

May 2019

## Executive Summary



Brooklyn Park Fire Department  
City of Brooklyn Park, Minnesota

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# CONSULTANT REPORT

**BROOKLYN PARK FIRE DEPARTMENT**  
**Brooklyn Park, MN**

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**Attachments:**

**PowerPoint**

**Data Report**

**GIS Report**

## **EXECUTIVE SUMMARY**

The City of Brooklyn Park released a request for proposals to solicit a public safety consulting firm to facilitate a data and community-driven strategic planning process for the Brooklyn Park Fire Department. In November 2018, FITCH conducted the study kick-off meetings with the city administration, the fire department administration, and labor leadership. The *FITCH* team was on site for a minimum of four visits throughout the process, stakeholder engagements, interim reporting, facilitation of strategic planning, and formal presentation to the Council.

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 analyses and best practices insulating the process from potential biases.

In addition, Phase II of the project included the facilitation of a community-driven strategic planning process. This process was well developed by the City and Department staff to include substantive citizen engagement and participation. The Phase II report is the Strategic Planning Document that accompanies this executive summary.

This report will be representative of the Phase I work products.

## **COMMUNITY DEMANDS FOR SERVICE**

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 67.7% and fire incidents accounts for less than 22% of the incidents. The Brooklyn Park Fire Department (BPFDD) answered nearly 9,407 unique calls for service in the 2018 calendar year. Over the past five years BPFDD has experienced an annualized average of 2.4% increase per year in demand for services.

## **HISTORICAL PERFORMANCE**

BPFDD currently operates from three fixed facility fire stations and has an average travel time of 4.1 minutes system wide. EMS related incidents have a 6.6-minute travel time or less and fire related incidents have a 6.4-minute travel time or less for 90 percent of the calls for service system wide. In other words, 9 out of 10 times, the department will provide this level

of service or better. Like many other communities BPFDD does not have a significant variation in service demand by month, with the busiest month being August and the least demand during the month of January. Similar to many communities the demand for service is greater during the mid-day while the overnight hours are the least busy.

## **DISPATCH PERFORMANCE AND EMERGENCY MEDICAL DISPATCHING**

Brooklyn Park's resources are dispatched by the 911 communications center in Hennepin County. Specific requests for Computer Aided Dispatch (CAD) records were provided by the *FITCH* team. However, Hennepin County had considerable difficulty extracting the data requested. An attempt was made with a legacy query that was insufficient for these purposes. Unfortunately, the employee who wrote the query no longer worked for the agency and there was limited evidenced ability to have timely command of the data held within the CAD system. Therefore, in communication with Brooklyn Park, a decision was made to utilize the fire reporting data managed by the fire department.

The assumption is that the dispatch center's performance is accurately reflected by the BPFDD's data since the data is populated from the CAD system. However, in full transparency and fairness to Hennepin County, it is not fully known whether variance exists between the CAD data and the department's RMS data. In other words, caution should be used when interpreting Hennepin County's performance in this report. Nonetheless, from a high-level perspective the current performance is calculated at 1.8 minutes at the 90<sup>th</sup> percentile for the dispatch time and is found to be of quality performance within the national experience. While the recommended standards may be more restrictive, in our experience performance under 2.0 minutes at the 90<sup>th</sup> percentile is typical of most modern dispatch centers.

This analysis focused on the dispatch time performance of first dispatched units. This specific analysis did not take into account whether or not the first unit dispatch arrived on scene. Dispatch times could be adversely impacted by a few significant long calls that may be attributed to variables such as calls transferred from other agencies (such as the police department or neighboring departments) or impacted by uncontrollable operating circumstances.

The average dispatch processing time in this analysis was 66 seconds or 1.1 minutes and the 90<sup>th</sup> percentile dispatch time was 108 seconds or 1.8 minutes.

