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## Final Summary Report



### Fire Station Location and Operational Review

### Maplewood Fire Department, Minnesota

*Prepared by:*



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**CONSULTANT REPORT**

# Maplewood Fire Department, Minnesota

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# EXECUTIVE SUMMARY

The City of Maplewood released a request for proposal to solicit a public safety-consulting firm to conduct a *Fire Department Station Location and Operations Review*. In early March 2017, FITCH conducted the study kick-off meetings with the public-safety workgroup, city administration, the fire department administration, and labor. In total, three on-site visits were completed in an effort to seek to understand the unique local conditions and to provide work products and gain feedback and direction.

This comprehensive summary report includes an executive summary, a presentation slide deck, a quantitative data report, and a geographic information system report. Overall, the firm's strategy is to provide administration and the elected policy group with sufficient objective data from which to establish policy. Therefore, all alternatives and recommendations are grounded in the data analysis and best practices insulating the process from potential biases.

## Community Demands for Service<sup>i</sup>

Commensurate with most communities that provide integrated fire and emergency medical services (EMS), requests for EMS are the vast majority of community driven incident activity. EMS accounts for 85% and fire accounts for less than 10% of the incidents. The Maplewood Fire Department answers nearly 5,400 unique requests for service per year.

## Historical Performance

The Maplewood Fire Department currently operates from three fixed facility fire stations and has a travel time of 8.3 minutes overall. EMS related incidents have an 8.2-minute travel time or less and fire related incidents have a 9-minute travel time or less for 90 percent of the incidents. In other words, 9 out of 10 times, the department will provide this level of service or better.

## Community Risk Assessment

In addition to the historical demands for services, a prospective review of occupancies within the jurisdiction was completed. In total, over 450 occupancies were evaluated based on variables for needed fire flow, the number of stories, the square footage, and the building combustion class. Each occupancy was rated as either high, moderate, or low risk occupancy and geocoded to each fire station first due response area.

This analysis provides direction for the allocation and concentration of resources based on each station's relative risk rating. The analysis suggests that both the North and Central Stations are high-risk station areas and the south station is of a moderate risk. Based on recommendations for efficiency in the distribution of stations, the North and Central stations were ultimately treated as

one territory as they had 99.9% duplication of coverage areas within the current performance of 8-minutes or less to 90% of the incidents. This combined area resulted in a maximum risk rating indicating the higher concentration of resources in the area.

**Recommendation: #1**

It is recommended that the Central station is combined with the North station from a planning perspective and the subsequent station will require multiple staffed resources to appropriately respond to and mitigate risk.

## **Establishing Desired Performance**

The fire department's current performance is defined as a travel time of 8.3 minutes or less to 90% of the incidents. However, the 8-minutes is relatively distant from either National Fire Protection Association's (NFPA) 1710 recommendations of 4-minutes or the Commission on Fire Accreditation International's (CFAI) recommendation of 5-minutes and 12-seconds.

Conversely, the evidenced-based research in emergency medical services and fire behavior suggests that if the agency cannot respond to the most critical of incidents within 5-minutes or less from onset, the outcome is not strictly correlated to the response time. Therefore, the City of Maplewood has considerable latitude in establishing the desired service levels as an improvement from 8-minutes to 7-minutes may introduce significant costs without the correlated improvement in outcomes.

This study provides two alternatives for consideration in a 6-minute and an 8-minute travel time, respectively. Results suggest that for the City to improve travel time from the current performance of 8-minutes to 6-minutes, it would require a four fire station configuration and five staffed units to overcome the geographic limitations and the hourly demand for services.

In contrast, a review of the current station configuration at 8-minutes reveals that there is considerable inefficiency in the response areas between the North and Central stations as there is nearly 100% duplication in the coverage area. Therefore, it is recommended that if the City elects to maintain current performance, a two-station model will be able to continue to ensure an 8-minute travel time to greater than 90% of the incidents.

