



Department of Community Safety

Fire and Paramedic Services Optimization Final Report

April 2017



MESSAGE FROM THE CHIEF ADMINISTRATIVE OFFICER

Mayor Bigger and Members of Council,

This report is a result of many months of research, analysis and hard work on the part of the Fire and Paramedic Optimization team and staff throughout the organization.

The goal was to respond to Council's request to optimize emergency services in our community. The objective was to produce a data-driven, fact-based document so that Council would have sufficient information to confidently make decisions about the future of fire and paramedic services in Greater Sudbury.

Throughout this work, a variety of opinions regarding what is best for the community when considering choices about emergency services have come to the forefront. Both staff's analysis and public comments revealed the importance of clearly defining service level expectations. Among the policy options Council may consider, defining service levels is possibly the most important because it influences so many other aspects of the potential changes under consideration. Staff's recommendations to support Council's decision-making are based on professional judgment and an understanding about the relationship between service, cost and risk factors inherent in today's emergency service model.

Staff hosted 11 information sessions – three focused on sharing information with employees and eight intended to share information with members of the general public. The sessions served as a way for people to demonstrate the passion they feel for fire and paramedic services and illustrated just how significant emergency services are in our community. I thank the residents who took time out of their busy schedules to attend a meeting, share their views and as a result, add great value to the optimization process.

This has been an all encompassing project for the Fire and Paramedic Services Optimization Team, and I want to thank Chief Trevor Bain for leading his staff through this very complex project. The result of this leadership can be seen in the detail and thoroughness of the report. I am proud of the collaboration and commitment I have seen in this team throughout the process, all in the name of improved safety for residents through the delivery of emergency services in their community.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ed Archer', with a stylized, cursive script.

Ed Archer

MESSAGE FROM THE GENERAL MANAGER OF COMMUNITY SAFETY AND CHIEF OF FIRE AND PARAMEDIC SERVICES

Mayor Bigger and Members of Council,

I am certain that the direction to optimize our Fire and Paramedic Services has been, for all those involved in this project, the most challenging and yet enlightening experience in our emergency services careers. We are very aware that it is our responsibility to lead our staff forward while ensuring that our way forward best serves our citizens. It's a balance that must favour the public interest and as a result, we fully recognize not all will appreciate our future direction but will come to realize it's the right thing to do.

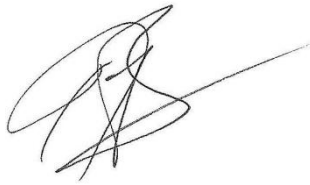
Our analysis clearly showed that our Paramedic Services have never stopped evolving since amalgamation. Our paramedic staff are the most passionate, skilled and dedicated people that you will find, and are second to none in the province for what they do. Although we have identified a few significant opportunities for improvement, it is evident that Paramedic Services, thanks to our governance model, combined with our past and current leadership, has our citizens in good hands when providing emergency pre-hospital patient care in Greater Sudbury. Paramedic Services, in fact, has already achieved a *One City, One Service* delivery model.

We cannot say the same for Fire Services since amalgamation. Although attempts have been made to evolve, reports have been written, consultants have come and gone and more reports have been written, the Fire Services delivery model has remained for the most part unchanged. That is not to say many of our firefighters are not highly skilled and more than capable of responding to fire service emergencies. The service staffing model has remained inconsistent and worse, our services are not aligned with our cities community risks. Fire Services has done little to achieve a *One City One Service* model. Tribalism, poor communications and the failure to collect key system performance data to carryout system analysis to support proper decision making has continued to hinder the evolution of our Fire Service. It must be understood that to achieve an optimal model, stations, trucks and equipment do not put out fires, perform auto-extrication or respond to hazardous incidents. Like their counterparts in Paramedic Services and Policing, a highly skilled and committed fire service staff whose delivery model serves all of our investments whether they are our homes, public institutions or businesses, ensures we serve all of our citizens as equals.

We would like to thank Mayor Bigger and Council for having the courage to even ask us to take on this task of optimizing Fire and Paramedic Services. It is evident that although amalgamation occurred over sixteen years ago, for some it's like it was yesterday, and from a fire and service perspective benefits were not realized. We are confident our Optimization Plan, over a seven to ten year phased-in period, will achieve an optimized Fire and Paramedic Service.

I am now in my 32nd year of having the honour and privilege of serving the public in some capacity within emergency services. To be asked to optimize Fire and Paramedic Services in my hometown, where I too raise a family, and where I will live out the rest of my years is personal. I do not take this responsibility lightly. Having said that, the responsibility we share to ensure we address our present needs while taking a long-term view involves considering bold changes in a service that places a high value on tradition and stability. It is my belief that future generations will look at our choices to change the service and conclude we did the right thing. While we can only anticipate, future generations will be able to look back and know we made our community safer.

Sincerely,

A handwritten signature in black ink, appearing to be 'T. Bain', with a long horizontal line extending to the right.

Chief Trevor Bain

General Manager of Community Safety

ACKNOWLEDGEMENTS / CREDITS / THANK YOUS

Staff Credits

Trevor Bain, Chief of Fire and Paramedic Services

Darrel McAloney, Deputy Chief of Fire Services

Joseph Nicholls, Deputy Chief of Paramedic Services

Lynn Webster, Manager of Business and Strategic Services

Graham Campbell, Deputy Chief of Fire Services

Aaron Archibald, Deputy Chief of Paramedic Services

Jesse Oshell, Assistant Deputy Chief of Fire Services

Paul Kadwell, Assistant Deputy Chief of Paramedic Services

Danielle Konner, Issues Manager

Christina Leader, Business Improvement Officer

Jacinda McLean, Business Improvement Officer

Jason Nelson, Co-ordinator Community Initiatives Quality Assurance

Amie Maurice, Paramedic Clinical Auditor

Bev Oickle-Halverson, Executive Assistant to the Chief's Office

Jennifer Olive, Administrative Assistant to Chief's Office

Michael MacIsaac, Executive Deputy Chief of Fire and Paramedic Services

Guy Gionet, GIS Technician

Krista Carre, Senior Planning Technician

Liisa Brule, Senior Budget Analyst

Eliza Bennett, Director of Communications and Community Engagement

Marie Edsall, Communications Advisor

Special thanks to Ed Archer, Chief Administrative Officer, for his unwavering commitment, guidance and for being there with staff at every moment providing his support and leadership.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
INTRODUCTION	13
Background.....	13
One City One Service	14
What Is Optimization?.....	15
Guiding Principles.....	15
Three Pillars of the Optimization Review – Service, Risk and Cost.....	15
The Process / Analysis Method	17
Who Is Emergency Services?	18
Introduction to Risk.....	23
ANALYSIS OF CURRENT MODEL - PARAMEDIC SERVICES	24
History of Optimization in Paramedic Services	25
Paramedic Service Legislation	27
Staffing	28
Stations.....	31
Vehicles	34
Service Levels and Community Risk	35
ANALYSIS OF CURRENT MODEL - FIRE SERVICES	57
Legislation and Standard Setting.....	57
Staffing	61
Stations and Fleet.....	66
Service Level and Community Risk.....	81

RISK ANALYSIS	109
Greater Sudbury Fire Services Community Risk Profile	109
Auditor General – Enterprise Risk Registry	124
COST ANALYSIS.....	129
Capital Gap	129
Presumptive Legislation	131
AREA RATED TAXATION ANALYSIS	133
Current Fire Service Taxation Model	133
PROPOSED OPTIMIZED MODEL	140
Service Level Standards.....	141
Stations.....	145
Staffing	153
Fire Vehicles and Major Equipment.....	160
Service Level and Community Risk.....	161
Optimized Costs	163
Optimized Taxation	171
IMPLEMENTATION	176
SUMMARY	179
APPENDIX	181
Maps (M)	181
Tables (T)	182
Financial Analysis (F)	182
Reports and Documents (R)	182
SUPPORTING DOCUMENTS.....	183

EXECUTIVE SUMMARY

Background

The City of Greater Sudbury was formed on January 1, 2001, with the amalgamation of Sudbury, Capreol, Nickel Centre, Onaping Falls, Rayside-Balfour, Valley East and Walden, as well as many unincorporated townships. This resulted in the creation of the Greater Sudbury Fire Services Department – a combination of seven distinct fire departments from these former communities. A year prior to this change, land ambulance services were transferred to municipalities from the Ontario government on a 50/50 cost sharing basis.

Since 2000, several reports and studies related to the delivery of fire and paramedic services have been prepared. These reports have provided information and recommendations on how to move forward in a more strategic manner. In August 2014 Council adopted the Emergency Services Strategic Plan which identified the need to optimize resources with a vision towards a *One City, One Service* approach to the delivery of Fire and Paramedic Services in the City of Greater Sudbury.

Following the municipal election, a motion was passed directing staff to prepare a report on the optimization of fire and paramedic services, stations and service levels. This resulting report details the evidence-based analysis that was completed, and outlines a series of recommendations to address the gaps and needs that were identified as part of the review.

The Fire and Paramedic Services Optimization team provided numerous updates to Council throughout the process and held several employee and public information sessions, which included a presentation followed by a Question and Answer period.

The goal of the Optimization Plan is ultimately to make the community safer, over the course of a number of years that is dependent on implementation decision points to be made by Council and taking into account the priorities and financial position of the City of Greater Sudbury.

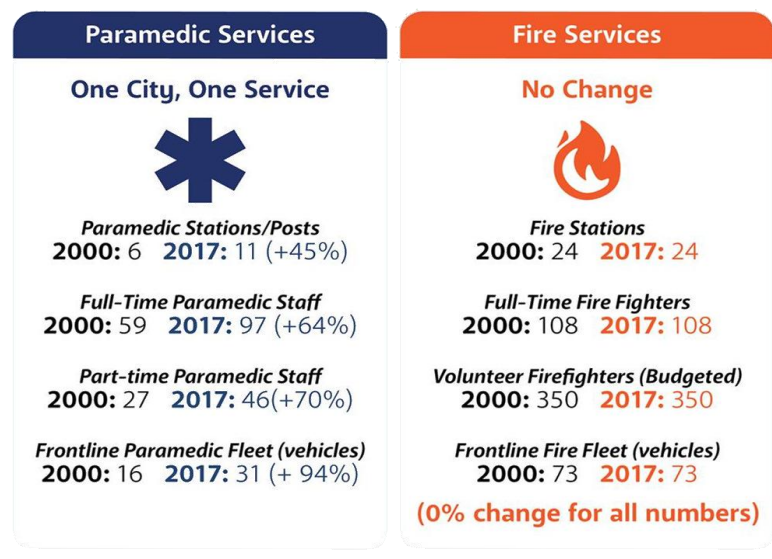
Guiding Principles

The analysis provided for Council's consideration respects five guiding principles that reflect the continuous focus on services, risk and cost as identified in both the Emergency Services Strategic Plan and Corporate Strategic Plan. These are:

1. A service-based systemic approach to planning and delivering Fire and Paramedic Services to achieve a consistent level of service and response throughout the city
2. Standardize response criteria to align with community needs and risks
3. Responsive, long-term decision-making for a service delivery model that aligns actual costs and taxation
4. Minimize risk to staff, the public, property and municipality by maintaining meaningful participating, competent, skilled responders
5. Protect the City of Greater Sudbury's economy and reputation

Context for the Delivery of Emergency Services

The figure below shows the state of Paramedic and Fire Services in 2000 and in 2017.



As part of the transfer of paramedic services, the Ministry of Health and Long-Term Care continued to set regulatory frameworks through the Ambulance Act, regulations and provincial standards. After assuming the service, the City of Greater Sudbury established a performance-based paramedic service model focused on a higher quality, reasonably priced service. Paramedic Services is required to report their response time performance on an annual basis not only to City Council, but to the Province through the Ministry of Health and Long-Term Care.

Over the past 16 years, Paramedic Services has continued to evolve their service delivery model through regular review and analysis of performance metrics, followed by implementation of improvements over time resulting in the achievement of a sophisticated and well-performing service that has continuously optimized towards a *One City One Service* model. Paramedic Services has evolved to meet the changing demands of the service and responds to nearly 90% of the population in a timely manner, making them one of the top ten response time performers in the province.

Fire service delivery is partly regulated by the province under the Fire Protection and Prevention Act. This legislation directs municipalities to provide fire education and fire prevention service, and provides the opportunity for Council to establish standards for fire suppression delivery in their community to address local risks and needs. These service levels are typically based on guidelines and standards established primarily by the National Fire Protection Association (NFPA), an internationally recognized authority on best practices for fire department operations. Fire Services are evaluated by the insurance industry through the Fire Underwriters Survey (FUS), who establish residential and commercial grades based on the ability of the department to prevent and control fires that may occur in a community.

While Paramedic Services has grown and evolved over the years, Fire Services has not evolved its delivery of fire services since amalgamation. The number of staff, stations and trucks has remained identical, and the service has maintained relatively the same scope of work, with the same seven different service models adopted at amalgamation.

Risk

Progressive communities choose to proactively identify, understand and assess the potential risks that exist and how they can be addressed by fire and paramedic services to help plan and deliver the service. The Auditor General (AG), in collaboration with staff, produced an enterprise risk assessment for both Fire and Paramedic Services.

For Paramedic Services, 54 overall risks were identified for analysis: eight related to reputation, 22 related to operations, 18 related to finance, and six connected to legal and regulatory issues. Of the 54 risk items identified by the AG's Office, 39 of them are currently mitigated to an acceptable level by way of the people, process, and system/technology. Of the remaining 15 risk items, five pertain to station location and functionality and cannot be further mitigated outside of investments in stations. These are identified as part of the proposed Optimization Plan.

In Fire Service, there were 60 identified risks including: 12 related to reputation, 23 for operations, 16 related to finance, and nine connected to legal and regulatory issues. Thirty-nine of these are currently mitigated to an acceptable level. The remaining 21 items require either: public acceptance of the risks at the current level(s) by the community or additional mitigation at an acceptable risk level by whatever means are deemed appropriate by Fire Services and/or Council.

Challenges for Fire and Paramedic Service Delivery

An analysis of the current delivery models for Fire and Paramedic Services identified a number of challenges.

- In Paramedic Services, the location, physical size and station design were identified as significant barriers to a more flexible vehicle deployment and harmonious station environment for staff. Management for both Fire and Paramedic Services is located at the Headquarters in Azilda, which is removed from the majority of on-duty employees. As a result, there is a significant loss of service hours and a disconnect between administration and support functions to those delivering front-line services.
- Paramedic Service call volumes continue to increase as the baby boomer generation ages. Seniors over the age of 65 now represent more than 15.5 % of city's population and this number is expected to climb to 19% by 2021. The projected call volumes would suggest high priority call volumes to increase by 37%, while all calls, including non-urgent, will increase by 20%. In consideration of these call volumes there are opportunities to improve non-urgent call volumes through the optimization process, as well as through work with the provincial government and other health care stakeholders, to ultimately increase service capacity for emergency calls.
- Other needs identified as part of the optimization of paramedic services included a full-time scheduler and an additional Equipment Vehicle Technician (EVT). It is important to recognize however, that additional paramedics and vehicle hours will likely be needed over the coming years if service demands exceed our paramedic response capacity.

- Paramedic Services will continue to come to Council through the budget process, as needed, to adjust service provision in response to the rapidly changing operating environment in which they work.

Fire Services faces numerous challenges, some of which are quite significant and pose significant financial risk.

- The Establishing and Regulating By-law is the by-law municipal Council approve to define the fire response service level for the community. In the current by-law, there is an unclear understanding of the service level expectations for fire suppression services in the City of Greater Sudbury. Generally, the focus of service level decisions reflects three aspects of performance: service scope (“What services will be provided?”), service response (“What resources will be deployed when a call for service is made?”) and service responsiveness (“What is the expected response time?”). In Greater Sudbury, the expectations of fire service response and responsiveness are not clearly established and the approved scope of service does not match community needs.
- Fire Services only protects about 70% of the value of the properties in the city in a timely manner, based on industry best practices. Further, fire services are delivered inconsistently across the city, as well as within each service delivery area (career, composite, volunteer). For example, some remote and rural areas receive a significantly delayed response, even within the same area rating taxation.
- Greater Sudbury Fire Services offer some specialized response for hazardous material, trench rescue and confined space emergencies, however they fall short of what would be expected in a community of our size and with the hazards that exist in our resource-based industrial economy.
- Greater Sudbury Fire Services operates and maintains 24 fire stations, eight of which are cohabitated with Paramedic Services. These stations were located to protect the individual communities that existed prior to amalgamation and have not been adjusted to protect the entire City of Greater Sudbury. Some stations are not located in a strategic manner so as to respond to the level of risk that exists in an area. As well, with the current 24 fire station model, the City does not have enough vehicles to maintain the service level it currently offers.
- The average age of Greater Sudbury’s fire stations is 44 years and minimal investment has been made to maintain and repair stations to support their ability to reach or exceed their recommended life cycle of 50 years. In 2014, the CCI Engineering Group completed an analysis and prepared a report that identified a required investment of \$20.4 million to address deficiencies related to the structures and their mechanical systems. Further, many of the stations are non-compliant with applicable health and safety regulations for dual gender operations, such as separate sleep quarters and shower areas. The amount identified in the report completed by the CCI Engineering Group does not address improvements to size and configurations that are needed to meet legislative requirements. The Red Deer Lake Station in Wahnapiatae is currently closed due to structural failure and firefighters are being deployed using a From Home Response model pending the completion of the optimization project.

- Current staffing does not provide enough resources to complete fire prevention and education duties recommended in NFPA industry guidelines, such as inspections and fire safety programming, which puts our community at risk of experiencing an increased number of incidents, delays in interior attack for structures where specific hazards are unknown, and endangering firefighters who may respond to high risk occupancies unknowing that hazards may exist.
- The current training model for volunteer firefighters provides instruction one night per week at each station. In 2016, the overall average for attendance at paid training by all volunteers was 66.2%. Frequent training can help to ensure skill and ability is at its finest levels, especially in those areas where call volume is low and infrequent and practical application is intermittent. Furthermore, volunteer firefighter incident attendance is neither guaranteed nor consistent in volunteer serviced areas. While many volunteer firefighters maintain an excellent attendance record, the overall average attendance at incidents was 32.1% in 2016. Poor participation and delayed response in volunteer protected areas poses a high risk for the occurrence of large damaging incidents in some areas of the city. This is especially true in those areas where significant population and commercial growth have occurred in recent years such as the Chelmsford, Garson, Lively and Valley East communities.

Cost and Taxation

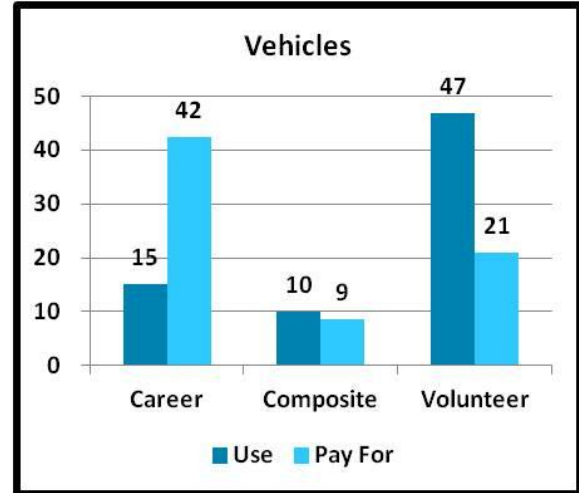
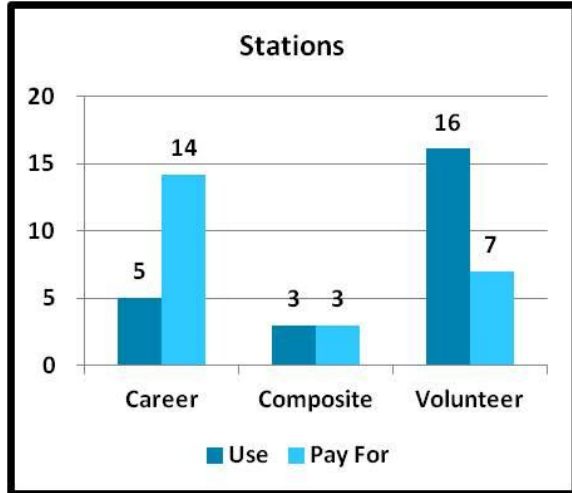
With respect to the costs and funding of Fire Services, a large shortfall exists for the replacement of aging vehicles and major equipment as well as repairs and renewals to old stations that are reaching the end of their life cycles and many of which are showing signs of impending failure. The current service delivery model of all 27 emergency services stations requires an investment of \$135 million over the next 20 years for the renewal of stations. The current fire fleet would require \$47.2 million over the next 20 years to replace front-line vehicles (fire trucks) and major equipment, but if the current funding model were to continue, the service would receive \$31.1 million, resulting in a shortfall of \$16.1 million.

Added to these financial pressures are the unique costs associated with the employment of emergency responders. Presumptive legislation results in a staffing cost for firefighters (career and volunteer) to cover WSIB claims associated with workplace related illnesses or injuries such as cancer, heart injury or post-traumatic stress disorder and paramedics to cover WSIB claims associated with post-traumatic stress disorder. The funding for this expense is allocated below the recommended rates resulting in a shortfall of nearly \$1.4 million.

At amalgamation a policy choice was made to establish a unique approach to charging taxes for a small number of services, including fire services. The taxation for fire services is based on level of service (career, composite or volunteer) and the associated firefighter wages. During the analysis, it was found that the rates established at the time of amalgamation did not appropriately align with the use of resources such as stations, vehicles and major equipment (base costs).

There is a significant difference between the use of resources (stations and vehicles) and the taxation that is charged to residents and businesses in both the career and volunteer rated areas as demonstrated below.

Ultimately, the boundaries and model established at amalgamation no longer reflect the service being received or the cost being paid. Several options are provided as part of the optimization model to re-align area taxation, at Council's discretion.



Proposed Optimization Model

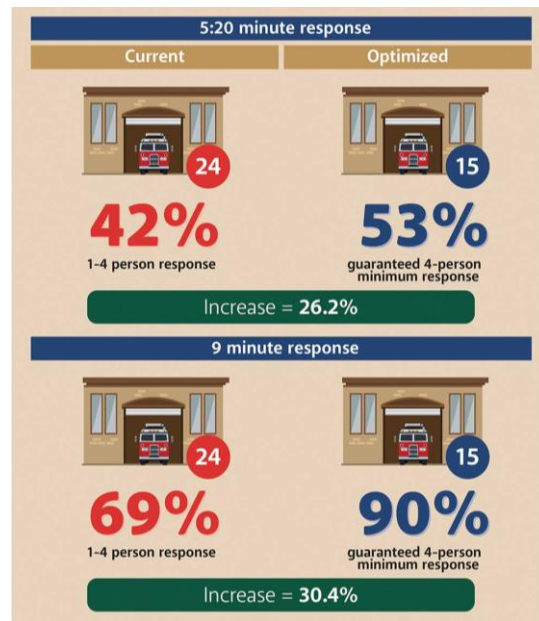
The optimized model is a deeply interconnected system that focuses on community safety and where solutions work together to create a highly functional and effective system. The recommendations being made as part of an optimized model for the delivery of emergency services are designed to be implemented over the course of seven to ten years – or less or more, at Council's discretion. Maintaining the current service delivery model will incur higher costs in the long term, and may not address the risks and needs of the community.

Service Standards for Fire Response

The first step towards optimizing emergency services is to establish service level standards. These are already in place for Paramedic Services, thanks to both regulations and legislation, and Council direction. Fire Services does not have established service standards. Several factors need to be considered when establishing service levels, including risk to life and property, hazards and population demographics. The standards recommended through the optimization analysis are:

- Dispatch time of 60 seconds or less, 90% of the time, for all fire beats;
- Chute time under 1:20, 90% of the time for career stations (inclusive of the career portion of composite stations) and under 5:00, 90% of the times for volunteer stations; and
- Differentiated response times based on urban, suburban, rural and remote designations.

The figure below shows the current fire response numbers, compared with anticipated response numbers of a fully optimized service model:



Stations

The Fire and Paramedic Services Optimized Model reduces the number of stations required in the provision of emergency response from 27 to 17 strategically located buildings that are best able to respond to the risks and needs of the entire city. This decrease in the number of stations will reduce the overall average age of stations to just 19 years, down from the current average age of 44, and will help ensure that buildings meet the modern needs and legislative requirements for both services. These stations will be appropriately staffed through the use of both career and volunteer firefighters.

Renovations, rebuilds, or new builds for stations over the years will address issues related to age, size, configuration, environmental impact and legislative requirements and also align service delivery more effectively with identified community risks. Further, these new builds represent a much needed investment in Fire and Paramedic Services infrastructure that will reduce the capital gap and long-term costs.

As part of optimization, it is recommended that the emergency service Headquarters currently located in Azilda be eventually relocated to the city core, near Notre Dame, Lasalle and Maley Drive. This move would result in a number of benefits, including but not limited to, a reduction in ambulance hours by 4,000 per year (which equates to nearly one full ambulance shift per day which could be redeployed to other areas of the community), and a significantly more effective emergency response in the event of a community incident. It is important to note that the location of Headquarters is the cornerstone of the Optimization Plan: other station locations and sizes are modeled on a Headquarters located in the city core.

Staffing

The optimized model relies on a greater number of career firefighters while still maintaining a core group of meaningfully participating volunteers. These changes, as noted above, align with the changes in numbers of stations and the need to ensure quick response in high risk areas (densely populated areas, or those with a concentration of industrial activity). The decrease in stations and equipment and correlating increase in staffing will actually improve service.

The proposed move from 108 career and 350 volunteer firefighters to 166 and 135 respectively aligns staffing with service and risk. This model allows for a guaranteed immediate response of four full-time firefighters – which is what is minimally required to effectively combat fires – with additional resources deployed from the volunteer force for larger incidents. It allows Fire Services to minimize staffing costs, while ensuring that the required number of firefighters are available to effectively fight a fire upon initial arrival at an emergency scene. This composite model is highly effective in delivering a timely response to denser suburban areas of the city and where there is significant risk identified due to vulnerable occupancies, and commercial and industrial activities.

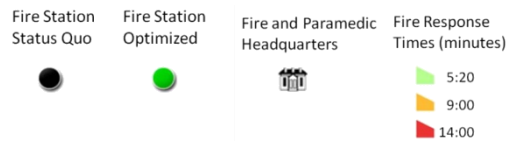
The Collective Bargaining Agreement for volunteer firefighters states that they have full discretion as to whether or not they attend an incident and no minimum attendance ratios have been established. Given the advances of technology and availability of cellular service even in more rural areas, an optimized service would greatly benefit from implementing modern advanced technology that allows firefighters to register their availability and/or quickly indicate their intention to respond to a call upon being notified.

A final modification recommended as part of optimization is the conversion of the firefighter training model to a more flexible and equitable format. The new format would allow volunteer firefighters to participate in training more frequently, alongside career firefighters, and would be designed to cater to community risks and hazards.

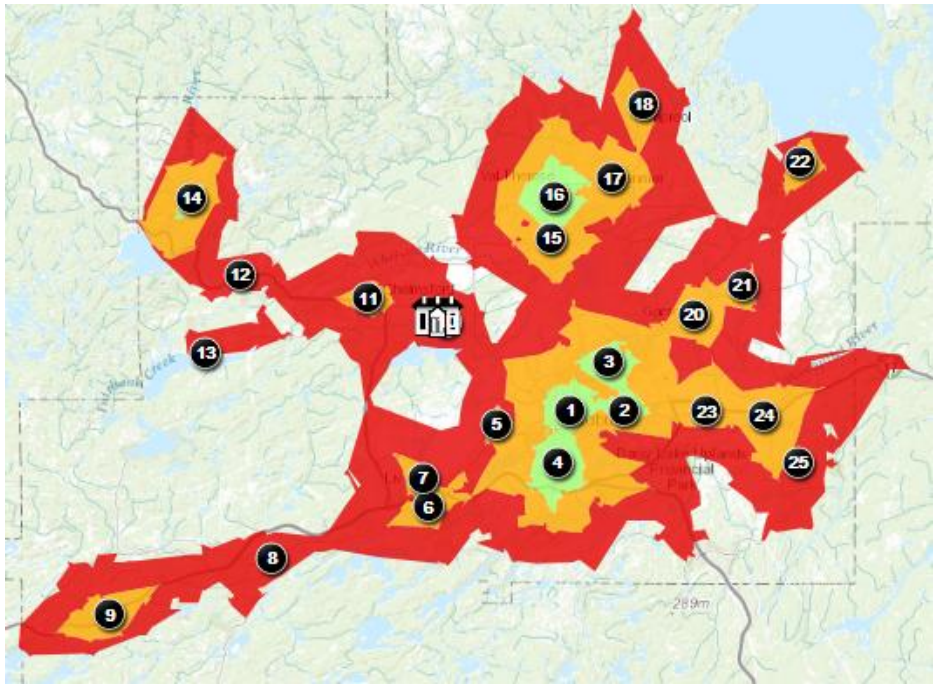
Vehicles and Equipment

The reduction in the overall number of stations will also enable the decrease in the number of fire trucks from 73 to 48 and a further decrease in the associated equipment required to deliver fire services. These changes all aim to help reduce the capital gap while increasing service delivery. As a result of these long-term changes, the cost to replace the number of vehicles and major equipment over a full 20-year lifecycle would be reduced from \$47.2 million to \$36.2 million.

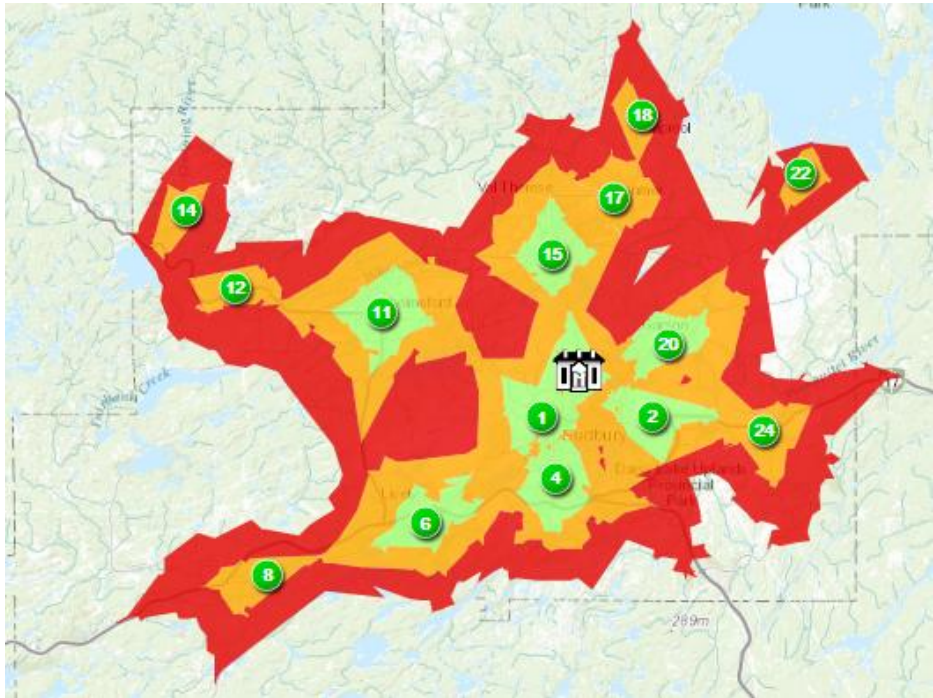
Ultimately, the recommendations of the Optimization Plan will result in a transformed model for the delivery of emergency services. The current and proposed optimized, maps detailing fire response times are as follows:



Current



Optimized



Costs

Three approaches to funding for emergency services are outlined in the optimization report. These relate primarily to Fire Services, as the funding model for Paramedic Services is a 50/50 cost-sharing model with the Province. The three approaches, broadly speaking, are:

- Current (Status Quo): This model represents no changes to the current delivery models, staffing or funding.
- Current (Status Quo) Fully Funded: This model represents no changes to the current delivery model or staffing but addresses funding shortfalls related to presumptive legislation and capital requirements for stations, vehicles and major equipment.
- Optimized: This model represents an optimized Fire Service that is fully funded.

Community Safety Department Operating Budget Impacts			
	Current Budget	Current Budget if Fully Funded	Optimized
2016 Operating Budget (starting point for analysis)	\$35,448,187	\$35,448,187	\$35,448,187
Revenues:			
Provincial Grants and Subsidies		(\$856,956)	(\$716,497)
Total Revenue	\$0	(\$856,956)	(\$716,497)
Expenses:			
Salaries and Benefits			\$8,409,775
Materials - Operating Expenses			(\$17,806)
Energy Costs			(\$137,457)
Purchased/Contract Services			(\$12,500)
Debt Costs / Insurance and Taxes		\$7,302,387	\$5,191,594
Contribution to Reserve - Presumptive Legislation		\$1,370,574	\$950,730
Contribution to Reserve and Capital		\$1,006,739	\$521,139
Internal Recoveries			(\$781,943)
Total Expenses	\$0	\$9,679,700	\$14,123,532
Net Total	\$0	\$8,822,744	\$13,407,035
Revised Operating Budget	\$35,448,187	\$44,270,931	\$48,855,221
2027 Operating Budget (with increases equalized over 10 years and a 3% annual inflation)	\$49,068,581	\$58,057,116	\$63,470,150

Phased Implementation

The proposed optimization model is recommended for implementation over the course of seven to ten years, but this can be adjusted based on Council's choices. Decision points will be brought forward to Council for consideration, and where there is a funding implication, a business case will be presented during the annual budget process. Ultimately, City Council will decide if and when each stage will proceed based on the priorities, issues and risks identified.

Conclusion

Ultimately, the Optimization Project has concluded that Paramedic Services provides a level of service which consistently and effectively addresses the community's risks, and does so with a reasonable, fully-funded budget. Fire Services does not provide a level of service that sufficiently addresses community risks and operates within a budget that does not reflect actual costs. Fire Services operates a 30-year-old tradition-based model that does not function in a consistent and effective manner, or address growing community risks. Furthermore, that the current fire service model is not adequately funded only adds to the ineffective response system and creates additional risks for critical service delivery interruptions. Continued operation of a Fire Service model that is confirmed to be ineffectively designed and maintained, and improperly funded represents a significant risk to the community.

Staff believe that the *One City One Service* Optimized Model for the delivery of emergency services will result in a consistent, and consistently better, level of service to the entire community. While many believe that the service delivered currently reflects a standardized response – in terms of staffing, timing, and more – this is not the case. The recommendations provided will address the issues identified as part of the analysis.

Optimization proposes a phased-in transformation of stations and locations, proper alignment and delivery of services to address the risks that exist in the community, and a phased-in transformation of the staffing profile to achieve the desired result of improved community safety. Embedded within these changes are costs that, over time, will create a fair taxation model that appropriately funds proper service delivery. This model realizes opportunities for cost avoidance and, where necessary, invests in infrastructure and staffing that best serves not only today's residents, but those of the future as well.

At the heart of optimization is public safety. From fire response times, enhanced risk mitigation and improved medical tiered response, to strengthened employee well-being and improved health and safety, the Optimized Plan is expected to bring about significant benefits to the community and organization alike.

INTRODUCTION

What you will learn in this section:

- *Following the adoption of the Emergency Services Strategic and Tactical Plans, in August 2015 Council directed staff to prepare a report on the optimization of Fire and Paramedic Services and a goal of achieving a One City One Service delivery model for Greater Sudbury.*
- *Five guiding principles form the foundation of the Optimization Plan and are related to the need to balance the three pillars of service, risk and cost associated with the delivery of emergency services.*
- *Paramedic and Fire Services fall under the responsibility of the Department of Community Safety and aims to protect the people, property, infrastructure, economy and reputation of the City of Greater Sudbury.*

Background

Greater Sudbury is the largest city in northern Ontario, the largest municipality by area (3,627km²) in Ontario, and the 29th largest in population (160,000 people)¹ in Canada. The city is also home to more than 4,000 businesses who employ at least one staff person according to the latest Canadian Business Patterns report (June 2016), with an additional 7,000 self-employed businesses (without paid staff).

The City of Greater Sudbury was formed on January 1, 2001, with the amalgamation of the communities which comprised the former Regional Municipality of Sudbury. Sudbury, Capreol, Nickel Centre, Onaping Falls, Rayside-Balfour, Valley East and Walden, as well as many unincorporated townships became part of Greater Sudbury as recommended by the Report to the Minister of Municipal Affairs and Housing on Local Government Reform for Sudbury (November 1999).

With the amalgamation of all of these communities, Greater Sudbury Fire Services inherited seven separate fire service delivery models that provided various service models of fire suppression, emergency rescue and medical assistance response to the community. Since that time, there has been very little change made to the way fire services are delivered to the entire community under the amalgamated, single-service delivery model.

In 2000, just prior to amalgamation, land ambulance services were transferred to municipalities from the Ontario government on a 50/50 cost sharing basis with the Ministry of Health and Long-Term Care (MOHLTC) continuing to play a regulatory role through the Ambulance Act, regulations and provincial standards.

¹ Statistics Canada. (2011). Population and Dwelling Count Highlight Tables, 2011 Census. Retrieved February 20, 2017 from Statistics Canada: <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/pd-pl/Table-Tableau.cfm?LANG=Eng&T=301&SR=1&S=3&O=D&RPP=50&PR=0&CMA=0>

Since assumption, the City of Greater Sudbury established a performance-based paramedic service model focused on a higher quality, reasonably-priced service. Paramedic Services have been continuously improving and optimizing their service delivery in Greater Sudbury since 2000.

One City One Service

As noted above, unlike Paramedic Services, Fire Services has seen minimal growth or adjustments in service since amalgamation. Several reports and studies have been commissioned and written related to the delivery of fire services in the community that provide information and recommendations on how to move forward more strategically. In particular, over the last several years as it became clear that more efficient operations could be achieved. A Master Fire Plan was completed with the assistance of the IBI (consultant) Group in 2003, a Fire Fleet Rationalization Study was prepared by Fire Protection Survey Services in December 2010, and in March 2014 the IBI Group was again contracted to prepare a Comprehensive Fire Services Review. Each of these studies attempted to identify how to improve fire service delivery within the City of Greater Sudbury, however, there was a need to look at the model of emergency services in totality to better provide context and more effectively frame recommendations for Council's consideration in moving forward.

In June 2011, following the consolidation of Fire, Paramedic and Emergency Management services into the City's Emergency Services department (now the Community Safety department), a high level review of the needs and capabilities of the department was undertaken, resulting in 38 recommendations. These were the foundation for the Emergency Services Strategic Plan, which was adopted by Council in August 2014 and identified the need to optimize resources with a vision towards a **One City, One Service** approach to the delivery of Fire and Paramedic Services in Greater Sudbury. Identified as a business principle in the Emergency Services Strategic Plan, the *One City, One Service* model is described as follows:

Resources are allocated based on the overall Council priority, risk assessment and collective needs.

Deployment and service models are based on getting the right resources to the right call, and those services that can provide the greatest opportunity for the best outcome.

The operations model for Fire Suppression and Paramedic Services must give consideration to response time/coverage capabilities balanced with approved staffing levels.

A seamless Emergency Service response model will be applied when responding to emergency service requests.

In August 2014, the Emergency Services Strategic Plan and IBI Group Comprehensive Fire Services Review were presented to Council through the Community Services Committee where the Strategic Plan was adopted through resolution. These plans identified the need to optimize resources and a resolution was passed by the committee in August 2015 to optimize Fire Services and prepare a report. Then, in February 2016, Council amended the original motion to include Paramedic Services and directed staff to prepare a report on the optimization of fire and paramedic services, stations and service levels via the following resolution:

“That the City of Greater Sudbury direct staff to bring a report back to a Council meeting in October 2016 regarding the optimization of Fire and Emergency Medical Services, stations and man power/service levels, in line with the Emergency Services Tactical Plan adopted by Council in 2014.”

The deadline to submit the report was ultimately extended to the first quarter of 2017 following an update to Council in September 2016.

What is Optimization?

The Merriam Webster Dictionary defines optimization as: *“an act, process or methodology of making something (as a design, system or decision) as fully perfect, functional or effective as possible”*². When considering Fire and Paramedic Services Optimization, it is important to assess the ability to meet desired service levels and their associated costs and the ability to effectively respond to the risks within the community. To be effective, leadership must align the delivery of services with the strategic direction of Council, and the expectations of the public. Of prime importance is a *One City, One Service* approach to service delivery, which is highlighted by an underlying set of guiding principles that identify the priorities in relation to service, cost and risk.

Guiding Principles

The *Emergency Services Strategic Plan 2014-2020* outlines three strategic business principles: Value for Money, *One City, One Service*, and One Team. The following guiding principles have arisen from this strategic plan. These principles offer a basis for establishing effective service plans that build public trust and confidence. The five guiding principles are:

- A service-based approach to planning and delivering fire and paramedic services to achieve a consistent level of service and response throughout the city
- Responsive, long-term decision-making for a service delivery model that aligns actual costs and taxation
- Standardize response criteria to align with community needs and risks
- Minimize risk to staff, the public, property and municipality by maintaining meaningful participating, competent, skilled responders
- Protect the City of Greater Sudbury’s economy and reputation

These principles also offer an approach for testing ideas that inform judgments about what an optimized service looks like.

Three Pillars of the Optimization Review – Service, Risk and Cost

When City Council initiated the project to study the optimization of Fire and Paramedic Services, a series of concerns existed which needed to be addressed.

² Optimization. 2017. In Merriam-Webster.com. Retrieved March 6, 2017 from <https://www.merriam-webster.com/dictionary/optimization>

These concerns had been defined and categorized as a result of the several reports and studies of the services done since amalgamation, by the Office of the Fire Marshal, staff and several consultants. Service level disparities resulting in gaps that manifest themselves as community risks along with overarching funding shortfalls were all noted by prior studies.

Within this report, **service** is focused on the provision of what stakeholders, Council and the public expect from their Fire and Paramedic Services. Public services work best when they are technically capable of achieving their objectives and meet stakeholder expectations. A stakeholder in the public service can represent many different groups, from the person who calls 911 for service, to the employee whose business experiences an emergency that threatens its ability to continue operations, to the taxpayers whose funds provide the means of paying for the service. The different groups can have unique and sometimes conflicting expectations. Nonetheless, choices about how the service works, how much it costs and who pays are all important considerations.

The Office of the Fire Marshal defines **risk** as, *“a measure of the probability and consequence of an adverse effect to health, property, organization, environment or community as a result of an event, activity or operation.”* Furthermore, the National Fire Protection Association, which is responsible for developing principles in fire operations, indicates:

“a fundamental concept of Fire risk is associated with modern society. Public fire service organizations are expected to reduce the risk within their areas of jurisdiction by taking measures to prevent the outbreak of fires, limit the extent and severity of fires, provide for the removal or rescue of endangered persons, control and extinguish fires that occur within the jurisdiction, and perform other emergency response operations and delivery of EMS.” (NFPA Standard 1710 A.1.2.1.)

All of this to say that risk mitigation is at the heart of any effective emergency service.

The last of the three pillars is of keen interest to all community members. In evaluating service delivery **costs**, both the current service costs as well as future costs must undergo an analysis. This can be complex. Costs are the direct and indirect financial expenditures associated with running the service (salaries and benefits for staff, and facility and equipment costs) and can also include predicted future expenditures, for example, if emergency services staff experience lost time injuries in the line of duty. While taxation is not necessarily related to cost, this report also includes an analysis of the current area-rated taxation model with an eye toward a fair taxation model to better support both current and future fire service delivery costs. Finally, insurance rates, which are important to not only the city resident but also the business owner and some industry corporate entities, were evaluated. Although these rates are not necessarily associated with cost, they can be a related outcome of the level of investment in the department.

All decisions about public services involve choices about how to best manage service, risk and cost. For example, a reduction of service, while leading to an initial reduction in cost, can have a subsequent increase in risk. There is the potential that if risk is realized, the costs will be far greater than the original cost it would have taken to properly provide the service in the first place.

The Process/Analysis Method

An evidence-based approach was used for this review. Evidence based research involves identification and definition of a problem, compilation and analysis of data, development and testing of possibilities, and arrival at a conclusion.

A comprehensive team of staff was established to complete the optimization project. The work included reviewing existing reports on the state of the Fire and Paramedic Services in Greater Sudbury, along with analysis of similar reports from comparator municipalities.

Data was collected and analyzed with support from the Geographic Information Surveys and Mapping, Finance and Tax departments. The age, condition, maintenance and life cycle of the existing stations and major pieces of equipment/vehicles were also assessed from a compliance perspective in relation to legislative requirements.

In developing different options, industry experts were consulted, and City systems were analyzed. The Fire Underwriter's Survey (FUS), a national third party organization, was engaged to update the Public Fire Protection Classification (PFPC), and Dwelling Protection Grade (DPG) ratings (See Appendix #R1). These ratings are used by the insurance industry to establish fire insurance rates for residents and businesses within the community. The full extent of FUS will be detailed further within this document however in this context, expected service delivery models for both Fire Services and Paramedic Services were reviewed based on pertinent dedicated legislation, supporting legislation, standard setting bodies and industry best practices.

An initial Community Risk Profile was completed in order to assess the hazards present in the community. A station location analysis was included to address the expectations of FUS, major stakeholders, City Council and the public. Additionally, station location recommendations were designed to maximize response to identified community risks, improve overall response coverage based on Municipal Property Assessment Corporation (MPAC) valuation, and comply with legislative requirements, standards and best-practices.

An Enterprise Risk Assessment (See Appendices #R2 and #R3) was also undertaken in conjunction with the City of Greater Sudbury Auditor General's Office to identify the ongoing business continuity risk for both Fire and Paramedic Services, and to ensure that any recommended improvements would serve to address them.

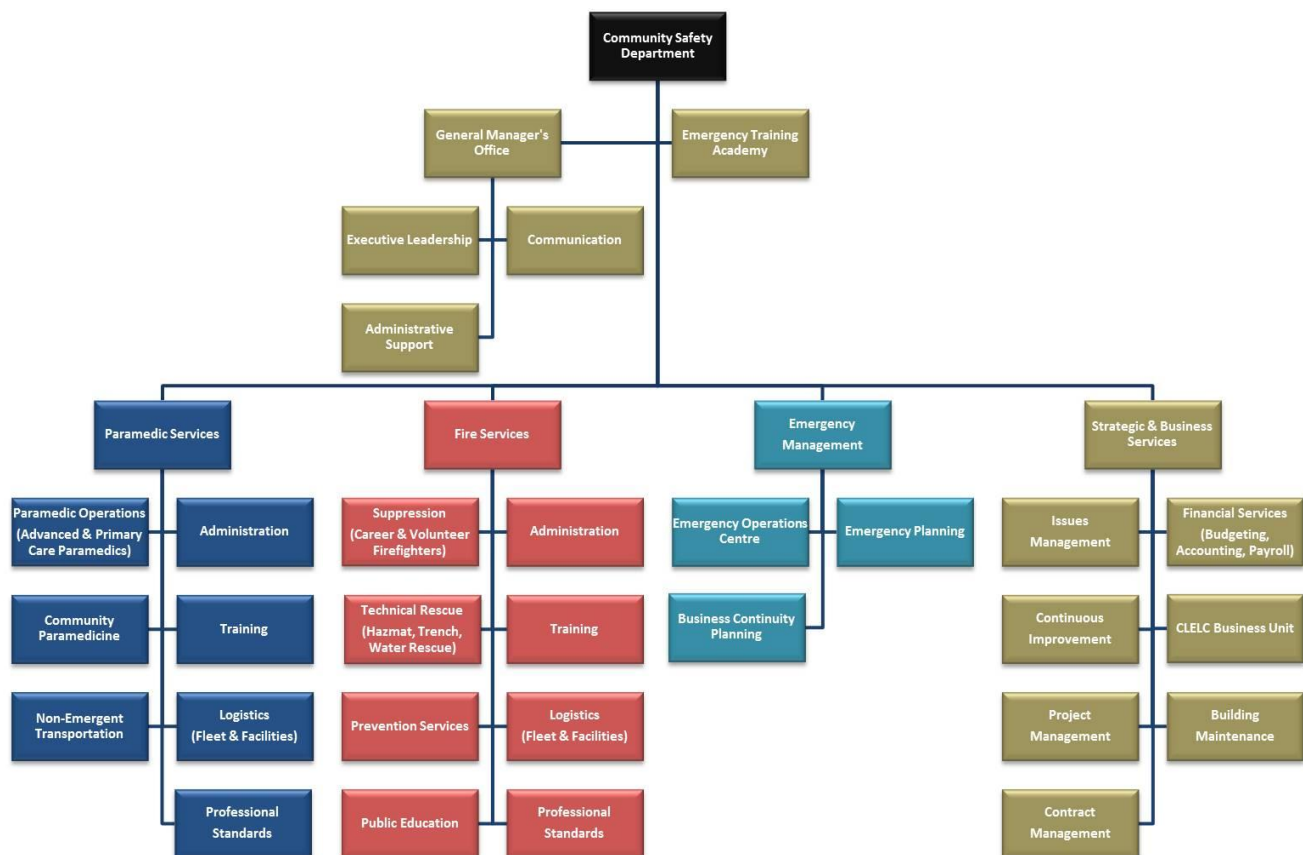
Operations in other comparable municipalities were reviewed and some visited, while various local stakeholder groups were engaged to identify additional challenges, and consider solutions and potential outcomes. This included an assessment of the expectations and delivery of response by career, composite and volunteer fire stations.

A series of Emergency Services Committee (ESC) reports were generated to outline the progress of the project, and to inform City Council and the public of the current service delivery models. As well, in the interest of transparency and accountability, an overhaul and update of the Fire Services website was completed to inform the public. Paramedic Services is currently undergoing a review and update of their website which is expected to be completed in the coming months.

From a process perspective, engagement with various stakeholder groups (Council, union groups, staff, public, media and other) was undertaken to educate and inform on Fire and Paramedic Services as a whole, as well as to provide an update on the Optimization Project. For local union groups this engagement was taken one step further through the use of consultation sessions where comments and written submissions for input was sought. Questions were asked but no written input was received.

Who is Emergency Services?

In brief, Paramedic Services protect people, while Fire Services generally protect property, infrastructure, and economy. Overall, both services along with Emergency Management aim to protect the city's reputation. As an essential public safety service responsible for citizens, visitors, businesses, industries and infrastructure, Fire and Paramedic Services is overseen by the City of Greater Sudbury's General Manager of Community Safety /Chief of Fire and Paramedic Services. All emergency preparedness, prevention, education and response not within the purview of Greater Sudbury Police Services is provided to the City of Greater Sudbury by this department. In support of this service, the Community Safety department also includes the Emergency Management Division and the Strategic and Business Services Division. Oversight of the department as a whole is completed through members of the Chief's office which consists of an Executive Assistant, an Administrative Assistant, the Executive Deputy Chief of Fire and Paramedic Services and the Manager of Strategic and Business Services. Daily operations of the individual divisions of Fire and Paramedic Services are overseen by two deputy chiefs per division. A detailed functional organizational chart providing a high level overview of the responsibility and function of the department is shown below.



Greater Sudbury Fire and Paramedic Services maintains over 600 employees in the provision of emergency medical, fire, technical rescue and hazardous material (HAZMat) response to the citizens and infrastructure of the community. Emergency resource allocation is based on a number of factors including departmental recommendation, Council priority, risk assessment and community need. Service and deployment models are centered on getting the right resources to the right location, within an appropriate response time.

Paramedic Services

Paramedic Services is responsible for the provision of primary and advanced medical care to ill and injured persons to, from, and between medical treatment facilities. Greater Sudbury Paramedic Services employs 170 full and part-time employees which include:

- 97 full-time and 46 part-time Paramedics,
- four full-time Platoon Superintendents (supervisors),
- seven full-time and six part-time Logistical staff,
- two Platoon Trainers,
- four Professional Standards (two non-union, two unionized) staff, and
- five front-line non-union personnel.

All of these employees perform a vital function in the delivery of emergency medical response to not only the over 160,000 citizens, but also an average of over 1.1 million annual visitors to the city. All unionized staff within Paramedic Services, including paramedics, are represented by the Canadian Union of Public Employees (CUPE) Local 4705 Inside Unit. This unit also represents municipal workers who perform office, clerical, technical, leisure programming, transit, library, museum and social services work.

Paramedic Services operates 31 front-line ambulances and emergency response vehicles out of 11 stations, while responding to over 30,000 calls per year. Of the 11 stations throughout the city, eight are cohabitated with Fire Services (See Appendix #M1). The operating budget for Paramedics Services in 2016 was \$21.3 million, of which 50% is currently funded through a grant from the provincial government (See Appendix #F1).

Paramedic Services evolved out of the former city and Regional Municipality of Sudbury, but for different reasons than Fire Services. A brief history of Paramedic Services within the City of Greater Sudbury reveals the following:

- 1960s** Ambulance service provided by Funeral Homes
- 1969** Ambulance service provided by Sudbury General Hospital as the MOHLTC continues an attempt to standardize provincial ambulance services
- 1979** Ambulance service provided by private operators

- 1996** Ambulance attendants trained to defibrillate patients in cardiac arrest and to administer six new symptom relief medications to patients with specific emergency medical conditions
- 1998** Ontario Prehospital Advanced Life Support Study (OPALS) results in Advanced Care Paramedics in Sudbury
- 2000** Province transferred responsibility of land ambulance to the municipality on a 50/50 cost sharing basis

Despite the transfer of land ambulance services to the municipal level, the provincial government has maintained responsibility for setting legislation and standards relating to ambulance services as well as maintaining full control of ambulance dispatch.

Since 2000, Paramedic Services has been optimizing operations in an effort to ensure consistent and reliable delivery throughout the city, utilizing a performance-based service. Many novel and innovative programs have been implemented within the city through Paramedic Services, including the Care Transition and Health Promotions and Community Paramedicine pilot programs. Paramedic Services has also developed and implemented two diversion programs: one for mental health and the other for addictions, which are unique programs within the province. Optimization presents further opportunities expected to enhance Paramedic Service delivery.

Fire Services

Fire Services is responsible for delivering what is known as the *Three Lines of Defense*: public fire safety education, fire safety standards and enforcement (fire prevention) and emergency response (fire suppression). In the provision of these services, Greater Sudbury Fire Services employs 129 full-time employees including:

- 104 career firefighters,
- four Platoon Chiefs
- nine fire prevention services personnel,
- four training personnel,
- three fleet services personnel, and
- five management personnel.

The longstanding complement of career (full-time) firefighters is represented by the International Association of Fire Fighters (IAFF) as Sudbury Professional Fire Fighters Association (SPFFA) Local 527. There are also approximately 260 volunteer firefighters who recently engaged in a relationship with the Christian Labour Association of Canada (CLAC) as Local 920 of the Eastern Ontario Volunteer Firefighters in 2013.

Fire Services provides protection to approximately 64,000 properties in the City of Greater Sudbury, which have an assessment value of nearly \$18.5 billion, based on the 2015 MPAC taxation year (see Appendix #T1). In addition, Fire Services protects the fixed infrastructure assets such as roads and bridges, the possessions of the residents and commercial and industrial businesses in the community, and residents from natural and human-made disasters. Two of the often overlooked duties of the Fire Service are fire safety education to the most vulnerable community citizens, and the code enforcement of residential, commercial, assembly and industrial buildings in the city. This is a vital service in the protection of the citizens and visitors to the city.

Operating a fleet of 73 front-line fire trucks and the associated major equipment out of 24 fire stations, Fire Services responds to nearly 4,500 calls per year. As noted previously, eight of the 24 stations throughout the Greater City are cohabitated with Paramedic Services (See Appendix #M1). The operating budget for Fire Services in 2016 was \$24.3 million, all of which is reflected wholly on the municipal tax levy (See Appendix #F1).

Greater Sudbury Fire Services have undergone some change over the last century. The latest change occurred at amalgamation in 2001, when seven fire services were combined under one administration. The Fire Service has not changed since that time. Unlike Paramedic Services, it is fully funded through the municipal tax levy. A review of the book, *We Have a Working Fire* written by retired Greater Sudbury Fire Services Chief Fire Prevention Officer Fern Bourque, provides the following brief history of Sudbury's Fire services.

- 1883** The Town of Sudbury is incorporated and creates a solely volunteer fire department.
- 1909** The Sudbury Fire Department shifts to a composite service with the hiring of a full-time Fire Chief
- 1931** The City of Sudbury Fire Department transforms to an all career service. The City of Sudbury at the time was entirely contained within the boundaries of Wilma Street across to Frood Road to the North and West, and the CP Rail tracks in the South, and the Kingsway at Kitchener to the East. This is commonly referred to today as the City Core or Downtown Sudbury.
- 1961** **Amalgamation I** – The City of Sudbury annexes the towns of Lebel, Neelon, McKim, Gatchell, Broder and Dill. The change creates composite stations in these areas, and eventually results in the construction of the four city core stations still in place today (Van Horne, Minnow Lake, New Sudbury-Leon and Long Lake).
- 1973** **Amalgamation II** – The Province compels the creation of The Regional Municipality of Sudbury, including the creation of the Towns of Walden, Rayside Balfour, Onaping Falls, Valley East, Capreol, Nickel Centre, and the annexation of the Town of Copper Cliff by the City of Sudbury. The associated fire departments are also amalgamated, and as a result several fire stations are built by the new towns, the latest being in 1985 in the Town (later City) of Valley East.

2001 Amalgamation III – The Province once again compels the amalgamation of the City of Sudbury with the Regional Municipality of Sudbury, and several other towns. As a result, the seven fire services then in existence were combined under one administration.

2017 Today – The Fire Service continues to operate from the same stations and with the same service model as at amalgamation. The service operates as a municipal responsibility and is fully funded by the municipal tax levy.

Key takeaways of this section:

- *A One City One Service delivery model aims to provide a seamless response model that fairly allocates resources based on Council priority, risk assessment and collective needs of the city when responding to emergency service requests.*
- *Optimization is making something as fully perfect, functional or effective as possible. It is not just about cutting costs, but creating efficiencies and highest achievable performance.*
- *This plan aims to create a balance of service, risk and cost that fits the needs of the community as a whole.*
- *An enormous collection of data has been reviewed, analyzed, modeled and tested to create a highly interconnected system that protects the safety of the community.*

Introduction to Risk

As noted earlier, the three pillars of service, risk and cost are the foundation of the Optimization Plan. Any service analysis, whether in the private or public sector, must address competing priorities and make choices that affect service and/or cost. The effect of such choices influences risk.

For Fire and Paramedic Services, managing risk is an overt part of the core business. There are two risk categories: external community risks that influence the design and delivery of emergency response, and internal business risks that could contribute to a negative operational impact, such as inadequate data for decision support, a lawsuit, or a loss of public confidence in their Emergency Services.

When it comes to external community risks, Paramedic Services has a robust system in place mainly due to legislative requirements instituted by the MOHLTC. Each ambulance (paramedic) service in the province of Ontario must undergo and successfully complete the Land Ambulance Certification service review administered by the MOHLTC. The purpose of this legislated Service Review is to ensure ambulance services are operated in a manner consistent with Land Ambulance Certification Standard and in compliance with all other applicable legislation, regulations and provincial standards. Services are required to successfully complete the prescribed Ambulance Service Review certification process once every three years in order to maintain their certification to operate. Participation in these comprehensive service audits provides an excellent opportunity for this division to have a third party review, assess operations and take a detailed critical view of all aspects of the service to ensure risks are being managed in all areas.

To address the external community risks, Fire Services has completed, as part of this project, an initial Community Risk Profile aimed at identifying and quantifying the risks in place within the city. This Community Risk Profile is based on established industry standard impact and likelihood criteria. It is important to note that the Fire Protection and Prevention Act (FPPA) identifies Community Risk Profiling as the primary step in identifying appropriate service levels for a given community. The recommendations identified within this report take into account community level risk, the service levels needed to protect these communities, and the associated costs. All of these factors have been evaluated against the five Guiding Principles and the *One City, One Service* principle approved by Council within the Emergency Services Strategic Plan.

Lastly, to address internal business risk, both divisions of Fire Services and Paramedic Services have completed an Enterprise Risk Register (ERR) in conjunction with the City of Greater Sudbury's Auditor General's Office (See Appendices #R2 and #R3). These ERRs aim to identify and quantify threats to the operation of each service, with an additional focus on the effectiveness of mitigation strategies currently in place. A further analysis of each ERR was performed to evaluate the impact of the Optimization Project in relation to recommendations for adjustments in service levels, staffing models and long-term financial accountability.

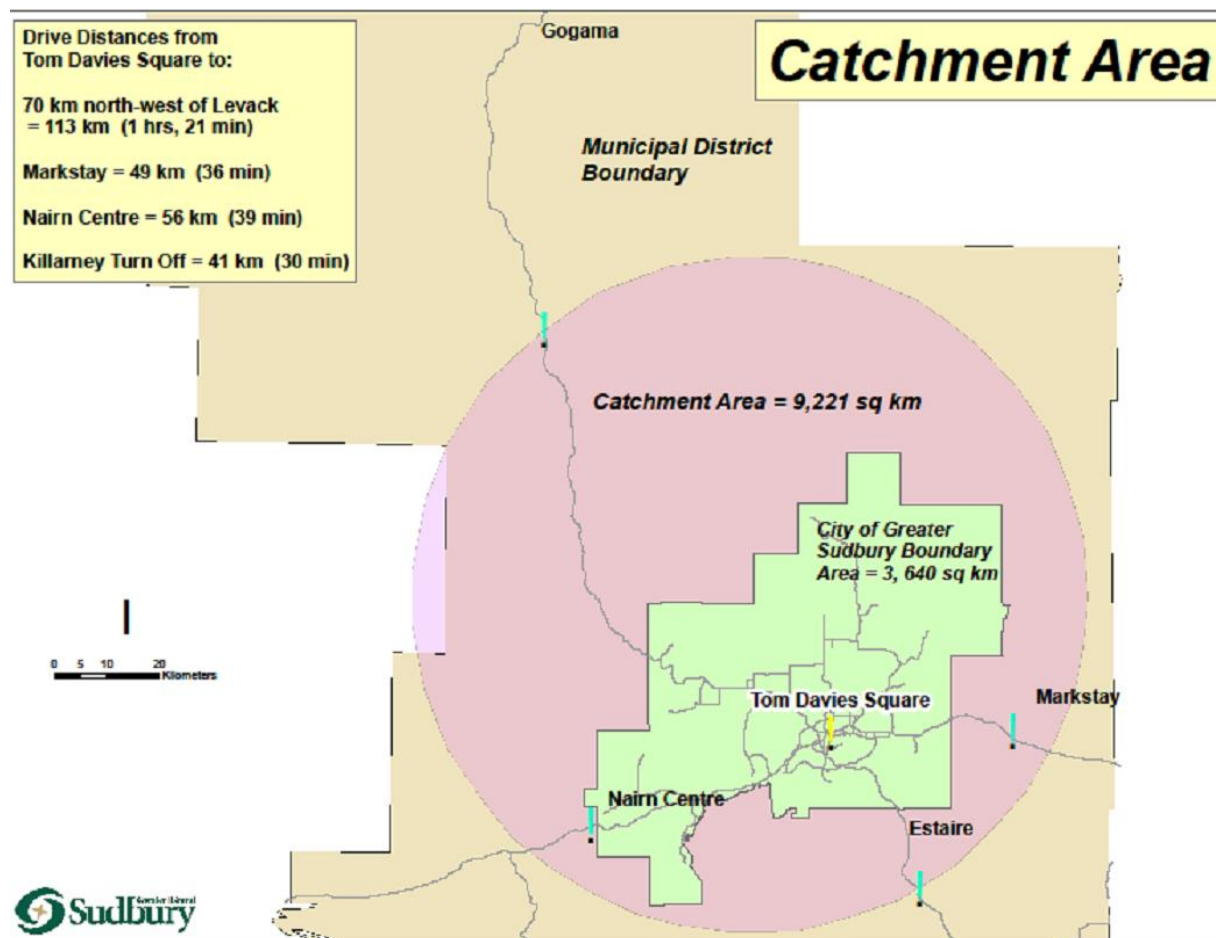
A detailed review of risk for each of the Fire and Paramedic Services will be presented in greater detail later in this report.

ANALYSIS OF CURRENT MODEL - PARAMEDIC SERVICES

What you will learn in this section:

- *Overview and analysis of Paramedic Service operations*
- *Legislative requirements of delivering paramedic services and regulated reporting requirements*
- *Evolution of the service since it was downloaded to municipalities by the provincial government in 2000*
- *Challenges faced by Paramedic Services*

Greater Sudbury Paramedic Services is responsible for seamless coverage of primary and advanced medical care to residents and visitors of the City of Greater Sudbury. Additionally, under the Ministry of Health and Long-Term Care's concept of seamless ambulance coverage, Greater Sudbury Paramedic Services also provides ambulance services to other adjacent areas where resources are closer than any other. In essence, Greater Sudbury ambulances cover an area approximately 9,221 square kilometres in size, which includes the City's 3,627 square kilometres.



History of Optimization in Paramedic Services

The provincial government adopted some fundamental principles to be considered in the assumption and ongoing operation of future ambulance services. These principles include the following concepts:

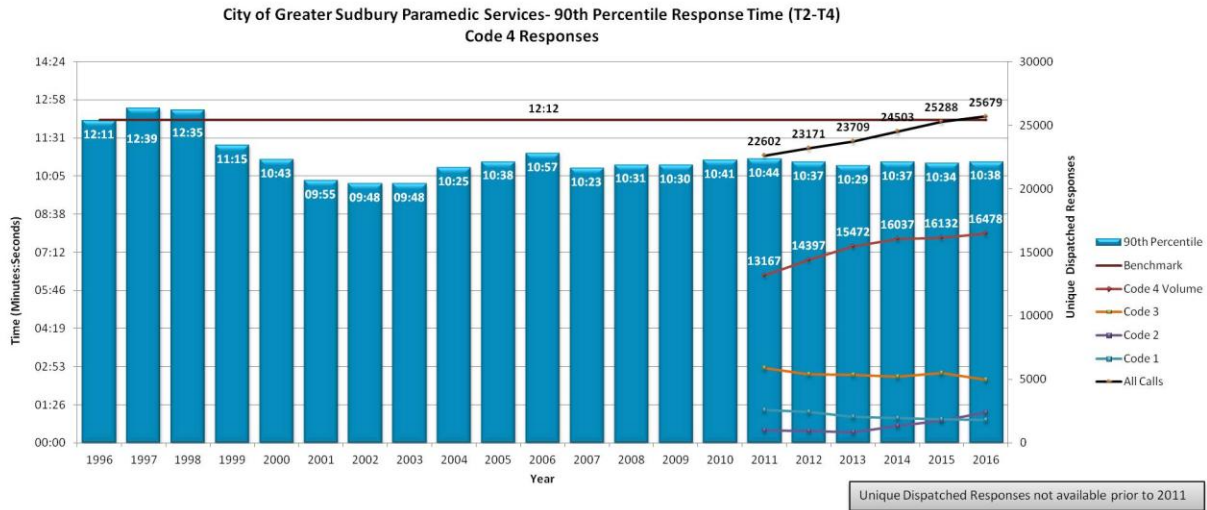
- accessibility to all persons
- integration within the greater health-care system
- seamlessness across municipal boundaries (nearest ambulance to respond to emergencies)
- accountability both financially and for the quality of service
- responsiveness to change (demographic change, advanced technology and other).

In 1999, the IBI Group was commissioned by the City to assess the current state of the land ambulance service and provide analysis on service delivery issues that would assist Council in making decisions on the future delivery model. These reports identified an ambulance service that was ministry funded and privately operated on behalf of the MOHLTC, but under resourced in terms of budget, stations, vehicles and staff.

Pre-amalgamation, the ambulance service system in Sudbury was considered a level-of-effort model that was focused on managing the financial bottom line. The Service used 14 ambulances to deliver service from one main four-vehicle station on Falconbridge Road, with two paramedic posts in the City on Notre Dame Avenue and Kelly Lake Road, and with satellite reporting stations in Valley East, Chelmsford and Lively. Vehicle deployment amounted to approximately 53,664 hours a year.

One of the beneficial projects the Service at the time was involved in was the Ontario Advanced Life Support Study (OPALS). OPALS was a research project focused on investigating the benefits of fully-trained Advanced Life Support Paramedics in 20 municipalities across Ontario. This study provided the opportunity to train 22 Sudbury Primary Care Paramedics to the Advanced Care Level.

Prior to assumption in 2000, the service was not meeting certain response time targets and was at risk of being removed from the OPALS research project. Additionally, the service was not meeting the legislated 1996, 90th percentile Code 4 (emergency) response time of 12 minutes and 12 seconds. The following table details historical yearly 90th percentile response times.



In an attempt to improve response times, paramedics working in the city core were required to spend their entire shift in their ambulance on stand-by in high call volume areas of the city. Under this model, crews were performing 10-12 calls per shift and rarely met the meal break provision within the Employment Standards Act. This model of deployment was unsustainable in the long term.

In the year 2000, Council made two key decisions. One was to implement a direct delivery model while the second was a commitment to transform the previous level-of-effort service to a performance-based model that:

- Delivers clinical excellence, response time reliability, economic efficiency and customer satisfaction;
- Monitors, measures and ensures accountability for pre-defined standards of care and response times;
- Is designed in a way that will provide paramedics with a working environment conducive to professional career development and employment stability;
- Is delivered by one provider to achieve a high-quality, reasonably-priced land ambulance service; and
- Creates a system where the dispatch function is integrated with the land ambulance service operation.

Although the provincial government created a new service relationship for ambulance services on a 50/50 grant cost sharing basis with the municipality, the MOHLTC maintained full control of the provincial ambulance dispatch system in an attempt to ensure ambulance services continued to be delivered in accordance with the ministry's established fundamental principles.

Since assuming responsibility for the delivery of ambulances services on December 3, 2000, Paramedic Services has been engaged in a continual process of quality improvements using evidence-based decision-making to evolve the service to a performance-based delivery model addressing all aspects of the service with consideration to service outcomes, risks and cost.

Some improvements are a result of legislative requirements, while many others are focused on quality outcomes, accountability, the specification of expected results measured against pre-determined standards or response times, economic efficiency, and patient outcomes, including patient satisfaction as key tenants of a performance-based service model.

Paramedic Services Legislation

Ambulance (Paramedic) Services in the Province of Ontario are governed by a multitude of legislation with the pre-eminent document being the Ontario Ambulance Act. Within the section entitled Responsibilities of Upper-Tier Municipalities it is stated;

6. (1) Every upper-tier municipality shall,

(a) except as otherwise provided by regulation, be responsible for all costs associated with the provision of land ambulance services in the municipality, subject to any grant made to the municipality under subsection 4 (3); and

(b) be responsible for ensuring the proper provision of land ambulance services in the municipality in accordance with the needs of persons in the municipality. An ambulance service “includes all services provided by an ambulance service in connection with the transportation of persons by land.” Every ambulance service must have a current certificate from the Province to operate.³

In being responsible for ensuring the proper provision of ambulance service in accordance with the needs of the persons within the municipality, it is clear that the Province expects each municipality to determine their own levels of service. While it is the municipality that sets the levels of service, other legislation governs who a municipality can hire, what qualifications they must have, what skills they can use, what equipment is carried and what vehicles are certified for use in the province.

From an optimization perspective it must be understood that any optimized Paramedic Service would continue to abide by all legislative requirements. The following provides a brief description of some of the more pertinent pieces of legislation.

The Ambulance Act

The MOHLTC provides provincial oversight through its authority established under the Ambulance Act and Regulations. The Ambulance Act provides the overall legislative framework in which governs the delivery of Paramedic Services (land ambulance) in Ontario. The Ambulance Act grants the Director of Emergency Health Services the authority to establish minimum standards governing the delivery of ambulance services. These key minimum standards include Patient Care, Vehicle design, Documentation, Communicable Disease, Equipment, Patient Care and Transportations, and Land Ambulance Certification Process.

³ Ambulance Act, Part 3

Ontario Regulation 257/00

This regulation made under the authority of the Ontario Ambulance Act covers specific legislative requirements on the following issues: Certification of ambulance operators, Qualifications of paramedics and re-qualifying exams for paramedics, standards of patient care and documentation, operations of ambulance services, obligations of communications centres, base hospitals and land ambulance services funded by the province, Response Time Performance Plans, and lists of controlled acts permitted by primary, advanced and critical care paramedics.

Ontario Regulation 129/99

This regulation, made under the authority of the Ontario Ambulance Act, provides the legislative framework and process in which municipalities can recover and shall apportion costs for the delivery of land ambulance services amongst two or more municipalities. In addition the process to establish cross border costs.

Ambulance Services Collective Bargaining Act

The above act sets out the legislative framework to ensure the continuation of essential ambulance services in the event of a strike by ambulance workers.

In addition to the Ambulance Act, regulations and provincial standards there are several other pieces of legislation that impact the delivery of paramedic services. These include, but are not limited to:

- Personal Health Information Protection Act
- Health Care Consent Act
- Child and Family Service Act
- Coroner's Act
- Health Protection and Promotion Act
- Highway Traffic Act
- Mental Health Act
- Occupational Health and Safety Act

Staffing

Greater Sudbury Paramedic Services employs both Primary Care (PCP) and Advanced Care (ACP) Paramedics in the delivery of pre-hospital medical care. At assumption, a PCP was able to deliver symptom relief (five medications) along with semi-automatic defibrillation. Over the last 10 years, the scope of practice has dramatically increased adding nine additional medications, and 10 new delegated acts. The ACP has also increased their scope with the addition of six new drugs and an additional 10 new medical directives. In support of the services delivered by the paramedics, equipment vehicle technicians (EVT) aid in the delivery of emergency care through a variety of methods including inspecting, stocking, decontaminating and disinfecting ambulances with the goal of allowing the paramedics to get out into areas of high call volume in the most effective manner possible.

Primary Care Paramedic (PCP)

A Primary Care Paramedic (PCP) is a graduate of a two-year community college paramedic program that meets the criteria to challenge the MOHLTC Advanced Emergency Medical Care Assistant (A-EMCA) exam. Upon successful passage of the A-EMCA, a person is able to obtain employment as a PCP with a certified service in Ontario. Once hired by a Paramedic Service, the PCP must also successfully certify with the Regional Base Hospital Medical Director in order to perform a number of delegated medical acts used by the respective service. A detailed review of medications delivered and skills performed is found within (See Appendix #T2).

Each PCP must also successfully complete many mandatory and elective continuing medical education courses on an annual basis to maintain their qualifications and certifications under the regional base hospital program.

Advanced Care Paramedic (ACP)

An Advanced Care Paramedic (ACP) will have had 2 years of training to become a PCP before spending an additional year of schooling to progress to the advanced care level. The ACP course is highly intensive and upon successfully completing the college portion the potential ACP must successfully complete a provincial exam administered by the MOHLTC. Once employed with a certified ambulance service the ACP must then successfully be certified by the Regional Base Hospital Medical Director. A detailed review of medications delivered and skills performed is found within (See Appendix #T3).

Each ACP must also successfully complete many mandatory and elective continuing medical education courses on an annual basis to maintain their qualifications and certifications.

In terms of continuous system improvements it is important to note that in many cases components have been modified several times to address specific system needs and challenges that have developed over the last 17 years. At assumption in December 2000, Paramedic Services began with 59 full-time staff (37 PCP, 22 ACP) in the delivery of 76,272 vehicle service hours annually. Over the years there have been incremental increases in staffing that align with vehicle service hour increases which were needed due to increasing call response volumes. The following table demonstrates an overall staffing increase of 66% from 2000 to 2016.

	2000			2017			2000-2017
Classification	Full-Time	Part-Time	Total	Full-Time	Part-Time	Total	% Increase
Primary Care Paramedic (PCP)	37	27	64	47	37	84	31 %
Advanced Care Paramedic (ACP)	22	0	22	50	9	59	168 %
SUB TOTAL:	59	27	86	97	46	143	66 %

Paramedic Services is a 24-hour-a-day, 365-day-a-year operation that uses a variety of staffing and schedule profiles including seven, eight, and 12-hour shifts to ensure appropriate staffing coverage requirements. This scheduling is currently shared between a Senior Payroll and Finance Clerk and the Paramedic Services Platoon Superintendent. These two roles are responsible to manage a schedule that is under constant change by the hour due to absences occurring from paramedics, logistics, training, professional standards and management staff. The Senior Payroll and Finance Clerk core function is not scheduling, but the contribution of over 20% of their time assisting with the scheduling needs of the Service places a strain on their ability to ensure all payroll and other financial matters are handled in an efficient manner. This position is currently responsible to schedule starting the one week ahead and out to a three-month period. The reality of the strain on this position often means that the schedule is only complete to 3-4 weeks out because of other job pressures.

The Platoon Superintendent is responsible for covering open shifts from the current day to seven days in advance. Handling over 300 time-off requests and in excess of 750 shift changes each year places strain on a position that again does not have scheduling as a true priority. Each time off request, shift change, or other scheduling requirement involves a significant number of steps to ensure that correct scheduling is completed in compliance with collective agreement requirements and corporate policy. The Platoon Superintendent often requires many hours to be spent in the office addressing scheduling requirements and reporting, at times making close to 100 calls to find replacement staff.

The previous table also demonstrates a significant increase in ACPs to meet demands. Upon assumption the service goal was to grow the number of ACPs in order to ensure an ACP was able to respond to every call. Throughout the years, different deployment models sought to ensure appropriate ACP response. Even though the closest available ambulance is always dispatched, the service deployment plan dictates a mandatory ACP response to those calls with an increased potential for serious illness and injury (for example cardiac arrest and penetrating trauma). So while the closest ambulance would always be dispatched per MOHLTC legislation, the closest ACP vehicle (if the initial unit was not an ACP unit) would also be sent in cases where their skill set has shown to help improve patient outcome.

Equipment Vehicle Technician (EVT)

Equipment Vehicle Technicians (EVT) are vital to the logistical support of Paramedic Services ensuring all vehicles and medical equipment are cleaned, sanitized, inspected and restocked in accordance with provincial legislation, regulations, standards and service policy. EVTs prepare a minimum of 16 vehicles with accompanying sets of medical equipment for deployment every 24 hours. EVTs manage a significant inventory of medical equipment including ambulance stretchers, immobilization equipment, cardiac defibrillators, oxygen equipment and laptops, in addition to a significant inventory of drugs and disposable medical supplies. They are trained and certified to carry out preventative maintenance and repairs on power stretchers and power load systems as well as specialized oxygen delivery equipment. Additionally, EVTs transport paramedic vehicles to and from the Lorne Street Depot for preventative maintenance and unscheduled repairs several times each shift.

Working shifts 24-hours a day and 365 days a year, EVTs respond with the service's Emergency Support Unit and Remote Paramedic Response Unit (Argo/Gator) to calls in remote areas, transporting paramedics and equipment to remote accident scenes, and back to the waiting ambulance. Finally, EVTs have been trained and licensed to drive the city's Mobile Command Unit which responds to incident scenes when requested by Police, Fire, Emergency Management and Paramedic Services.

Stations

To effectively deliver paramedic services with response time reliability across such a large municipality, there has been an increase in stations from the original four stations and two posts in 2000, to the current 11. These stations are comprised of three distinct types of configurations. One central start station, Paramedic Headquarters, is located in Azilda. There are also five posts which are located in the former City of Sudbury within former fire stations (Long Lake, Van Horne, Leon, Minnow Lake and Garson) where call volumes are higher. Lastly, there are five satellite reporting stations located in the suburban communities of Levack, Chelmsford, Walden, Val Therese and Capreol.

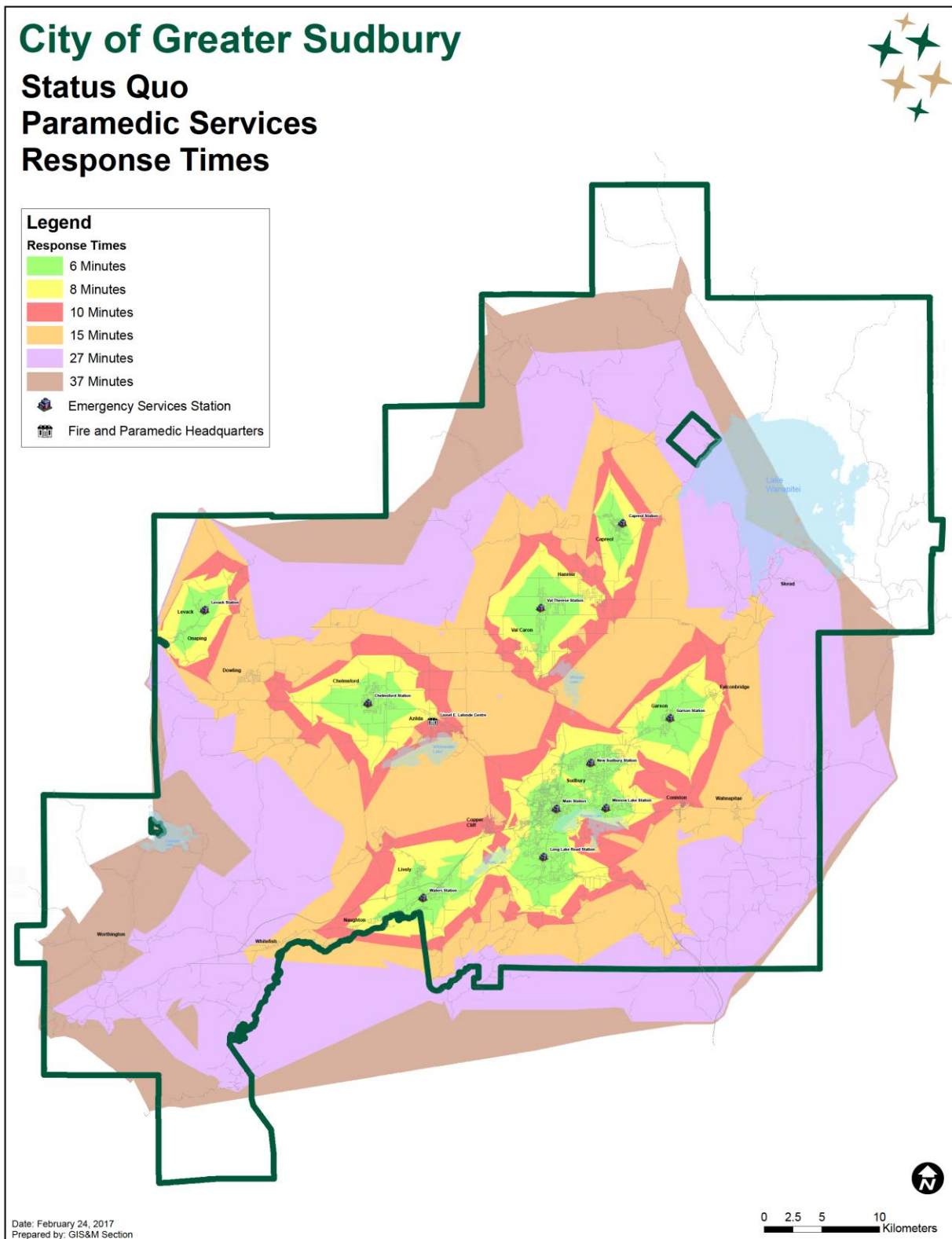
At assumption of Paramedic Services, the decision was made to co-habitate in existing fire stations in the city core along with some appropriate suburban stations (Levack, Walden and Val Therese) as a measure of economic efficiency. The paramedic stations in Chelmsford and Capreol started as, and have remained, as dedicated stand-alone paramedic stations.

An analysis completed in 2000, at the time of assumption, identified significant challenges with co-habitation which included:

- lack of sufficient space for paramedic vehicles in some stations,
- lack of proper male/female bathrooms,
- undesirable placement of common lounge/kitchen areas adjacent to sleeping quarters resulting in tension within the varied workforce,
- lack of private office space for paramedics to complete confidential paperwork.

Most of the stations lack the physical size and configuration required to properly support the number of fire and paramedic staff and vehicles needed to be located in each station. When a station lacks personal crew space and parking for vehicles, there is a resultant impact upon the ability to effectively deploy resources, which in turn can have a negative impact upon service within the community.

The current station locations are depicted on the following map with response time radiuses shown in varying colours dependent on time.



Headquarters Central Start Station Location

In the central start Headquarters station (HQ), all oncoming paramedic crews report to a vehicle that has been cleaned and fully equipped by the EVT's. The use of these specialized logistical staff decreases the need for paramedics (at higher hourly wage rates) to stock or clean the vehicles. This system drastically decreases the number of unit hours that are lost to these functions, which in turn increases the number of hours deployed in service to the emergency needs of the community. Single start stations are a best practice for many larger or busy urbanized paramedic services in Ontario providing effective deployment of paramedics and more efficiently managing large inventories of vehicles and medical equipment.

Paramedic Posts

A post is an existing Emergency Service Station that paramedics use to take breaks and meals when not performing emergency calls throughout the duty shift. Paramedics do not start or end their shift in these locations. Paramedic posts are supported by the HQ and are located in the old city at Long Lake, Van Horne, Leon, Minnow Lake and the Garson Emergency Service Stations. Many of these stations are well located for Paramedic Service delivery however they are old and in poor condition. As noted previously, they were also not originally designed to support both Fire and Paramedic services in terms of the numbers of staff and vehicles.

In 2004, an investment of \$200,000 was made to develop dedicated paramedic space to address the lack of staff space in the four career Fire stations (Long Lake, Van Horne, Leon and Minnow Lake) within the city. Then, in late 2016 some changes to Fire vehicle locations and configurations provided an opportunity, for the first time, to assign dedicated parking for two ambulances, an increase of just one space inside the downtown Van Horne station. Despite ongoing efforts by the Fire and Paramedic Services senior management team, the location, physical size and station design continue to be significant barriers to a more flexible vehicle deployment and harmonious station environment for staff.

Satellite Reporting Stations

Paramedic Services utilizes five reporting stations in lower call volume areas of the city. Paramedics report directly to these stations where they start their shift by advising dispatch while taking charge of a vehicle and equipment. In this model, paramedic crews are responsible to stock and clean their own ambulances at their home station. They are afforded this opportunity by the lack of needing to deploy to a post location and by the decreased number of calls for service. Three of the five reporting stations are staffed with a PCP/ACP crew configuration and are located in Chelmsford, Walden and Valley East. The remaining two stations house Paramedic Response Units (PRU) typically staffed with a single Advanced Care Paramedic. These stations are located in Levack and Capreol.

Vehicles

Since the year 2000, Paramedic Services has grown its fleet to 38 vehicles which allows for the proper support in the delivery of Paramedics Services. The breakdown of these vehicles includes 23 primary response ambulances and eight Paramedic Response Units (PRU). In addition, Paramedic Services deploys, on a need basis, an Emergency Support Vehicle, a Remote Paramedic Response Unit (Argo/Gator) and trailer for remote/off-road response, a Multi-Casualty Incident trailer, three Command Emergency Response Vehicles, a Mobile Command Unit (tractor-trailer unit) and an administration vehicle.

The service originally used ambulances both in a van single stretcher configuration (Type II) and a modular box design (Type III) with two stretchers. The ambulance fleet has since been standardized to Demers Type III modular box type ambulances with a single power stretcher-power load capability and mobility seating within patient compartment to maximize safety for the paramedics. All equipment and supplies are stored in a standardized fashion which streamlines vehicle checks, restocking and cleaning processes. Paramedics are able to quickly locate needed supplies and equipment to render care regardless of which of the 23 ambulances they deploy from.



Paramedic Response Units (PRU) are single paramedic cars or sport utility vehicles designed to provide rapid response and medical intervention in the treatment and stabilization of patients until a transport ambulance can arrive. Deploying a PRU is 50% less expensive than a traditional ambulance. The City of Greater Sudbury was one of the very first municipalities in Ontario to utilize a PRU model as part of normal service delivery. To address poor response time performance in Levack and Capreol, a

PRU deployment model was established in both of these communities staffed with Advanced Care Paramedics. This move brought an advanced level of patient care to the more peripheral areas of the City, resulting in immediate response time improvements in these areas. Finally, the PRU model enables the ability to maintain a paramedic response capacity in times of extreme call volume as PRUs do not transport patients.

Over the years there have been changes in both the number and deployment of PRUs. Up until 2011, three PRUs were utilized on both day and night shifts in the city core. This was being done to ensure the limited number of service ACPs were getting to those calls that required that level of care. Paramedics on the City PRUs raised concerns that they were spending a large amount of time driving around the city but not performing much significant patient care as they were being used to balance coverage within the city. The data also indicated that advanced procedures employed by the PRU ACP were not being utilized until a transport crew arrived on scene to assist. Because of these factors, there has been a gradual decrease in the number of PRUs deployed in the city in favour of an increase in transport capable ambulances. In 2012, data revealed 1.35 vehicles were responding per call on average, however, after elimination of City PRUs in 2016, the data showed a more optimized model of 1.075 vehicles per call on average which is 22.6% improvement in efficiency from 2012. It should be noted, however, that PRUs are still used from time to time within the City core to address staffing shortages due to illness or operational issues.

Service Levels and Community Risk

Deployment

Paramedic Services has developed and implemented a dynamic deployment model that has seen constant changes and improvements over the past 17 years. This regular review has helped in optimizing the use of the City's paramedics based on the ever evolving needs of the community. A dynamic deployment model moves vehicles to various posts or stations dependent on overall community busyness. The objectives for employing a dynamic deployment strategy is to balance emergency coverage so as to reduce the drive time and the emergency driving distance and to shorten patient wait times. These objectives translate to values in improving safety, response and patient satisfaction within the limited financial and resource constraints of the service.

In 2003, the City of Greater Sudbury was one of a few services in Ontario that had developed a dedicated System Status Plan (SSP). The goal of this service directed deployment plan was to provide direction and guidance to the MOHLTC Central Ambulance Communications Centre (CACC) on the City's expectations in utilizing its resources while maximizing service effectiveness in responding to the core business of emergency medical response.

Greater Sudbury Paramedic Services deploys 240 hours of ambulance coverage, and 48 hours of PRU coverage every day across the City as a whole in order to respond effectively. Vehicle start times are staggered to maintain a sufficient number of available vehicles in the City core in order to respond to calls during both morning and evening shift change periods. The following chart details the actual vehicle locations, shift times, level of care and primary code utilization.

Greater Sudbury Emergency Services Resource Allocation Monday to Sunday				
Station Assignment	DAY Shift Time	NIGHT Shift Time	Level of Care	Primary Utilization*
HQ	05:30 - 17:30		PCP/ACP	CODE 1, 2, 3, 4, 8
HQ	06:00 - 18:00	18:00 - 06:00	PCP/ACP	CODE 1, 2, 3, 4, 8
HQ	06:30 - 18:30	18:30 - 06:30	PCP/ACP	CODE 1, 2, 3, 4, 8
HQ	06:30 - 18:30		PCP/ACP	CODE 1, 2, 3, 4, 8
HQ	07:00 - 19:00	19:00 - 07:00	PCP/ACP	CODE 1, 2, 3, 4, 8
HQ	07:00 - 19:00	19:00 - 07:00	PCP/ACP	CODE 1, 2, 3, 4, 8
HQ	07:30 - 19:30	19:30 - 07:30	PCP/ACP	CODE 1, 2, 3, 4, 8
HQ	07:30 - 19:30		PCP/ACP	Code 1, 2, 3, 4, 8
HQ	14:00 - 02:00		PCP/ACP	CODE 1, 2, 3, 4, 8
LEVACK	07:00 - 19:00	19:00 - 07:00	ACP (PRU)	CODE 3, 4, 8
CHELMSFORD	06:30 - 18:30	18:30 - 06:30	ACP	CODE 3, 4, 8
VALLEY EAST	06:00 - 18:00	18:00 - 06:00	ACP	CODE 3, 4, 8
CAPREOL	07:00 - 19:00	19:00 - 07:00	ACP (PRU)	CODE 3, 4, 8
WALDEN	07:30 - 19:30	19:30 - 07:30	ACP	CODE 3, 4, 8

* Primary Utilization Call Definitions:

- Code 4 (Urgent – life-threatening) or lights and sirens responses
- Code 3 (Prompt – non-life threatening)
- Code 2 (Non-urgent Transfer for Scheduled Appointment)
- Code 1 (Non-urgent Transfer)
- Code 8 (Standby coverage for a police or fire incident, or to provide emergency coverage)

System Status (Deployment) Plan

There have been and continues to be numerous issues impacting upon service performance at any given time. Issues such as patient demographics, call volumes, the one-site hospital, ambulance off load delays, centralized health care to HUB hospitals (Health Sciences North), airport call volumes and paramedic wellness are just a few of the issues that require an evaluation of the System Status Plan (SSP) on an annual basis. The dynamic deployment model presented within the SSP has seen constant change and refinement over the past 17 years. Annual evaluations review patient and call data from various perspectives including patient demographics, call volumes, response times, vehicle utilization, current service issues and trends. Then, working directly with dispatch staff and in consultation with the paramedics, service gaps are identified and recommendations for positive change are made. Often these recommendations will result in short pilot projects aimed at testing new strategies. The deployment model is regularly monitored for improvements and any adjustments made to optimize outcomes. Over the years many changes have occurred including:

- alteration of shift start times to better align with peak call volume,
- shift changes to improve second meal break compliance,
- elimination of PRUs as part of the normal city deployment in favour of increased transport capability for both day and night shift,
- reduction in vehicle availability for non-urgent transportation which allows for the diversion of resources to emergency response.

Some additional changes have resulted in improved working conditions for the paramedics as part of the City's focus on employee wellness. These alterations aim to improve end of shift strategies to reduce/control shift extension getting crews home on time, maintain improved meal break compliance rate that was 93% compliant in 2016 and eliminate standby on street corners.

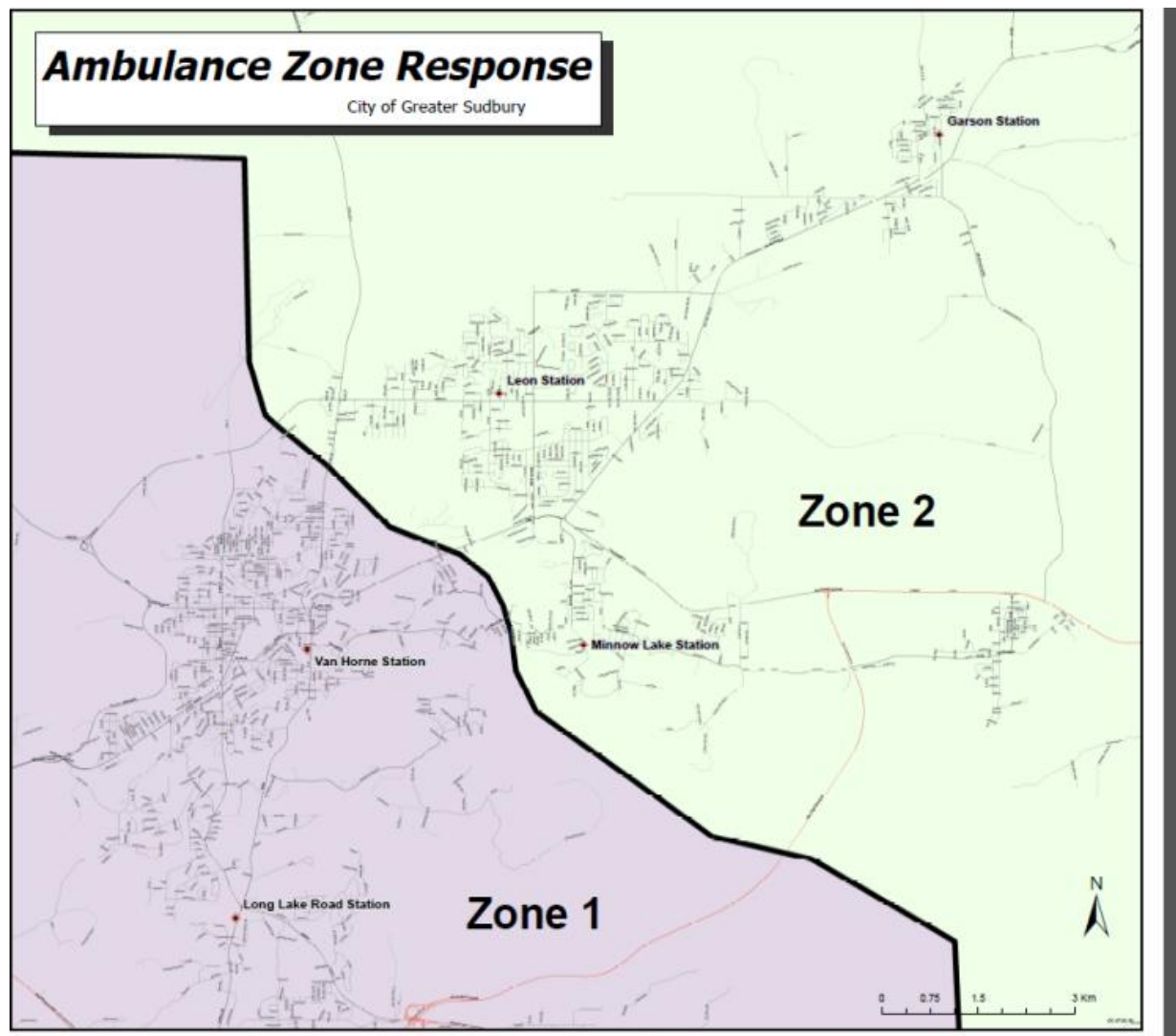
It is important to note that through service system improvement evaluations Paramedic Services remains focused on response time reliability, impact on patient outcomes and staff wellness. Most recently, last July Council supported an increase in vehicle service hours by 32 hours every weekend to better align with call volumes during those timeframes. In the past, having fewer ambulances on weekends reflected a time with lower emergency call volumes and less inter-facility transfers. Over the last few years, the number of calls on weekends is no longer significantly less than that of weekdays.

Balanced Emergency Coverage (BEC)

When a transporting unit from a reporting station has been assigned to a call, the Ambulance Communication Officer will assign the next available transport resource to the affected area to provide balanced emergency coverage (BEC). The stations are to be covered in the following order:

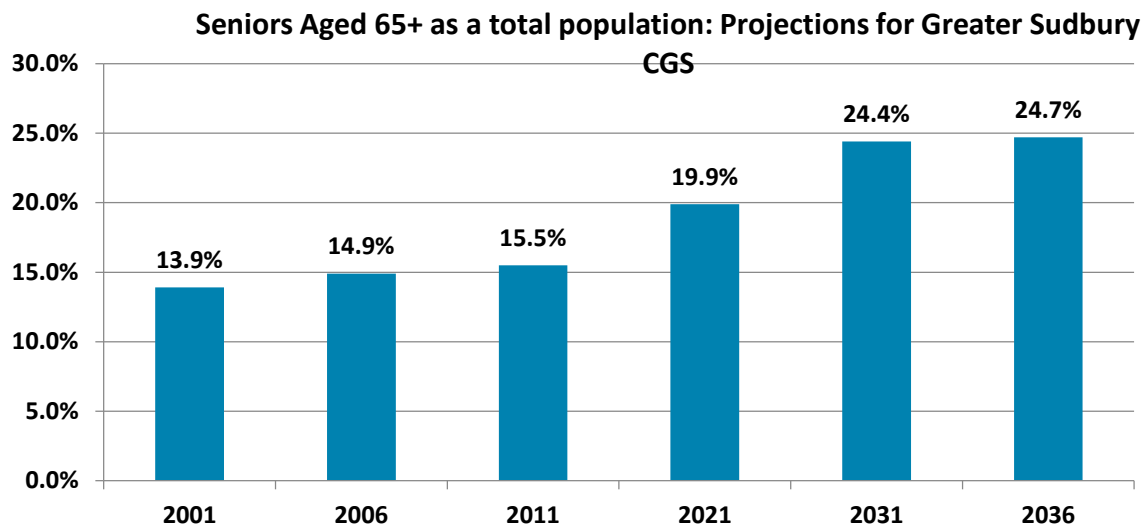
1. Walden Station
2. Valley Station
3. Chelmsford Station

In balancing emergency coverage within the City core, two response zones have been created. As depicted in the map below the zones separate the city on the basis of operational busyness. In Zone 1, there are two paramedic posts (Van Horne and Long Lake), while in Zone 2 there are three Posts (Leon, Minnow Lake and Garson). To balance response and centrally locate resources, the primary coverage station in Zone 1 is Van Horne while in Zone 2 the primary zone coverage station is Leon.