### ***EMERGENCY MEDICAL DISPATCHING AND/OR MEDICAL PRIORITY DISPATCHING***

Emergency Medical Dispatching (EMD) or Medical Priority Dispatching is a method where the dispatch center can triage EMS incidents based on clinical severity. There are several providers of call triaging programs. The advantage of utilizing call triaging in the communications center, is that the service providers such as Brooklyn Park may have an opportunity to reduce risk to employees and citizens by having a more robust mechanism to respond non-emergency or have an alternative resource allocation based on clinical risk. For example, in an effort to better align resource allocation and commitment to risk, the system will allow the agency to elect to assign more units to a clinically urgent incident and reduce or eliminate the fire department response to non-emergent incidents where the ambulance provider may be able to appropriately handle.

This approach will enhance risk management concepts for the department and the public, and provide for the potential for significant cost avoidance as workload is managed or distributed in a responsible clinically based manner.

Therefore, it is recommended that the City work with other stakeholders within the Hennepin County system of providers to explore options for the acquisition, implementation, and utilization of a medical call triaging process.

#### **Recommendation: #1**

It is recommended that the City work with other stakeholders within the Hennepin County system of providers and Hennepin County 911 to explore options for the acquisition, implementation, and utilization of a medical call triaging process.

## **COMMUNITY RISK ASSESSMENT**

In addition to the historical demands for services, a review of occupancies within the jurisdiction was completed to further evaluate potential risks. Occupancy risk was evaluated across the jurisdiction utilizing internal fire inspection records. Inspection records utilized the building occupancy type, square footage, building height, construction type, and needed fire flow as the risk variables. Secondly, the risk ratings were moderated if the building had an automatic sprinkler system. Ultimately, a risk-rating matrix was developed that categorized 1,577 occupancies within the jurisdiction into high, moderate, and low risks.

This analysis provides direction for the allocation and concentration of resources based on each station's relative risk rating. The risk rating is a collective analysis of the demand for services, call concurrency and the concentration of high or moderate risk occupancies.

Brooklyn Park has a limited number of high-risk occupancies located within the community, leaving the majority of the risk within the city being driven by the community demand for service and concurrent calls for service. The analysis suggests that both station 2 and 4 are moderate-risk station areas, station 3 is a high-risk area. Station 1 was not specifically calculated as a hypothetical area, but it is anticipated it would be a low risk station.

**TABLE 1: STATION DEMAND ZONE RISK CONCENTRATION MATRIX**

Station Demand Zone	Community Demand	Call Concurrency	High/Moderate Risk Occupancies	Total risk Score	Risk Rating
2	6	3	3	19.09	Moderate
3	7	4	7	44.55	High
4	6	3	3	19.09	Moderate

**Recommendation: #2**

It is recommended that the City consider this risk-based approach in resource allocation.

## ASSEMBLY OF AN EFFECTIVE RESPONSE FORCE AND STAFFING

A measure used to determine the ability to assemble enough firefighters to commence an effective firefight is called an effective response force. A single-family home structure fire requires approximately 15 personnel to effectively cover all of the time sensitive critical tasks.<sup>1</sup> Brooklyn Park is currently unable to assemble the recommended effective response force due to staffing limitations. This is not an uncommon challenge found in other similarly sized agencies. Therefore, any increase in on-duty staff would likely increase the effective response force capabilities.

**Recommendation: #3**

It is recommended that the City consider additional staffing strategies that balances the internal and autonomous needs of the City to provide an effective response force with the shared-service capabilities of mutual/automatic aid.

<sup>1</sup> National Fire Protection Association (2016) NFPA 1710: Standard for the Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments. National Fire Protection Association, Quincy, MA.  
QW4321

## ESTABLISHING DESIRED PERFORMANCE

The fire department's current performance is defined as a travel time of 6.6 minutes or less to 90% of the calls for service. The approximate 6.6 minutes is not specifically aligned with either the 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.

