*City of Minneapolis*
*Minnesota*

# Fire Department Agency Evaluation and Master Plan—Phase III

July 2012

Emergency Services Consulting International

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# City of Minneapolis

# Minnesota

## Fire Department Agency Evaluation and

## Master Plan – Phase III

**Summer 2012**

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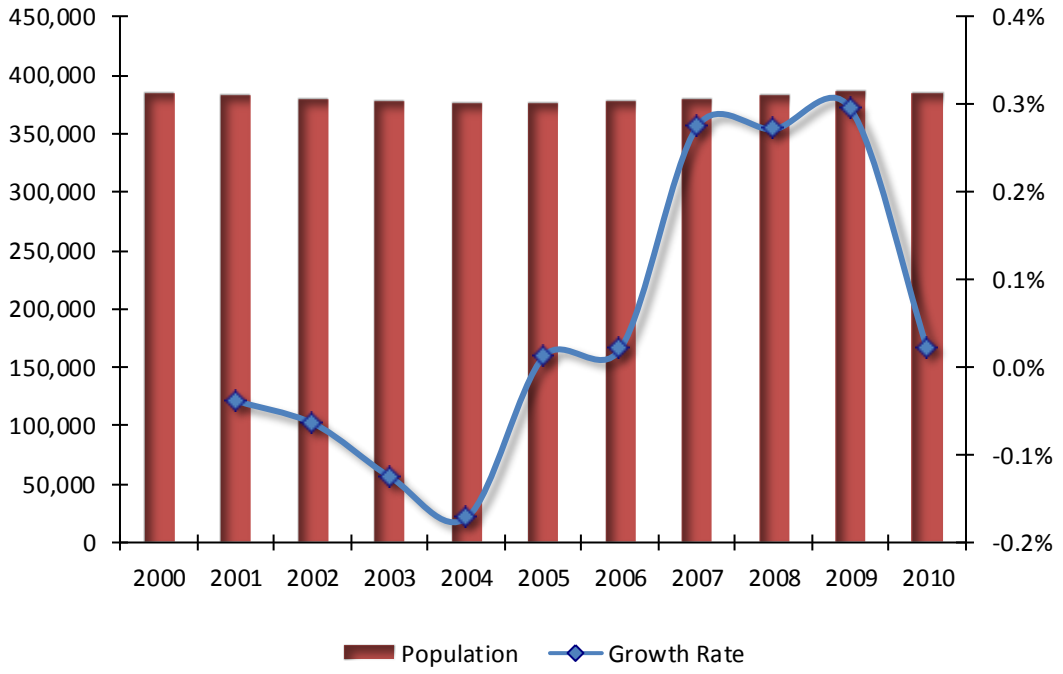
# Service Demand Projections

Previous phases of this project placed emphasis on current conditions. The intent of this section is to look forward into the future to determine potential service demand and appropriate deployment of resources to match that demand. The process of forecasting growth within the community begins with an overview of current demographic and risk categories.

### Current Population Information

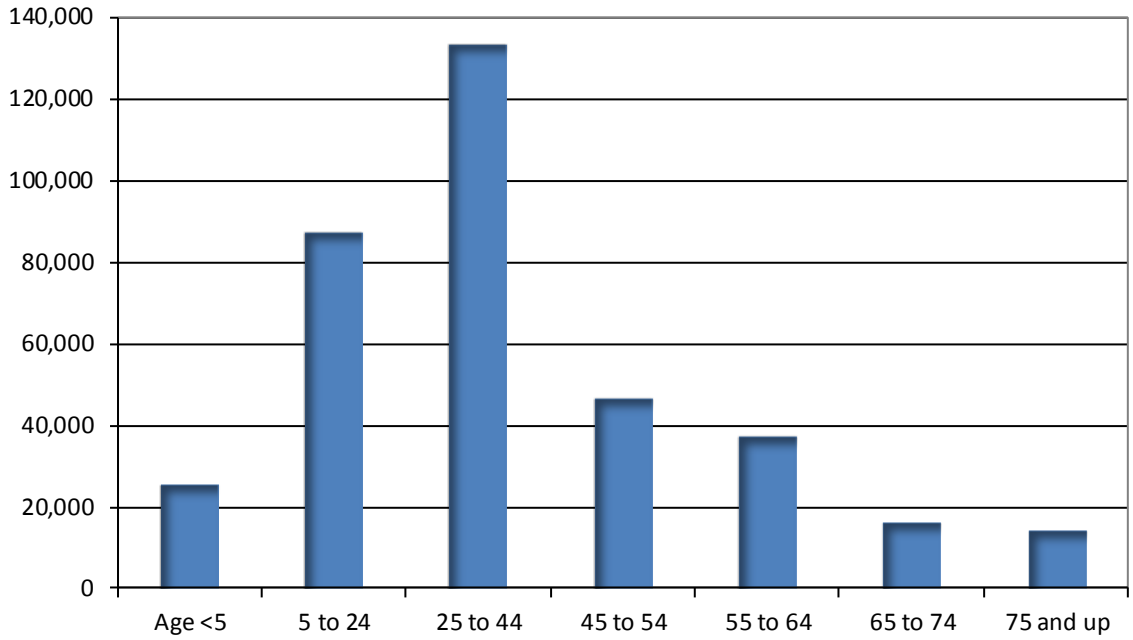
According to the 2010 U.S. Census estimates, the estimated population of the City of Minneapolis was 382,578 persons. This represents a decrease of only 40 persons since the 2000 census when a population of 382,618 was recorded. The average annual growth rate this decade has been 0.1 percent, but at times has been as high as 0.3 percent. The growth rate has increased in the most recent years as depicted in the chart that follows.

**Figure 1: Population Growth History**




How this population is composed by age group can have a significant effect upon the fire services. The following chart distributes the population into age groups based on available U.S. Census information.

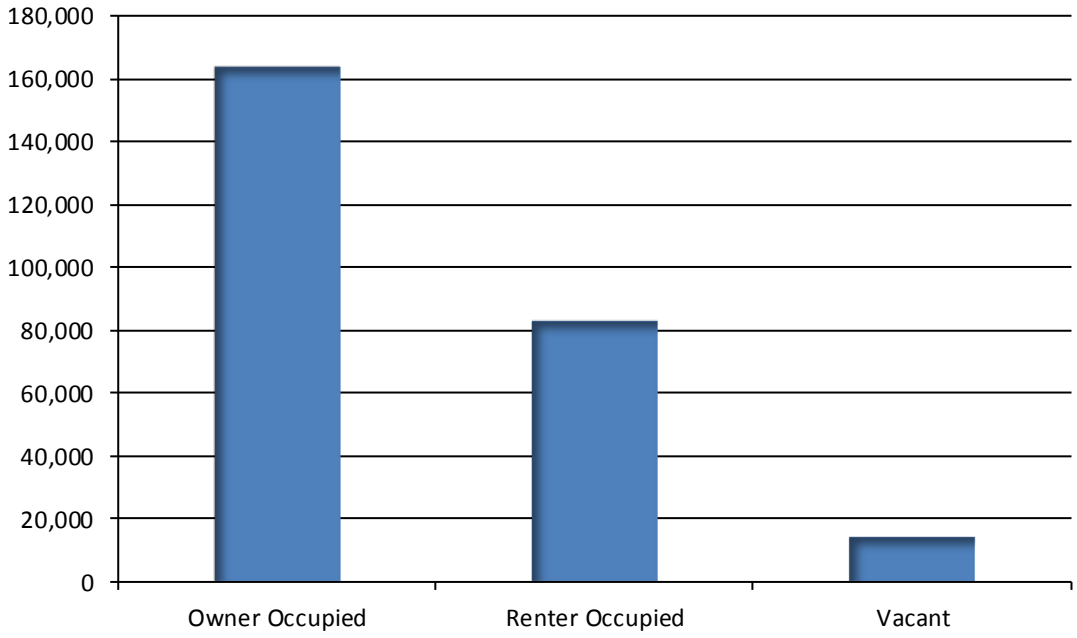
**Figure 2: Population by Age – 2010**




Approximately four percent of the population is 65 years of age or older and 6.5 percent of the population is under five years of age, placing a total of 10.5 percent of the area's population within the significant target age groups that pose the highest risk for fatalities in residential fire incidents as well as an increased level of EMS service demand.

Another factor in the demand for fire services is the status of housing as an indicator of economic conditions. Numerous rentals and vacancies can signal negative economic conditions, which correlate with higher rates of emergency incidents. The high level of owner-occupied housing in the city indicates a stable economic environment that would attract higher income wage earners. The following figure illustrates how housing tenure is distributed throughout the city.