Call Volume

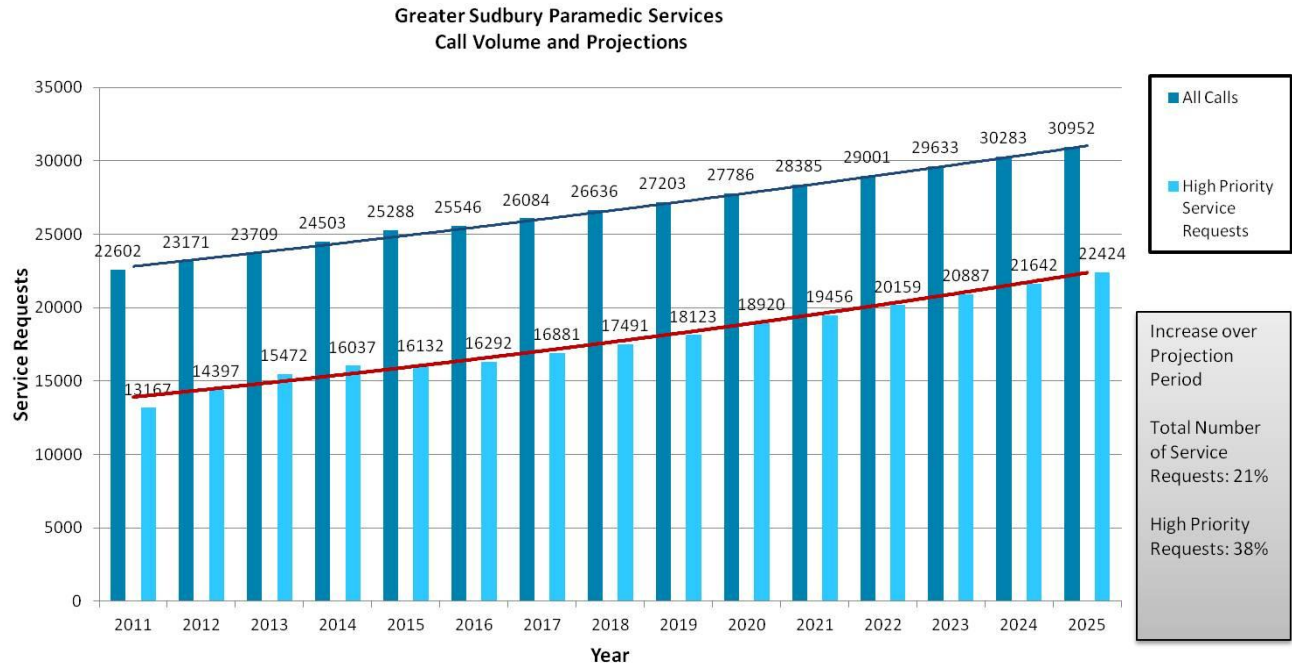
A key driver of ambulance call volume is the aging demographic. Baby boomers born in the post World War II era of 1946 to 1964 make up a large number of the population and are now between 53 and 70 years of age. The following chart details the percentage of seniors aged 65 or older within the city on a historic and predicted future basis.



2001-2006 Projections Source: Natural Increase Scenario (Community & Strategic Planning Section, March 2003)

Research suggests that nearly one-third of a person's lifetime health-care expenditure is incurred during middle age, and nearly half is incurred during the senior years. Greater Sudbury's aging population is becoming a larger share of its total population, so it is reasonable to anticipate increased call volumes in future years.

The following Call Volume and Projection Chart depicts the actual call volume by high priority (Code 3 and 4) and all calls (Code 1 to 4) from 2011 through to 2016. Projections for 2017 through to 2025 based upon historical call volume are also included.



The projected call volumes would suggest high priority call volumes to increase by 37%, while all calls will increase by 20%. In consideration of these call volumes, there exists an opportunity to improve through the Optimization process as well as through work with the MOHLTC and other stakeholders to reduce non-urgent call volumes which will be detailed later in this report.

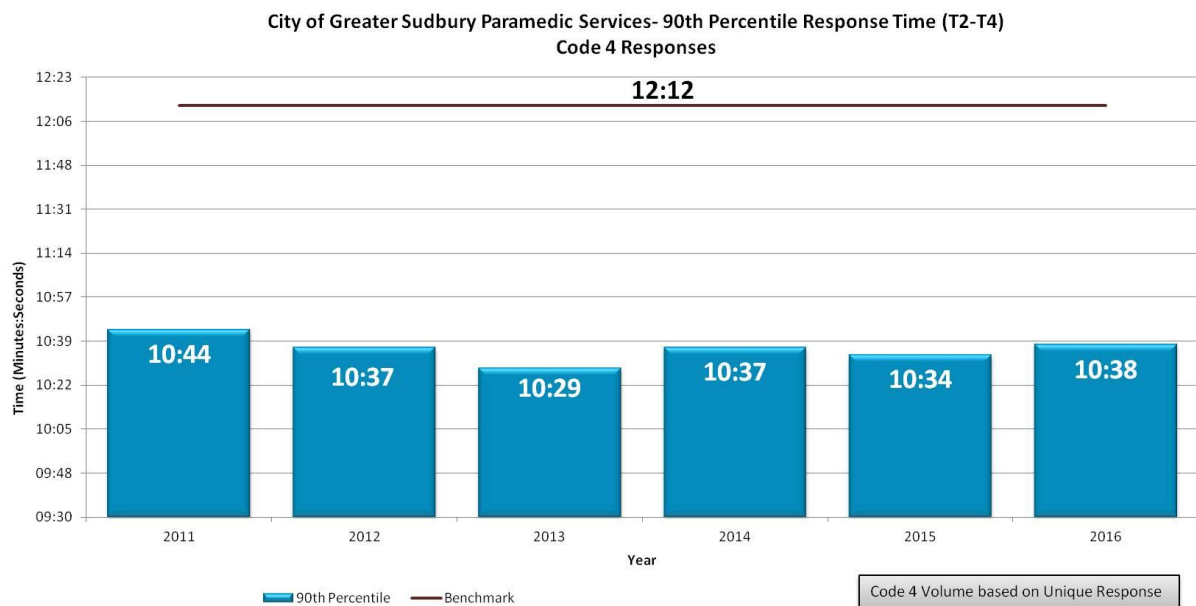
Managing Paramedic Service Community Risks

Since the year 2000, it is apparent that Paramedic Services has been on a continual path towards Optimization. Managing risk and service levels has been a focus as the delivery of emergency pre-hospital medical care is inherently a high risk public service. Most of the significant risks relate to response time reliability, appropriate patient care, and patient safety. As a highly legislated industry, Paramedic Services must be part of managing and mitigating risk through a variety of manners. The establishment of a Response Time Standard is one way in which the MOHLTC manages risk with the over 50 different municipal based systems operating individual services. Additionally, the MOHLTC maintenance of a Base Hospital Program ensures that Paramedic Services adhere to current medically evidenced standards. Dovetailing with the Base Hospital program, Greater Sudbury Paramedic Services maintains an active Quality Assurance program that evaluates all aspects in the delivery of service. Lastly, the Land Ambulance Certification Standard sets in part the standard to which services must operate. The MOHLTC as part of this responsibility has maintained control over licensure of Paramedic Services within the province through this standard and accompanying Ambulance Service Review process.

Response Time Standard

An important measure of a performance-based ambulance service is response time reliability. Lengthy response times for specific call types can have a greatly negative impact on patient outcome and mortality, length of hospital stay and long term recovery. There is however growing evidence that suggests the correlation between response times and patient outcomes is not as strong as once thought and that only a small subset of call types truly benefit from quick response times such as cardiac arrest and certain CTAS 1 calls.

The legislated response time requirement until 2013 required ambulance services to meet the 90th percentile code 4 (dispatched as life threatening) response time established in 1996 for that jurisdiction. Although this measure is no longer a legislated performance metric, many services continue to monitor this measure as a demonstration of response time reliability. The following chart demonstrates the response time reliability being achieved by paramedics across the City of Greater Sudbury. It reveals that response times have remained relatively stable over the last six years, with an average 90th percentile emergency response time of 10 minutes 38 seconds.



Commencing January 2013 the legislation was changed to reflect the newly developed Response Time Standards (RTS). The Ambulance Act mandates that every service provider in Ontario must prepare and submit an annual performance plan targeting response times for their respective service area by October 31st of each year. Furthermore, each service provider must submit the actual performance on their previous years plan by March 31st of the following year. It should be noted that each year the MOHLTC posts the results of every land ambulance service provider RTS Performance Plan publicly on the Ministry's website.

The Response Time Standard (RTS), through a retrospective analysis, measures response times according to how sick the patient was at time of paramedic arrival to the patient. The Regulation also sets out multiple response time targets based on medically relevant categories. These categories use the

Canadian Triage Acuity Scale (CTAS), a standardized triage tool used by all paramedics, nurses and doctors within the emergency field across Canada.

From a process perspective, the paramedic assesses a patient once on scene and then assigns a CTAS level using a five-level scale with Level 1 (Resuscitation) representing the “sickest” patients, and with Level 5 (Non-urgent) representing the least ill group of patients. paramedics assign a CTAS level to patients to more accurately define the patient’s need for care primarily based on the optimal time to medical intervention. The five levels are:

CTAS Level 1: Resuscitation

CTAS Level 2: Emergent

CTAS Level 3: Urgent

CTAS Level 4: Less Urgent

CTAS Level 5: Non Urgent

The legislation allows the services to build their own response time performance plans using the specific reportable call criteria as outlined within the Regulation. The following are the key criteria found in a response time performance plan:

1. The percentage of the time that a person equipped to provide any type of defibrillation has arrived on-scene to provide defibrillation to **sudden cardiac arrest patients within six minutes** of the time notice is received. Note, this is a community response – any bystander, emergency responder or paramedic with a defibrillator will count within this criterion.
2. The percentage of the time that a paramedic has arrived on-scene to provide medical care to a sudden cardiac arrest patient or other patient categorized as **CTAS 1 within eight minutes** of the time notice is received.
3. The percentage of the time that an ambulance crew has arrived on-scene to provide ambulance services to a patient categorized as **CTAS 2, 3, 4, and 5 within the response time targets set by the upper-tier municipality.**

Greater Sudbury City Council approved Paramedic Services Response Time Performance Plan in October 2013. This plan has not been amended since the start and sets out the following response time criteria:

Level of Acuity	Time	Percentile % (Set by Council)
Sudden Cardiac Arrest	6 minutes (Set by MOHLTC)	70%
CTAS 1	8 minutes (Set by MOHLTC)	80%
CTAS 2	10 minutes (Set by Council)	85%
CTAS 3 , 4, and 5	15 minutes (Set by Council)	85%

Since inception of the new standard, Paramedic Services has recommended aggressive response times to Council as a measure to improve system performance. In setting the recommended times, past response time performance was reviewed and the standard was set above the previous performance levels in an effort push the system towards better performance. The following table is an image of the posted yearly data on the MOHLTC website.

2013 Response Time Standard			
	Plan in Minutes	Plan in Percentage	Performance in Percentage Submitted March 31, 2014
SCA	6	70%	67.0%
CTAS 1	8	80%	73.0%
CTAS 2	10	85%	87.0%
CTAS 3	15	85%	97.0%
CTAS 4	15	85%	97.0%
STAS 5	15	85%	97.0%

2014 Response Time Standard			
	Plan in Minutes	Plan in Percentage	Performance in Percentage Submitted March 31, 2015
SCA	6	70%	65.0%
CTAS 1	8	80%	80.0%
CTAS 2	10	85%	86.0%
CTAS 3	15	85%	97.0%
CTAS 4	15	85%	98.0%
STAS 5	15	85%	97.0%

2015 Response Time Standard			
	Plan in Minutes	Plan in Percentage	Performance in Percentage Submitted March 31, 2016
SCA	6	70%	73.0%
CTAS 1	8	80%	81.0%
CTAS 2	10	85%	86.0%
CTAS 3	15	85%	97.0%
CTAS 4	15	85%	98.0%
STAS 5	15	85%	97.0%

2016 Response Time Standard			
	Plan in Minutes	Plan in Percentage	Performance in Percentage
SCA	6	70%	Due March 31,2017
CTAS 1	8	80%	
CTAS 2	10	85%	
CTAS 3	15	85%	
CTAS 4	15	85%	
STAS 5	15	85%	

Response Time Reliability

Response time reliability in meeting Council approved legislated Response Time Performance Plans is important to ensure response to high acuity calls to maintain the public confidence. For the Optimization project, a review of the three most time sensitive patient category calls was performed. A comparative analysis was completed based on actual 2015 response time performance against the other 52 paramedic services in Ontario. Greater Sudbury Paramedic Service's positioning further points to a system that is operating at a very high level.

Sudden Cardiac Arrest

The benchmark for Sudden Cardiac Arrest established in 2015 was 70% with the actual percentage achieved in 2015 of 73%. Sudden Cardiac Arrest responses account for less than 1% of all calls. This small volume (122 calls) means a small number of responses in excess of the six minutes can have a significant impact on the plan's results and can produce wide fluctuations in response time performance year over year. As noted previously, the Sudden Cardiac Arrest response time is not a direct reflection of just the Paramedic Service, but rather a community response as anyone with a defibrillator can stop the clock. Response times are measured from the time the paramedic crew is notified, to arrival on scene of any first responder or bystander with a defibrillator. When measuring response times it is important to note that when responding from the station, paramedics have a legislated two-minute "chute" time in which to collect call information and become mobile, leaving really only four minutes for travel time.

Greater Sudbury's very aggressive SCA response time plan of 70% in six minutes or less ranks within the top three highest goals for municipal paramedic services in Ontario. Despite significant challenges associated with the City's vast geography, Greater Sudbury is ranked fifth best in reported actual performance for the 52 services in the Province.

2015 Response Time Standards - Sudden Cardiac Arrest

Rank	Paramedic Service	SCA < 6 min. Plan	SCA < 6 min. Actual
1	Toronto	60 %	88 %
2	Middlesex	50 %	78 %
3	Peel, Region	70 %	77 %
4	Hamilton	75 %	75 %
5	Greater Sudbury	70 %	73 %
6	Thunder Bay	50 %	72 %
7	Halton, Region	55 %	71 %
8	York, Region	60 %	66 %
9	Durham, Region	60 %	66 %
10	Ottawa	75 %	63 %

This result is even more impressive in the fact that only 65% of households are within a four (4) minute drive time of existing Emergency Services Stations. The Service continues to work with community groups to install Public Access Defibrillators (PADs) and train local residents in cardiopulmonary resuscitation and PAD use in more remote locations of the City.

CTAS 1

The benchmark established in 2015 for a CTAS 1 calls was 80% with an actual achievement of 81%. CTAS 1 calls account for less than 2% of all emergency calls. As previously noted, when responding from the station paramedics have a legislated two-minute “chute” time in which to collect call information and get mobile, in this case leaving only six (6) minutes for travel time. Paramedic response to outlying areas continues to be a challenge, with only 86% of households within a six minute drive time from our stations. The CTAS 1 category includes both Sudden Cardiac Arrests and other calls reflecting the most acutely ill or injured patients who require aggressive treatment and resuscitation by a paramedic.

Greater Sudbury’s CTAS 1 response time plan of 80% in 8 minutes or less ranks the service 2nd highest in terms of goal setting with an actual result of 81% also placing the service as second best in actual performance amongst the 52 municipal services.

2015 Response Time Standards – CTAS 1

Rank	Paramedic Service	CTAS 1 < 8 min. Plan	CTAS 1 < 8 min. Actual
1	Middlesex	50 %	83 %
2	Greater Sudbury	80 %	81 %
3	Toronto	75 %	79 %
4	York, Region	75 %	79 %
5	Thunder Bay	70 %	79 %
6	Durham, Region	75 %	78 %
7	Hamilton	75 %	78 %
8	Lambton, County	60 %	77 %
9	Niagara, Region	80 %	76 %
10	Halton, Region	75 %	76 %

CTAS 2

The benchmark established in 2015 for a CTAS 2 call was a ten (10) minute response 85% of the time. The Service met its target with an actual percentage achieved of 85%. CTAS 2 patients are acutely sick and injured; some examples are strokes, heart attacks, and closed head injuries requiring emergency transport to hospital and as in the case of CTAS 1 responses, only a paramedic can stop the clock on the ten (10) minute response for a CTAS 2 call.

In evaluating the CTAS 2 response time performance it was noted that only 36% of the 52 services established a response time of 10 minutes or less (one 8 min.) for CTAS 2 calls. With an actual CTAS 2 performance coming in at 85% Greater Sudbury is ranked 7th best in reported performance for CTAS 2 responses amongst the 52 services in the Province.

2015 Response Time Standards – CTAS 2

Rank	Paramedic Service	CTAS 1 Response Time (DDA Defined)	CTAS 1 Actual %
1	Middlesex	8 min.	75 %
2	Toronto	10 min.	90 %
3	Peel, Region	10 min.	89 %
4	Durham, Region	10 min.	88 %
5	York, Region	10 min.	87 %
6	Halton, Region	10 min.	86 %
7	Essex, County	10 min.	86 %
8	Sudbury, City	10 min.	85 %
8	Sault Ste Marie	10 min.	83 %
9	Elgin, County	10 min.	82 %
10	Hamilton/Ottawa	10 min.	81 %

When assessing service based response time performance year over year from 2013 through to 2015 there has been gradual improvement year over year in all response times.

Globally, in 2015 Greater Sudbury paramedics achieved the mandated response times amongst all CTAS levels 95% of the time or better. Paramedic Services however, continues to explore opportunities for improvement in response time performance. In the spring of 2015, a detailed review of the System Status Plan, and subsequent deployment changes, realigned resources during peak response times. These changes resulted in a reduction of double dispatching of resources and increase of one transport ambulance during peak call times. Furthermore, the Service continues to develop and monitor key performance indicators to assist and guide system improvements aimed at improving effective and efficient deployment strategies.

Base Hospital System

Paramedic Services delivers mobile emergency health care, bringing a high level of clinical training and sophisticated medical skill and capability to address a patient's illness or injury. The MOHLTC has developed both Basic Life Support and Advanced Life Support patient care standards that provide clear expectations to paramedics in the treatment of most emergency situations. Additionally, the MOHLTC has 7 Regional Base Hospitals within Ontario with Medical Directors working out of each site that are responsible for the provision of medical oversight, paramedic certification, ongoing medical education and quality assurance for all paramedics working in their catchment area. This ongoing program is designed to ensure that paramedics are delivering patient care according to standards and improving patient safety relating to the provision of pre-hospital emergency care.

Internal Quality Assurance Program

Upon assumption the service established a Quality Assurance Section outside of Operations with a single manager responsible for monitoring service compliance in regards to the legislative requirements. Over a number of years this section has commonly become known in Paramedic Services as Professional Standards and has grown in capability and scope of responsibility with four dedicated staff now in this section. Responsibilities of this section in the maintenance of appropriately high quality care include:

- Monitoring of compliance with legislation, regulations and standards pertaining to patient care,
- Supporting clinical excellence through both patient care and service level clinical audits,
- Identifying training gaps and opportunities based on patient care and service wide audits,
- Development and implementation of new clinical diversion strategies,
- Conducting of patient care and complaint investigations in support of quality outcomes,
- Conducting of quality assurance activities and promotion of clinical excellence by supporting research projects the service is involved in through various activities including participation on the service's Quality Care Committee,
- Ensuring compliance with Personal Health Information and Protection Act
- Ensuring electronic patient care records are secure from unauthorized access and stored in compliance with legislative requirements,
- Supporting paramedics in job related legal proceedings and acting as liaison between the courts and the paramedics,
- Working with legal teams and the courts to protect the city's interests and reputation,
- Oversight of Community Paramedicine and health system integration and community engagement ensuring paramedic services are integrated into the health care system.

The above key functions of the Professional Standards Group demonstrate a patient centric focus in support of clinical excellence and protection of the patients and the communities as a whole. This section is an essential component of an Optimized model.

Logistics Section

A Logistical section has been cultivated since assumption. At the heart of this group are the Equipment Vehicle Technicians (EVTs). Noted in detail earlier, the EVT position is a best practice in the industry for larger urban services. It has been demonstrated that in order to manage vehicles and equipment effectively and efficiently, the Service needs to consolidate these resources as much as possible and manage these logistical needs through a team dedicated to this type of work. To use highly paid and trained paramedics for the logistical function is not an efficient use of their skills, and reduces their availability to deliver on their core mandate of patient care.

Introducing this section at assumption with only a couple of EVT staff, over the years there has been continual improvements to the system leading to the current Logistical Section that has 6 full-time and 6 part-time staff who have developed numerous logistical processes to provide support. In 2016 the service introduced the LEAN methodology into the logistics section as a way to evaluate and optimize work process through the identification and removal of ineffective non-value added steps (waste) from work processes. Implemented very recently, LEAN has since been successfully in the realm of improvement to vehicle processing.

Land Ambulance Certification Program

The Ambulance Act states that no person shall operate an Ambulance Service unless the person holds a certificate issued by the certifying authority. The certifying authority in this case is the MOHLTC Emergency Health Services Branch. The Act further stipulates that, *"a person shall be issued a certificate by the certifying authority only if the person has successfully completed the certification process prescribed by the Regulations"*. This certification process is known as the Ambulance Service Review.

The last Ambulance Service Review, completed in 2015, found that, *"the Greater Sudbury Paramedic Services continues ongoing improvement toward ensuring delivery of high quality ambulance service"*. Also stated was that Greater Sudbury Paramedic Services meets the certification criteria and the legislated requirements and accordingly, was issued a renewed Certificate to operate an ambulance service.

The purpose of the Ambulance Service Review is to ensure Ambulance Services are operated in a manner consistent with the Land Ambulance Certification Standards and in compliance with the legislation. Services are required to successfully complete the prescribed Ambulance Service Review certification process once every three (3) years in order to maintain their certification to operate the Service. In completing the Ambulance Service Review Certification process, Services are required to meet all of the legislative quality requirements in the following areas:

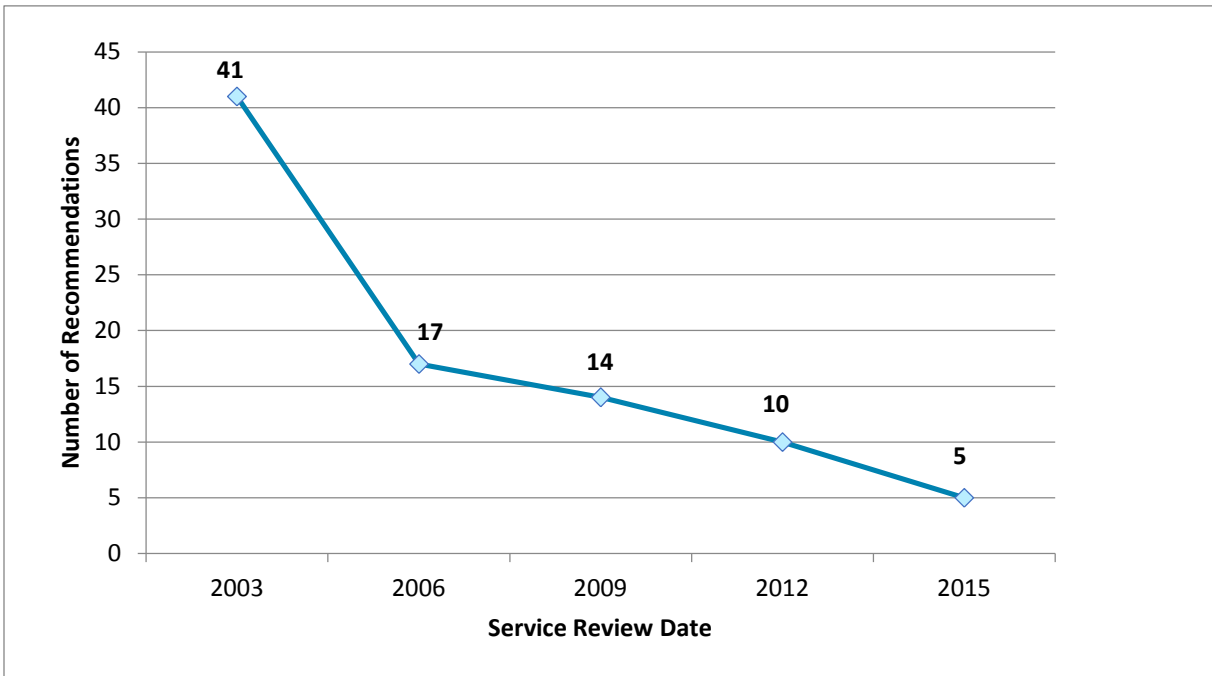
- Level of Service
- Employee Qualifications
- Staffing
- Documentation
- Training
- Service Review Program
- Patient Care
- Vehicles
- Patient Care Equipment
- Policy and Procedures
- Operations
- Liaison/Communication

From a process perspective, months in advance of the Ambulance Service Review site visit, the MOHLTC conducts a comprehensive review of the mandatory information and documents supplied by the Service. This includes background information on call volume, response times, staffing profiles, types and numbers of vehicles and station locations. In addition, several hundred random patient care records are submitted for off-site review and auditing.

During the actual site visit, over the course of two days the Ambulance Service Review team reviews all aspects of the organization. Everything from interviews with senior managers, and review of all maintenance, policy and procedure records, to peer review ride outs and vehicle inspections with paramedics occurs. The Service is then graded against legislative requirements and standards. Following the visit, the MOHLTC provides a “Draft” Ambulance Service Review - Executive Summary Report detailing the Service review findings. Within thirty days of receiving the draft report a service is to respond with an action plan that addresses the Ambulance Service Review findings. Once the Service responds with the action plan addressing the findings, an MOHLTC inspector is assigned to complete a follow-up site visit to verify that the Service action plan is being implemented in a manner satisfactory to the MOHLTC.

In the case of the last Ambulance Service Review, on November 19, 2015 the MOHLTC inspector conducted the follow-up site visit of Greater Sudbury Paramedic Services and was satisfied with the Services action plan to address the findings in the draft report. That visit concluded the most recent Ambulance Service Review.

The first Ambulance Service Review occurred in 2003, three years after assumption. Since then there has been a steady improvement in meeting the legislative standards expected by the MOHLTC as exemplified by the following chart.



While the Ambulance Service Review process is quite comprehensive it does allow for Paramedic Services to understand how they are performing against industry standards. To achieve a continual improvement with the last review detailing only 5 observations is a testament to the continual path towards Optimization in Paramedic Services.

NELHIN – Non-Urgent Patient Transportation Review and Restructuring

A review of non-urgent patient transportation (NUPT) across Northeastern Ontario began in June 2013 by the North East Local Health Integration Network (NELHIN) in response to concerns about the current system expressed by patients, hospitals and paramedic service providers. The review's objective was to develop a model of transportation that provides timely, safe and cost effective non-urgent patient transfers into and out of the four HUB hospital centres (Sudbury, North Bay, Timmins, and Sault Ste. Marie) in Northeastern Ontario, while safeguarding needed paramedic service coverage in communities across the region. The review of non-urgent patient transfers had been identified as a key project in the NELHIN's 2013-2016 Integrated Health Service Plan. Such a new operational model is intended to create two distinct delivery streams for NUPT.

1. Short Haul – Paramedic/EMS Services across the LHIN and non-EMS transfer resources (Sudbury, North Bay) will continue to deliver short haul transfers that fall within the coverage area.

2. Long Haul – Long Haul NUPT will be delivered via a route-based model with scheduled legs serviced by multi-patient vehicles. Eight routes were identified, with four of these being selected for early implementation they include:
 - Elliot Lake to Espanola to Sudbury (165 km)
 - Mindemoya to Little Current to Espanola to Sudbury (163 km)
 - Kapuskasing to Smooth Rock Falls to Timmins (166 km)
 - Cochrane to Iroquois Falls to Matheson to Timmins (224 km)

The NELHIN has secured sufficient funding to allow a limited implementation of the recommended NUPT delivery mode. Once implemented this 3rd party NUPT system will assume many long haul non-urgent patient transfers locally from HSN to other community hospitals. This model has the opportunity to reduce long distance NUPT which are currently completed by paramedic services. As noted earlier, there is a predicted disproportionate increase in emergency call volumes in comparison to non-urgent volumes. This is not due to mitigation strategies such as a NUPT system but rather due to the fact that the older population is creating a greater need for emergency response. A reduction of these non-urgent calls would thus create a resultant increase in paramedic service capacity to respond to emergency calls, furthering the path towards an optimized model.

Airport call Volume in Support of Provincial Centralized Health Care

HSN, as a hub hospital depends on the movement of patients between the Hospital and Airport to be carried out on demand, and on time in order to maximize overall health care system effectiveness. As a necessary part of a provincial health care system, inter-facility patient transfers between health care facilities must be performed. Lower acuity inter-facility patient transfers over 240 kilometres (one-way) are completed by Ontario's Provincial Air Ambulance system, Ornge Ambulance, through the utilization of third party air carriers. These air carriers do not currently have a mechanism in place to transport their patients to and from the airports and rely upon local Ambulance resources to perform this task.

The increasing emergency call volume within the city makes completion of the calls between the airport and the hospital more difficult. This challenge continues to result in negative impacts on patients, their caregivers, and the hospital, while increasing health care costs and eroding public confidence in the overall health care system. According to Ornge, the Sudbury Airport has the third highest volume of patient movement within the Province. As depicted in the chart below there is a great volume and correlating great amount of time spent on performing inter-facility transfers in support of the regional healthcare system. It must be clearly understood that most of the patients seeking care from other communities within HSN are not residents of the City of Greater Sudbury. Essentially the City is financially supporting this provincial health care transportation model on our local tax levy. The average length of time on an airport call is approximately 78 minutes.

YEAR	VOLUME	TOTAL TIME (hrs:min)
2015	1502	2016:09
2016	1356	1831:52

Paramedic Services has been seeking methods to mitigate this issue. Next steps will involve entering into discussions with the MOHLTC and Ornge to explore opportunities to service the lower acuity calls through an alternate service model. This model would have the added benefit of assisting the air carriers through a reduction of air carrier detention fees, while additionally providing a much needed timely and predictable movement of patients. The solution to this problem will require both innovation and a commitment from the MOHLTC, Ornge, and the City to come to the table to implement a successful and proactive solution that could further reduce call volumes for the service. This is yet another example of the path towards optimization currently underway in Paramedic Services.

Dispatch Transformation

Statistical call data indicates that the current dispatch triage tool (Dispatch Priority Card Index Version 2) prioritizes more than 60% of all calls dispatched as life threatening (lights and siren response) while less than 20% transported to hospital are prioritized as emergent. The MOHLTC is undertaking transformational change in the Provincial dispatch centres to modernize their medical triage tools. Once implemented this could result in a reduction in high priority calls by 20%. A new triaging tool that is more accurately able to identify the proper acuity of patients opens up opportunities to better coordinate lower acuity calls directing them to alternate health care pathways to better meet the patients' needs while at the same time freeing up ambulance resources.

Improved triage capability within the Provinces 22 dispatch centres open further opportunities for new strategies to divert patients away from hospital emergency departments and unnecessary ambulance transport in favour of community based care in a coordinated pro-active manner with an aim to reduce the escalating demand on ambulance resources. While these alternate clinical pathways will likely take years to develop, the new triage system being implemented could occur within the next couple of years and could have an immediate impact on call volumes. It is important to monitor this emerging issue closely to determine if it will result in increased ambulance call capacity. In the event the new triage system implementation is delayed, or not anticipated to yield the desired results, the service will need to consider additional ambulance resources to keep pace with the escalating call volumes.

Operational Control of Dispatch

For a number of years, the City of Greater Sudbury has been investigating the feasibility of integrating land ambulance dispatch, a function administered by the MOHLTC, into the City's dispatch system for 9-1-1, Police and Fire. An integrated dispatch model has the potential to increase service coordination and improve overall administration of the services.

In 2014, a comprehensive study was undertaken to examine the integration of emergency service dispatch services in Sudbury. The results of that study supported full integration of Paramedic Service's dispatch with the City's 9-1-1, recommending Police and Fire as the preferred emergency communications services system model for the City of Greater Sudbury. To complement this suggested integration, City Council adopted the following resolution on April 17, 2012:

THAT the City of Greater Sudbury undertake a feasibility study to achieve a fully integrated Emergency Communications Services System for Greater Sudbury, and

THAT the Chief of Emergency Services working with Police Services and the Office of the Chief Administrative Officer develop a Business Case for the consideration of Council and submission to the Ontario MOHLTC.

The next step on this initiative involves the development of a Business Case in partnership with the MOHLTC in support of a pilot project for a fully integrated Emergency Services Dispatch Centre.

Community Paramedicine

It is well documented that the aging population is a key driver of increased calls for paramedic services; a trend which is projected to continue to increase over the next 20 years. Currently, patients 60 years of age and older represent almost 60% of Greater Sudbury Paramedic Service's total call volume, with a forecasted increase of 33% in service request volume for cohorts 65+ over the next eight years. Frailty and disability are consequences of advanced age. Additionally, the elderly often suffer from complex inter-related health and social problems that make them highly vulnerable to serious, while potentially preventable, adverse outcomes.

The Community Paramedic Program is a paradigm shift from traditional emergency response to proactive preventative strategies with the goal of slowing the escalation of emergency calls. Many older adults are homebound and have access challenges to medical care and often suffer higher rates of complex and multiple illnesses including dementia and functional impairments. These measurements clearly demonstrate the need for Paramedic Services to focus more on proactive and preventative Community Paramedicine programs to address seniors' needs and chronic disease in the home with support from community based programs.

Dr. Samir Sinha, the Provincial Lead on Ontario's Seniors Strategy in his 2012 report "*Living Longer, Living Well*" has recommended the development and expansion of Community Paramedicine Programs that can offer significant contributions to improvement of health care in Ontario. The MOHLTC continues to consult with healthcare stakeholders including the Ontario Association of Paramedic Chiefs (OAPC) and Municipal Paramedic Services to determine advancing the development of a provincial Community Paramedicine program.

A number of pilot Community Paramedicine Programs have arisen across Canada. These programs utilize paramedics in an enhanced role in screening, community health referrals, and diverting patients from the Emergency Department to more appropriate community-based services.

In the fall of 2013, the MOHLTC in partnership with the OAPC funded work on a Provincial Community Paramedicine Toolkit aimed to support the roll-out of a standardized and evidence-based community paramedic referral program. These assessment tools enable paramedics, with a patient's consent, to make a direct referral to appropriate community agencies, the most common being the Community Care Access Centre (CCAC). Greater Sudbury Paramedic Services is an active participant in this innovative program.

Paramedic Services is also currently active in several other Community Paramedicine initiatives. These programs generally focus on three key areas: Prevention/Education, Intervention, and Diversion Strategies. These community initiatives are all aimed at improving the quality of life for City residents focusing on three overarching themes of innovation, building capacity, and creating synergistic partnerships while hand in hand continuing in the provision of first-class emergency services that are responsive, reliable, timely and safe.

Greater Sudbury Paramedic Services is actively involved in many prevention and education programs including:

- CP@Clinic (Community Paramedic at Clinic program formally The Community Health Assessment Program through Emergency Medical Services) – focused wellness clinics and overall health checkups
- Care Link Medical Information – magnetized fridge file holders that were developed in Sudbury and have now been used in other areas of the province to provide quick easy access to timely medical information in an emergency.
- Prevention of Alcohol Related Trauma in Youth (PARTY) Program – partnership with Health Sciences North Trauma Program aimed at providing education for high school students on the dangers of alcohol and increased risk of trauma in our youth.
- The City's Public Access Defibrillator (PAD) program coordinated through Paramedic Services has placed 120 units within the City in partnership with the Heart and Stroke AED program.
- Public CPR training in conjunction with the PAD program which aims to encourage citizen CPR and use of the public access defibrillators to help decrease out of hospital sudden cardiac arrest deaths.

In terms of intervention programs since 2011, paramedics have been able to submit "*Community Health Concern Reports*" to the Service. These reports identify patients who are faced with challenges in the home that may result in a medical crisis or a loss to their independent lifestyle. Conditions such as an unsanitary living environment or "failure to thrive" are of concern as these situations could indicate a level of benefit from additional community intervention and/or support. Submission of these reports results in a case review and typically some type of referral process from the Paramedic Service to community partner agencies that aims to address the patients unmet needs.

Paramedic Services also works to identify patients who have a high utilization service. Only about 40% of those high-use patients will accept additional assistance aimed at reducing their dependency on paramedic services, but for those who do accept the additional assistance there has been a 65% reduction in the use of paramedic services. The reverse trend is true for the frequent users of Paramedic Services who refused service intervention as there was an average increase of 8% across the year.

Discussions have been ongoing between Paramedic Services and HSN Mental Health and Addictions on diversion strategies that would see patients transported by paramedics to specialized clinics and

treatment centres within the community. This Diversion strategy is aimed at decreasing non-acute transportation to the Emergency Department (ED) reducing ED overcrowding, but most importantly, more appropriately meeting the patient's needs. Through this program a further reduction in the utilization of Paramedic Services can be realized.

There is strong evidence to suggest that community paramedics can support patients in their homes outside of the traditional institutional care model. This support, in turn, reduces 9-1-1 calls for paramedic response, Emergency Department visits, and hospital and long-term care admissions. These types of reductions have the ability to result in cost savings in comparison to the traditional model of institutional health care with an added opportunity for a re-investment of these savings to ensure the long-term sustainability of Community Paramedic Programs.

Continuing partnerships with and memberships in various Community Networks and Strategy tables (for example Community Drug Strategy, Sudbury Road Safety Committee, Community Mobilization Sudbury, Health Links Sudbury) will help at ensuring best practices in public and community safety.

The Paramedic Services division continues to advocate for an integrated Community Paramedicine Program within The City of Greater Sudbury with an aim of further optimizing of the overall department.

Key messages of this section:

- *Paramedic Services is a highly regulated service that is required to report on their performance on an annual basis not only to City Council, but to the Province through the Ministry of Health and Long Term Care.*
- *Since responsibility for the Land Ambulance Act was downloaded to municipalities in 2000, Paramedic Services has continued to evolve their service delivery model through regular review and analysis of performance metrics, followed by implementation of improvements over time resulting in the achievement of a sophisticated and optimized, One City One Service model that has evolved to meet the changing demands of the service responding to nearly 90% of the population in a timely manner making them one of the top ten performers in the province.*
- *The analysis identified a few challenges for Paramedic Service including: need for a full-time scheduler to help manage over 150 paramedics and support staff; imbalance of full-time Emergency Vehicle Technician hours needed and those available; station locations that were chosen based on existence in the general area, and not necessarily in the best site; stations that were moderately modified to accommodate the service, but do not fully meet the needs of the service.*

ANALYSIS OF CURRENT MODEL - FIRE SERVICES

What you will learn in this section:

- *Overview and analysis of Fire Service operations*
- *Understanding of legislation and standards for fire service delivery*
- *Lack of changes to service since amalgamation of seven distinct fire services*
- *What is the Fire Underwriter's Survey and what is their involvement with Fire Services*
- *Numerous challenges that Fire Services is trying to manage with limited resources*

Fire Services is responsible for delivering what is known as the, *Three Lines of Defense*: public fire safety education, fire safety standards and enforcement (fire prevention) and emergency response (fire suppression). Public education includes: visiting schools to educate students on fire safety and home escape plans; educating seniors and other vulnerable segments of the public; and informing the community about seasonal safety issues, such as Christmas tree safety and winter ice conditions. Fire prevention includes several types of inspection programs such as: request and complaint inspections; vulnerable occupancy inspections; building construction and renovation plans review; and targeted high risk inspections. Emergency Response includes fire suppression and fire rescue in relation to actual fires and also includes response to medical emergencies (in assistance of paramedic services) and technical rescues such as auto extrication, ice and water rescue, confined space, trench, and hazardous material (HAZMat) response.

Legislation and Standard Setting

Fire Protection and Prevention Act (FPPA)

In the Province of Ontario, Fire Services are mandated under the Ministry of Community Safety and Correctional Services and are governed under the authority of the Fire Protection and Prevention Act (1997). The Act makes fire education and fire prevention services mandatory in all communities, but allows fire suppression levels to be set by the municipality (Council with the advice of the Fire Chief), based on “local needs and circumstance.” This permissive legislation for fire suppression encourages the individual municipality to set individual emergency response service levels. In the City of Greater Sudbury, the Establishing and Regulating Bylaw 2014-84 (see Appendix #R4) is designed to identify the levels and types of services offered, and not offered throughout the community, and any exceptions to the services outlined. It also identifies the fees associated with certain services, if any.

The reference to ‘local needs and circumstance’ is the expectation in the legislation for the individual municipality to identify the risks in place in the community, and design its response capabilities to address them. Included in the risk assessment is the identification of the risks not only for fire response, but also for the related disciplines of technical rescue, HAZMat response, and medical tiered response. The above are known as the service types and are offered at varying service levels.

National Fire Protection Association (NFPA)

The service levels for each of the three lines of defense are identified by Fire Administration and are based on levels established primarily by the National Fire Protection Association (NFPA). The NFPA is an internationally recognized authority on fire department operations, including prevention, education and response. Amongst its programs, the NFPA develops and maintains a series of guidelines and standards for fire operations which are created by committees of stakeholders including fire administration, front-line employees, career and volunteer organizations, including labour, business, industry, and regulating bodies. These standards and guidelines are neither regulation nor law, but have been recognized worldwide as best practice.

In determining service levels, NFPA has created the following criteria in order from most basic to highly specialized. These training and response levels are identified in both NFPA 1670 *Standard on Operations and Training for Technical Search and Rescue Incidents* and in a much more thorough way, in NFPA 472 *Standard for Competence of Responders to Hazardous Material/Weapons of Mass Destruction Incidents*. The levels of capability are:

1. **Awareness** – This level represents the minimum capability for response, generally limited to scene security.
2. **Operations** – This level represents the capability to respond and mitigate an event in a defensive fashion, and support an agency trained to operate at a higher service level.
3. **Technician** – This level represents a capability to respond and mitigate an incident in an aggressive fashion, using advanced training and equipment.
4. **Specialist (HAZMat only)** – This level is reserved for incidents and hazards of special impact or unique response parameters.

The recognition of these service levels, and the NFPA Standards associated with them as ‘industry standard’ and/or ‘industry best practice’ can lead to serious consequences for fire services. These standards, while not having the same authority as legal regulation, are strongly encouraged to be adopted as minimum standards by industry stakeholders. For example, the insurance industry has accepted many of them as customary practice, and enforces them for their own purposes, while expecting fire services to as well in their operations. In addition, the Ministry of Labour, in its enforcement of the Occupational Health and Safety Act (OHSA) in particular Section 25.(2), (h), widely known as ‘due diligence’, does enforce these industry best practice standards as the de-facto regulation for operations.

NFPA has released two standards which are considered as industry best practice for recommended staffing at emergency response. NFPA 1710 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* is the standard which identifies the expected response by an urban fire department. NFPA 1720 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* refers to the performance expectations of volunteer departments, but also for composite departments.

Fire Underwriters Survey

The Fire Underwriters Survey (FUS) is a national organization that provides data on public fire protection for insurance underwriting purposes and establishes a Public Fire Protection Classification (PFPC) grade between one (best) and 10 for each fire department. The intent of the PFPC grade is to provide a standardized measure of the ability of the fire department to prevent and control fires that may be expected to occur and compare that level of protection against the level of fire risk in the community. FUS also sets a Dwelling Protection Grade (DPG) between one (best) and five for underwriters to determine personal property insurance rates for detached dwellings not exceeding 3600 sq ft. The FUS grading system considers fire potential based on the physical structures and makeup of the community environment when determining both the PFPC and DPG grades. A change of one rating point for a fire station's PFPC grade has an impact of approximately 10 per cent on the fire protection insurance for commercial properties. Changes to DPG grades can have a similar impact on residential insurance rates, however it is important to remember that there are several key factors which must be in place for residents and business owners to realize the benefits of these improvements. They must be in a hydrant protected zone, and they must be within 8 kilometres of the applicable fire station (5 km for commercial buildings).

The table below summarizes dwelling protection grade terms of reference for residential properties. Further details can be found in (see Appendix #R1).

Grade	Description
DPG 1	Career, Fully Protected Indicates to insurers that a <u>superior level of response</u> to a residence is located within 8 km of a <u>career or composite</u> fire department with <u>reasonable staffing</u> and <u>with recognized water supplies</u> .
DPG 2	Composite, Fully Protected Indicates to insurers that an <u>intermediate level of response</u> to a residence is located within 8 km of a <u>primarily volunteer</u> fire department with <u>limited staffing</u> and <u>recognized water supplies</u> .
DPG 3A	Volunteer, Fully Protected Indicates to insurers that a <u>minimum level</u> of response to a residence is located within 8 km of a <u>primarily volunteer</u> fire department <u>with recognized water supplies</u> .
DPG 3B	Volunteer, Standard Shuttle, Semi-Protected Indicates to insurers that a <u>minimum level</u> of response to a residence is located within 8 km of a <u>primarily volunteer</u> fire department <u>without recognized water supplies</u> .
DPG 4	Volunteer, Limited Protection (Semi or Unprotected) Indicates to insurers that the fire department is recognized however there are serious deficiencies in at least one area of fire protection that prohibit a minimum level of response. Normally given to communities with only one piece of apparatus and no recognized water supply (hydrant).

**Minimum volunteer response pool of 15 firefighters*

Greater Sudbury Fire Service contacted FUS to initiate a full fire service review in order to generate an up-to-date rating for the insurance industry to reference when insuring properties in the City of Greater Sudbury. This served two purposes: to act as an independent third party in the assessment of the efficiency of the municipal fire service without bias, and to provide an expectation of a reflection of savings to the community in the way of reduced fire insurance premiums under an Optimized model.

The review performed in 2015/2016 allowed FUS to update the two ratings for the City of Greater Sudbury for the first time since the late 1980s. The entire FUS report, including the updated ratings on a station-by-station basis can be found as an appendix of this report (see Appendix #R1) with some details of the evaluation being embedded within the correlated sections of this report.

Staffing

In the provision of the *Three Lines of Defense* Greater Sudbury Fire Services is composed of Fleet, Training, Prevention/Education, and Operations.

The Fleet Section consists of a Chief Mechanical Officer and a Fire Services Technician who in combination, are tasked to acquire, service and maintain the 73 large response vehicles, approximately 20 small fleet vehicles and all of the equipment required in the delivery of the service. This division also handles the maintenance of the 24 Fire/Emergency Services Stations that fall within the Fire Service scope.

The Training Section consists of a Chief Training Officer and two Training Officers who develop and deliver core and specialty training to firefighters. They also provide assistance and recommendations in the development of proactive strategies in equipment procurement and usage and service delivery.

The Fire Prevention and Education Section consist of a Chief Fire Prevention Officer, a single Public Safety Officer and six Fire Prevention Officers. The mission of the Prevention Section is to deliver focused education programs to the 97 schools, 78 day cares, 51 seniors' facilities and 57 care and treatment facilities located in the city. This Section also provides Building Services consultation regarding the Fire Code as it relates to building construction and renovation. The overarching goal of the section is to enforce Fire Code compliance of the city's 63,582 residential, commercial and industrial buildings. Achieving these goals is accomplished through scheduled inspections of vulnerable occupancies, as per regulation, and Complaint and Request Inspections. Complaint Inspections are generated as a result of a public complaint regarding the fire protection in a building, while Request Inspections are performed at the request of the owner, and are often associated with the sale of a building. The Fire Service currently does not offer any other type of regular preventative inspections, such as targeted inspections of high risk buildings, despite these inspections being recommended by the insurance industry.

The Fire Underwriters Survey evaluated the City's prevention and education activities during their analysis. For prevention, the ability to inspect, enforce, and utilize the Fire Code and municipal by-laws in order to manage the level of fire risk throughout the community was measured. The FUS frequency of inspection schedule and total occupancy numbers, and Municipal Property Assessment Corporation's (MPAC) classifications, identified that fire prevention and education services are provided at a less than adequate level, and are offered across the city at a standard that varies in the career, composite and volunteer areas.

Further to their evaluation, FUS considers community risk reduction programs, public education programs, and information provided to occupancies for items such as code enforcement, building codes, or fire loss occurrences. They then develop a score on the ability of the fire service to achieve these

within the community. The evaluation conducted by FUS for prevention and education activities demonstrates the need to make improvements to mitigate risks that exist in the community.

The Operations Section operates as the emergency response arm of the service. Often called the Suppression branch of fire services, it consists of four career Platoon Chiefs, 24 career station Captains, 35 volunteer Captains, 17 volunteer Lieutenants, 80 career firefighters, and 209 out of a budgeted 350 volunteer firefighters as of December 31, 2016. Greater Sudbury has a composite fire service which by definition means that operations include the use of both a career and volunteer firefighter force.

Consideration in the provision of Fire Response Service must be given to the varying service levels identified in each the career, composite and volunteer response areas. These three levels of response are established, operated and maintained in significantly different ways, and return significantly different performance outcomes.

Career Firefighters

The Fire Protection and Prevention Act defines a firefighter as, *“a fire chief and any other person employed in, or appointed to, a fire department and assigned to undertake fire protection services, and includes a volunteer firefighter.”* In the city core (former City of Sudbury), full-time career firefighting services are provided at four stations which are staffed 24 hours a day, seven days a week. These stations include: Van Horne, Minnow Lake, Leon Street (New Sudbury) and Long Lake Road. A minimum of four career firefighters are on duty at all times, with the Van Horne station having an additional four firefighters to operate the aerial truck.

Firefighting is a rather unique profession, and a brief description of operations is warranted. A team of four firefighters working together in a station work on the same truck and operate entirely as a single unit response. When the vehicle leaves the station for any reason, whether going for fuel, training, proactive pre-planning of buildings, community service or in response to a call, the team remains together at all times. For the entirety of their 24-hour shift, all firefighters are fully on duty and operate as what could be described as a pit crew when responding to an incident. Each seat within the fire truck has an assigned duty for each type of response including a Captain (supervisor) who is in charge of the entire crew. On any given day, all stations and crews (career and volunteer), the Platoon is directed by a single Platoon Chief.

Composite firefighting is not a classification of firefighter but rather a designation whereby response is accomplished with a team of both career and volunteer firefighters. Composite firefighting service is only provided at the Val Therese Emergency Service Station. This station maintains a minimum staffing of two career firefighters 24 hours a day, seven days a week and is augmented by volunteer firefighters. The two person crew operates in similar fashion to the career crew, with the obvious observation that the truck has only the driver and officer seats occupied. On arrival on the scene of a fire, interior rescue and/or fire attack is dependent on the arrival of additional firefighters from the volunteer complement. Career staff at the Val Therese station also provide support for calls to the Val Caron and Hanmer stations.

All career firefighters, including those working in Composite station staffing, receive 288 hours of training per year. Instruction is provided by the Captain on a daily basis, with occasional instruction by the Training Officers for subjects of special challenge or significance. Attendance is mandatory as it is provided during regularly scheduled shifts. Any training missed due to vacation or illness is made up by the firefighter at a later date. An annual training event is also undertaken at the Fire Training Grounds located at the Lionel E. Lalonde Centre (Headquarters) with participation by both career and volunteer firefighters.

Volunteer Firefighters

Volunteer firefighters are an integral part of the fire services delivery model in Greater Sudbury. The FPPA defines volunteer firefighters further as *“a firefighter who provides fire protection services either voluntarily or for a nominal consideration, honorarium, training or activity allowance.”* Volunteer services are provided at 19 fire stations throughout the city in the more rural areas. They include:

- Azilda
- Beaver Lake
- Capreol
- Chelmsford
- Coniston
- Copper Cliff
- Dowling
- Falconbridge
- Garson
- Hanmer
- Levack
- Lively
- Red Deer Lake
- Skead
- Val Caron
- Vermillion Lake
- Wahnapiatae
- Waters
- Whitefish

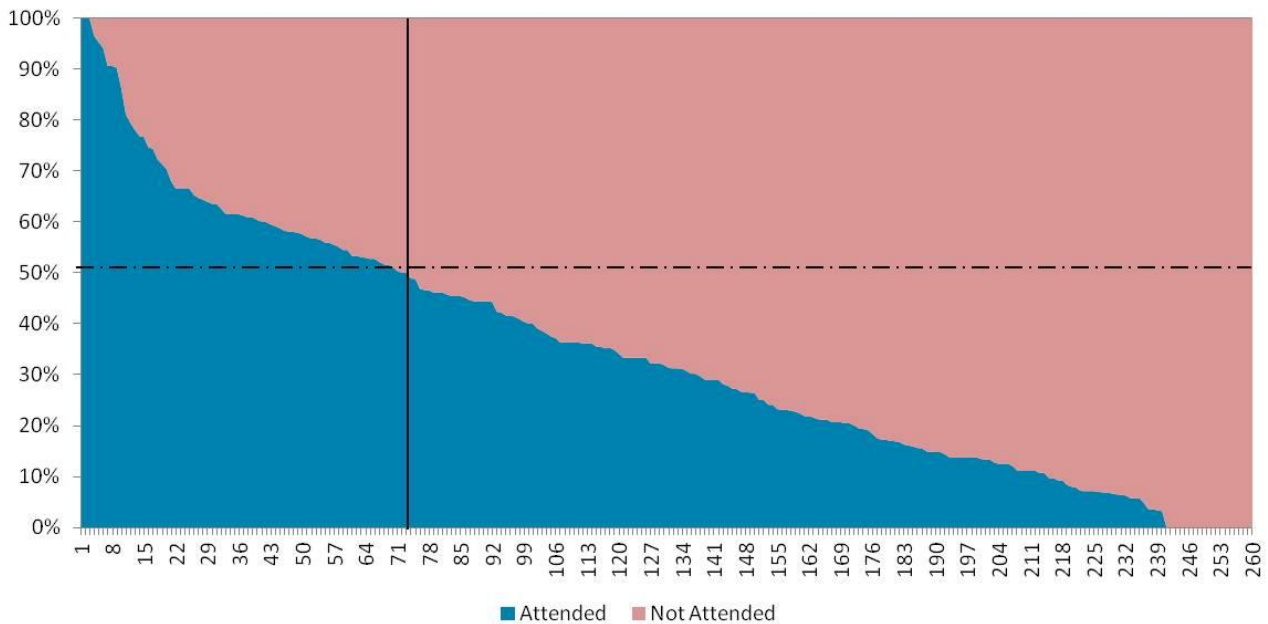
Volunteer firefighters are not posted at their stations like career firefighters, but respond when paged from wherever they may be at the time of the incident. As outlined in Schedule B, 1a of the Collective Bargaining Agreement between the City of Greater Sudbury and volunteer firefighters; *“A volunteer firefighter will respond to an alarm when he is available to respond. Each firefighter shall determine at his discretion when he is available to respond to an alarm, subject to the minimum attendance requirements set out in this agreement.”*

Presently, the City and CLAC have not agreed to a minimum attendance standard, and therefore individual employee attendance to incidents is entirely discretionary. As a result, volunteer firefighter attendance is neither guaranteed nor consistent in these volunteer serviced areas. While many volunteer firefighters maintain an excellent attendance record, the overall average attendance at incidents was 32.1% in the 2016 calendar year which can be a challenge when responding to larger incidents. Further details and analysis on volunteer attendance can be found in Appendix #T4.

The chart below demonstrates the attendance rate at incidents that each volunteer firefighter attended in their assigned station against the total number of incidents the station was dispatched to in its response area, also known as the fire beat. The blue area identifies the percentage of all incidents that

each volunteer firefighter attended and conversely, the pink coloured area shows the percentage of all incidents that a particular firefighter did not attend. In summary, about 75 (shown by the solid vertical line) of the total 260 volunteers attend incidents at least 50% of the time (as shown by the dashed horizontal line). A review of incidents within the district shows a similar result with about 70 of the 260 volunteer firefighters attending these incidents 50% of the time. Further details on volunteer firefighter attendance can be found in Appendix #T4.

Incident Attendance in Response Area



Volunteer firefighters are paid an honorarium for their services when they respond to incidents or attend paid training sessions. The current training model for volunteers provides instruction one-night-per-week at each station, with a maximum payment amount of six hours per month (72 per year). Some stations provide additional training with no monetary compensation. Additionally, volunteers are paid to participate in four hours of mandatory annual training with career firefighters at the Lionel E. Lalonde Fire Academy.

Similar to incident response is the requirement for volunteers to attend training. As outlined in Schedule B, 3a of the Collective Bargaining Agreement between the City of Greater Sudbury and volunteer firefighters (CLAC): *“The Employer shall schedule regular weekly training periods at each station that volunteer will attend at their discretion, subject to attendance requirements.”* Once again, there has been no agreement achieved between the parties regarding attendance requirements for volunteer attendance at training, and thus training attendance, and the resultant skill set, remain discretionary based upon the will of the volunteer to attend.

In 2016, the overall average for attendance at training by all volunteers was 37.31% and attendance hours ranged between two and 134 hours during the year (see Appendix T#4). It was observed that volunteers attended training more often when paid for their time (66.2%) versus unpaid training (8.8%). This may demonstrate the need for a more flexible training curriculum and perhaps additional paid training opportunities to encourage volunteer firefighters to attend training. Exit interviews provided by resigning volunteer firefighters regularly note the challenge of aligning their family life with the expectations of a restrictive training model. Frequent training can help to ensure skill and ability is at its finest level, especially in those areas where call volume is low and infrequent and practical application is intermittent.

Another challenge of utilizing a volunteer firefighter force is the high attrition rate. Similar to much of Ontario, Greater Sudbury Fire Services experiences an average loss of about 18% of their volunteer firefighters per year. This is often due to challenges from competing priorities of work, home, social and community involvement, resulting in an inability to be a meaningful, participating volunteer. This is terminology associated with the expectations of FUS, but the expectations for attendance associated with it are items to be negotiated with the CLAC to identify acceptable thresholds for training and incident attendance.

During the public information sessions, it was clear that volunteer firefighters are highly recognized and valued in their individual communities for their great participation and support of local events. They are seen as having a good sense and familiarity of neighbourhood characteristics and residents may fear that outside career firefighters would not be as knowledgeable of the intricacies of smaller communities like Beaver Lake, Skead, Capreol and Wahnapiatae.

It is important to note the importance that the volunteer response model presents to the optimized response model, and that the volunteer service is crucial to its success. As such, the recruit training, the ongoing training, and the efforts of recruiting and retention of quality volunteer staff is of the utmost importance. A meaningfully participating, well-trained volunteer firefighter represents a significant investment for Greater Sudbury Fire Services, and can represent an important return on this investment for the community. As was noted in the Final IBI Report, March, 2014:

“We recommend that GSFS should consider developing an ongoing evaluation process to assess the quality and effectiveness of the Training Program against the curriculum being used. They should investigate / take advantage of opportunities to combine volunteer and career training, to promote unity in operations and reinforce the ‘one department’ philosophy.”

This assessment has been confirmed by the analysis for optimization, and the recommendation for cooperative training has been incorporated.

Stations and Fleet

Location of Stations

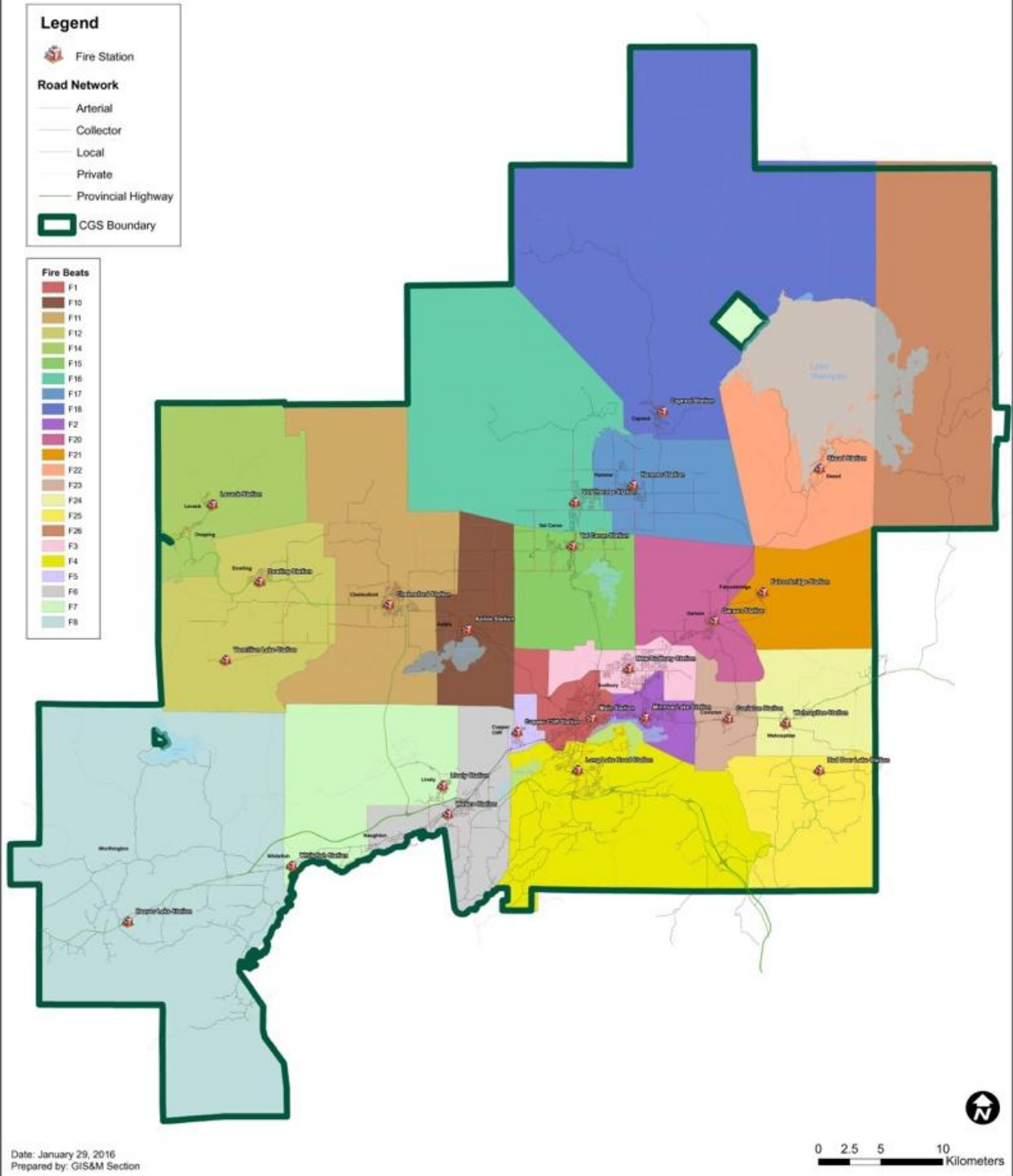
The Greater Sudbury Fire Service Division operates and maintains 24 fire stations, eight of which are co-habitated with Paramedic Services. Fire and Paramedic Services Headquarters is currently located in Azilda at the Lionel E. Lalonde Centre (LEL), which also houses the Azilda Fire Station. The location of Headquarters is removed from the bulk of employees, and as a result there is a disconnect between administration and those delivering front-line services. While many organizations operate with a number of distinct locations without issue, this separation of management from the front-line workforce increases the risk of poor communication and real-time feedback. For Fire Services, this risk has been fully realized.

The LEL Headquarters location also serves as the central maintenance site and supply and equipment warehouse for the service. While consideration has been given to the creation of district storage areas for crucial supplies, the size and layout of the current stations does not make this a viable option. The distance from the bulk of the front-line staff creates logistical bottlenecks and supply inefficiencies during daily operations. The impact is even more notable during emergency events of large size and impact, when equipment and supplies must be transported from Azilda to the location of the incident. Furthermore, there is no dedicated 24 hour staffing in the Fire Services Division at the Headquarters in Azilda and thus incidents that occur outside of regular business hours (8:30 a.m. to 4:30 p.m.) can experience delays in the supply of requested equipment at these times.

The following map details the current location of the stations as well as the fire beat, which is the surrounding geographic area associated with each station's response borders.

City of Greater Sudbury

Fire Stations and Fire Beats



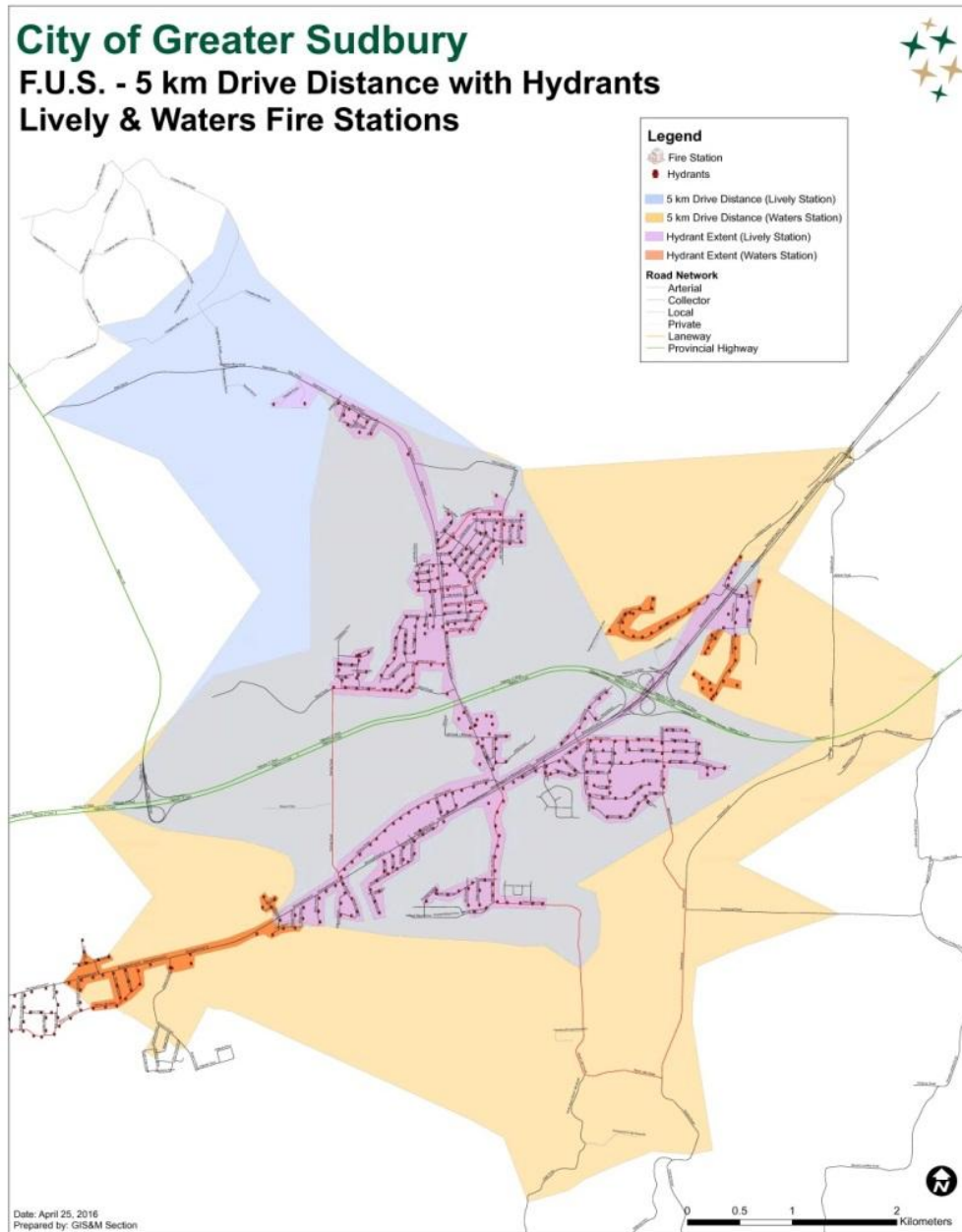
Date: January 29, 2016
Prepared by: GIS&M Section

0 2.5 5 10
Kilometers

All of the current stations were assumed at amalgamation; however the stations were originally located to service the former communities in which they were built without consideration of operational advantages that could be realized if they were considered as part of a network instead of an individual location. Since amalgamation and prior to the IBI study of 2014, no consideration had been made to station location that would best serve the City of Greater Sudbury as a whole community.

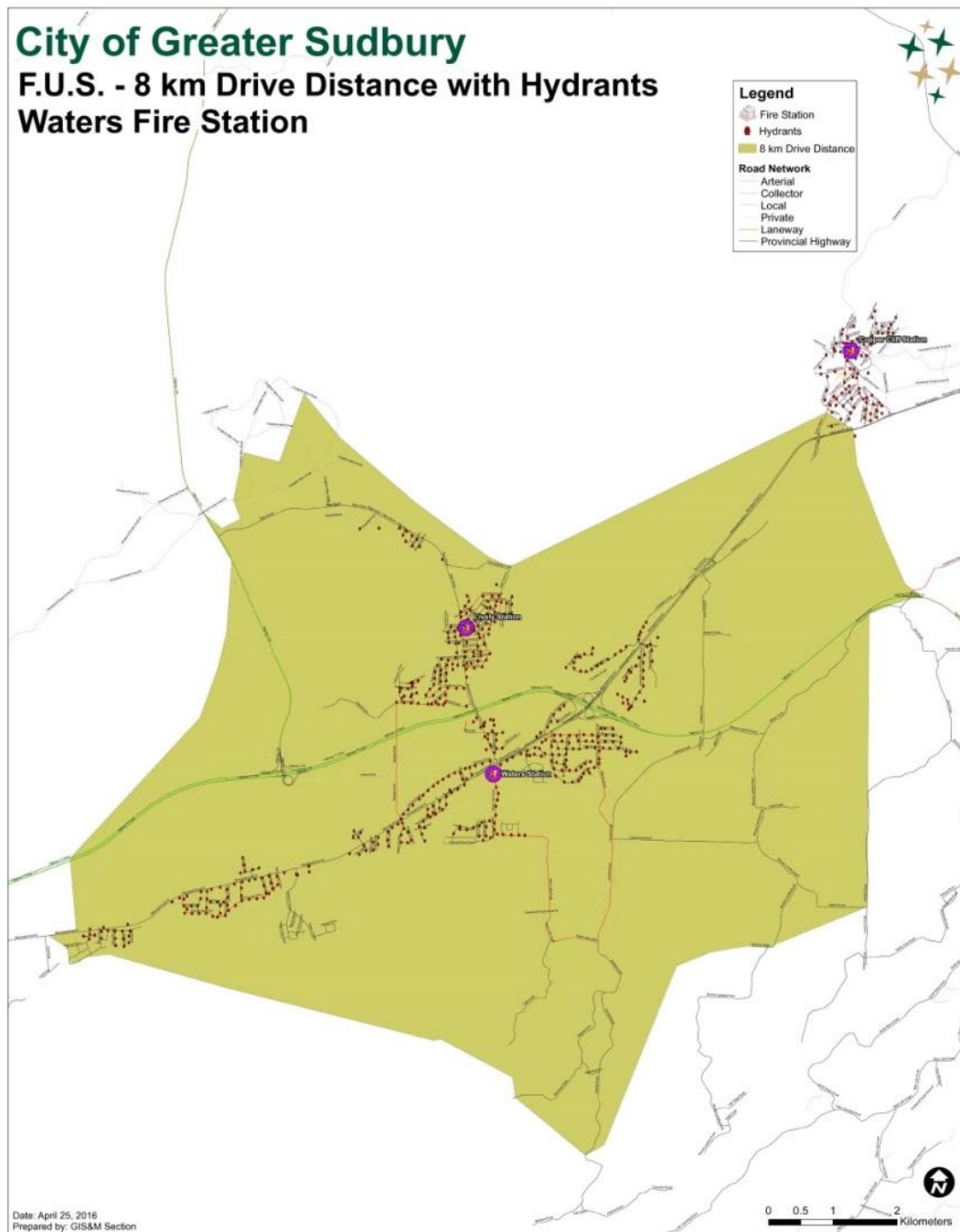
The implications of this lack of adjustment were observed in the analysis report provided by FUS when they scored the Public Fire Protection Classification (PFPC) and Dwelling Protection Grade (DPG) for Greater Sudbury Fire Services. During their assessment, FUS measured the ability to appropriately respond and attack a fire, taking into account the required water supply (through hydrants, water mains, tanker shuttles), initial response (first due apparatus), fire department resources and logistics, communications and dispatching, pre-incident programs, personnel and staffing levels, and operational training. The results of their assessment showed that some of Greater Sudbury's stations are not in locations that allow them to efficiently back each other up and/or provide coverage to parts of the community that duplicate the coverage provided by other nearby stations.

A review of response drive distances for each station, based on NFPA guidelines of 8 km for residential buildings, and 5 km for commercial and industrial buildings is part of FUS' analysis. These drive time distances were used to generate response maps for each station to assist in identifying both duplication and gaps in service.

Waters and Lively Stations (Walden Area) Overlap of Service

The map above exhibits hydrants in the community of Walden, located in the southwestern portion of the city. The yellow shaded polygon above represents a 5 km driving distance response, the NFPA guideline for commercial property protection, from the Waters Station. The blue shaded polygon represents the same distance response from the Lively Station. These polygons overlap to create a grey shaded polygon demonstrating a duplication of fire protection services in this area. In consideration of

the 8 km guideline for residential buildings, the map below demonstrates that the entire populated area could effectively be serviced by the Waters station.

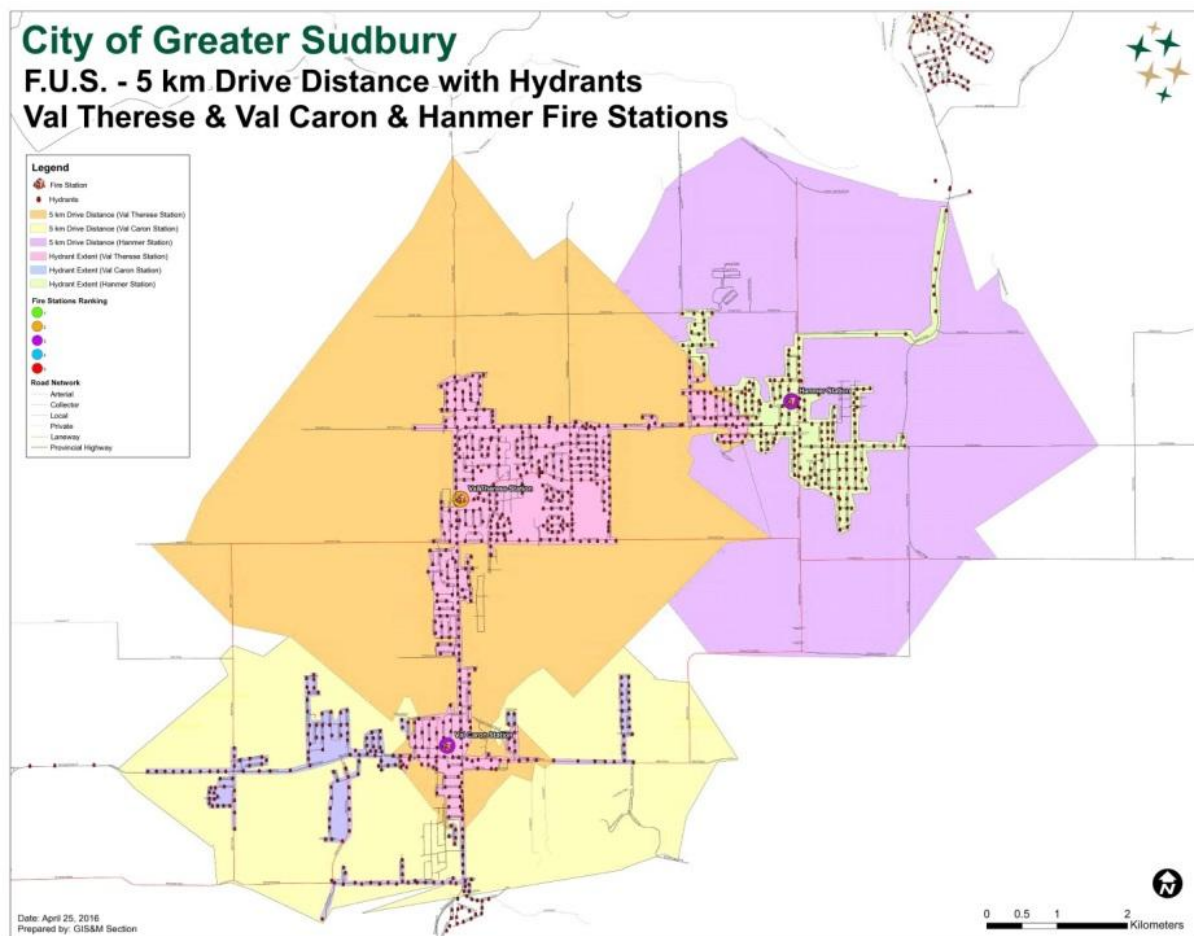


The analysis utilizing this map suggests that the Lively Station is largely redundant. This level of redundancy is not only inefficient from a cost perspective but also places hardship on the recruitment of volunteers.

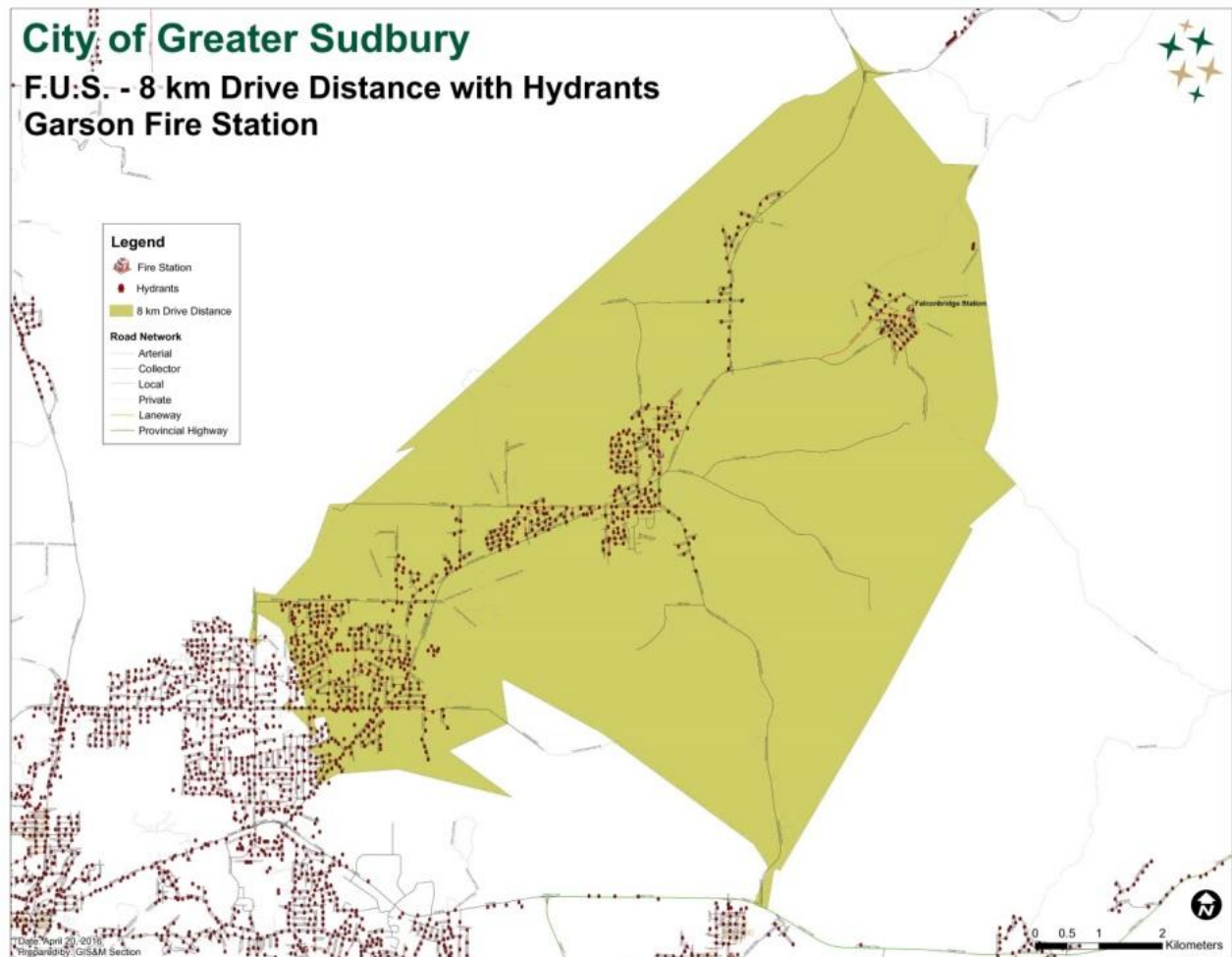
An example of volunteer recruitment revealed through the series of public information sessions on this subject, would be the case of the Town of Espanola. The Town of Espanola with one fire station was able to successfully recruit a large number of volunteers. The land area of Espanola based on 2011 census data is just less than 83km² with a population of nearly 5,000 people. In the case of the Waters and Lively stations, both stations exist within the Lively Population Centre as per the 2016 Census. Lively has a population of 5,608 with a geographic area of just over 9 km². Having nearly the same number of residents as Espanola, the Lively area is required to support two volunteer fire stations. This redundancy drives the need to staff two volunteer stations with a population base not much different than Espanola. If there were only one station within the Lively area there would be a full complement of volunteers.

Similar analysis follows which identifies that these redundancies exist among a number service areas in the city, most notably Valley East, Garson/Falconbridge, Wahnapiatae/Red Deer Lake, Chelmsford/Azilda and Long Lake/Van Horne/Copper Cliff.

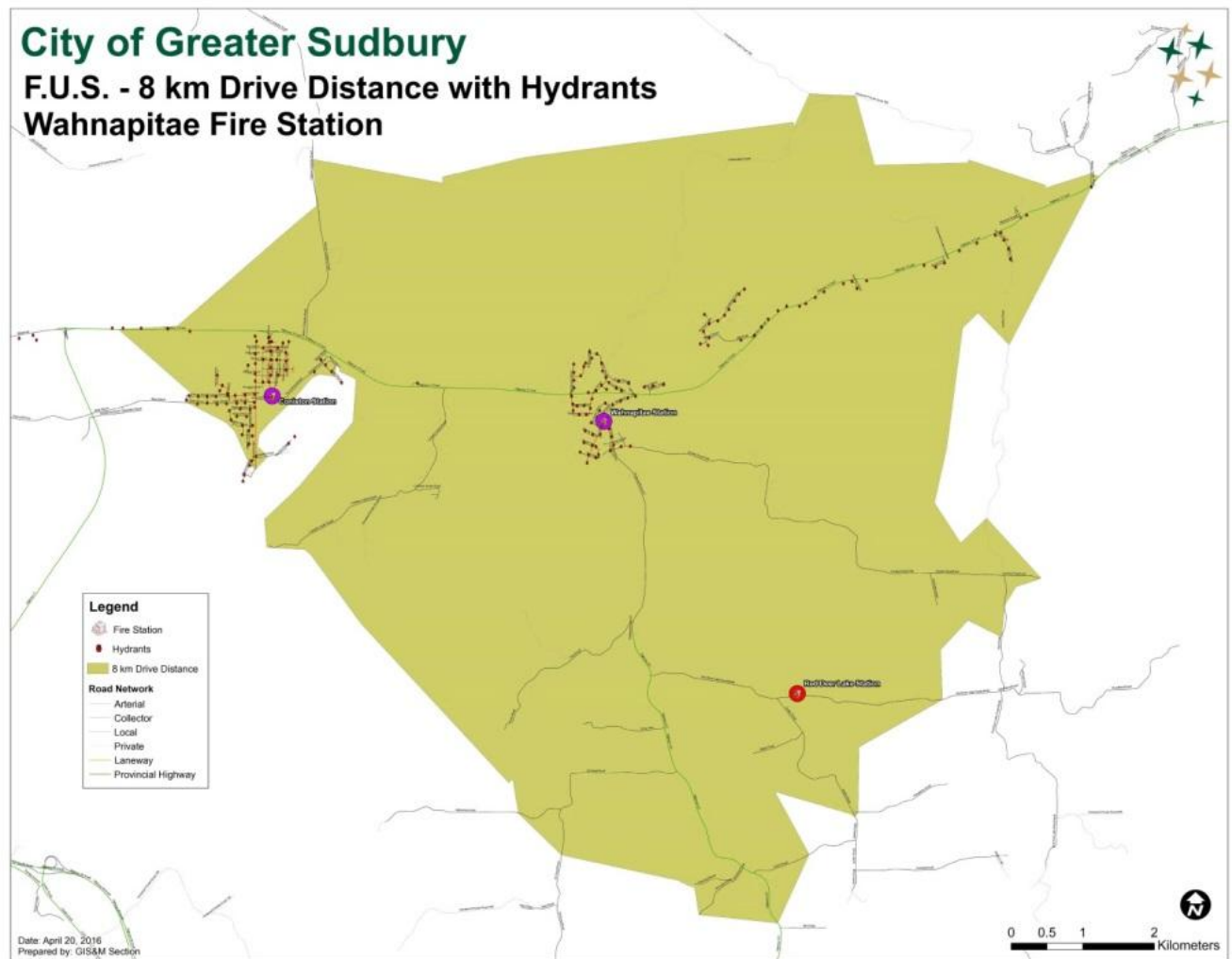
Valley East Overlap of Service



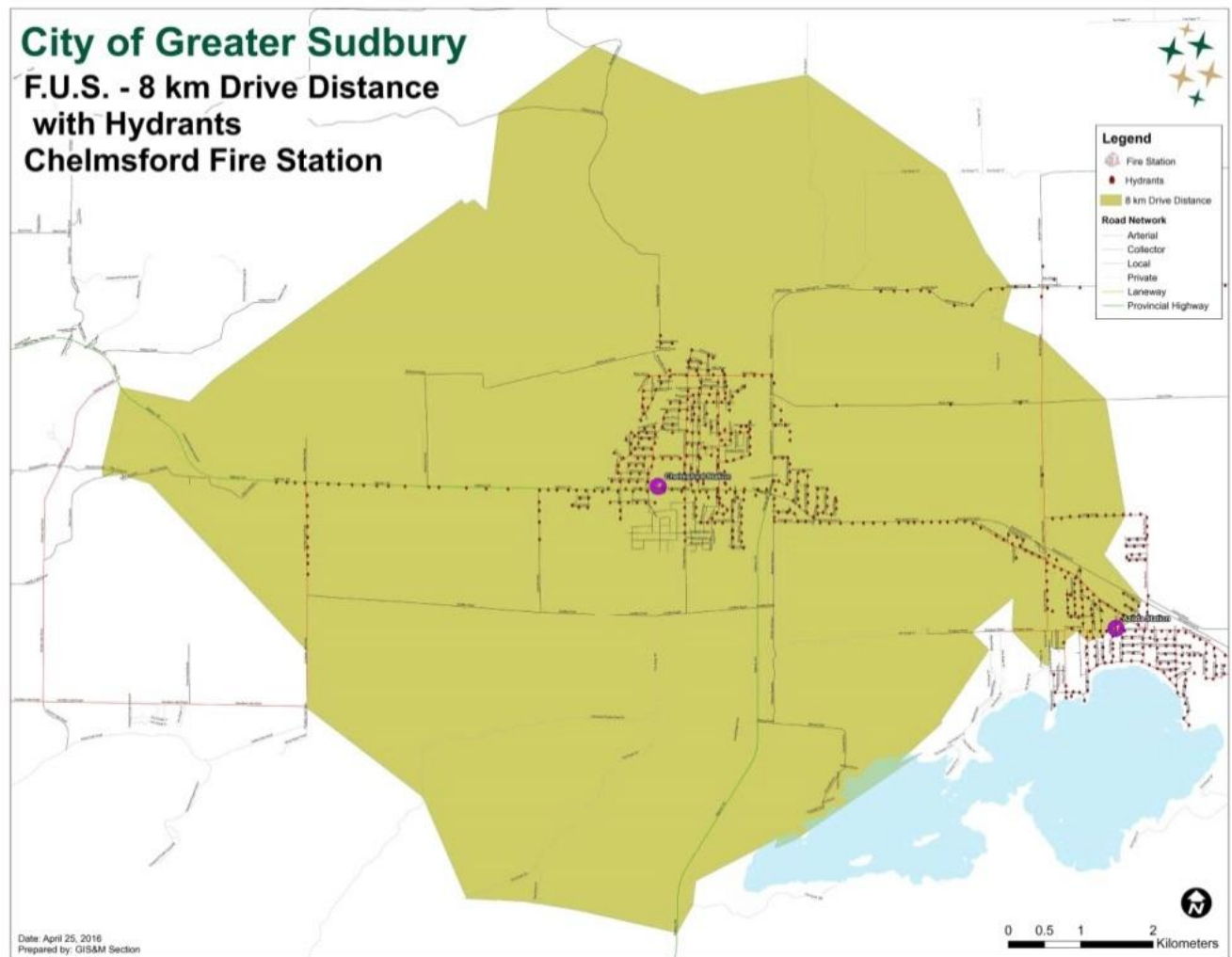
The Map above identifies the overlap of service represented by the three stations in the Val Caron, Val Therese and Hanmer Stations. While redundancy of service is important in higher risk areas, this redundancy is provided by the appropriate vehicle assignment for the area, and is not dependent on the number of stations. In the case of Valley East, the appropriate number of trucks in two stations provides superior response at a reduced long term cost.



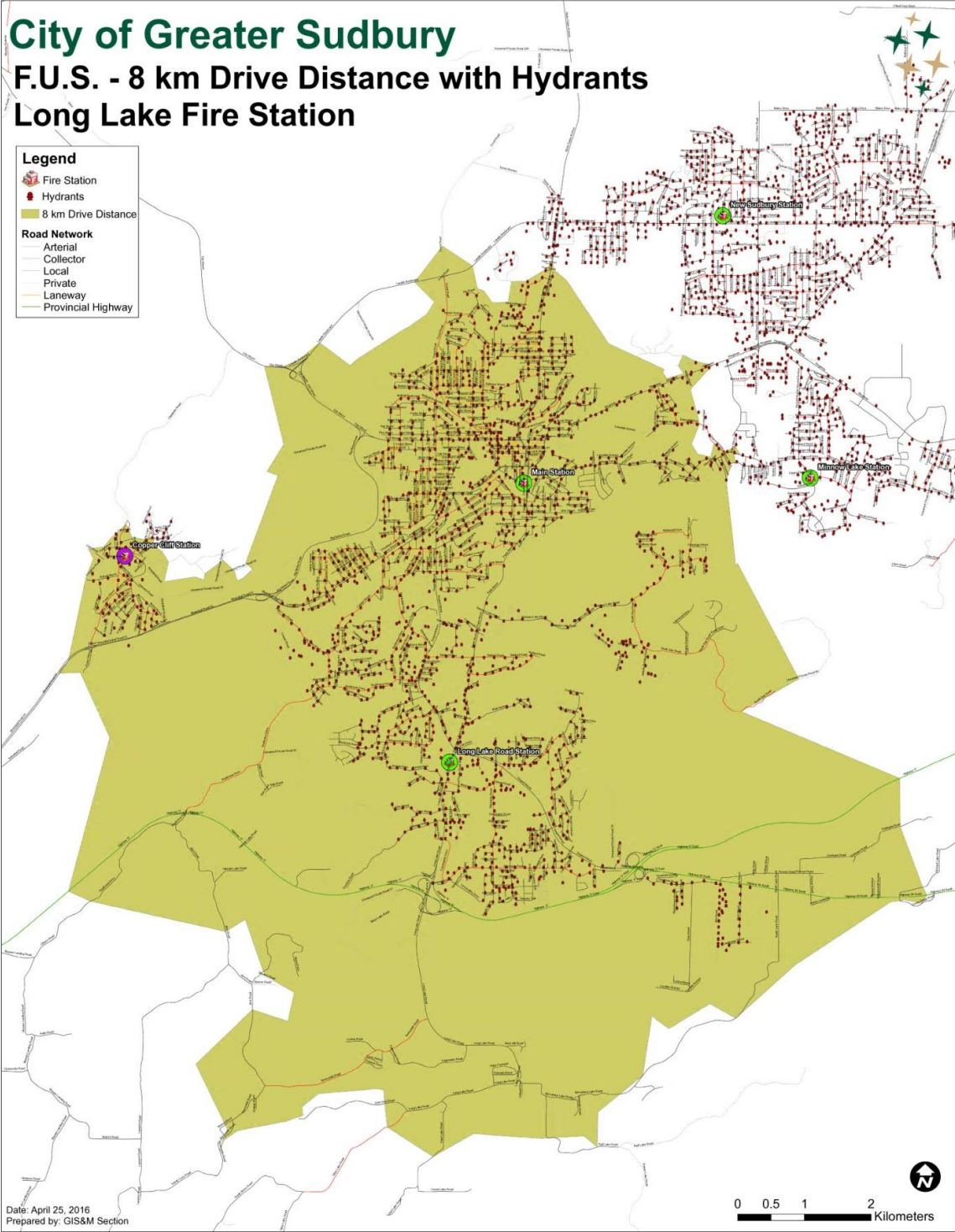
The above map serves to identify the coverage the community of Falconbridge receives, from Garson Station in its current location. The recommended optimized location was specifically identified to ensure continued coverage for Falconbridge.



The above map identifies the 8 kilometre response distance associated with Wahnapitae Station, and its coverage for the location for the Red Deer Lake Station, currently condemned and inoperable due to structural damage.



The above map identifies the 8 kilometre drive distance associated with the Chelmsford Station. Relocation of the station, as recommended, to the intersection of MR 15 and Highway 144, allows for full coverage of the town of Azilda where fire hydrants are present. Areas beyond hydrant protection receive the lowest FUS grading applicable to the city.

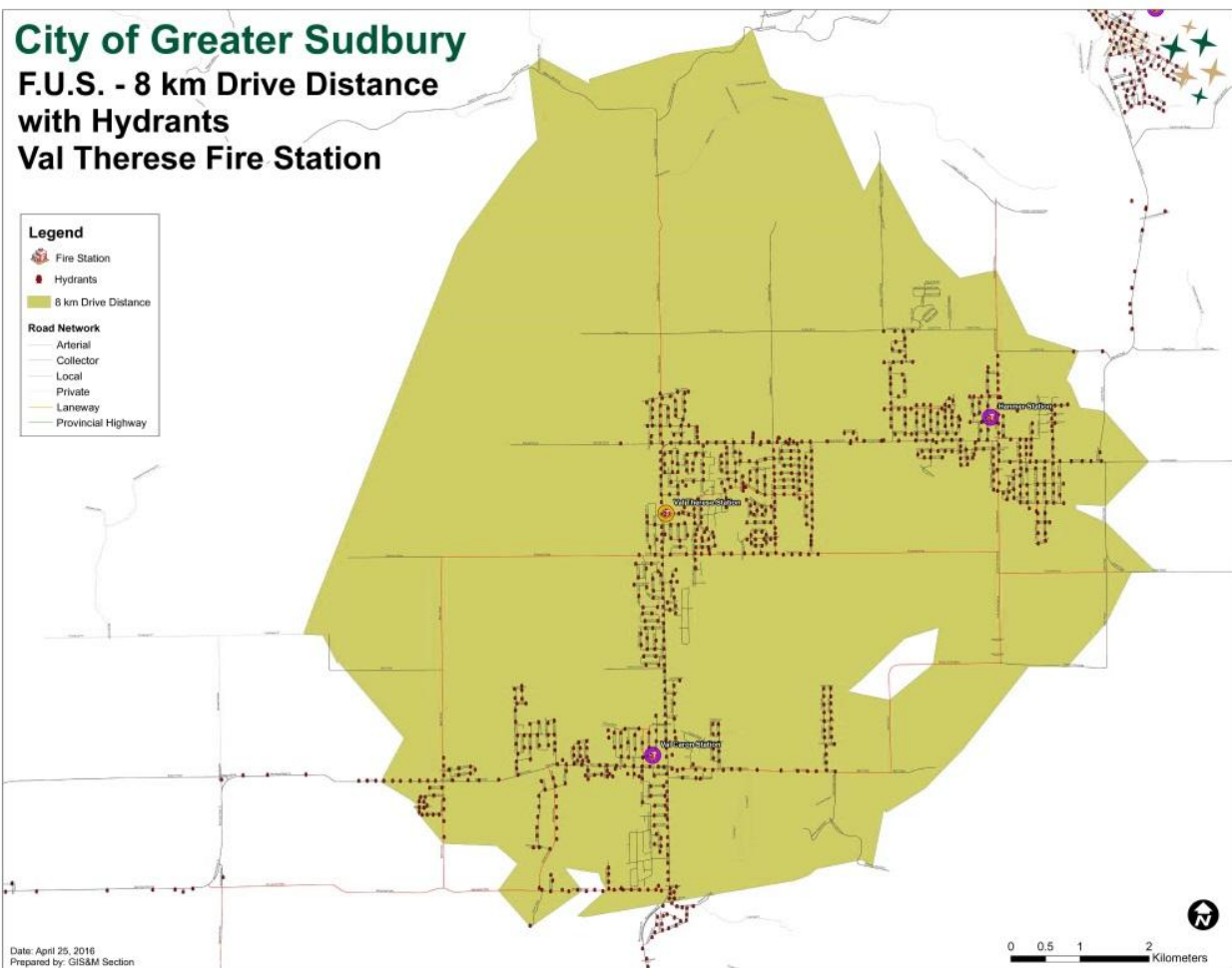


As noted in the map above, the 8 kilometre response distance for Long Lake Station identified by FUS, completely services the community of Copper Cliff. Although not shown on this map, the 8km response distance for Van Horne Station also serves to fully protect the community of Copper Cliff.

One consequence of note relates to the insurance impact associated with this drive distance phenomenon. Every residential building within 8 kilometres of a fire hall receives a value from that station, and in the event that there are two stations protecting a residence, only the higher rated station is counted.

The map for the Val Therese 8 kilometre response distance is provided below. This map indicates that all residential buildings in the former City of Valley East receive the FUS valuation from the Val Therese Station, including the residents living directly beside the Val Caron and Hanmer Stations. This is due to the Val Therese Composite Station achieving a higher FUS valuation than the Hanmer and Val Caron Volunteer Stations. A similar effect is demonstrated in other redundant coverage areas where one station is ranked higher than the adjacent one, Garson Station for Falconbridge, and Leon (New Sudbury) Station for areas of Garson. The areas where the station FUS rankings are equal operate with a redundancy of service only and do not have positive insurance costing implications. In the example of Chelmsford/Azilda, there is an overlap of service coverage with zero correlating improvement in insurance rates.

This redundancy of service demonstrates that some historically located stations exist in an improper location. It would further suggest that an opportunity exists to reduce the overall number of stations, provided there is an overarching view to relocation as a whole, with a focus on minimizing redundancy while attempting to improve services.