However, 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.<sup>2,3</sup> Therefore, City and Department has considerable latitude in establishing the desired service levels.

However, assuming the desire to maintain or improve the level of service, a 6-minute travel time goal is offered as a planning tool for policy related resource allocation decisions.

### Recommendation: #4

It is recommended that the City and Department adopt a 6-minute travel time goal at the 90th percentile to assist in policy decisions regarding resource allocation, asset management, performance, and sustainability.

## UTILIZATION OF THE EAST FIRE STATION #1

While the overall 90<sup>th</sup> percentile is between 6 and 7 minutes (6.6 minutes), the area in and around Station 1 (East) does not have a commensurate level of service with the rest of the City. Zones 401 and 402 are representative of the immediate first due station area for the East Station #1. Zones 401 and 402 have significantly longer travel times than any of the other response zones with the exception of zone 405. Excluding 401, 402, and 405, all zones receive a reasonably commensurate level of service. Zone 405 only had 35 incidents, so the validity of a 90<sup>th</sup> percentile measure should be used with caution. Zones 401 and 402 had over 800 incidents in 2018.

Therefore, if it is the City's desire to provide a commensurate level of service in all "station areas" then consideration should be given to re-opening and staffing East Station #1. Results are provided below.

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<sup>2</sup> Blackwell TH, Kline JA, Willis JJ, Hicks GM (2009) Lack of association between prehospital response times and patient outcomes. *Prehosp Emerg Care* 13 (4):444-450. doi:10.1080/10903120902935363

<sup>3</sup> Kerber S (2012) Analysis of Changing Residential Fire Dynamics. Underwriters Laboratories, Northbrook, IL

Table 2: 90th Percentile First Arrival Performance in Minutes by Demand Zone

Demand Zone	Dispatch Time	Turnout Time	Travel Time	Response Time
F201	1.7	2.2	5.1	7.6
F202	1.8	2.3	6.2	8.8
<b>Station 2 Zones Combined</b>	<b>1.7</b>	<b>2.2</b>	<b>5.4</b>	<b>8.0</b>
F301	1.8	2.1	6.6	9.1
F302	1.6	2.0	5.5	8.0
<b>Station 3 Zones Combined</b>	<b>1.7</b>	<b>2.1</b>	<b>6.1</b>	<b>8.7</b>
F401	1.7	2.2	8.5	11.2
F402	1.6	2.0	7.1	9.9
F403	1.6	2.2	6.1	8.4
F404	1.6	2.2	6.0	8.9
F405	2.1	2.5	7.0	9.9
<b>Station 4 Zones Combined</b>	<b>1.6</b>	<b>2.2</b>	<b>7.8</b>	<b>10.3</b>
F501	--	--	--	--
MA	7.9	4.4	11.3	20.2
<b>Total</b>	<b>1.7</b>	<b>2.2</b>	<b>6.6</b>	<b>9.1</b>
F401 and F402 Combined	1.7	2.2	8.2	10.9

### **GIS ANALYSES OF THE STATION PERFORMANCE AT 6-MINUTES TRAVEL TIME**

When referring to the marginal utility analysis provided below, the ascending rank order is the station's capability to cover risk (incidents) in relation to the total historical call volume of the sample period (calendar year 2018). The station is the current Brooklyn Park Fire Department (BPFDD) fire station identifier. The station capture is the number of calls the station would capture within a 6-minute travel time. The total capture is the cumulative number of calls captured with the addition of each fire station. The percent capture is the total cumulative percentage of risk covered by each station. The goal would be to achieve at least 90% capture.