**Recommendation: #2**

If the desired service level is to maintain the current 8-minute travel time, it is recommended that the City consider closing the Central station and reallocating the resources to the North station as a more efficient configuration.

## **Staffing Considerations and Peak Load Ambulances**

The middle of the day, between 8:00 am and 8:00 pm, experiences the vast majority of incident call volume and workload. In addition, the overwhelming volume is for EMS related incidents as

opposed to fire suppression incidents. Much of the non-peak overnight period has less than one call every two hours on average.

Therefore, it is recommended that the department continue with the strategy of hiring 12-hour employees to meet demands above and beyond the base level services. In addition, it is recommended that the department begin to deploy a peak-load medic/ambulance unit seven days a week. This is the most efficient manner to address increases in demand for the future once base level services have been established for the 24-hour period.

**Recommendation: #3**  
 The City is encouraged to continue to embrace 12-hour scheduled employees. In addition, it is recommended that the department deploy a peak load medic/ambulance seven days a week.

### Alternative Deployment Models for Consideration

Five alternative deployment models were developed for the City’s consideration. These alternatives are developed through a comprehensive review of the risk, demand, and performance of the department as well as future growth projections. Considering the alternative models, the current deployment utilizes a minimum of six personnel 24/7. All of these models assume that the Central station resources will be reallocated to the North station. The models are provided in escalating order beginning with the leanest alternative, model 1, for ease of comparison and not in any order of priority.

**Figure 1: Comparison of Staffing and Deployment Alternatives**

Model/ Minimum Staffing	South			North					Total 24/HR	Total Peak
	Engine	Ladder	Medic	Engine	Ladder	Medic	BC	Peak Medic		
1	2	0	0	2	0	2	0	2	6	2
2	2	0	0	2	0	2	PM	2	6	3
3	2	0	0	2	0	2	1	2	7	2
4	3	0	0	2	0	2	1	2	8	2
5	3	0	0	3	0	2	1	2	9	2

Each of the alternative models includes a peak-load medic/ambulance unit and three cross-staffed engine/medic units continuously staffed for 24 hours per day.

**Recommendation: #4**

The City is encouraged to consider one of the alternatives to ensure that the station configuration and deployment is sufficient to perform as described.

**Consideration for Increased Command and Control Capability**

Currently, the capability for command and control at emergency incidents is limited to the weekday chief officers, other regional fire departments, or a first line supervisor with Maplewood that is part of a two-person crew and multi-tasking rather than dedicated to this important function. Currently, the weekday chief officers respond on nights and weekends as needed, potentially introducing delays in command and control functions. One of the common themes in nearly all of the post-tragedy reviews of firefighter injuries and deaths include insufficient command and control and communications.

Therefore, it is recommended that the City and department consider creating a Battalion Chief position on shift that can respond immediately for command and control activities. When reviewing the alternative deployment models above, Models 2 through 5 all include this recommendation in the deployment. This is an efficient and cost effective manner in which to mitigate safety concerns when responding with limited personnel.

Specifically, model number two considers deploying 12-hour employees in the evenings after the weekday chief officers are no longer immediately available. In this manner, the weekday chief officers could handle the command and control responsibilities during the weekdays and then the shift-based Battalion Chief can take over for the evenings.

**Recommendation: #5**

The City is encouraged to consider deploying a Battalion Chief on shift for the primary purpose of having immediate command and control capabilities to reduce safety risks to personnel.

**Fiscal Comparison of Alternative Staffing and Deployment Models**

Several assumptions are utilized to provide the comparison of costs for each model. First, the comparisons utilize \$85,000 for each position. It is understood that nuances could increase or decrease projected costs, this is provided to evaluate the relative increase or decrease between models. Second, these cost projections include the sunset of the part-time employee pool and

transitions to a full-time fire department. Expenditures of over \$547,000 are reallocated to these models. The model numbers mirror the previous deployment comparison for clarity. Finally, these cost projections do not consider the salary savings of the Fire or EMS chiefs' retirement or the additional costs of the Assistant Fire Chief positions. Therefore, this analysis focuses on the costs of changes to the deployment model.