Condition of Stations

The state of repair of the entire composition of stations was assessed in 2013-2014 through engagement of the CCI Group, a private sector engineering firm. This group generated a significant report in which they described an ongoing deficiency of capital investment in Greater Sudbury fire stations. This deficiency requires an estimated \$20.4 million to repair the stations in order to bring them up to current standards. Furthermore, it was identified that the average age of the stations of over 40 years was high, and that most were approaching the end of their expected lifespan. This report confirmed the general observations of managerial and front-line staff that the buildings lack the essential functionality to operate as fire stations, paramedic stations or shared stations. In fact, many of the stations are non-compliant with applicable health and safety regulations for dual gender operations (for example separate sleep quarters and shower areas).

A more detailed analysis of the costs associated with required building maintenance is provided in the cost section of this report (see Appendix #F2). The table below provides a summary of expected station repairs and maintenance over a ten year period identified from the analysis completion date of 2014.

Total Estimated Repair and Maintenance Costs by Station

Station	Amount
01 - Main	\$2,237,000
02 - Minnow Lake	\$695,000
03 - New Sudbury / Leon	\$780,000
04 - Lockerby / Long Lake	\$1,014,000
05 - Copper Cliff	\$739,000
06 - Waters / Walden	\$947,000
07 - Lively	\$367,000
08 - Whitefish	\$931,000
09 - Beaver Lake	\$528,000
11 - Chelmsford	\$834,000
12 - Dowling	\$792,000
13 - Vermillion Lake	\$413,000
14 - Levack	\$700,000
15 - Val Caron	\$740,000
16 - Val Therese	\$776,000
17 - Hanmer	\$555,000
18 - Capreol	\$881,000
20 - Garson	\$872,000
21 - Falconbridge	\$506,000
22 - Skead	\$528,000
23 - Coniston	\$495,000
24 - Wahnapiatae	\$498,000
25 - Red Deer Lake	\$337,000
ES - HQ	\$3,318,000
Grand Total	\$20,483,000

As identified in the CCI Engineering Group Building Condition Assessment report, their analysis of the buildings was solely meant to determine the repairs and maintenance required to bring the buildings up to the minimum requirement of the Building Code. It is very clear in the background documentation that there is NO provision for:

- A hazard assessment to identify hazardous materials such as asbestos
- An energy audit to identify the efficiency of the stations
- An audit of the stations compliance with the Accessibility for Ontarians with Disabilities Act (AODA)
- A full assessment of the station's mechanical facilities, but instead provide only a reference for replacement based on life-cycle, and expected longevity

The implications of these exclusions are considerable. Any exposures to risks associated with the four items listed above are in addition to the estimated \$20.4 million. Of particular concern is the fact that none of the current stations are considered fully accessible as noted in the CCI Building Condition report disclaimer. The report states that given *"The City of Greater Sudbury has publicly indicated that they are in compliance to both the Ontarians with Disabilities Act 2001 (AODA) and the Accessibility for Ontarians with Disabilities Act, 2005 and supports the AODA's primary goal (refer to City of Greater Sudbury Multi Year Accessibility Plan)."* The costs associated with achieving compliance with the Accessibility legislation is not included in the station cost assessments, above.

As noted, the CCI Engineering Group Building Condition Assessment report was clearly focused on the assessment of the buildings in relation to the Ontario Building Code and it did not consider the Occupational Health and Safety requirements of a Fire and Paramedic Station. All of the stations currently in use were designed and built in the 1950s, 1960s, 1970s or 1980s, and a single station was built in the 1990s (Val Therese in 1993). While many of the stations have undergone significant renovations and upgrades, it is notable that none of these included renovations to comply with the Accessibility for Ontarians with Disabilities Act 2005 (AODA), nor have renovations focused on the expectations of the Ministry of Labour Section 21 Sub Committee under the Occupational Health and Safety Act. Additionally, several of the stations were not actually built as fire stations, but as municipal garages, which were later adapted to Fire and/or Paramedic stations. As such, they were neither designed nor built with the required infrastructure to operate a fire or paramedic service. Historically, the fire service in particular has been a male dominated service and the design of the older buildings reflects this in that no consideration was given to the needs of a dual gender workplace such as separate shower and sleeping facilities.

The conversion of the previous garages into emergency services stations has also created a situation where bathroom facilities lack showering capabilities. This is a mandatory requirement for a fire service under the regulations associated with the Occupational Health and Safety Act (OHSA). Similarly, although the connection between diesel soot and some forms of cancer are recognized in literature, none of the current Fire and Paramedic Stations are equipped with point-source-capture of diesel emissions.

Point of source capture is the recommended practice in the Province of Ontario under the OHSA Section 21 Guidance Notes for the Fire Service. Under the guidance of the OHSA, each of the stations undergoes a monthly inspection by a member of the OHS Committee. These inspections continue to identify these and similar concerns which place a significant liability on the municipality under the Occupational Health and Safety Act. Section 25 (2) (h) of the Act states an employer must *“take every precaution reasonable in the circumstances for the protection of a worker (e.g. to protect a worker from injury or getting a work related illness).”*

The combination of too many insufficiently-maintained stations, situated in inefficient and ineffective locations has provided a unique opportunity to optimize Fire and Paramedic Services through the relocation of services into new, modern, properly designed, and well-located stations aligning the services in the community with the risks they are designed to protect. To respond quickly, emergency response stations should be located on main roadways that provide easy access to multiple routes in an area.

Fire Vehicles and Major Equipment

Fire Services Administration implemented a Fleet Rationalization Policy in 2014 to address the ongoing issue of non-standard fleet and equipment, as well as to address vehicles and equipment operating beyond their expected life cycle. Greater Sudbury Fire Services has a fleet of 73 major response vehicles that were combined from the seven distinct fire services during amalgamation in 2001. In much the same manner as with stations, the fleet has seen no alterations since that time. The challenge with maintaining a fire fleet is significant. The vehicles are very expensive to purchase, operate and maintain, and the consequence of a vehicle failure is often serious. The insurance industry, as represented by FUS, expects that the vehicles will be designed, built and operated following the recommendations entrenched in the applicable NFPA Standard: *NFPA 1901 Standard for Automotive Fire Apparatus (2016) Annex D - Guideline for First Line and Reserve Fire Apparatus*. Of special note is life expectancy for fire response vehicles, which is 20 years for front-line service. Vehicles in operation beyond this lifespan are considered to be of no front-line service value by the insurance industry when calculating residential, commercial and industrial insurance premiums. This contributes to higher insurance costs.

This expectation places a significant strain on the capital funding model currently in place. In fact, the current investment in the fleet is materially below what is needed to maintain the fleet. Internal analysis has identified the current capital shortfall in fire vehicles and major equipment to be \$16.1 million (see Appendix F3).

Service Level and Community Risk

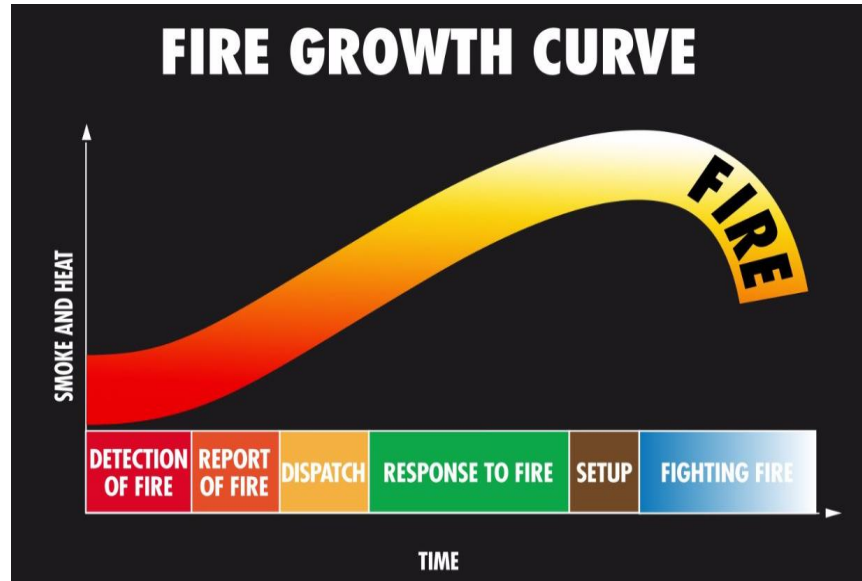
Service Level

It is understood that Fire Services offers protection to the community in the forms of Fire Education, Fire Prevention and Fire Suppression Response. What is less well known is that Fire Services offers additional protection in the community as directed by Council, in the form of Technical Rescue (such as auto extrication, water and ice rescue, rope rescue, confined space rescue and trench rescue), HAZMat response, and MTR. For all of the services offered except Medical Tiered Response, Greater Sudbury Fire Service's is the service of last resort in that there is no other agency capable of offering these services, and there is no adjacent community capable to assist in the response.

Fire Suppression Response

Fire suppression involves all of the activities in controlling and extinguishing fires. It is what generally comes to mind when people think of the work completed by a firefighter. As per the Establishing and Regulating By-law 2014-84 (see Appendix #R4), Fire Services currently attempts to deliver fire suppression services across the city in a consistent fashion, meaning that the entire city is entitled to both offensive and defensive fire response. Offensive fire response includes interior fire rescue and attack, while defensive fire response is exterior only attack, with additional consideration for exposure protection (adjacent buildings and vegetation). In 2016, Greater Sudbury Fire Services responded to 4,448 incidents of which 501 were fire calls. Of those, 254 were considered structure fires, therefore, these incidents are frequent and the consequences, if not mitigated quickly, are significant.

While Fire Services commits to offering this service consistently throughout the city, the actual delivery of the service is heavily dependent upon fire ground staffing levels, and effective response times in establishing an initial firefighting complement of four firefighters and an effective firefighting complement of 14 to 16 firefighters.



The diagram above details the progression of a fire over time, from when it starts, to when it's fully developed, to when it decays. The following is what can be described as the anatomy of a fire call. It is important to understand that the following requirement falls in line with the resources and steps required for Greater Sudbury Fire Services to successfully perform interior suppression and rescue efforts on a residential, under 2,000 square foot structure in alignment with fire services best practice, Occupational Health and Safety requirements, the Ministry of Labour Section 21 guidelines and Office of the Ontario Fire Marshal guidelines.

Interior fire attack and rescue for incidents with no risk of collapse or entrapment can begin with four firefighters, with a confirmed knowledge of additional resources en route. In the event that a fire is more advanced, and where there is a risk of collapse or entrapment, interior fire rescue and suppression cannot occur until 14 firefighters are on scene. These requirements are based on the National Fire Protection Association (NFPA) 1710 and 1720 Response Standards. While these standards are not currently officially adopted by Greater Sudbury Fire Services and are not enforceable in the province, they are considered best practice and are considered as such by the Ministry of Labour and FUS, and thus the insurance industry. In cases where legislation is absent or lacking, best practice principles provide agencies with the greatest possible guideline and direction for safe operation of services.

Once 911 have been notified, the closest fire stations will be alerted. In the case of a career response the dispatcher immediately notifies the station without operational delay via direct radio into the station or truck if firefighters are responding to a call. **Initially, three units will respond with a request for a fourth unit to respond** as rapidly as possible. Each unit will have four firefighters on each fire truck. As each unit arrives, each firefighter will be assigned a critical fire ground task(s) as outlined by Fire Service best practice and as required by legislation.

In the case of a volunteer response, a second dispatcher receives the call and makes preparations to notify the volunteers via pager. The volunteer paging system, as with any paging system that is not hardwired into a location relies on a series of events such as picking the appropriate volunteer response station, keying in the appropriate numbers, and then recording a voiceover message which will accompany the tones on the waist pager. This causes an inherent operational delay of 20 to 60 seconds. The units dispatched are currently done by station, with all vehicles in the station included in all messages. Fire Services has a dispatch protocol in place to determine minimum vehicle response, but it is not currently in use in the volunteer response area, pending introduction of the appropriate technology.

Once at the incident, the first officer on scene is the Incident Commander, who is in charge of the situation and will perform a quick external walk around to best determine a plan of attack. The apparatus driver will be the Pump Operator, staying beside the truck and in control of the water supply. The next two firefighters are on Hose Line duty, preparing to make entry upon notice of the imminent arrival of additional resources. While the work of these four fire fighters establishes initial operations, there is only so much they can do as they await the arrival of additional resources as required depending on the size and severity of the fire.

Two more fire trucks would then arrive, for a total of eight more firefighters. One firefighter will serve as an Accountability Officer for purpose of firefighter safety, keeping track of who is on the scene, where they are and what they're doing. Two members from one unit will serve as part of the Rapid Intervention Team, standing by outside for fellow firefighters that may need support or rescue. The final firefighter from this second truck acts as the second Tools and Pump Operator.

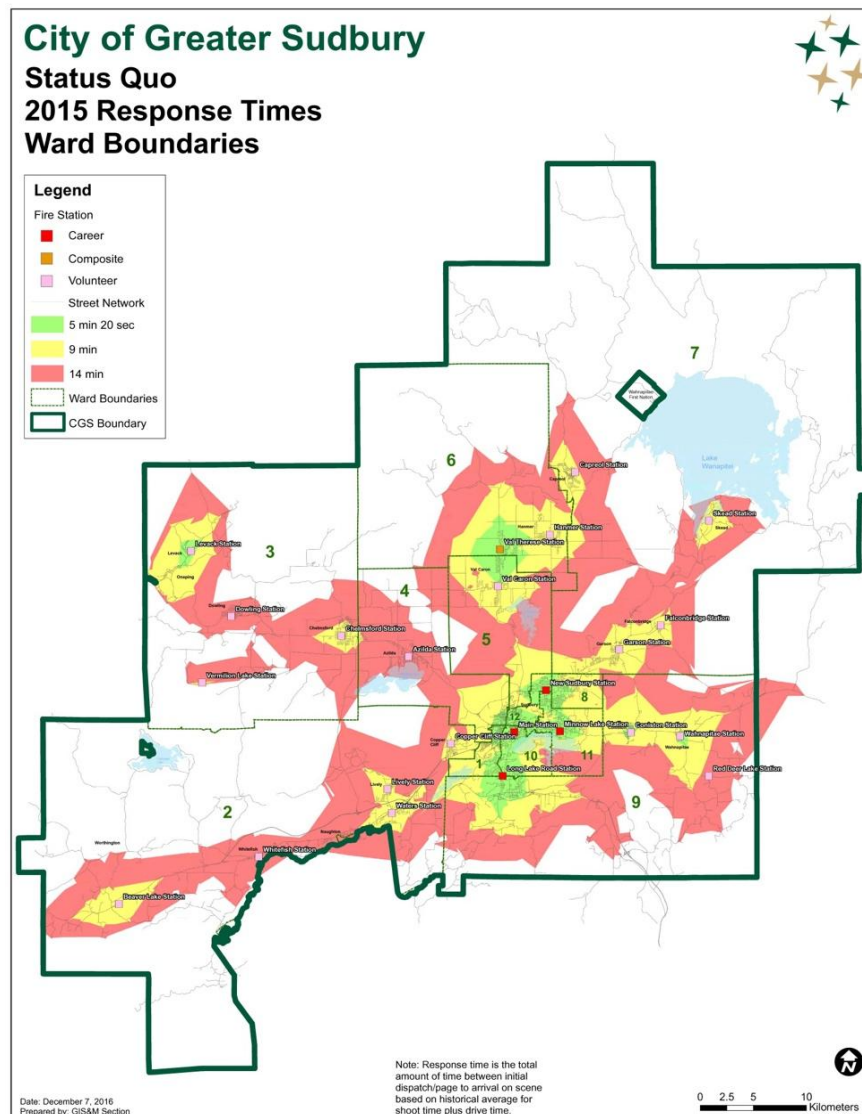
From the third truck, two firefighters will prepare to make entry with an additional hose line to search the residence for possible occupants. The final two firefighters perform the role of Ladders and Ventilation. This means they'll place ladders up the wall and prepare to ventilate heat out of the roof.

One more unit would then arrive. From this unit, two firefighters will serve as a safety hose line for the interior crews. The remaining two firefighters will complete the Rapid Intervention team as per regulations. With 16 firefighters on the scene, the house would safely be entered and the fire successfully controlled. As noted earlier, entry can be made with four firefighters on scene, if there is no risk of entrapment or collapse and also when the 16 necessary are en route and arrival is known to be **imminent**.

In the event of a fire in a larger structure, like a strip mall containing several businesses, there is a requirement for 44 firefighters performing a variety of tasks.

Whether it is a residential home or a strip mall, the resources required in person power and equipment to fight a fire is much more than what the initial unit of career or volunteer firefighters have at their disposal. At minimum 16 firefighters are required for an interior attack on a fire where there is risk of collapse or entrapment. Proper resources help ensure that Greater Sudbury Fire Services upholds its mission to *"prevent the loss of life and minimize the loss of property to fire and other emergencies, natural or human generated"*.

The recommended response criteria in the NFPA Standards are: five minutes and twenty seconds (5:20) for urban areas, nine minutes (9:00) for suburban areas and 14 minutes (14:00) for rural areas. All of these time goals include an inherent chute or assembly time, which is the time from notification (dispatch for career and pager notification for volunteer) until the fire truck leaves the station. In career response areas, this chute time is recommended to be one minute and 20 seconds (1:20). There is no defined time in a volunteer area. The actual average chute time for Greater Sudbury Fire Services is one minute and 34 seconds (1:34) in the career response area, and five minutes and 48 seconds (5:48) in the volunteer response area, according to 2015 response time data. The map below demonstrates the real-time response data for the initial truck arrival, based on the assembly times as noted above, using 2015 data plus the required drive time. The green colouration identifies areas where trucks arrive within 5:20 minutes from dispatch time, yellow indicates a response time between 5:21 and 9:00 minutes, and red indicates a response time between 9:01 and 14:00. Areas outside of these colourations indicate response times longer than 14:00 minutes. The table below summarizes response time performance in 2015. See Appendix #T4 for further details.



Protection Area	Percent response LESS THAN 6 MIN	Percent response LESS THAN 9 MIN	Percent response GREATER THAN 9 MIN	Average # of Firefighters per Unit
Career	66.78%	83.66%	16.35%	4
Composite	50.03%	78.16%	21.83%	2.3
Volunteer	19.36%	50.57%	49.43%	2.8

See Appendix T7 for 2015 Average Response Time by Fire Beat.

In addition to response time, the number of firefighters arriving on the first truck to an incident is very important to ensure effective fire ground staffing and the safety of not only firefighters, but bystanders as well. NPFA Guidelines (Annex A) states that,

“the progression of a structure fire to the point of flashover (i.e. the very rapid spreading of the fire to due superheating of room contents and other combustibles) generally occurs in less than 10 minutes. Two of the most important elements in limiting fire spread are the quick arrival of sufficient personnel and equipment to attach and extinguish the fire as close to the point of origin as possible”.

The tables below (taken from NFPA 1710 - Annex A) provides data on losses to life and assets based on various stages of fire containment. As mentioned previously, the city core is serviced by four career stations which operate five trucks with four responders per truck at all times. This guarantees that all responses have initial staffing of four firefighters and that when necessary any incident can have a response of twenty firefighters on scene within the limitations of the response times.

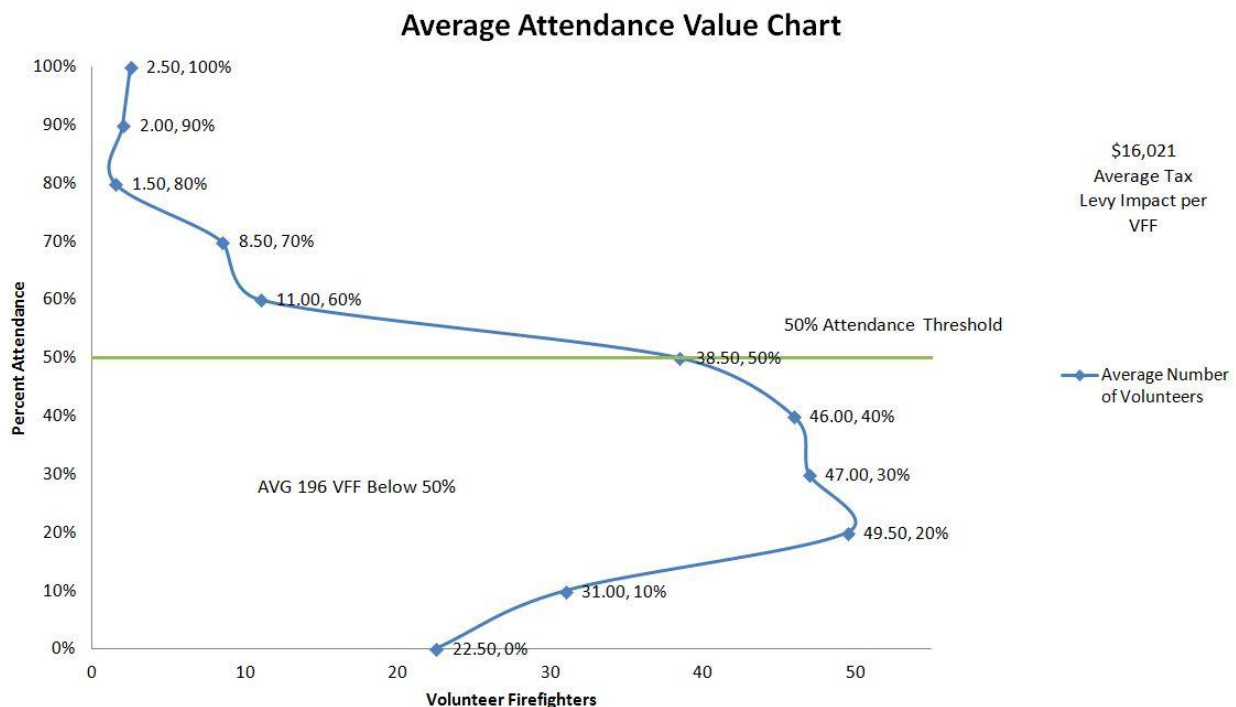
Extension	Rate per 1000 Fires		
	Civilian Deaths	Civilian Injuries	Average Dollar (US\$) Loss per Fire
Confined to room of origin	2.32	35.19	\$3,185
Beyond the room but confined to floor of origin	19.68	96.86	\$22,720
Beyond floor of origin	26.54	63.48	\$31,912

Extension	Rate per 1000 Fires		
	Civilian Deaths	Civilian Injuries	Average Dollar Loss per Fire
Confined fires or contained fire identified by incident type	0	10.29	\$212
Confined fire or flame damage confined to object of origin	0.65	13.53	\$1,565
Confined to room of origin, including confined fires and fires confined to object	1.91	25.32	\$2,993
Beyond the room but confined to floor of origin	22.73	64.13	\$7,445
Beyond floor of origin	24.63	60.41	\$58,431

The Val Therese Station in the former City of Valley East is a composite station staffed by both career and volunteer firefighters. As a minimum, two career firefighters on a single truck are posted at this station at all times ensuring that the first arriving vehicle will respond with that minimum number of firefighters. This response area is dependent upon a volunteer firefighter response to augment the guaranteed response for both the initial response (minimum of four firefighters) and the effective response (minimum of 14 to 16 firefighters). This volunteer response is not guaranteed and response times of volunteer firefighters vary and can result in a delay of the assembly time and overall fire ground staffing. Additionally, there is an effect on the rescue at the scene under a model that does not have a guaranteed full complement of four firefighters per truck, as four firefighters are required to perform initial rescue and attack activities.

The remainder of the city relies entirely on volunteer firefighters for initial truck response. When a call is placed, volunteer firefighters are paged to report to the fire station for assembly and deployment with a fire truck. There is currently no minimum number of volunteers identified to respond to incidents of any type and therefore, the initial truck may arrive with anywhere from a single firefighter, or a full complement of four, in any given incident. This system can result in a significantly delayed response of the initial four firefighter response and consequently the effective 14 to 16 firefighter large incident response.

It has been noted that incident attendance by volunteer firefighters is discretionary. They respond only when they are available. An analysis was completed to determine the additional volunteer firefighters required to meet a minimum response of 16 as outlined above. Using the 2016 average attendance rate of about 30%, it was determined that an additional pool of 747 volunteers would be needed at a cost of nearly \$12 million. This is equivalent to hiring 87 full-time career firefighters at an approximate cost of \$11.3 million. If response rates were to improve to 50%, Fire Services would need to hire an additional 320 volunteers at a cost of approximately \$5.1 million, the equivalent of 37 career firefighters at a cost of about \$4.8 million. This analysis only takes into account costs associated with the delivery of fire services (wages, protective equipment, WSIB contributions, and other). It does not include the cost of purchasing additional vehicles to transport the firefighters or the cost to enlarge stations where needed to store the additional protective equipment. Furthermore, the exposure to the potential liability from WSIB claims is higher in the model that relies on increased volunteer firefighters simply due to an overall larger staffing complement (total staffing of 1,165 versus 455 using the current 30% attendance rate). The graph below demonstrates the average incident attendance value based on 2016 attendance records. It shows the number of volunteers attending incidents at each percentage level. See Appendix #T4 for further details of this analysis.



First truck response by career firefighters occurs, on average, in less than six minutes 67% of the time in the city core and from the Val Therese composite station. Further, arrival on scene within nine minutes of a dispatch occurs 84% of the time. In the outlying areas, which are protected primarily by volunteer firefighters, response occurs on average within six minutes of dispatch about 25% of the time. Further, volunteer response occurs in less than nine minutes from time of page about 55% of the time on average. In 2016, seven volunteer stations took more than nine minutes to respond to a total of 342 incidents.

In the city core, there is a guaranteed immediate minimum response of four full-time career firefighters for every call. In the outlying areas protected primarily with volunteer coverage, the number of firefighters responding on the first truck ranges from 1.4 to 3.6 with the average being 2.7 firefighters. A complete table outlining average response capability for volunteer firefighters is provided in Appendix #T4.

Comparison of Services by Area Rated Taxation Boundaries

	<u>Career Stations</u> former City of Sudbury Full-time Stations	<u>Composite Station(s)</u> Val Caron, Val Therese and Hanmer response area only	<u>Volunteer</u> 16 stations
Proper fire ground staffing - industry best practice for interior fire suppression and entry requires 16 FFs on scene	guaranteed 22 Full- time FF response	guaranteed 2 full- time FF response - all others discretionary response	Discretionary volunteer response - data shows this response area rarely has a 16 + FF response - backed up by career response
Meets industry standard response times (5:20, 9:00, 14:00)	Yes	No - unless fully staffed with additional FFs	No
Attendance at training	100%	100% / 35%	34%
Medical Tiered Response	Yes	Yes	No except for Levack, Dowling and Capreol
Trench Rescue	Yes	Delivered by career (2018)	Delayed response by career only
Hazardous Material Response	Yes	Delivered by career (2018)	Delayed response by career only
Water and Ice Rescue	Yes	Delivered by career	Skead and Azilda plus delayed response by career in other areas
Fire Prevention	Yes	Delivered by career	Delayed response by career only
Public Education	Yes	Delivered by career	Delayed response by career only
Pre-incident Planning	Yes	Delivered by career	Delayed response by career only

The current modeling reveals that Greater Sudbury Fire Services provides fire response at three significantly different service levels across the city. The career service level is substantially compliant with public expectations and all standards and industry best practices. The composite service level is compliant in response time, but is non-compliant with staffing levels and public expectations, and the volunteer services level is inconsistent by its inherent nature and can operate below public expectations and industry best practices.

Protecting our Properties, Investments and Employment

An important concept in firefighting is that a fire department's main goal is to protect a community's property and infrastructure. This concept is self evident in all realms of the *three lines of defence* of firefighting, but it is obviously most associated with the fire response/suppression section.

In Ontario, the Municipal Property Assessment Corporation (MPAC) is responsible for classifying and assessing the value of all properties (see Appendix #T1 for assessment summary by category). These values are provided to the City of Greater Sudbury for municipal taxation purposes. The mission of Fire Services is to protect these properties, and the investment they represent. Therefore, an analysis of the MPAC value protected by Fire Services within the time criteria recommended by the NFPA is a direct measure of the efficiency of the service level provided to residents, businesses and industry in the city (see Appendix T6). An analysis of the data used to create the previous map was used to generate the following table, which identifies the MPAC valuation of properties currently protected by the career, composite and volunteer levels of response by the Greater Sudbury Fire Services.

Fire Response Coverage and Property Assessment Value – Current Model

Fire Response Times	5:20 minutes or less NFPA 1710		9:00 minutes or less NFPA 1720		14:00 minutes or less NFPA 1720		Coverage beyond 14 minutes	
	Properties Covered (%)	Assessed Value (billion \$)	Properties Covered (%)	Assessed Value (billion \$)	Properties Covered (%)	Assessed Value (billion \$)	Properties Covered (%)	Assessed Value (billion \$)
Current Model								
Career	35%	\$ 7.487	48%	\$ 10.428	61%	\$ 12.711	0%	-
Composite	5%	0.849	12%	1.902	15%	2.288	0%	-
Volunteer	1%	0.085	9%	1.166	18%	2.488	0%	-
Beyond 14 minutes	0%	-	0%	-	0%	-	6%	0.936
Total	42%	\$ 8.421	69%	\$ 13.496	94%	\$ 17.487	6%	\$ 0.936

In total, the City of Greater Sudbury had a 2015 MPAC valuation of nearly \$18.5 billion. Fire Services is able to respond within 5:20 minutes to about 42% of the MPAC valuation (approximately \$8.4 billion). An additional 27% (approximately \$5 billion) can be responded to within the 5:21 to 9:00 minute, and a further 25% (approximately \$4 billion) in the 9:01 to 14:00 minute response time. In combination with the previous map, this information demonstrates that fire protection meets industry best practices for first truck arrival for a significant portion of the city core (NFPA 1710) within the city core (Former City of Sudbury), however, the response in the outlying areas requires improvement.

The above simply identifies overall protection of all properties with no consideration for differences in risk. In order to identify locations of highest risk, Fire Services has performed a Community Risk Profile (CRP) which identifies the size, type and location of the high hazard buildings throughout the community. This detailed breakdown is provided in the CRP analysis below.

Fire Prevention and Education

Fire Services currently has six Fire Prevention Officers, who perform request inspections, complaint inspections, and annual vulnerable occupancy (for example retirement homes and long-term care facilities) inspections. In 2016, Fire Prevention Officers conducted 1,085 inspections and reviewed 537 building permits along with 27 site plans specific to Ontario Fire Code compliance. The 2016 Fire Underwriter's Survey (FUS) reviewed the operation of Fire Services and identified Fire Code enforcement as an area that has significant opportunity for improvement.

Noted earlier, FUS ratings are provided to insurance companies, of which approximately 90% use to set base insurance premiums for residential and commercial properties. FUS recommends that scheduled inspection of high risk occupancies should include regular visits to theatres, clubs, churches, hotels, restaurants, schools, jails, apartment buildings, gas stations, warehouses, paint booths and a variety of retail occupancies. Currently, Fire Services does not schedule or perform any annual inspections on these types of commercial, industrial or high occupancy residential properties.

Using the recommended FUS threshold for frequency of commercial, residential, assembly, and industrial occupancies (see Appendix #R1), Fire Services has generated the following table. The table identifies the total person hours required for the inspection of these identified properties, as well as the total person years. It has identified a total of about four person years as the required staffing to meet these recommended thresholds.

Fire and Paramedic Optimization Report

Occupancy Description (Building Code Occupancy)	Total # of Occupancies	Lines of Insurance	Hours per Initial (H)	Total Hours (T) (#xH=T)	Frequency (F) (1=annual) (0.5=every 2 yrs) (0.33=every 3 yrs)	Total Inspection Days (TD) Tx F/7	Total Person Years (TPY) TD/168	Number of Inspections if Risk Matrix Followed
Assembly Occupancies (A)	268	Commercial	1.0	268.0	1.0	38.3	0.2	268.0
Assembly >150 (A)	20	Commercial	2.0	40.0	1.0	5.7	0.0	20.0
Assembly >300 (A)	15	Commercial	3.5	52.5	1.0	7.5	0.0	15.0
Night Clubs (A2)	10	Commercial	2.0	20.0	2.0	5.7	0.0	20.0
Elementary Schools (A2)	87	Commercial	3.0	261.0	1.0	37.3	0.2	87.0
High Schools (A2)	10	Commercial	4.0	40.0	1.0	5.7	0.0	10.0
Daycares (A2)	78	Commercial	3.0	234.0	1.0	33.4	0.2	78.0
Hospitals (B2)	3	Commercial	80.0	240.0	0.5	17.1	0.1	1.5
B1	3	Commercial	4.0	12.0	1.0	1.7	0.0	3.0
B2	57	Commercial	3.0	171.0	1.0	24.4	0.1	57.0
B3	51	Commercial	2.5	127.5	1.0	18.2	0.1	51.0
Rooming Houses/Group homes (B3)	37	Commercial	2.0	74.0	1.0	10.6	0.1	37.0
Residential Mid Rise - up to 6 storeys (C)	196	Commercial	2.0	392.0	0.5	28.0	0.2	98.0
Residential High Rise - more than 6 storeys (C)	20	Commercial	4.0	80.0	0.5	5.7	0.0	10.0
Hotel, High (C)	0	Commercial	5.0	0.0	1.0	0.0	0.0	0.0
Hotel, Mid (C)	42	Commercial	4.0	168.0	1.0	24.0	0.1	42.0
Business, Personal Serv. Mercantile (D/E)	327	Commercial	1.0	327.0	0.3	14.0	0.1	98.1
High Hazard Industrial (F1)	608	Commercial	4.0	2432.0	1.0	347.4	2.1	608.0
Med Hazard Industrial (F2)	87	Commercial	3.0	261.0	0.5	18.6	0.1	43.5
Low Hazard Industrial (F3)	85	Commercial	2.0	170.0	0.5	12.1	0.1	42.5
Total: 3.9 Person Years								

Note that the recommended inspection schedule's time commitment is based upon inspection time alone, and does not include additional employee time allocations such as travel time, administrative duties, education/training, nor absences due to vacation or illness. Currently all inspections are conducted by Prevention Officers. There may be an opportunity for front-line firefighters to be tasked with providing some initial inspection information for specifically identified buildings to reduce the amount of time needed specifically by Prevention Officers to conduct an inspection. Administration may also consider balancing the frequency of inspections against the identified workload and expectations of FUS.

Fire Services has one Public Safety Officer who is tasked with providing targeted fire safety education programs to the most vulnerable members of the population: school-aged children and the elderly. In Greater Sudbury, there are 97 schools and 186 registered vulnerable occupancies (for example retirement/long-term care facilities, and care and treatment occupancies). The Public Safety Officer has the significant task of identifying, designing and presenting the public fire safety message to the students and residents in these facilities.

In summary, Fire Services currently provides the minimum fire prevention and education components however these services are not delivered consistently across the city. Providing these services at the recommended levels are known to help reduce the probability of a fire occurring, and if by chance one finds themselves involved in a fire, they are better prepared to react effectively to reduce the chance of injury to those involved. These are key components of improving community safety and awareness levels.

Technical Rescue

As per the Establishing and Regulating By-law 2014-84, Fire Services currently offers the technical rescue services of auto extrication, water and ice rescue, and low-angle rope rescue. The frequency of these types of incidents varies from frequent (auto extrication) to somewhat infrequent (ice rescue). Regardless of frequency, the consequence of these incidents, when serious, is high as these incidents are almost always life threatening if not responded to quickly with strategically located staff and equipment.

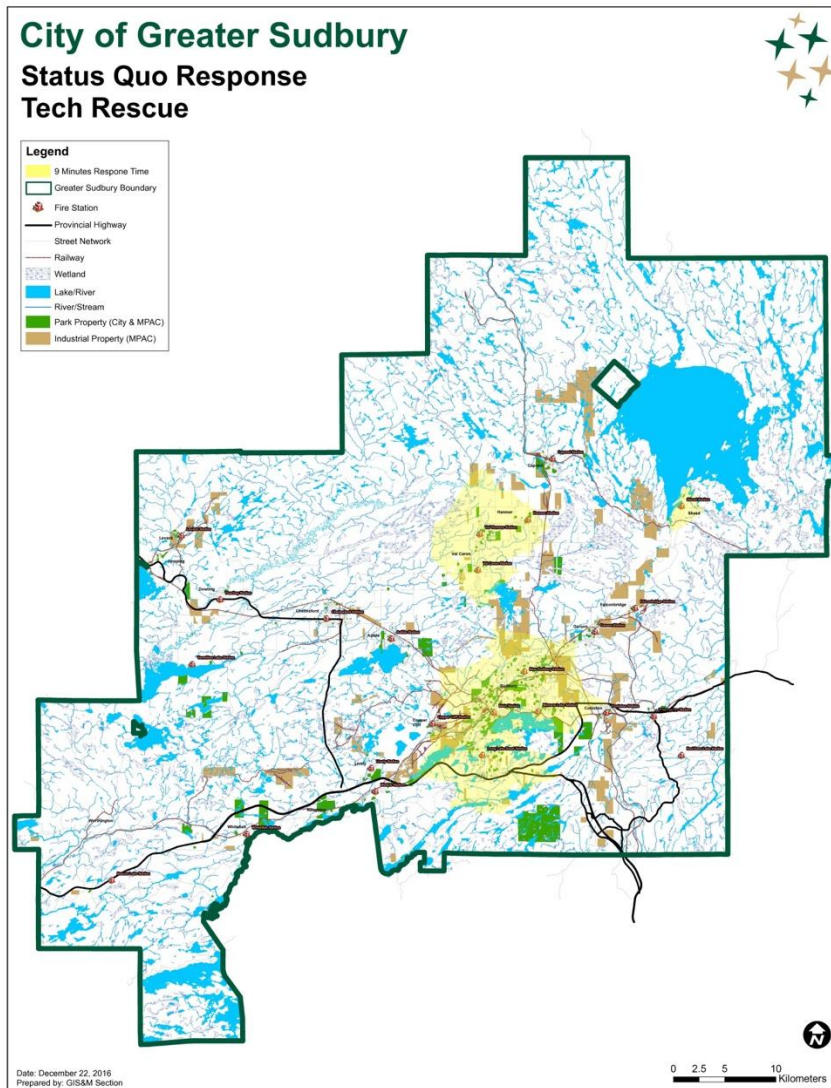
Auto extrication is offered from 13 stations (a mix of career, composite and volunteer stations). The only compromise to consistent service delivery across the city is related to the response time spectrum from the various stations as noted in the Fire Service 2015 Response Time Map above (see Appendix #M3).

Low angle rope rescue consists of assisting in patient extrication using rope, where the majority of the load is not supported by the rope, such as rescuing an unconscious person being carried on a stretcher on a hillside. Due to the geography and topography of the city, this service is offered throughout the community under the same response time limitations as above.

Water and ice technical rescue is provided by all career stations, the Val Therese composite station, and volunteer stations in Azilda and Skead at an enhanced level. This enhanced level speaks to additional training to the firefighters in these stations, and the additional equipment to perform these types of rescues, such as boats, personal floatation devices, ropes and harnesses. These types of rescue are offered elsewhere at an awareness level (shore-based rescue). Given that Greater Sudbury is known as a City of Lakes by virtue of containing more lakes than any other municipality in Canada (330 freshwater lakes over 10 hectares in size), water rescue service levels do not align with the risks associated with in the community. Lake Wanapitei is the largest city-contained lake in the world at 13,257 hectares and Ramsey Lake is the second largest. In 2009, approximately 7,000 people or 4% of the city's population lived on a lake and many others have camps and cottages on the city's lakes, not to mention the tourist activities that the city lakes attract⁴.

The response capability of Fire Services for water and ice technical rescue is identified on the map below (see full size map in Appendix #M4). Once again, the response time is based upon 2015 data for average assembly time, plus the required drive time. The yellow polygons on Map 2 indicate a nine minute response time for water and ice technical rescue based on response from the stations containing trained firefighters for this type of rescue. The intense concentration of blue (water) on this map demonstrates the vast network of lakes and rivers which are spread across the entire City of Greater Sudbury. The map also details industrial properties, railways, major highways and utility rights of way, further reinforcing that the service level offered to the community for all technical rescue does not align with the distribution of risk.

⁴ Greater Sudbury Key Facts. Retrieved March 7, 2017 from <https://www.greatersudbury.ca/living/about-greater-sudbury/key-facts/location/>



Fire Services is currently considering, in cooperation with Water/Wastewater Services, the implementation of confined space and trench rescue responses which have been identified as a need under the Occupational Health and Safety Act, Regulation 632/05, Confined Space. The risk profile for trench rescue and confined space rescue focuses on roadways and right-of-ways used for utility delivery, and other industrial properties spread throughout the city, as identified on the map above. These services are not currently offered by Fire Services, however, a Budget Enhancement was approved by Council for 2017. Due to the training commitment associated with these evolutions, delivery of these services will be limited to career firefighters at the present time.

It is important to note that Fire Services is the only agency within the city that offers these technical rescue services to the community. There are some other agencies that provide stand-by services but rescue services fall entirely within the purview of Fire Services.

Hazardous Materials (HAZMat) Response

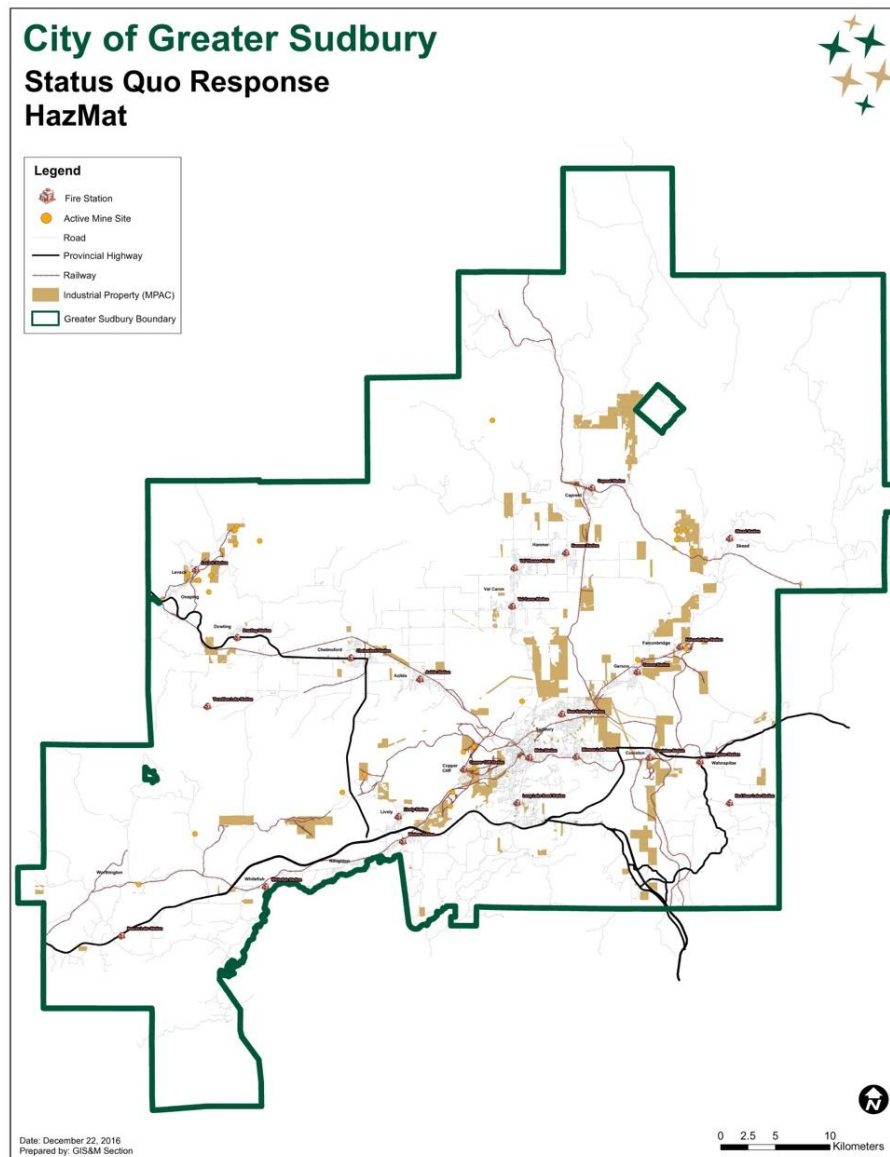
As per the Establishing and Regulating By-law 2014-84, Greater Sudbury Fire Services currently offers HAZMat response at the Awareness level (Awareness being the lowest level), throughout the city. The By-law identifies that Fire Services offers decontamination line services to agencies that may respond in order to mitigate any incidents in the city. This HAZMat training has only been provided to career firefighters. The department has the equipment as well, but requires the enhancement in order to properly protect the city for the hazards that exist. The City's Hazard Identification and Risk Assessment (HIRA) has identified HAZMat incidents as the highest risk incidents which could cause an emergency declaration for the community as a whole. The frequency of these types of incidents varies from frequent small spills to somewhat infrequent large spills and transportation emergencies, however, the consequence of these incidents, when serious, is extremely high, with a great possibility of being life threatening to entire neighbourhoods. Furthermore, HAZMat incidents can have serious community-wide impact to the infrastructure, environment, economy, and reputation of the City of Greater Sudbury.

The City's HIRA has also identified that the level of service provided by Fire Services is low and does not align with the identified risk in the community. Greater Sudbury has significant industrialization related primarily to the mining, milling and smelting of base metals which is the backbone of the local economy. Large quantities of chemicals needed for industrial manufacturing and processing are delivered into, out of and through the city by way of the three high volume railways and three major highway corridors, including the TransCanada Highway. In the first half of 2016, about 10,000 railcars (or 1.25 million barrels) of crude, oil and gas passed through Greater Sudbury just by rail alone. The amount of hazardous materials that are transported by road remains unknown as transportation companies are not required to report to municipalities the type or volumes of hazardous materials that are shipped through or around our city by road. Over the past three years, Greater Sudbury has experienced two train derailments with at least three major derailments having occurred just outside the city borders. Lastly, Transport Canada had identified that the Greater Sudbury area has nine of the top 500 highest risk railway crossings in Canada.

In Greater Sudbury, there are 733 industrial businesses which correlate to approximately 452 businesses per 100,000 of population. For comparison, the City of Ottawa has 236 industrial businesses per 100,000 and the City of Toronto has 446 per 100,000. Greater Sudbury currently supports an awareness level for HAZMat response, whereas the aforementioned two largest cities in the province while having a lower concentration of industrial businesses have a higher level of response (Technician Level). Given the high volume of industrial and mining activity in the city, it is no surprise that significant quantities of hazardous materials are also stored in warehouses within the city, with constant shipments throughout town for use in various manufacturing and industrial facilities. By nature of Greater Sudbury's industry, the risk of hazardous material spills in the community is extremely high and Fire Services should be better prepared to respond.

Many of the above noted risks can be generally identified by the location and concentration of these facilities (mine sites, industrial parks, warehouses, and other) in the community. These risk areas are

identified on map shown below (see full size map in Appendix #M5). As noted above, Greater Sudbury Fire Services responds to emergencies involving these risks at the awareness level, which means the provision of basic scene security, such as erecting barricades. A request for assistance would then be made from Ottawa or Toronto Fire Services. As Ottawa and Toronto have a technician level response, they may actively participate in mitigation of the HAZMat emergency. In Greater Sudbury, mitigation, clean up, and remediation would need to be led by agencies requested from outside of the city and Fire Services would be available for support only.



Medical Tiered Response (MTR)

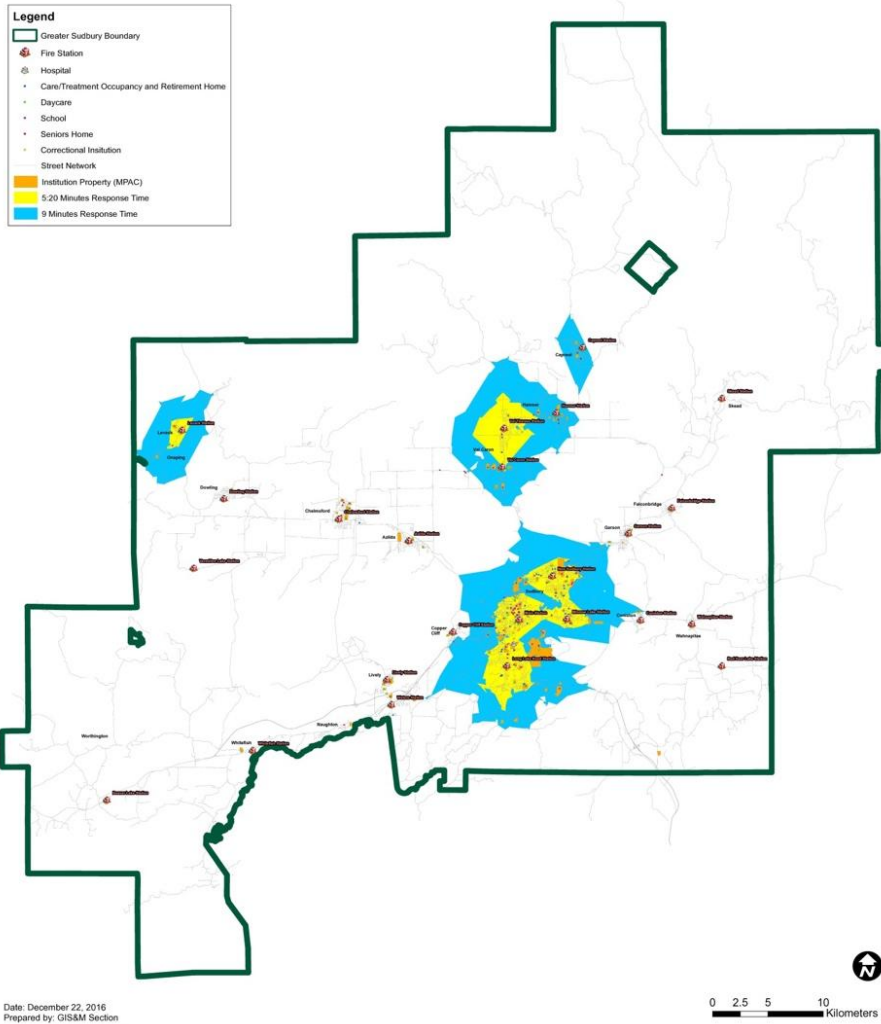
As per the Establishing and Regulating By-law 2014-84, Greater Sudbury Fire Services currently offers Medical Tiered Response (MTR) at the Emergency First Responder level. MTR is the act of Fire Services supporting Paramedic Services by responding to high priority calls such as heart failure and

unconsciousness when ambulances are unavailable to respond. This support by firefighters enhances service capacity in areas with high emergency response call volumes or in areas where service levels fluctuate due to unpredictable nature of emergency response. It is not meant to take away from paramedic responsibility. This means that firefighters could provide basic first aid, cardiopulmonary resuscitation (CPR), and rapid application of an automated external defibrillator (AED) when paramedics are not immediately available. They would continue to medically support patients only until the arrival of paramedics. MTR is currently provided by city core career stations, the Val Therese composite station, and the Capreol, Dowling and Levack volunteer stations. None of the remaining stations offer this type of response.

In 2015, Fire Services responded to almost 800 calls for medical assistance, which constitutes 18% of the total call volume. The frequency of these types of incidents is significant, and the consequence is high as the MTR Agreement outlines that Fire Services response is limited to incidents that are almost always life threatening when not responded to immediately. Fire Services offers this service in support of Greater Sudbury Paramedic Services when paramedics are otherwise preoccupied by other medical emergency calls or when a larger team of professionals would yield beneficial results in patient care. Fire Services is not the primary agency for medical response as MTR is meant to represent a depth of service for medical response to patient in need.

The following map details the response polygon for MTR as well as the location of occupancies which generate the highest frequency of incidents (see full size map in Appendix #M6). The yellow polygons indicate a 5:20 or less response time and the blue polygons indicate a 5:21 to 9:00 minute response time from those stations which have been trained for MTR.

City of Greater Sudbury Status Quo Response Fire MTR



It is important to recognize that Greater Sudbury Paramedic Services is the primary response agency for medical emergencies and that Paramedic Services offers a consistent level of service throughout the city, including single ambulances located in each of the identified communities. Greater Sudbury Fire Services medical tiered response provides primary coverage when an area's ambulance is responding to an incident and an additional ambulance is on route to backfill the coverage.

The table below provides a breakdown of the number of vulnerable occupancies and the response capability of Fire Services. As shown on the above map, there are a significant number of areas that do not have protection within a nine minute response. It is also noted that there are significant community risks such as schools, daycare centers, and old age/senior care facilities in the former communities of Rayside Balfour, Walden and Nickel Centre that are not currently being protected by Fire Services medical tiered response.

Number of Vulnerable Occupants

Category	Area	MTR			Total
		5 min	9 min		
# of Schools	Core	36	10	0	46
	Levack	1	0	0	1
	Val Therese	3	12	0	15
	Capreol	0	1	0	1
	Outside	0	0	21	21
	Total	40	23	21	84
# of Senior Homes	Core	28	2	0	30
	Levack	1	0	0	1
	Val Therese	0	5	0	5
	Capreol	0	2	0	2
	Outside	0	0	13	13
	Total	29	9	13	51
# of Hospitals	Core	1	0	0	1
# of Daycares	Core	41	6	0	47
	Levack	1	0	0	1
	Val Therese	3	8	0	11
	Capreol	0	1	0	1
	Outside	0	0	19	19
	Total	45	15	19	79
# of Correctional Institutions	Core	1	1	0	2
	Total	1	1	1	2
# of Care and Treatment Occupancies and Retirement Homes	Core	37	8	0	45
	Val Therese	2	3	0	5
	Outside	0	0	7	7
	Total	39	11	7	57

Prepared by the GIS&M Section, City of Greater Sudbury, January 17, 2017

Outside of the vulnerable facility listing, the 2011 Census shows that Greater Sudbury has 72,418 dwellings with a population of 160,269. Understanding that MTR is also utilized in private homes, Table 2 details the current ability Greater Sudbury Fire Services has to respond to private dwellings within five and nine minutes. This shows that just over 20,000 dwellings occupied by approximately 49,000 residents are not served by MTR.

Dwellings and Population

Dwellings #	MTR			Total
Area	5 min	9 min		
Core	30,339	11,535	-	41,874
Levack	487	430	-	917
Val Therese	2,888	4,883	-	7,771
Capreol	-	1,418	-	1,418
Outside	-	-	20,438	20,438
Total	33,714	18,266	20,438	72,418

Population #	MTR			Total
Area	5 min	9 min		
Core	58,942	26,419	-	85,361
Levack	1,036	1,006	-	2,042
Val Therese	8,218	12,380	-	20,598
Capreol	-	3,276	-	3,276
Outside	-	-	48,992	48,992
Total	68,196	43,081	48,992	160,269

SOURCE: 2011 Census of Canada, Statistics Canada

Prepared by the Community and Strategic Planning Section, City of Greater Sudbury, January 17, 2017

The above analysis of the service types and levels currently being provided by Greater Sudbury Fire Services demonstrates that services are currently being rendered in an inconsistent fashion and a significant opportunity for improvement exists.

Community Comparison

A review of current service levels would not be complete without a review of comparators. The City of Greater Sudbury is somewhat unique in that there is no singular comparator that mirrors all aspects inherent to the City of Greater Sudbury. Being so large in geography with pockets of population and unique hazards it is hard to find comparisons from a single community, so we must examine a variety of communities that have some, but not all, of Greater Sudbury's characteristics. A review of 12 other cities within the province was undertaken in an attempt to compare and contrast levels of service. A full table detailing the comparator communities can be found in Appendix #T6. The 12 comparators are:

- Barrie
- Burlington
- Chatham-Kent
- Hamilton
- Kingston
- London
- Mississauga
- Niagara Falls
- Ottawa
- Richmond Hill
- Thunder Bay
- Windsor

Many aspects of these comparator cities were reviewed including population, land area, population density, amount of dwellings and assessed value of property. Of greatest interest was a review on the basis of ratios utilizing career fire fighters as one of the data points.

It must be noted that to use the measure of career firefighter only is appropriate in these comparisons as the career model is the only one that guarantees a response. While many of the City of Greater Sudbury's communities are covered primarily by a volunteer response, a career response is always sent for an emergency involving a working fire or smoke emanating from a building. With no minimum attendance standard for volunteer firefighters it would be unfair to allocate the uncertain level of participation in relation to protection. As such, all volunteer firefighter numbers were excluded not only from Greater Sudbury's numbers, but also from any comparator that had volunteer staffing. Additionally, when it comes to the full gamut of firefighting performance, career firefighters regularly train in different techniques including specialized response skills and also perform in the community during the course of their normal daily duties. Areas involving education and pre-incident planning are part of the career, full-time duties.

The first analysis reviewed pure city population. The following table reveals Greater Sudbury's position in relation to career firefighters to the area's population. Ranking 12th out of 13 in protection of the population on a per career firefighter basis places Greater Sudbury near the bottom of the list. While ranked 12th in the per firefighter ratio, the City of Greater Sudbury ranks as the 8th largest in population. Being the 8th largest in actual population and 12th per capita is inconsistent and suggests Greater Sudbury Fire Services must be operating at a more efficient level, or is providing a different level of service. As this review illustrates, the latter is more applicable.

Protection of Population			
Rank	City	Total Population	1 Career Firefighter:Population
1	Thunder Bay	170,909	562
2	Niagara Falls	88,071	759
3	Windsor	217,188	839
4	Barrie	141,434	982
5	Kingston	123,798	1,032
6	Burlington	183,314	1,066
7	Ottawa	934,243	1,081
8	London	383,822	1,129
9	Hamilton	536,917	1,147
10	Mississauga	721,599	1,171
11	Richmond Hill	195,022	1,393
12	Greater Sudbury	161,531	1,496
13	Chatham-Kent	101,647	1,564

Next a review of protection of dwellings was performed by taking the total number of dwellings in each community and dividing again by the number of career firefighters. Falling 12th out of 13, Greater Sudbury is again near the bottom on a per career firefighter basis even though Greater Sudbury ranks 6th in terms of overall dwellings. This finding is once again misaligned in that the apparent level of protection does not match the overall quantity of what is being protected.

Protection of Dwellings			
Rank	City	Total Dwellings	1 Career Firefighter:Dwellings
1	Thunder Bay	50,388	262
2	Niagara Falls	37,265	321
3	Barrie	54,227	377
4	Windsor	97,777	378
5	Mississauga	248,469	403
6	Burlington	772,535	422
7	Ottawa	395,985	458
8	Richmond Hill	66,465	475
9	Hamilton	227,918	487
10	Kingston	59,977	500
11	London	175,558	516
12	Greater Sudbury	75,029	695
13	Chatham-Kent	46,103	709

Protection of overall property value assessment was also reviewed. Being 7th overall in assessed value of the property within the 13 cities, Greater Sudbury ranks 9th on a per career firefighter basis. This is better in terms of alignment however the fire protection being provided by Greater Sudbury Fire Services once again falls short, albeit only minimally in this case.

Lastly, comparisons on the protection of the city's overall economy was performed by looking at values in commercial and industrial properties.

Protection of Property (based on assessment value)			
Rank	City	Total Property Value (\$ Billion)	1 Career Firefighter: \$ Million
1	Thunder Bay	\$10.0	\$52.3
2	Windsor	\$16.8	\$65.0
3	Niagara Falls	\$10.7	\$92.0
4	Barrie	\$17.8	\$123.4
5	London	\$42.7	\$125.7
6	Ottawa	\$117.3	\$135.7
7	Hamilton	\$66.1	\$141.2
8	Kingston	\$17.2	\$143.5
9	Greater Sudbury	\$18.4	\$170.6
10	Chatham-Kent	\$11.8	\$180.8
11	Burlington	\$36.5	\$212.2
12	Mississauga	\$143.2	\$232.5
13	Richmond Hill	\$45.1	\$322.0

Protection of Commercial Property			
Rank	City	Total Property Value (\$ Billion)	1 Career Firefighter: \$ Million
1	Chatham-Kent	\$0.9	\$8.0
2	Thunder Bay	\$1.4	\$12.6
3	Greater Sudbury	\$1.9	\$17.5
4	Kingston	\$2.2	\$20.7
5	Niagara Falls	\$2.5	\$22.9
6	Barrie	\$2.5	\$23.2
7	Windsor	\$2.5	\$23.4
8	Richmond Hill	\$3.6	\$33.2
9	London	\$4.3	\$39.6
10	Burlington	\$4.6	\$42.4
11	Hamilton	\$5.7	\$52.4
12	Ottawa	\$25.1	\$232.0
13	Mississauga	\$25.1	\$232.6

Protection of Industrial Property			
Rank	City	Total Property Value (\$ Million)	1 Career Firefighter: \$ Million
1	Thunder Bay	\$ 128.84	\$ 0.7
2	Niagara Falls	\$ 102.08	\$ 0.9
3	London*	\$ 409.62	\$ 1.2
4	Kingston	\$ 158.89	\$ 1.3
5	Ottawa	\$ 1,377.25	\$ 1.6
6	Chatham-Kent	\$ 124.78	\$ 1.9
7	Windsor	\$ 518.62	\$ 2.0
8	Hamilton	\$ 1,082.53	\$ 2.3
9	Barrie	\$ 336.40	\$ 2.3
10	Greater Sudbury	\$ 453.69	\$ 4.2
11	Richmond Hill	\$ 605.50	\$ 4.3
12	Burlington	\$ 985.93	\$ 5.7
13	Mississauga	\$ 5,298.11	\$ 8.6

The comparison was interesting when it came to commercial and industrial property evaluation. Each comparator lined up in order in both total value and per firefighter categories. What this assessment truly revealed was that Greater Sudbury has a great deal of value in Industrial assessment. With \$454 million in assessed industrial value in Greater Sudbury it is apparent that industry is an important economic driver in the city. Understanding that it is Fire Services' responsibility to protect a city's infrastructure and economy, these are important items to note.

Key messages of this section:

- *Fire service delivery is partly regulated by the province in that they are mandated to provide fire education and fire prevention, and that each municipality's city council must establish standards for fire suppression delivery in their community to address local risks and needs.*
- *Fire stations, staffing and equipment were established to protect individual communities prior to amalgamation and have not been adjusted to protect the entire community of Greater Sudbury as a single, integrated and cohesive department.*
- *FUS is a third party organization that evaluates fire service departments across Canada based on best practice standards established by the National Fire Protection Association (NFPA) to determine their effectiveness in protecting communities and keeping them safe. FUS identified a number of areas where service delivery was below standard, which would be expected to result in increased insurance premiums being charged to residents and businesses of the community for the fire portion of their rates.*
- *Fire Services has been underfunded for many years and requires a significant investment in the service to meet NFPA standards and guidelines followed by fire departments around the world.*
- *Fire Services faces numerous challenges, some of which are quite significant and could cause grave financial hardship in a short period of time.*
 - *A large funding shortfall exists for the replacement of aging vehicles and major equipment as well as repairs and renewals to old stations that are reaching the end of their life cycles and many of which are showing signs of impending failure.*
 - *Poor participation and delayed response in volunteer protected areas poses a high risk for the occurrence of large damaging incidents in some areas of the city. This is especially true in those areas where significant population and commercial growth have occurred in recent years, such as the Chelmsford, Garson, Lively and Valley East communities.*
 - *The city lacks enhanced training and service delivery that would be expected in a community of our size and with the hazards that exist in our resource-based industrial economy. These include specialized response for: hazardous material, trench and confined space emergencies.*
 - *Fire Services only protects about 70% of the value of the properties in the city in a timely manner (based on industry best practices), and services are delivered inconsistently across the city, as well as within each service delivery area (career, composite, volunteer).*
 - *Current staffing does not provide enough resources to complete fire prevention and education duties recommended in NFPA industry guidelines (such as inspections and fire safety programming) which puts our community at risk of: experiencing an increased number of incidents; delays in interior attack for structures where specific hazards are unknown; and endangering firefighters who may respond to high risk occupancies unknowing that hazards may exist.*

RISK ANALYSIS

What you will learn in this section:

- *What is a Community Risk Profile?*
- *Understanding of where high risk properties exist in the City of Greater Sudbury*
- *Understanding of the response capability of Fire Services to respond to incidents at high risk properties*
- *Understanding of the business risks for Fire and Paramedic Services as analyzed by the City's Auditor General's Office*

Greater Sudbury Fire Services Community Risk Profile

The Fire Services mission is to respond to community risk as exemplified by the people, buildings, infrastructure, geography, and economy contained within. The assessment of the level of this risk within a given municipality is known as the Community Risk Profile (CRP). The community risk profile, in conjunction with the City of Greater Sudbury's Hazard Identification and Risk Assessment (HIRA) Report and the Fire Underwriter's Survey (FUS) Report (see Appendix #R1), has identified the residential, commercial and industrial areas of the city with the highest risk of potential emergency incidents. It has also identified that the services currently provided are not in place to mitigate these identified risks; and further, that they are not provided in a consistent manner across the city.

Like Paramedic Services, Fire Services is also exposed to the business continuity risk inherent in its own operation. These internal risks represent a concern which can be equally as serious and consist of such things as the service's reputation, ongoing fiscal stability, legislative demands and exposure to civil litigation. The analyses of these internal risk items have been quantified in cooperation with the Auditor General's Office within an Enterprise Risk Register (ERR) to demonstrate the current risk mitigation strategies, and assess the impact of Optimization on these risks.

A Community Risk Profile (CRP) is derived as a result of a community risk analysis. It provides an assessment of the hazards or dangers which may affect persons, properties and the economy within a community. The analysis includes several factors, including the exposure to natural and man-made disasters, the building risks due to age and occupancy type, population density and demographics, and exposure to hazardous materials and technical rescue situations.

Identification of community risk provides a basis for determining effective resource allocation and service provision. Essentially, the more probable and consequential the risk, the greater the need is for a plan to mitigate the event if the risk becomes a real problem. The CRP analysis also takes into account the ability of Greater Sudbury Fire Services to respond to these risks, based on factors identified in the analysis, such as weather conditions, road network layout and congestion, and existing station location and staffing profile. An analysis of the City of Greater Sudbury's community risk was undertaken in an effort to assess the community risk level, evaluate the current response, and match the appropriate initial response, and effective total necessary response to an emergency incident.

The City of Greater Sudbury, from a fire service perspective, is divided into five districts, and 24 fire beats each centered on a given station. For the purposes of the CRP, the city is further divided into 37 Fire Response Zones (FRZ). Greater Sudbury Fire Services adopted the community borders, as defined in the *Community Profiles*, which were developed through the City's Healthy Communities Initiative Strategy, to generate the Fire Response Zones (FRZs) to be used in the analysis. The borders of these *Community Profiles* and the resultant Fire Response Zones are determined based on information from the Planning Department and related Census Data. To view a map of all FRZs for Greater Sudbury see Appendix #M16. These FRZs do not represent individual response areas, and are not intended to represent borders to response. Their sole intent is to analyze the risk present within a defined area. These zones allow for a very detailed analysis from a risk perspective, with an opportunity to identify specific buildings, occupancies, infrastructure and geographic features that present a unique hazard not only to the community, but to the responders tasked with protecting them. Response to a building in a FRZ in any fire district is designed to be inclusive, and includes all of the resources necessary from all responding stations.

A geographical analysis of the city reveals that the population density overall is 0.5 persons per hectare (P/Ha). Population density is an important factor from a risk perspective, and the National Fire Protection Association (NFPA) has identified it as a key indicator for setting the response standard in a community. Obviously, the city's population is not evenly distributed, so it is important to identify and analyze each of the various hubs (communities) to determine their individual population density. Once these are identified, it is then recommended that similar communities receive similar response standards.

The CRP identifies natural and human-made disasters most likely to threaten the city in conjunction with the provincially mandated Hazard Identification and Risk Assessment (HIRA) which is updated annually. The CRP analyzes the community and Fire Services in a thorough manner, including;

- Climate and weather hazards and the impact of weather events on response;
- Current and future city road networks and the hazards and response challenges associated with them;
- Rail network and highway shipping hazards based on load characteristics and amounts; and the impact on response to rail events, and the traffic disruption characteristics of the rail crossings in the city;
- Critical infrastructure in the city, and the response challenges they represent;
- The city's exposure to wildland fires at the urban/rural interface;
- The building stock age, condition, construction, use and fire protection systems;
- The water supply from the seven municipal water systems, in addition to the access to water from fixed drafting locations in the non-hydrant serviced areas of the city;
- The water flow needs for high-risk residential, industrial, institutional, and commercial properties;
- Future growth areas, current and future land use, and neighbourhood and industrial park areas;
- Community demographic profiles and population density;

- Service type demands, and incident frequency and impact;
- Identified high risk areas for the four fire response types; fire, technical rescue, hazardous materials, and medical assist;
- Critical task identification for service delivery;
- Station location analysis for current stations, and recommendation criteria for integration, closure, and/or relocation and new construction.

Analysis of these and other factors has identified that the current Greater Sudbury Fire Services operations have several deficiencies in its capacity to respond. Many of the issues earlier were assessed as high risk.

Primarily, the response to hazardous materials (HAZMat), given the exposure the city has due to its large industrial economy, was found to be inadequate. Fire Services has a responsibility to protect Greater Sudbury as the *Hard Rock Mining Capital of the World* and *Global Leader in the Mining Supply and Services Industry* as identified and endorsed in *From the Ground Up: A Community Economic Strategic Plan*. Additionally, the service level delivery for Technical Rescue (auto extrication, water, ice, confined space, trench, rope rescues) was found to be inadequate and/or inconsistent in the various areas of the city, based on the risk factors present. Lastly, the fire response analysis identified a large variability in response between the career, composite, and volunteer areas, beyond the built-in delay aspect of the volunteer response system.

The career response area was found to align with industry standards in arrival time, initial vehicle staffing, effective firefighting force staffing and arrival time. Meanwhile, the composite and volunteer response areas are not currently in compliance with any of these response criteria, when judged against industry best practice or recommended standard setting bodies. Attendance for both training and incidents in the volunteer (and composite) areas was found to be substandard, resulting in a response model which does not align with the suburban communities where there is a large exposure to high risk type buildings, most notably in Chelmsford, Lively, Val Caron and Garson.

These four communities are not only the primary suburban towns in their respective fire districts, but also contain a concentration of high risk properties. These communities have the ability to serve as efficient, central response locations to service the high risk properties within their entire district. The Medical Tiered Response service offered by Fire Services was found to exhibit similar variances, with career and composite response generating notable impact, and response in the volunteer areas offering the service (Capreol, Dowling and Levack) providing value, within the limitations imposed by the built-in delay in response.

The station location analysis undertaken as part of the CRP was of particular importance in light of the Optimization Project. The findings confirmed those identified by the FUS in their analysis to update the Public Fire Protection Classification (PFPC) and Dwelling Protection Grade (DPG) numbers for the city. All the findings point to several stations being in the wrong location, with some providing an overlap of service creating an unnecessary level of redundancy. The table below provides information about each fire response zone that was used for the analysis that follows.

Fire Response Zones

(FRZ)	Community	Population (2011)	Pop. Density P/Ha	MPAC Assessed Value (2016) (Millions)	# of High Risk Properties	Total # of properties	% of High Risk Properties
FRZ 1	Downtown	2,717	15.22	497.3	107	732	14.6%
FRZ 2	Kingsmount	4,688	15.86	491.3	40	1,764	2.3%
FRZ 3	South End	17,443	4.83	2,944.20	123	5,756	2.1%
FRZ 4	West End	8,185	17.13	790.9	134	3,043	4.4%
FRZ 5	Donovan	6,021	11.2	497.3	62	2,157	2.9%
FRZ 6	Flour Mill	6,815	17.83	497.1	88	1,851	4.8%
FRZ 7	New Sudbury	24,329	6.79	2,903.30	232	9,090	2.6%
FRZ 8	Minnow Lake	11,303	4.96	1,274.60	55	4,115	1.3%
FRZ 9	Rural South End	4,086	0.28	739.9	28	1,997	1.4%
FRZ 10	Rural Sudbury	312	0.12	48.8	6	45	13.3%
FRZ 11	Copper Cliff	2,604	3.57	272.8	26	854	3.0%
District 1		88,503		10,957.50	901	31,404	2.9%
FRZ 12	Lively	6,365	3.47	610.2	23	2,421	1.0%
FRZ 13	Naughton	758	1.81	106	3	418	0.7%
FRZ 14	Whitefish	288	4.5	21.7	2	150	1.3%
FRZ 15	Rural Walden	3,153	0.04	748.2	108	2,730	4.0%
District 2		10,564		1,486.10	136	5,719	2.4%
FRZ 16	Azilda	4,297	1.24	496.2	31	1,961	1.6%
FRZ 17	Chelmsford	7,147	5.42	635.4	58	2,630	2.2%
FRZ 18	Rural Rayside Balfour	3,113	0.11	344.4	20	1,563	1.3%
FRZ 19	Dowling	1,712	2.27	140.7	8	642	1.2%
FRZ 20	Onaping	639	3.13	36.6	2	320	0.6%
FRZ 21	Levack	1,403	2.58	79.9	22	608	3.6%
FRZ 22	Rural Onaping Falls	1,120	0.04	191.4	13	853	1.5%

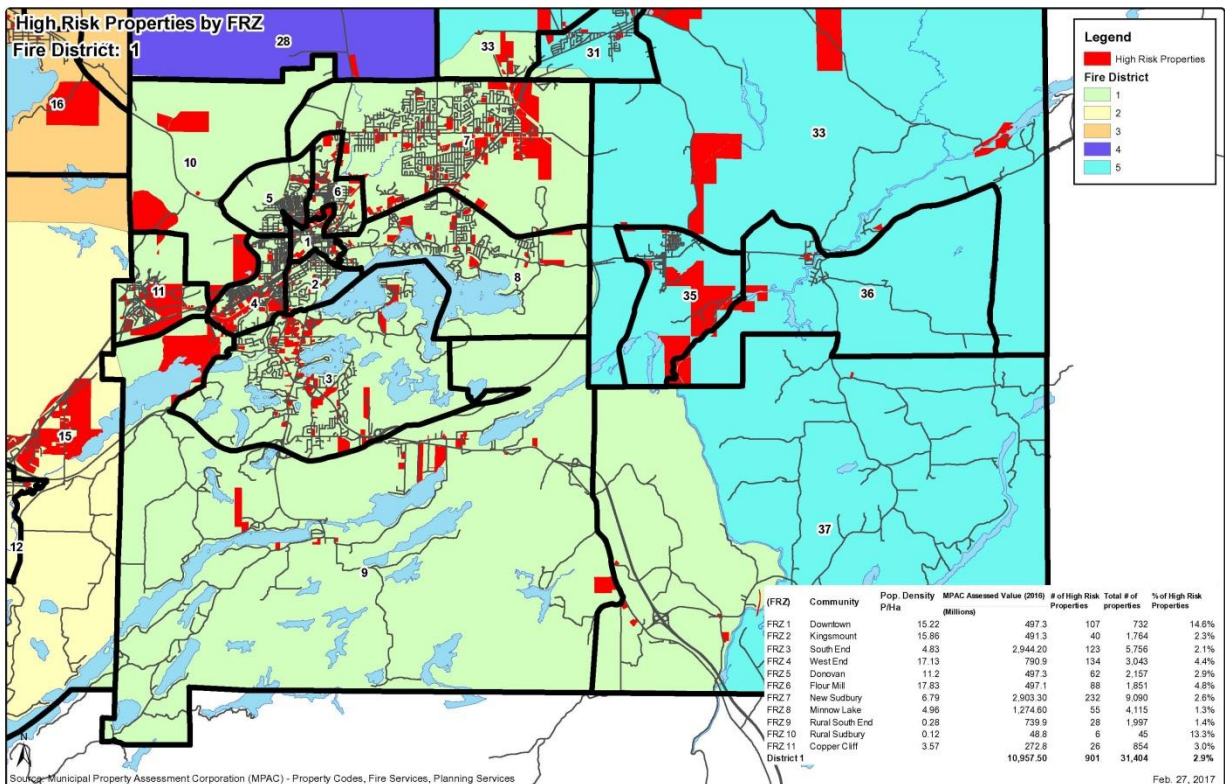
(FRZ)	Community	Population (2011)	Pop. Density P/Ha	MPAC Assessed Value (2016) (Millions)	# of High Risk Properties	Total # of properties	% of High Risk Properties
District 3		19,431		1,924.60	154	8,577	1.8%
FRZ 23	McCrea Heights	1,258	0.97	124.7	4	596	0.7%
FRZ 24	Blezard Valley	695	0.92	93	22	332	6.6%
FRZ 25	Val Caron	4,377	4.39	461.5	56	2,120	2.6%
FRZ 26	Val Therese	8,102	6.82	708.5	11	2,940	0.4%
FRZ 27	Hanmer	5,945	4.12	534.7	20	2,238	0.9%
FRZ 28	Rural Valley East	3,601	0.07	508	14	2,106	0.7%
FRZ 29	Capreol	3,276	5.12	224.2	31	1,425	2.2%
FRZ 30	Rural Capreol	10	0	19.3	1	100	1.0%
District 4		27,264		2,673.90	159	11,857	1.3%
FRZ 31	Garson	6,329	8.25	538.8	24	2,222	1.1%
FRZ 32	Falconbridge	683	2.29	89.6	4	314	1.3%
FRZ 33	Rural Nickel Centre	2,659	0.08	453.5	40	1,503	2.7%
FRZ 34	NE Townships	43	0	1.7	0	10	0.0%
FRZ 35	Coniston	2,149	1.64	171.4	12	875	1.4%
FRZ 36	Wahnapitae	1,349	0.38	97.6	9	465	1.9%
FRZ 37	SE Townships	1,232	0.08	116.7	37	729	5.1%
District 5		14,444		1,469.30	126	6,118	2.1%
		160,206		18,511.40	1,476	63,675	2.3%

Former City of Sudbury Fire Response

Zones 1-11 and Fire District 1

The following analysis by fire response zones reveals areas of risk within the communities. Recommendations for Optimization within this report are in part based upon this analysis.

Fire District 1 and the Associated Fire Response Zones



The former City of Sudbury, represented by Fire District 1, contains 901 of the 1,476 high risk properties in the City of Greater Sudbury (61% of the total). Notable concentrations of high risk buildings exist in the Downtown (FRZ 1), South End (FRZ 3), West End (FRZ 4), and New Sudbury (FRZ 7) areas. The 2015 MPAC Valuation for District 1 is \$10.96 billion, which represents 59.2% of the city's total valuation. All of the FRZs in District 1 are considered urban when taking into account their population density, with the exception of the Rural South End (FRZ 9), Rural Sudbury (FRZ 10) and Copper Cliff (FRZ 11).

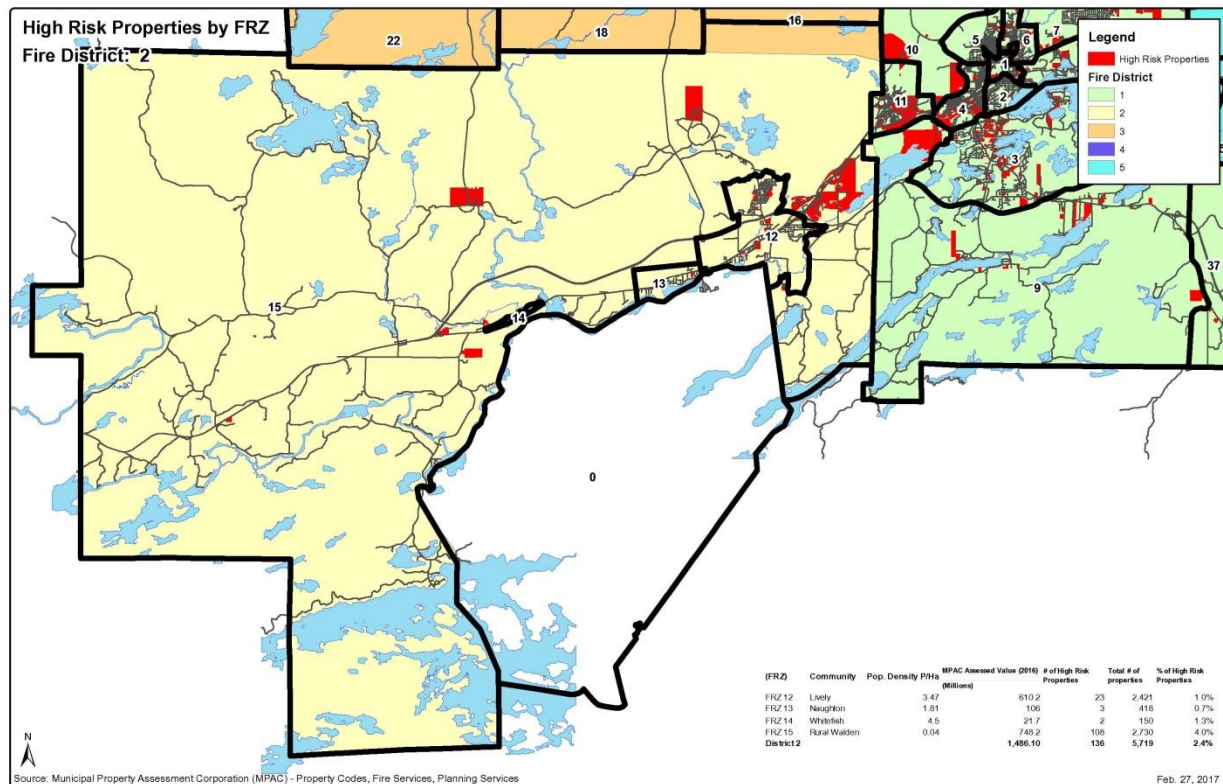
In 2016, there were 3,146 incidents in District 1 which returned a sub nine minute first truck arrival in 83.7% of those cases, primarily with a career level response. Additionally, due to the career fire response model of a guaranteed immediate minimum of four firefighters per truck, all arriving vehicles had the appropriate initial staffing for minor incident mitigation. Furthermore, the total available firefighter complement in District 1 is 23. This number is in close alignment with fire ground staffing recommendations for initial interior attack on an Open Air Shopping Centre as determined by NFPA to be 27/28 firefighters. NFPA has identified the same response complement to respond to a Garden Style Apartment Building (townhouse or row house). The current total firefighter complement falls significantly short of the recommended initial attack complement for a seven storey and higher apartment building, which is 43 firefighters. The City of Greater Sudbury has fewer than 20 high-rise buildings within this category.

Copper Cliff Fire Response Zone 11 (FRZ11)

Analysis of FRZ 11 reveals that there are currently 26 High Risk properties, a population density of 3.57 P/Ha, a MPAC valuation of \$200 million, and an average of 17 calls per year over a two-year period (2015-2016). Current response analysis reveals that the Copper Cliff Station achieves a nine minute or less response 62.9% of the time, with an average of 2.6 firefighters per response. GIS mapping also reveals that virtually the entirety of FRZ 11 is within the 8 kilometre response polygon of both the Van Horne and Long Lake Road stations, both of which currently respond to FRZ 11 in cooperation with Copper Cliff station. Waters Station, which currently does not respond to Copper Cliff unless requested, also contains Copper Cliff within its 8 kilometre response polygon. This demonstrates an impactful response to Copper Cliff when necessary.

Lively Fire Response Zone 12 (FRZ12) and Fire District 2

Fire District 2 and the associated Fire Response Zones (FRZ)



Lively is the largest suburban town on the Highway 17 West response corridor identified by Fire Services as District 2, which contains FRZs 12, 13, 14 and 15. District 2 contains 9.2% of the identified high risk properties in the City of Greater Sudbury.

Detailed analysis of FRZ12 (Lively) reveals that the population density is 3.47P/Ha (Persons per hectare), and has a MPAC assessment valuation of \$610.2 million. NFPA 1720 identifies a population density of 3.86P/Ha as the threshold for urban density, and between 1.93P/Ha and 3.86P/Ha for suburban. Therefore, the Lively/Waters area is currently just under the NFPA population density definition for urban density. It is important to note that this is an area of the city that has experienced sizeable growth over the past few years and has been identified in the City's Official Plan to expect continued growth into the future. There are 23 high-risk properties representing 1.0% of the building stock in this FRZ. The identified properties include elderly care occupancies, schools, and industrial and commercial business interests

Other Fire Response Zones within District 2 also contain significant high risk properties. Notably, FRZ15 (Rural Walden) while only having a population density of 0.04 P/Ha, exhibits a MPAC valuation of \$748.2 million, and has 108 high-risk buildings, representing 4% of the building stock. This high risk building stock is primarily concentrated in the Walden Industrial Park, and the related travel corridor on Municipal Road 55 between Copper Cliff and Lively. Response for FRZ 12, and FRZ 15 are primarily supplied by Waters, Lively and Copper Cliff Stations. Note that although Copper Cliff Station is in District 1, it is the initial response station to properties in the Copper Cliff/Lively response corridor. Combined, these three stations responded to 178 incidents in 2016. The primary response station Waters Station, achieved a nine minute first truck arrival to 36.7% of the 116 incidents in its area, with an average attendance of 3.4 firefighters. Lively Station achieved a nine minute first truck arrival to 68.5% of the 32 incidents in its area, with an average attendance of 3.3 firefighters. Copper Cliff Station achieved a nine minute first truck arrival to 62.9% of the 30 incidents in its area, with an average attendance of 2.6 firefighters.

These response averages fall short of the expectations of NFPA 1720 for an urban area, which is a nine minute response, 90% of the time. While FRZ12 Lively/Waters falls just under the threshold for strict inclusion in the urban response criteria, the high density and number of high risk properties in it and the adjacent FRZ are compelling for inclusion in the urban analysis.

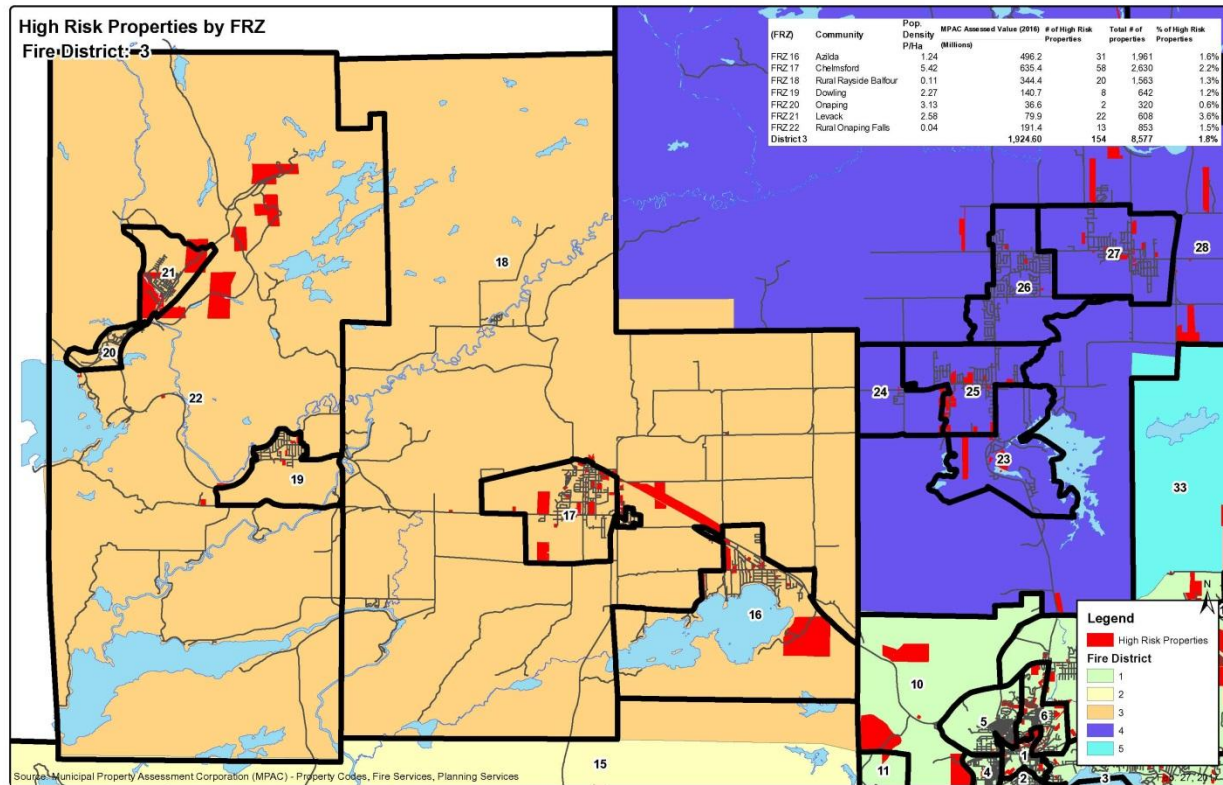
Fire Response Zone 15 (FRZ15) and Beaver Lake Station

Analysis of FRZ 15 reveals that, as noted above, there currently are 108 High Risk properties; a population density of 0.04 P/Ha, and that the response area covered by Beaver Lake Station received an average of 13 calls for service per year over the previous two year period. GIS mapping reveals that only a single High Risk property in FRZ 15 is within the Beaver Lake Station response area. Current response analysis reveals that the Beaver Lake Station achieves a nine minute or less response 12.9% of the time, with an average of 1.4 firefighters per response. Note that this FRZ does not have the population density to be considered an urban response area, and is in fact considered remote/rural. As such, the time threshold information is provided for reference only.

The initial response to the buildings in District 2 is volunteer service level response.

Chelmsford (FRZ 17) and Fire District 3

Fire District 3 and the associated Fire Response Zone



Chelmsford is the largest suburban town on the Highway 144 North response corridor identified by Fire Services as District 3, which contains Fire Response Zones 16, 17, 18, 19, 20, 21 and 22. District 3 contains 10.4% of the identified high risk properties in the City of Greater Sudbury.

Detailed analysis of FRZ17 (Chelmsford) reveals that the population density is 5.42P/Ha (Persons per hectare), and there is a MPAC assessment valuation of the building stock of \$635.4 million. NFPA 1720 identifies a population density of 3.86P/Ha as the threshold for urban density, and therefore, Chelmsford should be considered urban. There are 58 High Risk properties representing 2.2% of the building stock in this FRZ. The identified properties include elderly care occupancies, schools, and industrial and commercial business interests.

The associated Fire Response Zones also contain significant high risk properties. Notably, FR16 (Azilda) with a population density of 1.24 P/Ha and an MPAC valuation of \$496.2 million, contains 31 high risk buildings, representing 1.6% of the building stock. Also of note, FRZ21 (Levack) and FRZ 22 (Rural Onaping Falls) combined have 35 high risk buildings, concentrated in the mining areas surrounding the town. Response to these high risk properties represents a significant challenge to the service.

Response for FRZ 17 and FRZ 16 are primarily supplied by Chelmsford and Azilda Stations. Combined, these two stations responded to 211 incidents in 2016. The primary response station, Chelmsford Station, achieved a nine minute first truck arrival to 50.9% of the 123 incidents in its area, with an average of 4.7 firefighters. Azilda Station achieved a nine minute first truck arrival to 45.1% of the 88 incidents in its area, with an average attendance of 3.3 firefighters.

These response averages fall short of the expectations of NFPA 1720 for an urban area, which is for a nine minute response, 90% of the time.

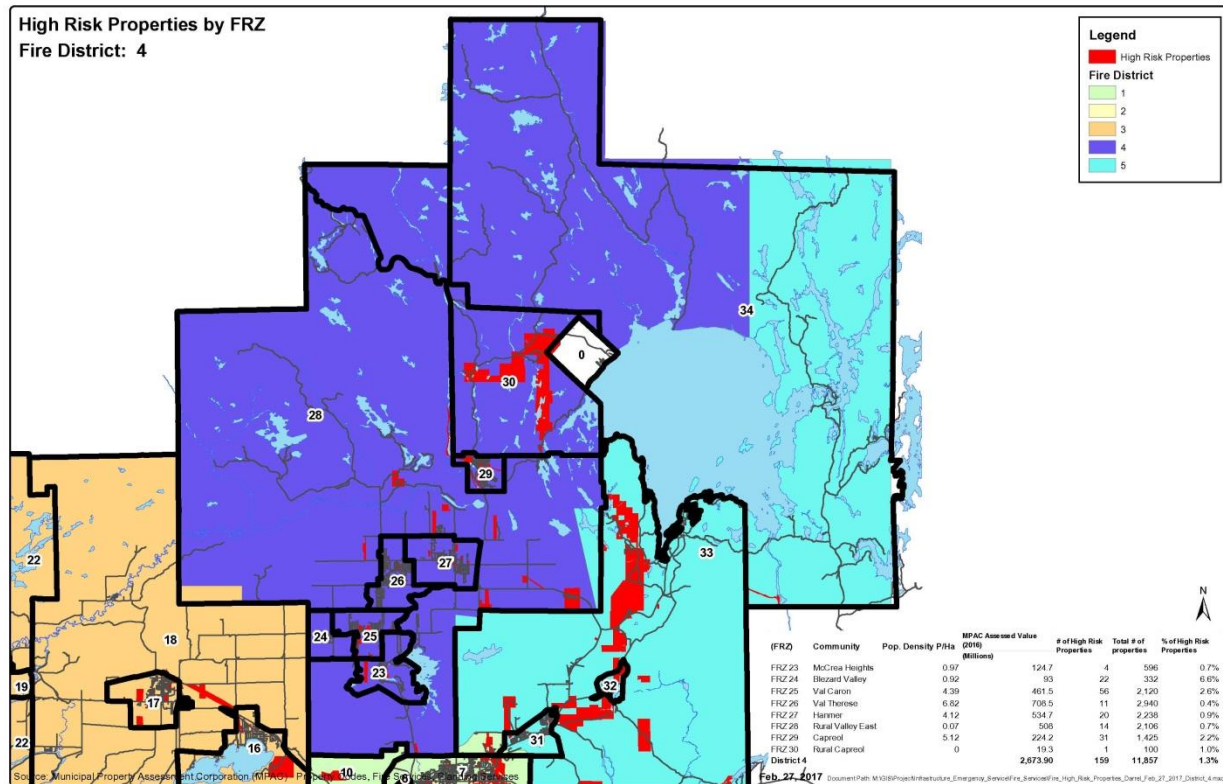
Fire Response Zone 18 (FRZ 18) and Vermillion Lake Station

Analysis of Rural Rayside Balfour, FRZ 18 reveals that, as noted above, there currently are 20 High Risk properties; a population density of 0.11 P/Ha, and that the response area covered by Vermillion Lake Station received an average of 1 call for service per year over the previous two-year period. GIS mapping reveals that there are no High Risk property in FRZ 18 that are within the Vermillion Lake Station response area. Current response analysis reveals that the Vermillion Lake Station achieves a nine minute or less response 0% of the time, with an average of 1.4 firefighters per response. Note that this FRZ does not have the population density to be considered an urban response area, and is in fact considered remote/rural. As such, the time threshold information is provided for reference only.

The initial response to the buildings in District 3 is volunteer service level response.

Val Caron (FRZ 25) and District 4

District 4 and the associated Fire Response Zones



Val Caron, while not the largest Fire Response Zone by population in District 4, exhibits the highest concentration of High Risk properties. This District 4 response corridor contains Fire Response Zones 23, 24, 25, 26, 27, 28, 29 and 30. District 4 contains 10.8% of the identified high risk properties in the City of Greater Sudbury.

Detailed analysis of FRZ25 (Val Caron) reveals that the population density is 4.39P/Ha (Persons per hectare), and has a Municipal Property Assessment Corporation (MPAC) assessment valuation of the building stock of \$461.5 million. NFPA 1720 identifies a population density of 3.86P/Ha as the threshold for urban density, and therefore, Val Caron should be considered urban. There are 56 High Risk properties representing 2.6% of the building stock in this FRZ. The identified properties include elderly care occupancies, schools, and industrial and commercial business interests. This concentration of High Risk properties identifies Val Caron as the economic hub of Fire District 4. Of note is the Valley East Industrial Park, with a significant amount of high risk and high impact occupancies.

The associated Fire Response Zones also contain significant high risk properties. Notably, FR26 (Val Therese) has an urban population density of 6.82 P/Ha, an MPAC valuation of \$708.5 million, and 11 high risk buildings. Also of note, FRZ27 (Hanmer) has an urban population density of 4.12 P/Ha, and 20 High Risk Buildings, and FRZ 29 (Capreol) has an urban population density of 5.12 P/Ha, and 31 High Risk Properties. Response to these high density areas and high risk properties represent a significant challenge to the service.

Response for FRZ 25, FRZ 26 and FRZ 27 are primarily supplied by Val Caron, Val Therese and Hanmer Stations respectively. Combined, these three stations responded to 438 incidents in 2016. The primary response station, Val Therese Station (Composite) achieved a nine minute first truck arrival to 81.5% of the 256 incidents in its area, with an average of 2.4 firefighters. Val Caron Station achieved a nine minute first truck arrival to 77.4% of the 99 incidents in its area, with an average of 2.3 firefighters. Hanmer Station achieved a nine minute first truck arrival to 75.6% of the 83 incidents in its area, with an average of 2.2 firefighters. Note that the responses in both FRZ 25 (Val Caron) and FRZ 27 (Hanmer) include the instances where the first responding truck is actually the Val Therese Composite Truck.

These response averages fall short of the expectations of NFPA 1720 for an urban area, which is for a nine minute response, 90% of the time.

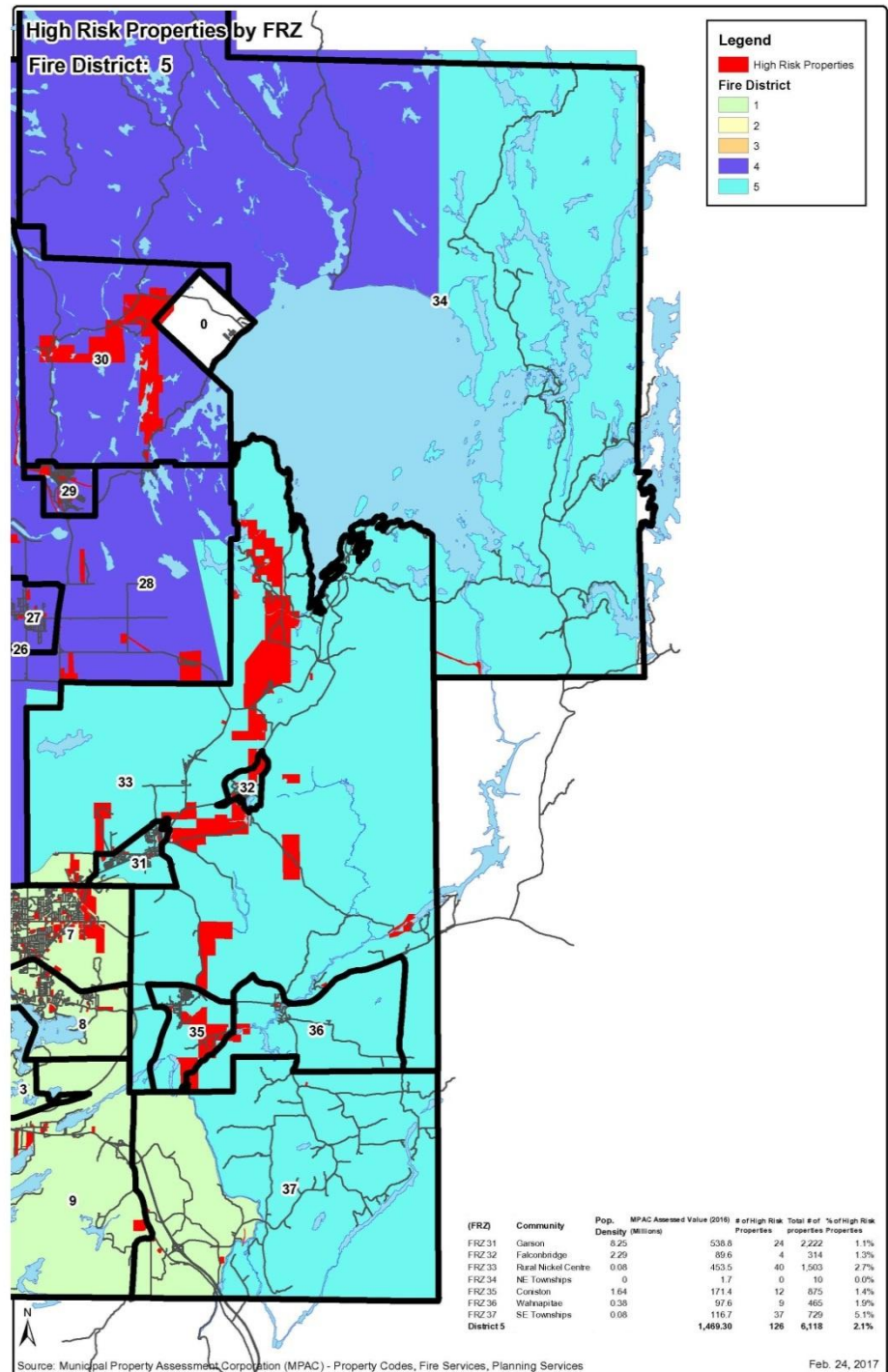
The initial response to the buildings in District 4 is composite level from the Val Therese Station supported by volunteer service level response, and volunteer service level in the remainder of Valley East, and all of Capreol.