Therefore, the station that contributed the most to the overall system's performance was Station 3 (W) in the first row and would capture 61.04% of the risks within 6 minutes. Station 2 (C) would cover an additional 20.92% of the risk bringing the cumulative total to 81.96%

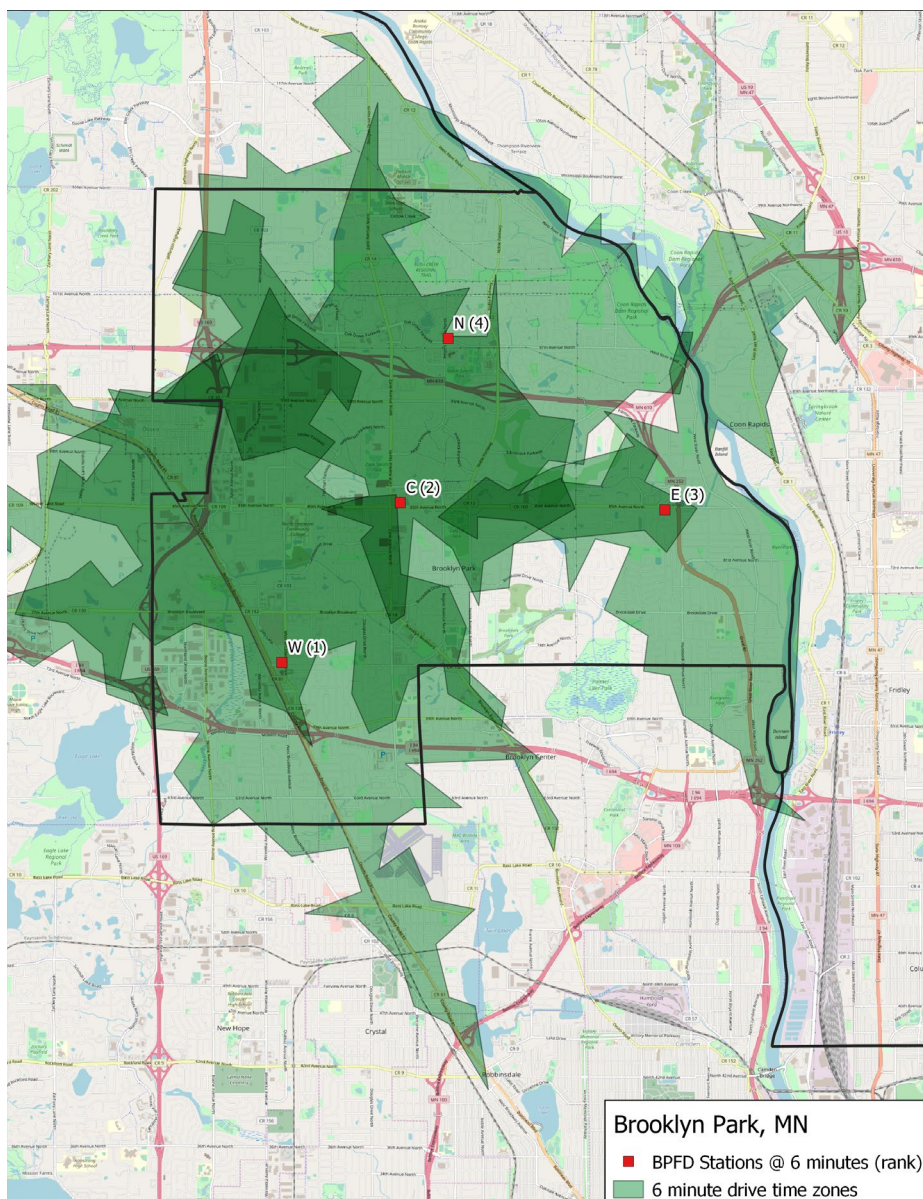


between Stations 2 and 3. In total, with all four fixed fire stations, 94.22% of the incidents could be responded to within 6 minutes travel time. Results are provided below.