**Figure 3: Housing Distribution by Tenure**

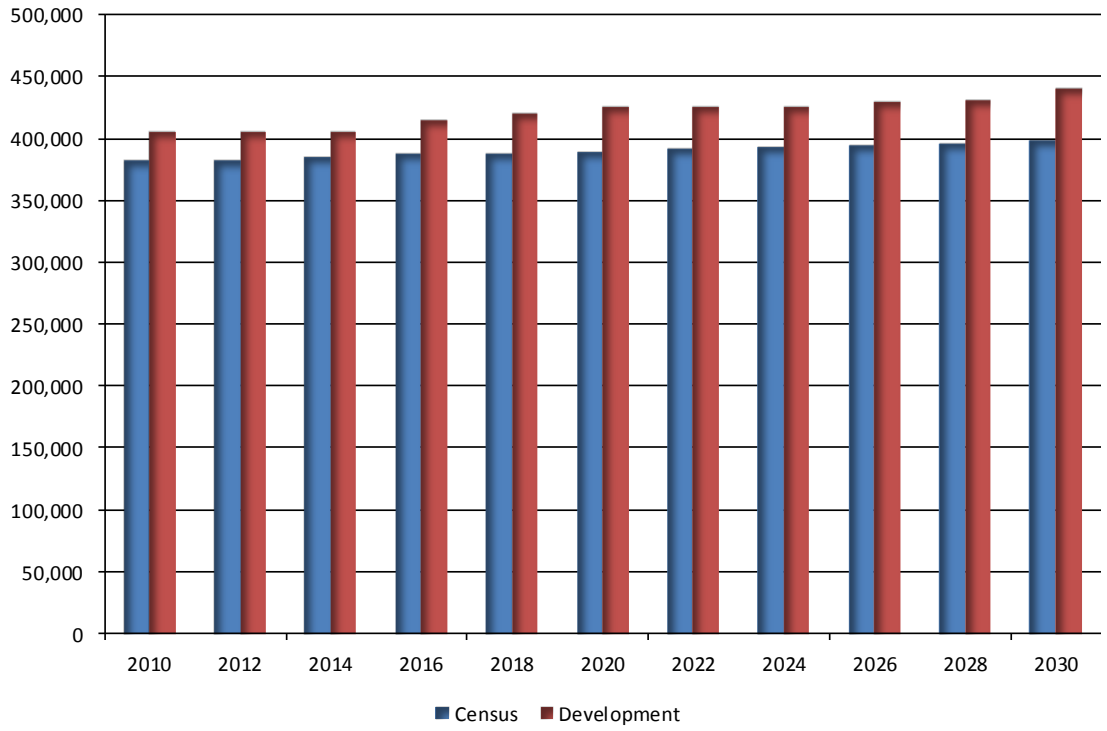



The low vacancy rate and high rate of owner occupied properties indicates that the economy in the community is relatively stable. This typically results in a lower fire risk and lower incident rate of EMS incidents.

**Population Growth Projections**

A noted previously, the population within the City of Minneapolis has remained relatively stable this decade. Local planning officials anticipate that additional growth may continue at a similar rate as previously experienced. In developing forecasts for population growth, ESCI typically develops a forecast based on several years of census experience. For Minneapolis, ESCI used figures from 2000 through 2010 from the U.S. Census Bureau to create a mathematical forecast through the year 2030. In addition, information obtained from local planning officials was adjusted based on an extrapolated rate of population growth. Population figures used by local planning officials have historically lagged slightly behind those posted by decennial census estimates but are provided here to generate a potential range of population growth.

**Figure 4: Population Forecast**




It is not the intent of this study to be a definitive authority for the projection of future population in the service area but rather to base our recommendations for future fire protection needs on a reasonable association with projected service demand. Since we know that the service demand for emergency agencies is based almost entirely on human activity, it is important to have a population-based projection of the future size of the community. While variation can be seen in the population projections discussed here, one thing that can be certain is that the area will continue to be an emergency service provider to a growing population, likely reaching between 400,000 and 450,000 by 2030. Planning should begin now to maintain the resources needed to meet the continuing demand for services.

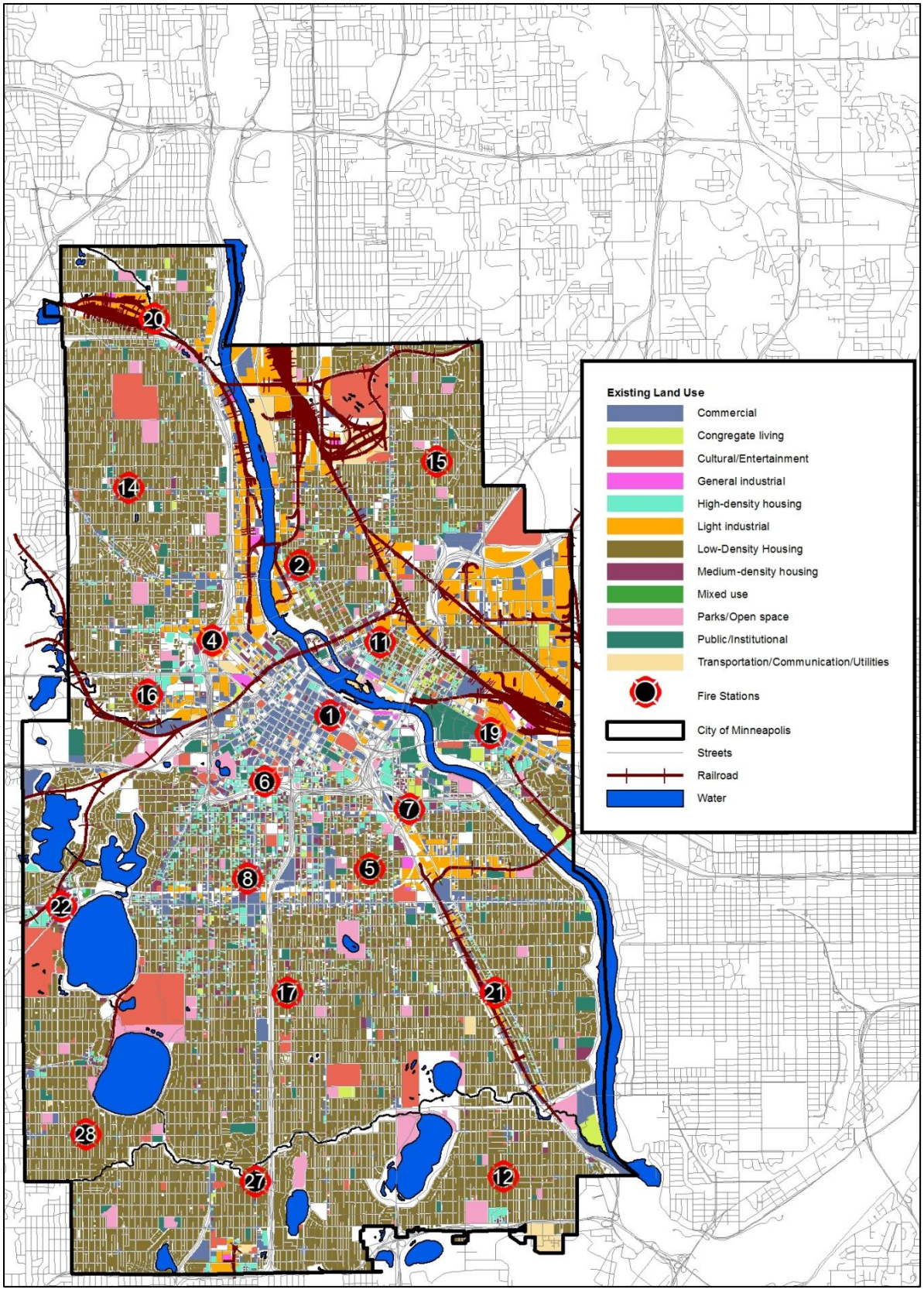
**Community Risk Analysis**

The fire service assesses the relative risk of properties based on a number of factors. Properties with high fire and life risk often require greater numbers of personnel and apparatus to effectively mitigate a fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk within geographic sub-areas of a community.

The community's risk assessment has been developed based on potential land use within its boundaries. These potential uses are found in the city's zoning designations. The following maps illustrate how land

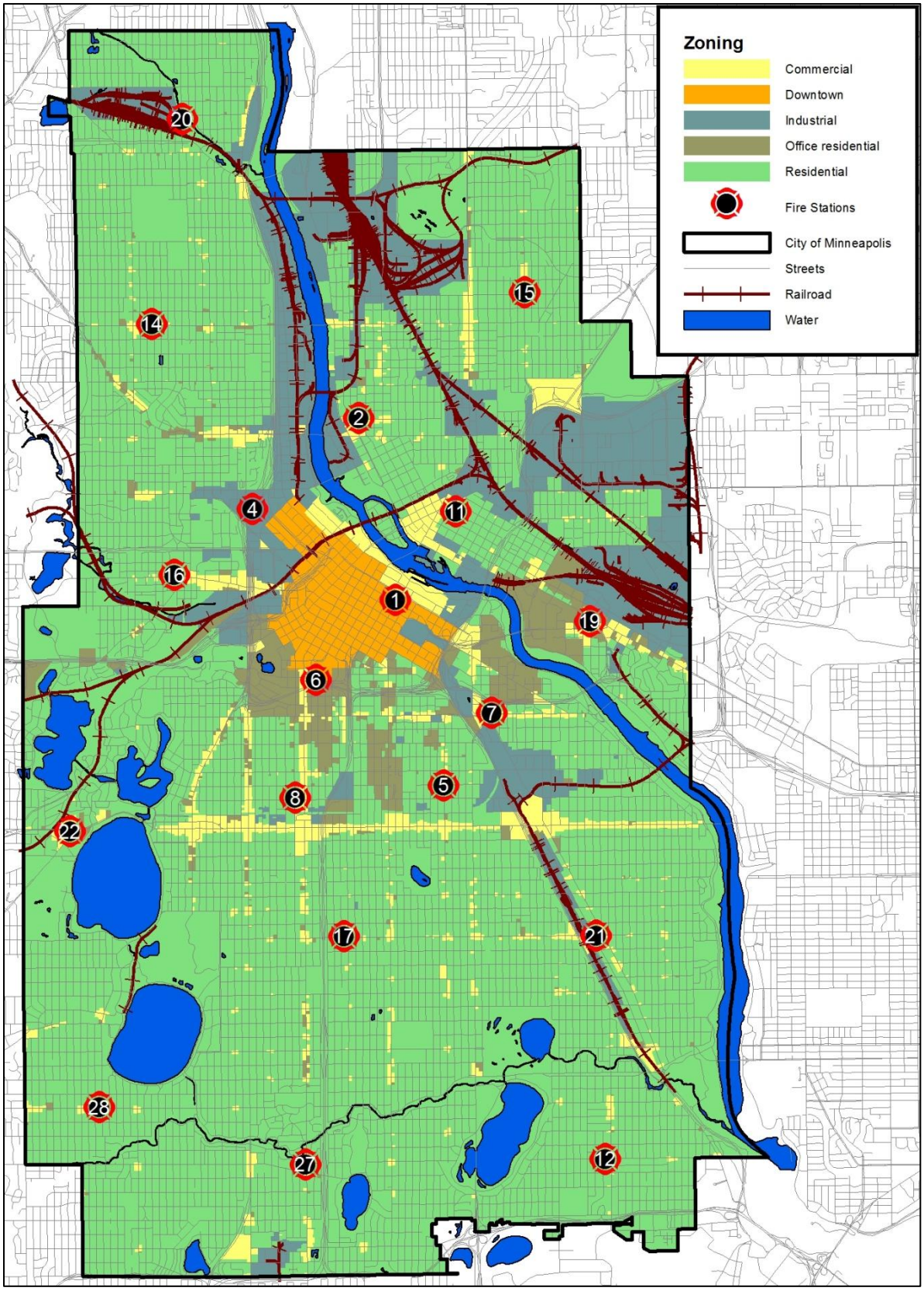
use (potential scale and type of development within geographic sub-areas) is distributed throughout the City of Minneapolis.