**Figure 2: Cost Comparisons of Staffing Models**

Model	24-Hour Employees	12-Hour Employees	Estimated Costs
Current	15	3	
1	20	4	\$74,242
2	20	6	\$92,794
3	23	4	\$207,285
4	27	4	\$488,813
5	30	4	\$770,340

**Recommendation: #6**

If the City elects to explore options to sunset the part-time employee program, it is recommended that the part-time employee pool is encouraged to seek additional training or certifications, if necessary, to apply for full-time positions if desired.

**Opportunities for Public Private Partnership in EMS**

Analyses were conducted to determine the City’s potential benefit for exploring public-private partnerships in EMS. Several measures were utilized to explore this option. First, the proportion of low acuity or non-emergency activity accounts for approximately 43% of the overall EMS workload. The potential to reduce nearly half of the workload has sufficient merit to continue further consideration. Second, was to evaluate the available capacity in the system and the potential negative repercussions to the fire suppression capabilities since the units are cross-staffed. Analyses revealed that the workload could nearly double before the workload was above the upper threshold for workload on a 24-hour shift. Additionally, the average hourly demand for fire related services was low at less than 0.1 calls per hour. In other words, the risk to the fire suppression capabilities is relatively low while performing EMS duties. Finally, the transport rate is 75% overall and over 80% for

the category for “illness and other”, a non-descript category that captures many of the non-emergency responses.

Ideally, the department would need relief from at least one of three distinct thresholds: workload, competing fire suppression demands, or low-acuity calls that don’t end up in treatment and transport. In all cases, the data suggests that Maplewood would not benefit from a public-private partnership at this time. A public-private partnership at this time may increase the costs for readiness and introduce a potential loss of revenues from patient transports.

<b>Recommendation: #7</b>
It is recommended that the City delay further consideration a public-private partnership in EMS at this time, but continue to reevaluate annually.