**TABLE 3: MARGINAL FIRE STATION CONTRIBUTION FOR 6-MINUTE TRAVEL TIME – WITH STATION 1 (E)**

Rank	Station	Station Capture	Total Capture	Percent Capture
1	3 (W)	5,706	5,706	61.04%
2	2 (C)	1,956	7,662	81.96%
3	1 (E)	625	8,287	88.65%
4	4 (N)	521	8,808	94.22%

**FIGURE 1: CURRENT FIRE STATION BLEED MAP FOR 6-MINUTE TRAVEL TIME – WITH STATION 1 (E)**

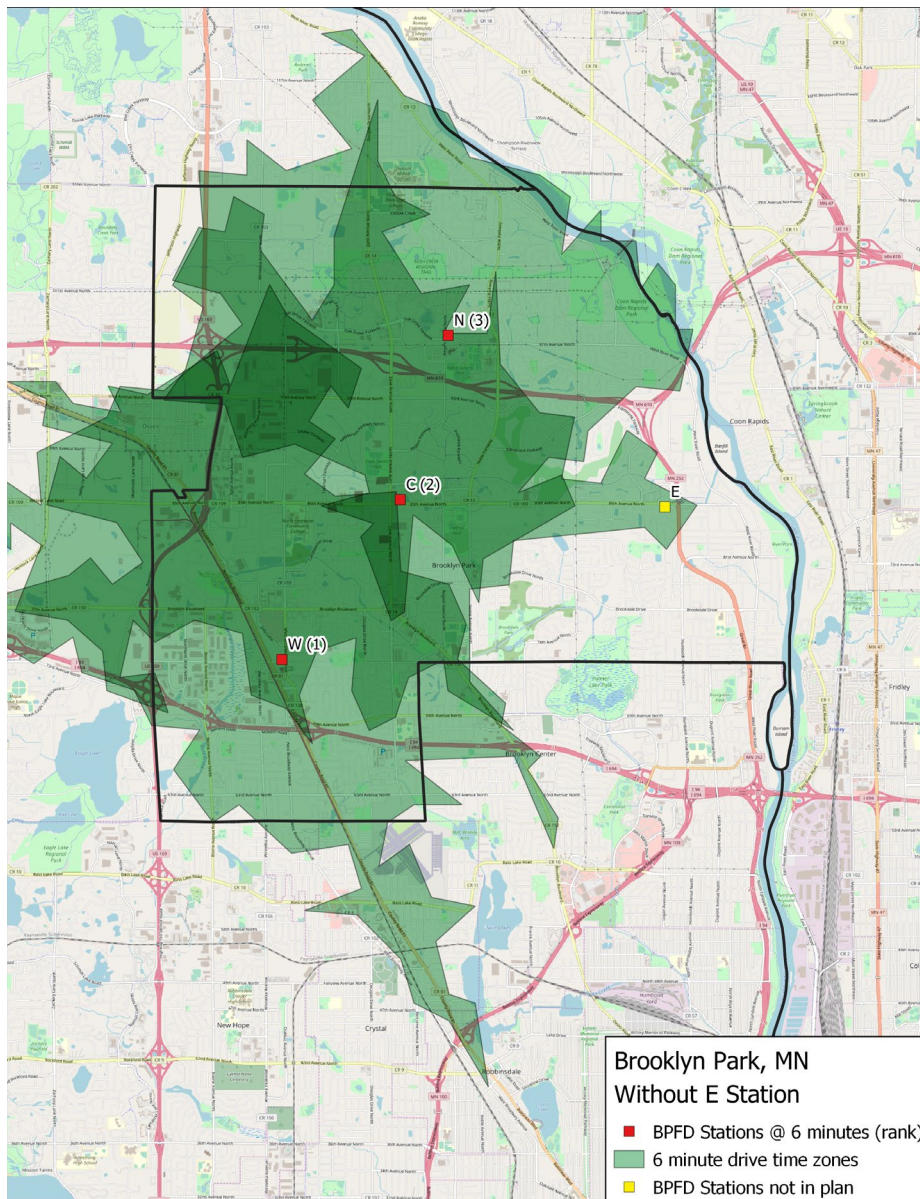


The current configuration leaves a gap in geographic coverage. The current configuration is analyzed below for illustrative purposes.