**Figure 5: Community Risk Assessment**



The City of Minneapolis is diverse in its land use. The core of the city contains mostly commercial or other high risk uses while industrial properties (also high risk) are located along the river to the north and along the eastern border of the city. The areas outside the urban core are primarily low density housing, considered medium risk, with a scattering of other uses. Although current use is one method to evaluate a fire department's risk, future land use, or zoning classifications, allow for a look at what might develop in currently low to moderate risk areas. The following map evaluates the City's current zoning classifications.

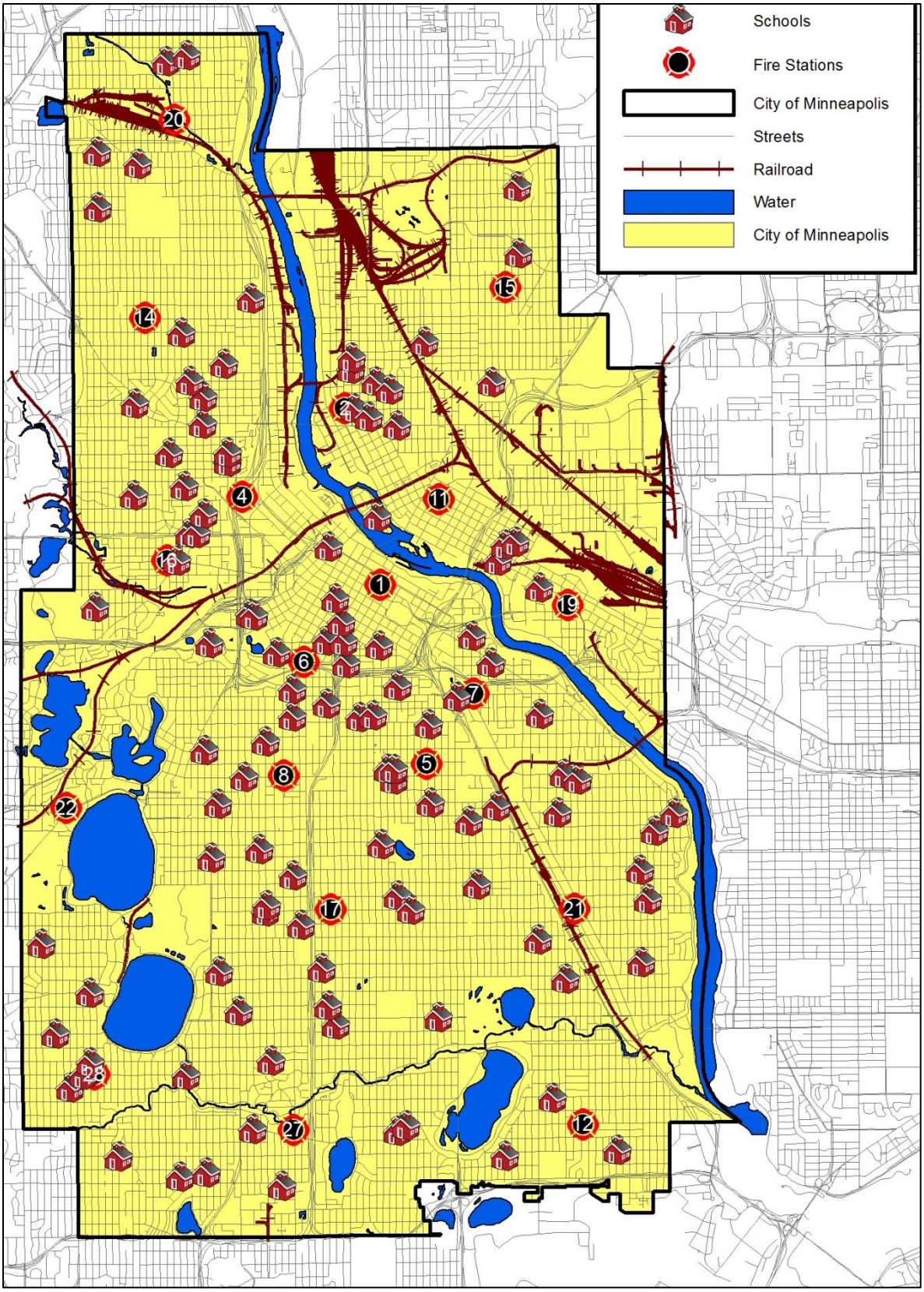
**Figure 6: Current Zoning Classifications**



Unlike many communities across the country, Minneapolis has done an excellent job of limiting spot zoning; zoning that doesn't follow a set pattern for community growth. As can be seen in the previous figure, the urban core is zoned 'commercial' and 'downtown' while 'industrial' properties are kept contained within certain areas; and 'residential' properties are well distributed. This method of zoning that closely matches current uses allows departments to effectively concentrate resources at appropriate levels based on risk.

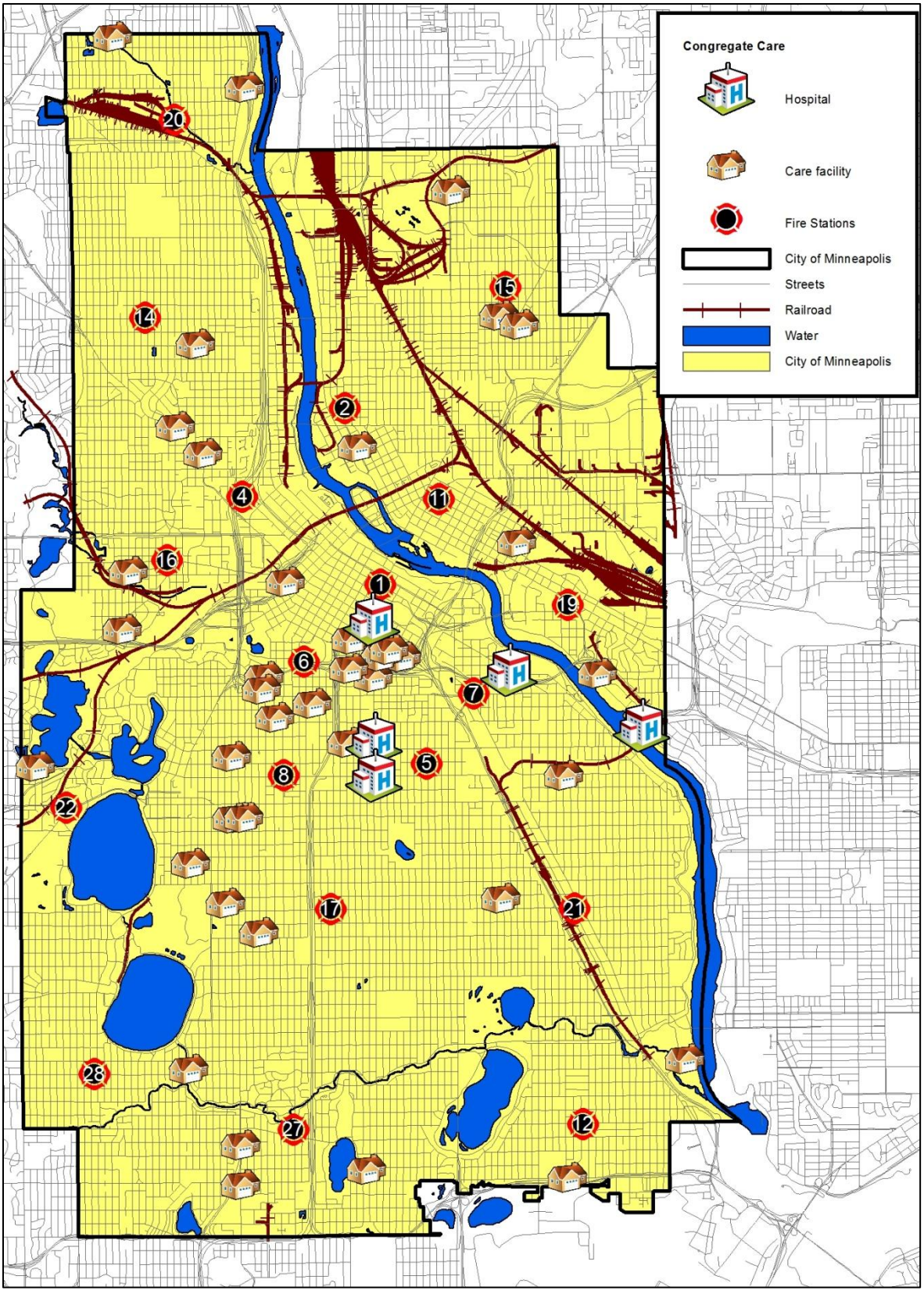
Special properties, such as schools, medical facilities and hazardous materials locations, pose specific risks to responders. Schools are typically large structures with a number of broken spaces making firefighting and rescue difficult. In addition, children in attendance pose a significant life hazard under emergency conditions. Hospitals are especially difficult because of the invalid nature of many of the patients combined with special needs in addition to large, multi-story structures. Location of all patients and movement of those individuals during an emergency situation is difficult at best. Hazardous materials locations are inherently dangerous and pose a risk not only to the immediate property but also to the surrounding areas. The following figures illustrate the placement of these three primary risk properties throughout the City of Minneapolis.