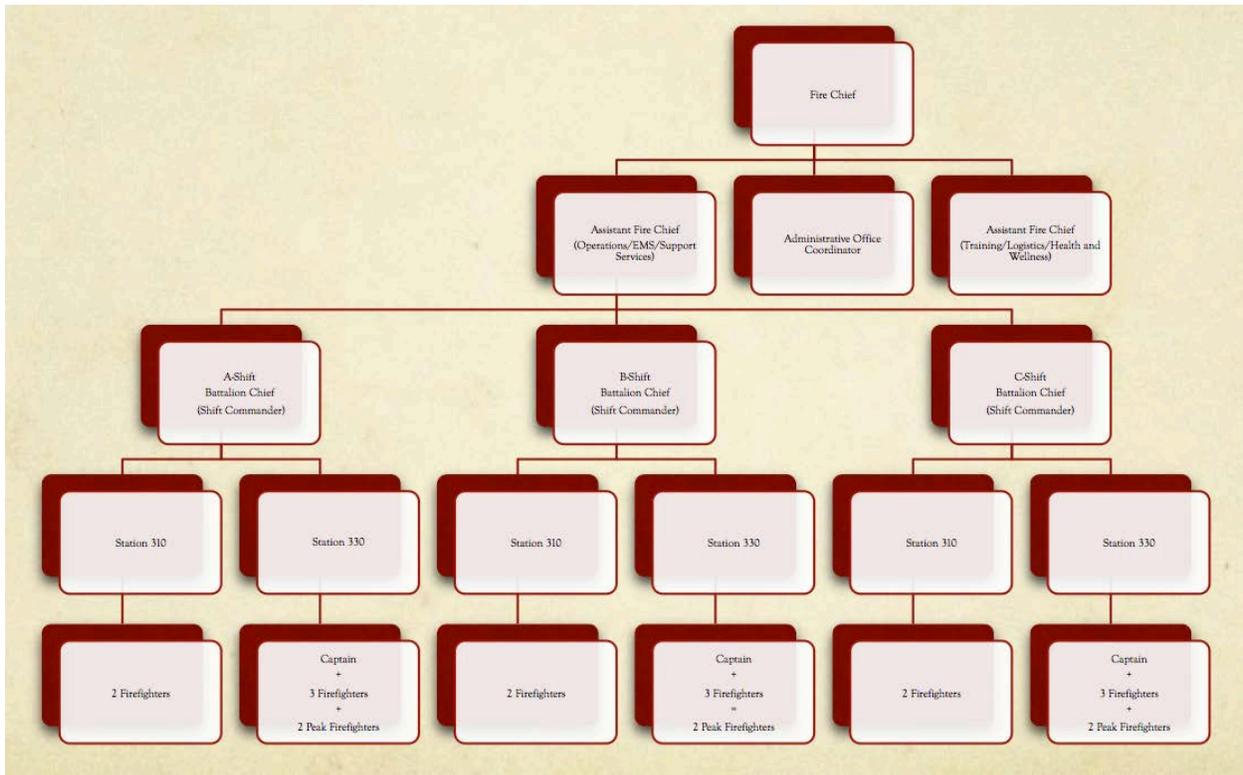
## **Administrative Staffing**

As previously discussed, it is suggested that once either the Fire Chief or EMS Chief retires, that the position is combined for a single department leader. In this manner, under all suggested models and alternatives, the number of chief officers working weekdays would remain constant at three full time officers. For example, under the current configuration there is the Fire Chief, EMS Chief, and a Battalion Chief. In the recommended models, the administrative capacity and oversight would have one combined Fire/EMS Chief, and two Assistant Fire Chiefs. Therefore, other than incremental costs, the models should be relatively cost neutral for administrative capacity. However, additional chief officers in the field are also suggested.

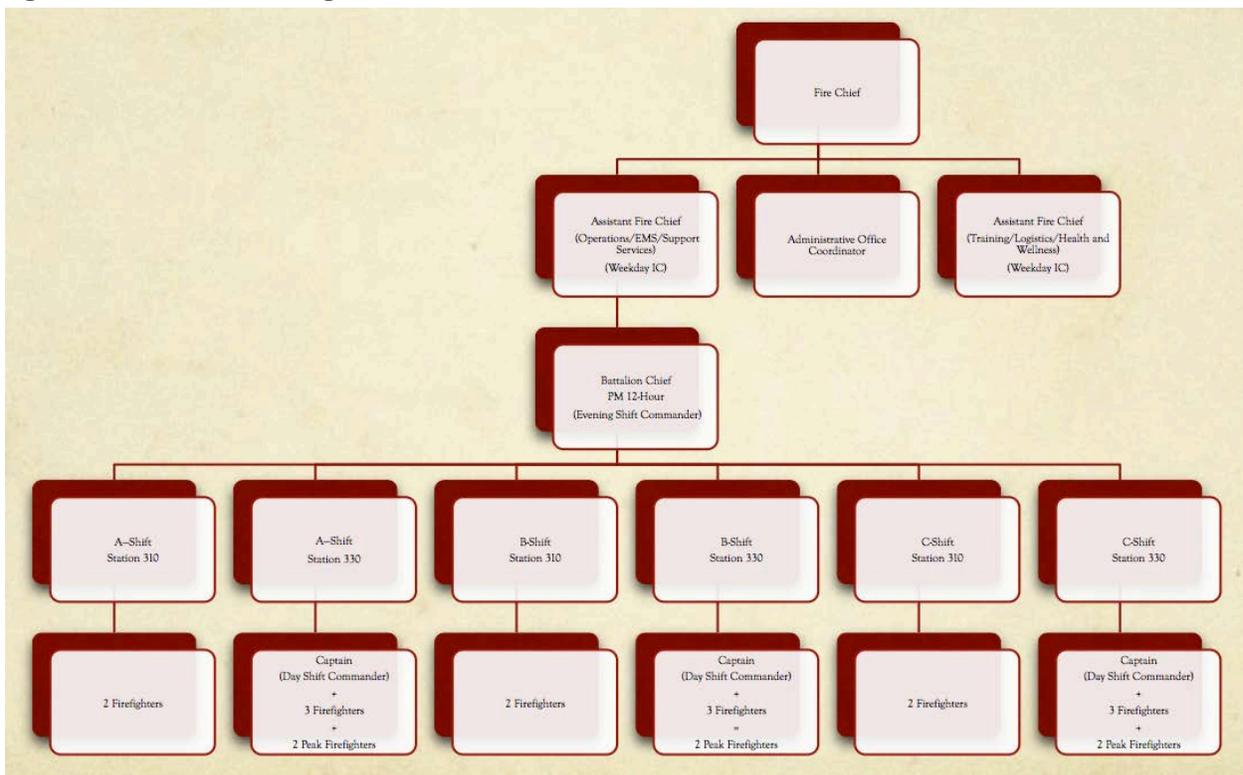
In addition, the recommended reorganization suggests that the department may benefit from one full-time administrative assistant, or functionally equivalent classification, to assist in the back-office operations and processes at the fire department. Therefore, it is recommended that the 0.6 FTE administrative assistant is reclassified to a 1.0 FTE.