Garson (FRZ 31) and Fire District 5

District 5 and the associated Fire Response Zones

Garson is the largest suburban town on the Eastern margin of the city. This area of the city, identified by Fire Services as District 5, contains Fire Response Zones 31, 32, 33, 34, 35, 36 and 37. District 5 contains 8.5% of the identified high risk properties in the City of Greater Sudbury.

Detailed analysis of FRZ31 (Garson) reveals that the population density is 8.25P/Ha (Persons per hectare), with a Municipal Property Assessment Corporation (MPAC) assessment valuation of the building stock of \$538.8 million. NFPA 1720 identifies a population density of 3.86P/Ha as the threshold for urban density, and therefore, Garson should be considered urban. There are 24 High Risk properties representing 1.1% of the building stock in this FRZ. The identified properties include schools, and industrial and commercial business



interests. The location of Garson being adjacent to the New Sudbury area allows for cooperative response to these areas.

The associated Fire Response Zones also contain significant high risk properties. Notably, FR33 (Rural Nickel Centre) with a population density of only 0.08 P/Ha, but with an MPAC valuation of \$453.5 million, and 40 high risk buildings, representing 2.7% of the building stock. Included in these occupancies are the Greater Sudbury Airport and the Garson/Falconbridge mining complex, which extends out to the Skead area. Response to these remote and high risk properties represent a significant challenge to the service. There are also several notable high risk properties identified in and around Coniston (FRZ35).

Response for FRZ 31 and FRZ 33 are primarily supplied by Garson Station and supported by the appropriate support station. Garson Station achieved a nine minute first truck arrival to 74.0% of the 117 incidents in its area, with an average attendance of 3.6 firefighters.

This response averages fall short of the expectations of NFPA 1720 for an urban area, which is for a nine minute response, 90% of the time.

Fire Response Zone 36 and 37 (FRZ 36, 37) and Red Deer Lake Station

Analysis of Wahnapiatae (FRZ 36) and the South East Townships (FRZ 37) reveals that there currently are a combined 46 High Risk properties; a population density of 0.38 P/Ha in Wahnapiatae and 0.08P/Ha in the Townships, and that the response area covered by Red Deer Lake Station received an average of four calls for service per year over the previous two-year period. GIS mapping reveals that there are minimal high risk properties in FRZ 36 and FRZ 37 that are within the Red Deer Lake Station response area. Current response analysis is currently not available for the Red Deer Lake Station. The station was condemned for structural issues in 2015, and its associated volunteers now co-respond with Wahnapiatae Station.

Wahnapiatae Station achieves an under nine minute response 63.2% of the time, with an average of 2.8 firefighters per response. Note that this FRZ does not have the population density to be considered an urban response area, and is in fact considered remote/rural. As such, the time threshold information is provided for reference only. Note also that much of FRZ 37 is served from a first response perspective from Long Lake Station.

The initial response to the buildings in District 5 is volunteer service level response.

The City of Greater Sudbury is notable for having a high level of industrial investment as a proportion of the overall MPAC valuation present in the city. This speaks to the resource extraction base of the economy, and the large associated mining supply and service industry. This industrial base constitutes a significant proportion of the high risk properties identified by the Community Risk Profile. In total, only 61% of high risk properties are located in the city core, while the remaining 39% are located in the surrounding suburban, rural and remote areas. Currently the 39% of suburban, rural, or remote high risk properties are protected by a composite response level, and/or a volunteer response level.

These properties are distributed relatively equally in what the Fire Service has identified as its four suburban districts; District 2 (Walden) – 9.2%, District 3 (Rayside Balfour and Onaping Falls) – 10.4%, District 4 (Valley East and Capreol) – 10.8%, and District 5 (Nickel Centre) – 8.5%. Further complicating matters is the fact that, included in the more remote areas, are high risk properties such as the city's airport, and much of the industrial mining and mine equipment sites. These properties form the base for much of the city's economy.

Auditor General – Enterprise Risk Registry

The Auditor General (AG) for the City of Greater Sudbury is tasked with researching the business risks for the various departments of the municipality. More recently the AG has contacted Community Safety to conduct an Enterprise Risk Registry (ERR) for each of Fire (see Appendix #R3) and Paramedic Services (see Appendix #R2). The AG's Office tracks information related to the short, mid-, and long-term sustainability of the department, and an analysis of the liabilities inherent in the delivery of services. Major criteria for the analysis include: reputation, operations, financial, and legal/regulatory.

The AG's Office used standard risk identification methodology by first identifying the potential consequence or impact of an event, and then assessing the frequency or likelihood of the event, based on historical analysis and/or projected frequency. The risk score for the event is then the simple multiplied product of these two numbers. Each criteria is scored on a scale of one to four, with one being low or least likely and four being high or likely, resulting in a risk score ranging from one to 16. The City of Greater Sudbury has adopted explanatory notes to assist in the scoring matrix for both impact and likelihood. These serve to reduce the subjectivity of the process to a minimum.

Both services worked independently with the AG's Office in identifying and scoring the departmental mitigation criteria to reduce or eliminate the identified risks. Mitigation techniques are grouped into three categories of people, process and information systems/technology.

The mitigation techniques of people, process and system/technology are not necessarily independent of each other, with the most successful mitigation techniques rely on a combination thereof. A conceptual example of this is the idea is that a new software program (system/technology) can reduce the likelihood of an identified risk, but the same program, when combined with a policy/procedure (process) for its use, and documented training (people) could reduce the likelihood of the risk significantly more. It should be noted, the impact of some risks cannot be mitigated so their impact on the organization remains consistent, for example the death of an employee. Each identified risk must be assessed individually to determine if the residual impact is changed by the application of mitigation techniques.

For Paramedic Services, 54 overall risks were identified for analysis. They are grouped into the following four categories: eight relate to Reputation, 22 relate to Operations, 18 relate to Finance, and six relate to Legal/Regulatory issues. Of the 54 risk subjects identified by the AG's Office, 49 are mitigated to a low risk level (six or less) by way of people, process or system/technology. The five remaining risks with a residual score of 6.1 or greater are related to station location and functionality and cannot be further mitigated outside of investments in stations. Building investments as proposed in the Optimization Plan would reduce the residual risk range from the current moderate residual levels to a low residual.

The five identified high risk items can be broken down further based on the ability for the Paramedic Services to design and implement impactful mitigation. For example in risk item O1A- paramedic stations are noted to be in wrong locations. Headquarters is identified as a significant mitigated risk with a rating of nine. Based on existing knowledge and the fact that current mitigation strategies have already been exhausted (EVT program, staggered shift start times) and there are no ways to reduce mitigation through evolving Paramedic Services opportunities, the only way left to reduce the risk would be to move the station, which is one of the recommendations of the Optimization Plan.

Paramedic Services
High Rated Risk Subjects – Current Mitigation and Optimized Mitigation

		Risk Subject	Unmitigated Risk	Mitigated Risk	Optimized Risk
Operational	O1A	Paramedic stations are in wrong locations (Headquarters)	16.0	9.0	2.7
	O1B	Paramedic stations are in wrong locations (In-town posts)	12.0	6.8	2.4
	O1C	Paramedic stations are in wrong locations (Satellite posts)	12.0	6.8	2.4
	O02	Paramedic stations lack essential functionality	12.0	7.7	2.8
Financial	F18	Financial impact of Paramedic Headquarters in wrong location	14.0	9.0	2.7

In Fire Service, there were 60 identified risks including: 12 related to reputation, 23 for operations, 16 related to finance, and nine connected to legal and regulatory issues. Thirty-nine of these are currently mitigated to an acceptable level by way of the people, process, system/technology that are in place. The remaining 21 items require either: public acceptance of the risks at the current level(s) by the community including Council, the Executive Leadership Team, Fire Services Administration, Community Stakeholders, and the citizens of the city; or additional mitigation at an acceptable risk level by whatever means are deemed appropriate by Fire Services and/or Council.

The 21 identified high risk items for Fire Services are listed in the following table and broken down further based on the ability of the Fire Services Administration to design and implement impactful mitigation. For example, risk item O1-Fire Stations are in the wrong locations, is identified as a significant risk, and based on the research associated with the Optimization Project, the likelihood of this item is four (out of a possible four).

That being said, Fire Services cannot mitigate this risk beyond a certain threshold, due to the fact that the stations cannot easily be moved. Further, the decision to move the stations rests with Council, not Fire Services. Additional examples would involve those dependent upon the provincial or federal

governments, or items under control of the municipal government, but primarily outside of the Fire Services Department, such as financial investment in the department.

The following table is designed to recognize these challenges. Items shaded in blue or orange are essentially beyond the scope of Fire Services to mitigate further than what has currently been done. The green coloured items do provide Fire Services with an opportunity for mitigation, but due to the necessity for financial investment for almost all of them, would require approval by Council to effect any significant mitigation. For the service level items, the basis for departmental mitigation at the present time would primarily entail public communication of service levels.

Fire Services
High Rated Risk Subjects – Current Mitigation and Optimized Mitigation

		Risk Subject	Unmitigated Risk (/16)	Mitigated Risk (/16)	Optimized Risk (/16)
Reputation	R1	Old trucks may result in breakdowns and incidents	10.5	8.5	3.8
	R2	Volunteer response is inconsistent, and may compromise service	12.0	10.8	4.9
	R4	Fire Prevention and Education Services are inadequate - Volunteer Area	10.5	10.5	3.8
	R5	Fire response capability may be inadequate – Volunteer Area	11.3	10.2	1.2
	R6	Medical response capability may be inadequate – Non-MTR Areas	7.5	7.5	2.4
	R7	Technical response capability may be inadequate – Non-Water Rescue Areas	10.5	10.5	3.8
	R8	HAZMat response capability may be inadequate	11.3	10.2	2.5
Operational	O1	Fire stations are in wrong locations	15.0	13.5	2.2
	O2	Fire stations lack essential functionality	14.0	12.6	2.0
	O3	Volunteer staff are ineffective in terms of skills (training, knowledge and experience)	10.5	9.5	4.3
	O4	Volunteer staff response is unreliable	12.0	10.8	4.9
	O12	Serious staff and/or citizen injuries occur while enroute to the scene	11.3	9.1	4.1
	O22	Fleet may fail and compromise service delivery	10.5	8.5	3.8
Financial	F1	Fire services are not sustainable/affordable	10.5	9.5	9.5
	F3	Labour costs are not sustainable/affordable	9.8	8.8	8.8
	F11	The investment in fleet has been insufficient for effective fire services	14.0	11.3	5.1
	F12	The investment in buildings has been insufficient for effective fire services	15.0	12.2	3.0
	F13	Lack of effective asset management systems compromises budget decisions	10.5	8.5	4.8
	F14	Lack of effective long-term financial planning processes in CGS compromises capital budget decisions	10.5	8.5	4.8
Legislative	L1	Presumptive legislation imposes unaffordable costs	9.0	7.3	4.7

All of the items have been assessed to determine the impact of the Optimization Project, and the resulting risk score is presented for consideration. The reduction credited to Optimization is a projection based on the current legislative framework in place in the province and the municipality, and assumes a relatively consistent expectation of services by the public. As a result, they may be under or overstated. Note that all items experience an impact, including the ones under outside jurisdiction. This is due to the reduced exposure to provincial legislation and Arbitral Jurisprudence that would result from optimization, once implemented.

Key messages of this section:

- The communities of Chelmsford, Garson, Lively and Val Caron/Val Therese each have a sizable total population, population density and considerable concentration of high risk buildings that are currently not responding at an urban level, in alignment with response standards of the National Fire Protection Association (NFPA).
- These finding have been confirmed through the analysis by the Fire Underwriter's Survey in 2015.
- The City's Auditor General reviewed Paramedic and Fire Service operations and identified over 100 risks (54 for Paramedic, 60 for Fire). Of these risks, 26 (five for Paramedic, 21 for Fire) were identified has high risk items that are not currently mitigated to an acceptable level. These items are mainly related to station condition and location, inadequate fire response capability, and insufficient funding for building repairs and replacement of fire vehicles and major equipment.
- Implementing the proposed optimized model can reduce the risk of many of the items identified in the Enterprise Risk Registry by the Auditor General.

COST ANALYSIS

What you will learn in this section:

- *Source and size of the funding shortfall that exists for Fire Services*
- *What is presumptive legislation and how does it affect the cost of staffing*

During the analysis, a number of key observations were identified that relate directly to the costs of operating Fire and Paramedic Services. Included observations are the existence of a significant capital gap for station maintenance, and replacement of fire vehicles and major equipment, and an underfunded presumptive legislation liability.

Capital Gap

Stations

Twenty-seven emergency services stations, including Headquarters, are currently operated by the Community Safety Department. Eight of these stations are shared by Fire and Paramedic Services, 16 are stand-alone fire stations and two are stand-alone paramedic stations. The average age of the stations is 44 years. Three stations are already beyond their recommended 50 year lifecycle and an additional 12 stations will reach the end of their lifecycle within the next 10 years. One station, Red Deer Lake, has been closed since 2015 due to foundation/structural failures. If a significant investment is not made to improve the condition of the stations, service delivery may be further compromised.

In 2013-2014, CCI Engineering Group was commissioned to conduct an independent building condition assessment on 25 of the 27 stations operated under the Community Safety Department. The two stand-alone paramedic stations were not included in this assessment. The report concluded that the probable costs required to address building deficiencies would necessitate an investment of \$20.4 million (in 2013-14 dollars) over the next 10 years (see Appendix #F2). This independent report focused solely on needs relational to systems and structures and did not address any improvements to size and configuration that are needed to meet current legislative requirements under the Occupational Health and Safety Act (OHSA).

A risk assessment analysis conducted by the Auditor General's Office, identified that several Emergency Services Stations lack essential functionality as required by the Occupational Health and Safety Act. In certain stations, the garage doors and bay areas are too small to accept the modern fleet of vehicles which results in placement of trucks based on their ability to fit in the station and not necessarily what is needed to effectively respond to calls in the area. Furthermore, none of the stations have a point-source-capture diesel emission system which is a recommended system under the Section 21 Guidelines from the Ministry of Labour. Several stations do have space ventilation systems, which activates when diesel emissions are detected, but these result in exposure prior to activation of the system. The lack of a proactive safety system creates a liability for the City.

In summary, a major financial investment is required to address current building deficiencies. The cost to repair and/or replace the existing stations is based on a recommended 50 year lifecycle and is

estimated to be \$135 million over the next 20 years (see Appendix #F4). This value has been calculated using the third party building condition assessments for repairs and a new construction rate from the City's Assets Management Real Estate Department of \$350 per square foot for new builds, which includes estimated costs for architecture and engineering services. There is currently no funding within the budget to address these needs.

Vehicles and Major Equipment

An analysis of the capital requirements for Paramedic Services was conducted and it was determined that the current funding model is sufficient to meet the replacement needs for vehicles and major equipment. This is primarily due to the fact that the delivery of land ambulance services is 50% funded through the Ministry of Health and Long-Term Care, but also due in part to Paramedic Services continual approach towards optimization. As a result, this section will focus solely on the replacement requirements for Fire Services front-line vehicles and major equipment.

Fire Services currently has 73 front-line response vehicles and over 6,900 pieces of major firefighting equipment (see Appendix #F3). Most of the front-line response vehicles have a 20 year lifecycle. A major factor in the 20-year lifecycle is that vehicles older than 20 years have a negative impact on the FUS rating and thus insurance rates for residents and businesses in the community. As of 2016, there were 14 front-line vehicles that are at or beyond the 20-year lifecycle with an additional 10 units surpassing their useful life within the next two or three years. This represents 33% of the front-line vehicle fleet. Lifecycles for major firefighting equipment range from five to 20 years. Some equipment, such as bunker gear (the fire protective clothing) must be discarded at the end of their 10 year lifecycle regardless of the condition of the equipment. Self-contained breathing apparatus (SCBA/oxygen mask and kit) are replaced every 15 years as per provincial regulations.

From a financial perspective, there is a direct correlation between the number of firefighters employed and the cost required to retain appropriate levels of vehicles and major equipment. Due to the high cost of firefighting vehicles and equipment, it's imperative that the service maintain an effective level of *meaningfully participating* firefighters to ensure efficient use of funds required to purchase these expensive pieces of equipment.

A capital replacement analysis (see Appendix #F3) shows that the cost to replace the current fleet of vehicles and major equipment over a full 20-year lifecycle is \$47.2 million. The amount of funding received over the same period is \$31.1 million resulting in a shortfall of \$16.1 million.

Presumptive Legislation

The City of Greater Sudbury is a Workplace Safety and Insurance Board (WSIB) Schedule 2 employer which means that the organization has opted to pay the WSIB dollar for dollar for costs associated with a claim instead of paying a regular premium based on wages. This payment also requires an additional administrative fee which averages approximately 35% of the claim amount. Furthermore, the City is responsible for paying the costs of claims indefinitely.

Employers of firefighters, both career and volunteer, are subject to presumptive legislation liability. WSIB policy states that *“if a firefighter is diagnosed with a prescribed cancer on or after January 1, 1960, and meets the employment duration and additional criteria for the prescribed cancer, then the disease is presumed to be an occupational disease due to the nature of the worker’s employment, unless the contrary is shown”*. There are currently 13 different cancers covered by this legislation which includes a number of the most common cancers such as prostate, lung, colorectal, kidney, brain, bladder and leukemia. Based on the 2015 Canadian Cancer Statistics Report, males have a 45% lifetime probability of contracting cancer. Additionally, a recent study conducted by Fraser Valley University suggests that firefighters are 9% more likely to contract cancer than the general population.

According to section 16.01 of the volunteer (CLAC) Collective Bargaining Agreement, the employer agrees to set the amount of Workplace Safety and Insurance Board coverage for volunteers to the maximum allowable rate as set by Workplace Safety and Insurance Act (WSIA). The WSIA requires that municipalities set an agreed WSIB amount for volunteers which must be at least 50% of the earnings maximum and it must be the same for all volunteers. Fire Services has 418 current and past employees that meet the employment duration eligibility for presumptive cancer legislation.

Presumptive legislation also exists for firefighters who, *“experience heart injury while, or within 24 hours of (a) attending a Fire scene in the performance of his or her duties, or (b) actively participating in a training exercise that is related to his or her duties and that involves a simulated Fire emergency”*. As of December 31, 2016, Greater Sudbury Fire Services employs 373 career and volunteer firefighters.

In addition to the above mentioned firefighter presumptive legislation, as an employer the City is subject to Bill 163 Supporting Ontario’s First Responders Act (Post-traumatic stress disorder), 2016. This legislation creates the presumption that post-traumatic stress disorder (PTSD) diagnosed in first responders including firefighters and paramedics, is work-related and thus employers are responsible for related costs. Unlike presumptive cancers, there is no minimum employment durations associated with post traumatic stress disorder legislation. It’s possible for a worker to develop post traumatic stress disorder on their very first call. There are a total of 158 paramedics employed by the City plus the above mentioned 373 firefighters, who would fall under this legislated liability.

Of the 613 full-time staff working within the Community Safety Department, 575 are covered by presumptive legislation under the Workplace Safety and Insurance Act. To provide sufficient funding to cover the potential liability related to presumptive legislation, it’s estimated that \$2.20 for every \$100 in wages is needed to be set aside in reserve to cover future claims. In the chronic exposure policy, for prescribed cancers and heart injury, under WSIA there is no distinction between a career firefighter and

a volunteer firefighter (a firefighter is a firefighter). As a result, for the purpose for calculating the potential liability for presumptive legislation a First Class Firefighter rate was used as the annual wage for volunteers. The total amount determined to be set aside each year is estimate at \$1.6 million. In 2016, the total amount of money set aside for WSIB related claims for Fire Services was \$252,000 meaning that \$1.37 million remains unfunded (see Appendix #F5). Since Bill 163, related to presumptive post traumatic stress disorder came into effect in 2016, the potential liability for Paramedic Services has been included in the estimates outlined above.

Key messages of this section:

- *In 2014, the CCI Engineering Group identified that the City's 24 fire stations and Headquarters require an investment of \$20.4 million to address deficiencies related to systems and structures. This amount does not address improvements to size and configurations that are needed to meet legislative requirements.*
- *Stations have a recommended lifespan of 50 years and currently, the average age of Greater Sudbury's 24 fire stations is 44 years old. This current service delivery model requires an investment of \$135 million over the next 20 years for the renewal of all emergency services stations.*
- *Fire Services requires \$47.2 million over the next 20 years to replace front-line vehicles (fire trucks) and major equipment, but are only funded to receive \$31.1 million resulting in a shortfall of \$16.1 million.*
- *Presumptive legislation results in a staffing cost for employers of firefighters (career and volunteer) and paramedics to cover WSIB claims associated with workplace related illnesses or injuries such as cancer, heart injury, or post-traumatic stress disorder (PTSD). The funding for this expense is allocated below the recommended rates resulting in a shortfall of nearly \$1.4 million.*

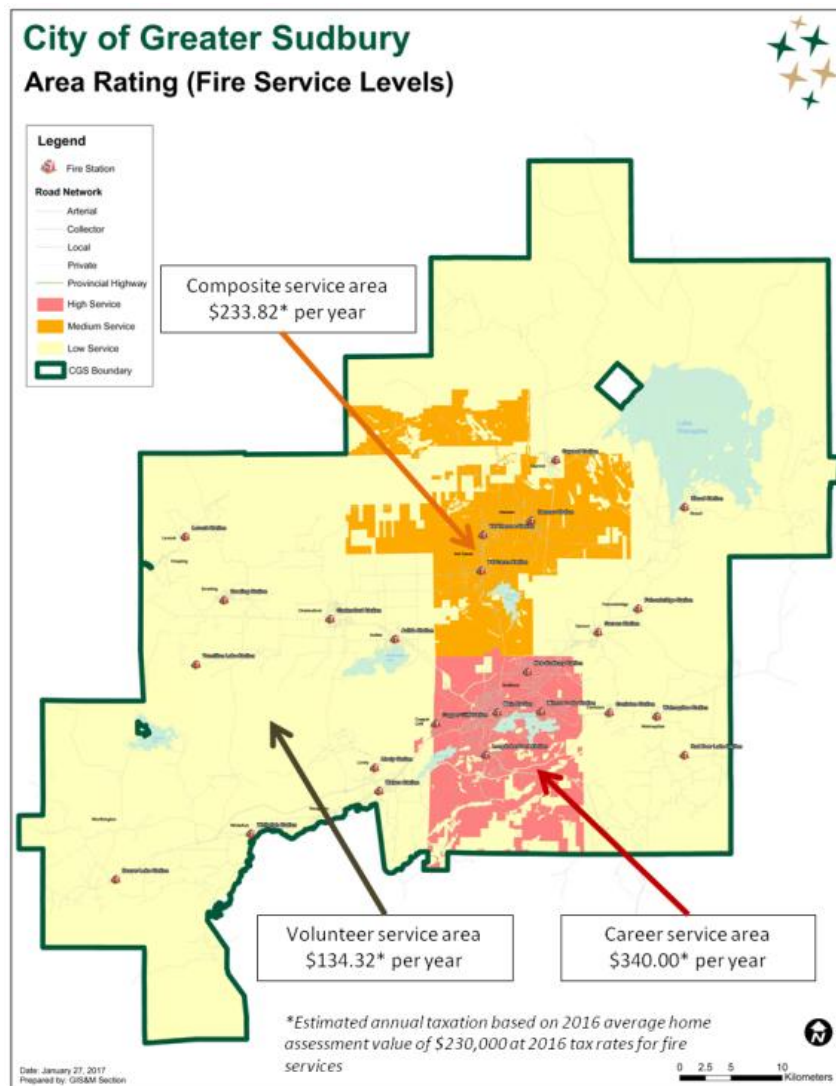
AREA RATED TAXATION ANALYSIS

What you will learn in this section:

- *How taxation for fire services is applied in Greater Sudbury*
- *Issues with current taxation model*
- *Options for possible changes to taxation for fire services that provide a fairer taxation model based on the current service delivery model*

Current Fire Service Taxation Model

Prior to amalgamation, a transition board was established to ensure a smooth changeover from a two-tiered municipal system to one city. A decision was made by the first Council of the City of Greater Sudbury, as recommended by the transition board to only area rate Fire and Transportation Services, recognizing the differing service levels. Although an analysis of the different service levels provided by the seven former area municipalities was completed, it's apparent now that there wasn't a clear understanding or ability to analyze true costs and usage (staffing, vehicle, equipment and buildings) to operate each Fire Service. Additionally, no benchmarks existed at that time to define a viable Fire Service and to provide a true measure of risks or needs and circumstances. There was also no consistent application of a third party analysis, standards and/or best practices (FUS/NFPA), and no consideration was given to response times.



The map above demonstrates the division of the city by career, composite and volunteer serviced areas. Based on an average home assessment value of \$230,000 in 2016 and on the 2016 tax rates, each of these areas pay a different tax rate based on these service levels. In the career serviced area (high service), a homeowner is paying approximately \$340 per year in taxes for fire service. This amount is \$233.82 for composite rated areas (medium service) and \$134.32 for volunteer rated areas (low service). See Appendix #F6 for further taxation calculation details.

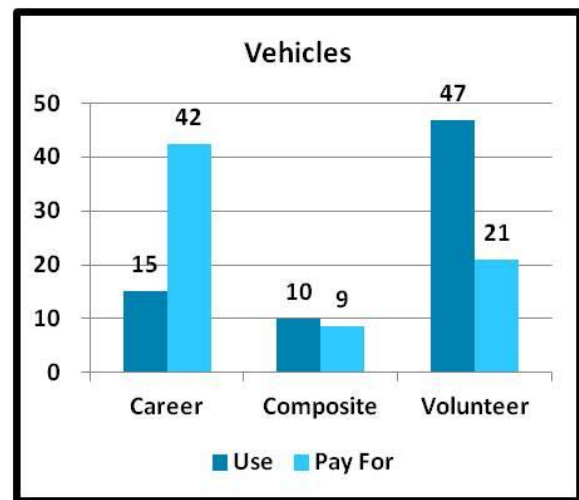
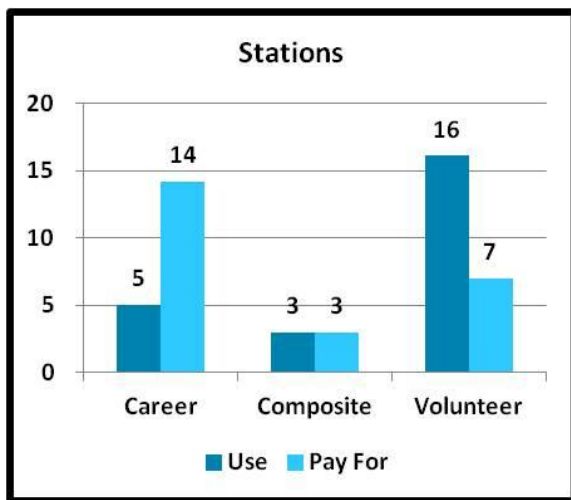
A substantial number of resources (staffing, vehicle, equipment and buildings) are required to support the delivery of fire protection services. It is often portrayed by some stakeholders that the volunteer firefighter costs are \$1.3 million annually. However, this amount only reflects the staffing component and doesn't take into consideration the usage of resources such as vehicles, equipment and buildings.

An in depth analysis of all costs related to the provision of fire protection services was conducted to identify the true costs for each level of service (career, composite and volunteer). Area rated taxation is distributed based on 100% of the wages of the firefighters associated with the level of service, plus a portion of the base costs. Base costs include:

- Contribution to capital envelope,
- administration costs,
- fleet and apparatus costs,
- prevention and public education costs,
- training costs, and
- the training academy.

These costs are allocated to each area based on a rate that was determined at amalgamation (59% to the career area, 12% to the composite area and 29% to the volunteer area). Calculations for taxation in each area are provided in Appendix #F7. In summary, the fire portion of 2016 taxation for a home valued at \$230,000 would be \$340.45 in the career rated area, \$233.79 in the composite rated area, and \$134.01 in the volunteer rated area.

An analysis of the actual costs of providing fire services in each of these areas compared to the taxation charged was also undertaken. As demonstrated in the diagrams below, there is a significant difference between the use of resources (stations and vehicles) and the taxation that is charged to residents and businesses in both the career and volunteer rated areas. The career rated area utilizes 26% of the resources required to provide fire services, but pays over 59% of the base costs. The opposite is true in volunteer rated areas which utilize 61% of the resources but are taxed factoring in just under 29% of the base costs. The composite rated area is the most balanced where resource utilization is about 13% and taxation is just under 12% of the base costs.



Further to this cost disparity, several service level inconsistencies currently exist within each area rated taxation level. For example:

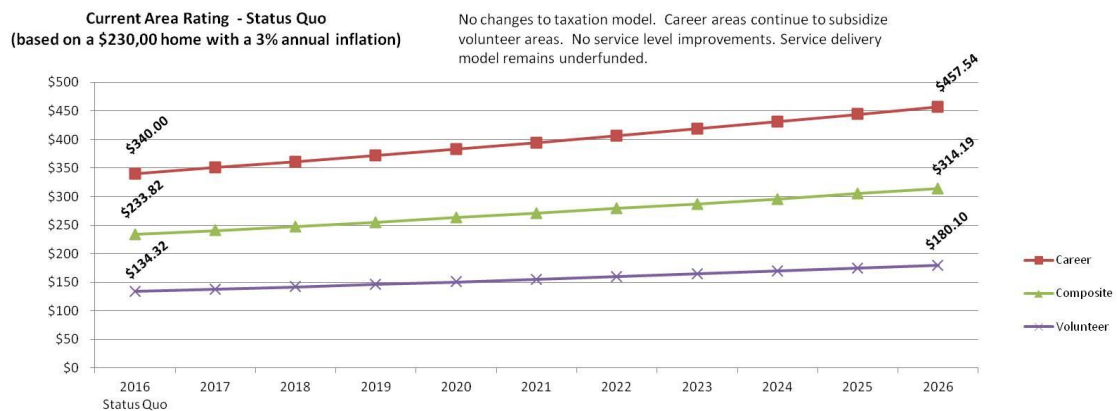
- Remote and rural areas such as Worthington, Fairbank Lake, Stinson, Hwy 537 corridor, receive a significantly delayed response within the same area rating taxation as downtown Chelmsford, Lively or Garson.
- Highway 69 South in the Wanup area pays volunteer taxation rate while its primary response is a career firefighter response from Long Lake Station.
- Copper Cliff pays career taxation rate while its primary response is volunteer with career co-response for every incident.
- Garson and Coniston currently pay volunteer taxation and have rapid career response for all significant incidents. Primary response remains at the volunteer level.
- Much of the greater Capreol area is entrenched in the composite taxation area and receives primary response from Capreol station which is volunteer response level.
- Skead and Azilda stations are the only two volunteer stations that offer water rescue response at an enhanced level while maintaining a volunteer taxation level.
- Capreol, Dowling and Levack stations are the only three volunteer stations which offer medical tiered response (MTR) while maintaining a volunteer taxation level.

Further adding to this inconsistent approach, Fire Services dispatches career response (optimized tiered response) to any working fire or smoke showing regardless of the taxation levels paid by the citizens. This is done in the interest of public safety, first responder safety, and in an attempt to minimize corporate risk identified in the inherent nature of the volunteer firefighter discretionary response. This enhanced response is also not accounted for in the current area rated taxation model.

The examples above demonstrate that the boundaries established at amalgamation no longer reflect the service being received. Should the boundaries remain unchanged, they may also not align with a *One City One Service* delivery model. Added to this is the need for greater investment to meet the current maintenance and capital replacement necessities previously mentioned for vehicles, equipment and buildings. In order to fully fund these requirements, an increase to the annual capital budget of approximately \$2.8 million per year is needed, which includes \$756,000 to close gap for vehicles and major equipment and an additional \$2.04 million to repair existing stations (based on CCI Group building condition report). This increase would be added to the base costs and allocated to each service level area based on the established rates as noted above (Career – 59%, Composite – 12%, Volunteer – 29%). Continuing to use the current area rated taxation model would result in a significant increase of this burden to taxpayers in the career-rated areas as they cover over 59% of base costs.

Current Model Taxation (No Change)

The graph below demonstrates inflationary increases only to taxation over the next ten years based on an average home assessment value of \$230,000 in 2016 at the 2016 tax rates and at an annual inflation rate of 3%. In this scenario, career rated areas will continue to subsidize volunteer rated areas as described above (actual adjustments will be greater or lesser depending on a property's actual assessed value).



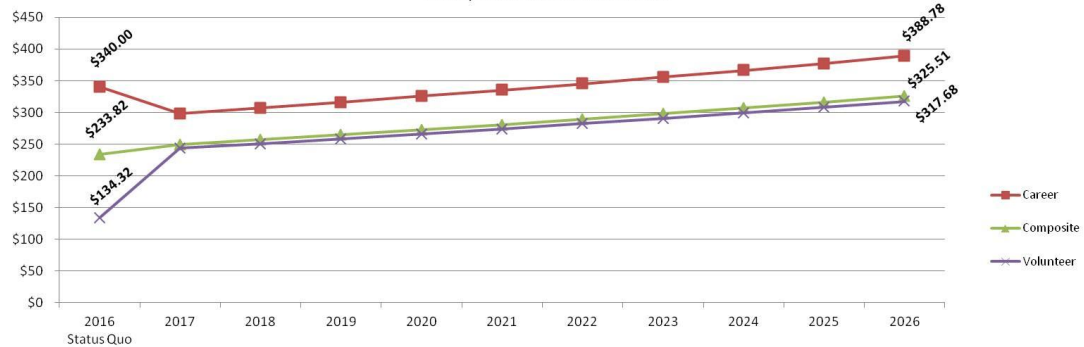
Current Model - Taxation Corrected Based on Actual Usage

The following graph demonstrates changes to taxation if the area rated model was adjusted. Once again, the calculations are based on an average home assessment value of \$230,000 in 2016 at the 2016 tax rates, and at an annual inflation rate of 3%. In this scenario, each area is taxed for the Fire Services resources they are actually using.

In the following taxation year, residents in the career rated area would see their taxes for Fire Services decrease from \$340 to \$297.97. Both the composite and volunteer rated area residents would receive tax increases to \$249.48 and \$243.47 respectively (actual adjustments will be greater or lesser depending on a property's actual assessed value).

Current Area Rating - Utilization
(based on a \$230,00 home with a 3% annual inflation)

Tax model reflects actual resources used by each area (career, composite and volunteer). No service level improvements. Service delivery model remains underfunded.

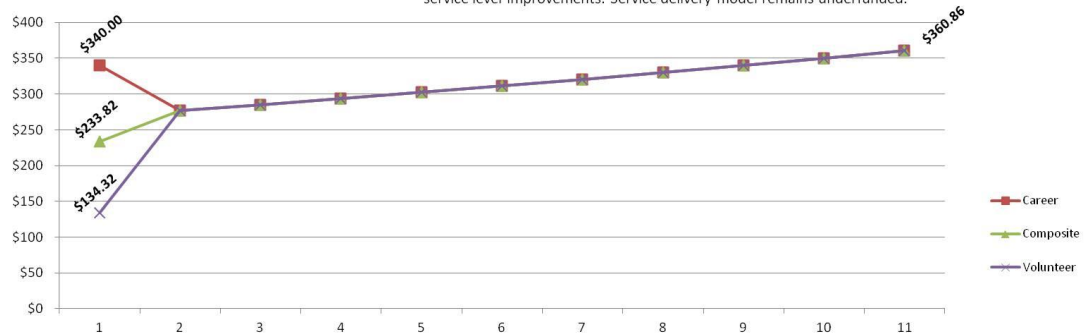


Current Model – Flat Rate Taxation

The graph below demonstrates changes to taxation if a flat rate model is applied. Once again, the calculations are based on an average home assessment value of \$230,000 in 2016 at the 2016 tax rates and at an annual inflation rate of 3%. In this scenario, all residents pay the same rate of taxation for Fire Services which would adjust immediately to \$276.57. This represents a decrease of \$63.43 for the career rated area, and an increase to the composite and volunteer rated areas of \$42.75 and \$142.25 respectively with no service level improvements for residents (actual adjustments will be greater or lesser depending on a property's actual assessed value).

Status Quo - Flat Rate
(based on a \$230,00 home with a 3% annual inflation)

Tax model reflects all taxpayers paying equally for the cost of current Fire Service operations (same tax model as Police and Paramedic Services). No service level improvements. Service delivery model remains underfunded.



The effects on taxation from implementing an optimized model will be described at the end of this section.

Key messages of this section:

- *Taxation for fire services was established during amalgamation based on level of service (career, composite or volunteer) and the associated firefighter wages. It did not appropriately allocate the use of resources such as stations, vehicles and major equipment (base costs). An analysis of actual resource usage identified that the career rated area is subsidizing the volunteer rated areas, and that the composite rated area is nearly balanced.*
- *Career response is dispatched to any working fire or smoke showing regardless of the taxation level paid by residents in the interest of public safety, first responder safety, and in an attempt to minimize risk to the organization of the City of Greater Sudbury.*
- *Recommendation that area rated taxation should be adjusted even if the Optimized Plan is not adopted so as to better reflect the actual usage of fire services by residents (an adjusted utilization model or flat rate model).*

PROPOSED OPTIMIZED MODEL

What you will learn in this section:

- *Solutions that place Fire and Paramedic Services in a sustainable position and focus on public safety.*
- *Suggested service level standards that will establish clear goals and performance metrics for fire service delivery that can be used to understand current and future staffing and service needs.*
- *Recommendations for changes to achieve an optimized, One City One Service delivery model that address community needs and risks.*
- *An overview of the costs associated with the changes for an optimized model that over time will create a fair taxation model that appropriately funds proper service delivery.*

Fire and Paramedic Services has developed an optimized service delivery model that is a highly interconnected system. All of the optimized solutions work together to create a system as fully functional and effective as possible.

This optimized model requires a phased in transformation of stations and locations, proper alignment and delivery of services to address the risks that exist in the community, and a phased in transformation of the staffing profile to achieve a *One City One Service* model that aims to realize the identified guiding principles. This model realizes opportunities for cost avoidance and, where necessary, invests in infrastructure and staffing that best serves not only today's residents, but those of the future as well.

At the heart of Optimization is public safety. This Optimized Plan offers a number of significant benefits to the community. From a Paramedic Services perspective, Optimization presents an opportunity to continue improvement with an ability to reach more of the communities through newly aligned station locations. There is also an opportunity for a cost avoidance strategy to redeploy service hours through the relocation of stations. From a Fire Services perspective, Optimization vastly improves fire ground attendance and response times which means an emergency vehicle gets to the citizens when it matters most. Optimization greatly increases the safety of residents, properties, motorists and injured persons through immediate guaranteed, timely response. Technical rescue services such as ice and water, confined space, trench rescue and hazardous materials are created and enhanced to align with community risks. Overall, public safety is of the greatest importance and the Optimization Plan would succeed in improving it.

Service Level Standards

The first step in pursuit of an optimized model should be the establishment of service level standards. In Paramedic Services, mainly due to provincial legislation but also based on direction from Council, service level expectations are set. The main area in this regard is the Ambulance Response Time Standard, touched upon earlier. There are clear goals that Paramedic Services strives toward and is measured against. Establishing goals and setting out to achieve them is the main focus of a performance based system. The decision at assumption to place Paramedic Services in a performance-based approach has led to Greater Sudbury Paramedic Services being one of the best services in the province.

Throughout the many public presentations leading up to this report, it has become evident that Paramedic Services provides a trusted, well established service delivery model. The same has not been said for Fire Services. There are best practice documents available, namely the NFPA 1710 and 1720 guidelines, which are primarily used to measure value for money and the ability to consistently serve the public. In the absence of legislation or direction, these standards would be used in an investigation to determine a service's response benchmark.

Service delivery standards would establish benchmarks that would allow Council, Fire Administration and the public to understand current and future staffing and service needs for the Fire Service. Greater Sudbury Fire Services does not have established service delivery standards for determining acceptable levels of emergency services that they provide.

As noted in the 2014 IBI Group Fire Service Comprehensive Review;

“At the present time there are no response standards / targets in place for the volunteer fire operations. The Communications Centre monitors the page-out and assembly of the volunteers to determine whether or not to re-page or call out additional resources.

Several peer departments surveyed have established standards and/or targets based on National Fire Protection Association 1720 for volunteers which suggests; time for the dispatch process, established assembly/turnout times, response times and on-scene staffing targets.

Although there is no legislative requirement of what performance measure or standard to meet, municipalities are tasked with setting the service level that meets the needs and financial capabilities of their municipality

We recommend that GSFS should establish and strive to achieve response standards/targets for the Volunteer Fire Operations based on NFPA 1720 and consider incorporating into an internal operating policy.”

While the IBI Group notes the lack for the volunteer area, it is important to recognize that there are also no service standards in place in the career or composite response areas in the City of Greater Sudbury. For purposes of Optimization, service standards aim to address this service gap identified by the IBI Group for all fire personnel regardless of being career, composite or volunteer.

The key to successful mitigation of emergencies is based on a combination of factors including: dispatch, chute, and response times. Dispatch time is considered the point of receipt of the emergency alarm at the public safety answering point (a call to 911 being answered), to the point where sufficient information is known to the dispatcher and applicable units are notified of the emergency (dispatcher notifies firefighters). Chute time was identified earlier as the time from being notified or paged of the emergency to the time that the crew notifies Dispatch that they are travelling to the scene. Response time is a combination of chute time and the actual travel time it takes to be on scene. It is important to note that these time measurements mirror similar measurements established within the performance based Paramedic Services model.

Several factors need to be considered when establishing service levels, including risk to life and property, hazards and population demographics. Below are a series of considerations for future discussion on service delivery standards:

1. Establishing a minimum of four firefighters per responding apparatus for engines, pumpers and aerial devices, with certain defined exceptions.
2. Establishing a risk analysis approach to response service standards for the entire City of Greater Sudbury.
3. Negotiate with Police Services Dispatch to establish dispatch standards which apply to all fire services incident paging and dispatch in the City of Greater Sudbury.
4. Fire Services establish a career turnout standard, and a volunteer assembly standard to apply in the entire City of Greater Sudbury.
5. Establishing a response time arrival standard for urban, suburban, rural and remote emergency incidents, based on the NFPA 1720 benchmark population densities of:
 - a. Urban - 3.86 Persons/Hectare,
 - b. Suburban - 1.93-3.86 P/Ha,
 - c. Rural - Less than 1.93P/Ha,
 - d. Remote - Beyond 13km from a fire station.
6. Establishing a policy for interior fire attack (and technical rescue) and rescue which identifies four firefighters on scene as the minimum for situations where, in the qualified opinion of the Incident Commander, there is no risk of entrapment or collapse, and the interior (or rescue) operations can be attempted safely.

7. Establishing a policy for interior attack and rescue which identifies a minimum of 14 firefighters on scene, or imminently arriving on the scene, for situations where in the qualified opinion of the Incident Commander a risk of entrapment or collapse is possible.
8. Establishing a policy of exterior attack, with no rescue, for incidents where fire ground staffing does not meet or exceed the thresholds identified above.
9. Establish annual auditing for all service delivery standards which will allow for confirmation of service levels and serve as a planning tool for future growth.
10. Establish a minimum annual call volume for a response station. Stations which regularly experience call volumes below this threshold should be given consideration for consolidation with adjacent stations. Such consideration will include a review of the Community Risk Profile, and the Service Delivery Standards as the basis for recommendations to Council.

Greater Sudbury Fire Services has researched industry best practice, and the initial recommendation would seek to establish a standard which will see a dispatch time of 60 seconds or less, 90% of the time, for all fire beats. In addition to seeking direction from Council, Greater Sudbury Police Services (GSPS) is the contractor for these services, and identification and administration of this standard would be dependent upon a Service Level Agreement (SLA) negotiated and agreed with them. This one-minute (60 second) Dispatch Time is in accordance with the NFPA 1710 and NFPA 1720 recommendation for all fire protection areas.

In addition, initial analysis and recommendation would seek to establish a chute time of 1:20 minutes, 90% of the time for career stations (inclusive of the career portion of composite stations) and under five minutes, 90% of the times for volunteer stations. Confirmation of these recommendations would be at Council's direction.

A compilation of the resultant response time initial recommendations would be established based upon urban, suburban, rural and remote designations as detailed above, and are summarized below;

A. URBAN for Fire Protection Districts with population density exceeding 3.86P/Ha, and a total population greater than 3,000.

- 1) A dispatch time of 60 seconds.
- 2) A turnout time of one minute, twenty seconds (1:20).
- 3) A response time of five minutes twenty seconds (5:20), or less 90% of the time for single unit responses, or for the first arriving unit of a multiple unit response. The initial unit will have a staffing of a minimum of four firefighters.
- 4) A response time of nine minutes or less 90% of the time be established for subsequent arriving units of a multiple unit response or alarm assignment.
- 5) A full alarm assignment consists of two Engines, one Aerial, for a total of 12 personnel.
- 6) A dedicated Incident Commander will be dispatched on full alarm assignments, with no response time criteria.

- 7) A subsequent alarm assignment consists of a minimum of two units (configuration acceptable to the Incident Commander) for a total of eight additional personnel.

B. SUBURBAN for Fire Protection Districts with population density between 1.93 and 3.86 P/Ha, and/or a total population greater than 1000.

- 1) A dispatch time of 60 seconds.
- 2) Career Turnout: A turnout time of one minute, twenty seconds (1:20).
- 3) Volunteer Turnout: A turnout time of five minutes (5:00) or less 90% of the time.
- 4) A response time of nine minutes or less 90% of the time for single unit responses, or for the first arriving unit of a multiple unit response. The initial unit has a staffing of a minimum of four firefighters.
- 5) A response time of nine minutes or less 80% of the time be established for subsequent arriving units and eight firefighters, for a multiple unit response or alarm assignment.
- 6) A dedicated Incident Commander will be dispatched on full alarm assignments, with no response time criteria.

C. RURAL for Fire Protection Districts with population density below 1.93 P/Ha, but within 13 kilometres of a fire station.

- 1) A dispatch time of 60 seconds.
- 2) Career Turnout: A turnout time of one minute, twenty seconds (1:20).
- 3) Volunteer Turnout: A turnout time of five minutes (5:00) or less 90% of the time.
- 4) A response time of 14 minutes or less 80% of the time for single unit responses, or for the first arriving unit of a multiple unit response. The initial unit has a staffing of a minimum of four firefighters.
- 5) A response time of 14 minutes or less 80% of the time be established for subsequent arriving units and six total firefighters, for a multiple unit response or alarm assignment.
- 6) A dedicated Incident Commander will be dispatched on full alarm assignments, with no response time criteria.

D. REMOTE for properties beyond 13 kilometres from the nearest fire station.

- 1) A dispatch time of 60 seconds.
- 2) Career Turnout: A turnout time of one minute, twenty seconds (1:20).
- 3) Volunteer Turnout: A turnout time of five minutes (5:00) or less - 90% of the time.
- 4) A response time dependent upon the drive time to the incident. The initial unit has a staffing of a minimum of four firefighters.

The establishment of a performance-based system of service delivery in the Fire Services would advance not only moving toward an optimized system, but would also establish the level of expectation from both Council and citizens. It is essential that service delivery standards are set to ensure that expectations of this essential public service are determined in advance of an actual emergency.

Stations

The Fire and Paramedic Services Optimized model reduces the total number of stations required in the provision of emergency response for paramedics and firefighters from 27 to 17 buildings in locations that are best able to respond to the risks and needs of the entire city (see Appendices #M23, #M24, and #M25). This reduction in number of stations will reduce the overall average age of stations to just 19 years from its current average age of 44, and will help ensure that buildings meet the modern needs and legislative requirements for both services. Furthermore, these stations will be appropriately staffed through the use of both career and volunteer firefighters. The transformation of these stations and associated staffing is anticipated to occur in a number of phases over the next seven to ten years.

Staff reviewed each area of the city and identified the appropriate classification of urban, suburban or rural as per NFPA guidelines to determine the level of response recommended for each area. Next, they reviewed historical number of incidents, response times and incident attendance for each area to see how they aligned to industry standards. Finally, staff looked at the presence of high risk properties in each area to determine the level of hazards that may exist in a community. A table summarizing these details of each station can be found in Appendix #T7. Cost and the ability to reduce operating expenses for building repairs and maintenance was also a determining factor for the overall plan. Staffing recommendations are also aimed to balance service level needs and risks present with labour costs.

New Fire and Paramedic Services Headquarters and Former City Stations

It has been determined that to best serve both Paramedic and Fire Services, the Headquarters should be located within the city core in the vicinity of Lasalle Boulevard and Maley Drive Extension, which is currently being constructed. The main Headquarters at the Lionel E. Lalonde Centre would look to be repurposed. The building, while older, still has a good infrastructure that could be used by many other departments within the City. The fact that the building is not in an optimal location for Fire and Paramedic Services does not mean that it wouldn't be a good location for others. With the current infrastructure inherent in the building, one use could be converting it into a full training centre.

The relocation of Headquarters to a more centrally located location within the city core has many benefits. A central location will allow management, logistical and administrative staff to better support front-line emergency services workers working in the field. The reduction in travel time for the Paramedic Services Platoon Superintendent required to reach the majority of the paramedic crews allows them to more effectively respond to issues from their office. Furthermore, being located within the area where over 70% of paramedic calls occur, allows the Platoon Superintendent to support and be more involved in major incidents in a more timely fashion.

Moving Headquarters into the city core would result in a change to the central reporting system for Paramedic Services and would save about 4,000 ambulance hours per year which equates to nearly one full extra paramedic shift per day, which can be redeployed to other high volume areas of the city (Valley East).

Moving paramedic response to the Hanmer location would provide for a more optimal response and reduces the dependence on the Capreol Paramedic Response Unit to provide balanced emergency coverage in the Valley East area. Increased paramedic resources in the area as a whole is enabled with the realignment of Emergency Services Stations in the Valley East area, which will undoubtedly lead to improvement in response time and depth of service with reduced dependence to backfill with a city vehicle to balanced emergency coverage.

Additionally, the change will allow for the implementation of central warehousing for supplies and equipment for both Fire and Paramedic Services. The Headquarters would also be used as a responding station for Fire Services to replace Leon Station (#3) located in New Sudbury. This move allows fire services to better protect the northwest quadrant of the city core up to McCrea Heights and Val Caron. With a Headquarters being within the core of higher call volume, Paramedic Services would be in a location from which to deploy all City resources and would also become a response station as well. The current HQ in Azilda does not support a response resource as all the resources deployed out of Headquarters respond from posts in the city core. Finally, further supporting response capability, being located near arterial roadways allows quick travel North, South, East and West with multiple access and egress routes. Currently, when MR35 is blocked ambulances can take up to one hour to reach the city as they need to go through Valley East.

Paramedics responded to 3,191 calls in 2016 from the New Sudbury Leon Street station. This represents 12% of the total annual call volume. The ambulance from this location also responded to Valley East, Garson and Minnow Lake as required when ambulances in those areas were busy. Being in close proximity to some arterial roadways has made this a good location for Paramedic Services. Response performance by the New Sudbury Station is shown below. A complete table of response time for all stations individually is included in Appendix #T9.

2016 New Sudbury Response Times (Leon)				
SCA < 6 min. 70%	CTAS1 <8 min. 80%	CTAS <10 85%	Average Response time	Code 4 90th Percentile
89%	94%	93%	05:54	08:56

As the Leon St. Station is not in the right location for Fire Services and with a new Headquarters being constructed in the vicinity of Lasalle Boulevard and the Maley Drive Extension, under the Optimized Plan a new Paramedic Post in the Barrydowne Road area will be sought. This location being fairly centrally located amongst the other relocated Emergency Services stations in the former city will allow this site to support not only New Sudbury, but also access the Kingsway, Second Avenue and Minnow Lake areas effectively. Potential properties for development will need to be evaluated from a response prospective as part of the implementation plan.

Locating the Headquarters in the city core provides opportunities for greater communication and training of front-line and supervisory staff. Furthermore, it improves the ability for Community Safety staff to engage and work more collaboratively with other City staff located at Tom Davies Square in downtown Greater Sudbury.

The downtown Van Horne Station (#1) would be closed and rebuilt out towards the intersection of Elm Street and Big Nickel Mine Road. This location removes the station from the congested downtown and puts it on a main thoroughway that allows quick access to multiple areas of the city (north toward Chelmsford, west toward Copper Cliff, and south into the Downtown). It would also enable the closure of Copper Cliff Station which is located too close to a major hazard in the city should an emergency arise. Volunteer firefighters would be integrated into adjacent stations.

Paramedics responded to 6,989 calls in 2016 from the downtown Van Horne station, representing 27% of the total annual call volume. Being in close proximity to several arterial roadways, namely Paris Street, Brady Street, Kingsway, and Notre Dame Avenue, allows ambulances from this location to move quickly around the city core. This location and its close proximity to several arterial roads has resulted in very good response times from this location.

2016 Downtown Response Times (Van Horne)				
SCA < 6 min. 70%	CTAS1 <8 min. 80%	CTAS <10 85%	Average Response time	Code 4 90th Percentile
94%	93%	96%	05:11	07:44

The Van Horne Street Station is recommended to be closed due to a number of reasons including:

- age of building (41 years old in 2016)
- CCI Engineering Group report details \$2.2 million in repairs required
- wrong location for Fire Services to respond to identified community risks
- while a good location for Paramedics Services, it is far too large for a paramedic post, and both the building and property are too small to repurpose as a Headquarters
- poor location due to inherent community risk (rail yard)

Van Horne Station is proposed to be replaced with a fire station in the area of Elm St. West. With this in mind, the Optimized Plan calls for a new Paramedic Post to be constructed in close proximity to the Van Horne location that is well situated for paramedic response to the highest call activity in the city. This plan recommends construction of a new Paramedic Post along Notre Dame Avenue near the downtown area.

The Long Lake Station (#4) is ideally located to protect both the south end of the city and into the downtown core. The Optimized Plan recommends that the station be rebuilt since it will be 45 years old by 2022. The cost to renovate is expected to be \$1.2 million based on the building condition assessments. The cost to rebuild five years later is estimated to be \$5.2 million. It would be more cost effective in the long term to build a new station rather than try to renovate the existing structure. It would remain a shared paramedic and fire response station.

To best service the northeastern portion of New Sudbury and former Nickel Centre areas of the city, this plan is recommending that the Garson Station (#20) be rebuilt in the town centre slightly south of its current location. This will allow better coverage and response into the northeast portion of the city core, including the industrial area located on Maley Drive. This relocation does not compromise coverage in the Garson area and places the station on a main roadway that allows for better and quicker response during an emergency. Paramedics would also remain in this emergency response station.

To provide optimal coverage to the southeastern portion of the city, it is recommended that the Minnow Lake Station (#2) be moved close to the intersection of the Kingsway/Hwy 17E and Levesque Street. Once again, it allows for quick and easy response onto a main roadway and extends coverage into the Coniston area, where there is abundant industrial activity, without compromising coverage into the city core. This is currently a shared station with Paramedic Services and should remain so when it is relocated.

All four of the city core fire stations would remain as career response. The realignment of locations would help to balance call volumes and allow Fire Services to better respond not only to incidents in the city core, but also into the outwardly areas of Walden, Chelmsford/Azilda, Garson, and Coniston where significant growth and industrial activity exists. It is recommended that Garson be converted to a composite station that would provide an immediate four person response that is augmented by volunteer firefighters. It is further recommended that Falconbridge Station be closed and volunteers be integrated into the Garson Station.

District 2 (Walden) Stations

The Walden area, District 2, currently contains five stations: Copper Cliff, Waters, Lively, Whitefish and Beaver Lake. The Optimized Plan recommends the integration of the Lively Station (#7) into the Waters Station (#6). These two stations are currently located just a couple of kilometres apart from each other. Although they are separated by a railway, the reduced rail traffic, shorter trains and ability to contact the railways to stop a train if needed reduces the concern of it affecting the ability of Fire Services to respond to an emergency. Due to the population density and concentration of commercial and industrial activity in the area, it is recommended that the Waters Station be converted to a composite station to ensure an immediate four-person guaranteed response that would be augmented with volunteer firefighters. The Waters Station should be rebuilt either on the existing City owned property or within one kilometre of its current location and remain as a shared emergency response station with Paramedic Services. Once again, this positions the Emergency Services Station on the main thoroughway allowing for quick response and access to many areas of the community including the Walden Industrial Park and numerous mine sites. When reviewing the Beaver Lake Station (#9), it was determined that given the low call volume, high costs and low presence of risk, this station's response should be integrated with the Whitefish Station (#8). Given the age and condition of the Whitefish Station, it should be rebuilt on the existing piece of property, perhaps in collaboration with Infrastructure Services who operate a public works station on the same piece of property which is as equally aged and in need of significant repairs. The administration is also currently investigating the possibility of engaging in an automatic aid agreement with the neighbouring town of Nairn Centre which is located just seven kilometres west of Beaver Lake.

District 3 (Rayside-Balfour) Stations

The former Rayside-Balfour area, District 3 includes five stations: Chelmsford, Azilda, Dowling, Vermillion and Levack. Paramedic Services shares the Levack Station and has their own station in Chelmsford. A review of the call volume, population growth, intensity of commercial and industrial businesses, as well as the presence of a long-term care facility, indicates that Chelmsford should be converted to a composite station. This station would be a new build ideally located at the intersection of Municipal Road 35 and Highway 144 to allow ease of access to the main corridors. This location allows for coverage into Azilda without compromising response into Chelmsford. The new Chelmsford Station would be an emergency response station that is shared with Paramedic Services. This improvement would provide an immediate four-person guaranteed response augmented by volunteer firefighters. It maintains coverage in the Dowling area with enhanced support from the Chelmsford Station. Both Dowling (#12) and Levack (#14) would remain in place and would undergo extensive renovations to bring the buildings up to required standard. At the end of their life cycle, these stations would eventually be replaced. The Vermillion Station (#13) is recommended for closure and would result in the integration of volunteer firefighters with the Dowling Station. Dowling has had only one call over the past two years, has an annual cost of about \$ 138,000 and requires about \$400,000 in repairs.

District 4 (Valley East) Stations

The community of Valley East (District 4) has four stations: Val Caron, Val Therese, Hanmer and Capreol. It has been determined that a composite response station should remain in the area, however, due to the concentration of industrial activity in the southern part of the community, the Optimized Plan recommends building a new station closer along Municipal Road 80, near Municipal Road 15. It further recommends the closure of the Val Therese Station and rebuilding of the Hanmer Station. These movements maintain coverage of the Valley East area with just two stations, reducing operating costs for the area. The Hanmer Station would be rebuilt with consideration for continued growth in the area. Volunteers would once again be integrated with adjacent stations. For paramedic response in the area, a full-time ambulance would operate 24 hours a day, seven days a week, most likely at the Val Caron Station. The addition of a 12-hour, seven day a week day shift ambulance would also be placed in the area at the Hanmer Station to provide coverage in response to the increased call volumes that are being experienced in the Valley East area. This can be done by repurposing the hours saved in travel time gained in the move of Headquarters into the city core area. Additionally, this will also help reduce the need to remove resources from the city core to provide coverage in the Valley East area. As well, it would provide an additional reporting option for paramedics, perhaps enticing those living in the Valley East area who may be interested in a shorter commute to work and a familiarity with the work location. In reviewing the district, it was also determined that the Capreol Station is nearing its useful life but is in a good location, with a decent call volumes for both Fire and Paramedic Services, and has acceptable volunteer firefighter participation. It should be rebuilt and turned into a shared post for Fire and Paramedic Services. The current standalone paramedic post can be sold.

Where appropriate, From Home Response should be implemented for volunteers. This means that some volunteers would go directly to the scene of an emergency instead of responding to the station first. This is a model used by many municipalities in Ontario and improves response times to emergencies, a critical element in ensuring the safety of residents and properties. In fact, the Red Deer Lake Station (#25) is already using From Home Response, due to their station being condemned. This type of response is particularly effective for composite station response which is being recommended for Waters, Chelmsford, Garson and Val Therese. Knowing that a fire truck had been dispatched with a minimum of four career firefighters allows for volunteers to carry their own personal protective equipment (PPE) and their bunker gear in an appropriate storage container in their vehicle. Enabling them to respond directly from wherever they may be without having to report to a station to become part of a crew responding in a fire truck can greatly improve fire ground staffing assembly and set up time, allowing firefighters to more quickly manage the emergency scene. This can often result in reduced damage to a property and/or improved success rates to the condition of any victims of an emergency scene whether it is a fire or motor vehicle accident.

It must be noted that the reduction in stations identified in the optimized map is absolutely dependent upon the staffing enhancement identified in the following section. The following table summarizes the recommended changes specific to the location of new builds and associated closures.

Summary of Proposed Station Changes

New Station	Old Station(s)
Elm West Fire Station (Elm Street at Big Nickel Mine Road)	Van Horne (Main) Fire and Paramedic Shared Station
	Copper Cliff
Downtown Paramedic Post (Notre Dame Avenue between bridge and Kathleen Street)	Van Horne (Main) Fire and Paramedic Shared Station
Minnow Lake Fire and Paramedic Shared Station (17 East at Kingsway)	Minnow Lake Fire and Paramedic Shared Station
	Coniston Fire Station
Headquarters and New Sudbury Fire and Paramedic Station (Maley Drive at Lasalle Boulevard and Notre Dame Avenue)	New Sudbury (Leon) Fire and Paramedic Shared Stations
	Emergency Services Headquarters (LEL)
New Sudbury Paramedic Post Only (Barrydowne/Lasalle area)	New Sudbury (Leon) Fire and Paramedic Shared Station
Chelmsford Fire and Paramedic Shared Station (Hwy 144 at MR 35/15)	Chelmsford Fire Station
	Chelmsford Paramedic Post
	Azilda Fire Station
Garson Fire and Paramedic Shared Station (Falconbridge Road near Garson Tim Horton's)	Garson Fire and Paramedic Shared Station
	Falconbridge Fire Station
Val Caron Fire and Paramedic Shared Station (MR 80 at MR 35 - Main Street)	Val Caron Fire and Paramedic Shared Station
	Val Therese Fire Station
Hanmer Fire Station (Cote Boulevard at MR 80)	Hanmer Fire and Paramedic Shared Station
Lively/Waters Fire and Paramedic Shared Station (Within 1 km of current Waters site or on current site)	Waters Fire and Paramedic Station
	Lively Fire Station

These new stations are strategically positioned for optimal service coverage, on main roadways which enable quick response, and in alignment with projected future growth of the community. See Appendix #M24 and 25 for response times for both Fire and Paramedic Services. When identifying the best location to position emergency stations, a consideration of major hazards such as railways and large industrial operations have been taken into account to reduce or eliminate the possibility of a station becoming located within or too close to an emergency scene. Stations were also located on the outer edges of city core in order to provide balanced response both inwards to the urban area and outwards to more suburban areas. The location of vulnerable occupancies such as daycares, schools, and senior housing complexes was also taken into account in the positioning of stations within optimal response times to these high demand and high risk populations. Lastly, there is an aim to locate stations on major roadways to allow for quick and flexible response by emergency crews.

Two new paramedic posts, as noted in the table above, are included in the plan to meet higher emergency medical call volume demand in the Downtown and New Sudbury areas. The separation of Paramedic and Fire Services stations in some areas will improve the effectiveness of medical tiered response with the reduction in duplication of response from the same station with an accompanying ability to cover greater gaps between paramedic posts or stations.

Concerns and issues regarding age, size, configuration, environmental impact and legislative requirements are addressed by building new structures that are designed for today's modern Fire and Paramedic Services. The changes noted above also aim to align with the identified community risks. Furthermore, these new builds represent a much needed investment in Fire and Paramedic Services infrastructure that will reduce the capital gap and long-term costs.

Positive outcomes relational to the merging of stations are numerous. By relocating and merging stations there is a great opportunity to reduce overall costs. Understanding that there is already a great deficit in capital funding, finding ways to reduce this gap is essential in an optimized plan. Merging stations reduces the overall operating and maintenance costs of the department while aligning staffing and resources to create better service. With the better service arrived at by merging stations there is also an opportunity to improve FUS ratings through the redundancy of stations. While obvious, it is not commonly thought that with a reduction in stations there would also be a reduction in equipment, such as vehicles required to support operations within those stations. This further reduces the capital gap in equipment purchasing. The redundant buildings would either be transformed for alternative purposes or sold thereby offsetting the costs of new construction. Lastly, merging stations can increase efficiency in aligning to call volumes (demand) for service while reducing operational costs.

Staffing

The optimized model relies on a greater number of career firefighters while still maintaining a core group of meaningfully participating volunteers. These changes, as noted above, align with the changes in numbers of stations and the need to ensure quick response in high risk areas (densely populated areas, or those with a concentration of industrial activity). The decrease in stations and equipment and correlating increase in staffing will actually optimize service.

Of largest impact to service is the creation of composite stations in the communities of Garson, Chelmsford, Val Caron, and Waters (Walden). There are many benefits to a composite model of firefighting. The transformation of fire suppression staffing ratio from 108 career and 350 volunteer firefighters to 166 and 135 respectively aligns staffing with service and risk. This model allows for a guaranteed immediate response of four full-time firefighters quickly with additional resources deployed from the volunteer force. It allows Fire Services to minimize staffing costs, while safeguarding that the required number of firefighters are available to effectively fight a fire upon initial arrival at an emergency scene. This composite model is effective in ensuring a timely response is available in these denser suburban areas of the city and where there is significant risk identified due to vulnerable occupancies, and commercial and industrial activities.

As noted in the fire growth curve earlier in this report, time matters when it comes to fighting fire. The goal of a proactive fire response is to arrive quickly with enough properly equipped firefighters before the fire spreads. With a career firefighting force not only is there a guaranteed four-person response, but there is an average assembly time of 1:20 minutes as these firefighters are working in the station awaiting calls, or in the field conducting inspections or pre-incident plans. The volunteer response model is designed to incorporate a delayed assembly time of approximately six minutes as these firefighters require the additional time to arrive at the station for deployment from their location at the time of page. With a guaranteed career fire response there is obviously a great improvement in response times. An additional benefit to a composite scenario is the improvement of volunteer attendance at emergency scenes knowing that full-time personnel are already responding.

As identified earlier, the Collective Bargaining Agreement for volunteer firefighters states that they have full discretion as to whether or not they attend an incident and no minimum thresholds have been established. Furthermore, the system currently being used does not allow for volunteer firefighters to indicate their availability to respond in a timely manner. Given the advances in technology and availability of cellular service even in more rural areas, an optimized service would greatly benefit from implementing modern, advanced technology that allows firefighters to register their availability and/or quickly indicate their intention to respond to a call upon being notified. This timely information would help the on-duty Platoon Chief determine if additional resources from adjacent stations is required for an incident in a quick and efficient manner, improving the outcomes of an emergency situation.

Currently, career firefighters complete training during their regularly scheduled shifts and volunteers generally train one night per week at their volunteer station.

By providing 24 hour, seven day a week, full-time staffing at composite stations, this allows for a more encompassing, consistent and flexible training model for all firefighters. The optimized model recommends that training be provided at composite and career stations every day with varying schedules and that all firefighters would be instructed collectively. This training model would allow volunteers to have the flexibility to attend training sessions that best match their home and work lives, and would build strong working relationships amongst all firefighters. A formally designed training program and curriculum would be developed to ensure all firefighters are trained consistently and appropriately on the risks that exist overall in the community. Specialty training would also be provided in areas to align with specific risks that exist within certain geographies, such as water and ice rescue in areas that have major waterways, or HAZMat in areas with industrial concentration. (See maps Appendices #M26, #M27, and #M28). These improvements to the training model will provide all firefighters with a consistent level of knowledge and skill which aligns with service needs and community risks.

The FUS Report identified that ratings could be improved if Greater Sudbury Fire Services conducted inspections and pre-incident planning according to their recommended guidelines (Appendix #R1). Applying these guidelines would suggest the need for additional resources in Fire Prevention to support the volume and type of inspections based on the composition of occupancies that exist in the community. The Risk Base Inspection Program Table (see Appendix #T8) demonstrates that nearly four person years is required to complete inspections based on the composition of businesses that exist in Greater Sudbury and the recommended inspection schedule. This serves to follow the recommendation of the 2014 IBI Group Comprehensive Fire Service Review, as can be seen in the excerpt below:

“Both the 2011 review and the OFM Audit have recommended that FPPE(fire prevention and public education) needs to develop a proactive building inspection strategy and prioritized work plan based on occupancy category and risk, giving priority to assembly, care facilities and large business / mercantile buildings.

We are advised that GSFS is currently addressing this recommendation as part of a Comprehensive Fire Risk Assessment that is underway and that a 5 year agreement with the Building Department to perform the plans review function has been established.

The work in process includes a review of Fire Prevention files to ascertain which buildings require an inspection, or follow up based on a past inspection, and a building stock inventory, giving initial consideration to extreme and high-risk occupancies.

The work also includes development of a strategy to deal with potential fire risks from a Fire Safety Standards and Code Enforcement perspective. The strategy will include a pre-fire inspection by suppression firefighters. Public education will also play a significant role, thereby utilizing the three lines of defence to avert potential risks posed by the building, its contents or occupants.

As noted above FPPE personnel are overwhelmed by the current volume of work, and they would be hard pressed to successfully implement the proposed strategy described above, despite the

OFM's participation in the process. For this reason, we again reiterate that the solution to this situation may be that, for a temporary period, GSFS may have to secure additional staff."

An improvement to the city's FUS ratings would potentially reduce insurance premiums for residents and business owners. Furthermore, improving inspections and record keeping on high risk occupancies in the community better prepares firefighters for a scene in the event of an emergency. Staff would be aware and knowledgeable of specific risks that are associated with these properties and would have a response plan in place should an emergency occur.

Public Education Officer

Public education was also identified as inadequate by FUS. This is mainly due to the fact that the Greater Sudbury Fire Services has only one Public Education Officer and there are nearly 100 schools and 200 long term care facilities in Greater Sudbury. Additional resources in Public Education would provide good coverage and penetration of fire prevention programs across the entire community. This includes programming such as: Learn Not to Burn, Family Escape Plans, Fire Drills, Senior Older and Wiser, Remembering When, and Arson Prevention Program for Children.

Generalist

A position entitled, Generalist has also been added in the recommendation for staffing increases. This position would be a full-time non-Union position that would provide support to the overall Community Safety Department. Currently there are only four positions available to provide support to major projects and initiatives such as continuous improvement, talent management, employee engagement, benchmarking and business analytics. As a result, the senior leadership is trying to complete these initiatives of the corner of their desks while still trying to run the department. This aligns with recommendations made in the IBI report which stated that increased support is needed for the department, especially for the management of volunteer firefighters.

Paramedic Services Scheduling Clerk

As mentioned in the analysis section for Paramedic Services, scheduling duties are currently being performed by the Payroll and Finance Clerk and the Platoon Superintendent. Completing this task takes away from other core duties of these positions therefore it is recommended that a new position, Scheduling Clerk, be created. The scheduling of staff could more effectively and efficiently be performed by a full-time Scheduling Clerk. This position would be responsible for performing all scheduling functions with the exception of last minute changes that affect the next shift which would remain the responsibility of the Platoon Superintendent. The addition of this position would free up the Platoon Superintendent enabling them to spend more time in the field directly supervising and supporting operations and employees.

Equipment Vehicle Technician (EVT)

As noted earlier EVTs are vital to the logistical support of Paramedic Services ensuring all vehicles and medical equipment are cleaned, sanitized, inspected and restocked in accordance with provincial

legislation, regulations, standards and service policy. The detailed job tasks related to the EVT system have been described previously within this report. A major issue with this part of the service they provide is that the time dedicated to this task has increased by 50%, now taking about 665 hours annually as a result of Fleet Services' move from Northwest Depot in Chelmsford to the Lorne Street garage.

The current complement of five full-time EVTs are available to work 400 regularly scheduled hours in a two week period, however the Service requires 552 hours of work during this time frame. Furthermore, this requirement does not take into account absences due to vacation, training or illness. The addition of one full-time EVT will:

- Fill an existing regular schedule rotation, reducing the dependence on part-time staff to cover these scheduled hours.
- Provide a modest increase in staffing hours (388) to meet the increased service demands that includes: processing vehicles/equipment for deployment and the increase of time on task to transport vehicles to Fleet Services located on Lorne Street.

The Optimization study shows that Paramedic Services does not require additional paramedics or vehicle hours at the present time. It is important however to recognize that any such request would fall in line with the current process when it comes to addressing emergency response pressures. Paramedic Services, as noted previously, has done a great job of ensuring that it has placed enough resources within the community to meet the needs of the citizens of Greater Sudbury. If the call volume trend continues without relief from other anticipated programs and processes, Paramedic Services will approach Council during the annual budget process with a business plan to address any needs. At this time it is prudent to simply monitor system performance and emerging trends that could have the ability to reduce call volumes and create capacity within the system before a request is made for additional staff or vehicles.

As noted earlier, trends in Paramedic Services are aimed at reducing the requirement to enhance vehicle deployment hours and staffing. The North East LHIN Non Urgent Patient Transportation Project is finalizing a public procurement process to secure third party services to carry out this work across Northeastern Ontario and specifically to address routine scheduled non urgent transportation in and out of Health Sciences North. This project, once in full operation, could significantly reduce the number of long distance transfers paramedics are currently doing, resulting in additional capacity to address system challenges. The MOHLTC is also undertaking transformational change within the Provincial dispatch centres to modernize their triaging algorithms. It is predicted that once implemented, there will be a reduction in the number of high priority calls thus allowing a better coordination of low acuity calls which will address system challenges including response time performance.

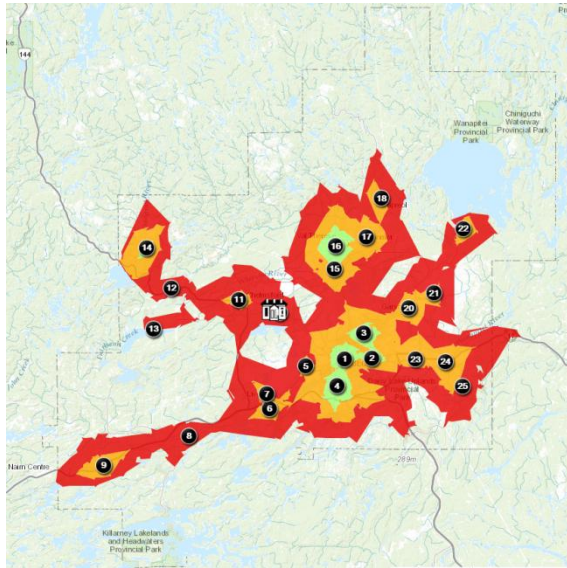
Paramedic Services has been successful in making small incremental increases to vehicle and staffing hours to meet increased demands on service over the last 17 years and will continue to monitor service performance to determine when additional resources are required to address emerging challenges.

When additional resources are deemed to be required, a request for additional paramedic staff or vehicles will be done through the normal budget process.

Finally, a Project Manager position has been included in the recommendations. This would be a limited contract position initiated to oversee and provide support for the implementation of the proposed Optimization Plan. This is a large and complex project that simply cannot be handled off the corner of someone's desk. It requires the full attention of a single person to manage the various aspects of the plan.

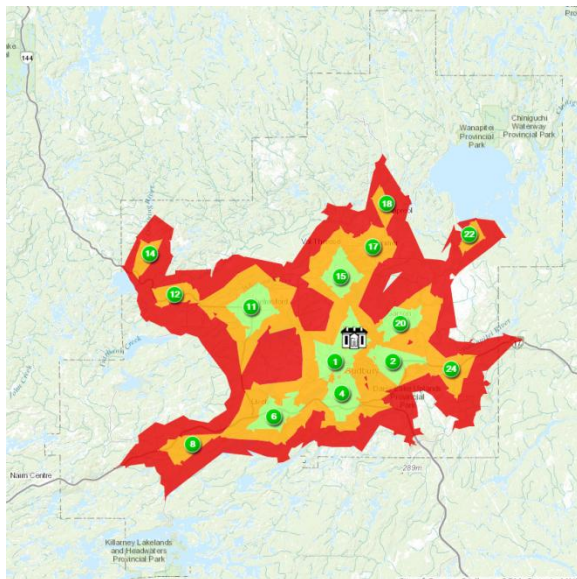
The Optimized Model, when mapped using the response criteria recommended in NFPA 1710 and NFPA 1720 (five minutes and twenty seconds (5:20) for urban areas, nine minutes (nine) for suburban areas, and 14 minutes (14:00) for rural areas), reveals the following before and after response situations. Actual historical assembly times were used for the current model. It is important to note that a five minute assembly time for volunteer stations has been used in the optimized model with the goal of improving existing response times and having these stations meet or exceed the industry standard.

Current Response Map



1 Van Horne	9 Beaver Lake	17 Hanmer
2 Minnow Lake	10 Azilda	18 Capreol
3 New Sudbury (Leon)	11 Chelmsford	20 Garson
4 Long Lake	12 Dowling	21 Falconbridge
5 Copper Cliff	13 Vermillion	22 Skead
6 Waters	14 Levack	23 Coniston
7 Lively	15 Val Caron	24 Wahnapiatae
8 Whitefish	16 Val Therese	25 Red Deer Lake

Optimized Model Response Map



1 Elm West	8 Whitefish	17 Hanmer
2 Kingsway @ 17E (HQ)	11 Chelmsford	18 Capreol
3 Maley @ Lasalle	12 Dowling	20 Garson
4 Long Lake	14 Levack	22 Skead
6 Lively / Waters	15 Val Caron	

A detailed analysis of these maps provided by the City's GIS Department in the table below reflects expected improvements in Fire Service coverage expected due to Optimization. Significant response time gains are identified in the 'under 5:20 minute' response where 53% of the MPAC valuation would have guaranteed response by four firefighters compared to 35% under the current model. The optimized model is expected to provide 90% coverage within a nine minute response as compared to only 69% in the current model. Additionally, this Optimized model is composed of a four-person

guaranteed response for 80% of the MPAC valuation with the remaining 10 % coverage being provided by volunteer firefighters, with continued career/composite support. Given the city's geographic challenges, this achievement is quite impressive.

Fire Response Coverage and Property Assessment Value
Current Model and Optimized Model

Fire Response Times	5:20 minutes or less NFPA 1710		9:00 minutes or less NFPA 1720		14:00 minutes or less NFPA 1720		14 minutes or more	
	Properties Covered (%)	Assessed Value (billion \$)	Properties Covered (%)	Assessed Value (billion \$)	Properties Covered (%)	Assessed Value (billion \$)	Properties Covered (%)	Assessed Value (billion \$)
Current Model								
Career	35%	\$ 7.487	48%	\$ 10.428	61%	\$ 12.711	0%	-
Composite	5%	0.849	12%	1.902	15%	2.288	0%	-
Volunteer	1%	0.085	9%	1.166	18%	2.488	0%	-
Beyond 14 minutes	0%	-	0%	-	0%	-	6%	0.936
Total	42%	\$ 8.421	69%	\$ 13.496	94%	\$ 17.487	6%	\$ 0.936
Optimized Model								
Career/ Composite	53%	\$ 10.985	80%	\$ 15.631	83%	\$ 16.175	0%	-
Volunteer	0%	-	10%	1.238	12%	1.510	0%	-
Beyond 14 minutes	0%	-	0%	-	0%	-	5%	0.738
Total	53%	\$ 10.985	90%	\$ 16.869	95%	\$ 17.685	100%	\$18.423

Note: Service level expectations are based on NFPA Standard 1720 – *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the public by Volunteer Fire departments*, which is applied for both composite and volunteer departments.

Fire Vehicles and Major Equipment

The reduction in the overall number of stations will also enable the decrease in the number of fire trucks from 73 to 48 and a further decrease in the associated equipment required to deliver fire services. The table below presents an overview of the current Fire Services large vehicle fleet and the expected impact of the Optimization implementation on it. The reduction in overall stations and firefighters, along with the conversion to From Home Response for some volunteer firefighters reduces the necessity for vehicles served primarily to transport volunteers to and from the scene of an incident. Additionally, the continued implementation of the current fleet rationalization introduced by Fire Services Administration in 2014 will continue to standardize the fleet and apparatus within the limitations of manufacturer's abilities over several purchase cycles. This process also includes the rotation of vehicles and equipment to maximize effective lifespan. The remaining stations will be better stocked with standardized vehicles that best meet the community needs and not based on what fits in the station.

These changes all aim to help reduce the capital gap while increasing service delivery. It should be recognized that the above noted efficiencies are estimates of fleet numbers when the plan is fully implemented, and amendments may be required as continued analysis refines these recommendations, based on evolving community risk, and service needs.

Front-Line Vehicles:			
	Current Model	Optimized Model	Change
Engine - Commercial	14	3	-11
Engine - Custom	13	16	3
Tanker	11	11	0
Support - Rehab Units	11	2	-9
Ladder (Aerial)	4	2	-2
Support - Bush Trucks	11	6	-5
Boat and Trailer	6	7	1
HAZMat Unit	1	1	0
Rescue Units	2	0	-2
Total Front-Line Vehicles	73	48	-25

Service Level and Community Risk

Greater Sudbury Fire Services has the potential to implement an emergency response model that delivers a consistent response to the community-based on a solid understanding of risk and a service response plan designed to address hazards present in the community. It can provide enhanced specialty team response for hazardous materials, trench rescue, confined spaced rescue, water and ice rescue, as well as deliver a consistent medical tiered response.

Improvements to service levels are expected to improve FUS ratings used by the insurance industry to determine premiums for businesses and home owners. For example, a single career firefighter on a truck gives a FUS Dwelling Protection Grade (DPG) of two, versus an all-volunteer truck which receives a three. Stations with four career firefighters on a truck receive a DPG of one. So, for areas where a composite station is being recommended, the FUS grade should improve simply based on these changes to staffing.

As part of Optimization, Fire Services will implement a fire prevention delivery model that is consistently applied throughout the city. It will be led by the Chief Fire Prevention Officer and where applicable, involves participation by both on duty career suppression and volunteer firefighters. This program will prioritize the type and scope of fire prevention delivery specific to the community risks. It will include volunteer firefighters to provide education and prevention in alignment with career firefighters. These improvements to fire prevention are expected to improve FUS ratings in some areas which again may result in a reduction in premiums for fire insurance.

A pre-incident planning program that is consistently applied throughout the city will be implemented as part of optimization. It will be led by the Deputy Fire Chief and where applicable, involves participation by both on duty career suppression and volunteer firefighters. Pre-incident planning will allow for proactive training of firefighters as they will have identified the type and scope of hazards that exist in the community prior to an emergency response. This program provides an opportunity to properly identify service types and levels. One again, it is expected that improved FUS ratings and thus more favourable insurance premiums will be achieved in some areas.

Finally, Fire Services will implement a Targeted Inspection Program for high risk occupancies including vulnerable occupancies, and heavy industrial and large commercial buildings. This will increase and enhance the pre-incident plan for suppression crews throughout the city. Firefighters will perform life safety walkthroughs in high density residential buildings, schools and seniors facilities to provide an initial level of inspection and identify any deficiencies to have a Fire Prevention Officer pursue. This also serves to provide a face to the service for our most vulnerable of citizens. The service will increase targeted education programs to youth and the elderly in line with the approximate 100 schools and 50 vulnerable occupancies that exist in Greater Sudbury. Where appropriate, volunteer firefighters will assist with education and prevention programming. These activities help to mitigate the risk of an emergency occurring and may improve FUS ratings in some areas, which as a result adjust insurance premiums for both residents and businesses.

For Paramedic Services, there will be continuous monitoring of the paramedic system through the use of established key performance indicators. Paramedic Services has not identified a need for new staff or vehicle hours within the context of the Optimization Plan's seven to 10 year implementation window. It is important to recognize, however, that additional staff will be needed over the coming years if service demand exceeds our paramedic response capacity. At this time it is prudent to monitor system performance trends along with some emerging health care system initiatives that have the ability to reduce service calls and work to improve service capacity within the paramedic system before there is a request for additional staff or vehicles.

Currently the North East LHIN Non Urgent Patient Transportation Project is finalizing a public procurement process to secure third party services to carry out this work across Northeastern Ontario and specifically to address routine scheduled non-urgent transportation in and out of Health Sciences North. This project, once in full operation, could significantly reduce the number of long distance transfers paramedics are currently performing resulting in additional capacity to address system challenges.

Another change that should address system busyness is the undertaking of the MOHLTC to make transformational change in the Provincial dispatch centres to modernize their triaging tools. Once implemented this could result in a reduction in high priority calls by 20%. A new triaging tool that is better able to identify less acute patients opens up opportunities to better coordinate low acuity calls by directing them to alternate health-care pathways that better meet the person's needs, while at the same time freeing up ambulance resources.

Paramedic Services will continue to monitor key performance indicators, such as call volumes, response times, no ambulance availability, airport call volumes and overtime due to shift extension to name just a few. In addition to monitoring system performance the service will continue to explore opportunities to reduce non-emergency call volume thereby creating service capacity. These opportunities in the shorter term may include further reducing non-urgent transfer call volumes and airport call volumes. Paramedic Services will also continue to be innovative in developing programming such as the Community Paramedicine and Diversion Programs which aim to support the health-care system. When Paramedic Service performance and capacity trends suggest a need for additional service enhancements, a business case will be brought to Council through the normal budget process as has been historical practice.

With all the above being noted, Optimization does present several opportunities to further improve the delivery of Paramedic Services. Infrastructure investment in station development is key to longer term plans for Valley East. The move of Headquarters from Azilda to the city (Notre Dame and Maley) and rebuild of both the Val Caron and Hanmer Emergency Services Stations would be required as a first step.

Once these infrastructure improvements are done Paramedic Services would redeploy a 12-hour day ambulance from the city core to Valley East in one of the remaining stations while the 24/7 crew currently located in Val Therese would be moved to the other remaining station.

These deployment changes would result in improved response times across the Valley East area, while at the same time reducing the number of times a city ambulance is moved to the Valley East area to provide balanced emergency coverage.

Optimized Costs

As with any service provider, budgets and costs are integral to providing reliable and trustworthy services. Being one of the three pillars of the plan, costs must be balanced with both service and risk. The Optimized Plan must provide an appropriate level of service for the risks that exist in the community, but should not come at an excessive cost to taxpayers.

An extensive financial analysis was conducted to review costs related to the delivery of Emergency Services (see Appendix #F7). The analysis is a snapshot in time and is based on information that was available as of March 3, 2016. As a result, the following three costing models were developed that are anticipated to be phased in over a 7 to 10 year period.

Current (Status Quo) – This model represents no changes to the current delivery models, staffing or funding. More specifically, there will be:

- No service level improvements to address community risks
- Insufficient funding to support presumptive legislation
- No funding to complete major repairs and/or replace stations
- Insufficient funding to replace existing front-line vehicles and major equipment

Current (Status Quo) Fully Funded – This model represents no changes to the current delivery model or staffing but addresses funding shortfalls related to presumptive legislation and capital requirements for stations, vehicles and major equipment. More specifically, there would be:

- No service level improvements to address community risks
- Sufficient funds to support presumptive legislation
- Sufficient funds to complete major repairs and/or replacement of stations
- Sufficient funds to replace existing front-line vehicles and major equipment

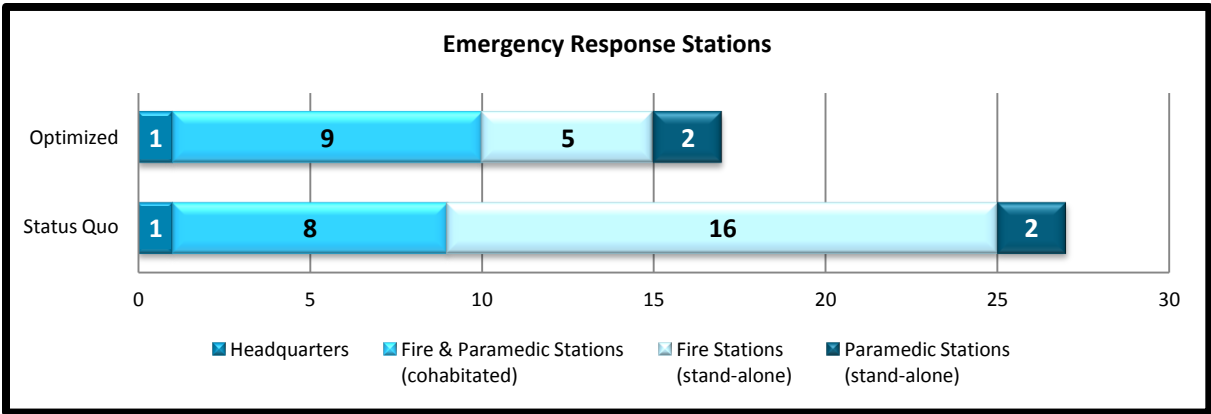
Optimized – This model represents an optimized Fire and Paramedic Service that is fully funded. More specifically, there would be:

- Service level improvements that address community risks
- Enhanced Technical Rescue capabilities (Hazardous Material, Trench Rescue, Medical Tiered Response)
- A reduction of 150 personnel over the next ten years. Staffing levels would be aligned to meet service level improvements.
- A reduction in the number of stations to 17 from the current 27
- A reduction in the number of front-line vehicles from 73 to 48
- Financially sustainable operating and capital renewal plans

Station Costs

Appropriately aligning the number of stations, vehicles and equipment with community needs, and without reducing service levels, allows Fire and Paramedic Services to avoid costs associated with maintaining and replacing these aging capital assets.

An optimized model reduces the number of stations by ten, from 27 to 17 as shown in the diagram below. This transformation of stations would require \$92 million in funding to renovate and/or build new stations. Staff engaged the City’s Real Estate Section who provided an estimate of \$3.3 million from the sale of surplus property. This would result in a net funding requirement of \$92 million. Operating costs for building maintenance and repair would increase by approximately \$250,000 each year to ensure the assets remained in a state of good repair.



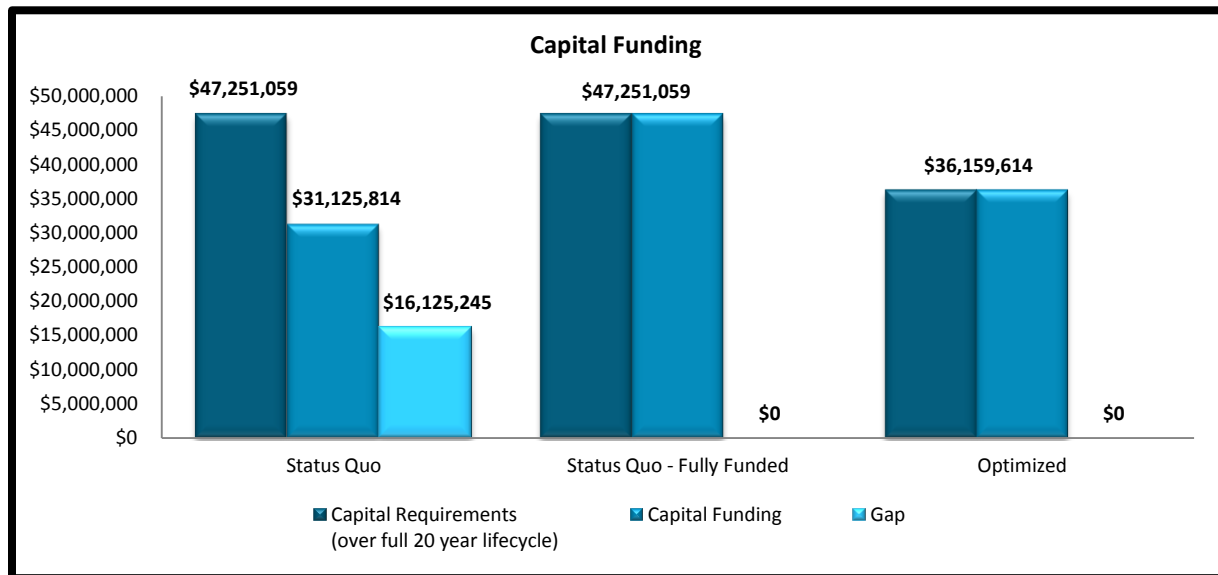
If no additional investment is made into repairs and maintenance for stations, they would continue to deteriorate and face the possibility of being rendered unusable. Further, not investing in stations would leave the service unable to address issues related to legislative requirements of workplaces under the Occupational Health and Safety Act. Ignoring requirements as made under the OHSA is not an option and any Ministry of Labour order written must be addressed. A proactive approach where the City controls the assignment of funds would be a superior solution than allowing an external legislative branch from making that decision.

Vehicles and Equipment Costs

The optimization of stations would also significantly reduce the need for front-line vehicles and major equipment from 73 to 48. Furthermore, the plan recommends an overall reduction in the number of personnel which would also reduce the number of major equipment pieces from 6,994 to 5,265 units. The cost to replace the number of vehicles and major equipment over a full 20 year lifecycle would thus be reduced from \$47.2 million to \$36.2 million.

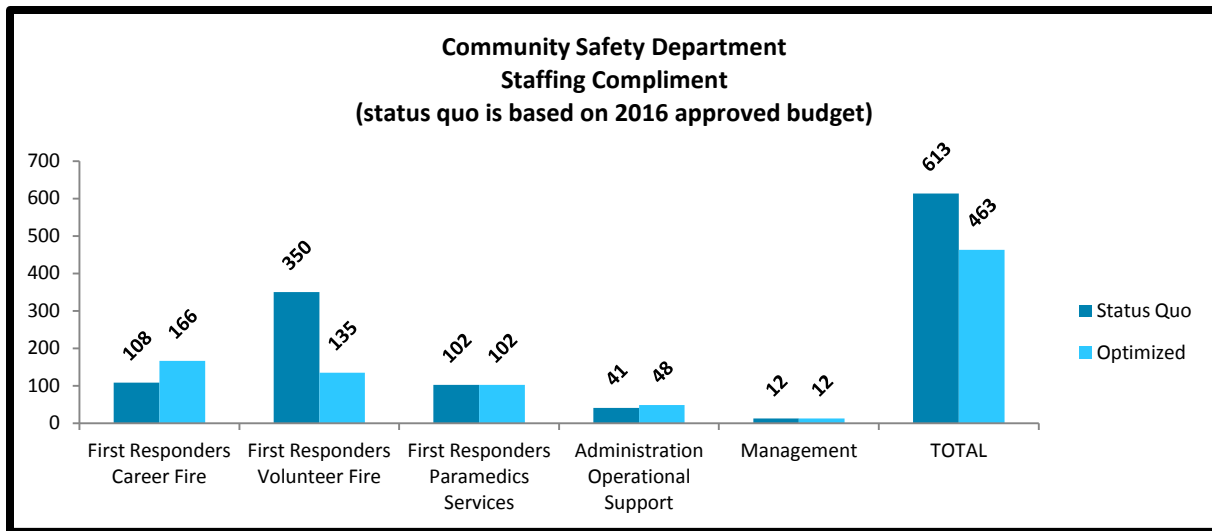
If no changes are made to the capital budget, the reductions in cost to repair and/or replace stations and equipment would reduce the current capital gap from \$16.1 million to \$5.1 million.

To eliminate this gap altogether, \$271,000 would be added to the annual operating budget to ensure that sufficient funds were available to meet the new replacement requirements and ensure sustainability of the service's needs.



Staffing Costs

The Optimized Plan would significantly reduce the overall number of personnel working within the Community Safety Department from 613 to 463 as shown in the diagram below. The net reduction of 150 personnel would be phased in through attrition over 7 to 10 years. The reduction of staffing is solely associated with Fire Services, and has positive impact on the management to staff ratio reducing it from 1:160 to 1:109. The focus of the reduction is in part-time volunteer firefighters, however every employee represents an equivalent exposure to demand for human resources. Furthermore, with an annual attrition rate of 18%, recruiting and retention of volunteers accounts for a significant investment of management time and resources. All other management to staff ratios remains unchanged (see Appendix #F7).



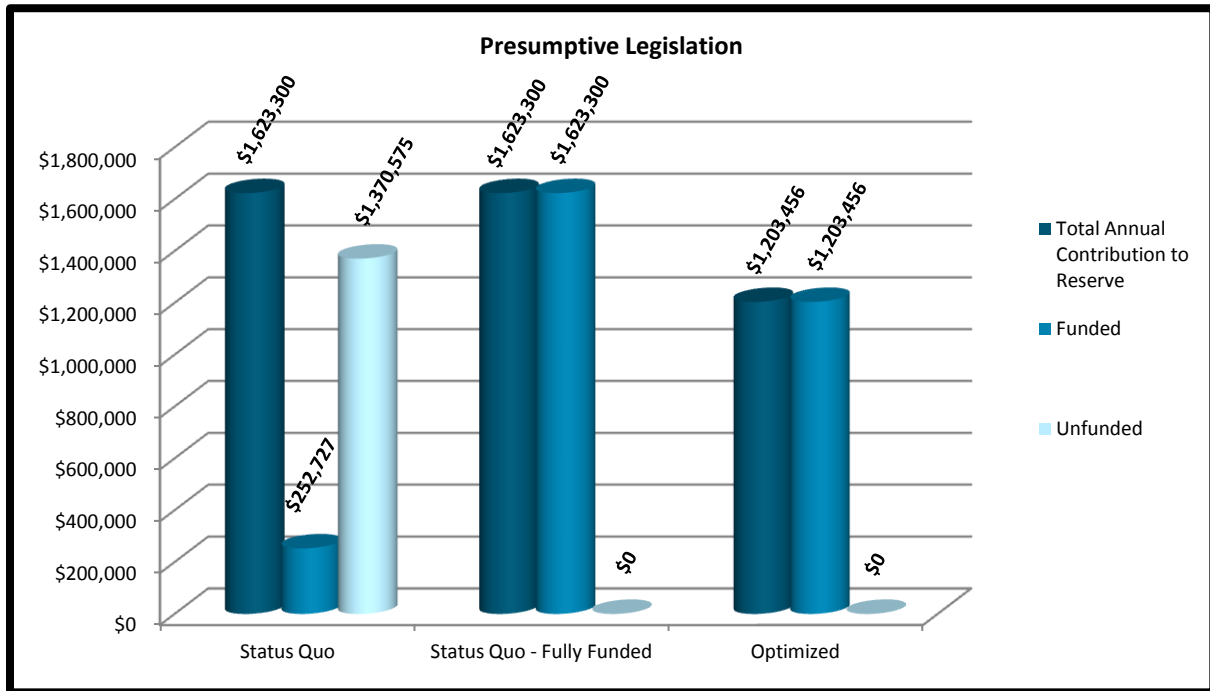
By increasing composite response and reducing the overall number of stations, Fire Services would increase the career firefighter complement by 58 and reduce the number of budgeted volunteers from 350 to 135.