**TABLE 4: MARGINAL FIRE STATION CONTRIBUTION FOR 6-MINUTE TRAVEL TIME – WITHOUT STATION 1 (E)**

Rank	Station	Station Capture	Total Capture	Percent Capture
1	3 (W)	5,706	5,706	61.04%
2	2 (C)	1,956	7,662	81.96%
3	4 (N)	524	8,186	87.57%

**FIGURE 2: CURRENT FIRE STATION BLEED MAP FOR 6-MINUTE TRAVEL TIME – WITHOUT STATION 1 (E)**



**Recommendation: #5**

If it is the City's desire to provide a commensurate level of service in all "station areas" then consideration should be given to re-opening and staffing East Station #1.

**Recommendation: #6**

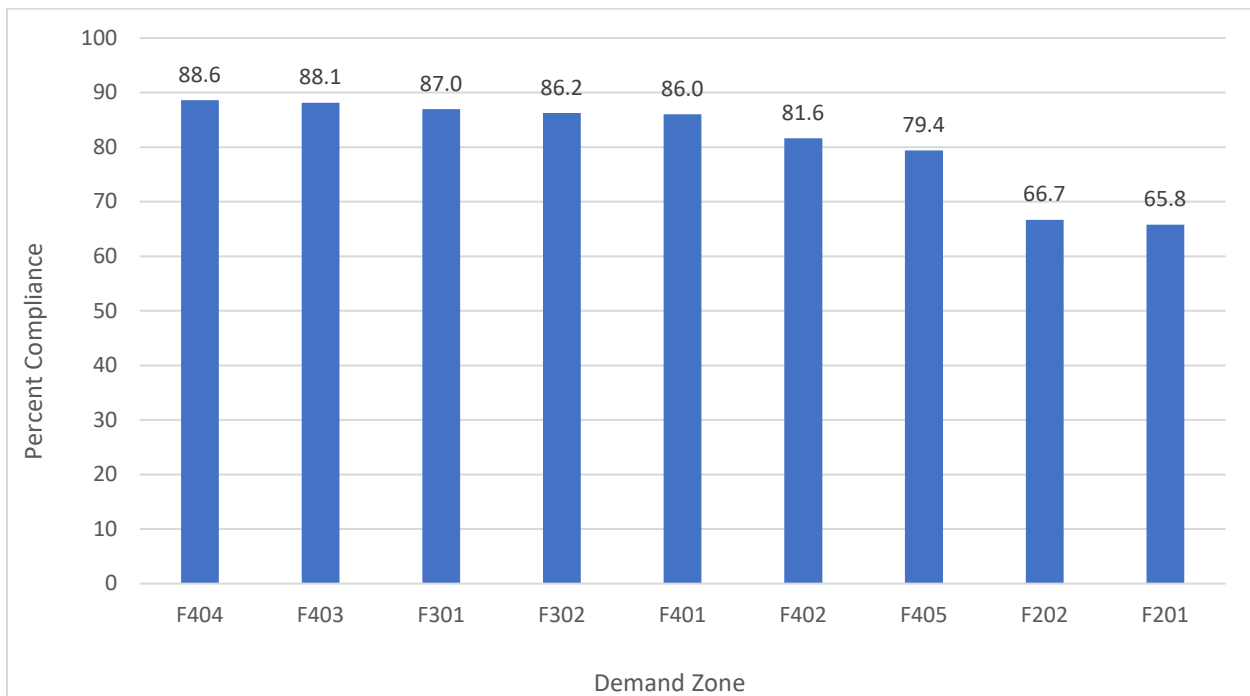
If it is the City's desire to deliver a 6-minute travel time goal at the 90<sup>th</sup> percentile, then consideration should be given to re-opening and staffing East Station #1.

