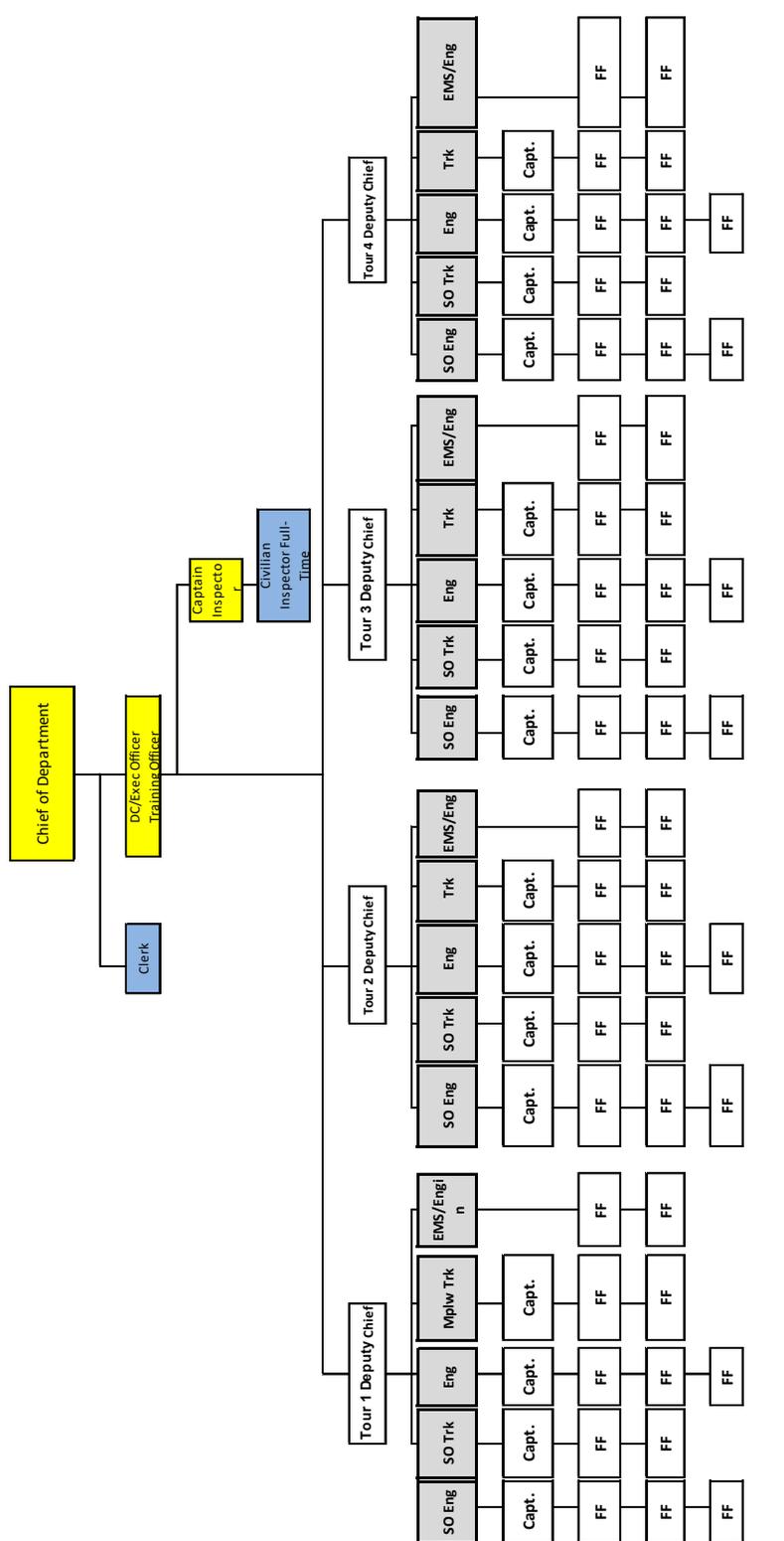
These initial meetings were arranged on a shift-by-shift basis to enable personnel from each Department to meet. Subsequent drills have included familiarization with major hazards and complex structures within each Town and most recently, the Departments coordinated live-burn training together. These trainings include a live burn exercise in which actual fires will be extinguished.

5.3 Dispatch

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 to 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.

Figure 5.1: Proposed Table of Organization



Within Maplewood Township, 9-1-1 calls are answered at 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.

The original report recommended that both Departments move to a common dispatch center, and this has been implemented. South Orange has appropriated the budget and has contracted with REMCS. Their incoming 9-1-1 calls would continue to be answered and screened by South Orange Police.

5.4 Radio Communications

At the time of the study, the two Departments did not have radio interoperability.

South Orange had planned a full implementation of all public safety agencies, including police, fire, rescue, and OEM onto the P25 system to improve coverage and enhance communication with agencies on the New Jersey Interoperability Communication System (“NJICS”). This went into effect in 2017.

Maplewood followed suit shortly after with moving the Fire Department on to P25 and acquiring the necessary equipment in 2018.