Although this represents a budget reduction of 215 volunteers, only 265 were employed as of December 31, 2016. Since 2007, the number of volunteer firefighters employed has steadily increased from 142 to a high of 317 in 2013. The actual physical reduction in the number of volunteers would be 130 over the next seven to 10 years. Historically, the service experiences a natural reduction of about 40 volunteers per year through resignations or dismissals which is in line with provincial norms. Therefore, the nature of the changes proposed in this plan would not affect those current volunteers who want to continue to meaningfully participate in the Fire Service.

Under the adjusted optimized staffing model, 422 personnel would be protected by presumptive legislation under the Workplace Safety and Insurance Act (WSIA). As mentioned in the analysis of current operating budget, it is recommended that employers put aside \$2.20 for every \$100 in wages to cover costs that may arise if a claim is made through this legislation. It is important to reiterate that both career and volunteer firefighters are subject to this legislation.

Furthermore, the employer is liable not only for wages associated with work as a firefighter, but for other wages as well if they are employed outside of this role. The adjusted staffing levels would reduce the annual funding requirement for presumptive legislation from \$1.6 million to \$1.2 million representing a cost avoidance of \$400,000 per year (see Appendix #F7). Currently, this fund is insufficiently supported with only \$252,000 per year allocated in the annual operating budget. Reducing the overall number of employees, as recommended above, will decrease the shortfall of the fund, however, it would continue to be underfunded if additional dollars are not allocated as recommended. An additional \$951,000 per year is required to fund the anticipated needs for these types of WSIA claims in the future.

As mentioned previously, it is estimated that 54% of firefighters will be diagnosed with any one of the prescribed cancers outlined in the legislation. Furthermore, the occurrence of claims resulting from post-traumatic stress disorder (PTSD) experienced by emergency responders, including firefighters and paramedics, is expected to be significant although few studies exist given the relative newness of this legislation. These are costs that the City, as an employer, must be prepared for to avoid additional future tax increases or funding pressures on other essential services provided by the municipality.



Seven new positions have been included in the Optimized Plan to provide sufficient administrative and operational support for Fire and Paramedic Services, none of which are management roles. Although these changes to both firefighter and administrative staffing require an additional \$8.4 million per year for salaries and benefits, there is a significant long-term cost avoidance related to the proposed reduction in the number of stations, vehicles and equipment.

Annual Operating Budget

The table below summarizes the effect of the three costing models on the operating budget.

Community Safety Department Operating Budget Impacts			
	Current Model	Current Model Fully Funded	Optimized Model
2016 Operating Budget (starting point for analysis)	\$35,448,187	\$35,448,187	\$35,448,187
Revenues:			
Provincial Grants and Subsidies		(\$856,956)	(\$716,497)
Total Revenue	\$0	(\$856,956)	(\$716,497)
Expenses:			
Salaries and Benefits			\$8,409,775
Materials - Operating Expenses			(\$17,806)
Energy Costs			(\$137,457)
Purchased/Contract Services			(\$12,500)
Debt Costs / Insurance and Taxes		\$7,302,387	\$5,191,594
Contribution to Reserve - Presumptive Legislation		\$1,370,574	\$950,730
Contribution to Reserve and Capital		\$1,006,739	\$521,139
Internal Recoveries			(\$781,943)
Total Expenses	\$0	\$9,679,700	\$14,123,532
Net Total	\$0	\$8,822,744	\$13,407,035
Revised Operating Budget	\$35,448,187	\$44,270,931	\$48,855,221
2027 Operating Budget (with increases equalized over 10 years and a 3% annual inflation)	\$49,068,581	\$58,057,116	\$63,470,150

Current Model (Status Quo)

Status Quo represents the starting point for the financial analysis and is based on the 2016 approved budget for the Community Safety Department (formerly Emergency Services). Under this model there are no changes to the current delivery models, staffing or funding. There are no service level improvements to address community risks. The department remains significantly underfunded for presumptive legislation and the replacement of existing front-line vehicles and major equipment, and there is no funding to complete major repairs and/or replace stations. This funding model doesn't sustain Fire and Paramedic Services operations. Even without addressing the significant funding gaps outlined above, the current operating budget would increase to just over \$49 million by 2027 (based on a 3% annual inflation rate).

Current Model – Fully Funded

Under this model there are no changes to the current delivery models or staffing and no service level improvements are made to address community risks. Funding shortfalls related to presumptive legislation and capital requirements for stations, vehicles and major equipment are addressed for a total of \$9.7 million in the annual budget. This includes:

- \$1.37 million to properly fund the estimated liability related to presumptive legislation,
- \$7.3 million to fund the annual debt repayment related to the cost of borrowing \$135 million to repair and/or replace the current stations based on a recommended 50-year lifecycle
- \$1 million to eliminate the funding gap to replace existing front-line vehicles and major equipment over a full 20-year life cycle.

This model also includes an \$856,000 increase of the provincial grant for land ambulance services related to paramedic's portion of the annual debt repayment related to the cost borrowing. If the current delivery model (status quo) was to be fully funded, the operating budget would increase to just over \$58 million by 2027 (with increases equalized over 10 years and a 3% annual inflation rate).

Optimized

A fully funded, *One City One Service* delivery model would have an expected annual operating budget of nearly \$64 million per year once the plan is fully implemented, expected by 2027. This amount includes annual inflation of 3% and debt repayment costs on the \$92 million required to repair or rebuild stations. This optimized model improves service levels to align with community risks including enhanced guaranteed response and improved technical, hazardous material and medical tiered response. It also addresses capital and operating shortfalls in the budget.

Of this increase, \$6.7 million is to address the adjusted funding shortfalls that would exist within the Service. This includes:

- \$951,000 to properly fund the adjusted liability related to presumptive legislation;
- \$5.3 million would be required incrementally over the life of the implementation, to fund the annual debt repayment related to the cost of borrowing \$92 million for repairs and/or new construction of the 17 stations; and
- \$521,000 to cover an adjusted funding gap of \$5.1 million for replacement of 48 front-line vehicles and a reduced number of major equipment over a full 20 year life cycle.

In an optimized model, the amount needed to address funding shortfalls related to presumptive legislation, stations and capital gap for vehicles and major equipment is \$3 million less than in the Current Model – Fully Funded model due to a reduction in the number of stations, vehicles, major equipment and overall staffing

Changes to the staffing complement results in an increase to the operating budget of \$8.4 million per year. This includes a reduction of 215 volunteers from a budgeted 350 to 135, an increase of 58 career firefighters from 108 to 166, and an increase of seven administrative/operational support staff.

The above noted increases have been off-set by a \$950,000 reduction in other operating costs such as materials, energy costs, purchased services and internal recoveries. As well, an additional \$716,000 would be received from the provincial grant for land ambulance services related to Paramedic Service's portion of any annual debt repayment.

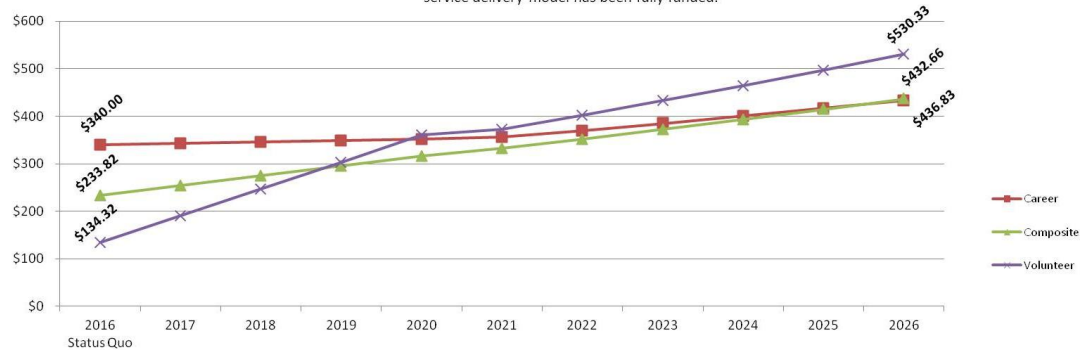
Optimized Taxation

Current Model (Status Quo) Fully Funded – Resource Allocation

If an area rated model is to continue to be used, the rates should be adjusted to reflect actual resource utilization as shown in the table below. In this scenario, Fire Services is fully funded to meet the needs of its existing service delivery model and the area rated taxation model is adjusted to reflect the actual use of resources by each service level area. No service level improvements are made. This diagram demonstrates that volunteer rated areas would actually pay higher taxation than the career and composite areas within ten years, an increase of nearly \$400. In fact, residents in the career rated area would see their taxes remain nearly unchanged in the first four years.

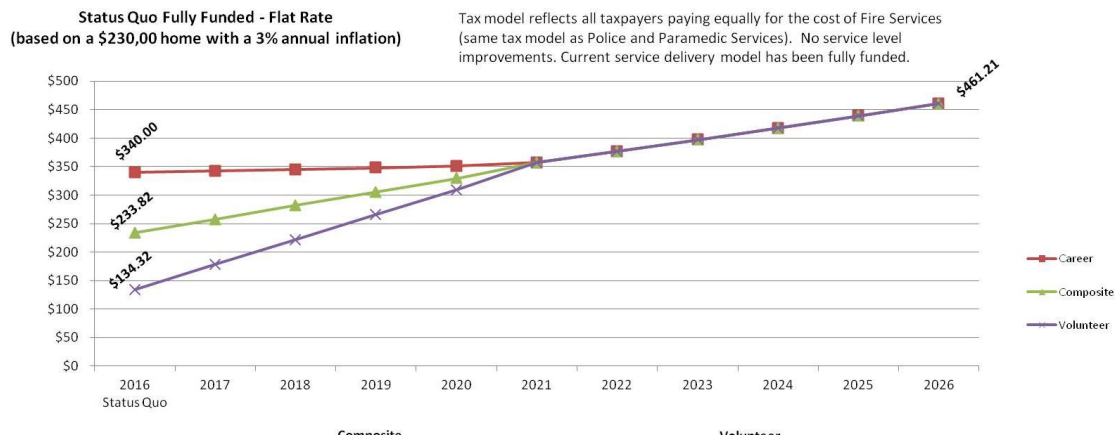
Status Quo Fully Funded - Resource Utilization
(based on a \$230,00 home with a 3% annual inflation)

Tax model reflects actual resources used by each area (career, composite and volunteer). No service level improvements. Current service delivery model has been fully funded.



Current Model (Status Quo) Fully Funded - Flat Rate

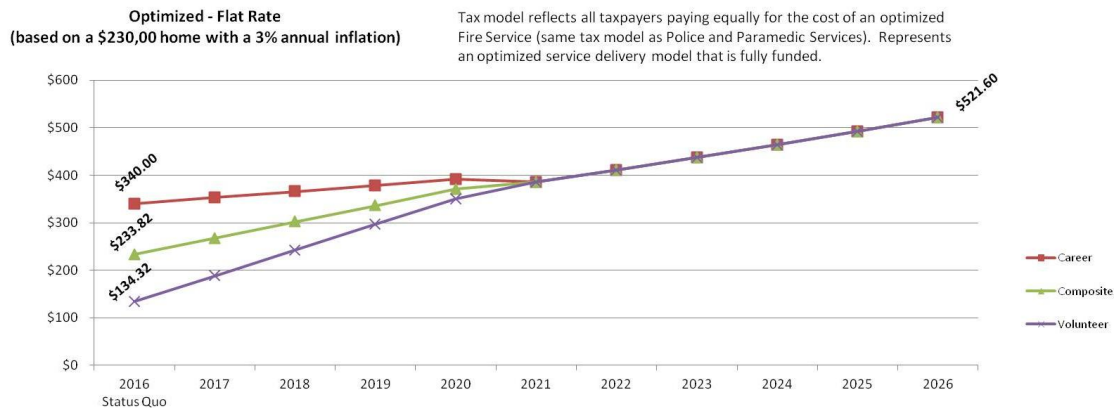
In this scenario, Fire Services is fully funded to meet the needs of its existing service delivery model; however flat rate taxation would be applied for all residents regardless of the service-level provided. Flat rate taxation is used for Police and Paramedic Services. This would result in an annual fire service taxation amount of \$461.21 per year for all residents regardless of where they live within the city and no improvements would be made to the service levels. In this case, both the career and composite rated areas would pay about \$30 more per year in taxes over an area rated model and no improvements to service levels would be achieved. Volunteer rated areas would pay about \$70 less than the example above, but nearly \$300 more than they do today again without any improvements to service levels. While utilizing a flat tax model balances the costs, in any scenario where services are not aligned a flat rate model would be unfair as services and costs (in the way of taxes) are not aligned.



Optimized Model Taxation

If the optimized model is adopted, a flat rate taxation model could be implemented. This is reflective of a *One City One Service* model and aligns with taxation for other emergency services provided in the community such as Police and Paramedic Services.

Under this scenario there would be an estimated annual Fire Service taxation amount of \$521.60 per year for the average homeowner to be realized over the lifespan of the implementation plan estimated to be seven to 10 years. In an optimized state, residents in volunteer rated areas would pay less than what they would under an adjusted area rating model where the Fire Service is fully funded, but no changes are made to service levels. The diagram below depicts that career and composite rated areas would pay \$18.16 and \$28.78 respectively more per year to realize the service level improvements over an estimated implementation of 10 years.



If the optimized model is not implemented, the operating and capital budgets along with the total taxation levels should appropriately fund Fire Services at the expected and Council approved service levels. As above, the following calculations for estimated annual fire services taxation are for illustration purposes only and are based on an average 2016 home assessment value of \$230,000 at 2016 tax rates for fire services. Additionally the figures include inflation using a historical rate of 3%. The changes to taxation are also phased in so as to reduce significant increases or decreases in a single year. The full calculations can be found in Appendix #F6.

The table below summarizes the effects on taxation for the average resident. Each scenario shows the annual increase (decrease) to taxation based on the current area rated service delivery areas. If the optimized model were to be implemented, taxation in the career rated area would result in a total increase of \$88.90 incrementally over the next 10 years when compared to taxation under the current (status quo) model. A similar increase of \$88.48 would be experienced in the composite rated area. However, when examining the volunteer rated area, residents would actually pay more to maintain the status quo model. Calculations demonstrating changes to taxation on a per \$100,000 of assessment

value can be found in Appendix #F6 for those who own a home that is higher or lower than the average assessment of \$230,000.

	Annual Change to Taxation when Compared to Current Taxation Paid		
	Career Rated Area	Composite Rated Area	Volunteer Rated Area
Current (Status Quo) – Fully Funded and Resource Allocation	\$ 9.27	\$20.30	\$ 39.60
One City, One Service Optimized Model	\$ 18.16	\$ 28.78	\$ 38.73
Difference per year	\$ 8.89	\$ 8.48	- \$ 0.87

*based on \$230,000 home assessment at 2016 taxation rates plus 3% inflation

Key messages of this section:

- *Maintaining the current service delivery model will incur higher costs in the long term, and may not address the risks and needs of the community.*
- *The optimized model is a deeply interconnected system that focuses on community safety and where solutions work together to create a highly functional and effective system that is recommended to be phased in over an implementation period of seven to 10 years. It includes:*
 - *Establishment of service level standards that address the needs of the community and existence of risks.*
 - *Reduction of the number of stations from 27 to 17 through mergers and integration of services at a lower cost of \$92 million versus \$135 for current infrastructure arrangement.*
 - *Construction of new stations in the right location that best service residents and businesses throughout the entire City of Greater Sudbury, and that are configured to meet the needs of modern fire and paramedic service operations.*
 - *Reduction of vehicle and equipment needs by 25 units which eliminates the funding shortfall over the next 20 years.*
 - *Hiring of career firefighters to institute composite response at stations in Chelmsford, Garson, Lively and Valley East.*
 - *Improvement of fire response within nine minutes to 90% of the property valuation from current coverage of 69% in the current service delivery model. This also improves the immediate minimum four-person response from 48% to 80% within nine minutes.*
 - *An appropriately funded service that is taxed under a flat rate model similar to paramedic and police services, that eliminates funding shortfalls for station repairs and maintenance, fleet and major equipment replacement, and presumptive legislation.*
 - *Achievement of a One City One Service delivery model that balances the three pillars of service, risk and cost, and that aligns with the guiding principles for emergency service delivery.*

IMPLEMENTATION

As identified in this report, it must be recognized that all stations, staffing and, ultimately, services are an interconnected response model. Implementation of the plan requires a phased in reorganization of stations and in some cases, a relocation of some stations. Implementation further requires: an alignment, and in some cases an enhancement, of services to best respond to community risk, and an alteration of the staffing model to achieve a safer community. As a general concept, the implementation of the Optimization Plan would be carried out using a priority based approach, with an aim to implement those components of the plan that have the best return on investment.

It is imperative that any change to a service level, service type, or station location would be predicated based on key considerations as follows:

- station condition (age, assessment of repairs required, other)
- call volume
- cost/funding
- demographics of area including population density
- service needs based on risks and hazards that exist in the areas of response
- training implications
- volunteer From Home Response availability
- established fire and paramedic response standards

Implementation Decision Points for Council's Consideration

The following decision points will be brought forward to Council for consideration, and where there is a funding implication, a business case will be presented during the annual budget process. Ultimately, City Council will decide if and when each stage will proceed based on the priorities, issues and risks identified.

2017

- Second Quarter:
 - Direct the General Manager of Community Safety to prepare a report for the establishment of performance standards for Fire Services to be recommended for adoption by Council by the end of the third quarter 2017 with the intent to report on service performance on an annual basis.
 - Provide direction to permanently close Red Deer Lake station immediately.
- Third Quarter: Business cases will be brought forward through the regular budget process in Fall 2017
 - Provide direction to undertake planning stages to identify site for new Headquarters in consultation with other city departments (roads, water/wastewater, police) to explore the feasibility of a joint complex to meet multiple departmental needs.
 - Authorize funding for site selection, design and planning for the new Headquarters, Garson Station and New Sudbury Paramedic Post. Return with conceptual drawings and costing for Council's consideration and approval.
 - Authorize funding for a contract Project Manager to manage infrastructure improvements associated with optimization.
 - Authorize funding for renovations of Wahnapiatae Station.
 - Provide direction and authorize funding to implement enhanced HAZMat response.

2018

- Authorize funding and provide direction to establish service enhancements for:
 - Medical tiered response (MTR) for all areas of the city
 - Water and ice water rescue for all areas of the city

2019

- Approve staffing enhancements and authorize funding for:
 - Increase staffing at Val Therese station to implement four-person career response.
 - Paramedic Services Scheduler
 - Emergency Vehicle Technician (EVT)
- Authorize funding for renovation of Capreol Fire Station for cohabitation of Paramedic And Fire Services followed by closure/repurpose/sale of Capreol Paramedic Station.

2020

- Authorize funding to eliminate the funding gap for fire service vehicles and major equipment.
- Approve staffing enhancements and authorize funding for:
 - two Fire Training Officers should the seven-day training model not be adopted based on the Val Therese pilot,
 - two additional Fire Prevention Officers,
 - one additional Public Safety Fire Educator,
 - Fire Service Clerk,
 - Generalist.
- Authorize funding to implement volunteer firefighter involvement in public fire safety education and fire prevention in volunteer response areas.
- Authorize funding for site selection and planning for new builds at: Waters, Chelmsford, Val Caron, Hanmer, Elm West, Garson, Minnow Lake (17E) and Downtown paramedic post.
- Authorize funding to renovate/rebuild the following stations: Whitefish, Dowling, Skead, Levack, and Capreol.

2020-2026

- Direct the closure/repurpose/sale of the following stations:

○ Leon	○ Val Therese
○ Minnow Lake (Second Avenue)	○ Van Horne
- Direct the consolidation of the following stations:

○ Azilda	○ Falconbridge
○ Beaver Lake	○ Lively
○ Coniston	○ Vermillion Lake
○ Copper Cliff	
- Approve staffing enhancements and authorize funding for:
 - Implementation of composite response at Garson, Waters and Chelmsford/Azilda Stations

SUMMARY

The recommended optimized model achieves a balance of the three pillars of service, risk and cost which were identified as the outset of this analysis. Furthermore, the optimized model follows all of the guiding principles aimed to achieve a vision of being a highly effective service that has the confidence of the public it serves. This optimized model is a highly interconnected system where the solutions work together to create *“something that is as fully perfect, functional or effective as possible”* achieving the direction that was laid out by Council.

It is important to understand the consequences to both the community and the organization of the City of Greater Sudbury if a choice is made to leave the delivery model of Fire and Paramedic Services unchanged.

By not making changes to the delivery model, Fire and Paramedic Services will continue to experience growth of the capital gap resulting in continued aging of buildings, vehicles and equipment. The risk would increase so that stations may need to be decommissioned with no replacement available to fill the resultant gaps. Further, the City could be subject to a number of complaints being filed against City of Greater Sudbury workplaces that do not meet Ontario Health and Safety Regulations.

By not thoughtfully locating the service’s emergency stations, residents and businesses will continue to experience longer response times in the outlying areas. Fire Services will continue to only be able to provide a five minute response time to 42% of the city and a nine minute response to 69% of the city. In some cases, there is no guarantee that a minimum of four firefighters will respond initially within established industry (NFPA 1710 and 1720) guidelines and a considerable time delay could be experienced for those waiting on the arrival of additional crews.

Maintaining status quo will also mean that identified risks remain unaddressed. The cost of litigation, if the risks become real and claims are made against the City, could include high settlement costs, substantial legal fees, and increased insurance premiums.

If taxation is unaddressed, residents living in career rated areas will continue to subsidize volunteer rated areas unless or career rated area surpluses are solely invested in the career rated area. Some residents will continue to receive enhanced services without paying for them and all residents outside of the career rated area will continue to have a guaranteed four person career service level backup to their volunteer service with no additional costs reflected in their taxation.

Avoiding tax increases to improve the service and bring it up to an expected level for a city of our size could result in an increase of others costs paid by residents and business owners. Without improvements to the service delivery as outlined in this report, FUS ratings may continue to decline and could adversely affect insurance premiums.

City Council's Corporate Strategic Plan recognizes that Greater Sudbury is a growing community. It outlines an aim to provide, "*quality municipal services and leadership in social, environmental and economic development.*" The plan values acting today in the interest of tomorrow, providing quality service with a citizen focus, and managing resources efficiently, responsibly and effectively. It is strongly believed that the Fire and Paramedic Services Optimization Plan, as presented in this report, achieves these desires and the direction provided by Council.



Appendix

APPENDIX

Maps (M)

Status Quo Response Time

1. Station Location
2. Paramedic Services Response Times
3. Fire Services Response Times
4. Technical Rescue Response
5. Hazardous Material Response
6. Medical Tiered Response (MTR)
7. Fire Stations and Fire Beats

FUS Drive Time Hydrant

8. 5 km Walden Area (Waters and Lively Stations)
9. 8 km Waters Station
10. 5 km Valley East Area (Val Therese, Val Caron and Hanmer Stations)
11. 8 km Garson Station
12. 8 km Wahnapiatae Station
13. 8 km Chelmsford Station
14. 8 km Long Lake Station
15. 8 km Val Therese Station

Fire Response Zone (FRZ) and High Risk Properties

16. Overall Greater Sudbury
17. Fire District 1
18. Fire District 2
19. Fire District 3
20. Fire District 4
21. Fire District 5

22. Area Rated Taxation

Optimized Model Response Time

23. Station Location
24. Paramedic Services Response Times
25. Fire Services Response Times
26. Hazardous Material Response
27. Technical Rescue Response
28. Medical Tiered Response (MTR)

Tables (T)

1. MPAC Assessment Summary
2. Primary Care Paramedic (PCP) Medications and Skills
3. Advanced Care Paramedic (ACP) Medications and Skills
4. Volunteer Firefighter 2016 Attendance and Analysis
5. GIS and M Analysis Fire Response Time and MPAC Assessed Values
6. Career Firefighter Protection Ontario Comparison
7. Station Summary Table
8. Risk Based Inspection Program
9. Paramedic Service Response Times by Station

Financial Analysis (F)

1. Operating Budget - 2016
2. CCI Engineering Group – Building Condition Summary
3. Capital Equipment Requirements and Funding Gap Analysis / Capital Costs by Category
4. Current Station Renewal Analysis
5. Current Financial Summary by Station
6. Area Rated Taxation Analysis Summary
7. Financial Analysis Summary
8. Optimized Model Station Construction and Renovation Analysis Summary
9. Optimized Model Capital Equipment Requirements and Funding Gap Analysis

Reports and Documents (R)

1. Fire Underwriter Survey Report
2. Enterprise Risk Registry for Paramedic Services
3. Enterprise Risk Registry for Fire Services
4. Establishing and Regulating Bylaw 2014-84
5. Fire Service Delivery Standards
6. Public Information Session Summary

SUPPORTING DOCUMENTS

- CCI Engineering Group – Building Condition Report, February 2014
- IBI Group – Comprehensive Fire Services Review Report, March 2014
- IBI Group, City of Greater Sudbury Master Fire Plan, February 2004
- IBI Group - Land Ambulance Review, 1999
- Fire Protection Survey Services - Fire Fleet Rationalization Study, December 2010
- *From the Ground Up: A Community Economic Strategic Plan 2015-2025*
- National Fire Protection Association 1710 Standard for Career Fire Response
- National Fire Protection Association 1720 Standard for Volunteer Fire Response
- National Fire Protection Association 1901 Standard for Automotive Fire Apparatus
- *We Have a Working Fire: A Compilation of Sudbury's Fire History – 1883 to 2013*, Former Greater Sudbury Chief Prevention Officer Fern Bourque, 2014
- City of Greater Sudbury Corporate Strategic Plan 2015 – 2018
- City of Greater Sudbury Emergency Services Strategic Plan 2014-2020
- City of Greater Sudbury Emergency Services Tactical Plan 2014-2020
- City of Greater Sudbury Hazard Identification and Risk Assessment (HIRA), November 2016

- City of Greater Sudbury Community Services Committee Reports
 - Current Service Levels, February 2017
 - Volunteer Recruitment and Retention, December 2016

- Legislation
 - Employment Standards Act
 - Fire Protection and Prevention Act (FPPA)
 - Occupational Health and Safety Act (OHSA)
 - Ontario Ambulance Act

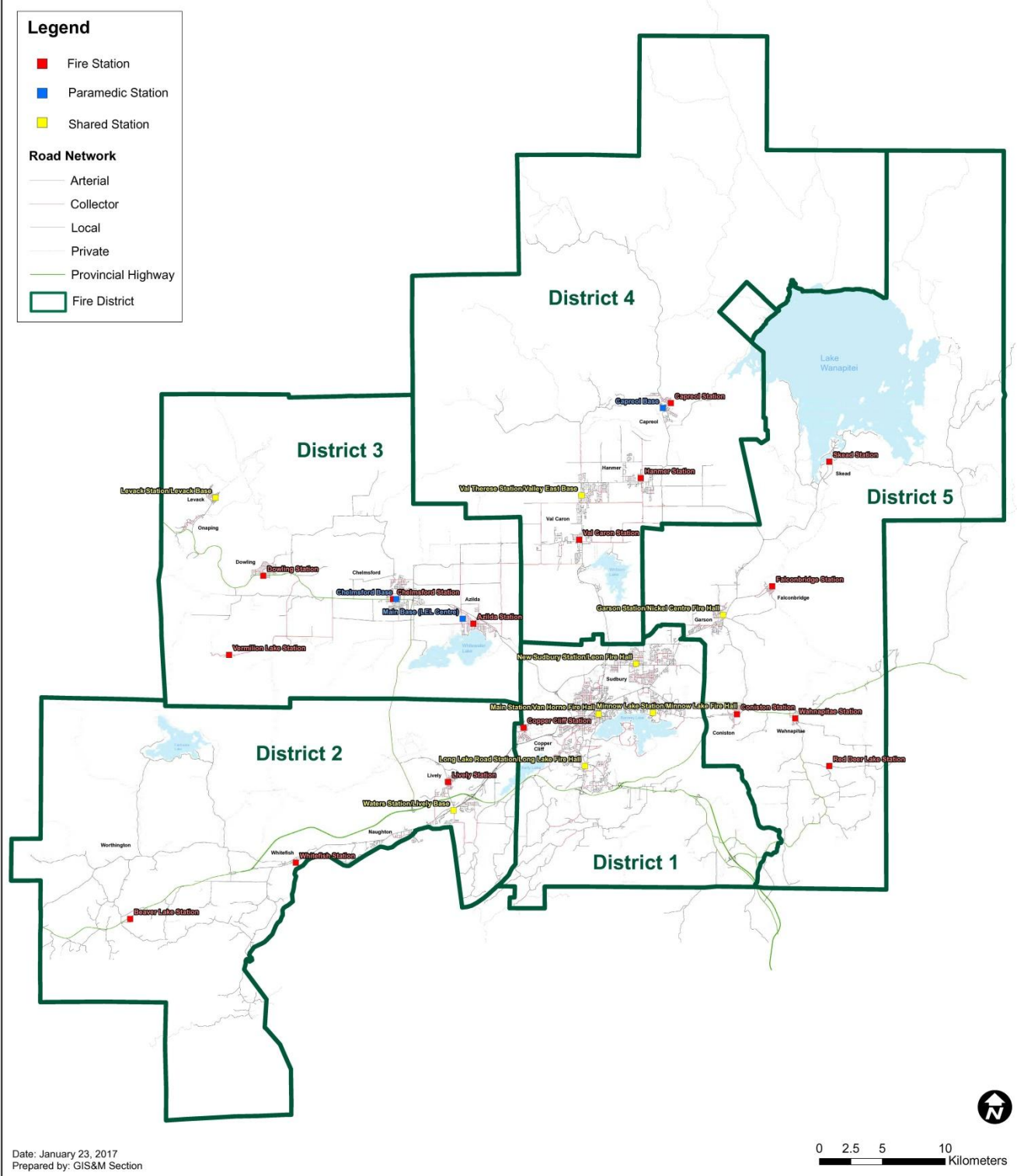


Maps (M)

City of Greater Sudbury

Status Quo

Fire and Paramedic Stations



City of Greater Sudbury

Status Quo

Paramedic Services

Response Times



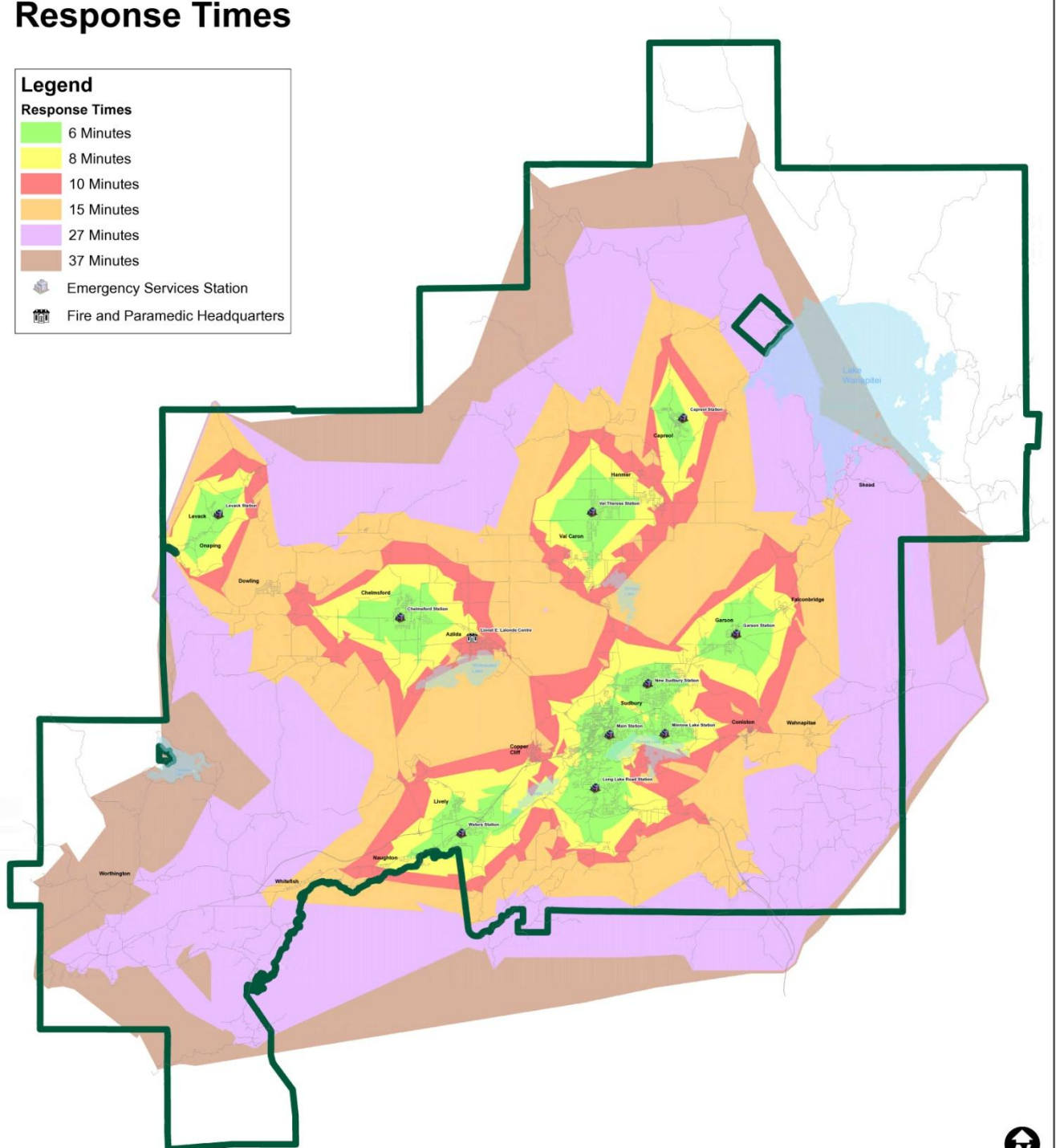
Legend

Response Times

- 6 Minutes
- 8 Minutes
- 10 Minutes
- 15 Minutes
- 27 Minutes
- 37 Minutes

Emergency Services Station

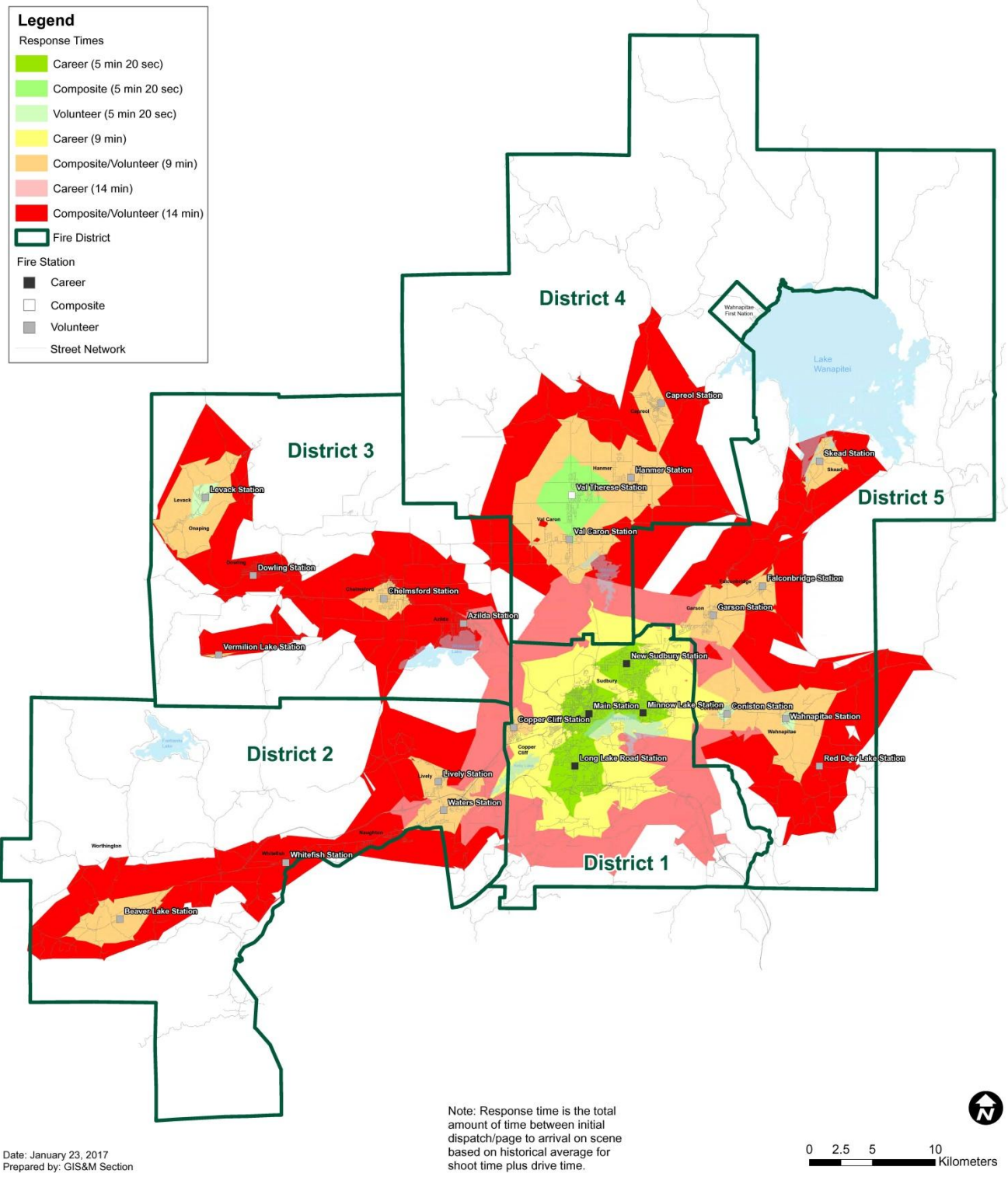
Fire and Paramedic Headquarters



City of Greater Sudbury

Status Quo

2015 Response Times



City of Greater Sudbury

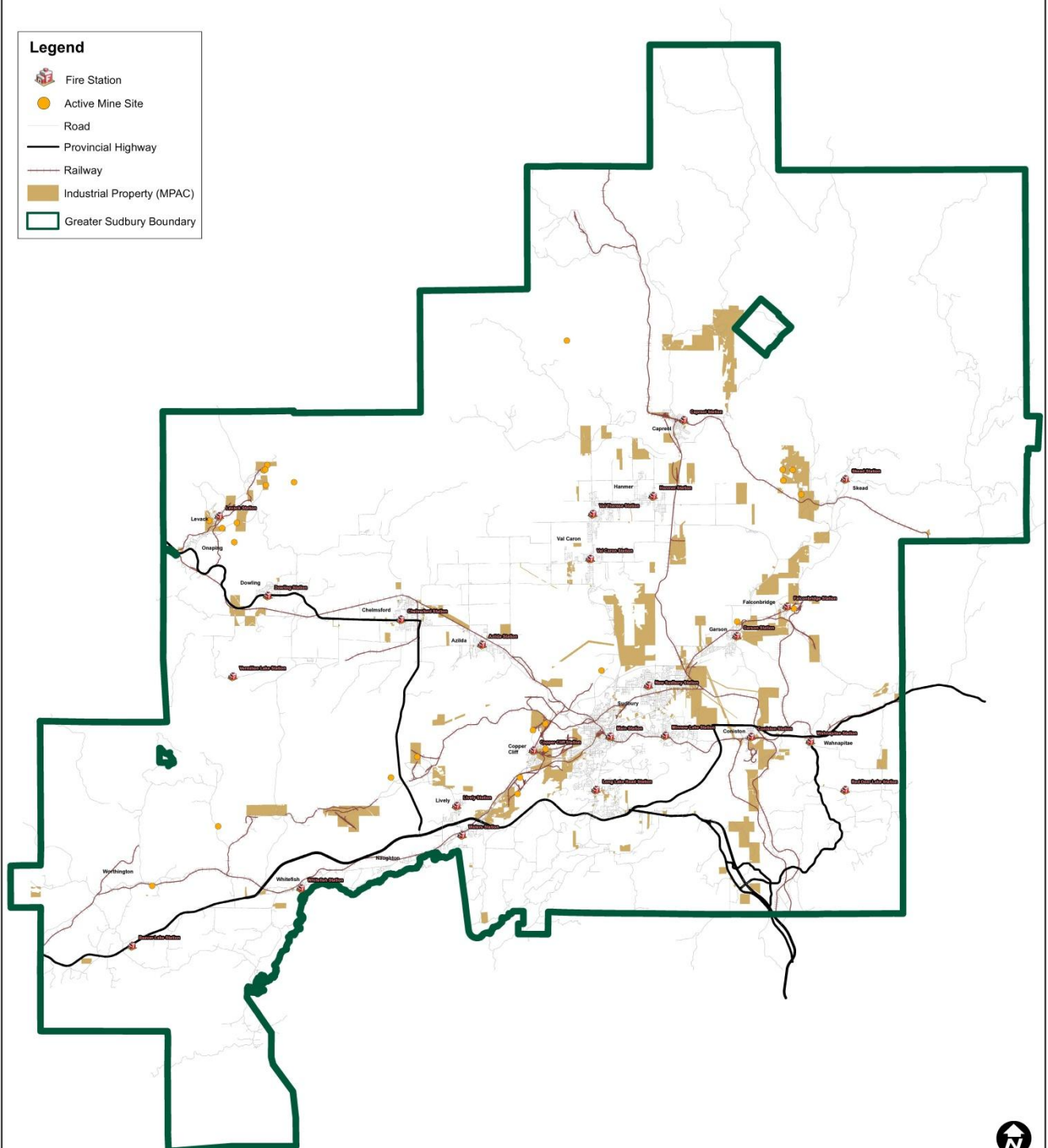
Status Quo Response

HazMat



Legend

-  Fire Station
-  Active Mine Site
-  Road
-  Provincial Highway
-  Railway
-  Industrial Property (MPAC)
-  Greater Sudbury Boundary



City of Greater Sudbury

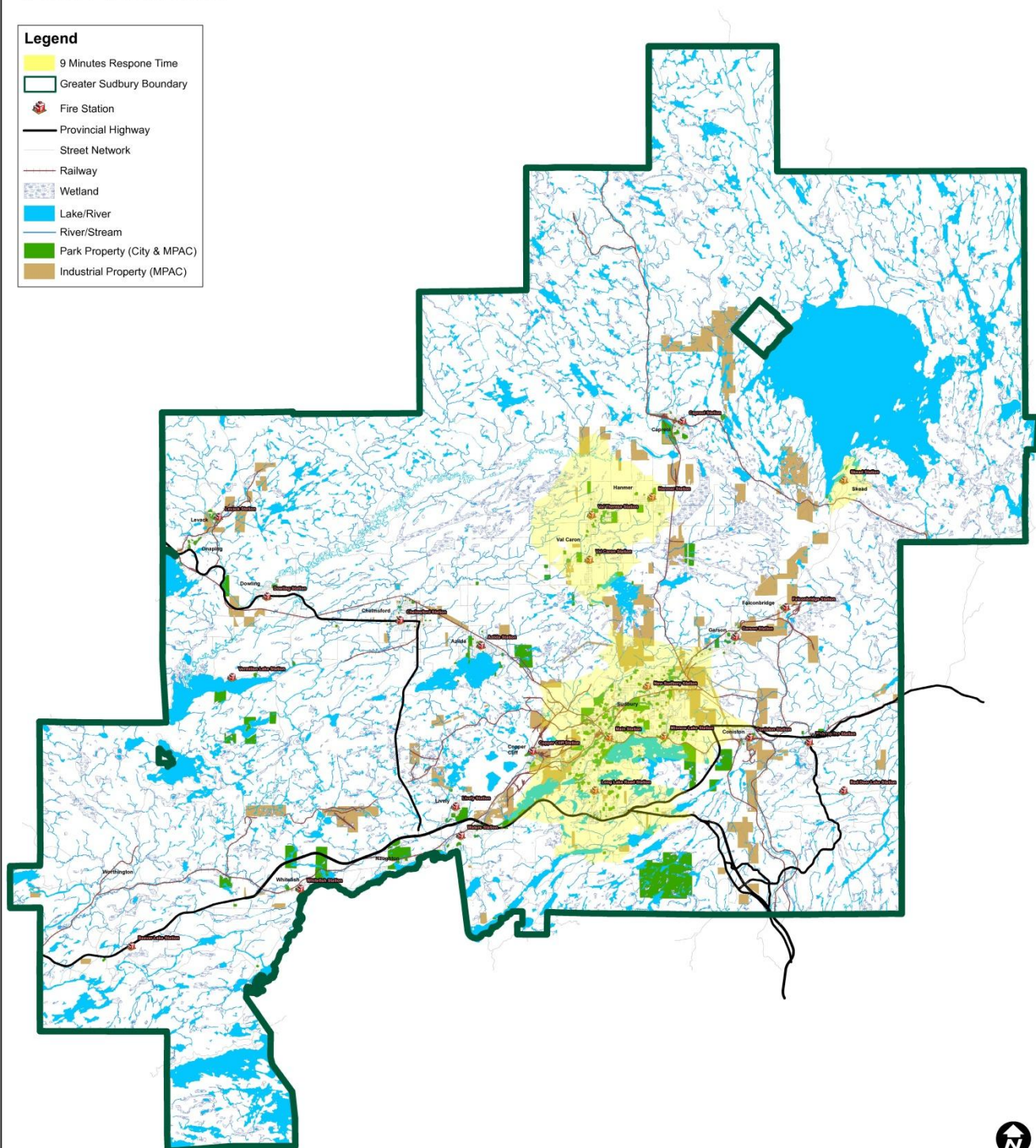
Status Quo Response

Tech Rescue



Legend

- 9 Minutes Response Time
- Greater Sudbury Boundary
- Fire Station
- Provincial Highway
- Street Network
- Railway
- Wetland
- Lake/River
- River/Stream
- Park Property (City & MPAC)
- Industrial Property (MPAC)



City of Greater Sudbury

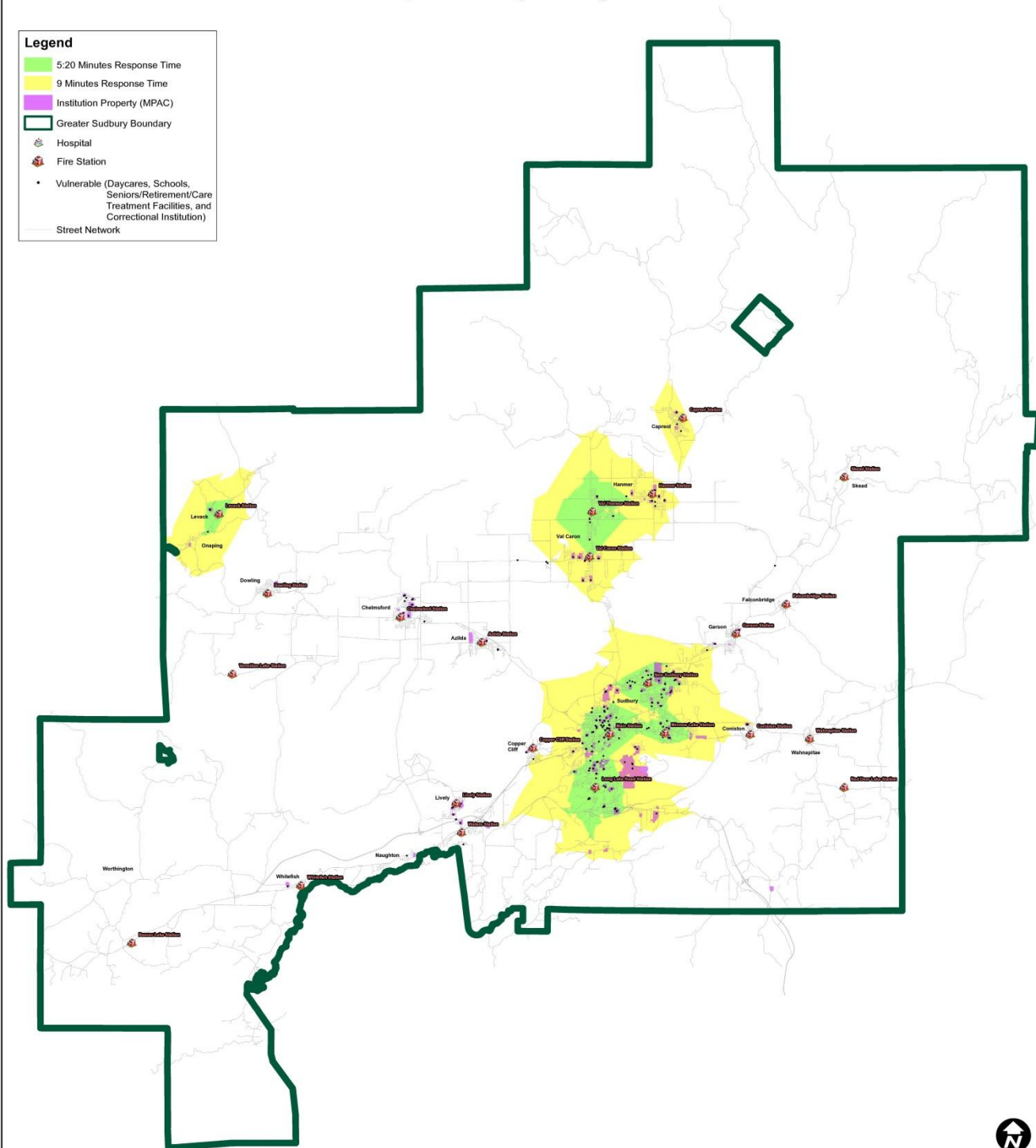
Status Quo

Fire Medical Tiered Response (MTR)



Legend

- 5:20 Minutes Response Time
- 9 Minutes Response Time
- Institution Property (MPAC)
- Greater Sudbury Boundary
- Hospital
- Fire Station
- Vulnerable (Daycares, Schools, Seniors/Retirement/Care Treatment Facilities, and Correctional Institution)
- Street Network



City of Greater Sudbury

Fire Stations and Fire Beats



Legend



Fire Station

Road Network



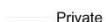
Arterial



Collector



Local



Private



Provincial Highway



CGS Boundary

Fire Beats

F1

F10

F11

F12

F14

F15

F16

F17

F18

F2

F20

F21

F22

F23

F24

F25

F26

F3

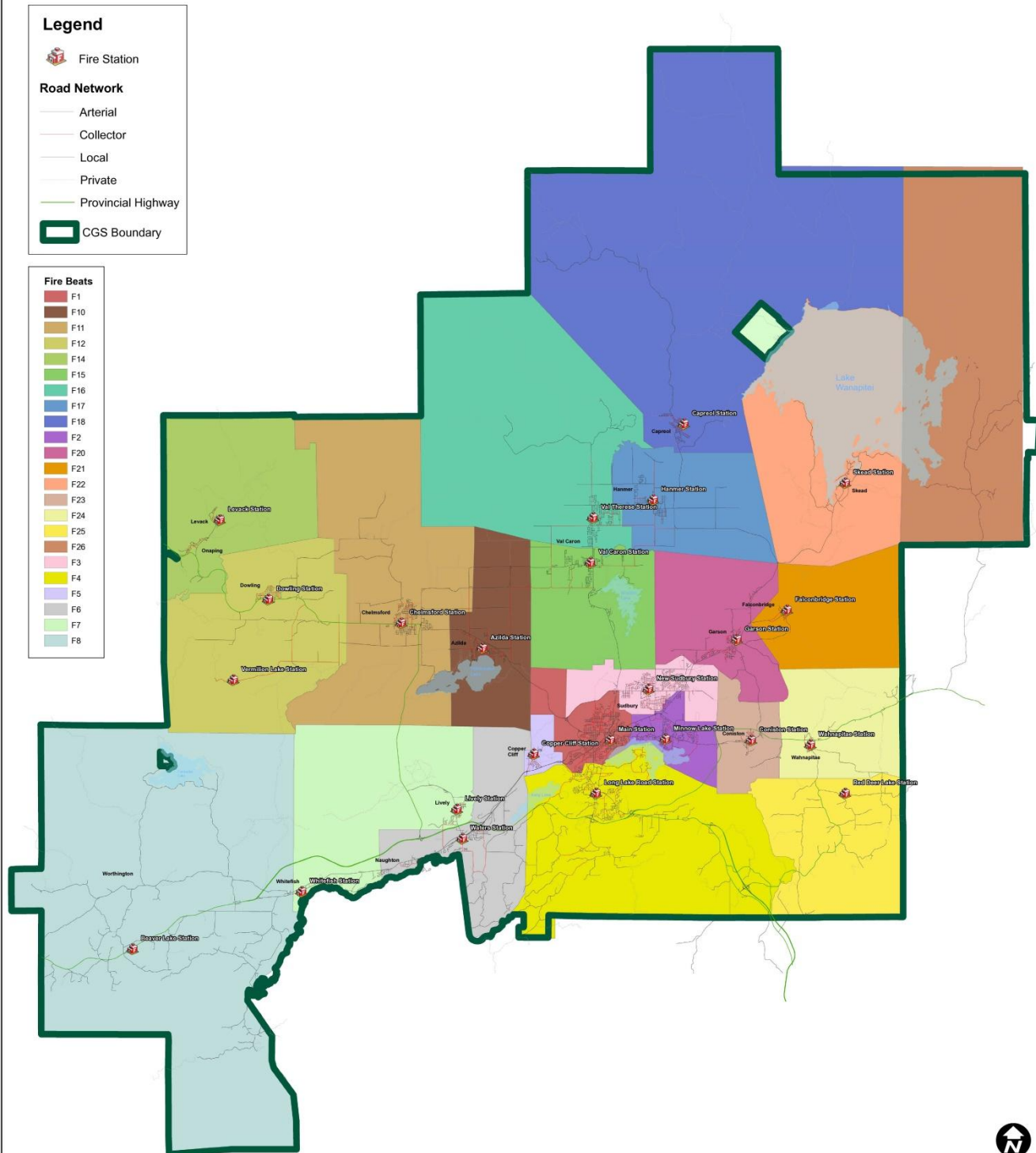
F4

F5

F6

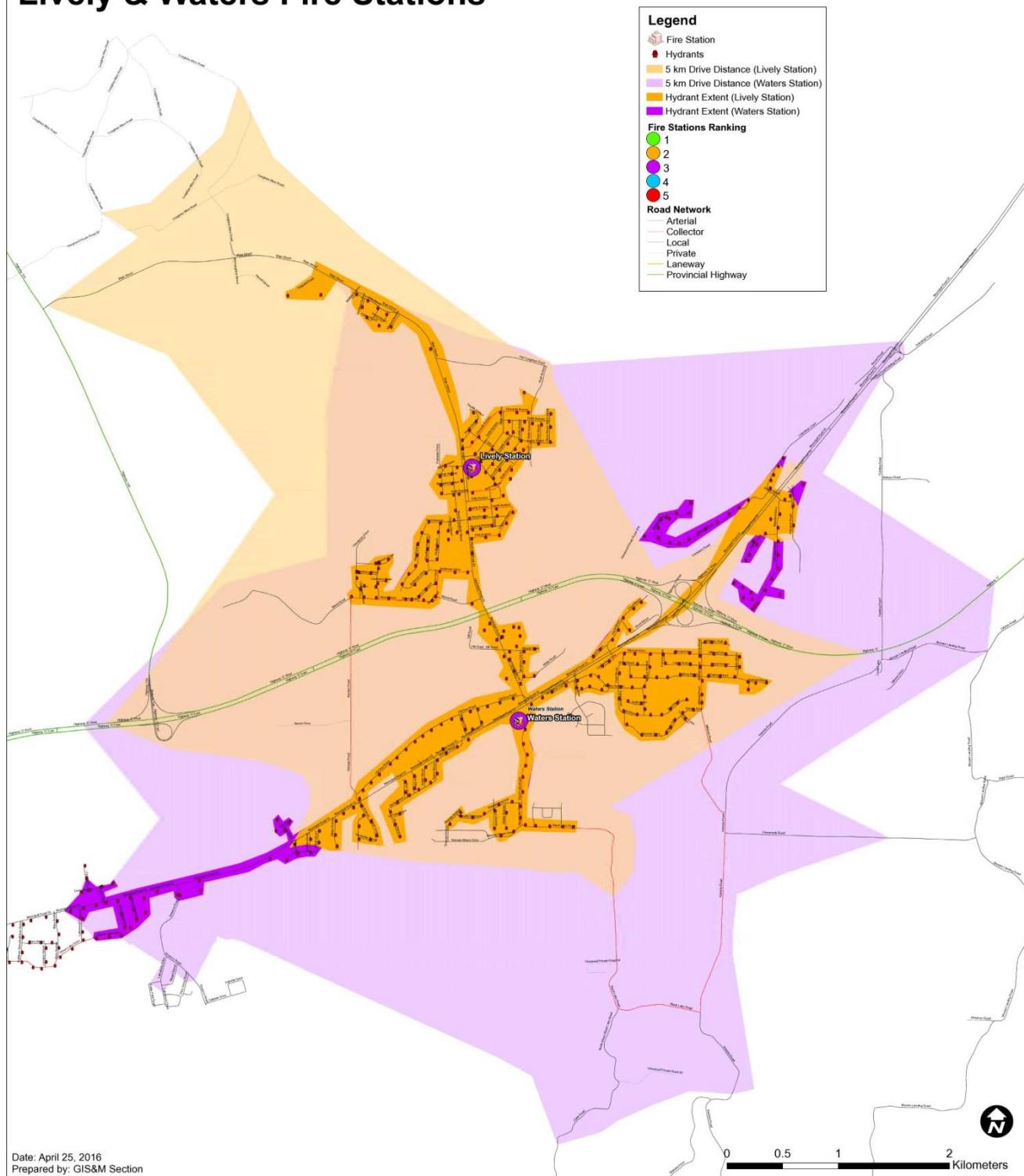
F7

F8



City of Greater Sudbury

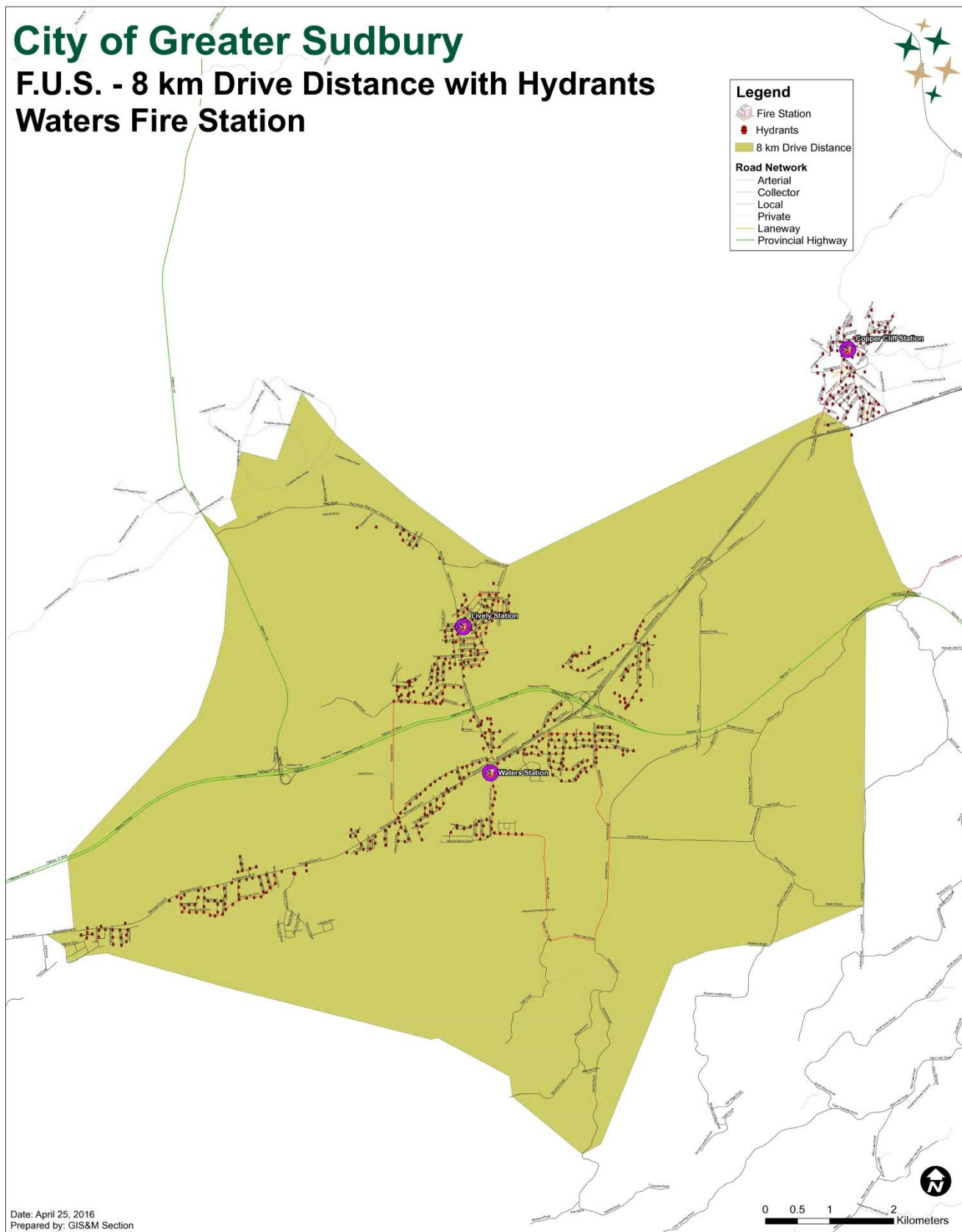
F.U.S. - 5 km Drive Distance with Hydrants Lively & Waters Fire Stations

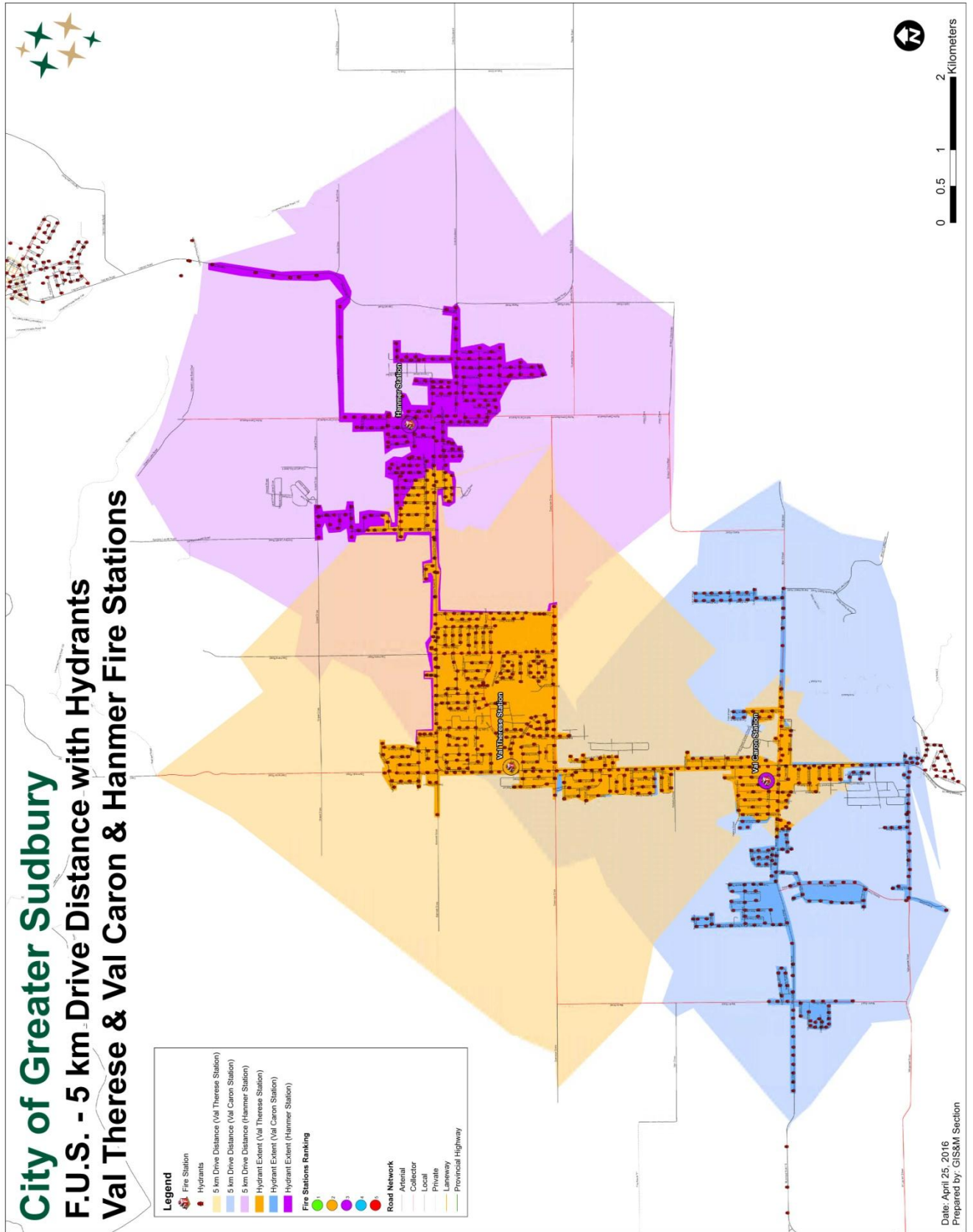


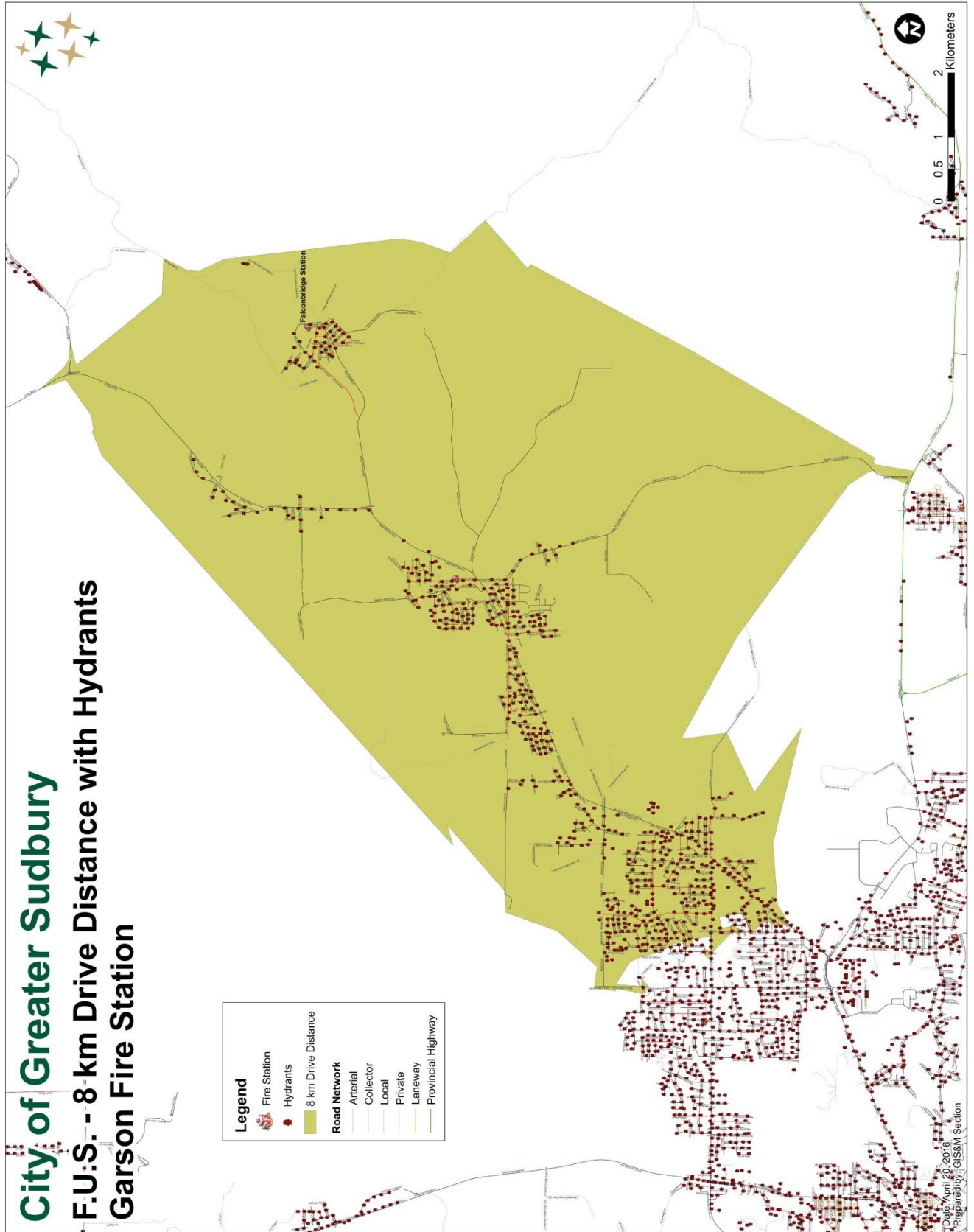
City of Greater Sudbury

F.U.S. - 8 km Drive Distance with Hydrants

Waters Fire Station

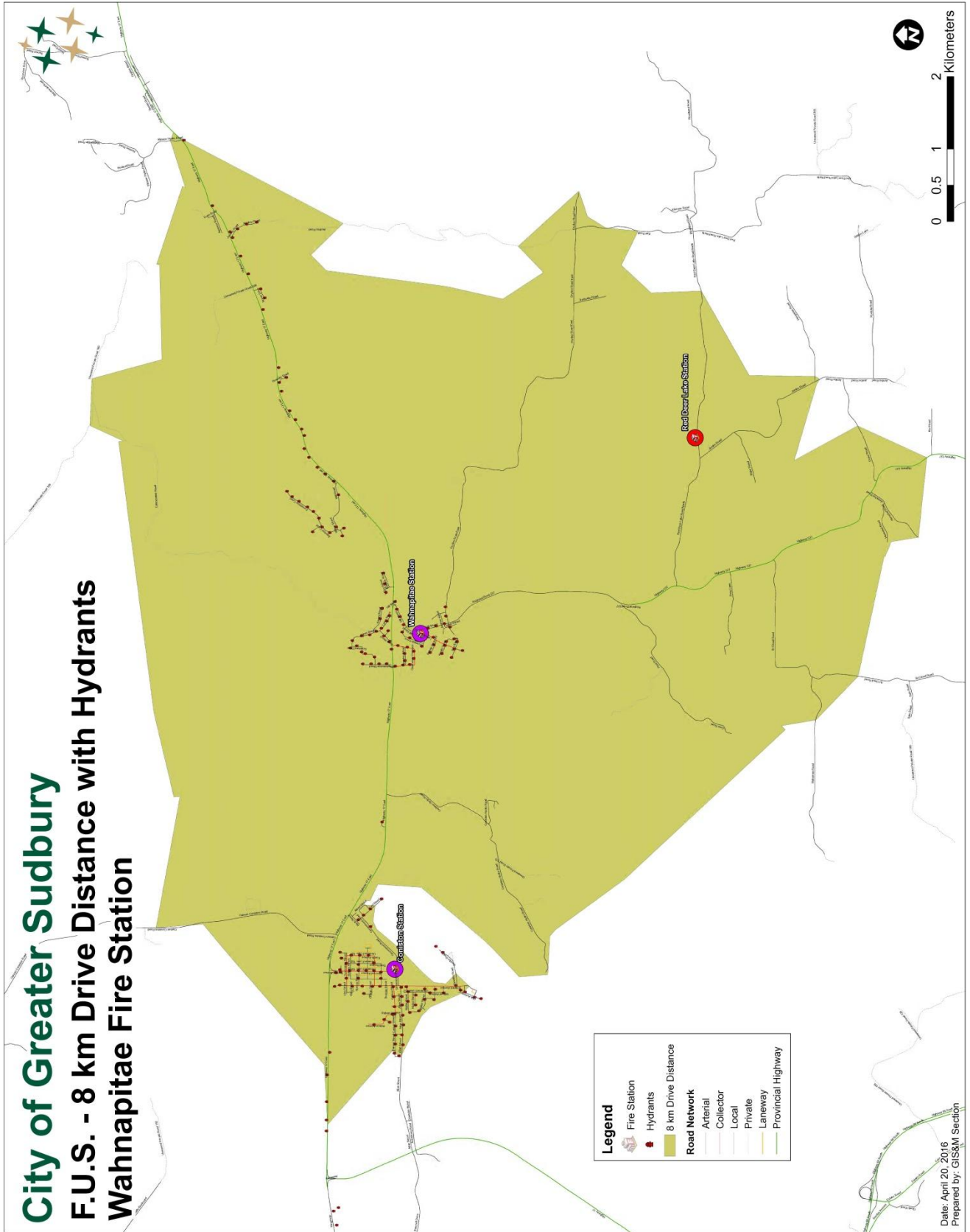


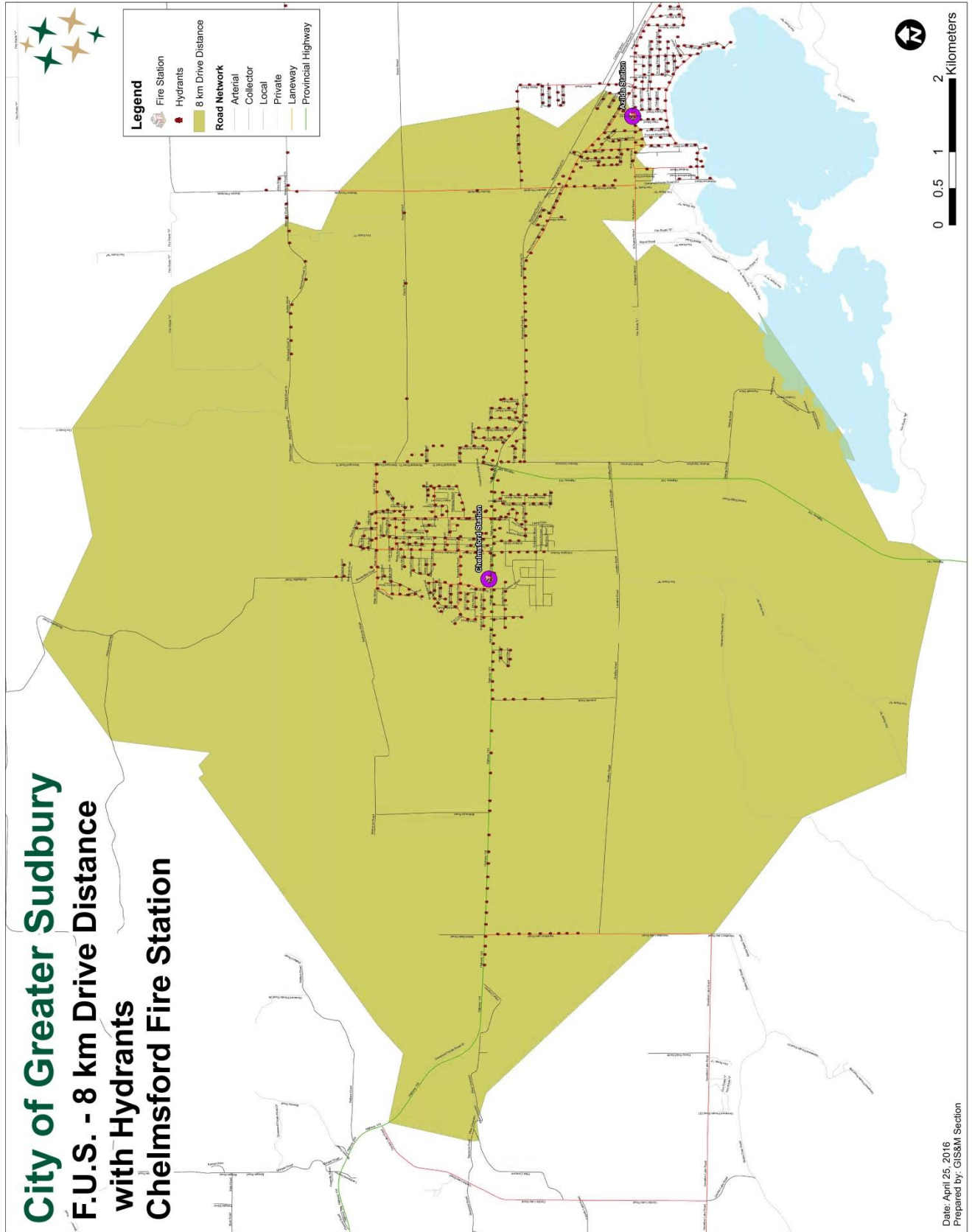




City of Greater Sudbury

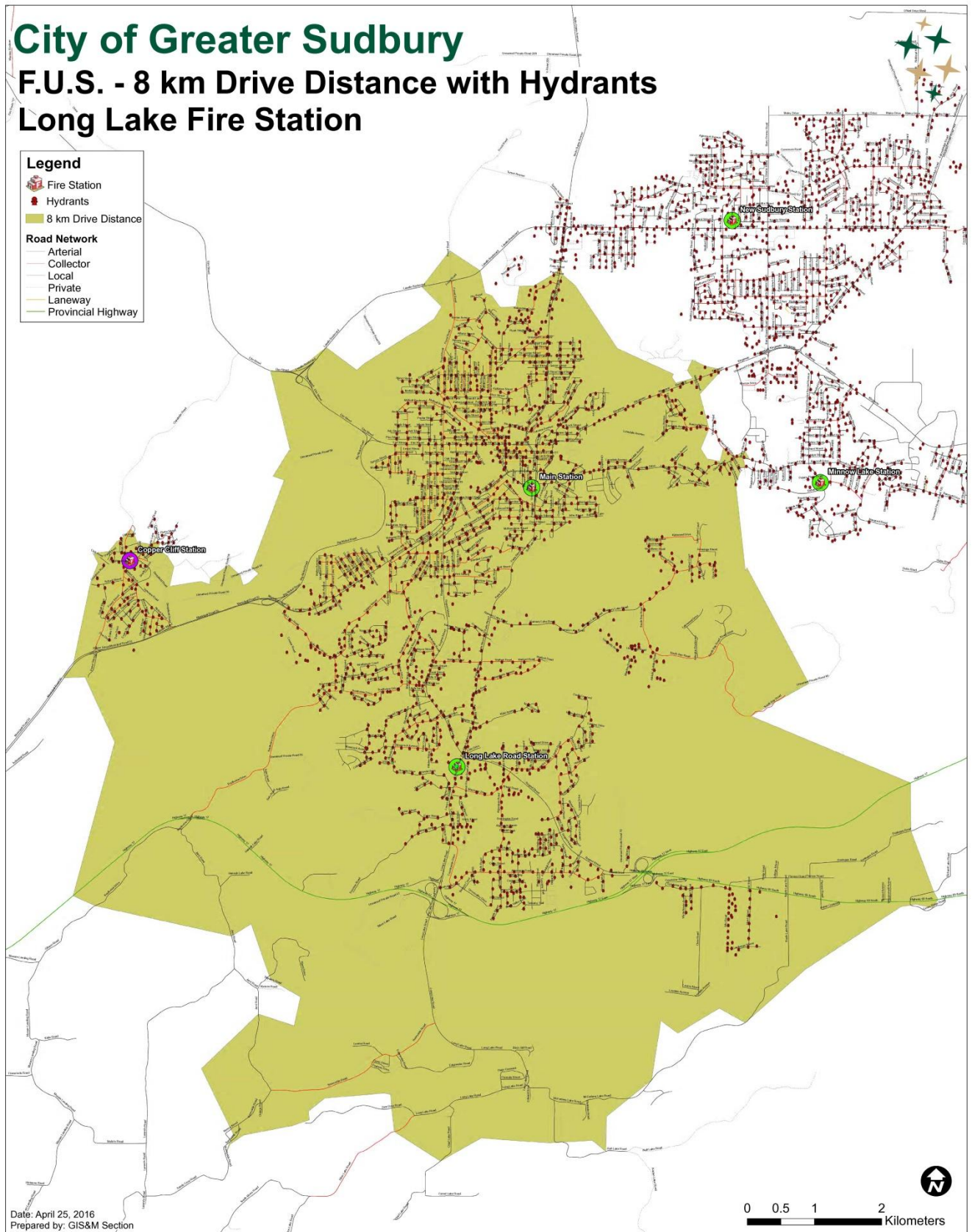
F.U.S. - 8 km Drive Distance with Hydrants Wahnapiitae Fire Station





City of Greater Sudbury

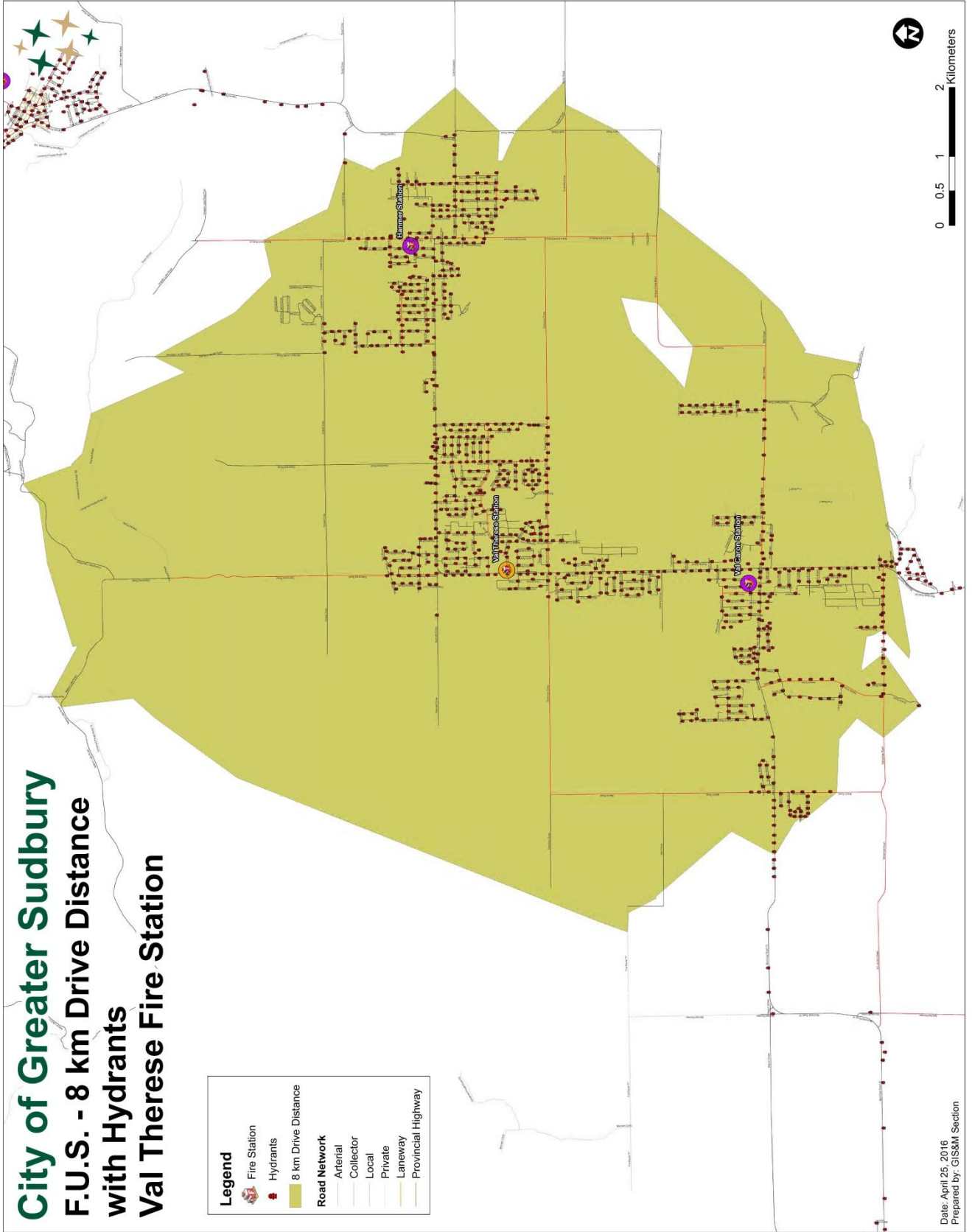
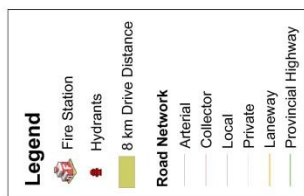
F.U.S. - 8 km Drive Distance with Hydrants Long Lake Fire Station



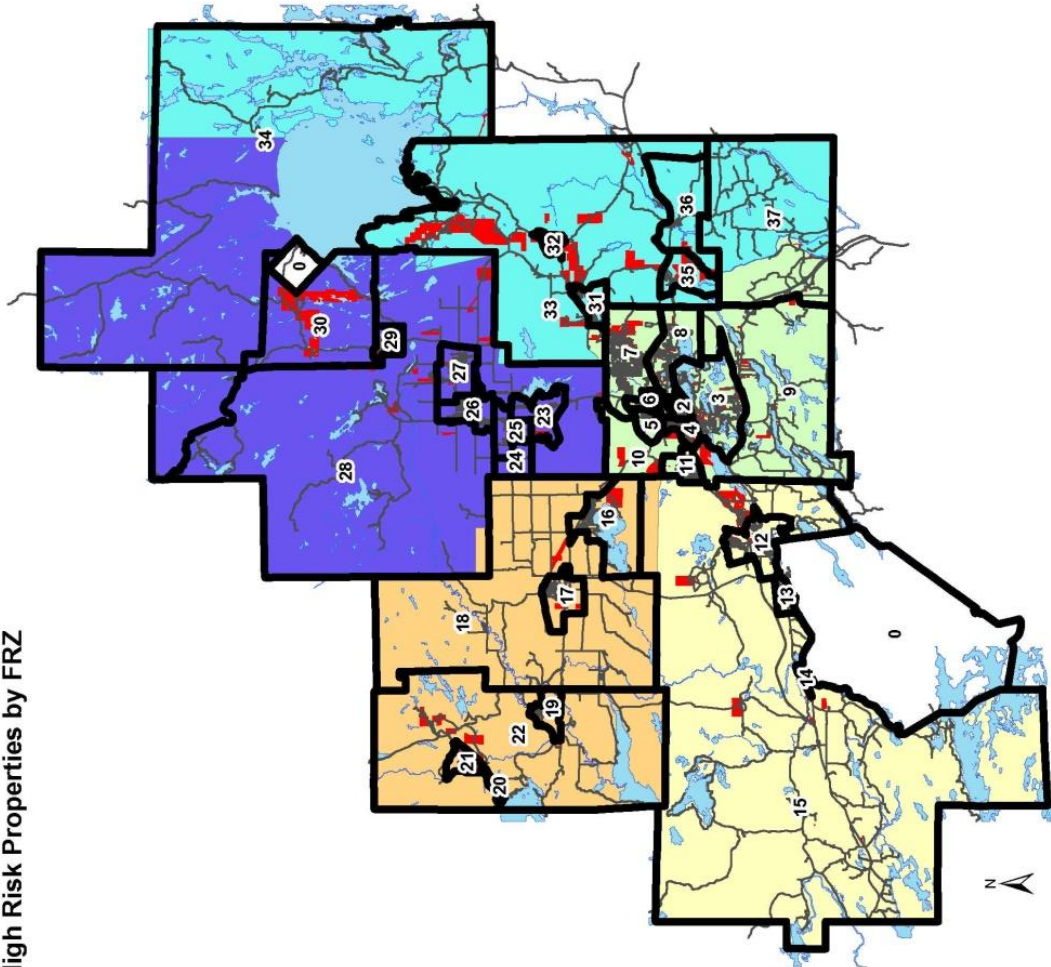
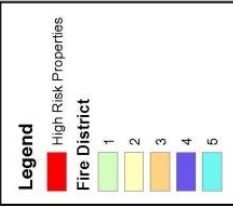
City of Greater Sudbury

F.U.S. - 8 km Drive Distance with Hydrants

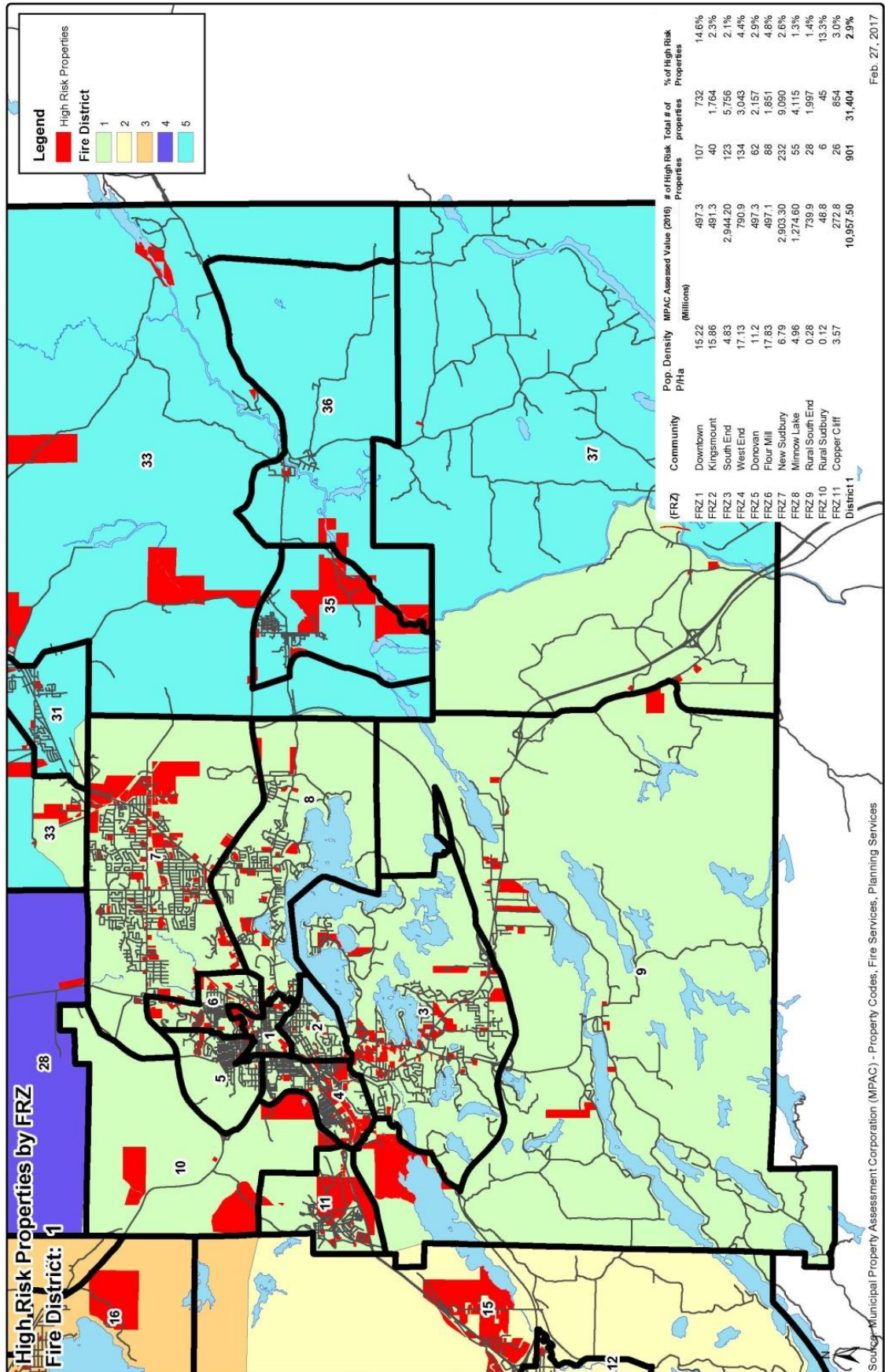
Val Therese Fire Station

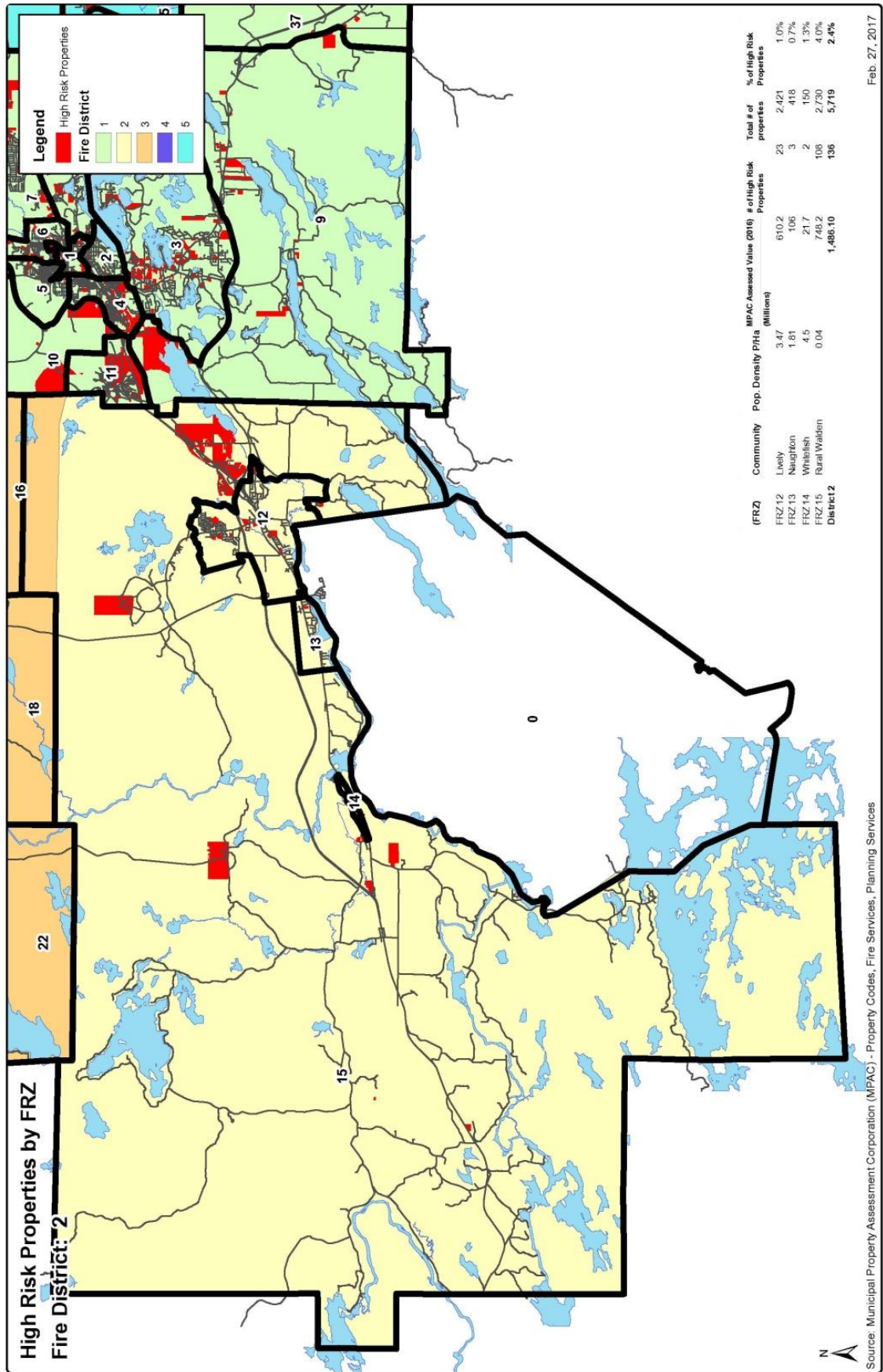


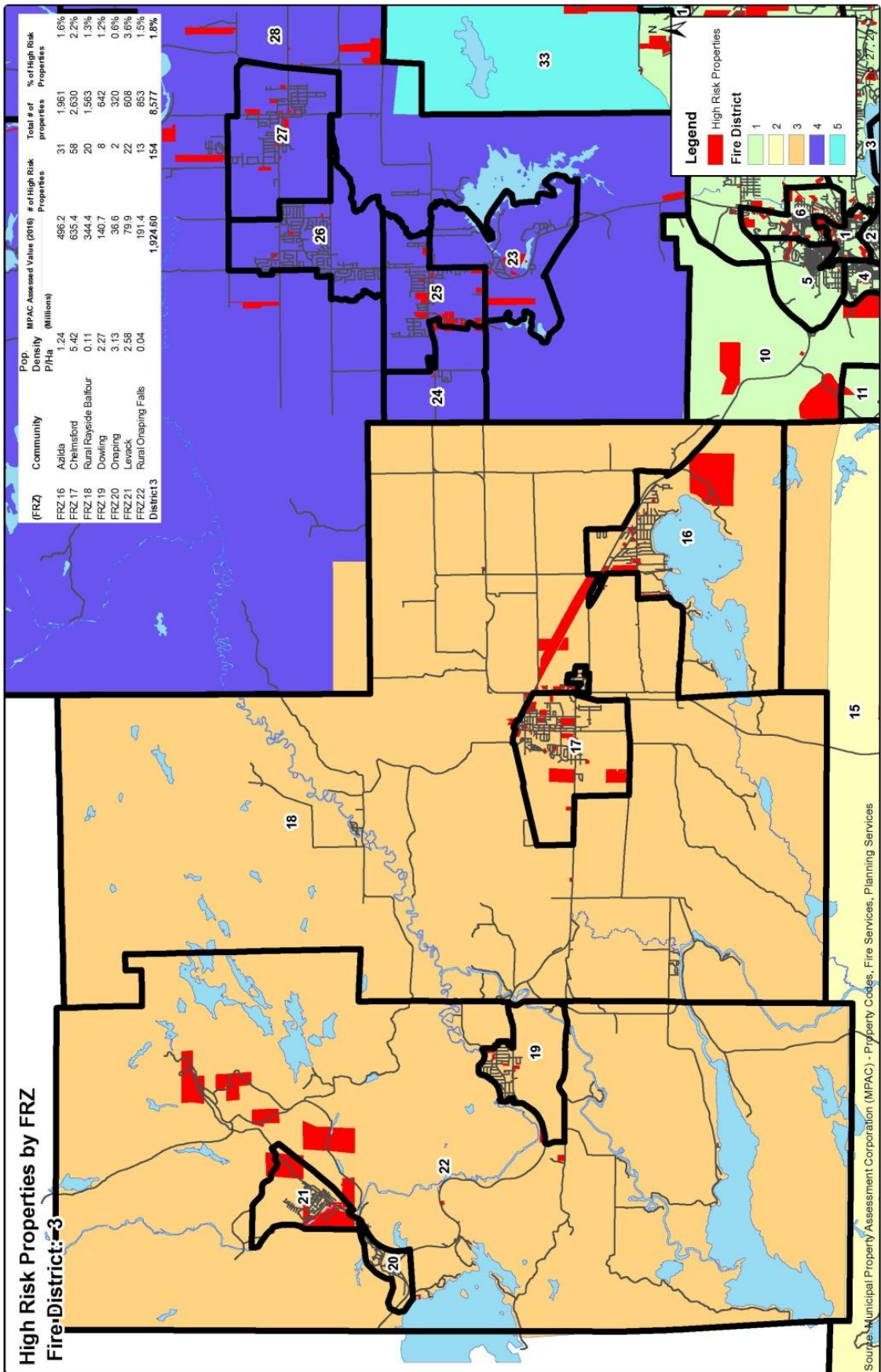
High Risk Properties by FRZ



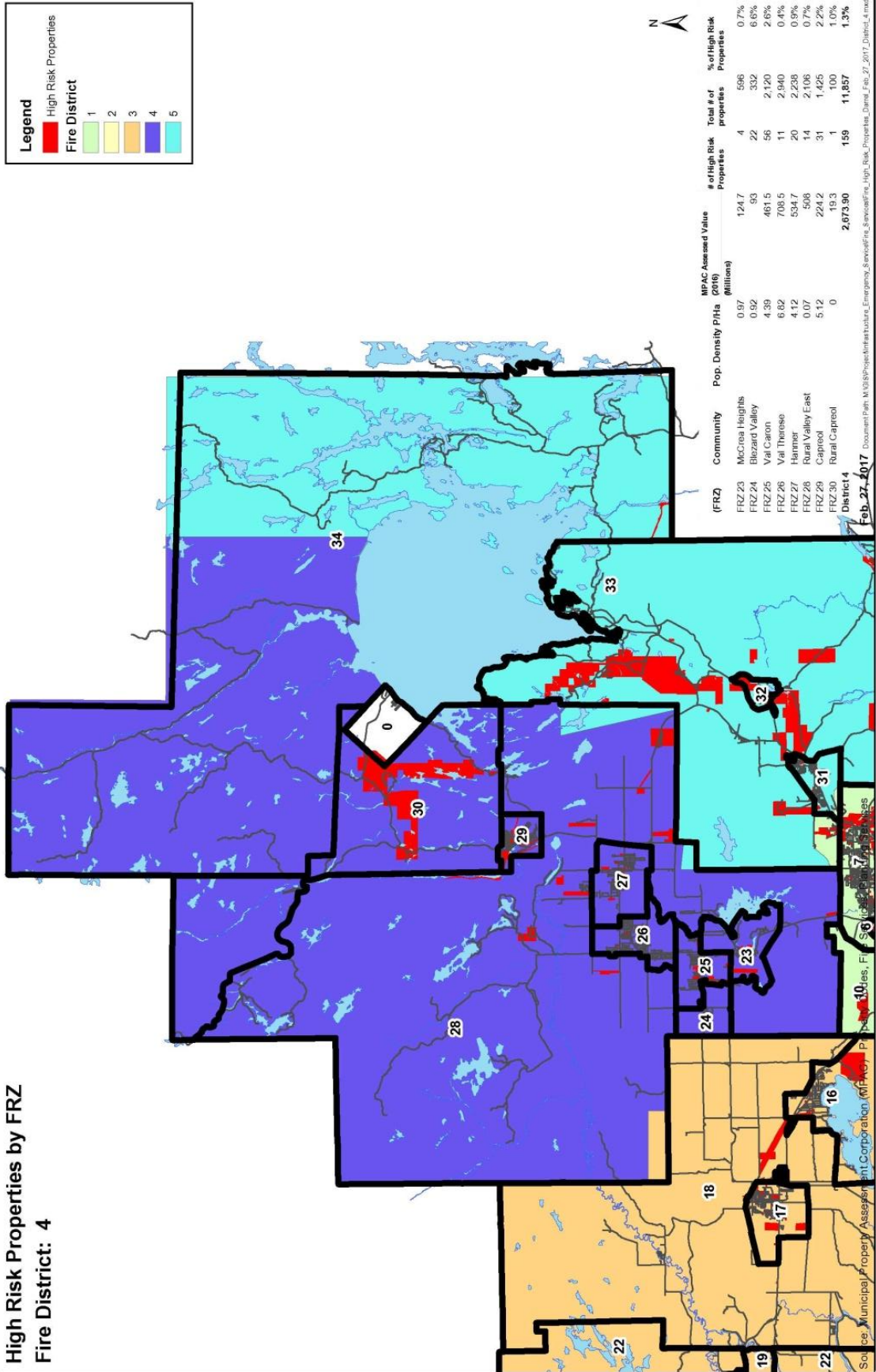
FRZ	Community	Pop. Density P/ha	MPAC Assessed Value (2016) (Millions)	# of High Risk Properties	Total # of Properties	% of High Risk Properties
FRZ 1	Downtown	15.22	457.3	107	732	14.6%
FRZ 2	Kingsmount	15.86	491.3	40	1,764	2.3%
FRZ 3	South End	4.83	2,944.20	123	5,766	2.1%
FRZ 4	West End	1.13	80.9	134	3,043	4.4%
FRZ 5	Forest Hill	11.2	487.1	86	1,057	8.1%
FRZ 6	Flower Hill	17.83	497.1	86	1,057	8.1%
FRZ 7	New Suburb	6.79	2,903.30	232	9,060	2.6%
FRZ 8	Minnow Lake	4.66	1,274.60	55	4,115	1.3%
FRZ 9	Rural South End	0.28	739.9	28	1,997	1.4%
FRZ 10	Rural South End	0.12	48.6	6	45	13.3%
FRZ 11	Copper Cliff	3.57	272.8	26	854	3.0%
District 1	Lively	3.47	10,957.50	901	31,404	2.9%
FRZ 12	Naughton	1.81	106	3	418	0.7%
FRZ 13	Whitefish	4.5	21.7	2	150	1.3%
FRZ 14	Rural Walden	0.04	748.2	108	2,730	4.0%
District 2	Adida	1.24	496.2	31	1,981	1.6%
FRZ 16	Chelmsford	5.42	635.4	58	2,630	2.2%
FRZ 17	Rural Bayside Harbour	0.11	344.4	20	1,563	1.3%
FRZ 18	Downing	0.11	344.4	20	1,563	1.3%
FRZ 19	Downing	3.13	38.6	2	320	0.6%
FRZ 20	Loxley	2.58	79.9	22	608	3.6%
FRZ 21	Rural Onaping Falls	0.04	191.4	13	863	1.5%
District 3	McGee Heights	0.97	1,924.60	154	8,577	1.8%
FRZ 23	Blizard Valley	0.92	124.7	4	596	0.7%
FRZ 24	Val Caron	4.39	461.5	22	332	6.6%
FRZ 25	Val Therese	6.82	708.5	11	2,940	0.4%
FRZ 26	Harmer	4.12	534.7	20	2,238	0.9%
FRZ 27	Rural Valley East	0.07	508	14	2,106	0.7%
FRZ 28	Capitol	5.12	224.2	31	1,425	2.2%
FRZ 29	Rural Capitol	0	19.3	1	100	1.0%
District 4	Garrison	8.25	2,673.90	159	11,857	1.3%
FRZ 30	Falconbridge	2.28	538.8	24	2,222	1.1%
FRZ 31	Rural Nisku Centre	0.08	69.6	4	314	1.3%
FRZ 32	Rural Nisku Centre	0.08	453.5	40	1,503	2.7%
FRZ 33	Concession	1.64	171.4	12	875	1.4%
FRZ 34	Wahnapitane	0.38	57.6	9	465	1.9%
FRZ 35	SE Townships	0.08	116.7	37	729	5.1%
District 5			1,489.30	126	6,118	2.1%
			18,511.40	1,476	63,675	2.3%