**Figure 7: Special Target Hazards – Educational Facilities**



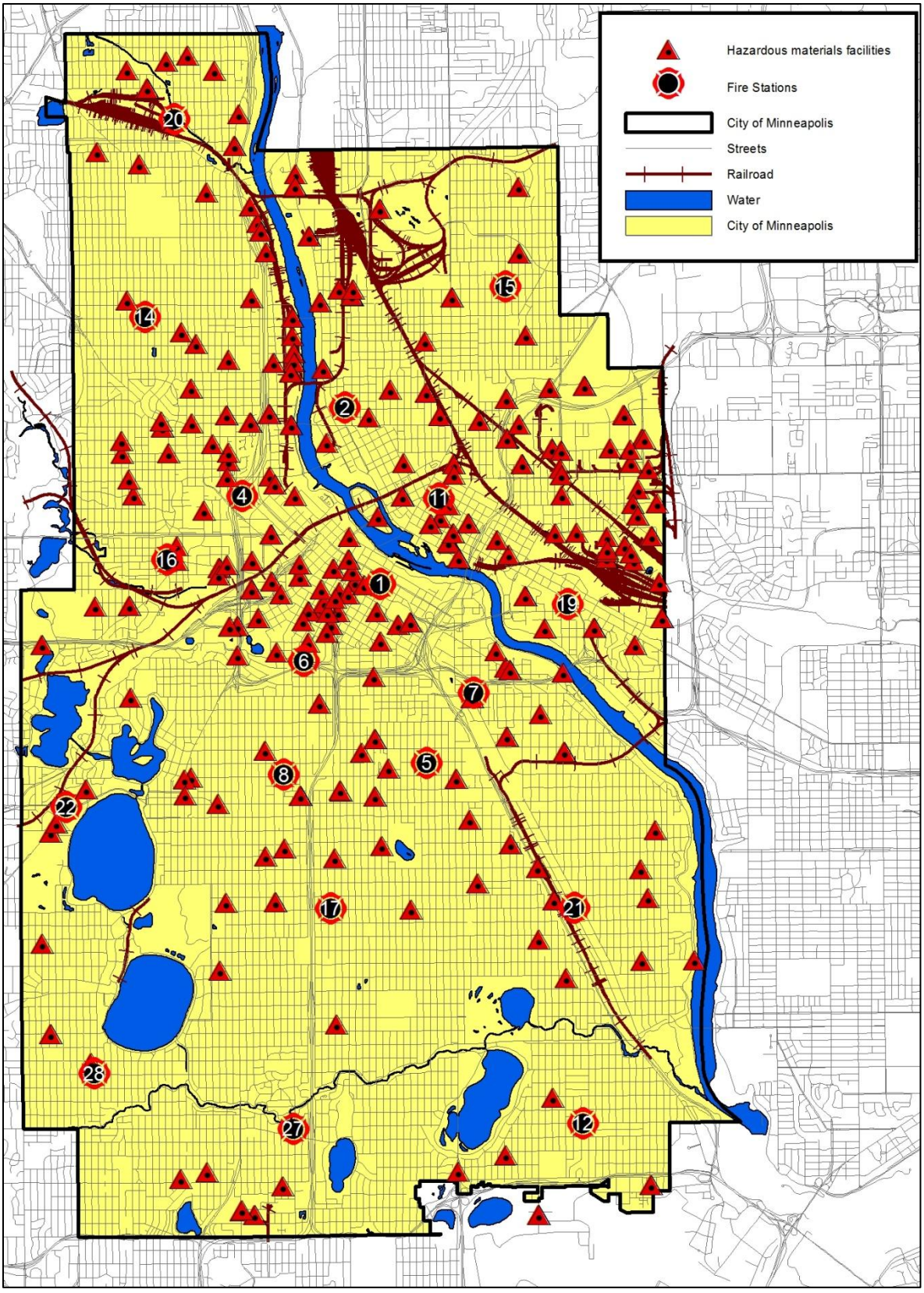
Minneapolis has a large number of educational facilities ranging from primary to university level. The department should be actively working with each of these institutions to ensure that proper planning is conducted prior to the occurrence of an emergency. The following map locates the medical facilities throughout the city.

**Figure 8: Special Target Hazards – Medical Facilities**



Although most medical facilities are located in the downtown core, there are a number of smaller medical and care centers scattered throughout the response area. As with schools, the department should ensure that proper preplanning is competed for each of these facilities. The final map displays known hazardous materials properties.

**Figure 9: Special Target Hazards – Hazardous Materials**



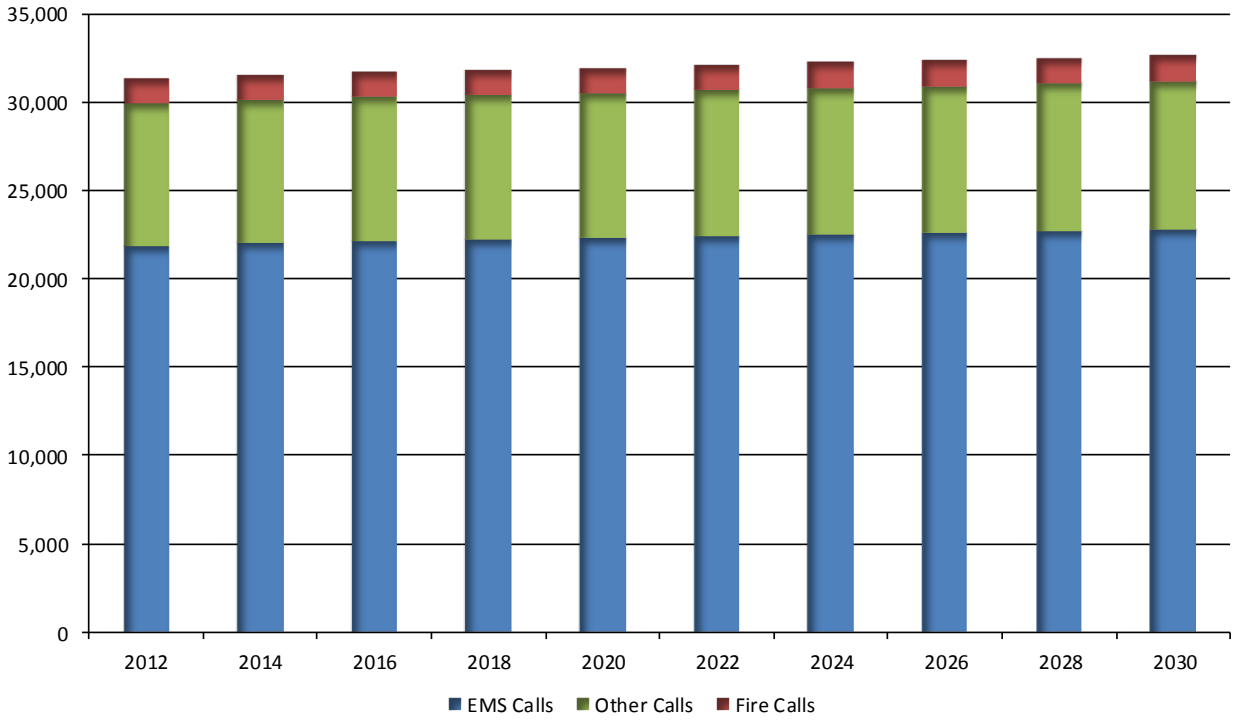
As with hospitals and medical centers, hazardous materials properties are primarily concentrated to the commercial and industrial areas of the city. There are, however, a number of other locations scattered throughout the city that must be property documented, inspected and preplanned. In addition, proper evacuation plans should be in place in the event of a hazardous materials release that jeopardizes surrounding properties.

Another method of determining overall community risk specific to fire suppression is to geographically display needed fire flow as determined by ISO and to highlight specific target hazards throughout the primary response area. Although this information was requested from ISO on two separate occasions, no data was received; making it impossible to complete this analysis.