## STATION RELIABILITY AND PEAK LOAD STAFFING STRATEGIES

The reliability of the distribution model is a factor of how often the response model is available and able to respond to a call within the assigned demand zone. This analysis utilized all dispatched calls within the demand zones, and performance included responses from primary front-line units in BPF's jurisdiction. Compliance was considered to be achieved if E22 or TW21 responded to calls in demand zones F201 and F202; if E11, E31, or R31 responded to calls in demand zones F301 and F302; and if E21, E41, or R41 responded to calls in demand zones F401, F402, F403, F404, and F405.

The Department's internal goal is 85%. Results are provided below.

**FIGURE 3: FIRE DEMAND ZONE RELIABILITY**





Station 2's performance is challenged compared to the other territories. It is assumed that this is due to the centralized location of the station and the need to cover other territories in either multi-unit responses or as the City gets busier during the peak of the day.

A fourth unit placed at Station #1 would assist in the number of times units were running outside of the "primary" area. However, understanding both the geographical requirements for 4 stations and the need for at least 1 additional unit to cover the hourly demand, it is recommended that a Peak Load Unit is placed into service 7 days a week for 12 hours per day during the peak periods. This could be between 8 am and 8 pm; 9 am to 9 pm; or 10 am to 10 pm, respectively. Finally, it is recommended that this unit is placed at Station 3 to account for the highest risk station and reduce the need for other stations, such as Station 2, to respond out of territory. The combination of Station 1 and a peak-load unit should provide capacity for significant improvement in station reliability.

The peak-load unit could be a more efficient and less expensify apparatus type. In addition, it should be designed to take the first call out of the station to maximize its potential on 12-hour shifts and keep the heavier more costly apparatus available. Finally, with approximately 5,800 incidents allocated to Station 3's area, the second unit, only during the peak of the day, would provide considerable capacity to manage workload for the 24-hour crews.

<b>Recommendation: #7</b>
It is recommended that the City consider implementing a 12-hour peak-load unit assigned to Station 3. This is in addition to Station #1 staffing considerations.

## OPTIMIZED STATION LOCATIONS FOR CONSIDERATION

Optimized locations were created for the department's consideration. Optimized plans utilize a "white board" approach where all existing locations are disregarded, and we allow the data to indicate the best station locations. It is understood that stations are placed for a variety of reasons and that few agencies would have the flexibility in land availability, purchase price, capital investment, and political considerations to build a brand-new deployment model.