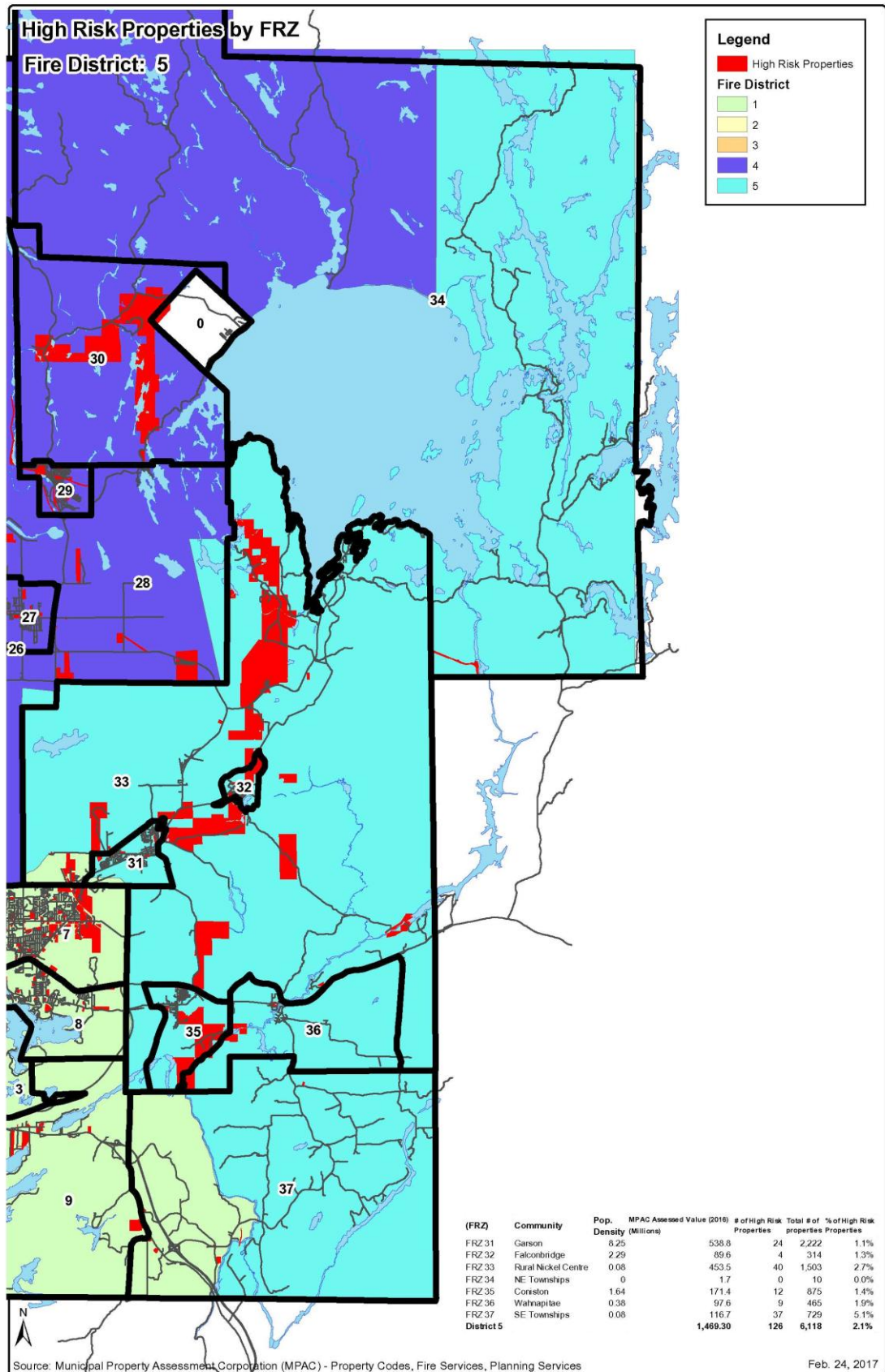






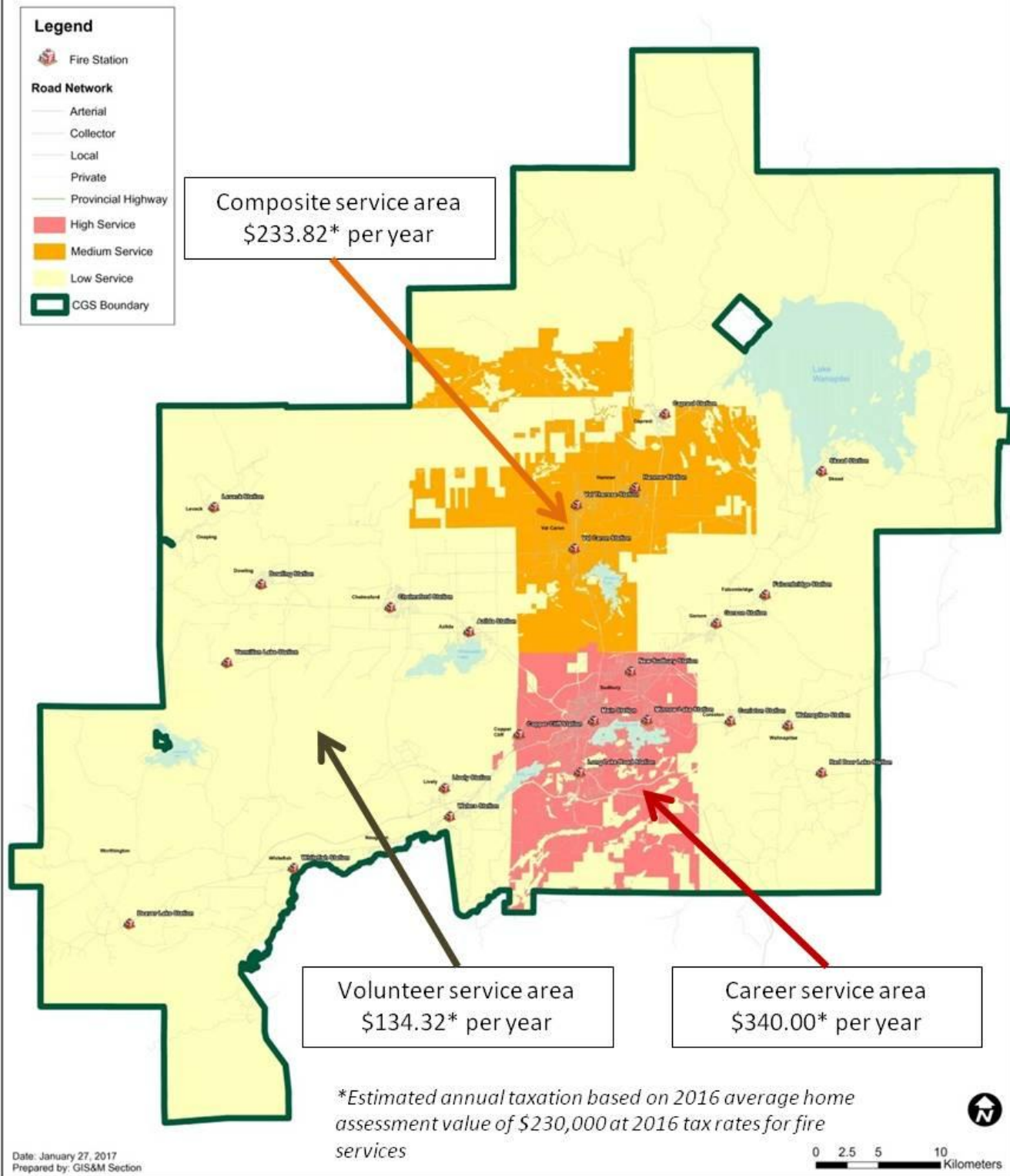
High Risk Properties by FRZ Fire District: 4





City of Greater Sudbury

Area Rating (Fire Service Levels)



City of Greater Sudbury

Optimized Fire and Paramedic Stations

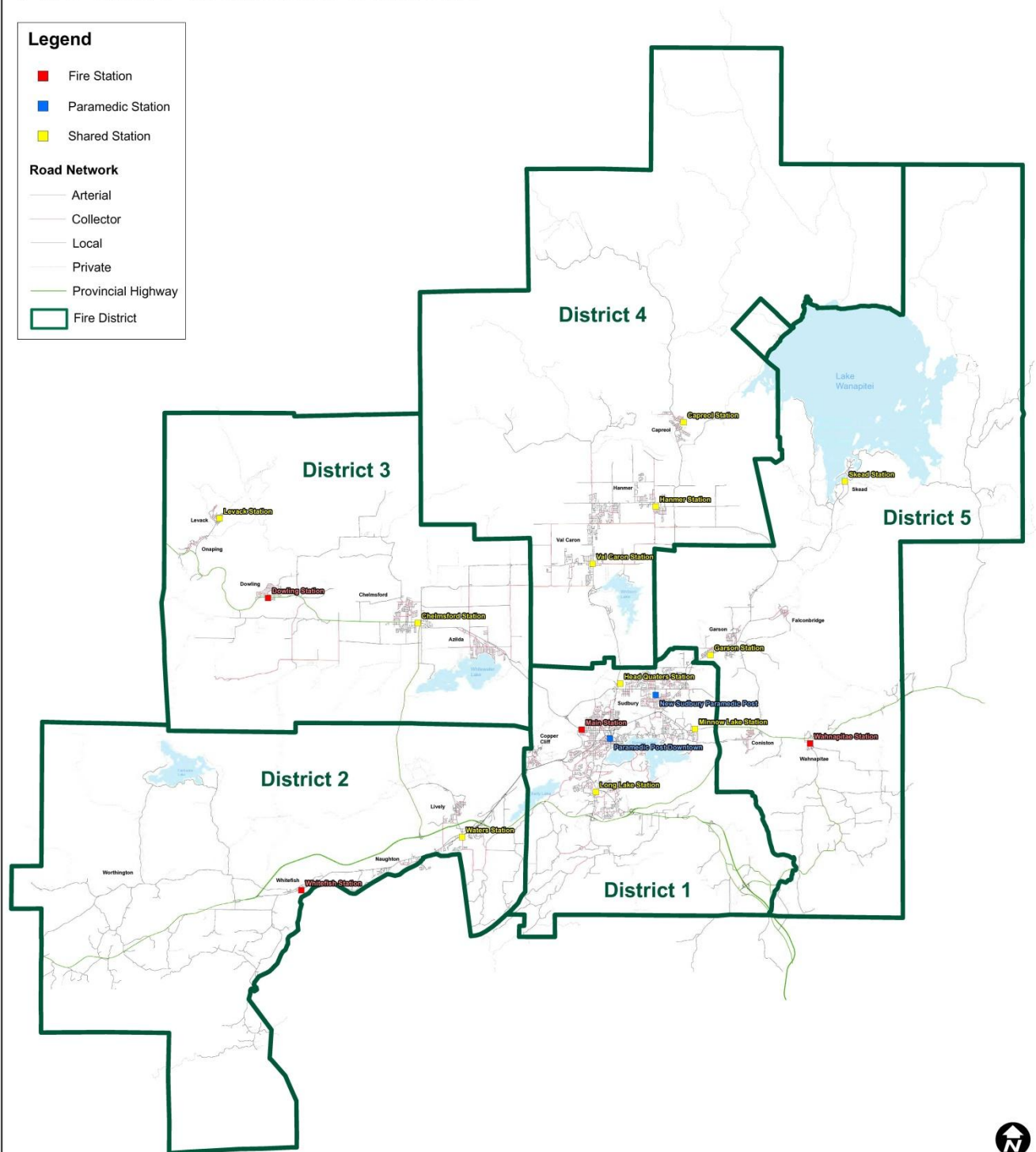


Legend

- Fire Station
- Paramedic Station
- Shared Station

Road Network

- Arterial
- Collector
- Local
- Private
- Provincial Highway
- Fire District



City of Greater Sudbury

Optimized Plan Paramedic Services Response Times



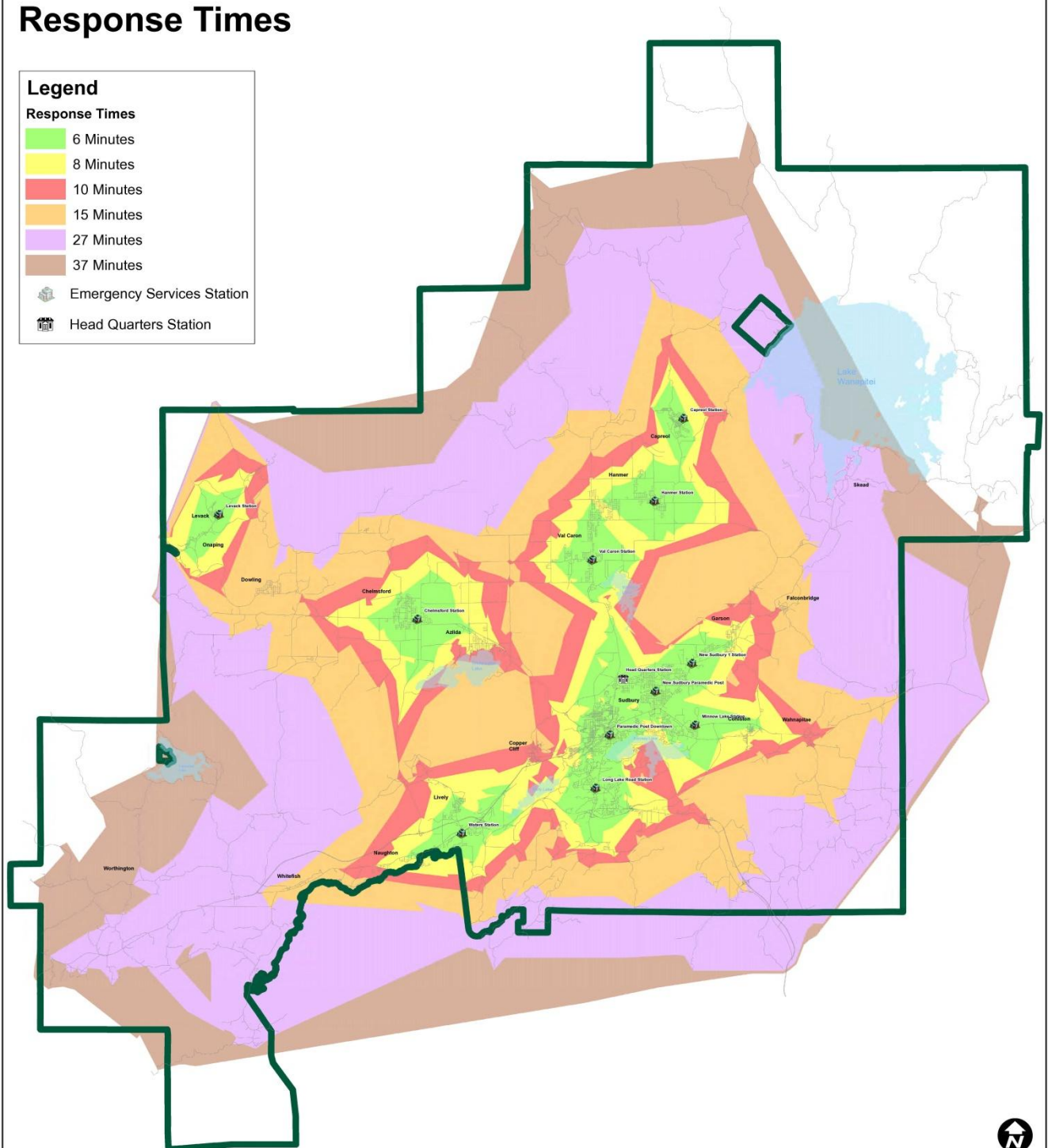
Legend

Response Times

- 6 Minutes
- 8 Minutes
- 10 Minutes
- 15 Minutes
- 27 Minutes
- 37 Minutes

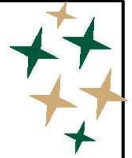
Emergency Services Station

Head Quarters Station



City of Greater Sudbury

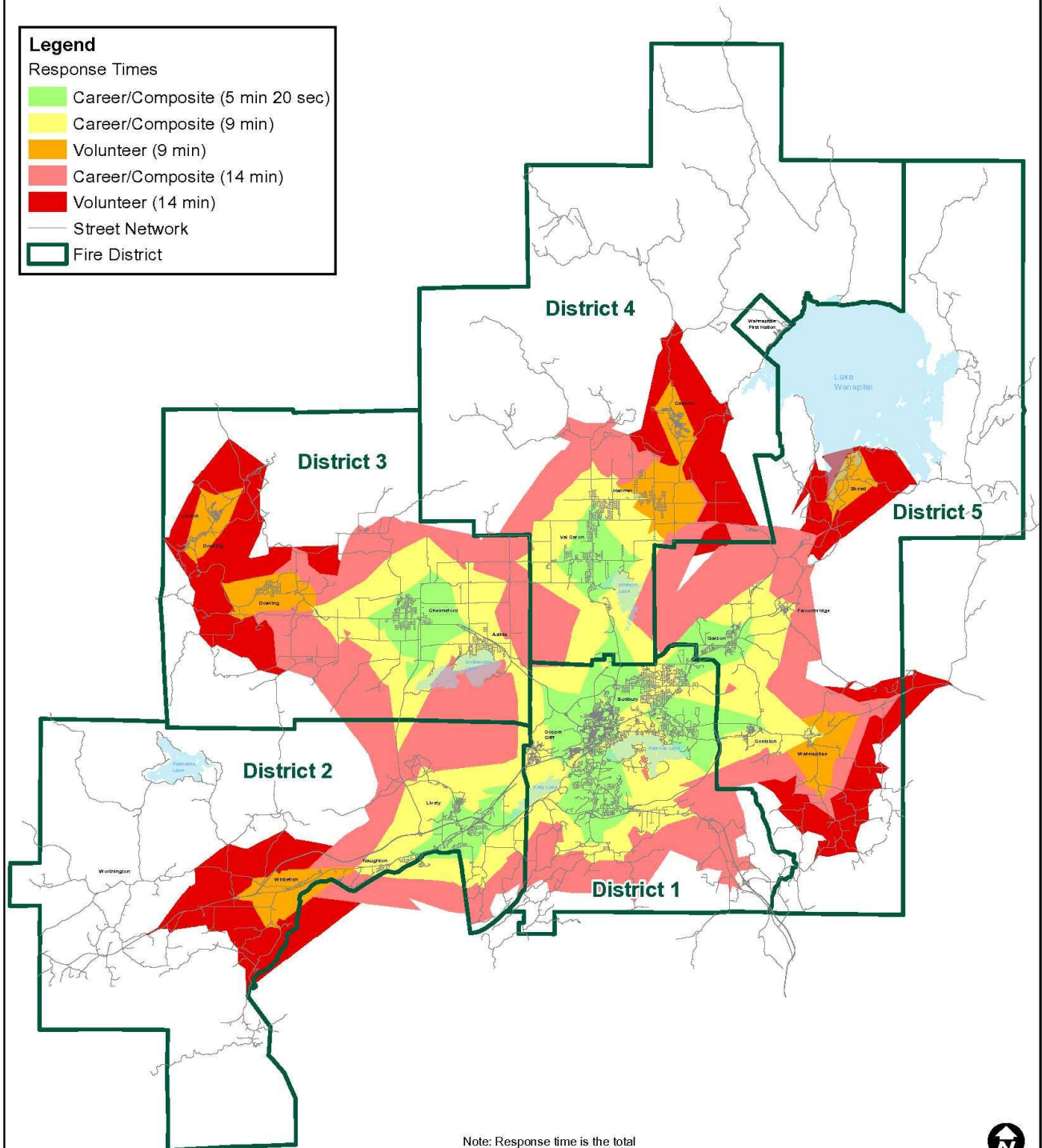
Optimized 2015 Response Times



Legend

Response Times

- Career/Composite (5 min 20 sec)
- Career/Composite (9 min)
- Volunteer (9 min)
- Career/Composite (14 min)
- Volunteer (14 min)
- Street Network
- Fire District



Note: Response time is the total amount of time between initial dispatch/page to arrival on scene based on historical average for shoot time plus drive time.



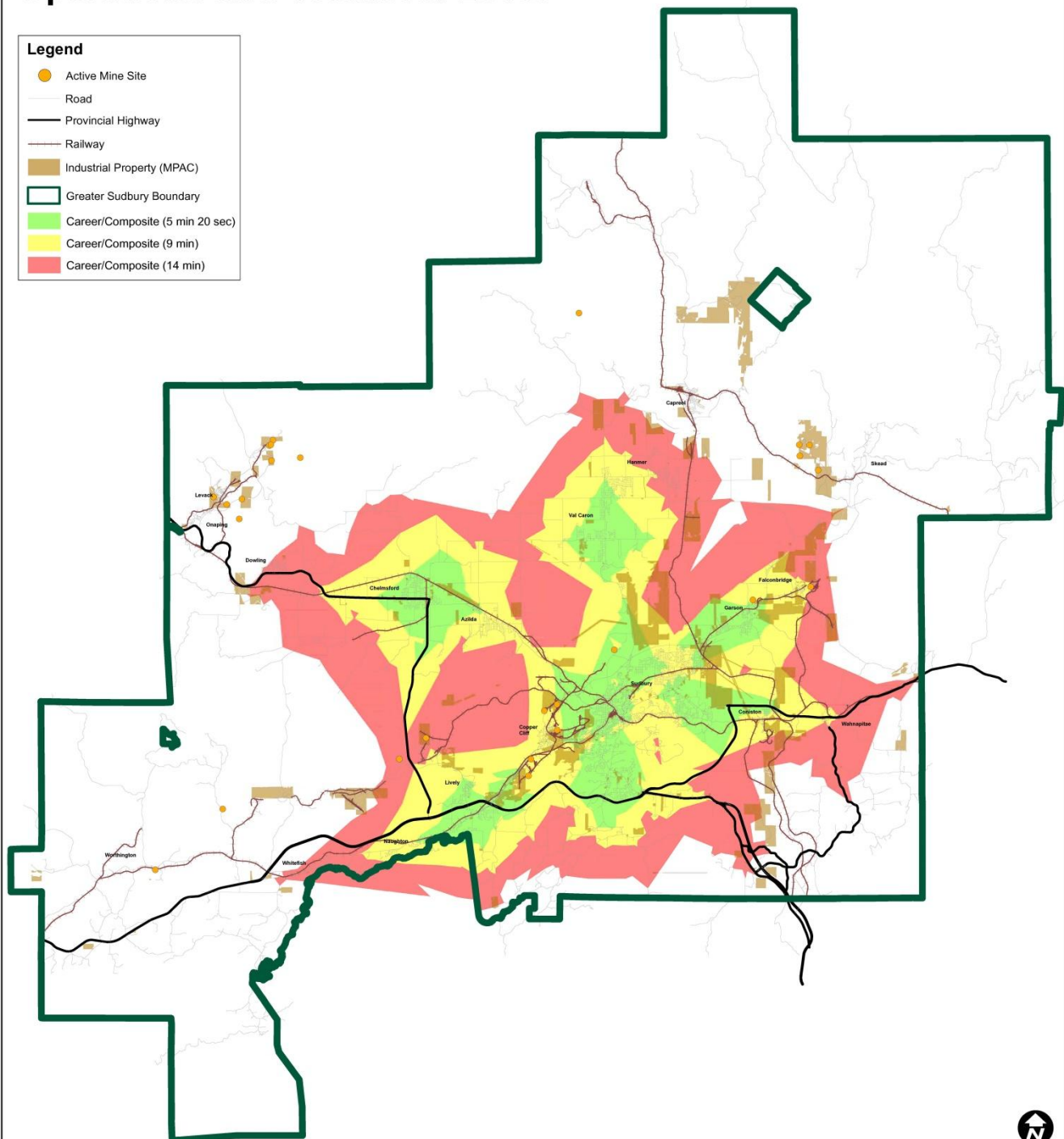
City of Greater Sudbury

Optimized Hazardous Material (HazMat) Response Operations and Technical Level



Legend

- Active Mine Site
- Road
- Provincial Highway
- Railway
- Industrial Property (MPAC)
- Greater Sudbury Boundary
- Career/Composite (5 min 20 sec)
- Career/Composite (9 min)
- Career/Composite (14 min)



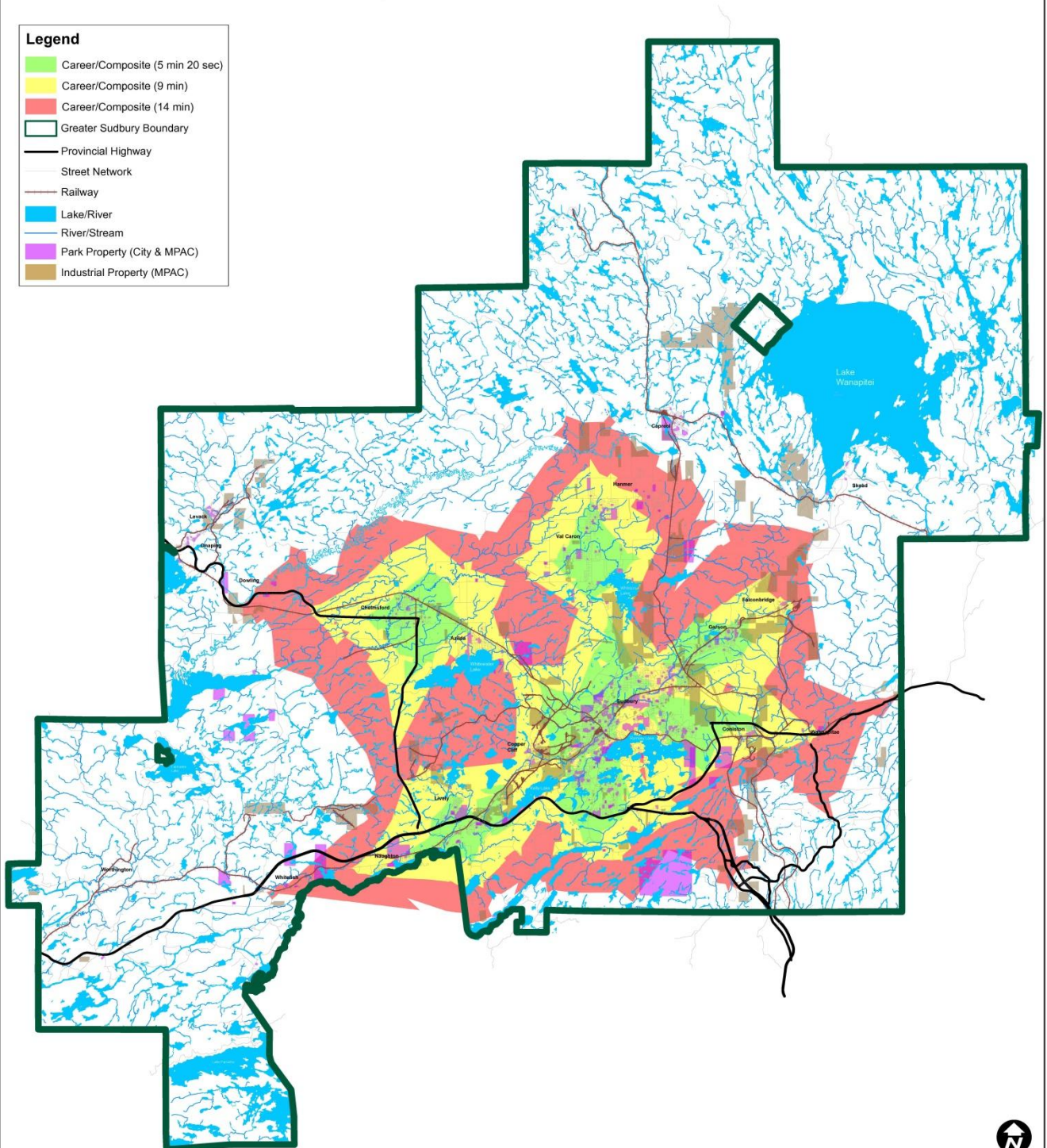
City of Greater Sudbury

Optimized Technical Rescue Response



Legend

- Career/Composite (5 min 20 sec)
- Career/Composite (9 min)
- Career/Composite (14 min)
- Greater Sudbury Boundary
- Provincial Highway
- Street Network
- Railway
- Lake/River
- River/Stream
- Park Property (City & MPAC)
- Industrial Property (MPAC)



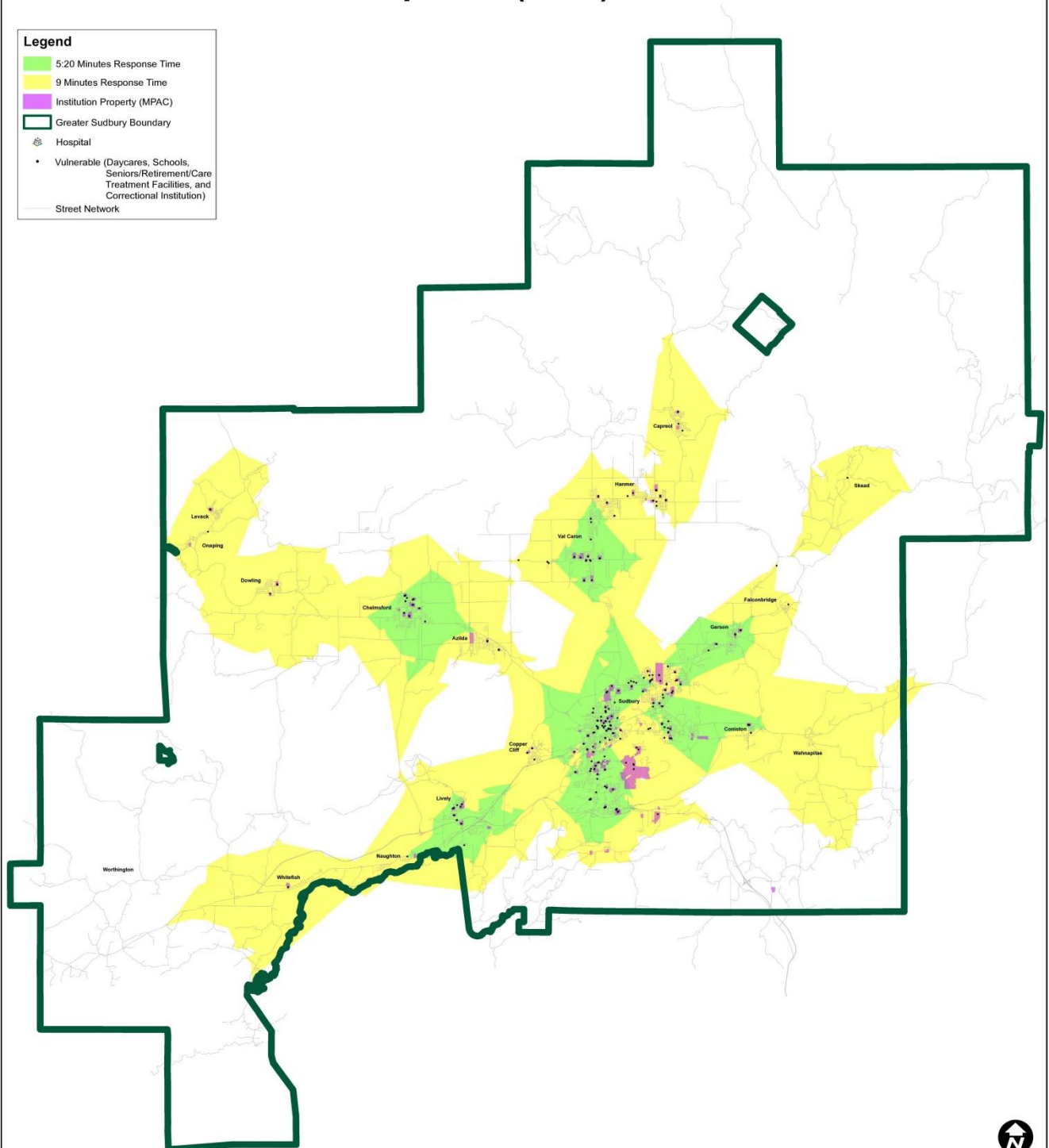
City of Greater Sudbury

Optimized Fire Medical Tiered Response (MTR)



Legend

- 5:20 Minutes Response Time
- 9 Minutes Response Time
- Institution Property (MPAC)
- Greater Sudbury Boundary
- Hospital
- Vulnerable (Daycares, Schools, Seniors/Retirement/Care Treatment Facilities, and Correctional Institution)
- Street Network





Tables (T)



MUNICIPAL
PROPERTY
ASSESSMENT
CORPORATION

Greater Sudbury Assessment Summary

Municipality Tax Class	2015 Roll for Tax Year	2016 Roll for Tax Year
	2016 (2012 CVA)	2016 (2016 CVA)
Commercial		
C Commercial	1,399,729,833	1,598,401,318
D Office Building	127,120,810	139,780,270
G Parking Lot	10,862,910	13,691,100
S Shopping Centre	353,796,560	456,589,090
Sub-total	1,891,510,113	2,208,461,778
Exempt		
E Exempt	1,273,514,630	1,526,552,576
Farm		
F Farm	15,938,900	31,823,700
Industrial		
I Industrial	206,007,440	221,858,800
L Large Industrial	247,686,426	133,194,700
Sub-total	453,693,866	355,053,500
Landfills		
H Landfills	-	1,054,600
Managed Forest		
T Managed Forest	10,318,900	11,840,400
Multi-Residential		
M Multi-Residential	689,441,900	666,511,000
New Commercial		
X New Construction Commercial	180,823,410	220,714,930
Y New Construction Office Building	293,500	291,000
Z New Construction Shopping Centre	51,079,930	60,461,370
Sub-total	232,196,840	281,467,300
New Industrial		
J New Construction Industrial	40,124,300	46,626,100
K New Construction Large Industrial	20,401,450	14,170,700
Sub-total	60,525,750	60,796,800
New Multi-Residential		
N New Multi-Residential	73,893,000	80,228,400
Pipeline		
P Pipeline	49,792,000	56,430,000
Residential		
R Residential	13,672,233,185	14,344,757,111
Total	\$ 18,423,059,084	\$ 19,624,977,165

BLS Skills	Medications	Year	Delegated Skills	Year
Patient Assessment	Acetylsalicylic Acid (PO)	2000	PCP Autonomous Intravenous	2016
Emergency Patient Care	Acetaminophen (PO)	2014	Supraglottic Airway (King-LT)	2009
Patient Immobilization	Dextrose D50W (IV)	2016	CPAP application	2010
Basic Trauma Life Support	Dimenhydrinate (IV, IM)	IV 2016	Capnometry (ETCO2)	2009
		IM 2011		
Neonatal Resuscitation Program	Diphenhydramine (IV, IM)	IV 2016	pulse oximetry monitoring	2000
		IM 2011		
Oxygen Therapy	Epinephrine (IM, NEB)	2000 IM	Manual defibrillation	2014
		2002 NEB		
Pulse Oximetry	Glucagon (IM)	2000	12-Lead ECG aquisition	2010
			STEMI interpretation	2016
Assess and Recognize obs emergencies	Glucose (PO)	2000	PCP Termination of Resuscitation	2009
Delivery of the neonate	Ibuprofen (PO)	2014	emergency disconnect of home dialysis	2016
	Ketorolac (IV, IM)	IV 2016	Emergency Child Birth	2017
	Naloxone (IM)	2015	Deep suctioning	2017
	Oxygen (100%)	2000	Adult Analgesia	2015
	Salbutamol (MDI, NEB, BVM)	2000	Oral and nasal pharyngeal airway	2000
	0.9% Normal Saline (IV)	2016	Oral and nasal pharyngeal suctioning	2000
			Positive pressure ventilation with BVM	2000
			Fluid Bolus	2016

	Medications	Year	Delegated Skills	Year
Patient Assessment	acetylsalicylic acid (PO)	2000	orotracheal and nasotracheal intubation	2000
Emergency Patient Care	Dimenhydrinate (IM, IV, IO)	2007	laryngoscopy - removal of foreign body obstruction using MacGill forceps	2000
Patient Immobilization	Diphenhydramine (PO, IM, IV, IO)	2007	needle thoracostomy	2000
Basic Trauma Life Support	Epinephrine 1: 1000 (IV, IM, IO, ETT, NEB)	2000	synchronized cardioversion	2000
	Epinephrine 1:10 000 (IV, IO)			
Neonatal Resuscitation Program	Glucagon (IM)	2000	external transcutaneous cardiac pacing	2000
Oxygen Therapy	glucose gel (PO)	2000	Treatment of Cardiac emergencies ACLS	2000
Pulse Oximetry	Acetaminophen (PO)	2014	IV Therapy	2000
Assess and Recognize obs emergencies	Ketorolac (IM, IV, IO)	2014	Intra Osseous IV Cannulation Pediatric	2000
			Intra Osseous IV Cannulation Adult	2013
Delivery of the neonate	Ibuprofen (PO)	2014	Supraglottic Airway (King-LT)	2009
	nitroglycerine spray (SL)	2000	CPAP application	2010
	Salbutamol (MDI, Neb, BVM)	2000	Capnometry (ETCO2)	2000
	Naloxone (IV, IM, SC)	2000	pulse oximetry monitoring	2000
	Dextrose D50W (IV, IO)	2000	12-Lead ECG application and STEMI interpretation	2010
	Dextrose D25W (IV, IO)			
	Dextrose D10W (IV, IO)			
	Adenosine (IV, IO)	2000	emergency disconnect of home dialysis	2014
	Atropine (IV, ETT, IO)	2000	Emergency Child Birth	2017
			ACP Termination of Resuscitation	2000
	Diazepam (IV, IM)	2000	Endotracheal suction	2000
	Dopamine, (IV, IO)	2000	Pediatric Pain Directive	2013

BLS Skills	Medications	Year	Delegated Skills	Year
Delivery of the neonate cont'd	Fentanyl (IV)	2000	Central Venous Access Device	2000
	Lidocaine,(IV, IO, ETT)	2000	Hyperkalemia Medical Directive	2015
	Lidocaine spray 10 mg (oral)			
	Morphine (IV, IM, IO)	2000	Adrenal Crisis	2017
	Midazolam IV, IO, IM)	2000	Manual Defibrillation	2000
	Sodium Bicarbonate (IV, IO)	2000	Deep Suctioning	2017
	Calcium Gluconate (IV, IO)	2015	Oral and nasal pharyngeal suctioning	2000
	Xylometaxoline HCL (Otrivin) (Nasal)	2000	Positive pressure ventilation with BVM	2000
	Oxygen (100%)	2000	Fluid Bolus	2000
	0.9% Normal Saline (IV, IO, CVAD)	2000	Valsalva manoeuvre	2000

2016 Volunteer Master Attendance Report

Incidents in Response Area			Incidents in District Area			Training by Curriculum Topic			Training by Payroll Hours			Training by Payroll Hours/Attended			Percentage Total Training		
Attended	Total	Percentage	Attended	Total	Percentage	Attended	Total	Percentage	Paid Training Attended	Unpaid Training Attended	Total Attended	Total Offered	Percentage Paid Training	Percentage Unpaid Training	Percentage Total Training	Percentage Total Training	Percentage Total Training
0	12	0.00%	1	22	4.50%	2	44	4.50%	7.00		7.00	7.00	9.72%	0.00%	9.72%	4.86%	
4	12	33.30%	6	22	27.20%	9	44	20.40%	15.00		15.00	15.00	20.83%	0.00%	20.83%	10.42%	
1	12	8.30%	3	22	13.60%	13	44	29.50%	25.00		25.00	25.00	34.72%	0.00%	34.72%	17.36%	
4	12	33.30%	6	22	27.20%	18	44	40.90%	32.00		32.00	32.00	44.44%	0.00%	44.44%	22.22%	
3	12	25.00%	12	22	54.50%	24	44	54.50%	32.00	1.00	33.00	33.00	44.44%	1.39%	45.83%	22.82%	
5	12	41.60%	9	22	40.90%	21	44	50.00%	32.00	3.00	35.00	35.00	44.44%	4.17%	48.61%	24.34%	
6	12	50.00%	13	22	59.00%	31	44	70.40%	40.00	3.00	43.00	43.00	55.56%	4.17%	59.72%	29.86%	
7	12	58.30%	37	44	84.00%	37	44	84.00%	46.00	7.00	53.00	53.00	63.64%	9.72%	73.36%	36.81%	
8	12	66.60%	12	22	54.50%	37	44	84.00%	49.00	5.00	54.00	54.00	68.00%	6.94%	74.94%	37.50%	
4	12	33.30%	7	22	31.80%	36	44	81.80%	47.00	13.00	60.00	60.00	65.28%	18.00%	83.28%	41.67%	
4	36	11.10%	5	54	9.20%	6	16	37.50%	14.00		14.00	14.00	77.78%	0.00%	77.78%	38.89%	
9	36	25.00%	12	54	22.20%	6	16	37.50%	13.00		13.00	13.00	72.22%	5.56%	77.78%	38.89%	
19	36	52.70%	26	54	48.10%	7	16	43.70%	13.00	2.00	15.00	15.00	72.22%	11.11%	83.33%	40.00%	
13	87	14.90%	27	169	15.30%	11	60	18.30%	20.00		20.00	20.00	27.78%	0.00%	27.78%	13.89%	
5	87	5.70%	9	169	5.30%	12	60	20.00%	19.00	2.00	21.00	21.00	26.39%	2.78%	29.17%	14.58%	
15	36	41.60%	18	54	33.30%	10	16	62.50%	18.00	4.00	22.00	22.00	100.00%	22.22%	122.22%	61.11%	
6	87	6.80%	15	169	8.80%	17	60	28.30%	33.00		33.00	33.00	45.83%	0.00%	45.83%	22.92%	
18	87	20.60%	31	169	18.30%	15	60	25.00%	32.00	2.00	34.00	34.00	44.44%	2.78%	47.22%	23.61%	
15	87	17.20%	36	169	21.30%	19	60	31.60%	32.00	7.00	39.00	39.00	44.44%	9.72%	54.16%	27.06%	
5	87	5.70%	17	169	10.00%	20	60	33.30%	38.00	2.00	40.00	40.00	52.78%	2.78%	55.56%	27.78%	
20	87	22.90%	45	169	26.60%	19	60	31.60%	38.00	6.00	44.00	44.00	52.78%	8.33%	61.11%	30.56%	
15	87	17.20%	36	169	21.30%	22	60	36.60%	44.00	1.00	45.00	45.00	61.11%	1.39%	62.50%	31.25%	
34	87	39.00%	62	169	36.60%	25	60	41.60%	42.00	4.00	46.00	46.00	58.33%	5.56%	63.89%	31.94%	
68	87	78.10%	121	169	71.50%	30	60	50.00%	53.00	1.00	54.00	54.00	73.61%	1.39%	75.00%	37.50%	
53	87	60.90%	101	169	59.70%	33	60	55.00%	59.00	6.00	65.00	65.00	73.61%	8.33%	81.94%	40.97%	
45	87	51.70%	80	169	47.90%	29	60	48.30%	58.00	4.00	62.00	62.00	80.56%	5.56%	86.11%	43.06%	
36	87	41.30%	75	169	44.30%	34	60	56.60%	60.00	5.00	65.00	65.00	83.33%	6.94%	90.28%	45.14%	
48	87	55.10%	93	169	56.20%	45	60	75.00%	67.00	14.00	81.00	81.00	93.33%	19.44%	112.78%	56.23%	
2	15	13.30%	2	21	9.50%	3	13	23.00%	6.00		6.00	6.00	33.33%	0.00%	33.33%	16.67%	
14	64	21.80%	24	84	28.50%	10	55	18.10%	25.00		25.00	25.00	34.72%	0.00%	34.72%	17.36%	
4	64	6.20%	5	84	5.90%	13	55	23.60%	25.00	1.00	26.00	26.00	34.72%	1.39%	36.11%	18.06%	
17	64	26.50%	26	84	30.30%	13	55	23.60%	33.00		33.00	34.00	45.83%	1.39%	47.22%	23.61%	
14	64	21.80%	20	84	23.80%	17	55	30.90%	35.00		35.00	35.00	48.61%	0.00%	48.61%	24.31%	
5	64	7.80%	4	84	7.10%	22	55	40.00%	49.00		49.00	49.00	68.06%	0.00%	68.06%	34.03%	
20	64	31.20%	28	84	33.30%	23	55	41.80%	46.00	4.00	50.00	50.00	63.64%	5.56%	69.20%	34.72%	
34	64	53.10%	50	84	59.50%	27	55	49.00%	55.00	7.00	62.00	62.00	76.39%	9.72%	86.11%	43.06%	
19	64	29.60%	28	84	33.30%	30	55	54.50%	61.00	2.00	63.00	63.00	84.72%	2.78%	87.50%	43.75%	
52	64	81.20%	75	84	89.20%	35	55	63.60%	55.00	16.00	71.00	71.00	76.39%	22.72%	99.11%	49.31%	
18	64	28.10%	26	84	30.90%	36	55	65.40%	61.00	13.00	74.00	74.00	84.72%	18.06%	102.78%	51.39%	
20	64	31.20%	32	84	38.00%	36	55	65.40%	70.00	10.00	80.00	80.00	97.22%	13.89%	111.11%	55.56%	
30	64	46.80%	44	84	52.30%	44	55	80.00%	74.00	17.00	91.00	91.00	102.78%	23.61%	126.39%	63.19%	
10	64	15.60%	17	84	20.20%	45	55	81.80%	70.00	23.00	93.00	93.00	97.22%	34.72%	131.94%	65.97%	
39	64	60.90%	61	84	72.60%	47	55	85.40%	72.00	43.00	115.00	115.00	100.00%	59.72%	159.72%	79.86%	
10	47	21.20%	14	68	20.50%	9	76	11.80%	20.00		20.00	20.00	27.78%	0.00%	27.78%	13.89%	
17	47	36.10%	21	68	30.80%	19	76	25.00%	31.00		31.00	36.00	43.06%	6.94%	49.00%	25.00%	
6	11	54.50%	9	15	60.00%	15	17	88.20%	21.00	15.00	36.00	36.00	116.67%	83.33%	120.00%	100.00%	
8	47	17.00%	12	68	17.60%	19	76	25.00%	35.00	3.00	38.00	38.00	48.61%	4.17%	52.78%	26.39%	
21	47	44.60%	30	68	44.10%	21	76	27.60%	43.00	7.00	50.00	43.00	50.00%	9.72%	59.72%	29.86%	
15	47	31.90%	22	68	32.30%	25	76	32.80%	45.00		45.00	45.00	62.50%	0.00%	62.50%	31.25%	
9	47	19.10%	13	68	19.10%	31	76	40.70%	53.00	1.00	54.00	54.00	73.61%	1.39%	75.00%	37.50%	
23	47	48.90%	35	68	51.40%	31	76	40.70%	48.00	11.50	59.50	59.50	66.77%	15.97%	82.74%	41.33%	
7	47	14.80%	9	68	13.20%	35	76	46.00%	69.00		69.00	67.00	87.50%	5.56%	93.06%	46.53%	
29	47	61.70%	44	68	64.70%	33	76	43.40%	57.00	12.50	69.50	69.50	79.17%	17.36%	96.53%	48.26%	
34	47	72.30%	48	68	70.50%	36	76	47.30%	64.00	6.30	70.30	70.30	88.89%	9.00%	97.89%	48.95%	
17	47	36.10%	34	68	50.00%	45	76	59.20%	54.00	24.00	78.00	78.00	75.00%	53.33%	128.33%	54.17%	
32	47	68.00%	50	68	73.50%	35	76	46.00%	60.00	19.50	79.50	79.50	70.56%	27.06%	97.62%	55.21%	
28	47	59.50%	45	68	66.10%	38	76	50.00%	60.00	22.00	82.00	82.00	83.33%	30.56%	113.89%	56.94%	
19	47	40.40%	28	68	41.10%	50	76	65.70%	68.00	33.00	101.00	93.00	83.33%	45.83%	129.17%	64.58%	
1	1	100.00%	7	15	46.60%	9	17	52.90%	18.00	6.00	24.00	24.00	100.00%	33.33%	133.33%	66.67%	
6	13	46.10%	17	68	25.00%	17	78	21.70%	36.50		36.50	36.50	50.69%	0.00%	50.69%	25.35%	
10	13	76.90%	32	68	47.00%	29	78	37.10%	46.00	3.00	49.00	49.00	63.89%	4.17%	68.06%	34.03%	
8	13	61.50%	43	68	63.20%	32	78	41.1%	53.00	5.00	58.00	58.00	73.61%	6.94%	80.56%	40.28%	
11	88	12.50%	25	145	17.20%	9	52	17.30%	21.00		21.00	21.00	29.17%	0.00%	29.17%	14.58%	
14	88	15.90%	25	145	17.20%	10	52	19.20%	24.00	1.00	25.00	24.00	33.33%	0.00%	33.33%	16.67%	
40	88	45.40%	65	145	44.80%	10	52	19.20%	23.00		23.00	24.00	33.34%	1.39%	34.73%	17.37%	
11	88	12.50%	15	145	10.30%	11	52	21.10%	25.00		25.00	25.00	27.78%	0.00%	27.78%	13.89%	
27	88	30.60%	34	145	23.40%	15	52	28.80%	31.00		31.00	31.00	43.06%	0.00%	43.06%	21.53%	
11	88	12.50%	23	145	15.80%	19	52	36.50%	41.00	1.00	42.00	42.00	56.94%	1.39%	58.33%	29.17%	
18	88	20.40%	30	145	20.60%	19	52	36.50%	42.00		42.00	42.00	58.33%	0.00%	58.33%	29.17%	

2016 Volunteer Master Attendance Report

Incidents in Response Area				Incidents in District Area				Training by Curriculum Topic			Training by Payroll Hours			Training by Payroll Hours Attended			Training by Payroll Hours Attended		
Attended	Total	Percentage		Attended	Total	Percentage		Attended	Total	Percentage	Paid Training Attended	Unpaid Training Attended	Total Attended	Total Offered	Percentage Paid Training	Percentage Unpaid Training	Percentage Total Training		
34	88	38.60%	53	145	36.50%	19	52	36.50%	42.00	42.00	42.00	42.00	42.00	42.00	58.33%	0.00%	29.17%		
24	88	27.20%	37	145	25.50%	25	52	48.00%	49.00	1.00	50.00	50.00	50.00	50.00	66.00%	1.39%	34.72%		
57	88	64.70%	87	145	60.00%	25	52	48.00%	52.00	2.00	54.00	54.00	54.00	54.00	72.22%	2.78%	37.50%		
41	88	46.50%	66	145	45.50%	27	52	51.90%	54.00	5.00	59.00	59.00	59.00	59.00	75.00%	6.94%	40.97%		
39	88	44.30%	62	145	42.70%	28	52	53.80%	56.00	4.00	60.00	60.00	60.00	60.00	77.76%	5.56%	41.67%		
30	88	34.00%	46	145	31.70%	30	52	57.60%	63.00	1.00	64.00	64.00	64.00	64.00	87.50%	1.39%	44.44%		
50	88	56.80%	89	145	61.30%	32	52	61.50%	65.00	1.00	66.00	66.00	66.00	66.00	90.26%	1.39%	45.83%		
20	88	22.70%	33	145	22.00%	33	52	63.40%	64.00	5.00	69.00	69.00	69.00	69.00	88.69%	6.94%	47.92%		
51	88	57.90%	98	145	67.50%	38	52	73.00%	70.00	5.00	75.00	75.00	75.00	75.00	97.22%	6.94%	52.06%		
33	88	37.50%	72	145	49.60%	29	52	55.70%	74.00	10.00	84.00	84.00	84.00	84.00	102.78%	13.89%	58.33%		
76	88	86.30%	122	145	84.10%	42	52	80.70%	74.00		74.00	91.00	91.00	91.00	102.78%	23.61%	63.19%		
10	125	8.00%	13	130	9.60%	6	68	8.60%	16.00		16.00	16.00	16.00	16.00	22.22%	0.00%	11.11%		
6	125	4.80%	7	130	5.40%	10	68	14.70%	18.00		18.00	18.00	18.00	18.00	25.00%	0.00%	12.50%		
21	125	16.80%	35	130	26.90%	23	68	33.80%	21.00	3.00	24.00	24.00	24.00	24.00	29.17%	4.17%	16.67%		
33	125	26.40%	59	130	45.40%	10	68	14.70%	27.00	2.00	29.00	29.00	29.00	29.00	37.50%	2.78%	20.16%		
9	125	7.20%	12	130	9.30%	16	68	23.50%	30.00	2.00	32.00	32.00	32.00	32.00	41.67%	2.78%	22.22%		
14	125	11.20%	23	130	17.70%	17	68	25.00%	32.50	2.00	34.50	34.50	34.50	34.50	45.14%	2.78%	23.96%		
44	125	35.20%	67	130	51.50%	20	68	29.40%	41.00	0.50	41.50	41.50	41.50	41.50	56.94%	0.69%	28.62%		
28	125	22.40%	49	130	37.70%	22	68	32.30%	46.00		46.00	46.00	46.00	46.00	65.69%	0.00%	31.94%		
64	125	51.20%	92	130	70.80%	19	68	27.90%	37.00	9.00	46.00	46.00	46.00	46.00	51.39%	12.50%	31.94%		
19	125	15.20%	42	130	32.30%	19	68	27.90%	44.00	3.00	47.00	47.00	47.00	47.00	61.11%	1.39%	32.64%		
39	125	31.20%	59	130	45.40%	25	68	36.70%	57.50	1.00	58.50	58.50	58.50	58.50	79.86%	1.39%	40.63%		
27	125	21.60%	47	130	24.70%	27	68	39.70%	57.50	7.50	65.00	65.00	65.00	65.00	83.33%	10.42%	45.14%		
34	125	27.20%	50	130	38.50%	30	68	44.10%	60.00	6.50	66.50	66.50	66.50	66.50	90.3%	9.03%	46.18%		
25	125	20.00%	36	130	27.70%	30	68	44.10%	58.00	12.00	70.00	70.00	70.00	70.00	80.56%	16.06%	48.61%		
80	125	64.00%	115	130	88.50%	33	68	48.50%	59.00	13.00	72.00	72.00	72.00	72.00	81.94%	18.06%	50.00%		
78	125	62.40%	144	130	110.80%	32	68	47.00%	64.00	8.50	72.50	72.50	72.50	72.50	88.69%	11.81%	50.35%		
71	125	56.80%	99	130	76.20%	37	68	54.40%	69.00	10.00	79.00	79.00	79.00	79.00	95.83%	13.89%	54.86%		
20	125	16.00%	110	130	84.60%	39	68	57.30%	69.00	11.00	80.00	80.00	80.00	80.00	95.83%	15.28%	55.56%		
74	125	59.20%	113	130	87.00%	34	68	50.00%	65.00	17.00	82.00	82.00	82.00	82.00	90.28%	23.61%	56.94%		
53	125	42.40%	80	130	61.50%	40	68	58.80%	68.00	16.50	84.50	84.50	84.50	84.50	94.44%	22.92%	58.68%		
63	125	50.40%	86	130	65.40%	36	68	52.90%	65.00	19.50	84.50	84.50	84.50	84.50	90.28%	27.06%	58.68%		
72	125	57.60%	103	130	79.20%	42	68	61.70%	72.00	14.00	86.00	86.00	86.00	86.00	100.00%	19.44%	59.22%		
10	108	9.20%	12	146	8.20%	7	59	11.80%	21.00		21.00	21.00	21.00	21.00	29.17%	0.00%	14.58%		
16	108	14.80%	29	146	19.80%	14	59	23.70%	38.50		38.50	38.50	38.50	38.50	53.47%	0.00%	26.74%		
10	108	9.20%	14	146	9.50%	16	59	27.10%	44.00	8.50	42.50	42.50	42.50	42.50	47.22%	11.81%	29.51%		
48	108	44.40%	61	146	41.70%	15	59	25.40%	41.00		41.00	44.00	44.00	44.00	61.11%	0.00%	30.56%		
7	108	6.40%	13	146	8.90%	20	59	33.80%	48.00		48.00	49.00	49.00	49.00	66.67%	1.39%	34.03%		
16	108	14.80%	29	146	19.80%	20	59	33.80%	51.00	6.50	57.50	57.50	57.50	57.50	70.83%	9.03%	39.93%		
25	108	23.10%	40	146	27.30%	21	59	35.50%	60.00		60.00	60.00	60.00	60.00	83.33%	0.00%	41.67%		
12	108	11.10%	18	146	12.30%	21	59	35.50%	60.00	4.50	64.50	64.50	64.50	64.50	85.33%	6.25%	44.79%		
19	108	17.50%	28	146	19.10%	24	59	40.60%	61.50	9.50	71.00	71.00	71.00	71.00	85.42%	13.19%	49.31%		
57	108	52.70%	78	146	53.40%	32	59	54.20%	57.00	20.00	77.00	77.00	77.00	77.00	79.17%	27.78%	53.47%		
103	108	95.30%	132	146	90.40%	52	59	88.10%	66.00	68.50	134.50	134.50	134.50	134.50	91.67%	95.14%	93.40%		
1	1	100.00%	8	81	9.80%	2	68	2.90%	9.00		9.00	9.00	9.00	9.00	12.50%	0.00%	6.25%		
0	1	0.00%	1	81	1.20%	5	68	7.30%	15.00	3.00	18.00	18.00	18.00	18.00	20.83%	4.17%	12.50%		
0	1	0.00%	2	81	2.40%	3	68	4.40%	19.00		19.00	19.00	19.00	19.00	26.39%	0.00%	13.19%		
0	1	0.00%	2	81	2.40%	6	68	8.80%	21.00	3.00	24.00	24.00	24.00	24.00	29.17%	4.17%	16.67%		
0	1	0.00%	4	81	4.90%	9	68	13.20%	33.00		33.00	33.00	33.00	33.00	45.83%	0.00%	22.92%		
1	1	100.00%	6	81	7.40%	5	68	7.90%	36.00		36.00	36.00	36.00	36.00	50.00%	0.00%	25.00%		
0	1	0.00%	1	81	1.20%	2	68	2.90%	42.00		42.00	42.00	42.00	42.00	58.33%	0.00%	29.17%		
0	1	0.00%	39	81	48.10%	9	68	13.20%	36.00	6.00	42.00	42.00	42.00	42.00	50.00%	8.33%	29.17%		
0	52	0.00%	0	69	0.00%	0	56	0.00%											
3	52	5.70%	4	69	5.70%	8	56	14.20%	18.00		18.00	18.00	18.00	18.00	25.00%	0.00%	12.50%		
7	52	13.40%	9	69	13.00%	11	56	19.60%	23.00		23.00	23.00	23.00	23.00	31.94%	0.00%	15.97%		
24	52	46.10%	29	69	42.00%	19	56	33.90%	44.50	4.00	48.50	48.50	48.50	48.50	61.81%	5.95%	33.68%		
12	52	23.00%	14	69	20.20%	22	56	39.20%	49.00	5.00	54.00	54.00	54.00	54.00	68.06%	6.94%	37.50%		
32	52	61.50%	38	69	55.00%	24	56	42.80%	50.00	5.00	55.00	55.00	55.00	55.00	72.22%	6.94%	38.19%		
24	52	46.10%	28	69	40.50%	27	56	48.20%	52.00	4.50	56.50	56.50	56.50	56.50	72.22%	6.25%	39.24%		
32	52	61.50%	38	69	55.00%	27	56	48.20%	56.50	1.00	57.50	57.50	57.50	57.50	76.47%	1.39%	39.93%		
11	52	21.10%	14	69	20.20%	28	56	50.00%	56.50	5.00	61.50	61.50	61.50	61.50	78.47%	1.39%	42.71%		
34	52	65.30%	40	69	57.90%	32	56	57.10%	56.00	9.00	65.00	65.00	65.00	65.00	77.78%	12.50%	45.14%		
0	52	0.00%	1	69	1.40%	38	56	67.80%	66.00	1.00	67.00	67.00	67.00	67.00	91.67%	13.89%	52.78%		
49	52	94.20%	61	69	88.40%	51	56	91.00%	73.00	30.50	103.50	103.50	103.50	103.50	42.36%	42.36%	71.88%		
0	28	0.00%	0	54	0.00%	1	46	2.10%	2.00		2.00	2.00	2.00	2.00	2.78%	1.39%	0.00%		
0	6	0.00%	3	12	25.00%	4	12	33.30%	11.00		11.00	11.00	11.00	11.00	61.11%	0.00%	30.56%		
0	28	0.00%	18	54	33.30%	3	46	6.50%	17.00		17.00	17.00	17.00	17.00	23.61%	0.00%	11.81%		
0	6	0.00%	6	12	50.00%	4	12	33.30%	15.00	3.00	18.00	18.00	18.00	18.00	83.33%	16.67%	50.00%		
2	28	7.10%	24	54	44.40%	12	46	26.00%	31.00	1.00	32.00	32.00	32.00	32.00	43.06%	1.93%	22.22%		
2	28	7.10%	13	54	24.00%	10	46	21.70%	35.00	3.00									

2016 Volunteer Master Attendance Report

Incidents in Response Area			Incidents in District Area			Training by Curriculum Topic			Training by Payroll Hours			Training by Payroll Hours Attended			Training by Payroll Hours Attended			Training by Payroll Hours Attended		
Attended	Total	Percentage	Attended	Total	Percentage	Attended	Total	Percentage	Paid Training Attended	Unpaid Training Attended	Total Attended	Paid Training Attended	Unpaid Training Attended	Total Attended	Percentage Paid Training	Percentage Unpaid Training	Percentage Total Training	Percentage Paid Training	Percentage Unpaid Training	Percentage Total Training
2	28	7.10%	6	54	11.10%	14	46	30.40%	42.50	1.00	43.50	42.50	1.00	43.50	59.03%	1.39%	30.21%	59.03%	1.39%	30.21%
1	28	3.50%	16	54	29.60%	15	46	32.60%	46.50		46.50	46.50		46.50	64.58%	0.00%	32.29%	64.58%	0.00%	32.29%
3	28	10.70%	29	54	53.70%	17	46	36.30%	59.50	10.50	59.50	59.50	10.50	59.50	68.06%	14.58%	41.32%	68.06%	14.58%	41.32%
3	28	10.70%	27	54	50.00%	20	46	43.40%	60.00	7.00	69.00	69.00	7.00	69.00	86.11%	9.72%	47.92%	86.11%	9.72%	47.92%
1	28	3.50%	14	54	25.90%	21	46	45.60%	68.00		68.00	68.00		68.00	94.44%	18.06%	56.25%	94.44%	18.06%	56.25%
13	23	56.50%	15	24	62.50%	6	16	37.50%	12.00	12.00	12.00	12.00	0.50	12.50	66.67%	34.72%	66.67%	66.67%	34.72%	66.67%
12	23	52.10%	14	24	58.30%	6	16	37.50%	14.00	0.50	14.50	14.00	0.50	14.50	77.78%	2.78%	40.28%	77.78%	2.78%	40.28%
25	83	30.10%	28	96	29.10%	14	78	17.90%	24.00	4.00	28.00	28.00		28.00	33.33%	5.56%	19.44%	33.33%	5.56%	19.44%
34	83	40.90%	37	96	38.50%	11	78	14.10%	22.00	7.00	29.00	29.00		29.00	30.56%	20.44%	20.44%	30.56%	20.44%	20.44%
10	83	12.00%	11	96	11.40%	13	78	16.60%	29.50		29.50	29.50		29.50	40.97%	0.00%	20.49%	40.97%	0.00%	20.49%
38	83	45.70%	44	96	45.80%	14	78	17.90%	31.00		31.00	31.00		31.00	43.06%	0.00%	21.53%	43.06%	0.00%	21.53%
22	83	26.50%	24	96	25.00%	18	78	23.00%	35.00		35.00	35.00		35.00	48.61%	0.00%	24.31%	48.61%	0.00%	24.31%
17	83	20.60%	25	96	26.00%	15	78	19.20%	41.00	2.00	43.00	43.00		43.00	56.94%	2.78%	29.86%	56.94%	2.78%	29.86%
20	83	24.00%	28	96	29.10%	22	78	28.20%	37.50	9.00	46.50	46.50		46.50	52.08%	12.50%	32.29%	52.08%	12.50%	32.29%
62	83	74.60%	74	96	77.00%	28	78	35.80%	54.50	8.50	63.00	63.00		63.00	75.65%	11.81%	48.75%	75.65%	11.81%	48.75%
30	83	36.10%	36	96	37.50%	28	78	35.80%	49.50	15.00	64.50	64.50		64.50	68.75%	20.83%	44.79%	68.75%	20.83%	44.79%
66	83	79.50%	77	96	80.20%	40	78	51.20%	61.00	23.00	84.00	84.00		84.00	84.72%	31.94%	58.33%	84.72%	31.94%	58.33%
44	83	53.00%	55	96	57.20%	32	78	41.00%	55.50	30.00	85.50	85.50		85.50	77.08%	41.67%	59.38%	77.08%	41.67%	59.38%
0	9	0.00%	3	19	15.70%	2	11	18.10%	6.00		6.00	6.00		6.00	33.33%	0.00%	16.67%	33.33%	0.00%	16.67%
1	9	11.10%	4	19	21.00%	3	11	27.20%	13.00		13.00	13.00		13.00	72.22%	0.00%	36.11%	72.22%	0.00%	36.11%
1	9	11.10%	4	19	21.00%	5	11	45.40%	17.00		17.00	17.00		17.00	23.61%	11.81%	20.14%	23.61%	11.81%	20.14%
4	29	13.70%	17	84	20.20%	15	41	36.50%	26.00	3.00	29.00	29.00		29.00	40.28%	0.00%	20.14%	40.28%	0.00%	20.14%
4	29	13.70%	24	84	28.50%	14	41	34.10%	29.00		29.00	29.00		29.00	43.06%	0.00%	21.53%	43.06%	0.00%	21.53%
4	29	13.70%	11	84	13.00%	9	41	21.90%	31.00		31.00	31.00		31.00	32.00	1.39%	22.22%	32.00	1.39%	22.22%
4	29	13.70%	31	84	36.90%	9	41	21.90%	52.00	1.00	53.00	53.00		53.00	58.33%	15.28%	50.00%	58.33%	15.28%	50.00%
2	29	6.60%	21	84	25.00%	14	41	34.10%	31.00		31.00	31.00		31.00	72.22%	0.00%	36.11%	72.22%	0.00%	36.11%
4	29	13.70%	40	84	47.60%	19	41	46.30%	42.00	11.00	53.00	53.00		53.00	77.78%	22.22%	50.00%	77.78%	22.22%	50.00%
7	29	24.10%	39	84	46.40%	25	41	60.90%	56.00	16.00	72.00	72.00		72.00	73.61%	29.17%	54.17%	73.61%	29.17%	54.17%
4	29	13.70%	28	84	33.30%	22	41	53.60%	53.00	21.00	74.00	74.00		74.00	81.94%	25.00%	54.66%	81.94%	25.00%	54.66%
6	29	20.60%	52	84	61.90%	29	41	70.70%	59.00	19.00	78.00	78.00		78.00	84.72%	20.00%	54.66%	84.72%	20.00%	54.66%
4	29	13.70%	20	84	23.80%	23	41	70.70%	61.00	18.00	79.00	79.00		79.00	79.17%	30.56%	54.66%	79.17%	30.56%	54.66%
6	29	20.60%	37	84	44.00%	31	41	75.60%	57.00	22.00	79.00	79.00		79.00	84.44%	0.00%	47.22%	84.44%	0.00%	47.22%
6	17	35.20%	37	84	44.00%	30	14	71.40%	17.00		17.00	17.00		17.00	105.36%	22.22%	63.89%	105.36%	22.22%	63.89%
10	17	58.80%	11	20	55.00%	12	14	85.70%	19.00	4.00	23.00	23.00		23.00	30.56%	2.08%	16.22%	30.56%	2.08%	16.22%
0	45	0.00%	2	60	3.30%	12	59	20.30%	22.00	1.50	23.50	23.50		23.50	44.44%	1.39%	22.92%	44.44%	1.39%	22.92%
16	45	35.50%	8	60	13.30%	14	59	23.70%	33.00	1.00	34.00	34.00		34.00	56.94%	0.00%	28.47%	56.94%	0.00%	28.47%
16	45	35.50%	21	60	35.00%	20	59	33.80%	41.00		41.00	41.00		41.00	61.94%	8.53%	43.75%	61.94%	8.53%	43.75%
20	45	44.40%	23	60	38.30%	34	59	57.60%	59.00	4.00	63.00	63.00		63.00	81.94%	5.35%	47.75%	81.94%	5.35%	47.75%
6	45	13.30%	7	60	11.60%	36	59	61.00%	62.00	6.00	68.00	68.00		68.00	88.89%	6.84%	47.92%	88.89%	6.84%	47.92%
13	45	29.30%	23	60	38.30%	34	59	57.60%	64.00	5.00	69.00	69.00		69.00	88.89%	6.84%	47.92%	88.89%	6.84%	47.92%
24	45	53.30%	29	60	48.30%	34	59	57.60%	71.00	10.00	81.00	81.00		81.00	87.72%	13.89%	49.31%	87.72%	13.89%	49.31%
25	45	55.50%	27	60	45.00%	37	59	62.70%	62.00	9.50	71.50	71.50		71.50	86.11%	13.19%	49.65%	86.11%	13.19%	49.65%
29	45	64.00%	35	60	58.30%	40	59	67.70%	69.00	3.00	72.00	72.00		72.00	95.83%	4.17%	50.00%	95.83%	4.17%	50.00%
20	45	44.40%	23	60	38.30%	38	59	64.40%	61.00	12.50	73.50	73.50		73.50	84.72%	17.36%	51.04%	84.72%	17.36%	51.04%
21	45	46.60%	29	60	48.30%	40	59	67.70%	67.00	7.00	74.00	74.00		74.00	93.06%	9.72%	51.39%	93.06%	9.72%	51.39%
27	45	60.00%	29	60	48.30%	38	59	64.40%	66.00	8.50	74.50	74.50		74.50	91.67%	11.81%	51.74%	91.67%	11.81%	51.74%
30	45	66.60%	34	60	56.60%	45	59	76.20%	68.00	17.50	85.50	85.50		85.50	94.44%	24.31%	59.38%	94.44%	24.31%	59.38%
20	45	44.40%	21	60	35.00%	47	59	79.60%	72.00	16.00	88.00	88.00		88.00	100.00%	22.22%	61.11%	100.00%	22.22%	61.11%
0	31	0.00%	0	32	0.00%	2	18	11.10%	6.00		6.00	6.00		6.00	33.33%	0.00%	16.67%	33.33%	0.00%	16.67%
3	31	9.60%	3	32	9.30%	6	18	33.30%	15.00		15.00	15.00		15.00	63.33%	0.00%	41.67%	63.33%	0.00%	41.67%
9	31	29.00%	11	32	34.30%	8	18	44.40%	15.00	3.00	18.00	18.00		18.00	83.33%	16.67%	50.00%	83.33%	16.67%	50.00%
9	31	29.00%	10	32	31.20%	11	18	61.10%	21.00	6.00	27.00	27.00		27.00	116.67%	33.33%	75.00%	116.67%	33.33%	75.00%
17	118	14.40%	17	137	12.40%	16	73	21.90%	37.00		37.00	37.00		37.00	51.59%	0.00%	25.69%	51.59%	0.00%	25.69%
20	118	16.90%	25	137	18.20%	15	73	20.50%	37.00		37.00	37.00		37.00	51.59%	0.00%	25.69%	51.59%	0.00%	25.69%
4	118	3.30%	7	137	5.10%	8	73	10.90%	24.00	14.00	38.00	38.00		38.00	55.56%	19.44%	26.99%	55.56%	19.44%	26.99%
15	118	12.60%	21	137	15.30%	19	73	26.00%	40.00	6.00	46.00	46.00		46.00	66.67%	2.78%	48.61%	66.67%	2.78%	48.61%
25	118	21.10%	32	137	23.30%	22	73	30.10%	51.00		51.00	51.00		51.00	70.83%	0.00%	35.42%	70.83%	0.00%	35.42%
37	118	31.30%	42	137	30.60%	26	73	35.60%	48.00	16.00	64.00	64.00		64.00	66.67%	22.22%	44.44%	66.67%	22.22%	44.44%
23	118	19.40%	29	137	21.10%	28	73	38.30%	68.00	2.00	70.00	70.00		70.00	94.44%	0.00%	48.61%	94.44%	0.00%	48.61%
66	118	55.90%	75	137	54.70%	30	73	41.00%	70.50		70.50	70.50		70.50	97.92%	0.00%	48.86%	97.92%	0.00%	48.86%
38	118	32.20%	43	137	31.30%	31	73	42.40%	65.00	10.00	75.00	75.00		75.00	90.28%	13.89%	52.08%	90.28%	13.89%	52.08%
74	118	62.60%	84	137	61.30%	31	73	42.40%	75.00	14.50	89.50	89.50		89.50	100.00%	20.14%	69.10%	100.00%	20.14%	69.10%
63	118	53.30%	71	137	51.80%	37	73	50.60%	72.00	27.50	99.50	99.50		99.50	100.00%	45.83%	72.92%	100.00%	45.83%	72.92%
5	118	50.00%	68	137	49.60%	46	73	63.00%	105.00		105									

2016 Volunteer Master Attendance Report

Incidents in Response Area			Incidents in District Area			Training by Curriculum Topic			Training by Payroll Hours			Training by Payroll Hours Attended			Training by Payroll Hours Attended			Training by Payroll Hours Attended		
Attended	Total	Percentage	Attended	Total	Percentage	Attended	Total	Percentage	Paid Training Attended	Unpaid Training Attended	Total Attended	Paid Training Attended	Unpaid Training Attended	Total Attended	Percentage Paid Training	Percentage Unpaid Training	Total	Percentage Paid Training	Percentage Unpaid Training	Total
5	11	45.45%	33	49	67.32%	26	43	60.40%	59.00		59.00	59.00		59.00	81.94%	0.00%	59.00	81.94%	0.00%	40.97%
4	11	36.36%	14	49	28.50%	26	43	60.40%	56.50	6.00	62.50	62.50	6.00	68.50	78.47%	8.33%	62.50	78.47%	8.33%	43.40%
5	11	45.45%	25	49	51.00%	24	43	55.80%	59.50	3.00	62.50	59.50	3.00	62.50	82.64%	4.17%	62.50	82.64%	4.17%	43.40%
4	11	36.36%	22	49	44.80%	28	43	65.10%	66.50		66.50	66.50		66.50	92.36%	0.00%	66.50	92.36%	0.00%	46.18%
6	11	54.55%	37	49	75.50%	32	43	74.40%	68.00		68.00	68.00		68.00	94.44%	0.00%	68.00	94.44%	0.00%	47.22%
7	11	63.64%	40	49	81.63%	28	43	65.10%	65.50	6.00	71.50	65.50	6.00	71.50	90.97%	8.33%	71.50	90.97%	8.33%	49.65%
0	2	0.00%	0	1	0.00%	5	8	62.50%	15.00		15.00	15.00		15.00	83.33%	0.00%	15.00	83.33%	0.00%	41.67%
4	15	26.67%	5	15	33.33%	13	26	50.00%	36.00	3.00	39.00	36.00	3.00	39.00	50.00%	4.17%	39.00	50.00%	4.17%	27.08%
9	15	60.00%	9	15	60.00%	12	26	46.10%	42.00		42.00	42.00		42.00	58.33%	0.00%	42.00	58.33%	0.00%	29.17%
5	15	33.33%	5	15	33.33%	13	26	50.00%	38.50	6.00	44.50	38.50	6.00	44.50	53.47%	8.33%	44.50	53.47%	8.33%	30.90%
1	15	6.67%	1	15	6.67%	14	26	53.80%	42.00	3.00	45.00	42.00	3.00	45.00	58.33%	4.17%	45.00	58.33%	4.17%	31.25%
5	15	33.33%	6	15	40.00%	16	26	61.50%	44.00		44.00	44.00		44.00	61.11%	8.33%	44.00	61.11%	8.33%	34.22%
6	15	40.00%	6	15	40.00%	17	26	65.30%	54.00		54.00	54.00		54.00	75.00%	0.00%	54.00	75.00%	0.00%	37.50%
10	15	66.67%	11	15	73.33%	21	26	80.70%	56.50		56.50	56.50		56.50	78.47%	0.00%	56.50	78.47%	0.00%	39.24%
5	15	33.33%	5	15	33.33%	20	26	76.90%	60.00		60.00	60.00		60.00	83.33%	0.00%	60.00	83.33%	0.00%	41.67%
10	15	66.67%	11	15	73.33%	21	26	80.70%	57.00	6.00	63.00	57.00	6.00	63.00	83.33%	8.33%	63.00	83.33%	8.33%	43.75%
6	15	40.00%	6	15	40.00%	23	26	88.40%	62.50	3.00	65.50	62.50	3.00	65.50	86.81%	4.17%	65.50	86.81%	4.17%	45.49%
0	11	0.00%	0	16	0.00%	3	7	42.80%	9.00		9.00	9.00		9.00	50.00%	0.00%	9.00	50.00%	0.00%	25.00%
7	43	16.28%	10	57	17.50%	4	28	14.20%	12.00		12.00	12.00		12.00	16.67%	0.00%	12.00	16.67%	0.00%	8.33%
3	43	6.98%	3	57	5.20%	6	28	21.40%	18.00		18.00	18.00		18.00	25.00%	0.00%	18.00	25.00%	0.00%	12.50%
4	11	36.36%	5	16	31.20%	6	7	85.70%	18.00		18.00	18.00		18.00	25.00%	0.00%	18.00	25.00%	0.00%	12.50%
15	43	34.88%	18	57	31.50%	12	28	42.80%	35.00		35.00	35.00		35.00	48.61%	0.00%	35.00	48.61%	0.00%	24.31%
13	43	30.23%	19	57	33.30%	16	28	57.10%	51.00		51.00	51.00		51.00	70.83%	0.00%	51.00	70.83%	0.00%	35.42%
10	43	23.26%	14	57	24.50%	18	28	64.20%	51.00	5.00	56.00	56.00	5.00	61.00	70.83%	6.94%	56.00	70.83%	6.94%	38.89%
21	43	48.80%	28	57	49.10%	18	28	64.20%	57.00		57.00	57.00		57.00	73.17%	0.00%	57.00	73.17%	0.00%	39.58%
16	43	37.20%	20	57	35.00%	21	28	75.00%	60.00	3.00	63.00	60.00	3.00	63.00	83.33%	4.17%	63.00	83.33%	4.17%	43.75%
26	43	60.40%	33	57	57.80%	21	28	75.00%	66.00		66.00	66.00		66.00	91.67%	4.17%	66.00	91.67%	4.17%	47.92%
12	43	27.90%	17	57	29.80%	23	28	82.10%	66.00	6.00	72.00	66.00	6.00	72.00	91.67%	8.33%	72.00	91.67%	8.33%	50.00%
39	43	90.60%	49	57	85.90%	23	28	82.10%	69.00	3.00	72.00	69.00	3.00	72.00	95.83%	4.17%	72.00	95.83%	4.17%	50.00%
25	43	58.10%	32	57	56.10%	24	28	85.70%	72.00		72.00	72.00		72.00	100.00%	4.17%	72.00	100.00%	4.17%	52.08%
32	43	74.40%	43	57	75.40%	22	28	78.50%	69.00	6.00	75.00	69.00	6.00	75.00	95.83%	8.33%	75.00	95.83%	8.33%	52.08%
33	43	76.70%	42	57	73.60%	23	28	82.10%	75.00	3.00	78.00	75.00	3.00	78.00	104.17%	4.17%	78.00	104.17%	4.17%	54.17%
39	43	90.60%	50	57	87.70%	24	28	85.70%	72.00	7.00	79.00	72.00	7.00	79.00	100.00%	9.72%	79.00	100.00%	9.72%	54.66%
2	31	6.40%	5	47	10.60%	2	23	8.00%	6.00		6.00	6.00		6.00	8.33%	0.00%	6.00	8.33%	0.00%	4.17%
11	31	35.40%	13	47	27.60%	2	23	8.00%	6.00		6.00	6.00		6.00	8.33%	0.00%	6.00	8.33%	0.00%	4.17%
3	31	9.60%	5	47	10.60%	3	23	12.00%	7.00		7.00	7.00		7.00	9.72%	0.00%	7.00	9.72%	0.00%	4.86%
6	31	19.30%	11	47	23.40%	3	25	12.00%	12.00		12.00	12.00		12.00	16.67%	0.00%	12.00	16.67%	0.00%	8.33%
5	31	16.10%	6	47	12.70%	5	25	20.00%	15.00		15.00	15.00		15.00	20.83%	0.00%	15.00	20.83%	0.00%	10.42%
4	7	57.10%	5	13	38.40%	6	7	85.70%	18.00		18.00	18.00		18.00	100.00%	0.00%	18.00	100.00%	0.00%	50.00%
5	7	71.40%	6	13	46.10%	6	7	85.70%	18.00		18.00	18.00		18.00	100.00%	0.00%	18.00	100.00%	0.00%	50.00%
0	31	0.00%	0	47	0.00%	9	25	36.00%	30.00		30.00	30.00		30.00	41.67%	0.00%	30.00	41.67%	0.00%	20.83%
1	31	3.20%	1	47	2.10%	11	25	44.00%	36.00		36.00	36.00		36.00	50.00%	0.00%	36.00	50.00%	0.00%	25.00%
10	31	32.20%	14	47	29.70%	12	25	48.00%	39.00		39.00	39.00		39.00	54.17%	0.00%	39.00	54.17%	0.00%	27.08%
16	31	51.60%	21	47	44.60%	12	25	48.00%	39.00		39.00	39.00		39.00	62.50%	0.00%	39.00	62.50%	0.00%	31.25%
14	31	45.10%	18	47	38.20%	14	25	56.00%	45.00		45.00	45.00		45.00	62.50%	0.00%	45.00	62.50%	0.00%	31.25%
10	31	32.20%	19	47	40.40%	14	25	56.00%	45.00		45.00	45.00		45.00	62.50%	0.00%	45.00	62.50%	0.00%	31.25%
18	31	58.00%	20	47	42.50%	15	25	60.00%	48.00		48.00	48.00		48.00	66.67%	0.00%	48.00	66.67%	0.00%	33.33%
19	31	61.00%	26	47	55.30%	15	25	60.00%	45.00	3.00	48.00	45.00	3.00	48.00	62.50%	4.17%	48.00	62.50%	4.17%	33.33%
9	31	29.00%	10	47	21.20%	16	25	64.00%	51.00		51.00	51.00		51.00	70.83%	0.00%	51.00	70.83%	0.00%	35.42%
9	31	29.00%	12	47	25.50%	17	25	68.00%	54.00		54.00	54.00		54.00	75.00%	0.00%	54.00	75.00%	0.00%	37.50%
28	31	90.30%	35	47	74.40%	24	25	96.00%	72.00	4.00	76.00	72.00	4.00	76.00	100.00%	5.96%	76.00	100.00%	5.96%	52.78%

Training by Payroll Hours Attended calculates the percentage of paid and total training attended against the paid and total available training hours.
72 paid hours and 144 total hours.

Training by Payroll Hours measures the number of hours a firefighter attended for Paid Training/Unpaid Training and provides a total of those hours

Training by Curriculum Topic measures the number of training topics a firefighter attended against the total number of training topics delivered in their assigned station.

Incidents in District Area measures the number of incidents a firefighter attended in their assigned district against the total number of incidents the station was dispatched to in it's

Incidents in Response Area measures the number of incidents a firefighter attended in their assigned station against the total number of incidents the station was dispatched to in it's

90th Percentile	
Total Training	56.46%
Paid Training	96.11%
Unpaid Training	23.61%
Training Curriculum	77.22%
Incidents in District	62.71%
Incidents in Response Area	64.94%

90th Percentile means 90 percent of all volunteers achieved at / or below the value stated. *For example, if the value is 56.46%, then 90% of all volunteers achieved at / or below 56.46%*

Average	
Total Training	37.31%
Paid Training	66.23%
Unpaid Training	8.83%
Training Curriculum	44.81%
Incidents in District	35.74%
Incidents in Response Area	34.49%

Average is the average for each category . *For example, the average of total training is 37.31%*

Mean Average minus top 5% and bottom 5%	
Total Training	36.80%
Paid Training	66.87%
Unpaid Training	6.92%
Training Curriculum	44.62%
Incidents in District	35.03%
Incidents in Response Area	33.29%

Mean Average minus top 5% and bottom 5% is the average for each category with the lowest 5% and the highest 5% removed when sorted lowest to highest. *For example, out of 260 rows the bottom 13 scoring and the top 13 scoring rows have been removed then the remaining rows averaged*

Attendance 60%	
Attendance	60.00%
Number of VFF's	6.00
Percent of VFF's	2.31%

Attendance 50%	
Attendance	50.00%
Number of VFF's	34.00
Percent of VFF's	13.08%

Attendance 40%	
Attendance	40.00%
Number of VFF's	73.00
Percent of VFF's	28.08%

Attendance 30%	
Attendance	30.00%
Number of VFF's	124.00
Percent of VFF's	47.69%

Attendance 20%	
Attendance	20.00%
Number of VFF's	183.00
Percent of VFF's	70.38%

Attendance % gives the number of volunteer firefighters that achieve the percentage shown in both incident attendance and total training. The percent of total volunteer firefighters this represents is shown as well.

For example, at a 60% attendance requirement, 6 volunteer firefighters meet this threshold and this represents 2.31% of all volunteer firefighters.

Attendance = Productivity

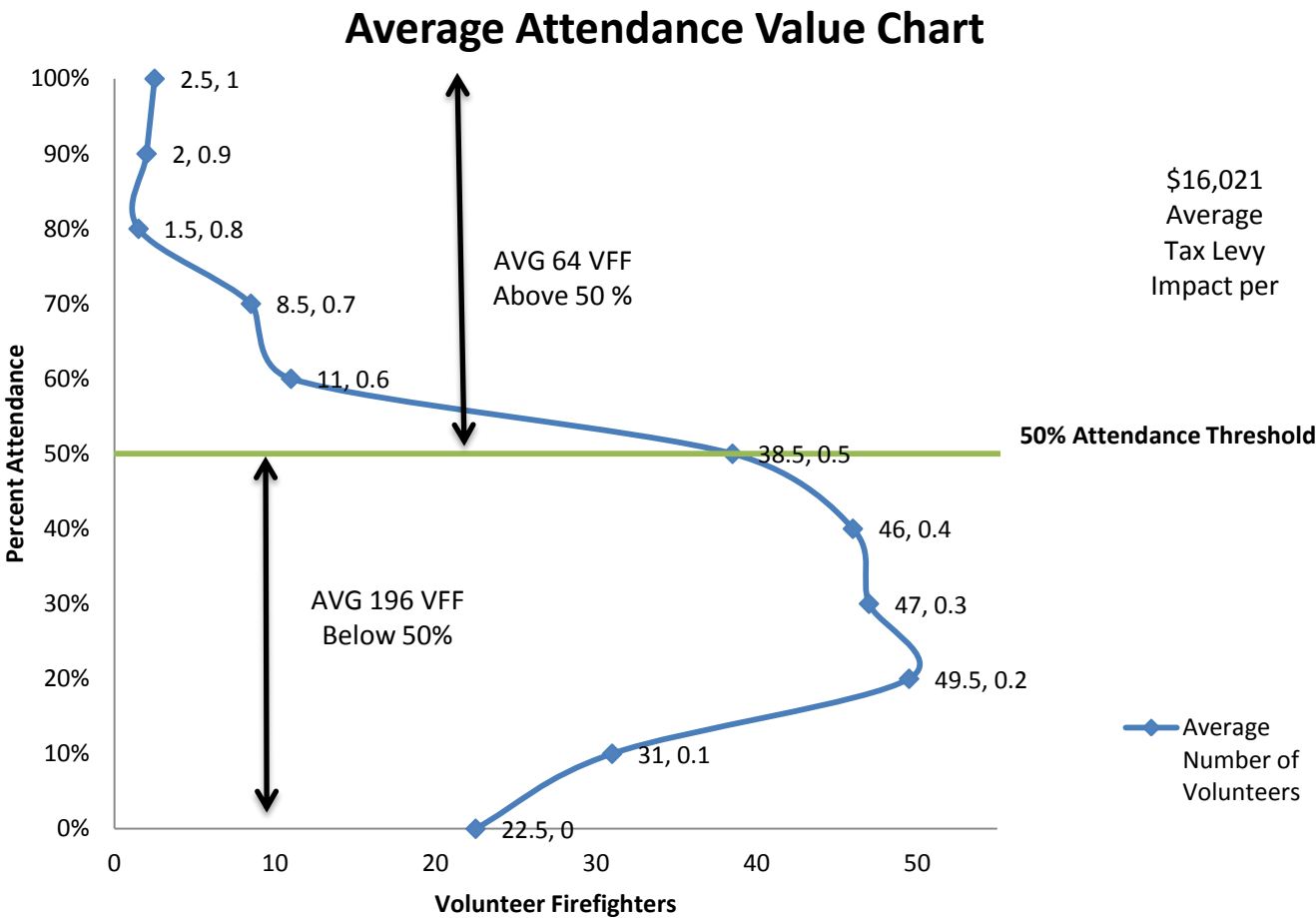
Average Attendance Value Chart is a visual description of Volunteer Firefighter combined average attendance at incidents and training. Shown are the 90% and 60% attendance thresholds and the average number of Volunteer Firefighters (VFF) who achieve at or below the threshold.

Average cost on the tax levy per Volunteer Firefighter is \$16,021. This cost includes all resources such as - wages / equipment / vehicles / stations

For example, at \$16,021
For 350 Volunteer Firefighters the budget is \$5,608,373
For 260 Volunteer Firefighters the actual is \$4,166,240

If 26 VFF's achieve above 60% the cost is \$416,624
If 234 VFF's achieve below 60% the cost of the lost productivity is \$3,749,616

90% Normal Attendance Threshold is calculated as follows [288 working days - (12 paid vacation days + 18 sick days) / 288]



Attendance = Productivity

Average Attendance Value Chart is a visual description of Volunteer Firefighter combined average attendance at incidents and training. Shown are the 90% and 60% attendance thresholds and the average number of Volunteer Firefighters (VFF) who achieve at or below the threshold.