**Service Demand Projections**

In evaluating the deployment of facilities, resources, and staffing, it is imperative that consideration be given to potential changes in workload that could directly affect such deployment. Any changes in service demand can require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance. For purposes of this study, ESCI utilized population projections obtained through community development research and multiplied these by a forecasted incident rate derived from a five-year history of incident per capita rates to identify workload potential through the year 2030. The results of the analysis are shown in the following chart and table.

**Figure 10: Total Workload Forecast**




The increase in actual fire incidents is forecast to be relatively low during the study period, a reflection of trends for fire incident rates per capita and believed to be a result of improvements made in building codes and public fire education during the last several decades. EMS is expected to continue to be a predominate factor in service demand, while other emergency service calls not involving actual fires are forecasted to increase, in part due to the use of automatic alarm and water flow systems. Regardless of alarm type, service demand is expected to closely mimic population growth and, while increasing slightly, should remain relatively stable.

# Future Service Delivery Models

This section identifies strategies and recommendations for future resource deployment changes that would maintain or improve the department's response capability and performance as growth and development continue at the projected levels.

The process of setting response time performance objectives will include two primary considerations:

1. *What are the expectations of the community in regard to initial response time of the fire department to an emergency incident? What is the public's perception of quality emergency service where response time is concerned?*
2. *What response time performance would be reasonable and effective in containing fire, reducing damage, and saving lives when considering the types of incidents and fire risks faced by Minneapolis?*

To initiate the process of considering the expectations of the customer, the historical travel time is examined from the incident records. Turnout time, the time for personnel to begin responding after alarm, has an effect upon overall response time, but does not, nor should it, bear an effect upon station location analysis since it has no geographic impact.

MFD currently has formal performance objectives that call for the arrival of the first unit on an emergency incident within five minutes from the time of dispatch. As noted in the Phase II report, the department's actual performance at the 90$^{th}$ percentile for the first arriving unit is currently five minutes 53 seconds, just 53 seconds off the adopted informal performance objective.

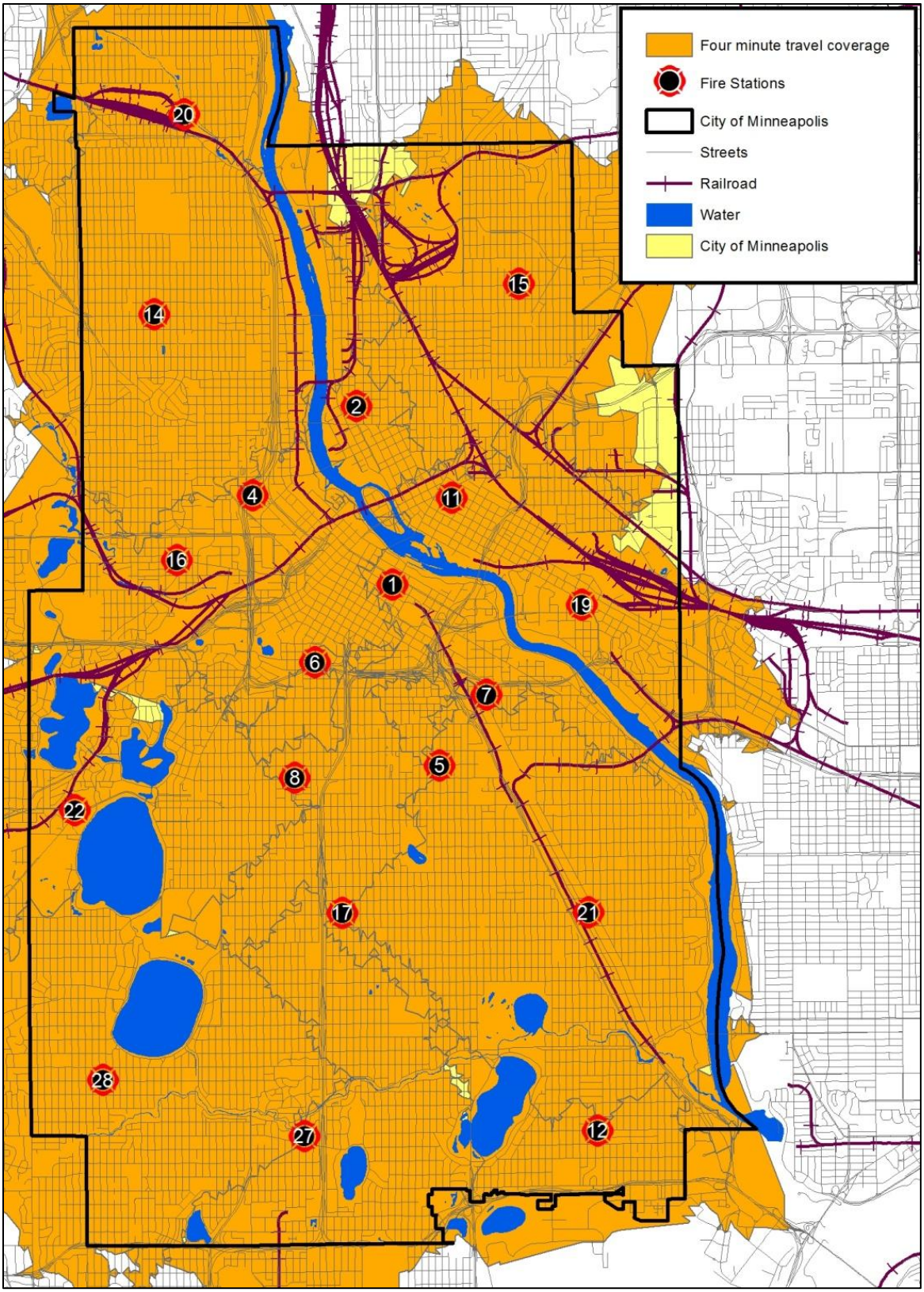
Based on this minimal gap between desired and actual performance, ESCI recommends that MFD evaluate the area of turnout time for ways in which to improve performance. If the department's turnout time performance objective (60 seconds at the 90$^{th}$ percentile) were achieved, total response time would be reduced by 41 seconds when measured at the 90$^{th}$ percentile.

Although the foregoing phases of this project focused primarily on the conditions that currently exist within the emergency services system of MFD, the intent of this study is to combine that evaluation with a look into the future and provide policy makers with information necessary to carry the system forward over the next 10 to 20 years. This portion of the project provides recommendations related to the deployment of facilities, apparatus, and personnel with a focus on future service delivery and an improvement in overall efficiency within the system.

## Facilities

While the current distribution of fire stations was discussed in the Phase II report, this phase would normally intend to provide strategies that policy makers can use to look into the future in an effort to reduce costs and deliver emergency services to the community more efficiently. As outlined in the Phase II report, however, the current deployment of MFD facilities is such that 97.7 percent of the department's service demand can be reached within four minutes of travel from an existing station as illustrated in the following figure.

**Figure 11: Initial Unit Travel Time Capability - Four Minute Travel**



Based on the department's ability to reach such a large portion of the primary response area within four minutes of travel, ESCI does not make any recommendations regarding additional facilities. The only improvement that can be made in the availability of physical resources is that of rapidly utilizing the resources of the neighboring departments for enhancing manpower on major incidents through enhanced mutual and/or automatic aid agreements.

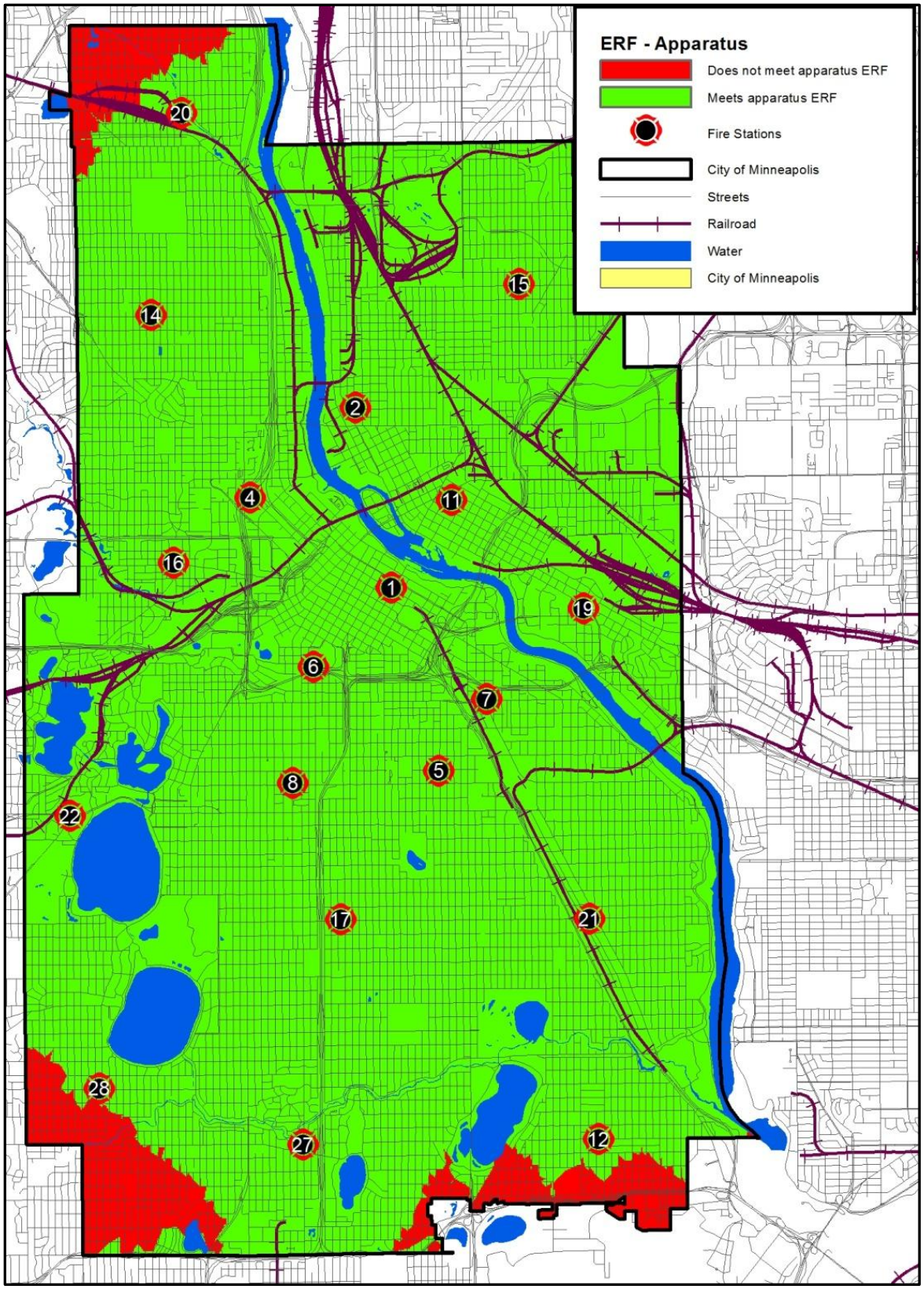
There are, however, 13 stations that were rated 'fair' or 'poor' and should be considered for replacement and/or renovation in the coming years. Of these, the department's Business Plan (Equipment and Space Plan) identifies three stations (1, 2 and 11) for action during the 2010-2014 planning period.