Recommended organizational structures for alternatives 3 and 2 are provided below.

**Figure 3: Recommended Organizational Chart for Alternative Model 3**



**Figure 4: Recommended Organizational Chart for Alternative Model 2**



**Recommendation: #8**

It is recommended that the City consolidate the Fire Chief and EMS Chief positions upon one of the positions being vacated.

**Recommendation: #9**

It is recommended that the City consider upgrading the administrative assistant support position from a 0.6 FTE to a 1.0 FTE for the fire department.

## **Implications for ISO**

An evaluation of potential deployment and staffing alternatives was completed with respect to potential implications to the City's Insurance Services Organization (ISO) rating. ISO rates fire departments on three categories as follows:

1. Receiving and Handling of Fire Alarms – 10%
2. Fire Department – 50%
3. Water Supply – 40%

Considering the rating schedule, the available alternatives would not change any elements of either the receiving and handling of fire alarms or the water supply. Changes for the fire department would include a potential reduction in the “credit for distribution” of up to 33% for closing a station. However, the 2017 rating indicates that the department could improve training points by up to 135% for the next rating. Training is largely under management control. Similarly, a potential exists to increase the “credit for company personnel” through the expansion of dedicated staffing.

The analysis assumed that all current rating elements would stay the same with the exception of reducing the staffing calculations to the most conservative factor, reducing the distribution by 33%, and increasing the training 88% of the available points. Utilizing these assumptions, and holding all other variables constant, the department should improve the overall score and remain an ISO 4. Finally, the rating did not include two items identified in the new schedule for additional points for the deployment strategies and specifically an additional 5.5 points for life safety and community risk reduction efforts. The life safety and community risk points are largely under management control as well. Therefore, a potential exists to improve the overall rating in the future and consider the available alternatives.

## Summary of Recommendations

- Transition from part-time employee group to full-time employees
- Adopt Alternative 3 or 2 to provide for the most efficient performance and coverage
  - Reallocate resources from the Central station to the North station
  - Deploy a peak-load ambulance 7-days a week
  - Deploy a Battalion Chief for command and control on at least nights
- Reorganize the department's administrative structure as the chief officers attrition
- Consider upgrading the civilian administrative assistant position to a 1.0 FTE
- Delay consideration for public-private partnerships for EMS at this time

# REPORT PRESENTATION BODY



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