Average cost on the tax levy per Volunteer Firefighter is \$16,021. This cost includes all resources such as - wages / equipment / vehicles / stations

For example, at \$16,021
For 350 Volunteer Firefighters the budget is \$5,608,373
For 260 Volunteer Firefighters the actual is \$4,166,240

If 26 VFF's achieve above 60% the cost is \$416,624
If 234 VFF's achieve below 60% the cost of the lost productivity is \$3,749,616

90% Normal Attendance Threshold is calculated as follows [288 working days - (12 paid vacation days + 18 sick days) / 288]

Additional Annual Cost to Meet Attendance Threshold (per 16FF)

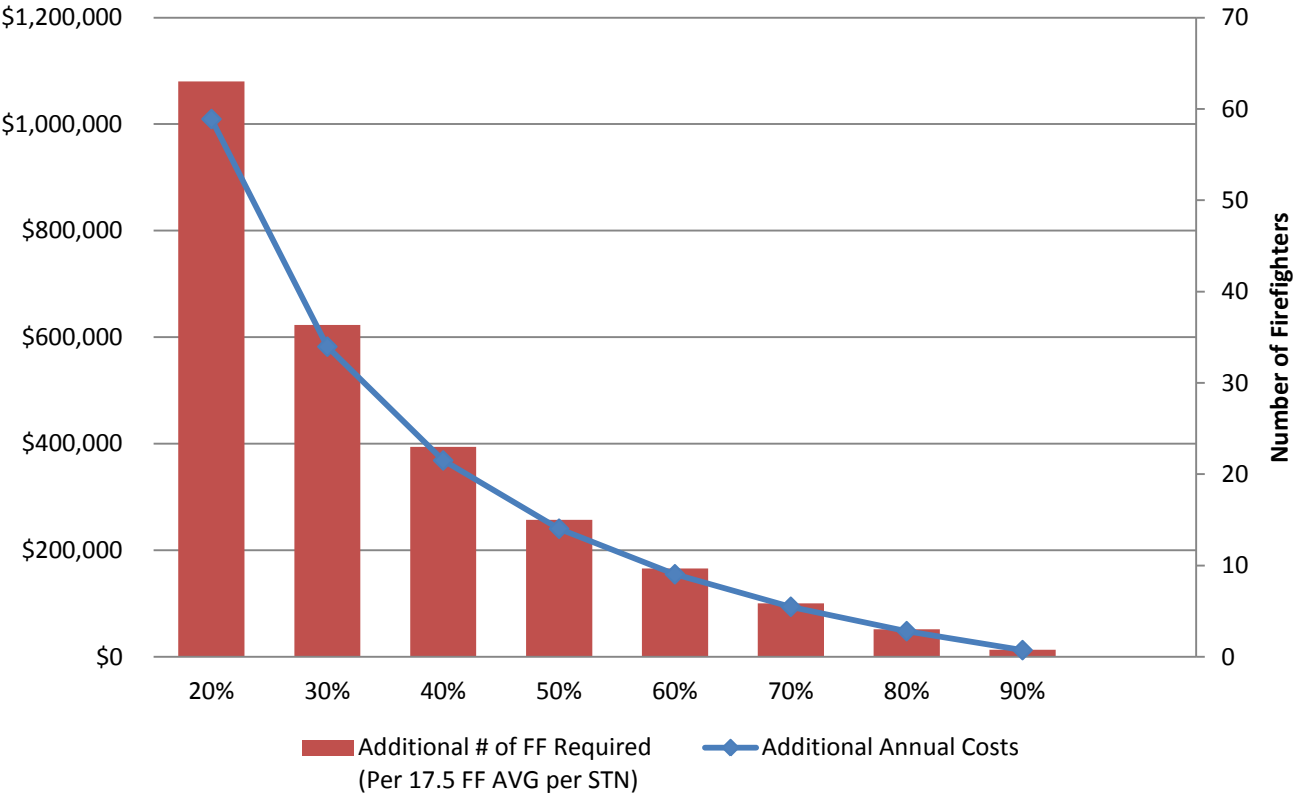
Average Percentage of Attendance (Training & Incidents)	Number of FF needed to meet minimum response capability (per 16 FF)	Additional # of FF Required (per 16 FF)	Total Additional Annual Costs to Meet Attendance Threshold (per 16 FF)	Total Number of Additional Volunteers (all stations)	Total Additional Costs (all stations)	Total Number of Additional Career (all stations)
20	80	64	\$ 1,025,531	1280	\$ 20,510,621	149
30	53	37	\$ 598,226	747	\$ 11,964,529	87
40	40	24	\$ 384,574	480	\$ 7,691,483	56
50	32	16	\$ 256,383	320	\$ 5,127,655	37
60	27	11	\$ 170,922	213	\$ 3,418,437	25
70	23	7	\$ 109,878	137	\$ 2,197,567	16
80	20	4	\$ 64,096	80	\$ 1,281,914	9
90	18	2	\$ 28,487	36	\$ 569,739	4
100	16	0	\$ -	0	\$ -	0

16 - Minimum number of FF needed to meet minimum response capability
\$5,608,373 - Total annual cost for volunteer services
\$16,024 - Average cost per volunteer
20 - Total number of volunteer stations
\$137,198 - Average cost per career firefighters

Additional Annual Costs to Meet Attendance Threshold is a visual description of the additional costs to meet the minimum response requirement of 16 Firefighters per incident.

For example, at a 20% attendance threshold there is \$1,001,495 required to staff 63 additional Volunteer Firefighters in order to achieve a minimum of 16 Firefighters attending at an incident.

*Additional Firefighters Required is calculated as follows [(16 / Average Percent of Attendance) - 17]
17 is the budgeted average number of Volunteer Firefighters per station.*



2016 First Truck Response Times

Fire Beat	Percent response Less than or equal 6 MIN	Percent response Less than or equal 9 MIN	Percent response Greater than 9 MIN	First Arriving Truck Average # FF
1 – Van Horne	62.00%	74.60%	25.40%	4.0
2 – Minnow Lake	71.20%	90.60%	9.40%	4.0
3 – New Sudbury	70.70%	86.90%	13.10%	4.0
4 – Long Lake	63.20%	82.50%	17.50%	4.0
AVERAGE	66.78%	83.65%	16.35%	4.0
5 – Copper Cliff	29.70%	62.90%	37.10%	2.6
6 – Waters	11.00%	36.70%	63.30%	3.4
7 – Lively	28.00%	68.50%	31.50%	3.3
8 – Whitefish	4.10%	14.30%	85.70%	3.1
9 – Beaver Lake	0.00%	12.40%	87.60%	1.4
10 – Azilda	8.90%	45.10%	54.90%	3.3
11 – Chelmsford	12.80%	50.90%	49.10%	4.7
12 – Dowling	26.20%	56.20%	43.80%	2.2
13 – Vermillion	0.00%	0.00%	100.00%	1.4
14 – Levack	14.10%	49.70%	50.30%	3.1
15 – Val Caron	52.30%	77.40%	22.60%	2.3
16 – Val Therese	59.40%	81.50%	18.50%	2.4
17 – Hanmer	38.40%	75.60%	24.40%	2.2
18 – Capreol	28.00%	68.60%	31.40%	2.6
20 – Garson	23.70%	74.00%	26.00%	3.6
21 – Falconbridge	41.60%	83.10%	16.90%	2.6
22 – Skead	23.20%	46.60%	53.40%	1.8
23 – Coniston	38.60%	77.00%	23.00%	3.3
24 – Wahnapiatae	19.90%	63.20%	36.80%	2.8
AVERAGE	24.21%	54.93%	45.07%	2.7

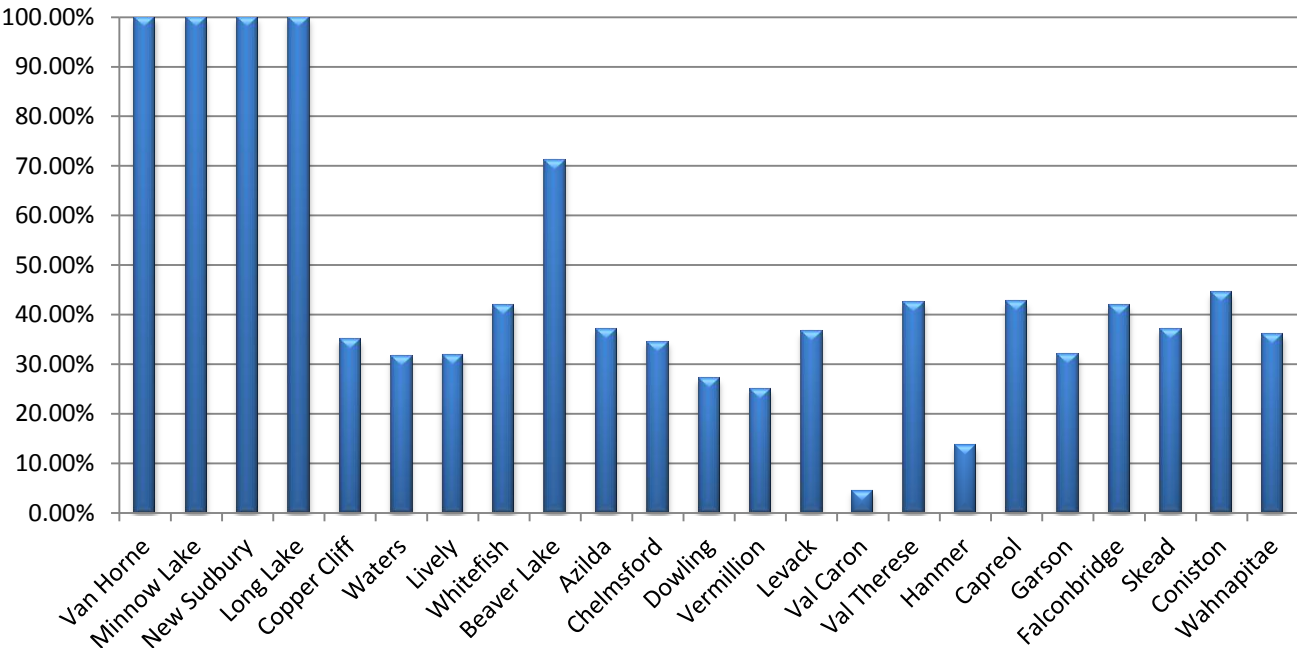
Firefighter Attendance Summary

	Station	# of calls	# of Firefighters	Average Incident Attendance (Station)	Average Incident Attendance (District)	Average Paid Training Attendance	Average Unpaid Training Attendance	Average Overall Training
1	Van Horne*	1569	47	100.00%	100.00%	100.00%	n/a	100.00%
2	Minnow Lake*	377	16	100.00%	100.00%	100.00%	n/a	100.00%
3	New Sudbury*	610	16	100.00%	100.00%	100.00%	n/a	100.00%
4	Long Lake*	590	16	100.00%	100.00%	100.00%	n/a	100.00%
5	Copper Cliff	12	10	34.97%	34.95%	45.14%	4.44%	24.79%
6	Waters	87	18	31.53%	30.88%	63.35%	6.33%	33.68%
7	Lively	64	15	31.67%	35.67%	69.91%	12.87%	41.39%
8	Whitefish	47	15	41.74%	43.66%	71.30%	19.35%	45.32%
9	Beaver Lake	13	4	71.13%	45.45%	72.05%	11.11%	41.58%
10	Azilda	88	18	37.02%	37.54%	67.13%	4.09%	35.61%
11	Chelmsford	125	22	34.47%	34.43%	67.96%	9.97%	38.97%
12	Dowling	108	11	27.14%	28.22%	68.31%	14.96%	41.64%
13	Vermillion	1	8	25.00%	9.68%	36.63%	2.08%	19.36%
14	Levack	52	12	36.49%	33.28%	68.75%	9.34%	39.05%
15	Val Caron	28	11	4.52%	31.55%	57.70%	6.00%	31.85%
16	Val Therese**	385	13	42.42%	44.43%	58.17%	10.95%	34.56%
17	Hanmer	29	14	13.59%	31.31%	58.53%	11.01%	34.77%
18	Capreol	45	16	42.51%	37.68%	82.47%	10.20%	46.33%
20	Garson	118	18	31.97%	32.47%	78.90%	19.95%	49.42%
21	Falconbridge	11	10	41.77%	50.36%	76.53%	2.08%	39.31%
22	Skead	15	11	36.94%	39.37%	69.76%	3.41%	36.58%
23	Coniston	43	16	44.52%	43.35%	71.79%	3.39%	37.59%
24	Wahnapitae	31	18	35.95%	30.18%	53.55%	0.54%	27.04%
Total		4448	355					
Average (all stations)				46.32%	46.72%	71.21%	8.53%	47.78%
Average (volunteer stations)				35.02%	35.50%	65.15%	8.53%	36.78%

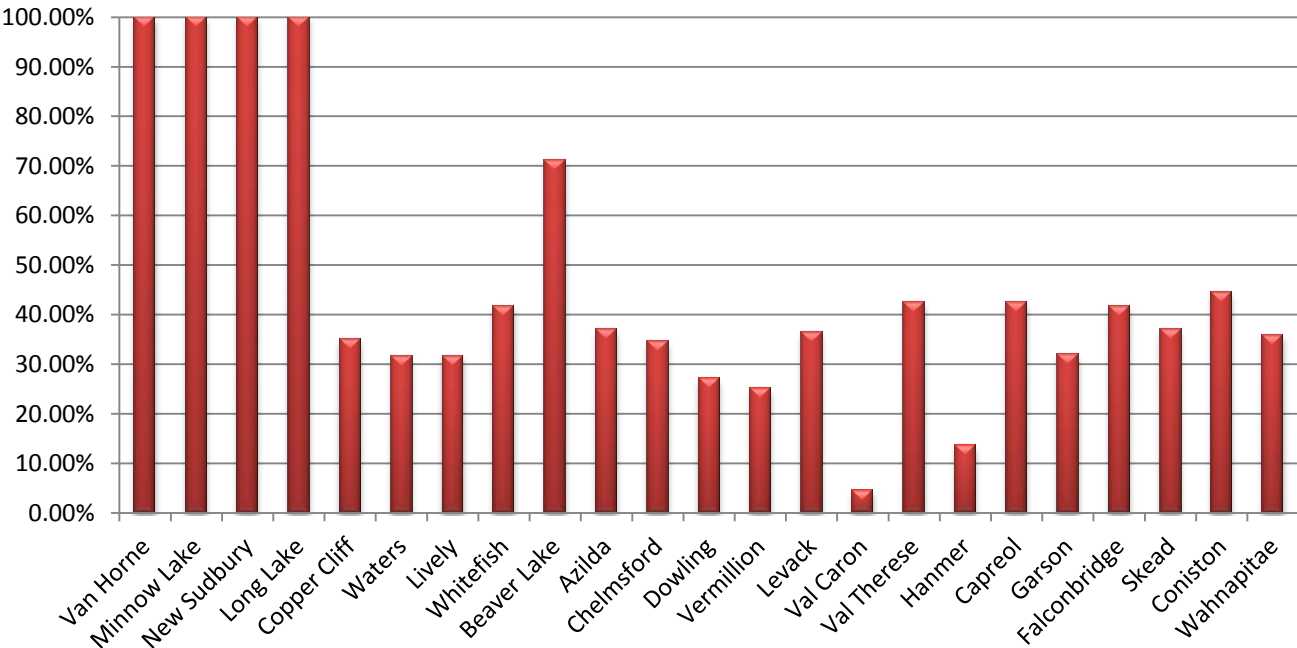
*Career station

** Composite station

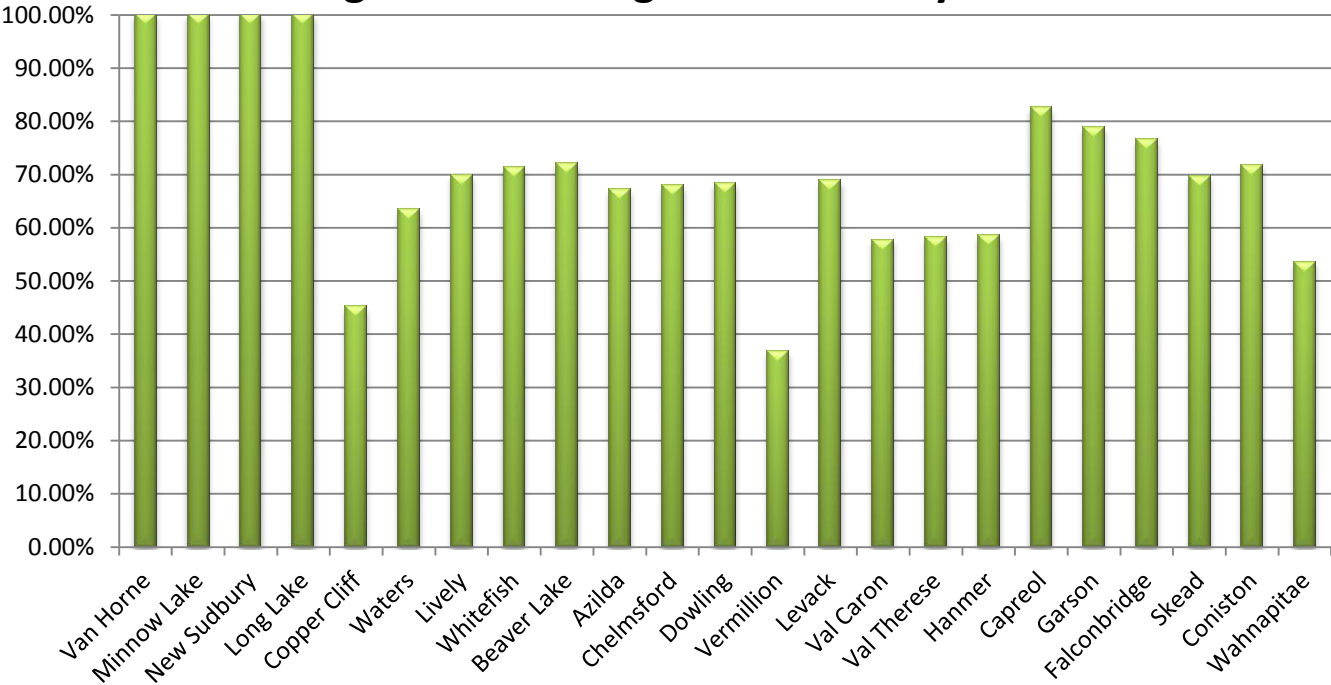
Average Fire Beat Incident Attendance by Station



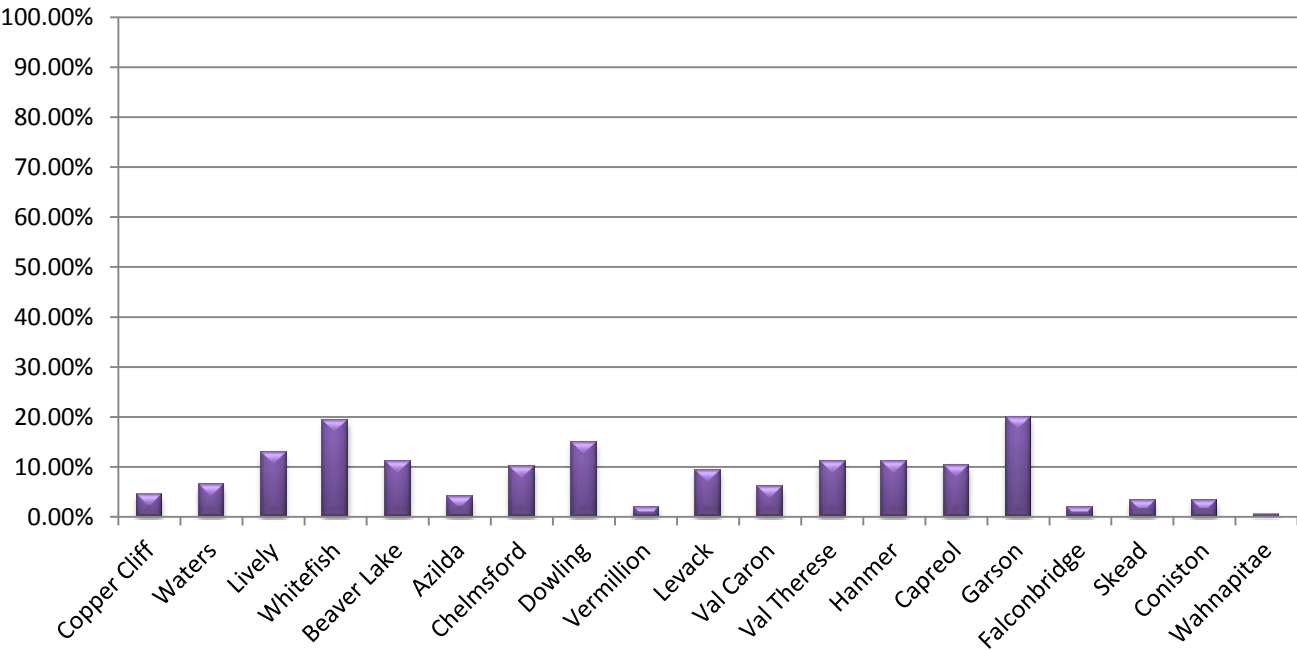
Average District Incident Attendance by Station



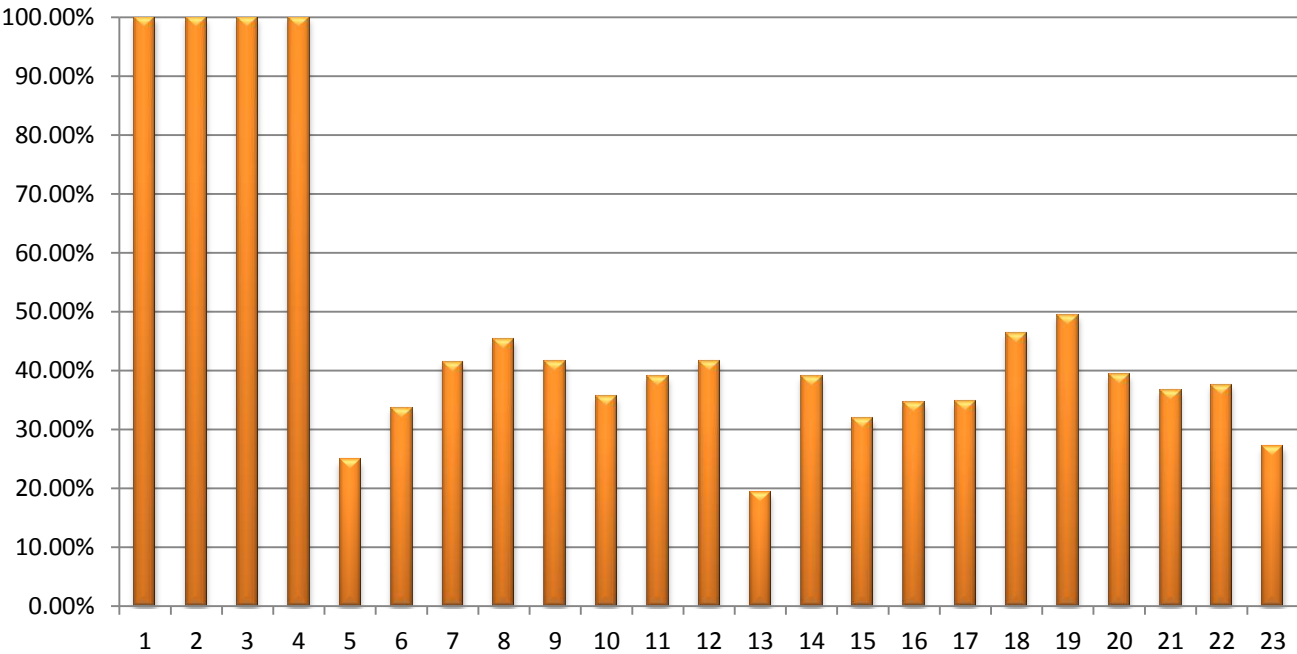
Average Paid Training Attendance by Station



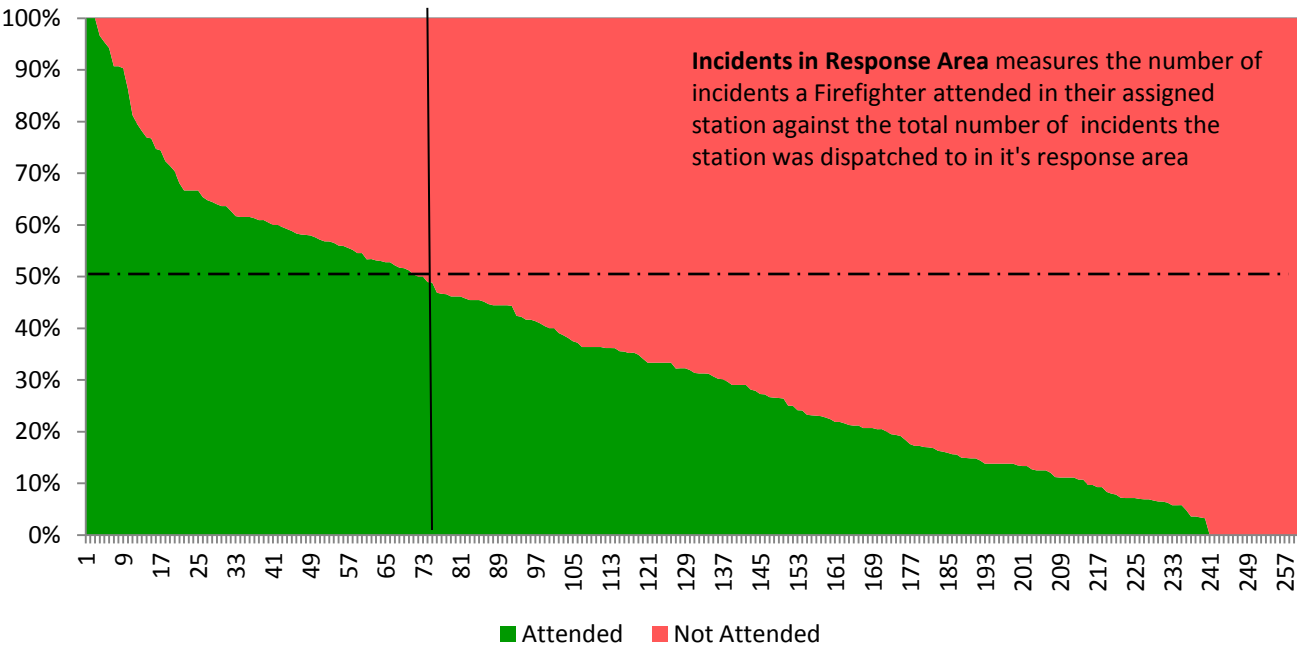
Average Unpaid Training Attendance



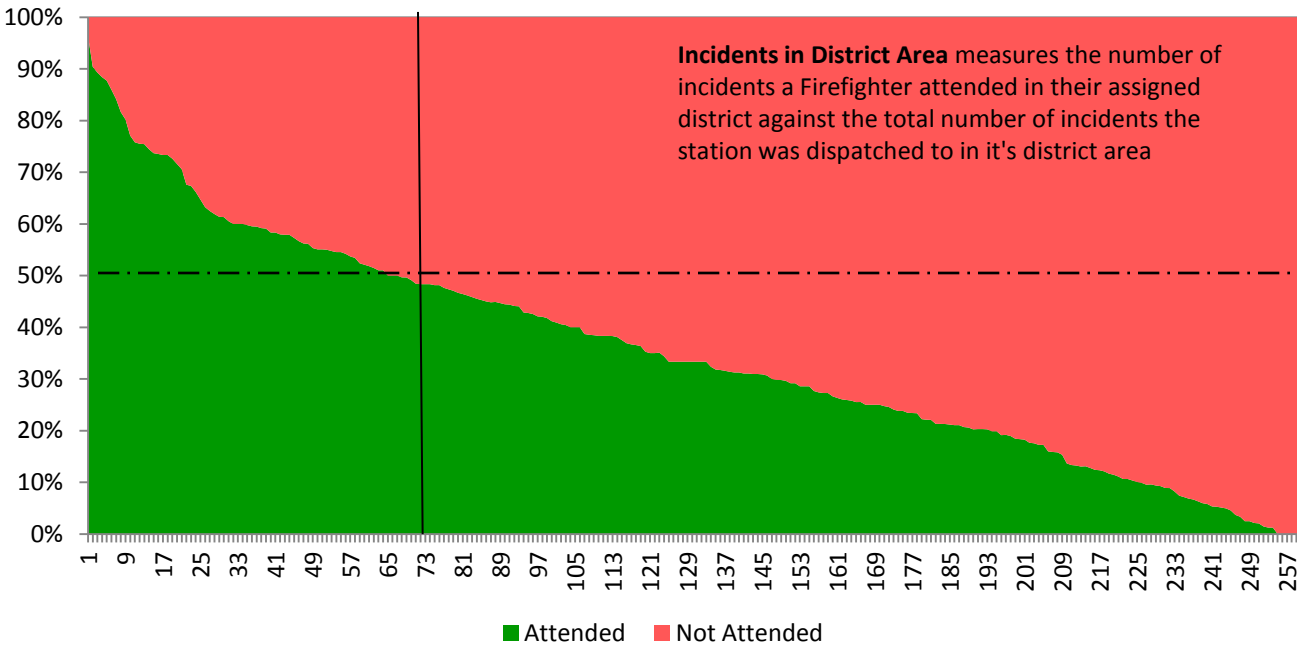
Average Overall Training Attendance by Station



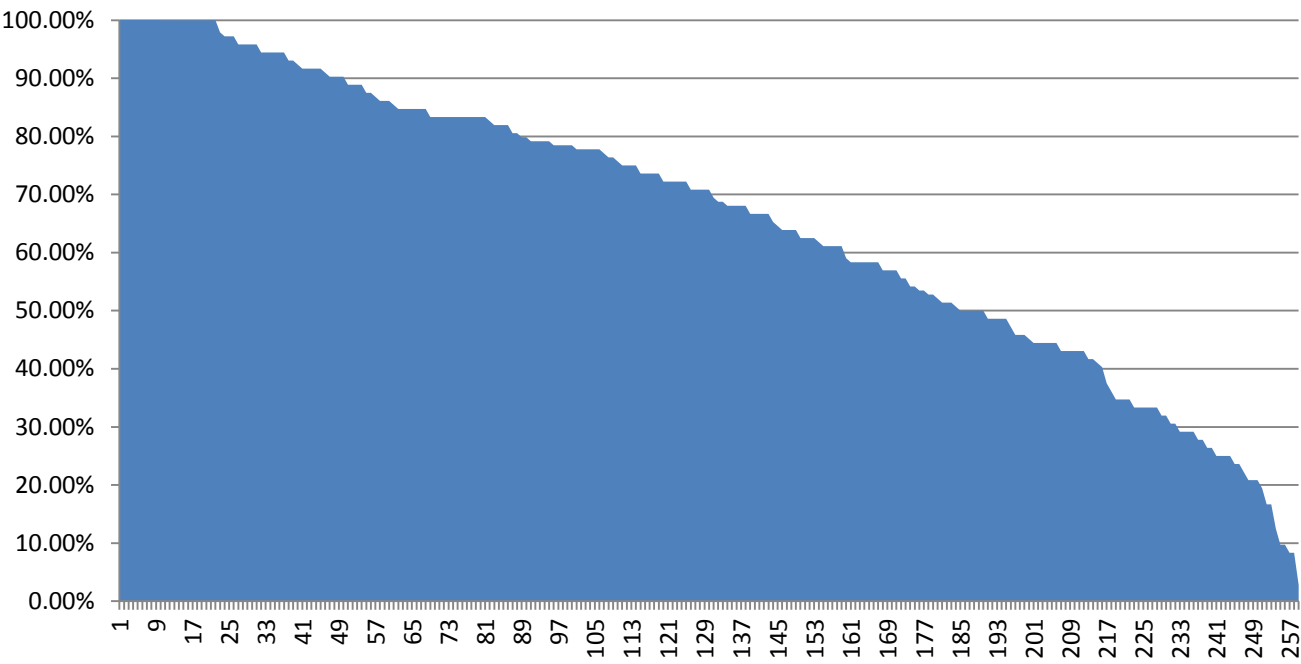
Incident Attendance in Response Area



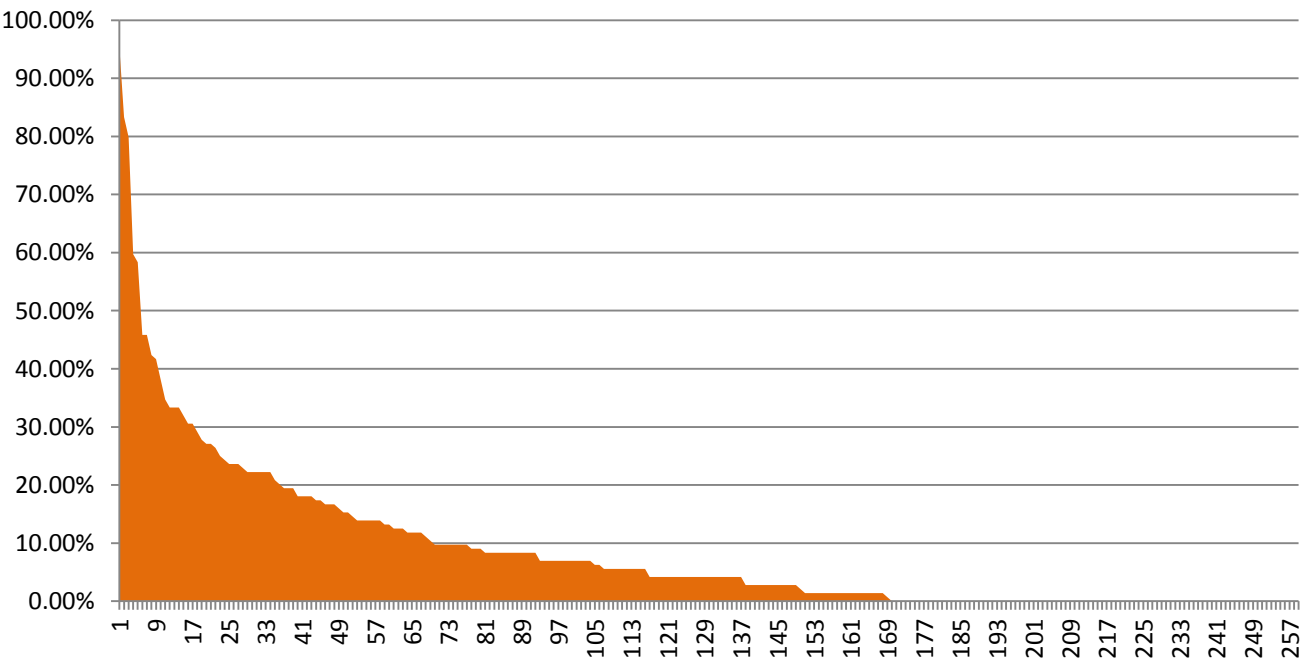
Incident Attendance in District Area



Volunteer Firefighter Paid Training Attendance



Volunteer Firefighter Unpaid Training Attendance



Fire Optomization Study

Fire Protection Coverage by Drive time (reaction time), Fire Protection Type, and Optimization Options (Status Quo, 6A, 6C)

Fire Response Times		5:20		9:00		14:00		Coverage beyond 14 minutes		Total Coverage	
	% properties covered	\$ Assessed Value	% properties covered	\$ Assessed Value	% properties covered	\$ Assessed Value	% properties covered	\$ Assessed Value	% properties covered	\$ Assessed Value	% properties covered
Status Quo											
Career	35%	\$ 7,487,885,102.00	13%	\$ 2,940,199,260.00	13%	\$ 2,283,322,500.00	0%	\$ -	61%	\$ 12,711,406,862.00	
Composite	5%	\$ 849,823,700.00	7%	\$ 1,052,303,667.00	2%	\$ 385,476,200.00	0%	\$ -	15%	\$ 2,287,603,567.00	
Volunteer	1%	\$ 85,491,900.00	8%	\$ 1,080,308,500.00	9%	\$ 1,322,024,400.00	0%	\$ -	18%	\$ 2,487,824,800.00	
Beyond 14 minutes	0%	\$ -	0%	\$ -	0%	\$ -	6%	\$ 936,422,600.00	6%	\$ 936,422,600.00	
Total	42%	\$8,423,200,702.00	27%	\$5,072,811,427.00	25%	\$3,990,823,100.00	6%	\$936,422,600.00	100%	\$18,423,257,829.00	
Optimized Model											
Career/Composite	53%	\$ 10,985,206,224.00	27%	\$ 4,646,109,405.00	3%	\$ 544,176,600.00	0%	\$ -	83%	\$ 16,175,492,229.00	
Volunteer	0%	\$ -	10%	\$ 1,237,745,000.00	2%	\$ 272,164,400.00	0%	\$ -	12%	\$ 1,509,909,400.00	
Beyond 14 minutes	0%	\$ -	0%	\$ -	0%	\$ -	5%	\$ 737,856,200.00	5%	\$ 737,856,200.00	
Total	53%	\$10,985,206,224.00	37%	\$5,883,854,405.00	5%	\$816,341,000.00	5%	\$737,856,200.00	100%	\$18,423,257,829.00	

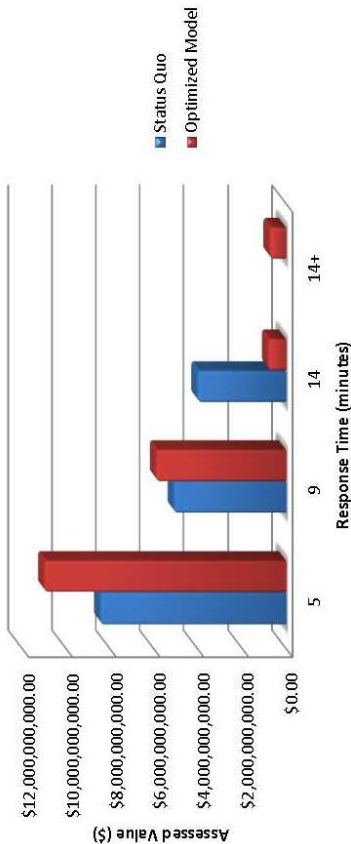
Source:

Drive time and options: Data compiled from the Geographic Information Systems Section (Planning Services), Fire Services, City of Greater Sudbury

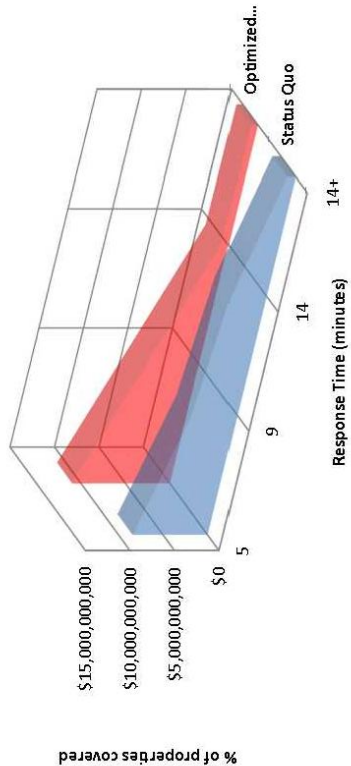
Assessed Value: Real Property Tax Analytics (RPTA), as of August 3, 2016

2-Nov-16

Assessed Value by Fire Protection Type and Response Time



Assessed Value Covered by Fire Protection Type and Response Time



Source: Office of the Fire Marshal and Emergency Management Community Profile
 Karwartha Lakes provides 95% of fire suppression (remaining 5% provided by Bracebridge, Scugog, Twp of Selwyn)
 London Fire Department provides 96% of fire suppression (remaining provided by Central Elgin)

Station		Station Characteristics					Staffing				Costs						Fire Underwriters Survey (FUS)				
		Location			# of Calls (2016)	Admin	Career	Volunteer			2016 Total Operating Costs	Total Est. Capital Replacement Costs	Presumptive Legislation Liability Recommended Annual Contribution to Reserve (funded and unfunded)	Cost to Maintain Stations (unfunded)	Total Annual Cost	2016 Average Cost per call	Rating				
								Budget	Actual	2016 First Call District Incident Attendance							2016 Training Attendance	Dwelling Protection Grade (DPG)	Public Fire Protection Classification (PFFC)		
Station Name	Station #	Address	Fire District	Age													Single Residential In Hydrant Area (HFA)	Single Residential Non Hydrant Area (FPA)	Commercial In Hydrant Area (HFA)	Commercial Non Hydrant Area (FPA)	
Van Horne	1	193 Van Horne Street Sudbury, ON	1	41	1,569	-	47	-	100%	6,602,546	3,295,788	145,256	2,237,000	7,061,204	4,500	1	4	4	N/A	N/A	
Minnow Lake	2	144 Second Avenue Sudbury, ON	1	33	377	-	16	-	100%	2,282,117	1,102,303	50,207	695,000	2,431,270	6,449	1	4	4	N/A	N/A	
New Sudbury	3	1190 Leon Street Sudbury, ON	1	42	610	-	16	-	100%	2,282,118	2,163,410	50,207	780,000	2,498,721	4,096	1	4	4	N/A	N/A	
Long Lake	4	2069 Long Lake Road Sudbury, ON	1	39	590	-	16	-	100%	2,282,118	3,082,203	50,207	1,014,000	2,573,154	4,361	1	4	4	N/A	N/A	
Copper Cliff	5	7 Serpentine Copper Cliff, ON	1	43	12	-	-	16	10	35.0%	48,591	1,234,917	45,318	739,000	236,173	19,681	3A	4	5	N/A	N/A
Waters	6	25 Black Lake Road Lively, ON	2	47	87	-	-	20	18	30.9%	83,182	1,700,275	56,647	947,000	328,635	3,777	3A	4	5	N/A	N/A
Lively	7	229 Ninth Street Lively, ON	2	66	64	-	-	18	15	35.7%	75,230	719,506	50,982	367,000	202,597	3,166	3A	4	5	N/A	N/A
Whitefish	8	4895 Municipal Road 55 Whitefish, ON	2	37	47	-	-	20	15	43.7%	83,182	1,570,752	56,647	931,000	319,887	6,806	3A	38	5	N/A	N/A
Beaver Lake	9	7535 Highway 17 Worthington, ON	2	39	13	-	-	10	4	45.5%	42,238	754,760	28,323	528,000	165,062	12,697	N/A	4	N/A	9	9
Azilda	10	239 Montée Principale Azilda, ON	3	46	88	-	-	18	18	37.5%	76,404	1,219,588	50,982	253,339	220,210	2,502	3A	38	5	N/A	N/A
Chelmsford	11	3400 Highway 144 Chelmsford, ON	3	46	125	-	-	20	22	34.4%	84,479	2,281,370	56,647	834,000	350,939	2,808	3A	38	5	N/A	N/A
Dowling	12	65 Highway 144 Dowling, ON	3	46	108	-	-	20	11	28.2%	84,483	1,289,042	56,647	792,000	291,633	2,700	3A	38	5	N/A	N/A
Vermillion	13	2214 Vermillion Lake Road Chelmsford, ON	3	42	1	-	-	10	8	9.7%	42,888	476,091	28,323	413,000	138,805	138,805	N/A	4	N/A	9	9
Levack	14	50 Nickel Street Levack, ON	3	45	52	-	-	20	13	33.3%	84,782	1,072,877	56,647	700,000	270,712	5,206	3A	4	5	N/A	N/A
Val Caron	15	3064 Leduc Street Val Caron, ON	4	31	28	-	-	18	11	31.5%	76,941	898,189	50,982	740,000	251,549	8,984	3A	38	5	N/A	N/A
Val Therese	16	4200 Highway 69N Val Therese, ON	4	23	385	-	-	9	18	44.4%	1,349,853	3,022,461	80,583	776,000	1,657,619	4,306	2	4	4	N/A	N/A
Hamner	17	4680 Lalontaine Street Hamner, ON	4	58	29	-	-	18	14	31.3%	76,941	947,663	50,982	555,000	235,799	8,131	3A	38	4	N/A	N/A
Capreol	18	65 Railway Street Capreol, ON	4	34	45	-	-	20	16	37.7%	93,450	1,462,338	56,647	881,000	319,134	7,092	3A	4	5	N/A	N/A
Garson	20	206 Church Street Garson, ON	5	61	118	-	-	20	18	32.5%	69,535	1,479,995	56,647	872,000	295,235	2,502	3A	4	4	N/A	N/A
Falconbridge	21	21 Edition Road Falconbridge, ON	5	39	11	-	-	16	10	50.4%	56,064	924,605	45,318	506,000	203,099	18,464	5	5	7P	N/A	N/A
Skead	22	22 MacLennan Drive Skead, ON	5	36	15	-	-	20	11	39.4%	69,834	888,791	56,647	528,000	228,348	15,223	N/A	4	N/A	9	9
Coniston	23	7 Second Avenue Coniston, ON	5	31	43	-	-	20	16	43.4%	69,531	917,646	56,647	495,000	226,354	5,264	3A	4	6	N/A	N/A
Wahnapitae	24	162 Hill Street Wahnapitae, ON	5	40	31	-	-	18	18	30.2%	62,951	942,428	50,982	498,000	215,814	6,962	3A	4	5	N/A	N/A
Red Deer Lake	25	566 Red Deer Lake Road Wahnapitae, ON	5	41	0	-	-	10	0	n/a	35,414	302,701	28,323	337,000	114,089	n/a					

Occupancy	Building Code Occupancy	Total number of Occupancies (#)	Lines of Insurance	Hours per Initial (H)	Total Hours (T) (#xH=T)	Frequency (F) (1=annual) (0.5=every 2 yrs) (0.33=every 3 yrs)	Total Inspection Days (TD) TxF/7	Total Person Years (TPY) TD/168	Number of Inspections if Risk Matrix Followed
Assembly Occupancies (General, >150 Licensed and >300)	A	268	Commercial	1.0	268.0	1.0	38.3	0.2	268.0
Assembly >150	A	20	Commercial	2.0	40.0	1.0	5.7	0.0	20.0
Assembly >300	A	15	Commercial	3.5	52.5	1.0	7.5	0.0	15.0
Night Clubs	A2	10	Commercial	2.0	20.0	2.0	5.7	0.0	20.0
Elementary Schools	A2	87	Commercial	3.0	261.0	1.0	37.3	0.2	87.0
High Schools	A2	10	Commercial	4.0	40.0	1.0	5.7	0.0	10.0
Daycares	A2	78	Commercial	3.0	234.0	1.0	33.4	0.2	78.0
Hospitals	B2	3	Commercial	80.0	240.0	0.5	17.1	0.1	1.5
B1	B1	3	Commercial	4.0	12.0	1.0	1.7	0.0	3.0
B2	B2	57	Commercial	3.0	171.0	1.0	24.4	0.1	57.0
B3	B3	51	Commercial	2.5	127.5	1.0	18.2	0.1	51.0
Rooming Houses/Group homes	B3	37	Commercial	2.0	74.0	1.0	10.6	0.1	37.0
Residential Mid Rise - up to and including 6 storeys	C	196	Commercial	2.0	392.0	0.5	28.0	0.2	98.0
Residential High Rise - Higher than 6 storeys	C	20	Commercial	4.0	80.0	0.5	5.7	0.0	10.0
Hotel, High	C	0	Commercial	5.0	0.0	1.0	0.0	0.0	0.0
Hotel, Mid	C	42	Commercial	4.0	168.0	1.0	24.0	0.1	42.0
Business, Personal Services and Mercantile	D/E	327	Commercial	1.0	327.0	0.3	14.0	0.1	98.1
High Hazard Industrial Occupancies	F1	608	Commercial	4.0	2432.0	1.0	347.4	2.1	608.0
Medium Hazard Industrial Occupancies	F2	87	Commercial	3.0	261.0	0.5	18.6	0.1	43.5
Low Hazard Industrial Occupancies	F3	85	Commercial	2.0	170.0	0.5	12.1	0.1	42.5

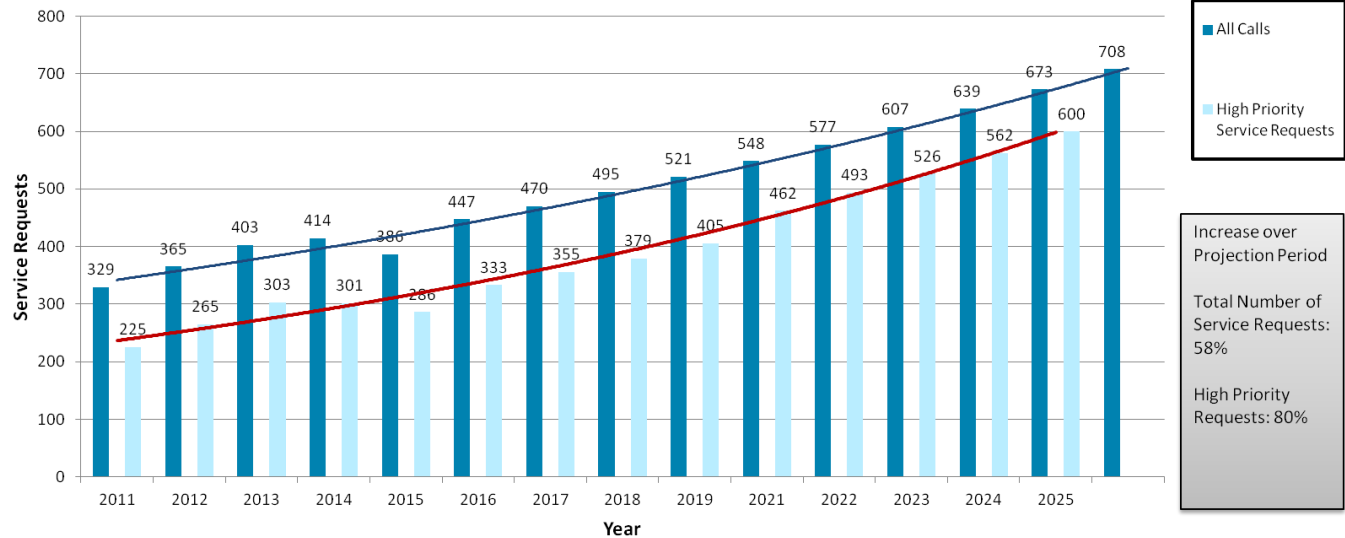
Call Volume Projections by Station																	
Station	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Annual	Total Over Period
Levack	455	495	488	486	514	503	511	520	529	538	547	556	565	575	585	1.69%	16%
Chelmsford	1,303	1,449	1,358	1,480	1,550	1,596	1,651	1,708	1,766	1,827	1,890	1,955	2,022	2,092	2,164	3.44%	36%
Valley East	1,585	1,630	1,660	1,816	1,860	1,890	1,946	2,004	2,064	2,125	2,189	2,254	2,321	2,390	2,461	2.98%	30%
Capreol	329	365	403	414	386	447	470	495	521	548	577	607	639	673	708	5.24%	58%
Lively	1,035	1,167	1,193	1,278	1,281	1,315	1,369	1,424	1,482	1,543	1,605	1,671	1,739	1,810	1,883	4.07%	43%
Long Lake	5,387	5,448	5,186	5,243	5,382	6,039	6,155	6,273	6,394	6,517	6,642	6,770	6,900	7,033	7,168	1.92%	19%
Van Horne	6,525	6,658	7,036	6,631	7,144	6,862	6,920	6,978	7,037	7,096	7,156	7,216	7,277	7,339	7,400	0.84%	8%
New Sudbury	2,723	2,681	3,080	3,140	3,177	3,167	3,248	3,331	3,415	3,503	3,592	3,683	3,777	3,874	3,972	2.55%	25%
Garson	1,521	1,342	1,174	1,791	1,774	1,590	1,602	1,614	1,626	1,638	1,650	1,662	1,674	1,687	1,699	0.74%	7%
Minnow Lake	1,739	1,936	2,131	2,224	2,220	2,137	2,212	2,289	2,369	2,452	2,537	2,626	2,718	2,813	2,911	3.49%	36%
All Stations	22,602	23,171	23,709	24,503	25,288	25,546	26,084	26,636	27,203	27,786	28,385	29,001	29,633	30,283	30,952	2.16%	21%
*****Projections based on Service Response Zones, out of Area Responses not included																	

*****Projections based on Service Response Zones, out of Area Responses not included

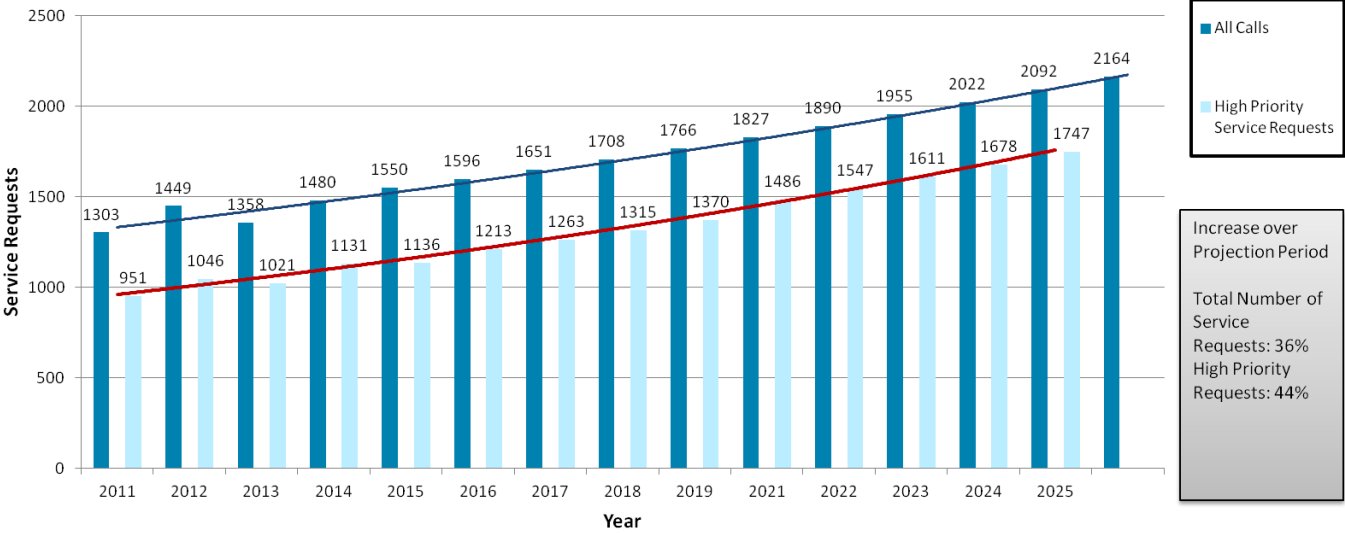
High Priority Volume by Station Response Area																				
Station	Growth Rate				High Priority Service Requests								Projected Code 4 Volumes							
	Total	Code 1	Code 2	Code 3	Code 4	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Levack	1.7%	2.1%	-10.9%	-5.8%	4.1%	312	350	355	378	358	398	414	432	450	488	508	529	551	573	
Chelmsford	3.4%	3.6%	29.7%	-1.3%	4.1%	951	1,046	1,021	1,131	1,136	1,213	1,263	1,315	1,370	1,486	1,547	1,611	1,678	1,747	
Valley East	3.0%	5.1%	18.4%	0.2%	3.1%	1,161	1,232	1,248	1,323	1,424	1,393	1,436	1,480	1,526	1,621	1,671	1,723	1,776	1,831	
Capreol	5.2%	23.2%	0.0%	0.0%	6.8%	225	265	303	301	286	333	355	379	405	462	493	526	562	600	
Lively	4.1%	-0.4%	5.5%	1.7%	5.1%	705	825	877	955	946	950	998	1,049	1,103	1,218	1,280	1,345	1,414	1,486	
Long Lake	1.9%	-7.2%	17.2%	0.8%	4.8%	1,964	2,191	2,334	2,423	2,426	2,601	2,726	2,856	2,993	3,287	3,445	3,610	3,783	3,964	
Van Horne	0.8%	-4.0%	3.1%	-4.4%	3.1%	4,225	4,595	4,989	4,808	5,039	5,062	5,217	5,376	5,541	5,885	6,065	6,250	6,441	6,638	
New Sudbury	2.5%	8.5%	18.8%	-1.2%	2.9%	1,856	1,878	2,166	2,227	2,176	2,198	2,261	2,325	2,392	2,531	2,603	2,677	2,754	2,833	
Garson	0.7%	16.8%	20.0%	-16.7%	-0.2%	624	653	652	956	819	616	615	613	612	609	608	607	605	604	
Minnow Lake	3.5%	-11.8%	19.1%	-0.1%	4.9%	1,144	1,362	1,527	1,535	1,522	1,528	1,604	1,683	1,766	1,945	2,041	2,142	2,248	2,359	
All Stations	2.1%	-5.6%	17.0%	-2.9%	3.6%	13,167	14,397	15,472	16,037	16,132	16,292	16,881	17,491	18,123	19,456	20,159	20,887	21,642	22,424	

Total Call Volume Projections by Station Response Area																			
Station	Actual Volumes (All)							Projected Volumes (All)							Avg Growth/yr	Over Projection Period			
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024					
Levack	455	495	488	486	514	503	511	520	529	538	547	556	565	575	16%				
Chelmsford	1,303	1,449	1,358	1,480	1,550	1,596	1,651	1,708	1,766	1,827	1,890	1,955	2,022	2,092	36%				
Valley East	1,585	1,630	1,660	1,816	1,860	1,890	1,946	2,004	2,064	2,125	2,189	2,254	2,321	2,390	30%				
Capreol	329	365	403	414	386	447	470	495	521	548	577	607	639	673	58%				
Lively	1,035	1,167	1,193	1,278	1,281	1,315	1,369	1,424	1,482	1,543	1,605	1,671	1,739	1,810	43%				
Long Lake	5,387	5,448	5,186	5,243	5,382	6,039	6,155	6,273	6,394	6,517	6,642	6,770	6,900	7,033	19%				
Van Horne	6,525	6,658	7,036	6,631	7,144	6,862	6,920	6,978	7,037	7,096	7,156	7,216	7,277	7,339	8%				
New Sudbury	2,723	2,681	3,080	3,140	3,177	3,167	3,248	3,331	3,415	3,503	3,592	3,683	3,777	3,874	25%				
Garson	1,521	1,342	1,174	1,791	1,774	1,590	1,602	1,614	1,626	1,638	1,650	1,662	1,674	1,687	7%				
Minnow Lake	1,739	1,936	2,131	2,224	2,220	2,137	2,212	2,289	2,369	2,452	2,537	2,626	2,718	2,813	36%				
All Stations	22,602	23,171	23,709	24,503	25,288	25,546	26,084	26,636	27,203	27,786	28,385	29,001	29,633	30,283	21%				

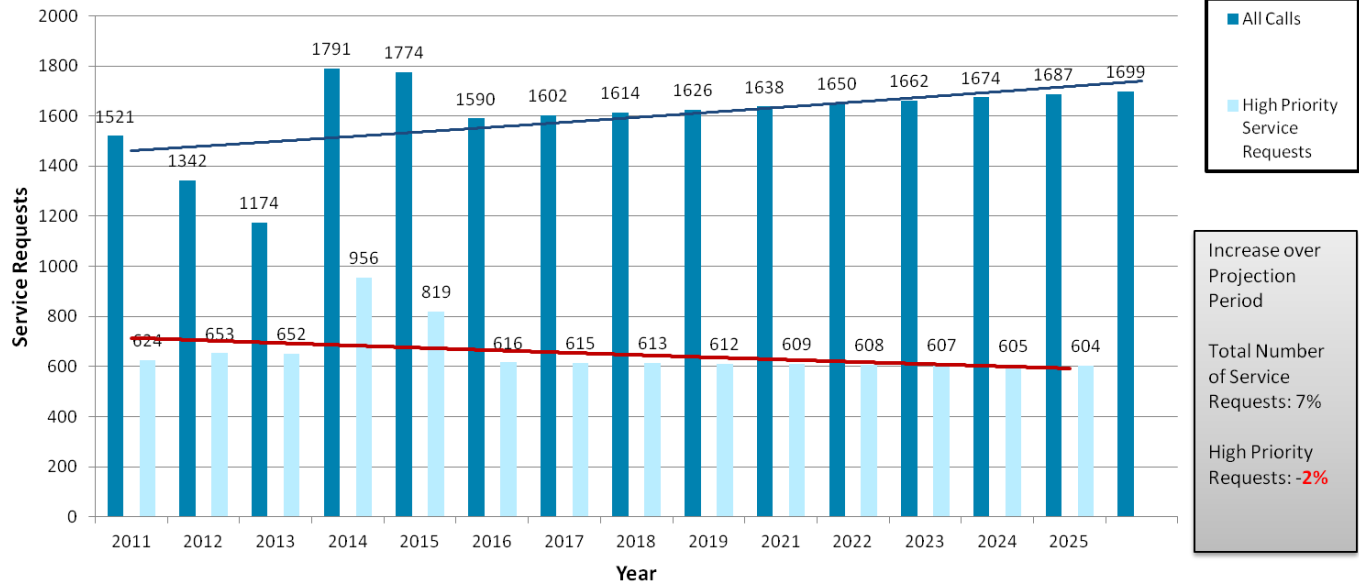
Capreol Station Response Area
Call Volume and Projections



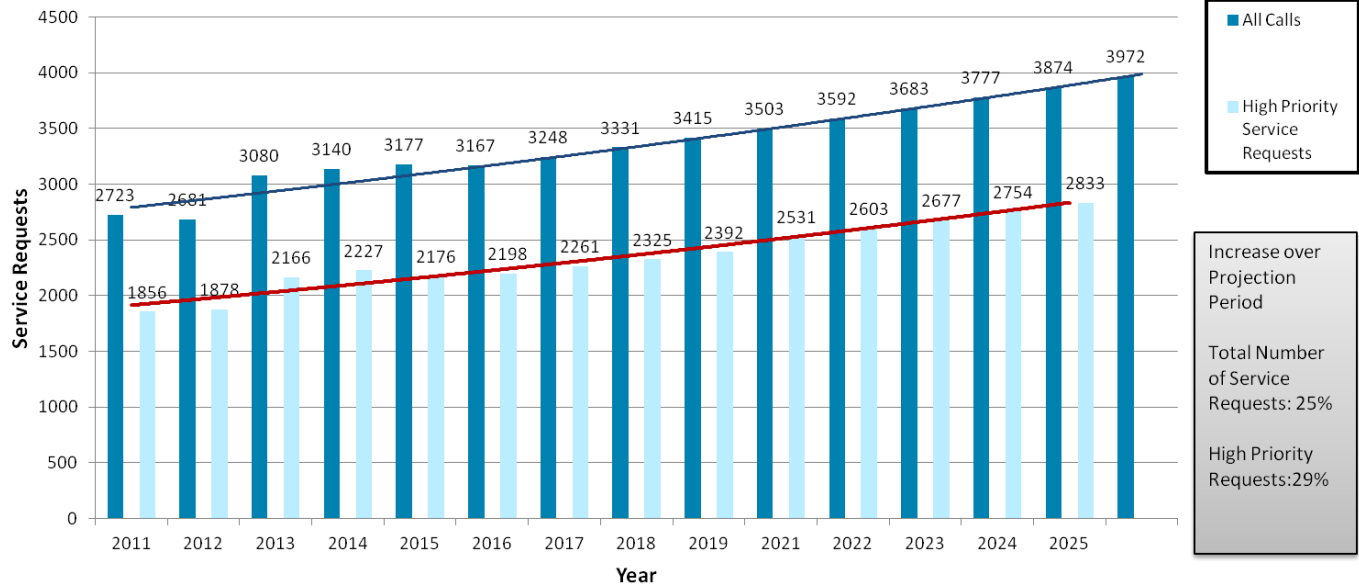
Chelmsford Station Response Area
Call Volume and Projections



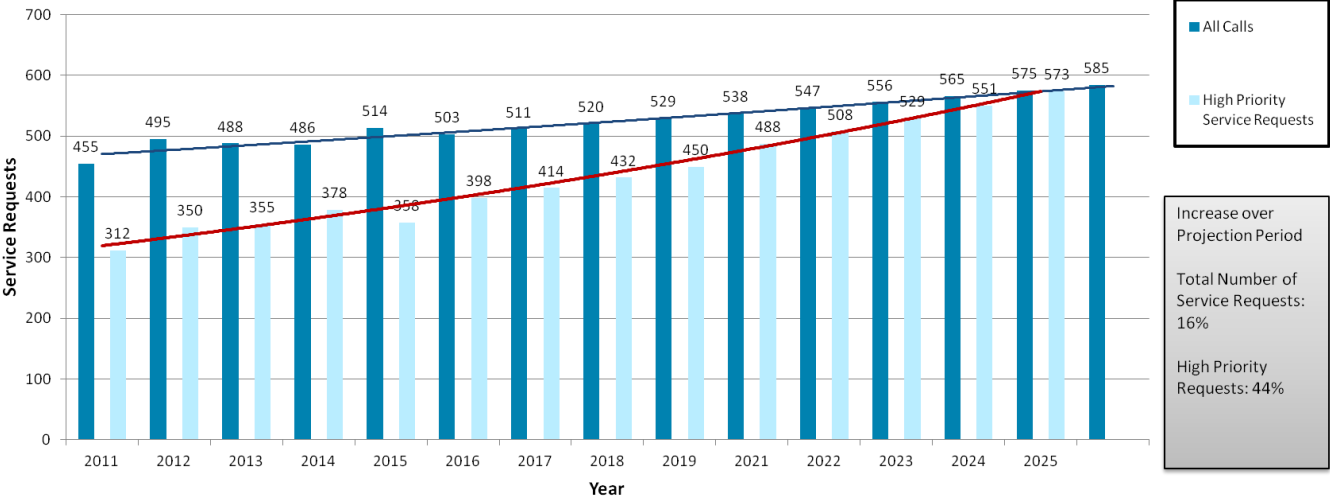
Garson Station Response Area
Call Volume and Projections



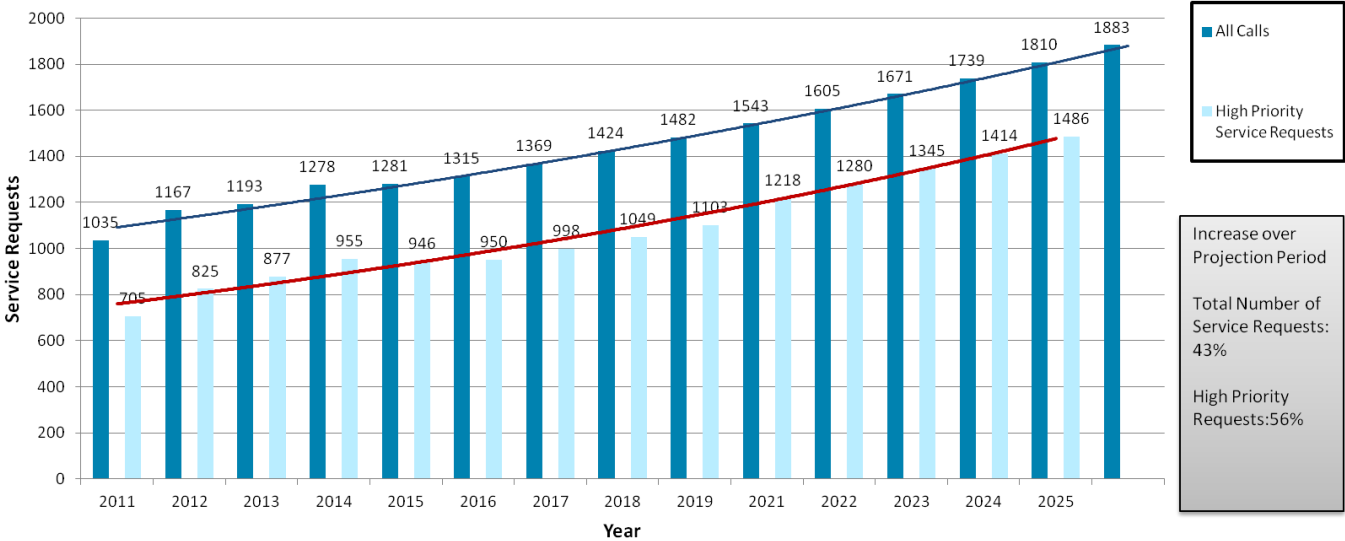
Leon Station Response Area
Call Volume and Projections



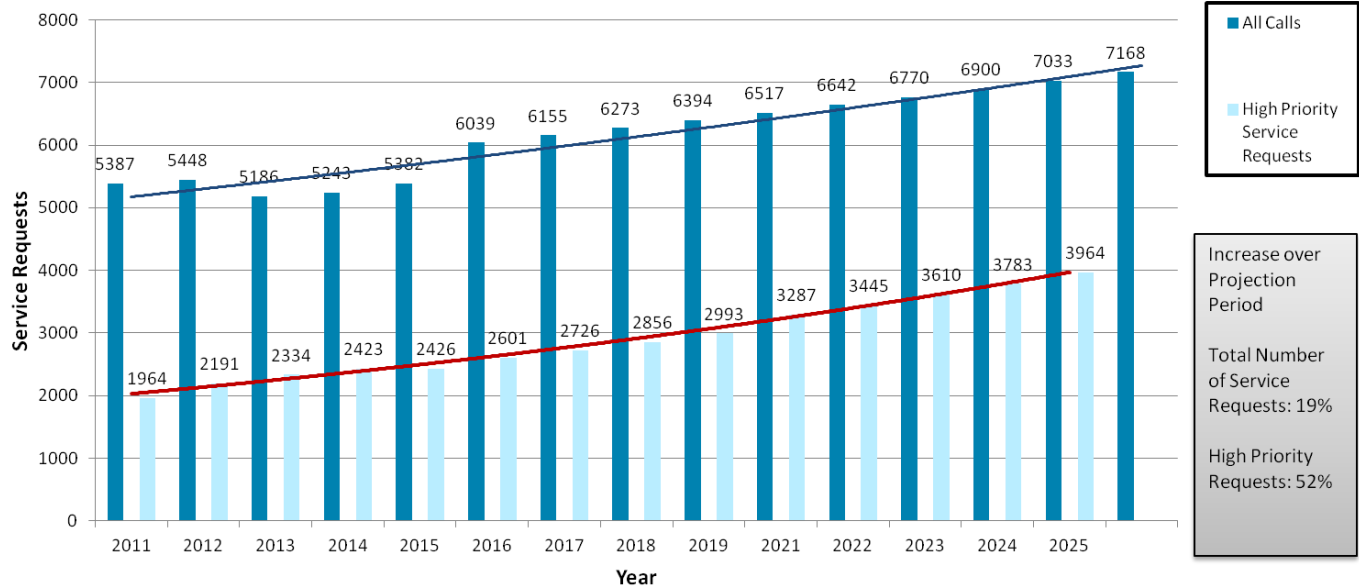
Levack Station Response Area
Call Volume and Projections



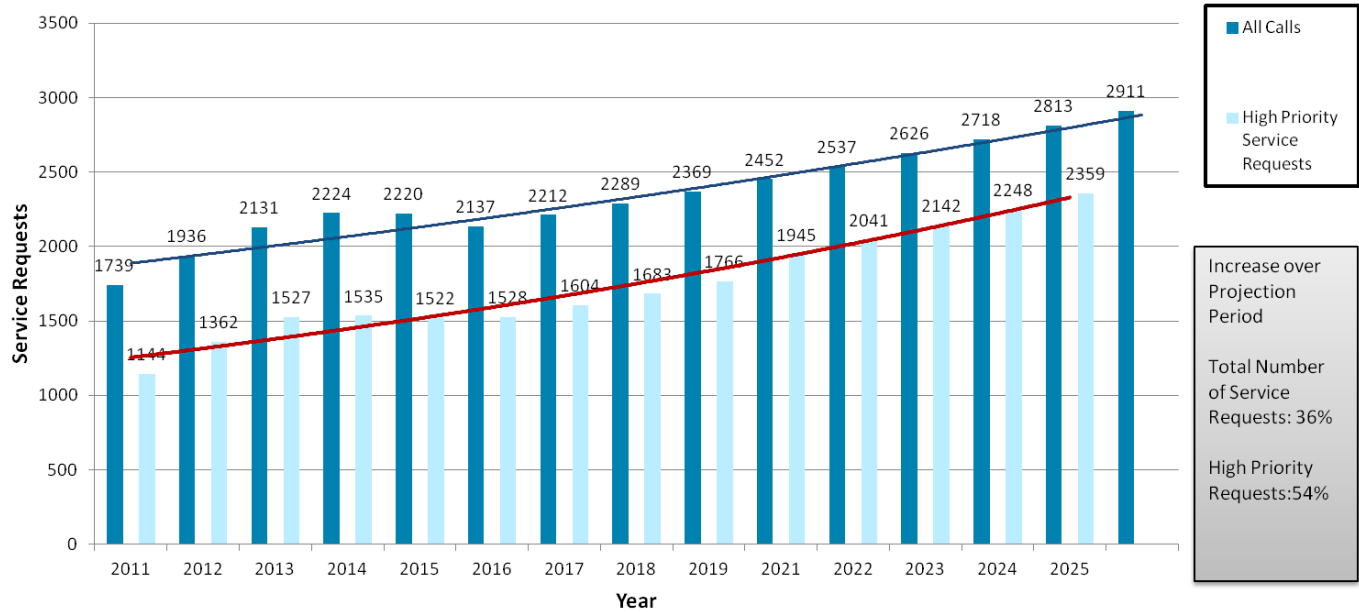
Lively Station Response Area
Call Volume and Projections



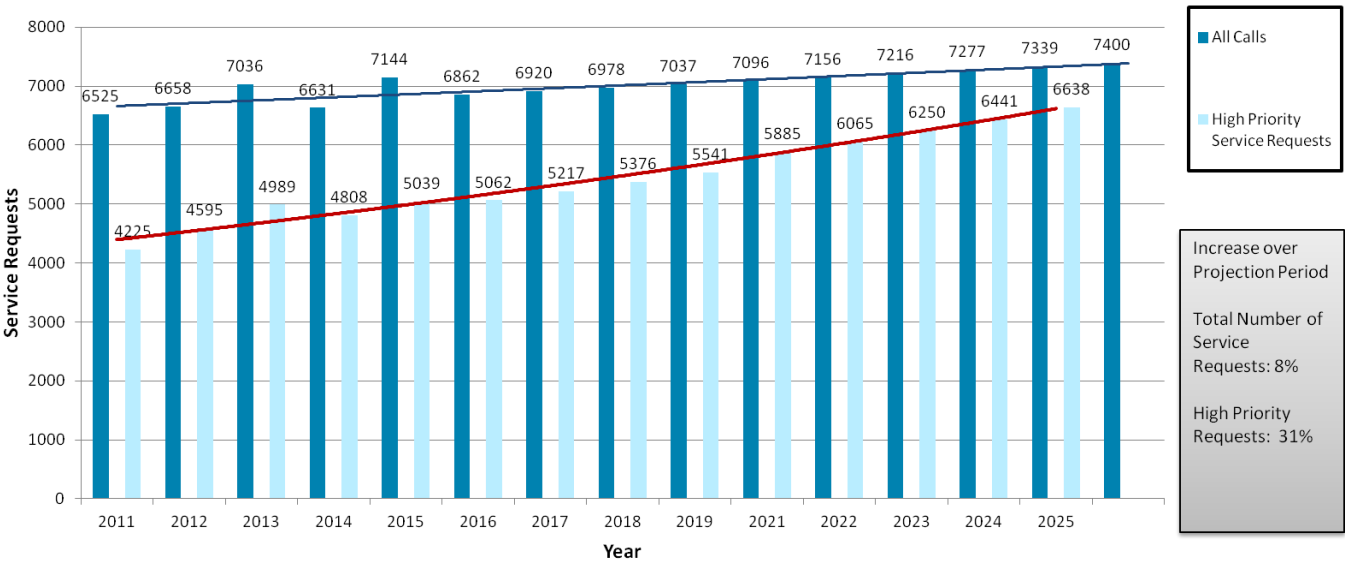
Long Lake Station Response Area
Call Volume and Projections



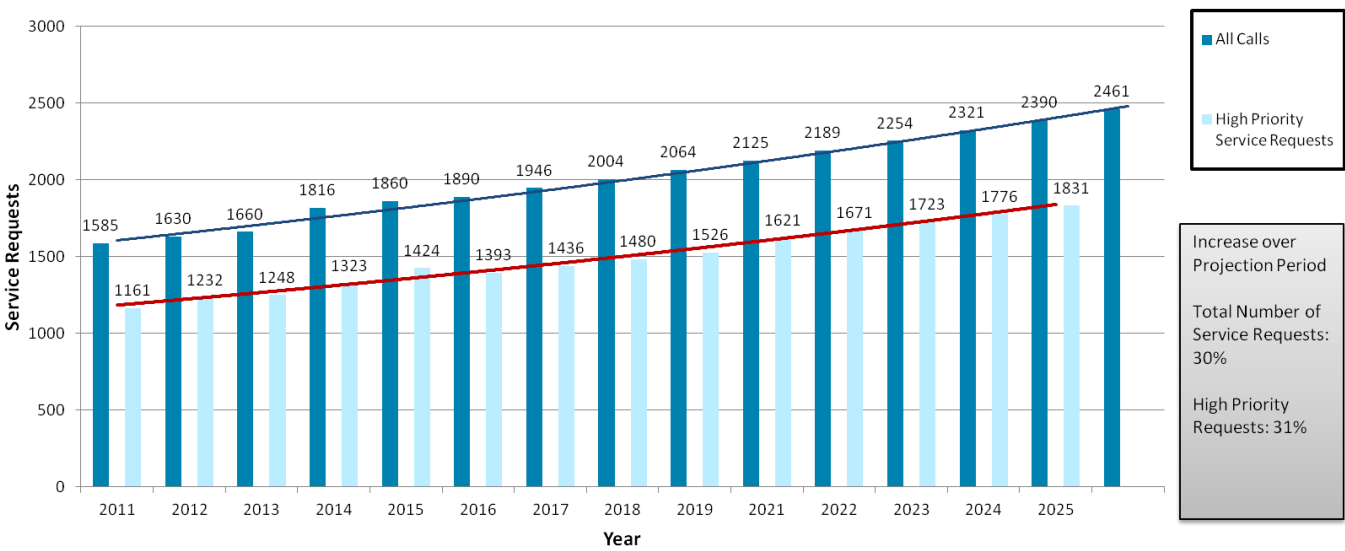
Minnow Lake Station Response Area
Call Volume and Projections

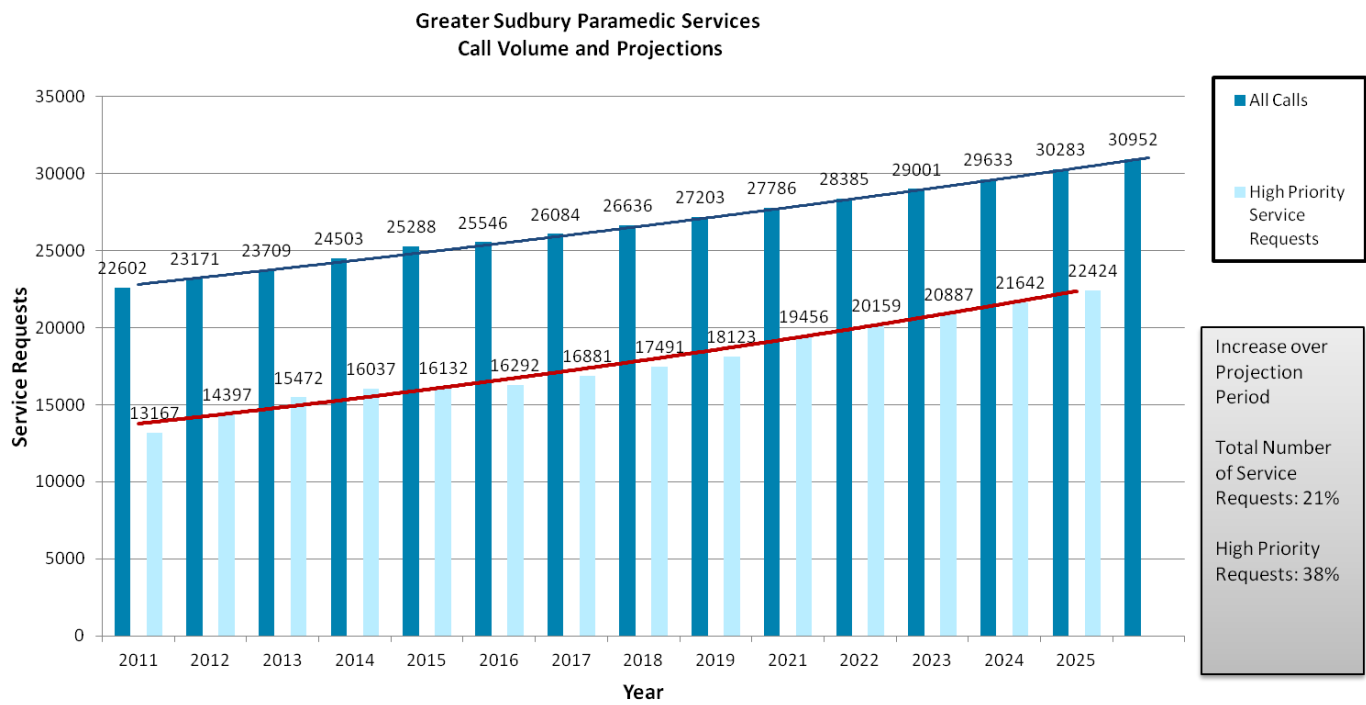


Van Horne Station Response Area
Call Volume and Projections



Valley East Station Response Area
Call Volume and Projections







Financial Analysis (F)

Emergency Services

2016 Annual Budget

Net Total	35,448,187
Revenues	(11,931,268)
Provincial Grants & Subsidies	(10,698,366)
User Fees	(494,340)
Contribution from Reserve and Capital	(219,041)
Other Revenues	(519,521)
Expenses	47,379,456
Salaries & Benefits	37,119,912
Debt Repayment	100,091
Materials - Operating Expenses	3,163,621
Energy Costs	1,057,650
Prof Development & Training	159,125
Purchased/Contract Services	789,010
Rent and Financial Expenses	0
Grants - Transfer Payments	20,000
Contr to Reserve and Capital	2,670,351
Internal Recoveries	2,299,695

Source: Monthly Cost Centre Report (as of March 2016)

Paramedic Services	2016 Annual Budget
Net Total	10,145,374
Revenues	(11,133,958)
Provincial Grants & Subsidies	(10,698,366)
User Fees	(11,723)
Other Revenues	(423,869)
Expenses	21,279,333
Salaries & Benefits	15,938,953
Materials - Operating Expenses	1,424,098
Energy Costs	336,846
Prof Development & Training	71,528
Purchased/Contract Services	413,824
Contribution to Reserve and Capital	961,105
Internal Recoveries	2,132,978

Source: Monthly Cost Centre Report (as of March 2016)

Fire Services	2016 Annual Budget
Net Total	24,344,468
Revenues	(392,920)
User Fees	(224,818)
Contribution from Reserve and Capital	(118,950)
Other Revenues	(49,152)
Expenses	24,737,388
Salaries & Benefits	19,818,396
Materials - Operating Expenses	1,316,335
Energy Costs	410,368
Prof Development & Training	59,660
Purchased/Contract Services	160,436
Contr to Reserve and Capital	1,255,918
Internal Recoveries	1,716,275

Source: Monthly Cost Centre Report (as of March 2016)

Station	Location	Year	Must (10)	Critical (9)	Urgent (8)	Essential (7)	Necessary (6)	Highly Desirable (5)	Strategic (4)	Enhancement (3)	Aesthetic (2)	Deferrable (1)	Total Per Year
01 - Main	193 Van Horne Street	2014		105,000	11,000	41,000	62,000	3,000					222,000
		2015		110,000		632,000	105,000	151,000	101,000				1,099,000
		2016				75,000	216,000	294,000	60,000		7,000		652,000
		2017					45,000						45,000
		2018											0
		2019		94,000		3,000		57,000	12,000				166,000
		2020											0
		2021					8,000						8,000
		2022					5,000			30,000			35,000
		2023									10,000		10,000
02 - Minnow Lake	144 Second Avenue South	2014		5,000	1,000	68,000	3,000						77,000
		2015		65,000		45,000	15,000	116,000	89,000				330,000
		2016					8,000	102,000					110,000
		2017					16,000						16,000
		2018					8,500	1,000	42,500				52,000
		2019					3,000			7,000			10,000
		2020											0
		2021							25,000	45,000		6,000	76,000
		2022								10,000			24,000
		2023											0
03 - New Sudbury / Leon	1190 Leon Avenue	2014		5,000	1,000	15,000	8,000						29,000
		2015		65,000		37,000	12,000	174,000	54,000				342,000
		2016					30,000	80,000					110,000
		2017											0
		2018						1,000	50,000			6,000	57,000
		2019					3,000						3,000
		2020								5,000			5,000
		2021						2,000					2,000
		2022							58,000	10,000			68,000
		2023			60,000				39,000	25,000			164,000
04 - Lockerby / Long Lake	2069 Long Lake Road	2014		2,000	1,000	3,000	8,000						14,000
		2015		50,000		62,000	103,000	96,000	36,000				347,000
		2016					41,000	178,000	2,000			8,000	229,000
		2017					25,000					25,000	25,000
		2018						1,000					1,000
		2019							92,000				92,000
		2020											0
		2021						2,000					2,000
		2022					3,000		160,000	49,000		2,000	214,000
		2023			60,000				30,000				90,000
05 - Copper Cliff	7 Serpentine Street	2014			1,000		2,000						3,000
		2015		105,000			24,000	54,000	62,000	39,000		15,000	299,000
		2016											0
		2017											0
		2018											68,000
		2019					104,000	1,000	177,000	15,000			297,000
		2020											0
		2021											0
		2022											0
		2023					3,000		34,000	30,000		5,000	72,000

Emergency Services - Building Stock Summary
Based on 2013 - 2014 Condition Reports

Prepared by CCI Group

Station	Location	Year	Must (10)	Critical (9)	Urgent (8)	Essential (7)	Necessary (6)	Highly Desirable (5)	Strategic (4)	Enhancement (3)	Aesthetic (2)	Deferrable (1)	Total Per Year
06 - Waters / Walden	25 Black Lake Road	2014			1,000		5,000						6,000
		2015		70,000		18,000	63,000	122,000	35,000				308,000
		2016						107,000	25,000				132,000
		2017		35,000				60,000					95,000
		2018											0
		2019				135,000	1,000	30,000			10,000		176,000
		2020						20,000	2,000				22,000
		2021											0
		2022		40,000		67,000		37,000	64,000				208,000
		2023											0
07 - Lively	229 Ninth Line	2014					5,000						5,000
		2015		35,000		21,000	10,000	108,000	30,000				204,000
		2016											0
		2017					3,000	8,000					11,000
		2018							1,000				1,000
		2019					11,000	33,000			8,000		52,000
		2020				16,000							16,000
		2021											0
		2022				39,000		8,000	31,000				78,000
		2023											0
08 - Whitefish	4895 Municipal Road 55	2014											0
		2015		45,000		103,000	28,000	259,000	34,000		6,000		475,000
		2016		25,000				19,000	8,000				52,000
		2017											0
		2018											0
		2019				5,000	1,000						6,000
		2020											0
		2021						48,000					52,000
		2022				89,000		143,000	54,000		4,000		286,000
		2023				60,000							60,000
09 - Beaver Lake	7535 HWY 17 West	2014				17,000							17,000
		2015		45,000		101,000	23,000	126,000	29,000		6,000		330,000
		2016		25,000					5,000				30,000
		2017							40,000				40,000
		2018											0
		2019				42,000	1,000	4,000	40,000				87,000
		2020											0
		2021						6,000			4,000		10,000
		2022						2,000	12,000				14,000
		2023											0
11 - Chelmsford	3400 HWY 144	2014				7,000	6,000		26,000				39,000
		2015				51,000		57,000	68,000	4,000			180,000
		2016										25,000	25,000
		2017										15,000	15,000
		2018											0
		2019					1,000		15,000				16,000
		2020				45,000	15,000	60,000	199,000				319,000
		2021						60,000	10,000		8,000		78,000
		2022											0
		2023				69,000		35,000	58,000				162,000

Emergency Services - Building Stock Summary
Based on 2013 - 2014 Condition Reports

Prepared by CCI Group

Station	Location	Year	Must (10)	Critical (9)	Urgent (8)	Essential (7)	Necessary (6)	Highly Desirable (5)	Strategic (4)	Enhancement (3)	Aesthetic (2)	Deferrable (1)	Total Per Year
12 - Dowling	65 Main Street	2014		45,000		84,000	15,000		42,000				186,000
		2015				35,000		95,000	66,000	35,000	6,000		237,000
		2016						50,000	10,000			25,000	85,000
		2017						50,000	9,000				59,000
		2018						12,000	5,000				17,000
		2019				30,000	1,000		68,000				99,000
		2020											0
		2021						23,000			4,000		27,000
		2022				15,000	2,000		47,000				64,000
		2023				13,000			5,000				18,000
13 - Vermillion Lake	2214 Vermillion Lake Road	2014				9,000	2,000		13,000				24,000
		2015		45,000		25,000		42,000	56,000	12,000	6,000		186,000
		2016						25,000					25,000
		2017							10,000				10,000
		2018				13,000	3,000		47,000				63,000
		2019					1,000		17,000				18,000
		2020											0
		2021						19,000			4,000		23,000
		2022				1,000	2,000	5,000	48,000				56,000
		2023							8,000				8,000
14 - Levack	50 Nickel Street	2014				5,000	6,000						11,000
		2015		45,000		71,000	91,000	105,000	91,000		10,000		413,000
		2016		25,000		19,000		40,000	28,000				112,000
		2017						40,000	5,000				45,000
		2018							2,000				2,000
		2019				2,000	1,000	9,000					12,000
		2020							12,000				12,000
		2021				30,000		6,000	5,000		4,000		45,000
		2022					4,000		44,000				48,000
		2023											0
15 - Val Caron	3064 Leduc Street	2014				5,000	3,000		3,000				11,000
		2015				100,000	1,000	54,000	81,000	3,000		6,000	245,000
		2016		25,000				35,000	73,000				133,000
		2017						35,000	40,000				75,000
		2018					1,000						1,000
		2019				3,000			35,000				38,000
		2020							37,000			25,000	62,000
		2021										0	0
		2022						5,000	100,000			10,000	115,000
		2023				5,000	5,000		50,000				60,000
16 - Val Therese	4200 HWY 69 North	2014				5,000	2,000						7,000
		2015				50,000	3,000	86,000	134,000	5,000		23,000	301,000
		2016		25,000				50,000	20,000				95,000
		2017				3,000		50,000	29,000				82,000
		2018					1,000		55,000			20,000	76,000
		2019										0	0
		2020										0	0
		2021											0
		2022				5,000	5,000	25,000	110,000			20,000	165,000
		2023							50,000				50,000

Emergency Services - Building Stock Summary
Based on 2013 - 2014 Condition Reports

Prepared by CCI Group

Station	Location	Year	Must (10)	Critical (9)	Urgent (8)	Essential (7)	Necessary (6)	Highly Desirable (5)	Strategic (4)	Enhancement (3)	Aesthetic (2)	Deferrable (1)	Total Per Year
17 - Hammer	4680 Lafontaine Street	2014				20,000	36,000		5,000				61,000
		2015		45,000			15,000	56,000	161,000	3,000		25,000	305,000
		2016		25,000		50,000			25,000				100,000
		2017										0	0
		2018										0	0
		2019					1,000						1,000
		2020										0	0
		2021							13,000				13,000
		2022				1,000	9,000		20,000			15,000	45,000
		2023							30,000				30,000
18 - Capreol	65 Railway Street	2014				52,000	4,000						56,000
		2015		70,000		80,000	17,000	89,000	213,000	3,000			472,000
		2016		25,000				50,000					75,000
		2017						50,000					50,000
		2018						50,000	5,000				55,000
		2019				20,000	1,000	4,000	3,000				28,000
		2020											0
		2021				8,000						8,000	16,000
		2022				18,000	4,000		38,000			24,000	84,000
		2023							45,000				45,000
20 - Garson	206 Church Street	2014					4,000					1,000	5,000
		2015				50,000	26,000	87,000	77,000	25,000	6,000		271,000
		2016				30,000		25,000	43,000				98,000
		2017		35,000				175,000					210,000
		2018					20,000		10,000	5,000			35,000
		2019					1,000	9,000					10,000
		2020											0
		2021									4,000		4,000
		2022				31,000	5,000	15,000	142,000				193,000
		2023				6,000		5,000	35,000				46,000
21 - Falconbridge	21 Edison Road	2014				12,000			2,000				20,000
		2015		45,000		5,000	25,000	56,000	36,000		10,000	6,000	20,000
		2016				40,000		68,000	38,000	10,000		5,000	161,000
		2017						42,000					42,000
		2018											0
		2019				6,000	11,000		25,000				42,000
		2020											0
		2021					2,000	3,000	10,000		5,000		20,000
		2022											0
		2023				6,000		5,000	23,000			5,000	39,000
22 - Skead	20 Macdellen Drive	2014				17,000	5,000		2,000			6,000	30,000
		2015		45,000		6,000	9,000	52,000	30,000		10,000	5,000	157,000
		2016				40,000		81,000	33,000	10,000			164,000
		2017											0
		2018											0
		2019				25,000	11,000		62,000				98,000
		2020											0
		2021					2,000	3,000	10,000		5,000		20,000
		2022											0
		2023				1,000		20,000	33,000			5,000	59,000

Emergency Services - Building Stock Summary
Based on 2013 - 2014 Condition Reports

Prepared by CCI Group

Station	Location	Year	Must (10)	Critical (9)	Urgent (8)	Essential (7)	Necessary (6)	Highly Desirable (5)	Strategic (4)	Enhancement (3)	Aesthetic (2)	Deferrable (1)	Total Per Year
23 - Coniston	7 Second Avenue	2014				2,000	17,000		2,000				21,000
		2015		45,000		12,000	12,000	49,000	41,000			7,000	166,000
		2016				40,000		37,000	58,000	10,000			145,000
		2017						53,000	4,000		4,000		61,000
		2018											0
		2019					1,000		5,000				6,000
		2020				6,000			20,000			5,000	31,000
		2021					4,000				12,000		16,000
		2022				1,000							1,000
		2023				22,000		5,000	16,000			5,000	48,000
24 - Wahnapiitae	162 Hill Street	2014				15,000	23,000						39,000
		2015		45,000		5,000	12,000	59,000	24,000		3,000	1,000	153,000
		2016				40,000		80,000	40,000	10,000			170,000
		2017											0
		2018											0
		2019				29,000	1,000		40,000			5,000	75,000
		2020											0
		2021					2,000	2,000	17,000		12,000		33,000
		2022				1,000							1,000
		2023						5,000	17,000			5,000	27,000
25 - Red Deer Lake	566 Red Deer Lake North	2014				6,000							6,000
		2015		45,000		52,000	9,000	24,000	33,000	8,000	8,000		179,000
		2016		25,000				15,000					40,000
		2017											0
		2018							35,000				35,000
		2019					1,000	5,000					6,000
		2020					2,000	1,000	20,000				23,000
		2021									5,000		5,000
		2022				13,000		20,000	6,000			4,000	43,000
		2023							0				0

Emergency Services - Building Stock Summary
Based on 2013 - 2014 Condition Reports

Prepared by CCI Group

Station	Location	Year	Must (10)	Critical (9)	Urgent (8)	Essential (7)	Necessary (6)	Highly Desirable (5)	Strategic (4)	Enhancement (3)	Aesthetic (2)	Deferrable (1)	Total Per Year
ES - HQ	239 Montee Principale (CLELC)	2014				84,000	197,000	58,800	53,000				392,800
		2015		60,000		84,000	197,000	58,800	53,000				452,800
		2016				84,000	197,000	58,800	53,000				392,800
		2017				84,000	197,000	58,800	53,000				392,800
		2018				84,000	197,000	58,800	53,000				392,800
		2019				92,000	20,000	114,800	27,000				278,800
		2020		25,000		92,000	20,000	114,800	27,000				253,800
		2021				92,000	20,000	114,800	27,000				253,800
		2022				92,000	20,000	114,800	27,000				253,800
		2023				92,000	20,000	114,800	27,000				253,800
	TOTAL COST PER RISK FACTOR		0	1,791,000	16,000	4,392,500	2,325,000	6,469,500	4,807,000	1,43,000	223,000	316,000	20,483,000

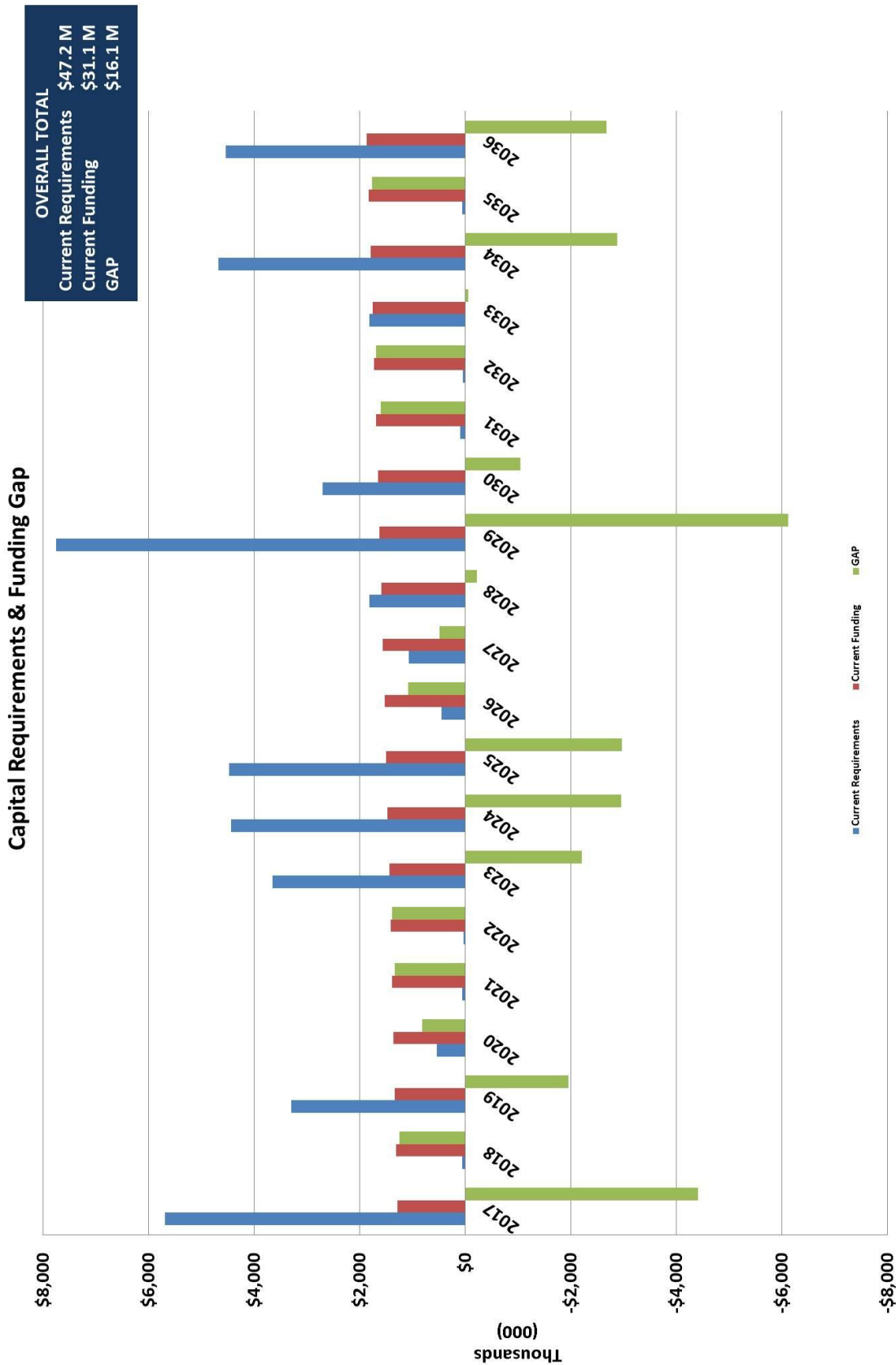
LEGEND:

- Must (10)
Fire Safety, Life, OHS, address dangerous situations
- Critical (9)
Legislated, health & welfare
- Urgent (8)
Items that threaten the operation of the facility/shutdown, loss of service etc.
- Essential (7)
Projects that are not urgent but cannot be postponed due to building integrity
- Necessary (6)
Barrier free access related items and commitments from previous years as warranted as public need
- Highly Desirable (5)
Energy conservation, projects for external funding is available
- Strategic (4)
Items that are worn out, are of high maintenance cost and requires replacement to prevent costly further repair
- Enhancement (3)
Modification, addition, renovation to improve operational needs of facility
- Aesthetic (2)
Items that are aesthetic nature (painting, landscaping, asphalt)
- Deferrable (1)
Items that are in working order but have surpassed their useful life expectancy.