## Apparatus

Although personnel expenditures comprise a majority of most fire department's budgets, the deployment and replacement of appropriate apparatus based on risk can be an enormous factor in budget planning. Many of today's modern fire apparatus cost in excess of $500,000; and some, particularly aerial apparatus, can cost more than $1,000,000. It is essential that fire departments ensure that apparatus are matched appropriately to the risks contained within the community and that proper planning is conducted for the future replacement of apparatus.

When evaluating the need for additional apparatus, it is first necessary to determine how well the department can perform at assembling apparatus currently. The following figure illustrates how well MFD can assemble an effective response force of three engines, one aerial truck and one battalion chief.

**Figure 12: Effective Response Force - Apparatus**



As can be seen in the figure, with the exception of areas to the extreme northwest and southern sections of the city, MFD can effectively assemble sufficient apparatus. Therefore, no additional apparatus are recommended over and above that already in service.

The preceding information pertains to apparatus that is currently in service and applies only to suppression. At the time of data collection and interviews, MFD was using only one of the two specialized rescue units and it was fulfilling a dual role as a ladder company. ESCI's recommendation is that both rescue companies be staffed with dedicated personnel and deployed strategically within the system.

**Capital Replacement Planning**

Most fire departments do not maintain a comprehensive capital replacement plan that captures and plans for the replacement of all heavy apparatus. The following figure lists the current replacement costs of existing heavy apparatus and places them in a plan to ensure sufficient funds are set aside each year for replacement upon reaching the end of its life expectancy.

**Figure 13: Suggested Capital Vehicle Replacement Plan**

| Unit | Year | Replacement Cost | Annual Fund Contributions | Current Cash Requirements | Current Age | Life Expectancy | Replacement Year |
|---|---|---|---|---|---|---|---|
| Engine 12 | 1998 | $400,000 | $26,667 | $373,333 | 14 | 15 | 2013 |
| Engine 22 | 1998 | $400,000 | $26,667 | $373,333 | 14 | 15 | 2013 |
| Engine 27 | 1998 | $400,000 | $26,667 | $373,333 | 14 | 15 | 2013 |
| Engine 28 | 1998 | $400,000 | $26,667 | $373,333 | 14 | 15 | 2013 |
| Rescue 1 | 2000 | $600,000 | $40,000 | $480,000 | 12 | 15 | 2015 |
| Rescue 9 | 2002 | $600,000 | $40,000 | $400,000 | 10 | 15 | 2017 |
| Ladder 4 | 1998 | $1,200,000 | $60,000 | $840,000 | 14 | 20 | 2018 |
| Engine 1 | 2004 | $550,000 | $36,667 | $293,333 | 8 | 15 | 2019 |
| Engine 2 | 2004 | $550,000 | $36,667 | $293,333 | 8 | 15 | 2019 |
| Engine 15 | 2004 | $550,000 | $36,667 | $293,333 | 8 | 15 | 2019 |
| Engine 17 | 2004 | $550,000 | $36,667 | $293,333 | 8 | 15 | 2019 |
| Engine 19 | 2004 | $550,000 | $36,667 | $293,333 | 8 | 15 | 2019 |
| Engine 20 | 2004 | $550,000 | $36,667 | $293,333 | 8 | 15 | 2019 |
| Ladder 3 | 2001 | $1,200,000 | $60,000 | $660,000 | 11 | 20 | 2021 |
| Ladder 10 | 2001 | $1,200,000 | $60,000 | $660,000 | 11 | 20 | 2021 |
| Engine 5 | 2008 | $550,000 | $36,667 | $146,667 | 4 | 15 | 2023 |
| Engine 7 | 2008 | $550,000 | $36,667 | $146,667 | 4 | 15 | 2023 |
| Engine 21 | 2008 | $550,000 | $36,667 | $146,667 | 4 | 15 | 2023 |
| Engine 6 | 2009 | $550,000 | $36,667 | $110,000 | 3 | 15 | 2024 |
| Ladder 2 | 2004 | $1,200,000 | $60,000 | $480,000 | 8 | 20 | 2024 |
| Ladder 5 | 2004 | $1,200,000 | $60,000 | $480,000 | 8 | 20 | 2024 |
| Ladder 11 | 2004 | $1,200,000 | $60,000 | $480,000 | 8 | 20 | 2024 |
| Engine 4 | 2011 | $400,000 | $26,667 | $26,667 | 1 | 15 | 2026 |
| Engine 8 | 2011 | $400,000 | $26,667 | $26,667 | 1 | 15 | 2026 |
| Engine 11 | 2011 | $400,000 | $26,667 | $26,667 | 1 | 15 | 2026 |
| Engine 14 | 2011 | $400,000 | $26,667 | $26,667 | 1 | 15 | 2026 |
| Engine 16 | 2011 | $400,000 | $26,667 | $26,667 | 1 | 15 | 2026 |
| | | ***TOTALS*** | ***$1,046,667*** | ***$8,416,667*** | | | |

Based on the estimated replacement costs of existing heavy apparatus, the city should be allocating $1,046,667 to an annual fund for vehicle replacement. In addition, if this plan were to be implemented today, a deficit of $8,416,667 would exist due to a lack of previous planning efforts. Since MFD rents apparatus from fleet services, this allocation would not apply directly to the department operating and capital budgets. In addition, some capital replacement planning is already in place and included in the department's Business Plan.

Outside the need for additional capital replacement planning, the department is sufficiently resourced in regard to emergency apparatus. The deficiency, however, with these apparatus is the availability of personnel to operate them. This is discussed below.

## Staffing

Future staffing is perhaps the most difficult of all future service delivery models to forecast. As the demographics and development of a community change, so do the needs in regard to adequate staffing. When evaluating the need for personnel in the future, it is necessary to consider the types and volume of incidents that are projected as well as the risks that exist within the community. As presented previously, MFD's workload is expected to increase slightly but steadily over the next 10 to 20 years, and a majority of these incidents are projected to be medical in nature, as is the current scenario.

The difficulty of any fire department in facing this type of increasing workload is the ability to maintain adequate fire suppression resources while delivering a needed service within the community. What must be understood first is that fire incidents must be staffed differently than medical incidents. Most medical responses can be handled by a single unit with two to three personnel. Fire incidents, however, depending on the type of risk and level of fire involvement, require anywhere from three firefighters (for non-structural fires) to as many as 30 or more for high risk structural fires. While true that the number of structure fires has declined throughout the last five years (485 in 2006 to 335 in 2010), those fires that are occurring tend to be much more involved such as the recent church fire. This indicates that a sufficient number of personnel, although used less frequently, are still required to mitigate the current number of structure fires occurring within the city.