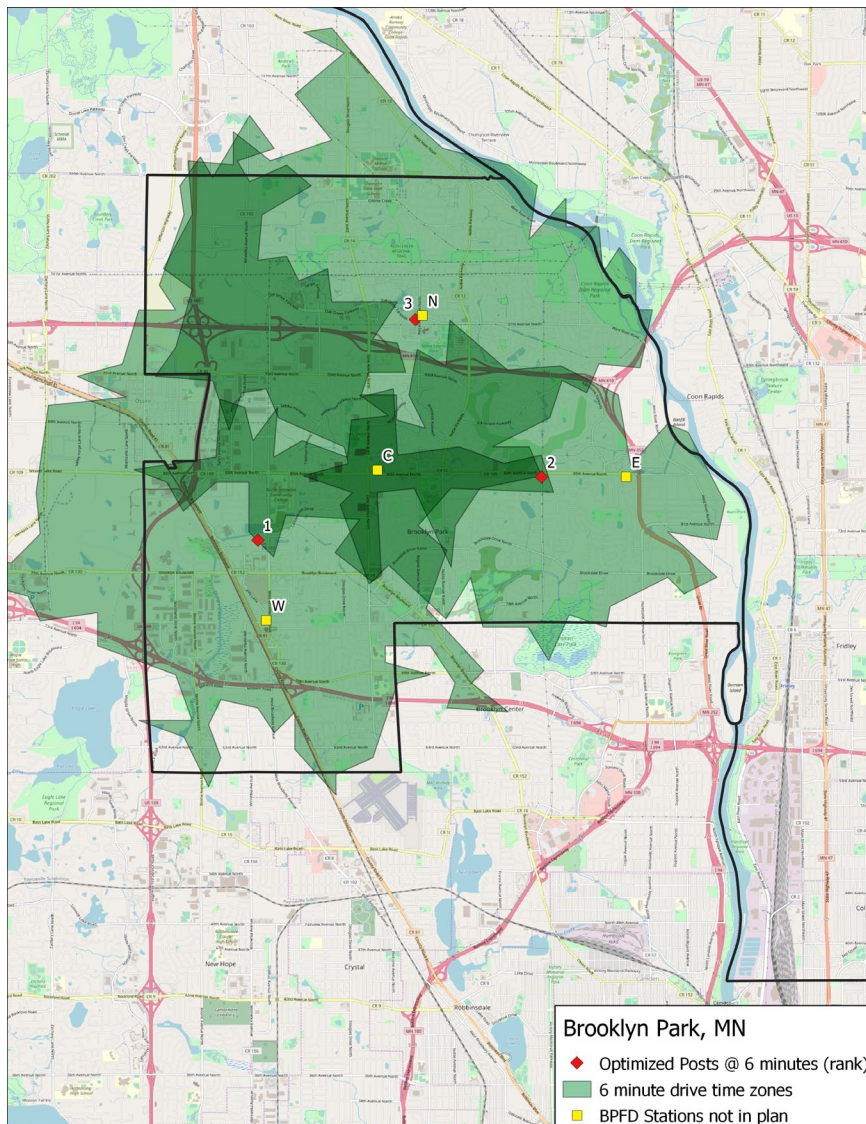
However, these analyses are beneficial for validating existing stations where applicable and identifying potential areas of future need for either new stations or station relocations.

### **OPTIMIZED 6-MINUTE TRAVEL TIME**

Analyses were completed to develop an optimized station distribution model for a 6-minute travel time. This evaluation suggests that an optimized 3-station model can provide for nearly 92% effectiveness covering all incidents within 6 minutes or less travel time 90% of the time. This would require one less capital facility and the ability to have a greater depth of resources where the risk profiles have indicated (Station 3). In other words, a minimum of four resources would be sufficient to cover both the geography and demand for services through the efficient placement of the physical assets.

The “RED” diamonds are recommended optimized station locations and the “YELLOW” squares the current stations. A graphic illustration is presented below.

**FIGURE 4: OPTIMIZED STATION DEPLOYMENT PLAN - 6-MINUTE TRAVEL TIME**



## SUMMARY OF PHASE 1 RECOMMENDATIONS

The following summary of recommendations are not intended to be in priority order, but rather in order of presentation in the executive summary. All goals and objectives that were developed within the strategic planning (Phase II) are captured within the Strategic Plan.

- It is recommended that the City work with other stakeholders within the Hennepin County system of providers and Hennepin County 911 to explore options for the acquisition, implementation, and utilization of a medical call triaging process.
- It is recommended that the City consider this risk-based approach in resource allocation.
- It is recommended that the City consider additional staffing strategies that balances the internal and autonomous needs of the City to provide an effective response force with the shared-service capabilities of mutual/automatic aid.
- It is recommended that the City and Department adopt a 6-minute travel time goal at the 90th percentile to assist in policy decisions regarding resource allocation, asset management, performance, and sustainability.
- If it is the City's desire to provide a commensurate level of service in all "station areas" then consideration should be given to re-opening and staffing East Station #1.
- If it is the City's desire to deliver a 6-minute travel time goal at the 90<sup>th</sup> percentile, then consideration should be given to re-opening and staffing East Station #1.
- It is recommended that the City consider implementing a 12-hour peak-load unit assigned to Station 3. This is in addition to Station #1 staffing considerations.