In 2020, radios from both fire departments were programmed to enable “talk groups” and to listen to each other’s frequencies.

Both South Orange and Maplewood have expressed concern regarding certain in-building coverage and low areas throughout the towns. The agencies are currently working together with the State Office of Information Technology on infrastructure upgrades to minimize down zones and improve overall communications for all agencies in the Essex County region.

Both departments are also actively looking at P25 Digital Vehicular Repeater Systems to be mounted in Deputy Chief vehicles.

5.5 ISO

Both communities have been surveyed by ISO representatives in recent years. The following table (Table 5.1) presents an overview of the four surveys provided to us for review. A complete discussion of ISO's Public Protection Classification is in the original report.

Table5.1: Recent ISO Surveys

	2008		2013		2014		2019	
	PPC	Score	PPC	Score	PPC	Score	PPC	Score
Maplewood	4	66.08	3	70.51			3	TBD
South Orange					4	68.44		

As shown above, Maplewood was last evaluated in 2019. The Township's fire defenses improved enough since a 2008 survey to earn enough credits, though barely, to receive a Class 3 rating. The most recent survey saw that they maintained their rating into 2019.

The ISO can be consulted to provide advice on the impacts of any potential automatic aid scheme or merger. It is believed that the planned improvements could improve the ratings given to the communities.

5.6 Automatic Aid

While there were philosophical differences between the Chiefs with regard to what types of incidents and the number or amount of apparatus to be sent across the municipal boundary, an agreement was reached authorizing an automatic response to all confirmed Signal 11/structure fires with one engine company or by request of the Incident Commander.

Our analysis finds that automatic aid will not unduly tax either department, and has the potential for saving costs for recall, aside from putting more personnel on the scene of confirmed fires more quickly than at present.

5.7 Mutual Aid

We were also tasked with estimating the impact of a merger on the utilization and associated costs of providing overtime. Mutual aid is a reciprocal service provided among communities, and is the backbone of effective fire service provision, as many Fire Departments within Essex County do not maintain sufficient staffing to suppress a structure fire or other serious incident in accordance with prevailing practice or industry norms.⁸ This analysis will focus on mutual aid

⁸ Mutual Aid is governed by the Essex County Mutual Aid plan, which is approved by the municipal governments of the County, and organized by the Essex County Fire Chiefs Association under the Fire Service Resource Emergency

provided – that is, mutual aid given to a neighboring community. It will not consider mutual aid received, which occurs when either Town experiences a fire or other significant incident.

The use of mutual aid remains in many ways a function of the workload of neighboring fire departments. Busier fire departments are likely to require more frequent mutual aid. In those terms, neither South Orange or Maplewood request an inordinate amount of aid, at an average in the 50s for Maplewood from 2016-2019 (with a low of 23 requests in 2020), while South Orange requested aid an average of less than 4 (3.4) times annually over the 2016-2019 period.

Requests for mutual aid by neighboring jurisdictions can drive overtime, as additional personnel may be brought in to provide what each jurisdiction deems minimal coverage. Therefore, costs of recall are driven by the numbers of personnel who must be hired back under policy, which is in turn driven by the number of personnel on duty.

Both Departments currently recall personnel, depending on the nature and timing of the mutual aid request. Maplewood has more flexibility because they can utilize weekday daytime uniformed personnel to avoid having to hire back. Based on historic expenditures, the cost per recall is shown in Table 5.2.

Table 5.2: Estimated Current Annual Cost of Providing Fire Mutual Aid

Department	Average Mutual Aid Given 2016-2019	Historic/ Actual Cost	Cost/Mutual Aid Request
South Orange	59	\$39,235 ^a	\$665
Maplewood	103	\$22,042	\$214

^a Estimated cost.

Policy Implications

At present, both South Orange and Maplewood appear independently within the Essex County Fire Mutual Aid plan. Should the Departments merge, they would be faced with a question of whether they would provide one unit or two units (a continuation of the current two-department configuration). If one unit were selected as the maximum to be provided, then the need to recall personnel could be even further reduced, assuming that a larger number of personnel on duty would reduce the need to call back. Additionally, by flexibly interpreting the recall policy, expenditures could be further reduced.

Deployment Act, New Jersey Statutes Annotated 52:14E-14 and the regulations promulgated thereunder, including but not limited to New Jersey Administrative Code 5:75A-2.2.

Current mutual aid between the two Departments would now be provided automatically, and as they would effectively be the same agency, there would be no added cost for this aid. South Orange responded to Maplewood an average of 7.5 times annually from 2016-2019, and Maplewood responded to South Orange an average of 3 times per year over this time period. These account for just over 6 percent of total mutual aid requests.

A combined department would need to establish a policy for recall based on on-duty and available staffing. Again, as any resources within the combined South Orange and Maplewood service area would be available for initial alarm dispatch, the need for recall on minor incidents would be avoided.

In closing, we see no impediments to providing mutual aid from a combined, single department. Such a system would not have a major change in the Department's daily operations, but would require the County to adjust their mutual aid plan to reflect response of one unit from the combined organization.