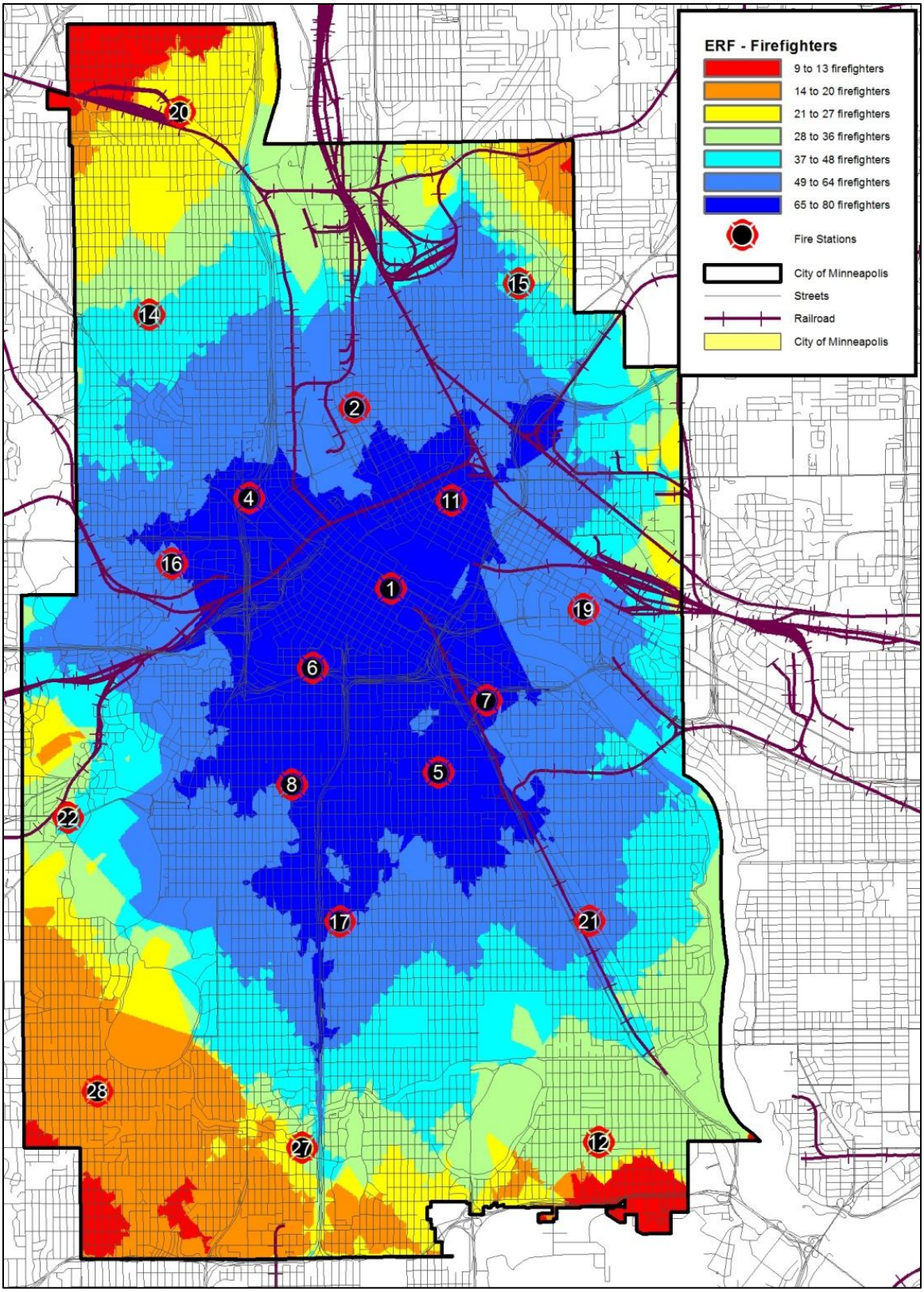
As discussed previously, the overall number of operational personnel within MFD has decreased over the last decade from 483 in 2001 to the current level of 394; an overall reduction of 18.4 percent. At the same time, however, department incident records indicate that the average number of personnel on the scene of structure fires has only declined by 0.04 percent (from 22.5 to 21.6). Although no official minimum staffing is in place either within ordinance or the collective bargaining agreements, MFD has established a current minimum staffing level of 94 personnel. The figure below lists minimum staffing by unit and position and is based on staffing levels at the time of data collection.

**Figure 14: Minimum Staffing by Unit and Position**

| Apparatus | Apparatus Type | Location | Minimum Staffing |
|---|---|---|---|
| Engine 1 | Engine | Station 1 | 3 |
| Engine 2 | Quint | Station 2 | 3 |
| Engine 4 | Engine | Station 4 | 3 |
| Engine 5 | Engine | Station 5 | 3 |
| Engine 6 | Engine | Station 6 | 3 |
| Engine 7 | Engine | Station 7 | 3 |
| Engine 8 | Engine | Station 8 | 3 |
| Engine 11 | Engine | Station 11 | 3 |
| Engine 12 | Engine | Station 12 | 3 |
| Engine 14 | Engine | Station 14 | 3 |
| Engine 15 | Quint | Station 15 | 3 |
| Engine 16 | Engine | Station 16 | 3 |
| Engine 17 | Engine | Station 17 | 3 |
| Engine 19 | Engine | Station 19 | 3 |
| Engine 20 | Quint | Station 20 | 3 |
| Engine 21 | Engine | Station 21 | 3 |
| Engine 22 | Engine | Station 22 | 3 |
| Engine 27 | Engine | Station 27 | 3 |
| Engine 28 | Engine | Station 28 | 3 |
| Ladder 2 | Quint | Station 21 | 4 |
| Ladder 3 | Tiller | Station 7 | 4 |
| Ladder 4 | Platform | Station 4 | 4 |
| Ladder 5 | Quint | Station 17 | 4 |
| Ladder 10 | Tiller | Station 14 | 4 |
| Ladder 11 | Platform | Station 6 | 4 |
| Rescue 1 | Rescue | Station 6 | 4 |
| Rescue 9 | Rescue | Station 11 | 4 |
| Salvage | | Station 5 | 0 |
| Mobile Command | | Station 1 | 0 |
| Board-up | | Station 6 | 0 |
| | | **Subtotal** | **89** |
| Deputy Chief | Command | Station 1 | 1 |
| Battalion Chief 1 | Command | Station 6 | 1 |
| Battalion Chief 2 | Command | Station 8 | 1 |
| Battalion Chief 3 | Command | Station 7 | 1 |
| Battalion Chief 4 | Command | Station 2 | 1 |
| | | **Subtotal** | **5** |
| | | **Total** | **94** |

In the minimum staffing matrix, the three non-critical units (salvage, mobile command and board-up) are not staffed, and all ladder companies retain minimum staffing of four personnel while all engine companies are reduced to three personnel. This maintains all stations in operational status without the necessity for 'brown outs' or the temporary closing of stations due to insufficient personnel. When evaluating the need for additional apparatus, it is first necessary to determine how well the department can perform at assembling personnel currently. The following figure illustrates how well MFD can assemble an effective response force of firefighters.

**Figure 15: Effective Response Force - Firefighters**



As can be seen in the prior figure, the department is able to assemble upwards of 80 personnel in the core of the city. This assumes, however, that all units are available for response and are in their respective stations. This is not usually the case. Concurrent incidents, multiple incidents that occur simultaneously, can degrade the department's ability to generate an effective response force. As was discussed in the Phase II report, the department typically responds to incidents singularly, that is, one at a time although some incidents require multiple apparatus. The station that has the highest concurrency is Station 8 at 6.2 percent while the lowest concurrency rates occur in the areas of Station 11 and 28 at 3.1 percent. Typically, concurrency rates below 10 percent are common but, as population grows and resources are redeployed, this analysis should be repeated to ensure that sufficient personnel are always available for response.

NFPA 1710 defines *companies* as, "A group of members: (1) under the direct supervision of an officer; (2) trained and equipped to perform assigned tasks; (3) usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies; (4) operating with one piece of fire apparatus (pumper, aerial fire apparatus, elevating platform, quint, rescue, squad, ambulance) except where multiple apparatus are assigned that are dispatched and arrive together, continuously operate together, and are managed by a single company officer; (5) arriving at the incident scene on fire apparatus."[1] Notice within this definition that a *company* can be made up of multiple apparatus that are "dispatched and arrive together." In other words, although NFPA 1710 also states engine and ladder companies, "…shall be staffed with a minimum of four on-duty personnel"[2] there is no requirement that these personnel be on the same apparatus.

In other words an engine *company* can consist of two separate apparatus that are dispatched and arrive together to function as a single unit. Likewise, three engines and a ladder truck could be dispatched with three personnel on each (for a total of nine personnel) to form one engine company and one ladder company. The current minimum staffing, although less than four personnel per apparatus, requires that multiple apparatus be dispatched to incidents for the creation of companies that meet the intent of NFPA 1710.

To this end, any further reductions below the current 94 minimum would require the movement of personnel from the ladder companies to engine companies to prevent 'brown outs' or other station

[1] NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, and Special Operations to the Public by Career Fire Departments. 2010 Edition. 3.3.13
[2] NFPA 1710. 5.2.3.1.1 for engine companies and 5.2.3.2.1 for ladder companies.

closures, resulting in all engine and ladder apparatus minimum staffing levels of three personnel. As noted above, under this scenario, more existing apparatus will be required to be dispatched and arrive together for involved incidents in order to create the necessary *company* staffing levels.

A reduction or realignment of staffing at minimum levels will not directly impact response times throughout the city. Response times, however, may be indirectly impacted under certain circumstances. As discussed in the Phase II report of this project, NFPA 1710 recommends that career departments achieve a turnout time of 1:00 for medical incidents and 1:20 for fire incidents combined with a four-minute travel time to 90 percent of all incidents. This results in an overall response time recommendation of 5:00 for medical incidents and 5:20 for fire incidents. MFD's current performance at the 90$^{th}$ percentile is provided below as a comparison.

**Figure 16: Response Performance Comparison**

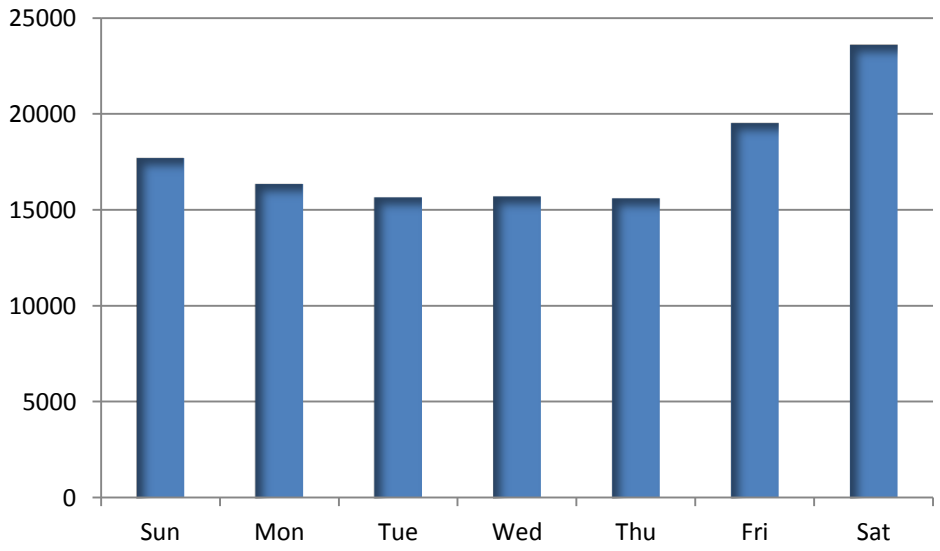
| | NFPA 1710 | MFD 2011 | Difference |
|---|---|---|---|
| Turnout | 1:00 for Medical<br>1:20 for Fire | 1:41 | **0:21** |
| Travel | 4:00 | 4:43 | **0:43** |
| Response | 5:00 for Medical<br>5:20 for Fire | 5:53 | **0:33** |

As seen in the figure above, although the department's turnout, travel and total response times are longer than the recommendation, the overall response performance for the department is only slightly above the recommendation, which by many is considered to be a fairly aggressive standard. MFD operates as the first responder component within the City of Minneapolis and supplements the Advanced Life Support service that provides ALS transport. As noted previously, these incidents typically require only one apparatus and can usually be mitigated with as few as two to three personnel. At minimum apparatus staffing levels of three, medical incidents will not be directly impacted. At the reduced staffing levels however, involved suppression incidents, although infrequent, will require more apparatus to create functional companies thereby reducing the availability of resources to respond to the higher frequency medical incidents.

Although the department has seen a decrease in staffing levels throughout the last decade, incident staffing remains stable. One issue that should be more deeply evaluated is the usage of sick time. As discussed in the Phase II report, the department's busiest day of the week has historically been

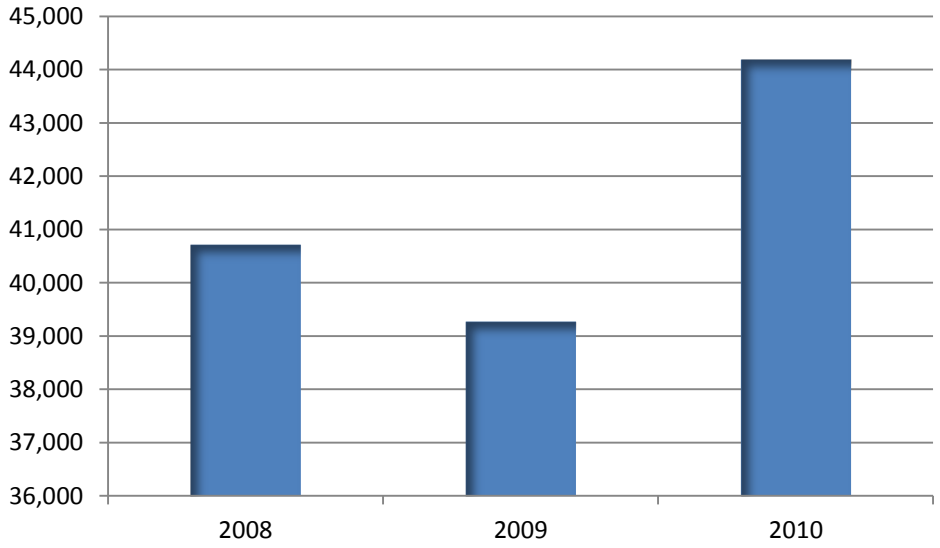
Saturday. Unfortunately, department personnel tend to use the most sick time on Saturdays, as identified in the following figure, placing the entire system in jeopardy on its busiest day.

**Figure 17: Unscheduled Hours Used by Day of Week - 2010**




The usage of sick time has also dramatically increased over the last three years (from less than 41,000 hours in 2008 to over 44,000 hours in 2010) as illustrated below.

**Figure 18: Unscheduled Hours Used by Year**



Department management should work with labor representatives to better understand the usage of unscheduled leave and the problems that it causes.

An additional component to consider when evaluating appropriate staffing levels is that MFD is surrounded by other career and combination fire departments. Rather than planning in a vacuum, the department should work closely with its neighbors to ensure that regional staffing levels are not adversely impacted by internal reductions. In other words, if MFD unilaterally reduces staff without consulting a neighboring department, and that department also reduces staff, the regional availability of mutual aid has been negatively impacted. Today's fire service, due primarily to economic conditions, are being forced to look outside their own jurisdictions for assistance.

As this report is being completed, other departments around the City of Minneapolis (all of North Hennepin County, St. Louis Park, Falcon Heights to name a few) are actively seeking assistance from third party firms to develop plans for increased efficiency and reduced operating costs. This should serve as a sign to department leadership that all the departments within the region should implement, or enhance, mutual and automatic aid agreements that provide assistance with necessary and available.

## Cost Avoidance and Cost Recovery

As was discussed in the Phase II report of this project, MFD consumes approximately 4.47 percent of the City's overall budget of $1.168 billion. Over the past three years, the department's budget has remained relatively stable, showing a less than one percent increase since 2008. A vast portion of the department's revenue is generated through the general fund. However, over $3 million in revenue is generated by the department through licenses and permits and amortized aid. An additional $674,000 is budget in 2012 as revenue from 'Other Services Provided,' $400,000 of which is to be generated by the Board-Up unit.

As a provider of emergency medical services at the non-transport level within the City of Minneapolis, it is difficult for MFD to generate additional revenue. The focus, therefore, should be on efficiency and cost avoidance. One area of potential cost avoidance is the Board-Up unit. This unit is staffed 24 hours per day (unless minimum staffing levels cannot be met) and is tasked with responding to properties throughout the City, whether involved in fire or not, to secure the property by placing wooden panels over doors, windows and other openings. A report issued by the fire department as part of the annual budget stated that during the period October 2010 to August 2011, the Board-Up unit produced

revenue of $81,637, well below the estimate. Based on equipment, supplies, vehicle expenses and personnel, the department estimates that this program results in an annual loss of at least $107,000. While not much in the grand scheme of the department's overall budget, the personnel assigned to the Board-Up unit could be reassigned to an operational position to bolster response levels.

Three additional areas of revenue generation lie with fire prevention, the training center and emergency response to specific incidents. While the department is currently billing for inspections, plans reviews, permits, etc. the fee structure should be evaluated more closely to determine if costs are being covered. Based on documentation provided, fire prevention generated $2,729,796 in 2011 while the costs of this division totaled $1,375,980. This indicates that the division is in fact generating more revenue than it costs to operate the division.

The state of the art training center in use by MFD is currently offered free of charge to other emergency services agencies for training. Although emergency services organizations tend to work with one another in circumstances such as this, the City of Minneapolis should consider entering into agreements with regional fire and rescue agencies that will generate revenue for the use of the training center. In addition, the city should consider allowing non-emergency services organizations to use the facilities for meetings, gatherings, or compatible training. This provides an additional potential source of revenue.

The fire department is also charging insurance companies for responses to motor vehicle accidents. Currently, MFD charges $577 per patient for each engine company response to a motor vehicle accident and $721 per patient for each ladder or rescue company response to a motor vehicle accident. In addition to these charges, the department should consider charging for specialty rescue services as well as hazardous materials responses where personnel and disposable resources are consumed. This is common practice in the industry today and many departments have contracts with billing service providers to increase potential collection rates. Rates for these services should be determined based on the cost of the service provided and the resources consumed.

The Fire Service Institute of Iowa State University Extension suggest that hazardous materials incidents be charged at a rate of $100 per apparatus plus $30 per hour per firefighter plus the cost of disposable materials.[3] During calendar year 2010, MFD responded to approximately 184 technical rescue incidents

[3] Callahan, Patrick and Oster, George. 1999. "Assessing Fees for Fire and Emergency Services" Fire Service Institute of Iowa State University Extension to Communities, University of Iowa, Institute of Public Affairs. http://www.state.ia.us/government/dps/fm/fstb/assessingfees.PDF March 11, 2002

(including vehicle extrication) and 453 hazardous materials incidents (including fuel spills). Assuming that each incident was completed in one hour and occupied two apparatus and six personnel, the city could have realized revenue of approximately $240,000 using the fees noted above for technical rescue and hazardous materials incidents. Again, the revenue is not substantial considering the department's overall budget but leadership should continue to pursue all available avenues for revenue generation.

## Conclusion

The ESCI project team began collecting information concerning the fire protection systems of Minneapolis in October 2011. The compilation of that information and the preparation of this report have required nearly five months to complete. The team members recognize that the report contains an extremely large quantity of information and ESCI would like to thank the elected and appointed officials of the City of Minneapolis and the staff of Minneapolis Fire Department for their tireless efforts in bringing this project to fruition. We sincerely hope that the information contained in this report is utilized to its fullest extent and that the emergency services provided to the citizens of the City of Minneapolis are improved by its implementation.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