Current Capital Equipment Renewal Requirements			
Year	Current Requirements	Current Funding	GAP
2017	\$5,691,481	\$1,281,036	(\$4,410,444)
2018	\$61,994	\$1,306,657	\$1,244,663
2019	\$3,295,531	\$1,332,790	(\$1,962,741)
2020	\$541,889	\$1,359,446	\$817,557
2021	\$54,514	\$1,386,635	\$1,332,121
2022	\$31,635	\$1,414,368	\$1,382,733
2023	\$3,651,112	\$1,442,655	(\$2,208,457)
2024	\$4,432,367	\$1,471,508	(\$2,960,859)
2025	\$4,470,043	\$1,500,938	(\$2,969,104)
2026	\$445,376	\$1,530,957	\$1,085,581
2027	\$1,074,360	\$1,561,576	\$487,216
2028	\$1,820,088	\$1,592,808	(\$227,281)
2029	\$7,751,210	\$1,624,664	(\$6,126,546)
2030	\$2,698,195	\$1,657,157	(\$1,041,038)
2031	\$89,605	\$1,690,300	\$1,600,695
2032	\$39,518	\$1,724,106	\$1,684,588
2033	\$1,820,960	\$1,758,588	(\$62,372)
2034	\$4,675,606	\$1,793,760	(\$2,881,846)
2035	\$62,565	\$1,829,635	\$1,767,070
2036	\$4,543,009	\$1,866,228	(\$2,676,781)
TOTAL	\$47,251,059	\$31,125,814	(\$16,125,245)
*Includes inflation and replacement cycle(s)			

Current Capital Inventory By Category

Category	Quantity	Sum of Current Estimated Replacement Cost
Communication	1401	2,512,966
Equipment	2065	3,440,821
Personal Protective Equipment (PPE)	3427	1,458,793
Vehicle	24	635,448
Vehicle - Front Line	77	28,247,265
Grand Total	6994	36,295,293



	Station	Station #	Age (2016)	TOTAL
Emergency Services	Van Horne	1	41	\$8,301,956
Emergency Services	Minnow Lake	2	33	\$7,178,230
Emergency Services	New Sudbury	3	42	\$5,970,877
Emergency Services	Long Lake	4	39	\$6,770,923
Fire - Only	Copper Cliff	5	43	\$4,125,443
Emergency Services	Waters	6	47	\$4,157,558
Fire - Only	Lively	7	66	\$3,334,940
Fire - Only	Whitefish	8	37	\$5,077,578
Fire - Only	Beaver Lake	9	39	\$4,513,562
Fire - Only	Azilda	10	46	\$253,339
Fire - Only	Chelmsford	11	46	\$3,469,671
Paramedic - Only	Chelmsford		46	\$0
Fire - Only	Dowling	12	46	\$3,334,940
Fire - Only	Vermillion	13	42	\$5,082,721
Emergency Services	Levack	14	45	\$5,242,086
Fire - Only	Val Caron	15	31	\$5,409,721
Emergency Services	Val Therese	16	23	\$8,558,868
Fire - Only	Hanmer	17	58	\$3,334,940
Fire - Only	Capreol	18	34	\$4,535,598
Paramedic - Only	Capreol		34	\$1,532,319
Emergency Services	Garson	20	61	\$4,076,038
Fire - Only	Falconbridge	21	39	\$3,334,940
Fire - Only	Skead	22	36	\$4,253,198
Fire - Only	Coniston	23	31	\$3,334,940
Fire - Only	Wahnapitae	24	40	\$4,229,198
Fire - Only	Red Deer Lake	25	41	\$3,334,940
Emergency Services	New Headquarters		46	\$22,232,932
TOTAL			44	\$134,981,452
Debt Financing @ 3.5% over 30 years				\$7,302,387

Assumptions:

Area needed (sq ft)

	Fire	Paramedic	Total
Van Horne	11,000	4,300	15,300
Career	11,000	2,000	13,000
Composite	13,000	2,000	15,000
Volunteer	9,000	2,000	11,000
Paramedic - Stand Alone	3,600		3,600
Head Quarters	30,000	30,000	60,000

Station maintenance costs applied to any building that will not be replaced within 5 years

Annual increase for construction rates = 2.0% per year

Construction rate of \$350 per square foot as provided by Real Estate Division. Includes estimates for architectural and engineering fees.

Building Replacement
Estimated Amortization Schedules

Purchase Price \$ 134,981,452 30 Years

Payment (Annual) \$ 7,302,387

Interest Rate 3.5%

Date	Remaining Principal	Payment	Interest	Principal
31-Dec-17	134,981,452	7,302,387	4,670,358	2,632,029
31-Dec-18	132,349,423	7,302,387	4,579,290	2,723,097
31-Dec-19	129,626,326	7,302,387	4,485,071	2,817,316
31-Dec-20	126,809,010	7,302,387	4,387,592	2,914,795
31-Dec-21	123,894,215	7,302,387	4,286,740	3,015,647
31-Dec-22	120,878,568	7,302,387	4,182,398	3,119,988
31-Dec-23	117,758,579	7,302,387	4,074,447	3,227,940
31-Dec-24	114,530,639	7,302,387	3,962,760	3,339,627
31-Dec-25	111,191,012	7,302,387	3,847,209	3,455,178
31-Dec-26	107,735,835	7,302,387	3,727,660	3,574,727
31-Dec-27	104,161,108	7,302,387	3,603,974	3,698,413
31-Dec-28	100,462,695	7,302,387	3,476,009	3,826,378
31-Dec-29	96,636,317	7,302,387	3,343,617	3,958,770
31-Dec-30	92,677,547	7,302,387	3,206,643	4,095,744
31-Dec-31	88,581,803	7,302,387	3,064,930	4,237,457
31-Dec-32	84,344,347	7,302,387	2,918,314	4,384,073
31-Dec-33	79,960,274	7,302,387	2,766,625	4,535,761
31-Dec-34	75,424,513	7,302,387	2,609,688	4,692,699
31-Dec-35	70,731,814	7,302,387	2,447,321	4,855,066
31-Dec-36	65,876,748	7,302,387	2,279,335	5,023,051
31-Dec-37	60,853,696	7,302,387	2,105,538	5,196,849
31-Dec-38	55,656,847	7,302,387	1,925,727	5,376,660
31-Dec-39	50,280,187	7,302,387	1,739,694	5,562,692
31-Dec-40	44,717,495	7,302,387	1,547,225	5,755,162
31-Dec-41	38,962,333	7,302,387	1,348,097	5,954,290
31-Dec-42	33,008,043	7,302,387	1,142,078	6,160,309
31-Dec-43	26,847,735	7,302,387	928,932	6,373,455
31-Dec-44	20,474,279	7,302,387	708,410	6,593,977
31-Dec-45	13,880,303	7,302,387	480,258	6,822,128
31-Dec-46	7,058,174	7,302,387	244,213	7,058,174
TOTAL		219,071,607	84,090,156	134,981,452

STATUS QUO FINANCIAL SUMMARY BY STATION																
Asset	STAFFING			OPERATING BUDGET				CAPITAL				STATIONS			PRESUMPTIVE LEGISLATION	Total Annual Costs
	Admin	Career	Volunteer	Total	2016 Operating Costs (Salaries & Benefits)	2016 Operating Costs (Other Costs)	Annual Debt Financing (New Builds)	2016 Total Operating Costs (annual)	Number of Front-Line Vehicles (Includes Boats / Trailers)	Estimated Capital Replacement Costs Front-Line Vehicles (Includes Boats / Trailers)	Estimated Capital Replacement Costs Equipment & Non-Front-Line Vehicles	Total Estimated Capital Replacement Costs	Age	UNFUNDED Total Cost to Maintain Stations		
Van Horne Stn 1		47		47	\$6,602,546	\$0	\$0	\$6,602,546	5	\$2,582,736	\$713,052	\$3,295,788	41	\$2,237,000	\$145,256	\$7,061,204
Minnow Lake Stn 2		16		16	\$2,282,117	\$0	\$0	\$2,282,117	1	\$862,768	\$239,535	\$1,102,303	33	\$895,000	\$50,207	\$2,431,270
New Sudbury Stn 3		16		16	\$2,282,118	\$0	\$0	\$2,282,118	3	\$1,884,541	\$278,869	\$2,163,410	42	\$780,000	\$50,207	\$2,498,721
Long Lake Stn 4		16		16	\$2,282,118	\$0	\$0	\$2,282,118	3	\$2,750,452	\$331,751	\$3,082,203	39	\$1,014,000	\$50,207	\$2,573,154
Copper Cliff Stn 5		16		16	\$447,751	\$3,840	\$0	\$48,591	2	\$1,033,432	\$201,486	\$1,234,917	43	\$739,000	\$45,318	\$2,361,173
Waters Stn 6 - can't sell		20		20	\$78,751	\$4,431	\$0	\$83,182	3	\$1,351,484	\$348,791	\$1,700,275	47	\$947,000	\$56,647	\$2,826,635
Lively Stn 7		18		18	\$70,877	\$4,353	\$0	\$75,230	2	\$489,228	\$230,278	\$719,506	66	\$867,000	\$50,982	\$2,021,557
Whitefish Stn 8		20		20	\$78,751	\$4,431	\$0	\$83,182	4	\$1,313,287	\$257,465	\$1,570,752	37	\$931,000	\$56,647	\$3,019,887
Beaver Lake Stn 9		10		10	\$39,376	\$2,862	\$0	\$42,238	2	\$626,300	\$128,461	\$754,760	39	\$528,000	\$28,323	\$1,051,062
Azilda Stn 10 - can't sell		18		18	\$72,047	\$4,357	\$0	\$76,404	4	\$874,843	\$344,745	\$1,219,588	46	\$253,339	\$50,982	\$2,202,210
Chelmsford Stn 11		20		20	\$80,052	\$4,427	\$0	\$84,479	6	\$1,954,404	\$326,966	\$2,281,370	46	\$834,000	\$56,647	\$3,050,939
Douling Stn 12		20		20	\$80,052	\$4,431	\$0	\$84,483	4	\$1,032,700	\$256,343	\$1,289,042	46	\$792,000	\$56,647	\$2,931,633
Vernillion Stn 13		10		10	\$40,026	\$2,862	\$0	\$42,888	1	\$321,115	\$124,977	\$476,091	42	\$413,000	\$28,323	\$1,388,805
Lewack Stn 14		20		20	\$80,052	\$4,730	\$0	\$84,782	2	\$805,201	\$267,676	\$1,072,877	45	\$700,000	\$56,647	\$2,707,712
Val Caron Stn 15		18		18	\$72,588	\$4,353	\$0	\$76,941	2	\$688,477	\$209,712	\$898,189	31	\$740,000	\$50,982	\$2,511,549
Val Therese Stn 16		9	18	27	\$1,345,496	\$4,357	\$0	\$1,349,853	5	\$2,479,604	\$542,857	\$3,022,461	23	\$776,000	\$80,583	\$1,657,619
Hammer Stn 17		18		18	\$72,588	\$4,353	\$0	\$76,941	2	\$738,556	\$209,106	\$947,663	58	\$555,000	\$50,982	\$2,351,799
Capreol Stn 18		20		20	\$89,022	\$4,428	\$0	\$93,450	5	\$1,212,098	\$250,240	\$1,462,338	34	\$881,000	\$56,647	\$3,019,134
Falconbridge Stn 21		16		16	\$65,104	\$4,431	\$0	\$69,535	4	\$1,111,901	\$368,094	\$1,479,995	61	\$872,000	\$56,647	\$2,031,099
Shead Stn 22		20		20	\$65,104	\$4,730	\$0	\$69,834	3	\$647,952	\$240,839	\$898,791	36	\$528,000	\$56,647	\$2,281,348
Coniston Stn 23		20		20	\$65,104	\$4,427	\$0	\$69,531	2	\$687,080	\$230,566	\$917,646	31	\$495,000	\$56,647	\$2,261,354
Wainapiae Stn 24		18		18	\$58,594	\$4,357	\$0	\$62,951	2	\$724,580	\$217,848	\$942,428	40	\$498,000	\$50,982	\$2,315,814
Red Deer Lake Stn 25		10		10	\$32,552	\$2,862	\$0	\$35,414	1	\$168,367	\$134,334	\$302,701	41	\$337,000	\$28,323	\$1,141,089
New HQ									0	\$0	\$0	\$0		\$0	\$0	\$0
Base Costs	21	4		25	\$3,787,526	\$4,442,071		\$8,229,597		\$1,155,593	\$1,390,000	\$2,545,593	46	\$3,064,661	\$83,304	\$7,460,841
Paramedic Services				122	\$15,938,953	(\$5,793,579)	\$0	\$10,145,374							\$223,198	\$10,368,573
GM's Office				5	\$618,048	(\$618,048)		\$0								\$0
Lionel E. Lalonde Centre (LELC)				5	\$533,157	(\$272,032)	\$0	\$261,125								\$681,125
Emergency Management				2	\$211,359	\$485,862	\$0	\$697,221								\$697,221
Total	21	108	350	613	\$371,201,914	(\$1,672,726)	\$0	\$35,448,187	73	\$28,247,265	\$8,048,028	\$36,295,293	44	\$2,048,000	\$1,623,300	\$39,623,301

NOTES:
1) Current contribution to WSIB reserve is \$25.2K as per Finance. The challenge is that the calculations for volunteers are based on current budget but doesn't take into consideration that volunteer benefits would be based on a 1st Class
2) New build debt repayment 3.5% financing rate over a 25 - 30 repayment schedule * Based on Infrastructure Ontario rates
3) New build construction rate estimated between \$275-\$350 per square foot. The higher amount takes into consideration potential architectural/engineering fees (as per Real Estate Division)

OPTIMIZED MODEL FINANCIAL SUMMARY BY STATION															
	STAFFING			OPERATING BUDGET				CAPITAL				STATIONS		PRESUMPTIVE LEGISLATION	
	Admin	Career	Volunteer	Total	2016 Operating Costs (Salaries & Benefits)	2016 Operating Costs (Other Costs)	Annual Debt Financing (New Builds)	2016 Total Operating Costs (annual)	Number of Front-Line Vehicles (includes Boats / Trailers)	Estimated Capital Replacement Costs Front-Line Vehicles (includes Boats / Trailers)	Estimated Capital Replacement Costs Equipment & Non Front-Line Vehicles	Total Estimated Capital Replacement Costs	Cost to Build (debt financing)	Recommended Annual Contribution to Reserve (\$2.20 per \$100 for Fire)	
Asset															
		36		36	\$5,057,269	\$0	\$220,510	\$5,277,779	3	\$2,286,385	\$751,568	\$3,037,954	\$4,076,038	\$111,260	\$5,556,891
		18		18	\$2,567,383	\$0	\$132,908	\$2,700,291	4	\$1,232,966	\$383,775	\$1,616,741	\$4,913,478	\$56,482	\$2,846,099
				0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0
		18		18	\$2,567,383	\$0	\$183,151	\$2,750,534	4	\$1,283,429	\$365,024	\$1,648,453	\$6,770,923	\$56,482	\$2,898,091
				0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0
		18	10	28	\$2,606,759	\$1,243	\$156,422	\$2,764,424	5	\$1,730,453	\$541,011	\$2,271,464	\$5,782,786	\$84,805	\$2,974,729
				0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0
		15	15	30	\$59,063	\$4,430	\$279,804	\$343,297	2	\$1,125,694	\$248,933	\$1,374,626	\$5,172,059	\$42,485	\$461,723
				0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0
				0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0
		18	10	28	\$2,607,409	\$1,243	\$159,551	\$2,768,203	5	\$1,920,129	\$566,632	\$2,486,761	\$5,898,441	\$84,805	\$2,990,400
			15	15	\$60,039	\$4,430	\$184,026	\$248,495	2	\$887,926	\$248,606	\$1,136,531	\$3,401,639	\$42,485	\$553,772
				0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0
		18	10	28	\$2,625,755	\$1,169	\$162,742	\$2,789,665	5	\$2,221,845	\$620,719	\$2,842,564	\$6,016,410	\$84,805	\$3,031,518
			0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	
	15	15	30	\$60,490	\$4,353	\$110,255	\$175,098	2	\$738,556	\$224,578	\$963,135	\$4,076,038	\$42,485	\$270,796	
		15	15	\$66,767	\$4,428	\$145,713	\$216,908	3	\$1,122,166	\$255,816	\$1,377,983	\$5,386,886	\$42,485	\$395,519	
	18	10	28	\$2,599,935	\$1,243	\$150,348	\$2,751,526	3	\$1,304,052	\$537,247	\$1,841,299	\$5,558,233	\$84,805	\$2,938,076	
			0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	
	10	10	20	\$32,552	\$4,730	\$230,095	\$267,377	3	\$647,952	\$207,220	\$855,172	\$4,253,198	\$28,323	\$342,950	
			0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	
	15	15	30	\$48,828	\$4,356	\$228,796	\$281,980	2	\$783,112	\$233,356	\$1,016,468	\$4,229,198	\$42,485	\$380,625	
			0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	
	18		18	\$2,567,383	\$0	\$601,392	\$3,168,775	3	\$2,822,464	\$412,869	\$3,235,332	\$11,116,466	\$56,482	\$3,403,971	
	25	4	29	\$4,862,513	\$5,383,740	\$0	\$9,746,253	\$1,078,027	1	\$7,822	\$1,085,849	\$383,304	\$7,789,354	\$1,789,354	\$7,789,354
			124	\$16,059,146		\$2,104,086	\$11,414,863							\$11,646,014	
			6	\$797,473											
			5												
			5												
			5												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												
			2												

NOTES:

1) Current contribution to WSIB reserve is \$252K as per Finance. The challenge is that the calculations for volunteers are based on current budget but doesn't take into consideration that volunteer benefits

2) New build debt repayment 3.5% financing rate over a 25 - 30 repayment schedule * based on Infrastructure Ontario rates

3) New build construction rate estimated between \$2.75-\$3.50 per square foot. The higher amount takes into consideration potential architectural/engineering fees (as per Real Estate Division)

Fire Services Area Rated Taxation
Based on the 2016 Average Home Assessment Value of \$230,000 and the 2016 Tax Rates

Time Frame	STATUS QUO						OPTIONS					
	Current Area Rated - Status Quo *with 3% annual inflation			Current Area Rated Taxation *resource utilization with 3% annual inflation			Status Quo - Fully Funded * resource utilization with 3% annual inflation (Softened)			Status Quo - Fully Funded * flat rate with 3% annual inflation (Softened)		
	Career	Composite	Volunteer	Career	Composite	Volunteer	Career	Composite	Volunteer	Career	Composite	Volunteer
2016	340.00	233.82	134.32	340.00	233.82	134.32	340.00	233.82	134.32	340.00	233.82	134.32
2017	350.66	240.80	138.03	297.97	249.48	276.57	342.80	254.36	190.75	342.70	257.76	178.16
2018	361.18	248.02	142.17	306.91	256.96	253.47	345.60	274.90	247.18	345.60	281.69	221.99
2019	372.02	255.46	146.43	316.12	264.67	258.30	348.40	295.44	303.62	348.10	305.63	265.83
2020	383.18	263.13	150.83	325.60	272.61	266.05	351.20	315.98	360.05	350.80	329.56	309.66
2021	394.68	271.02	155.35	335.37	280.79	274.03	355.69	332.94	372.51	357.75	357.75	357.75
2022	406.52	279.15	160.01	345.43	289.21	282.25	370.19	352.02	402.24	377.24	377.24	377.24
2023	418.71	287.53	164.81	355.79	297.89	290.72	385.12	372.29	432.86	397.31	397.31	397.31
2024	431.27	296.15	169.76	366.47	306.82	299.44	400.50	393.17	464.39	417.98	417.98	417.98
2025	444.21	305.04	174.85	377.46	316.03	308.42	416.34	414.68	498.87	439.28	439.28	439.28
2026	457.54	314.19	180.10	388.78	325.51	317.68	432.66	436.83	530.33	461.21	461.21	461.21

Overall Increase
(over 10 years)

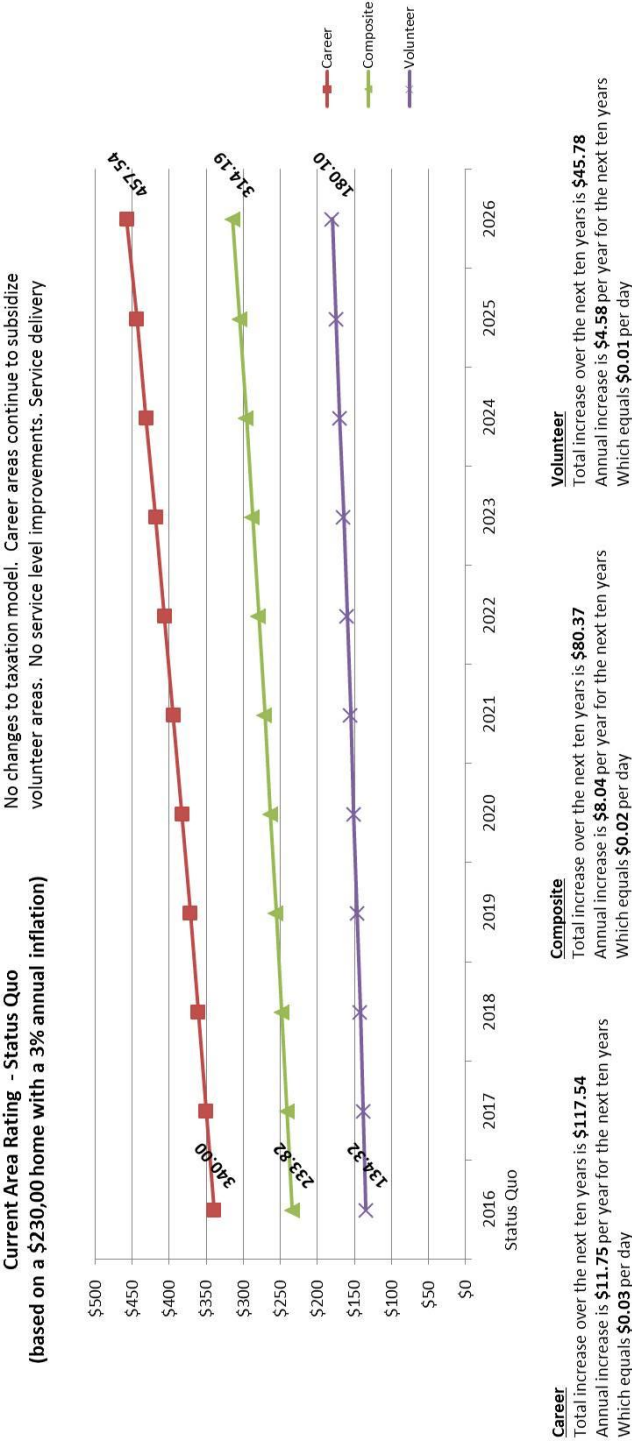
\$117.54	\$80.37	\$45.78	\$48.78	\$91.69	\$183.36	\$20.86	\$127.04	\$226.54	\$92.66	\$203.01	\$396.01	\$121.21	\$227.39	\$326.89	\$181.60	\$287.78	\$387.28
\$11.75	\$8.04	\$4.58	\$4.88	\$9.17	\$18.34	\$2.09	\$12.70	\$22.65	\$9.27	\$20.30	\$39.60	\$12.12	\$22.74	\$32.69	\$18.16	\$28.78	\$38.73
\$0.03	\$0.02	\$0.01	\$0.01	\$0.03	\$0.05	\$0.01	\$0.03	\$0.06	\$0.03	\$0.06	\$0.11	\$0.03	\$0.06	\$0.09	\$0.05	\$0.08	\$0.11
0.0322	0.0220188	0.012541	0.01337	0.0251203	0.05023497	0.00571548	0.03480589	0.06206616	0	0.02539	0.05561925	0.10849574	0.03320764	0.06229805	0.049754	0.07884424	0.106104512

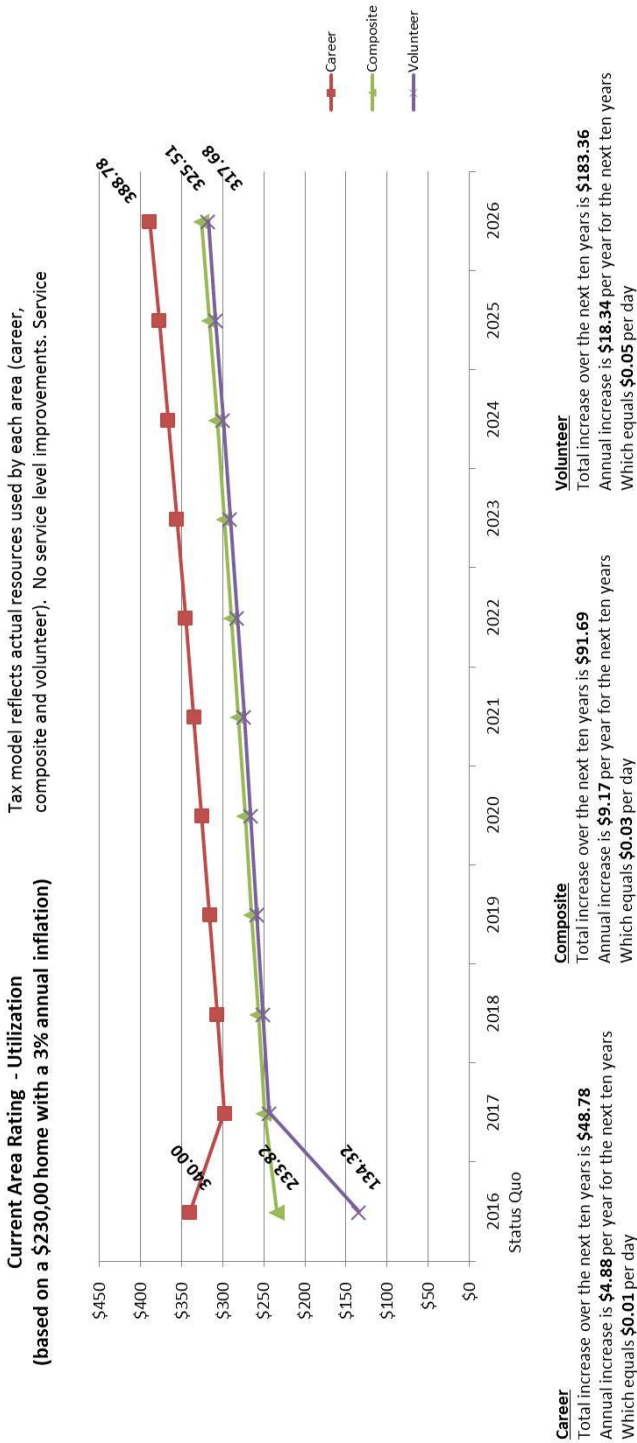
Based on per \$100K Assessment

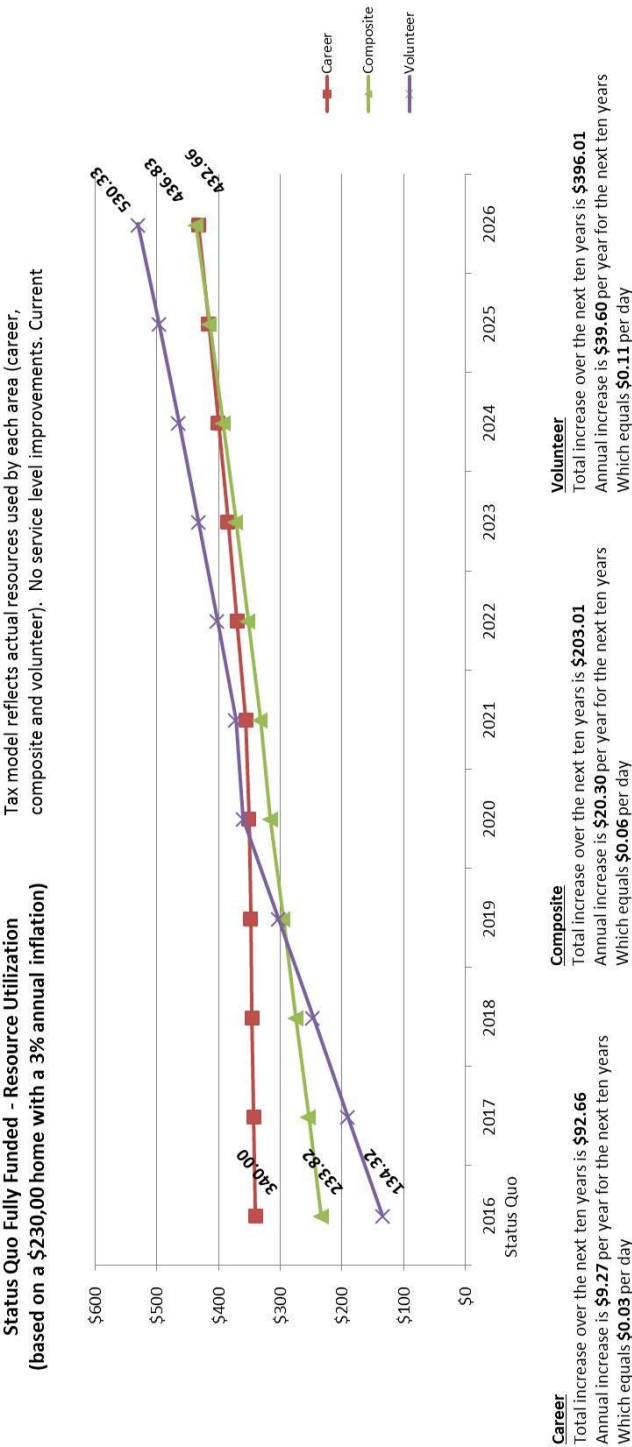
Time Frame	STATUS QUO						OPTIONS					
	Current Area Rated - Status Quo *with 3% annual inflation			Current Area Rated Taxation *resource utilization with 3% annual inflation			Status Quo - Fully Funded * resource utilization with 3% annual inflation (Softened)			Status Quo - Fully Funded * flat rate with 3% annual inflation (Softened)		
	Career	Composite	Volunteer	Career	Composite	Volunteer	Career	Composite	Volunteer	Career	Composite	Volunteer
2016	147.83	101.66	58.40	147.83	101.66	58.40	147.83	101.66	58.40	147.83	101.66	58.40
2017	152.46	104.70	60.01	129.55	108.47	105.86	149.04	110.59	82.94	149.00	112.07	77.45
2018	157.04	107.84	61.81	135.44	111.72	109.03	150.26	119.52	107.47	150.17	122.47	96.52
2019	161.75	111.07	63.67	137.44	115.07	112.30	151.48	128.45	113.20	151.35	132.88	115.58
2020	166.60	114.40	65.58	141.57	118.53	115.67	152.70	137.38	115.54	152.52	143.29	115.64
2021	171.60	117.84	67.54	145.81	122.08	119.14	154.65	144.50	161.96	155.55	155.55	155.55
2022	176.75	121.37	69.57	150.19	125.74	122.72	160.95	153.05	174.89	164.02	164.02	164.02
2023	182.05	125.01	71.66	154.69	129.52	126.40	167.44	161.87	188.20	172.74	172.74	172.74
2024	187.51	128.76	73.81	159.33	133.40	130.19	174.13	170.94	201.91	181.73	181.73	181.73
2025	193.14	132.62	76.02	164.11	137.40	134.10	181.02	180.30	216.03	190.99	190.99	190.99
2026	198.93	136.60	78.30	169.04	141.53	138.12	188.11	189.93	230.58	200.53	200.53	200.53

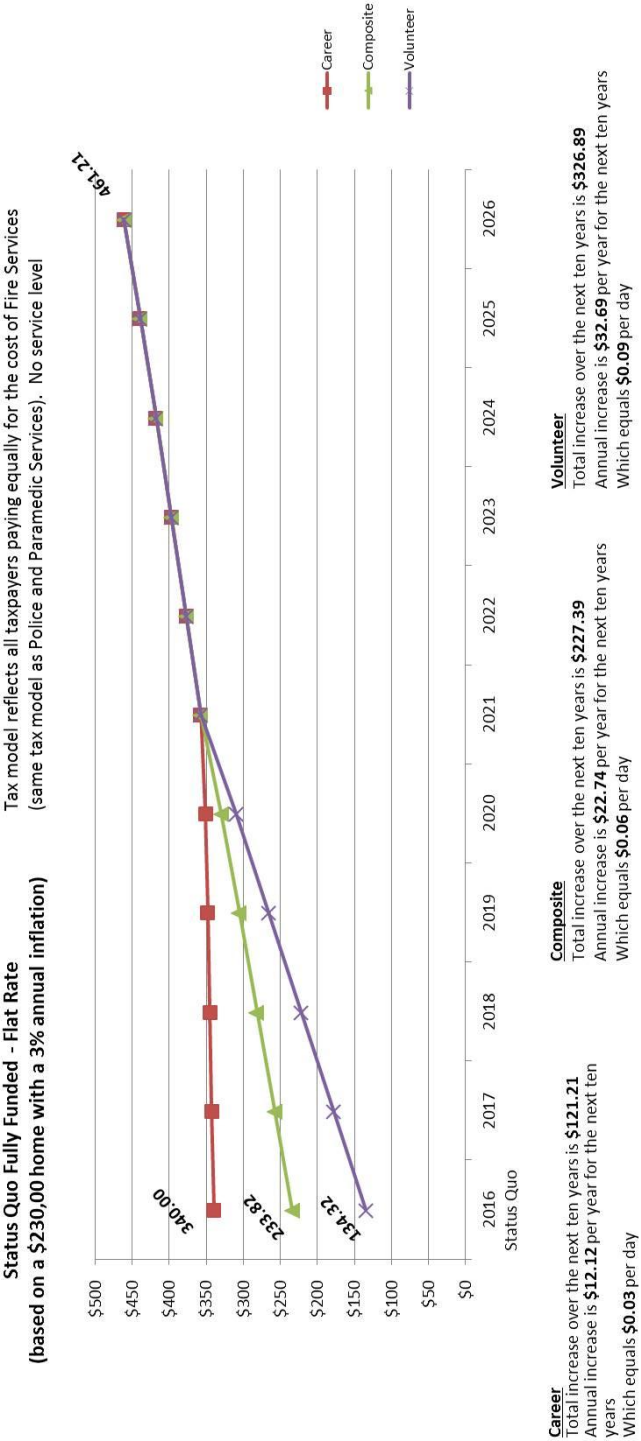
Time Frame

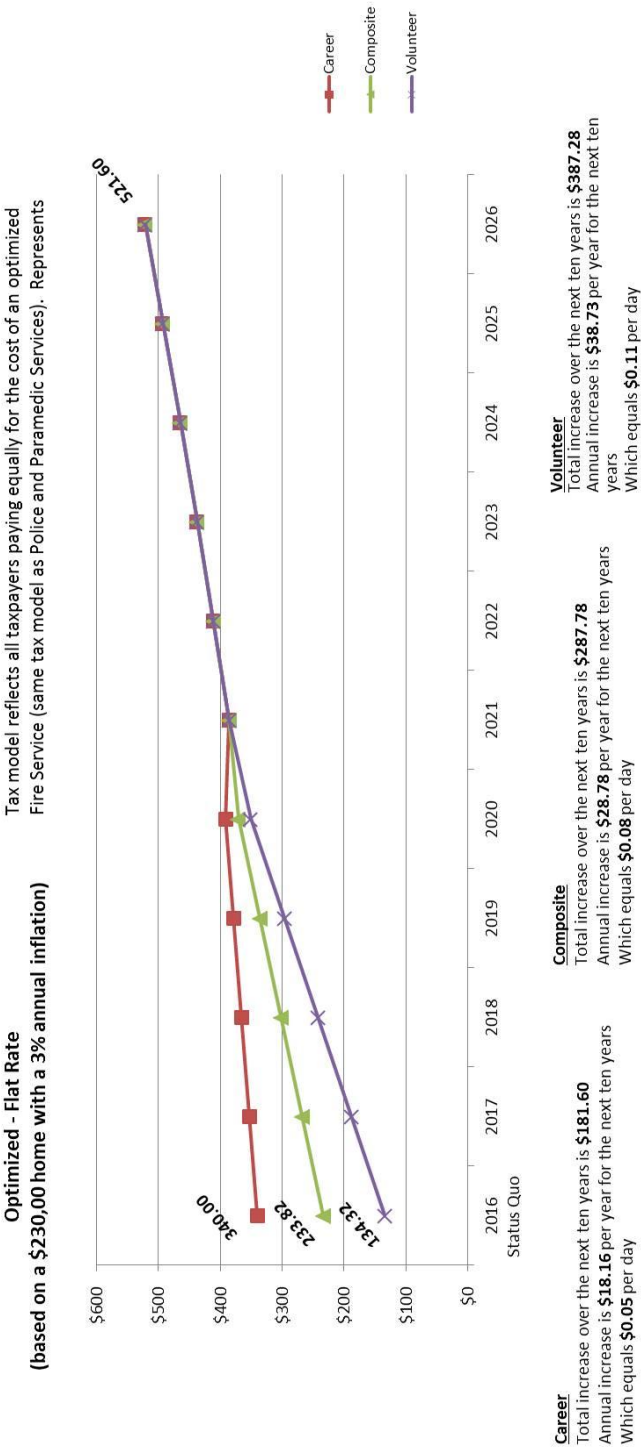
Status Quo











Summary - Pre & Post Optimization Analysis

Staffing - Budget (based on 2016 staffing levels):					
General Manager's Office					
Lionel E Lalonde Centre (CLELC)					
Emergency Management					
Fire Services					
Administration:					
Prevention					
Public Safety					
Training					
Fleet & Apparatus					
Suppression - Platoon Chiefs					
Suppression - Career					
Suppression - Volunteer					
Sub-Total					
Paramedic Services					
Administration					
Logistics					
Professional Standards					
Training					
Equipment Vehicle Technicians					
Platoon Superintendents					
Paramedics - ACP					
Paramedics - PCP					
Sub-Total					
Paramedic Part-Time Staffing (crew hours)					
Total Staffing					
Status Quo					
	5	5	6	1	Generalist * plus 5 year contract Project Management position
	5	5	5	0	
	2	2	2	0	
	5	5	6	1	Office Clerk
	8	8	10	2	Prevention Officers
	1	1	2	1	Public Education Officer
	4	4	4	0	
	3	3	3	0	
	4	4	4	0	
	104	104	162	58	
	350	350	135	(215)	
	479	479	326	(153)	
	7	7	8	1	Scheduler
	2	2	2	0	
	4	4	4	0	
	2	2	2	0	
	6	6	7	1	Equipment Vehicle Technician
	4	4	4	0	
	50	50	50	0	
	47	47	47	0	
	122	122	124	2	
	50,027	50,027	50,027	0	* Representing 40 Part-Time Staff
	613	613	463	(150)	

Summary - Pre & Post Optimization Analysis

	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
Operating Budget (based on 2016 approved budget):					
General Manager's Office					
Revenues:					
Provincial Grants & Subsidies	\$0	\$0	\$0	\$0	
User Fees	\$0	\$0	\$0	\$0	
Other Revenues	\$0	\$0	\$0	\$0	
Total Revenue	\$0	\$0	\$0	\$0	
Expenses:					
Salaries & Benefits	\$618,048	\$618,048	\$797,473	\$179,425	1 FTE * Generalist (NU 9/3) * plus 5 year Project Manager contract (NU 11/3)
Materials - Operating Expenses	\$65,672	\$65,672	\$65,672	\$0	
Energy Costs	\$0	\$0	\$0	\$0	
Purchased/Contract Services	\$0	\$0	\$0	\$0	
Debt Costs / Insurance & Taxes	\$0	\$0	\$0	\$0	
Grants - Transfer Payments	\$0	\$0	\$0	\$0	
Contr to Reserve and Capital	\$0	\$0	\$0	\$0	
Internal Recoveries	(\$683,720)	(\$683,720)	(\$863,145)	(\$179,425)	
Total Expenses	(\$0)	(\$0)	(\$0)	(\$0)	
Net Total	(\$0)	(\$0)	(\$0)	(\$0)	
Lionel E Lalonde Centre (CLELC)					
Revenues:					
Provincial Grants & Subsidies	\$0	\$0	\$0	\$0	
User Fees	(\$257,799)	(\$257,799)	(\$257,799)	\$0	
Contribution From Reserves	(\$100,091)	(\$100,091)	(\$100,091)	\$0	
Other Revenues	(\$40,000)	(\$40,000)	(\$40,000)	\$0	
Total Revenue	(\$397,890)	(\$397,890)	(\$397,890)	\$0	
Expenses:					
Salaries & Benefits	\$533,157	\$533,157	\$533,157	\$0	
Materials - Operating Expenses	\$231,137	\$231,137	\$231,137	\$0	
Energy Costs	\$310,023	\$310,023	\$310,023	\$0	
Purchased/Contract Services	\$202,750	\$202,750	\$202,750	\$0	
Debt Costs / Insurance & Taxes	\$100,091	\$100,091	\$100,091	\$0	
Grants - Transfer Payments	\$0	\$0	\$0	\$0	
Contr to Reserve and Capital	\$442,281	\$442,281	\$442,281	\$0	
Internal Recoveries	(\$1,160,424)	(\$1,138,893)	(\$1,138,893)	\$21,531	Cost recovery for additional positions in GM's Office
Total Expenses	\$659,015	\$659,015	\$680,546	\$21,531	
Net Total	\$261,125	\$261,125	\$282,656	\$21,531	

Summary - Pre & Post Optimization Analysis

	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
Emergency Management					
Revenues:					
Provincial Grants & Subsidies	\$0	\$0	\$0	\$0	
User Fees	\$0	\$0	\$0	\$0	
Other Revenues	(\$6,500)	(\$6,500)	(\$6,500)	\$0	
Total Revenue	(\$6,500)	(\$6,500)	(\$6,500)	\$0	
Expenses:					
Salaries & Benefits	\$211,359	\$211,359	\$211,359	\$0	
Materials - Operating Expenses	\$154,316	\$154,316	\$154,316	\$0	
Energy Costs	\$413	\$413	\$413	\$0	
Purchased/Contract Services	\$12,000	\$12,000	\$12,000	\$0	
Debt Costs / Insurance & Taxes	\$0	\$0	\$0	\$0	
Grants - Transfer Payments	\$20,000	\$20,000	\$20,000	\$0	
Contr to Reserve and Capital	\$11,047	\$11,047	\$11,047	\$0	
Internal Recoveries	\$294,586	\$294,586	\$317,911	\$23,325	Cost recovery for additional positions in GM's Office
Total Expenses	\$703,721	\$703,721	\$727,046	\$23,325	
Net Total	\$697,221	\$697,221	\$720,546	\$23,325	

Summary - Pre & Post Optimization Analysis

	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
Fire Services					
Revenues:					
Provincial Grants & Subsidies	\$0	\$0	\$0	\$0	
User Fees	(\$224,820)	(\$224,820)	(\$224,820)	(\$0)	
Contribution From Reserves	(\$118,950)	(\$118,950)	(\$118,950)	\$0	
Other Revenues	(\$49,152)	(\$49,152)	(\$49,152)	\$0	
Total Revenue	(\$392,922)	(\$392,922)	(\$392,922)	\$0	
Expenses:					
Salaries & Benefits	\$19,819,396	\$19,819,396	\$27,929,554	\$8,110,158	Add: * 58 Career FF * 2 x Prevention Officer (FIR 11/1) * 1 x Public Education Officer (FIR 11/1) * 1 x Office Clerk (FIR 14/1) Less: * 215 x Volunteers
Materials - Operating Expenses	\$1,313,100	\$1,313,100	\$1,295,294	(\$17,806)	
Equipment Costs	\$49,894	\$49,894	\$49,894	\$0	
Energy Costs	\$410,369	\$410,369	\$272,912	(\$137,457)	
Purchased/Contract Services	\$160,436	\$160,436	\$147,936	(\$12,500)	
Debt Costs / Insurance & Taxes	\$13,000	\$5,271,682	\$3,100,508	(\$2,171,174)	Status Quo - Fully Funded = \$5,258,682 Optimized = \$3,087,508
Grants - Transfer Payments	\$0	\$0	\$0	\$0	
Contr to Reserve - Presumptive Legislation	\$0	\$1,147,376	\$719,579	(\$427,797)	Status Quo - Fully Funded Add'l \$758K to eliminate the capital gap for vehicles & major equipment plus \$250K for future building capital needs.
Contr to Reserve and Capital	\$1,255,918	\$2,262,657	\$1,777,057	(\$485,600)	Optimized: Add'l \$271K to eliminate the capital gap for vehicles & major equipment plus \$250K for future building capital needs
Internal Recoveries	\$1,715,275	\$1,715,275	\$1,537,345	(\$177,930)	Reduction in rent allocation for space used at CLEIC plus cost recovery for additional positions in GM's Office
Total Expenses	\$24,737,388	\$32,150,186	\$36,830,079	\$4,679,893	
Net Total	\$24,344,467	\$31,757,264	\$36,437,156	\$4,679,892	

Summary - Pre & Post Optimization Analysis

	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
Paramedic Services					
Revenues:					
Provincial Grants & Subsidies	(\$10,698,366)	(\$11,555,322)	(\$11,414,863)	\$140,459	50/50 provincial funding
User Fees	(\$11,723)	(\$11,723)	(\$11,723)	\$0	
Other Revenues	(\$423,869)	(\$423,869)	(\$423,869)	\$0	
Total Revenue	(\$11,133,958)	(\$11,990,914)	(\$11,850,455)	\$140,459	
Expenses:					
Salaries & Benefits	\$15,938,953	\$15,938,953	\$16,059,146	\$120,193	2 FTE's * Scheduler (NU 6/3) * Equipment Vehicle Technician (IW 5/3)
Materials - Operating Expenses					
Energy Costs	\$1,424,098	\$1,424,098	\$1,424,098	\$0	
Prof Development & Training	\$336,846	\$336,846	\$336,846	\$0	
Purchased/Contract Services	\$71,528	\$71,528	\$71,528	\$0	
	\$413,824	\$413,824	\$413,824	\$0	
Debt Costs / Insurance & Taxes	\$0	\$2,043,705	\$2,104,086	\$60,381	Status Quo - Fully Funded = \$2,043,705 Optimized = \$2,104,086
Grants - Transfer Payments	\$0	\$0	\$0	\$0	
Contr to Reserve - Presumptive Legislation	\$0	\$223,198	\$231,151	\$7,953	
Contr to Reserve and Capital	\$961,105	\$961,105	\$961,105	\$0	
Internal Recoveries	\$2,132,978	\$2,132,978	\$1,663,534	(\$469,444)	
Total Expenses	\$21,279,333	\$23,546,236	\$23,265,318	(\$280,917)	Reduction in rent allocation for space used at CLELC plus cost recovery for additional positions in GM's Office
Net Total	\$10,145,374	\$11,555,322	\$11,414,863	(\$140,459)	
Total Operating Budget	\$35,448,187	\$44,270,932	\$48,855,220	\$4,584,289	

Summary - Pre & Post Optimization Analysis

Front-Line Vehicles: Engine - Commercial Engine - Custom Tanker Support - Rehab Units Ladder (Aerial) Support - Bush Trucks Boat & Trailer Hazmat Unit Rescue Units Total Front-Line Vehicles	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
	14	14	3	(11)	
	13	13	16	3	
	11	11	11	0	
	11	11	2	(9)	
	4	4	2	(2)	
	11	11	6	(5)	
	6	6	7	1	
	1	1	1	0	
	2	2	0	(2)	
	73	73	48	(25)	
Capital - Vehicles & Major Equipment: Estimated Replacement Costs - Front-Line Vehicles (includes boats & trailers) Estimated Replacement Costs - Major Equipment & Non Front-Line Vehicles Total Capital - Vehicles & Equipment (reduction in overall value of assets)	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
	\$28,247,265	\$28,247,265	\$20,739,155	(\$7,508,110)	* Based on a 20 year life cycle for Vehicles & 10 year life cycle for Boats / Trailers
	\$8,048,028	\$8,048,028	\$6,898,907	(\$1,149,121)	* Based on life cycles of 15, 10 and/or 5 years depending on the type of equipment and legislative requirements.
	\$36,295,293	\$36,295,293	\$27,638,062	(\$8,657,231)	
Capital Gap (2017 - 2036): Estimated Capital Requirements Estimated Capital Funding Total Capital Gap (cost avoidance)	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
	\$47,251,059	\$47,251,059	\$36,159,614	(\$11,091,445)	
	\$31,125,814	\$47,251,249	\$36,159,873	(\$11,091,375)	
	(\$16,125,245)	\$189	\$259	\$70	

Summary - Pre & Post Optimization Analysis

	Status Quo	Status Quo (Fully Funded)	Optimized	Impact	Notes
Stations:					
Emergency Services Stations	8	8	9	1	Co-habitation stations (shared with Fire & Paramedic Services)
Fire Station - Stand Alone	16	16	5	(11)	
Paramedic Stations - Stand-Alone	2	2	2	0	Moving out of Chelmsford & Capreol and building 2 new posting stations (Downtown & New Sudbury)
Headquarters	1	1	1	0	Moving out of Azilda and building a new HQ at Lasalle & Notre Dame
Total Stations	27	27	17	(10)	
Station Costs:					
Cost to Build / Renovate	\$0	\$134,981,452	\$95,964,357	(\$39,017,094)	* Repayment included in Operating Budget - Internal Debt Financing option @ 3.5% over 30 years ** Doesn't include land acquisitions
Market Assessments - Sale of Buildings	\$0	\$0	(\$3,278,000)	(\$3,278,000)	* Due to the condition of the Red Deer Lake station - no market assessment available
Total Station Costs:	\$0	\$134,981,452	\$92,686,357	(\$42,295,094)	Doesn't include any land acquisitions

		Station	Station #	Age	TOTAL
Fire - Only	Move - Build	Van Horne	1	0	\$3,516,038
Paramedic - Only	Build	Downtown		0	\$1,593,360
Emergency Services	Move - Build	Minnow Lake	2	0	\$4,638,478
Emergency Services	Close (move to New HQ)	New Sudbury	3	0	
Paramedic - Only	Build	New Sudbury		0	\$1,360,655
Emergency Services	Renovate	Long Lake	4	39	\$6,770,923
Fire - Only	Close	Copper Cliff	5	0	
Emergency Services	Build	Waters	6	0	\$5,782,786
Fire - Only	Close	Lively	7	0	
Fire - Only	Renovate	Whitefish	8	37	\$5,172,059
Fire - Only	Close	Beaver Lake	9	0	
Fire - Only	Re-Purpose	Azilda	10	46	\$0
Emergency Services	Move - Build	Chelmsford	11	0	\$5,413,441
Fire - Only	Renovate	Dowling	12	46	\$3,401,639
Fire - Only	Close	Vermillion	13	0	
Emergency Services	Renovate	Levack	14	45	\$5,242,086
Emergency Services	Move - Build	Val Caron	15	0	\$5,803,410
Emergency Services	Close	Val Therese	16	0	
Emergency Services	Move - Build	Hanmer	17	0	\$3,926,038
Emergency Services	Renovate	Capreol	18	34	\$5,386,886
Paramedic - Only	Re-Purpose	Capreol		34	\$0
Emergency Services	Move - Build	Garson	20	0	\$5,408,233
Fire - Only	Close	Falconbridge	21	0	
Fire - Only	Renovate	Skead	22	36	\$4,253,198
Fire - Only	Close	Coniston	23	0	
Fire - Only	Renovate	Wahnapiatae	24	40	\$4,229,198
Fire - Only	Close	Red Deer Lake	25	0	\$0
Emergency Services	Build	New Headquarters		0	\$22,232,932
Total Cost to Build / Renovate Stations					\$95,964,357
Sale of Buildings					(\$3,278,000)
Net Cost to Build / Renovate Stations					\$92,686,357
Debt Financing @ 3.5% over 30 years					\$5,191,594

Assumptions:

Estimated Square Footage

	Fire	Paramedic	Total
Van Horne	11,000	4,300	15,300
Career	11,000	2,000	13,000
Composite	13,000	2,000	15,000
Volunteer	9,000	2,000	11,000
Paramedic - Stand Alone	3,600		3,600
Head Quarters	30,000	30,000	60,000

Station maintenance costs applied to any building that will not be replaced within 5 years

Annual increase for construction rates = 2.0% per year

Construction rate of \$350 per square foot as provided by Real Estate Division. Includes estimates for architectural and engineering fees.

Building Replacement
Estimated Amortization Schedules

Purchase Price \$ 95,964,357 30 Years
Payment (Annual) \$ 5,191,594
Interest Rate 3.5%

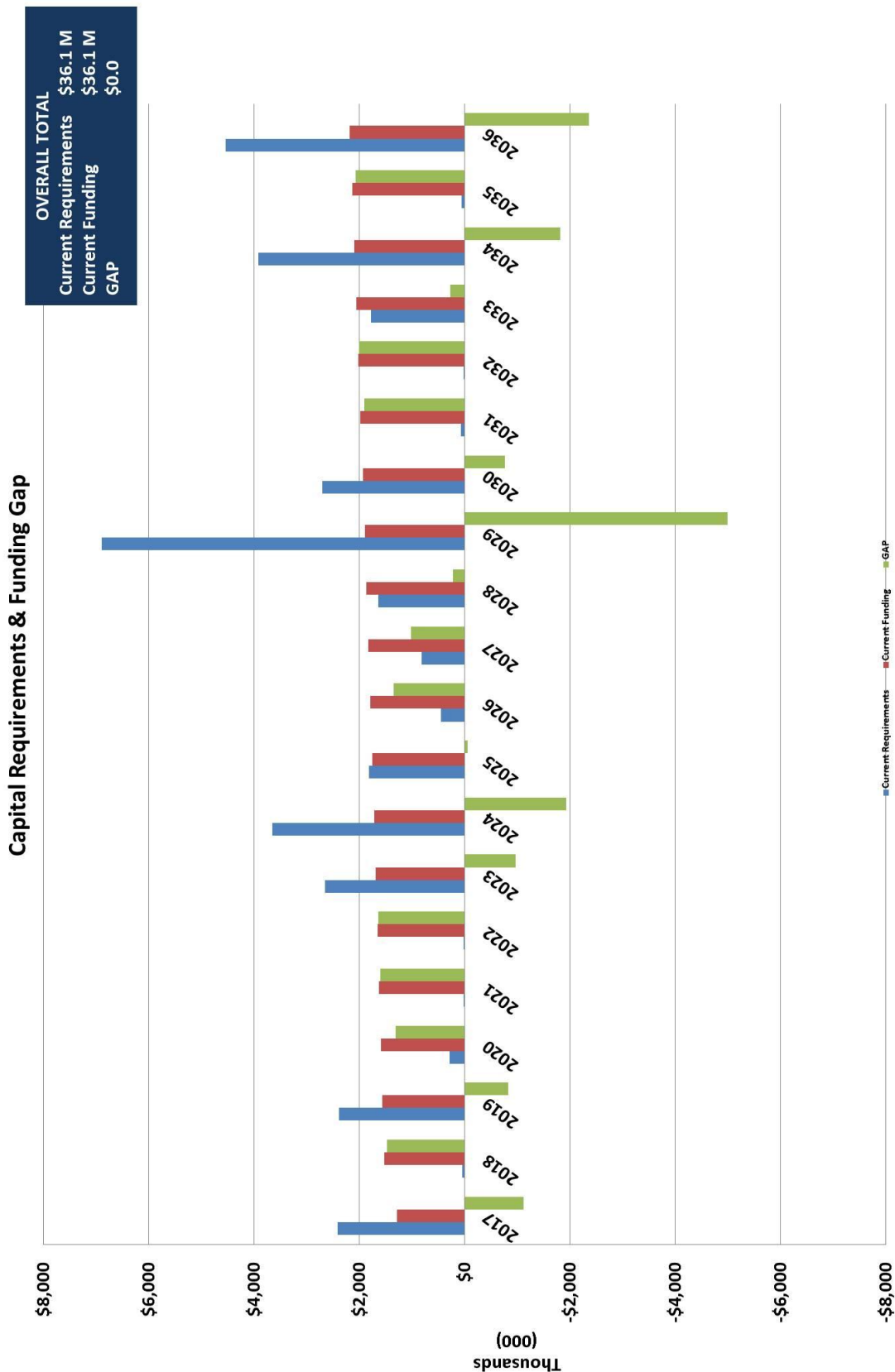
Date	Remaining Principal	Payment	Interest	Principal
31-Dec-17	95,964,357	5,191,594	3,320,367	1,871,227
31-Dec-18	94,093,130	5,191,594	3,255,622	1,935,971
31-Dec-19	92,157,158	5,191,594	3,188,638	2,002,956
31-Dec-20	90,154,202	5,191,594	3,119,335	2,072,258
31-Dec-21	88,081,944	5,191,594	3,047,635	2,143,959
31-Dec-22	85,937,986	5,191,594	2,973,454	2,218,139
31-Dec-23	83,719,846	5,191,594	2,896,707	2,294,887
31-Dec-24	81,424,959	5,191,594	2,817,304	2,374,290
31-Dec-25	79,050,669	5,191,594	2,735,153	2,456,441
31-Dec-26	76,594,228	5,191,594	2,650,160	2,541,433
31-Dec-27	74,052,795	5,191,594	2,562,227	2,629,367
31-Dec-28	71,423,428	5,191,594	2,471,251	2,720,343
31-Dec-29	68,703,084	5,191,594	2,377,127	2,814,467
31-Dec-30	65,888,617	5,191,594	2,279,746	2,911,848
31-Dec-31	62,976,770	5,191,594	2,178,996	3,012,598
31-Dec-32	59,964,172	5,191,594	2,074,760	3,116,833
31-Dec-33	56,847,339	5,191,594	1,966,918	3,224,676
31-Dec-34	53,622,663	5,191,594	1,855,344	3,336,250
31-Dec-35	50,286,413	5,191,594	1,739,910	3,451,684
31-Dec-36	46,834,729	5,191,594	1,620,482	3,571,112
31-Dec-37	43,263,617	5,191,594	1,496,921	3,694,673
31-Dec-38	39,568,945	5,191,594	1,369,085	3,822,508
31-Dec-39	35,746,436	5,191,594	1,236,827	3,954,767
31-Dec-40	31,791,669	5,191,594	1,099,992	4,091,602
31-Dec-41	27,700,067	5,191,594	958,422	4,233,171
31-Dec-42	23,466,896	5,191,594	811,955	4,379,639
31-Dec-43	19,087,257	5,191,594	660,419	4,531,175
31-Dec-44	14,556,082	5,191,594	503,640	4,687,953
31-Dec-45	9,868,128	5,191,594	341,437	4,850,157
31-Dec-46	5,017,972	5,191,594	173,622	5,017,972
TOTAL		155,747,813	59,783,456	95,964,357

Optimized Model Capital Equipment Requirements

Year	Current Requirements	Current Funding	GAP
2017	\$2,408,303	\$1,281,036	(\$1,127,267)
2018	\$47,599	\$1,527,057	\$1,479,458
2019	\$2,382,944	\$1,557,598	(\$825,345)
2020	\$278,914	\$1,588,750	\$1,309,836
2021	\$23,306	\$1,620,525	\$1,597,220
2022	\$9,366	\$1,652,936	\$1,643,570
2023	\$2,657,715	\$1,685,994	(\$971,720)
2024	\$3,653,457	\$1,719,714	(\$1,933,743)
2025	\$1,811,550	\$1,754,109	(\$57,441)
2026	\$445,376	\$1,789,191	\$1,343,814
2027	\$811,870	\$1,824,975	\$1,013,105
2028	\$1,642,394	\$1,861,474	\$219,081
2029	\$6,901,046	\$1,898,704	(\$5,002,342)
2030	\$2,702,798	\$1,936,678	(\$766,120)
2031	\$69,358	\$1,975,411	\$1,906,053
2032	\$11,700	\$2,014,919	\$2,003,220
2033	\$1,783,430	\$2,055,218	\$271,788
2034	\$3,912,914	\$2,096,322	(\$1,816,592)
2035	\$62,565	\$2,138,249	\$2,075,683
2036	\$4,543,009	\$2,181,014	(\$2,361,996)
TOTAL	\$36,159,614	\$36,159,873	\$259

Optimized Capital Inventory By Category

Category	Quantity	Sum of Estimated Replacement Cost
Communication	1013	\$1,901,896
Equipment	1819	\$3,274,128
Personal Protective Equipment (PPE)	2353	\$1,087,435
Vehicle	24	\$635,448
Vehicle - Front Line	56	\$20,739,155
Grand Total	5265	\$27,638,062





Reports & Documents (R)



Fire Underwriters Survey
A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

April 8th, 2016

Greater Sudbury Fire Services
239 Montee Principale, Unit 5
Azilda, ON
P0M 1B0

Attention: Trevor Bain, Fire Chief

Fire Underwriters Survey – Corporation of the City of Greater Sudbury

Fire Underwriters Survey is a national organization that represents more than 90 percent of the private sector and casualty insurers in Canada. Fire Underwriters Survey provides data to program subscribers regarding public fire protection for fire insurance statistical and underwriting evaluation.

Fire Underwriters Survey conducted an assessment for each area of the fire defenses primarily for fire insurance grading and classification purposes. The following letter provides a brief description of the grading process.

The Public Fire Protection Classification (PFPC) is a numerical grading system scaled from 1 to 10 that is used by Commercial Lines¹ insurers. Class 1 represents the highest grading possible and Class 10 represents an unrecognized level of fire protection, or fire protection beyond 5 km by road travel distance from the nearest responding fire station. The PFPC grading system evaluates the ability of a community's fire protection programs to prevent and control major fires that may occur in multi-family residential, commercial, industrial, institutional buildings, and course of construction developments.

Fire Underwriters Survey also assigns a second grade for fire protection. The second grading system, entitled Dwelling Protection Grade (DPG), assesses the protection available for small buildings such as single-family dwellings and is used by Personal Lines² insurers.

The DPG is a numerical grading system scaled from 1 to 5. One (1) is the highest grading possible and five (5) indicates little or no fire protection is present; Class 5 also represents fire protection beyond 8 km by road travel distance. This grading reflects the ability of a community to handle fires in small buildings such as single family dwellings and semi-detached dwellings.

We are pleased to inform that our analysis of the City of Greater Sudbury that our fire insurance classification assessment is complete. The following two tables outline past and present Public Fire Protection Classifications and the Dwelling Protection Grades attributed to the City of Greater Sudbury.

1 Commercial Lines: A distinction marking property and liability coverage written for business or entrepreneurial interests (includes institutional, industrial, multi-family residential and all buildings other than detached dwellings that are designated single-family residential or duplex) as opposed to Personal Lines.

2 Personal Lines: Insurance covering the liability and property damage exposures of private individuals and their households as opposed to Commercial Lines. Typically includes all detached dwellings that are designated single family residential or duplex.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Table 1 – Public Fire Protection Classification (PFPC) Updates for the City of Greater Sudbury

SUB DISTRICT(S) and (contract protection areas)	PFPC Previous	PFPC 2016	COMMENTS
Sudbury Fire Station 1 (H.P.A)	4	4	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Minnow Lake Fire Station 2 (H.P.A)	4	4	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
New Sudbury Fire Station 3 (H.P.A)	4	4	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Long Lake Fire Station 4 (H.P.A)	4	4	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Copper Cliff Fire Station 5 (H.P.A)	5	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Waters Fire Station 6 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Lively Fire Station 7 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Whitefish Fire Station 8 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Beaver Lake Fire Station 9 (F.P.A)	9	9	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Azilda Fire Station 10 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Chelmsford Fire Station 11 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Dowling Fire Station 12 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Vermillion Lake Fire Station 13 (F.P.A)	9	9	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Levack Fire Station 14 (H.P.A)	5	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Val Caron Fire Station 15	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Val Therese Fire Station 16 (H.P.A)	6	4	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Hanmer Fire Station 17 (H.P.A)	6	4	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Capreol Fire Station 18 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Garson Fire Station 20 (H.P.A)	6	4	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Falconbridge Fire Station 21 (H.P.A)	4	7P	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Skead Fire Station 22 (F.P.A)	9	9	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



c/o SCM Opta Information Intelligence

Coniston Fire Station 23 (H.P.A)	6	6	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Wahnapitae Fire Station 24 (H.P.A)	6	5	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Fire Hall Protected Area	9	9	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Rest	10	10	Rest – Commercial Lines insured property beyond 5 km by road of a fire hall.

Table 2 – Dwelling Protection Grade (DPG) Updates for the City of Greater Sudbury

SUB DISTRICT(S) and (contract protection areas)	DPG Previous	DPG 2016	COMMENTS
Sudbury Fire Station 1 (H.P.A)	1	1	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Sudbury Fire Station 1 (F.P.A)	3B	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Minnow Lake Fire Station 2 (H.P.A)	1	1	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Minnow Lake Fire Station 2 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
New Sudbury Fire Station 3 (H.P.A)	1	1	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
New Sudbury Fire Station 3 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Long Lake Fire Station 4 (H.P.A)	3A	1	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Long Lake Fire Station 4 (F.P.A)	N/A	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Copper Cliff Fire Station 5 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Copper Cliff Fire Station 5 (F.P.A)	N/A	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Waters Fire Station 6 (H.P.A)	N/A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Waters Fire Station 6 (F.P.A)	N/A	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Lively Fire Station 7 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Lively Fire Station 7 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Whitefish Fire Station 8 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Whitefish Fire Station 8 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Beaver Lake Fire Station 9 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Fire Underwriters Survey

A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

Azilda Fire Station 10 (H.P.A)	2	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Azilda Fire Station 10 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Chelmsford Fire Station 11 (H.P.A)	2	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Chelmsford Fire Station 11 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Dowling Fire Station 12 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Dowling Fire Station 12 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Vermillion Lake Fire Station 13 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Levack Fire Station 14 (H.P.A)	2	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Levack Fire Station 14 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Val Caron Fire Station 15 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Val Caron Fire Station 15 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Val Therese Fire Station 16 (H.P.A)	2	2	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Val Therese Fire Station 16 (F.P.A)	3B	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Hanmer Fire Station 17 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Hanmer Fire Station 17 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Capreol Fire Station 18 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Capreol Fire Station 18 (F.P.A)	3B	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Garson Fire Station 20 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Garson Fire Station 20 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Falconbridge Fire Station 21 (H.P.A)	3A	5	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Falconbridge Fire Station 21 (F.P.A)	4	5	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Skead Fire Station 22 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Coniston Fire Station 23 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Fire Underwriters Survey

A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

Coniston Fire Station 23 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Wahnapitae Fire Station 24 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Wahnapitae Fire Station 24 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Rest	5	5	Unprotected – Personal Lines insured properties further than 8 km by road of a fire hall.

As indicated in the table above, there are numerous stations that have received downgrades. Stations were downgrades are present reflect deficiencies within the fire insurance grading of Greater Sudbury, as it relates to Volunteer Rosters below 15 firefighters, and apparatus with a service life of over 20 years. Supporting documentation has been provided within the Appendices of this letter to assist the community in restoring their fire insurance classifications back to previous grades, should there be interest in doing so.

Please note that this letter is private and confidential. The underlying data of this report has been developed for fire insurance grading and classification purposes. This letter may be used by the stakeholders to assist in planning the future direction of fire protection services for the City of Greater Sudbury.

Please contact our office if there are any questions or comments regarding the intent or content found throughout this letter.

Robert Aguiar
Senior Public Fire Protection Specialist
Fire Underwriters Survey

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Fire Underwriters Survey
A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

Appendix A

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



TECHNICAL BULLETIN

FIRE UNDERWRITERS SURVEY™

A Service to Insurers and Municipalities

FIRE UNDERWRITERS SURVEY RECOMMENDED FREQUENCY OF FIRE PREVENTION INSPECTIONS

The frequency of fire prevention inspections for all occupancies should be specifically appropriate for the level of fire risk within the occupancy. The frequency of inspections will vary from one occupancy to another depending on:

1. Type of occupancy.
2. Occupant load.
3. Function.
4. Grade of hazard

As the fire risk increases, the frequency of inspections should also be increased.

The following table is a minimum frequency guideline for major occupancy classifications from the National Building Code of Canada.

<i>Group - Division National Building Code</i> Occupancy	Minimum Inspection Frequency
A-1	6 months
A-2	6 months
A-3	6 months
A-4	6 months
B-1	6 months
B-2	6 months
C	6 months
D	12 months
E	12 months
F-1	3 months
F-2	6 months
F-3	6 months

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Sample Customized Frequency Schedule

<i>Group - Division National Building Code Occupancy</i>	<i>Inspection Frequency</i>	<i>Group - Division National Building Code Occupancy</i>	<i>Inspection Frequency</i>
A-1 Movie Theaters Theaters	6 months 6 months	C Apartments Boarding Houses Hotels (Unsprinklered) Hotels (Sprinklered) Lodging Houses Motels Residential Schools	6 months 6 months 2 months 4 months 6 months 6 months 6 months
A-2 Bowling Alleys Churches Non-Residential Clubs Community Halls Dance Halls Exhibition Halls Gymnasiums Libraries Licensed Beverage Premises (Unsprinklered) Licensed Beverage Premises (Sprinklered) Museums Restaurants Schools Daycares Undertaker Premises	6 months 6 months 6 months 6 months 6 months 6 months 6 months 6 months 2 months 4 months 6 months 6 months 4 months 6 months 6 months	D Banks Barbers/Hairdressers Beauty Parlours Dental Offices Self-Services Laundries Medical Offices Offices Radio Stations Appliance Service/Rentals	12 months 12 months 12 months 12 months 12 months 12 months 12 months 12 months
A-3 Arenas Rinks Indoor Pools	6 months 6 months 6 months	E Department Stores Shops Stores Supermarkets	12 months 12 months 12 months 12 months
A-4 Stadiums	6 months	F-1 Feed Mills Spray Paint Booths	3 months 3 months
B-1 Jails Police Stations	6 months 6 months	F-2 Warehouses, Service Stations	12 months
B-2 Children's Custodial Homes Hospitals Nursing Homes	2 months 2 months 4months	F-3 Storage Garages, Medical Labs	12 months

For further information regarding frequency of fire prevention inspections for fire insurance grading purposes, please contact a Fire Underwriters Survey office.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Fire Underwriters Survey
A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

Appendix B

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



TECHNICAL BULLETIN

FIRE UNDERWRITERS SURVEY™

A Service to Insurers and Municipalities

Insurance Grading Recognition of Used or Rebuilt Fire Apparatus

The performance ability and overall acceptability of older apparatus has been debated between municipal administrations, the public fire service and many others for years. Fire Underwriters Survey (FUS) has reviewed experiences across Canada and in other countries and has developed a standard for acceptance of apparatus as the apparatus becomes less reliable with age and use.

The public fire service is unique compared to other emergency services in that fire apparatus vehicles are not continuously in use. However, when in use, the apparatus is subject to considerable mechanical stress due to the nature of its function. This stress does not normally manifest itself on the exterior of the equipment. It is effectively masked in most departments by a higher standard of aesthetic care and maintenance. Lack of replacement parts further complicates long term use of apparatus. Truck and pump manufacturers maintain a parts inventory for each model year for a finite time. After that period, obtaining necessary parts may be difficult. This parts shortage is particularly acute with fire apparatus due to the narrow market for these devices.

Fire Underwriters Survey lengthy experience in evaluating fire apparatus indicates that apparatus should be designed to an acceptable standard. The standard that is accepted throughout Canada by Fire Underwriters Survey is the Underwriters' Laboratories of Canada (ULC) Standard S515 (most updated version) titled, "Automobile Fire Fighting Apparatus," which was adopted as a National Standard of Canada in September 2004. Alternatively, NFPA 1901, the Standard for Automotive Fire Apparatus (most updated version) is also accepted by Fire Underwriters Survey with respect to apparatus design. Fire apparatus should be built by recognized manufacturers and tested by a suitably accredited third party.

Fire apparatus should respond to first alarms for the first fifteen years of service. During this period it has reasonably been shown that apparatus effectively responds and performs as designed without failure at least 95% of the time. For the next five years, it should be held in reserve status for use at major fires or used as a temporary replacement for out-of-service first line apparatus. Apparatus should be retired from service at twenty years of age. Present practice indicates the recommended service periods and protocols are usually followed by the first purchaser. However, at the end of that period, the apparatus is either traded in on new apparatus or sold to another fire department. At this juncture, the unit may have one or more faults which preclude effective use for emergency service. These deficiencies include:

- a. Inadequate braking system
- b. Slow pick-up and acceleration
- c. Structurally weakened chassis due to constant load bearing and/or overloading
- d. Pump wear

Western Canada	Ontario	Quebec	Atlantic Canada
3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528



FUS has modified its application of the age requirement for used or rebuilt apparatus. Due to municipal budget constraints within small communities we have continued to recognize apparatus over twenty years of age, provided the truck successfully meets the recommended annual tests and has been deemed to be in excellent mechanical condition. The specified service tests are outlined below under the heading “Recommended Service Tests for Used or Modified Fire Apparatus”. Testing and apparatus maintenance should only be completed by a technician who is certified to an appropriate level in accordance with NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications*.

Insurance grading recognition may be extended for a limited period of time if we receive documentation verifying that the apparatus has successfully passed the specified tests. If the apparatus does not pass the required tests or experiences long periods of “downtime” we may request the municipal authority to replace the equipment with new or newer apparatus. If replacement does not occur, fire insurance grading recognition may be revoked for the specific apparatus which may adversely affect the fire insurance grades of the community. This can also affect the rates of insurance for property owners throughout the community.

Table 1 Service Schedule for Fire Apparatus For Fire Insurance Grading Purposes

Apparatus Age	Major Cities ³	Medium Sized Cities ⁴	Small Communities ⁵ and Rural Centres
0 – 15 Years	First Line Duty	First Line Duty	First Line Duty
16 – 20 Years	Reserve	2 nd Line Duty	First Line Duty
20 – 25 Years ¹	No Credit in Grading	No Credit in Grading or Reserve ²	No Credit in Grading or 2 nd Line Duty ²
26 – 29 Years ¹	No Credit in Grading	No Credit in Grading or Reserve ²	No Credit in Grading or Reserve ²
30 Years +	No Credit in Grading	No Credit in Grading	No Credit in Grading

¹ All listed fire apparatus 20 years of age and older are required to be service tested by recognized testing agency on an annual basis to be eligible for grading recognition. (NFPA 1071)

² Exceptions to age status may be considered in a small to medium sized communities and rural centres conditionally, when apparatus condition is acceptable and apparatus successfully passes required testing.

³ Major Cities are defined as an incorporated or unincorporated community that has:

- a populated area (or multiple areas) with a density of at least 400 people per square kilometre; AND
- a total population of 100,000 or greater.

⁴ Medium Communities are defined as an incorporated or unincorporated community that has:

- a populated area (or multiple areas) with a density of at least 200 people per square kilometre; AND/OR
- a total population of 1,000 or greater.

⁵ Small Communities are defined as an incorporated or unincorporated community that has:

- no populated areas with densities that exceed 200 people per square kilometre; AND
- does not have a total population in excess of 1,000.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Table 2 Frequency of Listed Fire Apparatus Acceptance and Service Tests

	Frequency of Test					
	@ Time of Purchase New or Used	Annual Basis	@ 15 Years	@ 20 Years See Note 4	20 to 25 Years (annually)	After Extensive Repairs See Note 5
Recommended For Fire Insurance Purposes	Acceptance Test if new; Service Test if used & < 20 Years	Service Test	Acceptance Test	Acceptance Test	Acceptance Test	Acceptance or Service Test depending on extent of repair
Required For Fire Insurance Purposes	Acceptance Test if new; Service Test if used & < 20 Years	No Test Required	No Test Required	Acceptance Test	Acceptance Test	Acceptance or Service Test depending on extent of repair
Factor in FUS Grading	Yes	Yes	Yes	Yes	Yes	Yes
Required By Listing Agency	Acceptance Test	No	No	No	N/A	Acceptance Test
Required By NFPA See Note 6	Acceptance Test	Annual Service Test	Annual Service Test	Annual Service Test	Annual Service Test	Service Test

Note 1: See: 'Service Tests for Used or Rebuilt Fire Apparatus' for description of applicable tests

Note 2: Acceptance Tests consist of 60 minute capacity and 30 minute pressure tests

Note 3: Service Tests consist of 20 minute capacity test and 10 minute pressure test in addition to other listed tests

Note 4: Apparatus exceeding 20 years of age may not be considered to be eligible for insurance grading purposes regardless of testing. Application must be made in writing to Fire Underwriters Survey for an extension of the grade-able life of the apparatus.

Note 5: Testing after extensive repairs should occur regardless of apparatus age within reason.

Note 6: Acceptance Tests: See NFPA 1901, Standard for Automotive Fire Apparatus

Service Tests: See NFPA 1911, Standard for Service Tests of Fire Pump Systems on Fire Apparatus, Article 5.1

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



SERVICE TESTS FOR USED OR MODIFIED FIRE APPARATUS

The intent of this document is to ensure that all used or modified fire apparatus, equipped with a pump or used for tanker service, essentially meet the requirements of Underwriters' Laboratories of Canada (ULC) "Standard for Automobile Fire Fighting Apparatus" S515-04 or subsequent (current) editions of the Standard. Full adherence with the following specified tests is recommended when purchasing used apparatus.

Weight Tests

Load Balance Test:

When fully laden (including a 460kg (1000 lbs) personnel weight, full fuel and water tanks, specified load of hose and miscellaneous equipment), the vehicle shall have a load balance of 22% to 50% of total vehicle mass on the front axle and 50% to 78% of this mass on the rear axle.

Distribution of mass of 33% and 67% respectively on the front and rear axles is preferable for a vehicle having dual rear tires or tandem rear axles.

For a vehicle having tandem rear axles and dual tires on each axle, a loading of between 18% and 25% on the front axle with the balance of mass on the rear axles is permissible.

Road Tests

Acceleration Tests:

- 2.1.1) From a standing start, the apparatus shall attain a true speed of 55 km/h (35 mph) within 25 seconds for Pumpers carrying up to 3,150 litres (700 gallons) of water.

For apparatus carrying in excess of 3,150 litres (700 gallons) or apparatus equipped with aerial ladders or elevating platforms, a true speed of 55 km/h (35 mph) in 30 seconds should be attained.

- 2.1.2) The vehicle should attain a top speed of at least 80 km/h (50mph).

Braking Test:

The service brakes shall be capable of bringing the fully laden apparatus to a complete stop from an initial speed of 30 km/h (20 mph) in a distance not exceeding 9 metres (30 feet) by actual measurement. The test should be conducted on a dry, hard surfaced road that is free of loose material, oil and grease.

Pump Performance Tests

Hydrostatic Test

Recent evidence of hydrostatic testing of the pump for 10 minutes at a minimum pressure of 3,400 kPa (500 psi). APPLICABLE TO NEW OR REBUILT PUMPS ONLY (see 3.3).

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Priming and Suction Capability Tests

Vacuum Test:

The pump priming device, with a capped suction at least 6 metres (20 feet) long, shall develop -75 kPa (22 inches of mercury) at altitudes up to 300 metres (1000 feet) and hold the vacuum with a drop of not in excess of 34 kPa (10 inches of mercury) in 10 minutes.

For every 300 metres (1000 feet) of elevation, the required vacuum shall be reduced 3.4 kPa (1 inch mercury).

The primer shall not be used after the 10-minute test period has been started. The test shall be made with discharge outlets uncapped.

Suction Capability Test:

The pump (in parallel or series) when dry, shall be capable of taking suction and discharging water with a lift of not more than 3 metres (10 feet) through 6 metres (20 feet) of suction hose of appropriate size, in not more than 30 seconds and not over 45 seconds for 6000 L/min (1320 Igpm) or larger capacity pumps. Where front or rear suction is provided on midship pumps, an additional 10 seconds priming time will be allowed. The test shall be conducted with all discharge caps removed.

Pump Performance

Capacity Test:

Consists of drafting water (preferably with a 10 feet lift) and pumping the rated capacity at 1000 kPa (150 psi) net pump pressure for a continuous period of at least 1 hour.

Pressure Test:

Under the same conditions as in 3.3.1 above pumping 50% of the rated capacity at 1700 kPa (250 psi) net pump pressure for at least ½ hour

For additional information on the above noted tests and test procedures, the following documents provide useful data:

- Underwriters Laboratories of Canada (ULC) publication titled S515 Standard for Automobile Fire Fighting Apparatus, latest edition.
- Fire Underwriters Survey (FUS) publication titled Fire Stream Tables and Testing Data latest edition.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



c/o SCM Opta Information Intelligence

- International Fire Service Training Association (IFSTA) publication titled Fire Department Pumping Apparatus, latest edition.
- National Fire Protection Association (NFPA) 1901 Standard for Automotive Fire Apparatus, latest edition.
- National Fire Protection Association (NFPA) 1911 Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus, latest edition.
- National Fire Protection Association (NFPA) 1912 Standard for Fire Apparatus Refurbishing, latest edition.

For further information regarding the acceptability of emergency apparatus for fire insurance grading purposes, please contact:

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Fire Underwriters Survey
A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

Appendix C

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



TECHNICAL BULLETIN

FIRE UNDERWRITERS SURVEY™

A Service to Insurers and Municipalities

LADDERS AND AERIALS: WHEN ARE THEY REQUIRED OR NEEDED?

Numerous standards are used to determine the need for aerial apparatus and ladder equipment within communities. This type of apparatus is typically needed to provide a reasonable level of response within a community when buildings of an increased risk profile (fire) are permitted to be constructed within the community.

Please find the following information regarding the requirements for aerial apparatus/ladder companies from the Fire Underwriters Survey Classification Standard for Public Fire Protection.

Fire Underwriters Survey

Ladder/Service company operations are normally intended to provide primary property protection operations such as:

- 1.) Forcible entry;
- 2.) Utility shut-off;
- 3.) Ladder placement;
- 4.) Ventilation;
- 5.) Salvage and Overhaul;
- 6.) Lighting.

Response areas with five (5) buildings that are three (3) stories or 10.7 meters (35 feet) or more in height, or districts that have a Basic Fire Flow greater than 15,000 LPM (3,300 IGPM), or any combination of these criteria, should have a ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed ladder companies. When no individual response area/district alone needs a ladder company, at least one ladder company is needed if the sum of buildings in the fire protection area meets the above criteria.

The needed length of an aerial ladder, an elevating platform and an elevating stream device shall be determined by the height of the tallest building in the ladder/service district (fire protection area) used to determine the need for a ladder company. One storey normally equals at least 3 meters (10 feet). Building setback is not to be considered in the height determination. An allowance is built into the ladder design for normal access. The maximum height needed for grading purposes shall be 30.5 meters

Western Canada	Ontario	Quebec	Atlantic Canada
3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528



Exception: When the height of the tallest building is 15.2 meters (50 feet) or less no credit shall be given for an aerial ladder, elevating platform or elevating stream device that has a length less than 15.2 meters (50 feet). This provision is necessary to ensure that the water stream from an elevating stream device has additional "reach" for large area, low height buildings, and the aerial ladder or elevating platform may be extended to compensate for possible topographical conditions that may exist. See Fire Underwriters Survey - Table of Effective Response (attached).

Furthermore, please find the following information regarding communities' need for aerial apparatus/ladder companies within the National Fire Protection Association.

NFPA

Response Capabilities: The fire department should be prepared to provide the necessary response of apparatus, equipment and staffing to control the anticipated routine fire load for its community.

NFPA Fire Protection Handbook, 20th Edition cites the following apparatus response for each designated condition:

HIGH-HAZARD OCCUPANCIES (schools, hospitals, nursing homes, explosive plants, refineries, high-rise buildings, and other high-risk or large fire potential occupancies):

*At least four pumpers, **two ladder trucks** (or combination apparatus with equivalent capabilities), two chief officers, and other specialized apparatus as may be needed to cope with the combustible involved; not fewer than 24 firefighters and two chief officers.*

MEDIUM-HAZARD OCCUPANCIES (apartments, offices, mercantile and industrial occupancies not normally requiring extensive rescue or firefighting forces):

*At least three pumpers, **one ladder truck** (or combination apparatus with equivalent capabilities), one chief officer, and other specialized apparatus as may be needed or available; not fewer than 16 firefighters and one chief officer.*

LOW-HAZARD OCCUPANCIES (one-, two-, or three-family dwellings and scattered small businesses and industrial occupancies):

*At least two pumpers, **one ladder truck** (or combination apparatus with equivalent capabilities), one chief officer, and other specialized apparatus as may be needed or available; not fewer than 12 firefighters and one chief officer.*

In addition to the previous references, the following excerpt from the 2006 Ontario Building Code is also important to consider when selecting the appropriate level of fire department response capacity and building design requirements with regard to built-in protection levels (passive and active fire protection systems).

Western Canada	Ontario	Quebec	Atlantic Canada
3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528



Excerpt: National Building Code 2006

A-3 Application of Part 3.

In applying the requirements of this Part, it is intended that they be applied with discretion to buildings of unusual configuration that do not clearly conform to the specific requirements, or to buildings in which processes are carried out which make compliance with particular requirements in this Part impracticable. The definition of “building” as it applies to this Code is general and encompasses most structures, including those which would not normally be considered as buildings in the layman's sense. This occurs more often in industrial uses, particularly those involving manufacturing facilities and equipment that require specialized design that may make it impracticable to follow the specific requirements of this Part. Steel mills, aluminum plants, refining, power generation and liquid storage facilities are examples. A water tank or an oil refinery, for example, has no floor area, so it is obvious that requirements for exits from floor areas would not apply. Requirements for structural fire protection in large steel mills and pulp and paper mills, particularly in certain portions, may not be practicable to achieve in terms of the construction normally used and the operations for which the space is to be used. In other portions of the same building, however, it may be quite reasonable to require that the provisions of this Part be applied (e.g., the office portions). Similarly, areas of industrial occupancy which may be occupied only periodically by service staff, such as equipment penthouses, normally would not need to have the same type of exit facility as floor areas occupied on a continuing basis. It is expected that judgment will be exercised in evaluating the application of a requirement in those cases when extenuating circumstances require special consideration, provided the occupants' safety is not endangered.

The provisions in this Part for fire protection features installed in buildings are intended to provide a minimum acceptable level of public safety. It is intended that all fire protection features of a building, whether required or not, will be designed in conformance with good fire protection engineering practice and will meet the appropriate installation requirements in relevant standards. Good design is necessary to ensure that the level of public safety established by the Code requirements will not be reduced by a voluntary installation.

Firefighting Assumptions

The requirements of this Part are based on the assumption that firefighting capabilities are available in the event of a fire emergency. These firefighting capabilities may take the form of a paid or volunteer public fire department or in some cases a private fire brigade. If these firefighting capabilities are not available, additional fire safety measures may be required.

Firefighting capability can vary from municipality to municipality. Generally, larger municipalities have greater firefighting capability than smaller ones. Similarly, older, well established municipalities may have better firefighting facilities than newly formed or rapidly growing ones. The level of municipal fire protection considered to be adequate will normally depend on both

Western Canada	Ontario	Quebec	Atlantic Canada
3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528



the size of the municipality (i.e., the number of buildings to be protected) and the size of buildings within that municipality. Since larger buildings tend to be located in larger municipalities, they are generally, but not always, favoured with a higher level of municipal protection.

Although it is reasonable to consider that some level of municipal firefighting capability was assumed in developing the fire safety provisions in Part 3, this was not done on a consistent or defined basis. The requirements in the Code, while developed in the light of commonly prevailing municipal fire protection levels, do not attempt to relate the size of building to the level of municipal protection. **The responsibility for controlling the maximum size of building to be permitted in a municipality in relation to local firefighting capability rests with the municipality. If a proposed building is too large, either in terms of floor area or building height, to receive reasonable protection from the municipal fire department, fire protection requirements in addition to those prescribed in this Code, may be necessary to compensate for this deficiency.** Automatic sprinkler protection may be one option to be considered.

The municipality may, in light of its firefighting capability, elect to introduce zoning restrictions to ensure that the maximum building size is related to available municipal fire protection facilities. This is, by necessity, a somewhat arbitrary decision and should be made in consultation with the local firefighting service, who should have an appreciation of their capability to fight fires.

The requirements of Subsection 3.2.3 are intended to prevent fire spread from thermal radiation assuming there is adequate firefighting available. It has been found that periods of from 10 to 30 minutes usually elapse between the outbreak of fire in a building that is not protected with an automatic sprinkler system and the attainment of high radiation levels. During this period, the specified spatial separations should prove adequate to inhibit ignition of an exposed building face or the interior of an adjacent building by radiation. Subsequently, however, reduction of the fire intensity by firefighting and the protective wetting of the exposed building face will often be necessary as supplementary measures to inhibit fire spread.

In the case of a building that is sprinklered throughout, the automatic sprinkler system should control the fire to an extent that radiation to neighboring buildings should be minimal. Although there will be some radiation effect on a sprinklered building from a fire in a neighboring building, the internal sprinkler system should control any fires that might be ignited in the building and thereby minimize the possibility of the fire spreading into the exposed building. NFPA 80A, "Protection of Buildings from Exterior Fire Exposures," provides additional information on the possibility of fire spread at building exteriors.

The water supply requirements for fire protection installations depend on the requirements of any automatic sprinkler installations and also on the number of fire streams that may be needed at any fire, having regard to the length of time the streams will have to be used. Both these factors are largely influenced by the conditions at the building to be equipped, and the quantity and pressure of water needed for the protection of both the interior and exterior of the building must be ascertained before the water supply is decided upon. Acceptable water supplies may be a

Western Canada	Ontario	Quebec	Atlantic Canada
3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528



Fire Underwriters Survey
A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

public waterworks system that has adequate pressure and discharge capacity, automatic fire pumps, pressure tanks, manually controlled fire pumps in combination with pressure tanks, gravity tanks, and manually controlled fire pumps operated by remote control devices at each hose station.

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



Fire Underwriters Survey
A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

Appendix D

Western Canada 3999 Henning Drive Burnaby, BC V5C 6P9 1 (800) 665-5661	Ontario 175 Commerce Valley Drive West Markham, ON L3T 7P6 1 (800) 268-8080	Quebec 1611 Cremazie Boulevard East Montreal, QC H2M 2P2 1 (800) 263-5361	Atlantic Canada 238 Brownlow Avenue, Suite 300 Dartmouth, NS B3B 1Y2 1 (800) 639-4528
--	--	---	---



PERSONAL LINES

Dwelling Protection Grade Terms Of Reference

Dwelling Protection Grade 1: Career, Fully Protected

DPG 1 is an indicator to insurers that the response to typical fires in single family residences (detached dwellings) located within 8 kilometres by road from the responding fire station will be a superior level of response from a career or composite fire department with reasonable staffing and with recognized water supplies.

This grade is an indicator to insurers that the responding fire department is very well established and has a sufficient number of career fire fighters such that the initial response to fires will consistently include a minimum of 3 career fire fighters (on-duty) and the fire chief (or other career officer). Response times for DPG 1 fire stations are expected to be good due to the typically short turn-out times and consistent availability of career fire fighters.

This grade is also an indicator that the water supply system is well-designed, reliable and will provide a favourable amount of water for fire suppression activities at fires in single family residences located within 300 metres (one hose lay) of a recognized fire hydrant.

Dwelling Protection Grade 2: Composite, Fully Protected

DPG 2 is an indicator to insurers that the response to fires in single family residences within 8 kilometres by road from the responding fire station will be an intermediate level of response from a primarily volunteer fire department with limited staffing and with recognized water supplies.

This grade is an indicator to insurers that responding fire department is well established and is likely a composite of career members and volunteers. The department has a sufficient number of career fire fighters such that the initial response will include a minimum of 1 career fire fighter (on-duty), a career fire chief (may be off-duty) and a minimum of 15 volunteers (or off-shift fire fighters). Response times for DPG 2 fire stations are expected to be somewhat delayed due to the unpredictability of turn-out times and varying availability of volunteers, however significantly superior to an all volunteer response.

This grade is also an indicator that the water supply system is well-designed, reliable and will provide a reasonable amount of water for fire suppression activities in single family residences located within 300 metres (one hose lay) of a recognized fire hydrant.



Dwelling Protection Grade 3A: Volunteer, Fully Protected

DPG 3A is an indicator to insurers that the response to fires in single family residences within 8 kilometres by road from the responding fire station will be a minimum level of response from a primarily volunteer fire department with recognized water supplies.

DPG 3A is an indicator to insurers that the fire department is recognized for fire insurance grading purposes and that the fire department roster has the minimum number of volunteers who are equipped and trained to provide a reasonable minimum response in a timely manner to typical fires in single family residences (detached dwellings) located within 8 kilometres by road of the responding fire station and located within 300 metres (one hose lay) of a recognized fire hydrant. Response times for DPG 3A fire stations are expected to be somewhat delayed due to the unpredictability of turn-out times and varying availability of volunteers.

This grade also indicates to insurers that the water supply system is recognized for fire insurance grading purposes and is maintained and reasonably reliable for use in fire suppression activities.

Dwelling Protection Grades 3B: Volunteer, Standard Shuttle, Semi-Protected (aka. Firehall Protected)

DPG 3B is an indicator to insurers that the response to fires in single family residences within 8 kilometres by road from the responding fire station will be a minimum level of response from a primarily volunteer fire department without recognized water supplies.

DPG 3B is an indicator to insurers that the fire department is recognized for fire insurance grading purposes and that the fire department is adequately manned, equipped and trained to provide a reasonable minimum response in a timely manner to typical fires in single family residences (detached dwellings) located within 8 kilometres by road of the responding fire station. Response times for DPG 3B fire stations are expected to be somewhat delayed due to the unpredictability of turn-out times and varying availability of volunteers.

This grade also indicates to insurers that there is NOT a recognized water supply system, however the fire department has adequate resources to utilize the "Specified Shuttle Service" when responding to fires. This grade typically requires the use of a pumper and mobile water supply apparatus together to provide limited quantities of water to the fire scene and may or may not be adequate to extinguish typical fires.



Dwelling Protection Grades 3B-S: Superior Tanker Shuttle Service Accredited

Superior Tanker Shuttle Service Accreditation indicates to insurers that the accredited fire hall has adequate equipment and resources to provide the minimum amount of water required for fire insurance grading purposes. The minimum amount of water required is 200 lpgm (one hose stream) and is the same flow rate required as a minimum for fire hydrants.

For a risk to be considered as STSS protected, the risk must lie within 8 kilometres by road of the responding fire station and within 5 kilometres by road of a recognized alternative water supply point.

This accreditation is an equivalency to the minimum requirements for hydrant protection as set out by the insurance industry and the Fire Underwriters Survey.

It is important to note that providing the minimum of one hose stream (200 lpgm) is not necessarily adequate for effective fire fighting, however it is the lowest rate of water delivery that is recognized for fire insurance grading. Communities should be encouraged to develop water supplies that provide required fire flows as calculated using the method specified in the Fire Underwriters Survey "Water Supply for Public Fire Protection"

Dwelling Protection Grades 3B-L: Large Diameter Hose Lay Accredited

Large Diameter Hose Lay Accreditation indicates to insurers that the accredited fire hall carries the appropriate equipment and has incorporated specialized procedures to allow extended coverage from recognized fire hydrants to a distance of 600 metres (two hose lays) from hydrants. This procedure involves relay pumping and large diameter hose. To be accredited the fire department must demonstrate that it can continuously deliver service within the same allotted time for set up as per normal hydrant operations.

For a risk to be considered as LDHL protected, the risk must lie within 8 kilometres by road of the responding fire station and within 600 metres (two hose lays) of a recognized fire hydrant.

This accreditation is an equivalency to the minimum requirements for hydrant protection as set out by the insurance industry and the Fire Underwriters Survey.

Dwelling Protection Grade 4: Volunteer, Limited Protection (Semi or Unprotected)

DPG 4 is an indicator to insurers that the fire department is recognized for fire insurance grading purposes however there are serious deficiencies in at least one significant area of fire protection that prohibit the delivery of a minimum level of response to typical fires in single family residences (detached dwellings) located within 8 kilometres by road of the responding fire station.

DPG 4 is normally given to communities with only one piece of apparatus (ex. a pumper) and no recognized water supplies. Without a second piece of apparatus (ex. mobile water supply), such a fire department will not be able to shuttle water to the fire scene. DPG 4 is also given to communities "borrowing" fire protection service from an adjacent community with a DPG 3B, and to communities who generally qualify for DPG 3B, but have one major deficiency.



Dwelling Protection Grade 5: Unprotected

DPG 5 is an indicator to insurers that there is no fire protection or that the fire protective service levels do not meet the minimum fire insurance grading standards.

Note: In some areas of Canada, Dwelling Protection Grades from 6 through 10 are used. This is carried over from previous editions of the Fire Insurance Grading Index and will be phased out. In all cases, the Dwelling Protection Grades from 6 through 10 have identical definitions to those from 1 through 5:

Dwelling Protection Grade1	=	Dwelling Protection Grade 6
Dwelling Protection Grade2	=	Dwelling Protection Grade 7
Dwelling Protection Grade3A	=	Dwelling Protection Grade 8C
Dwelling Protection Grade3B	=	Dwelling Protection Grade 8D
Dwelling Protection Grade4	=	Dwelling Protection Grade 9
Dwelling Protection Grade5	=	Dwelling Protection Grade 10*

DPG 10 is represented as DPG 0 in the grading index.

Dwelling Location - Note 1

Hydrant protection is not credited owing to a weak water supply or the failure to meet grading minimums. In addition to water supply limitations, deficiencies may exist in the fire department.

Dwelling Location - Note 2

Denotes those locations with fire protection grades 5 or 0, other than those receiving borrowed fire department service, that have sufficient water supply to receive creditable hydrant protection but, the fire department deficiencies preclude giving a protected grade.

Dwelling Location - Note 3

Hydrant protected area is situated further than 8 kilometres by road from the responding fire department.

Auditor General Risk Assessment Summary – Paramedic Services

		Risk Subject	Unmitigated Risk (/16)	Mitigated Risk (/16)	Mitigated Risk Evolving Paramedic Opportunities (/16)	Optimized Risk (/16)
Reputation	R1	Old ambulances may result in breakdowns and incidents	14	0.9	0.9	0.9
	R2	The city is not engaging the residents sufficiently to identify their service level expectations	14	3.5	3.5	2.9
	R3	Response to Coroner's report may be inadequate	14	4.2	3.4	3.4
	R4	Emergency response capability may be inadequate	16	4.0	3.6	3.2
	R5	Paramedic service levels do not meet the expectations of the public	14	3.5	3.5	2.9
	R6	Paramedic Association lobbies against proposal to rationalize services	9	3.2	3.2	3.2
	R7	Failure to deliver or implement reasonable optimization plan	9	1.4	1.4	1.4
	R8	HAZMat response capability may be inadequate	9	5.1	5.1	3.8
Operational	O1A	Paramedic stations are in wrong locations (Headquarters)	16	9.0	9.0	2.7
	O1B	Paramedic stations are in wrong locations (In-town posts)	12	6.8	6.8	2.4
	O1C	Paramedic stations are in wrong locations (Satellite posts)	12	6.8	6.8	2.4
	O2	Paramedic stations lack essential functionality	12	7.7	7.7	2.8
	O3	Turnover of senior staff	9	1.8	1.8	1.8
	O4	Death of a staff member in the workplace	16	0.8	0.8	0.8
	O5	Serious staff injuries occur while providing services	16	1.0	1.0	1.0
	O6	Insufficient management capacity to administer and manage staff effectively	12	4.3	4.3	3.5
	O7	Labor management and bargaining processes are inadequate to ensure sustainability	12	3.6	3.6	3.6
	O8	Excessive calls transferred to Paramedic Services from Ministry	12	4.3	3.5	3.5
	O9	Ineffective/inefficient deployment of staff in response to calls for service	16	4.8	3.7	3.7

****Information provided in this report relies on professional judgment and speculative assessments about potential effects if the risks identified here are realized.**

		Risk Subject	Unmitigated Risk (/16)	Mitigated Risk (/16)	Mitigated Risk Evolving Paramedic Opportunities (/16)	Optimized Risk (/16)
Operational	O10A	Service agreements with other EMS providers cause overlaps/gaps- City and area with MTR (Includes city, Capreol, Levack and Dowling)	12	3.0	3.0	2.6
	O10B	Service agreements with other EMS providers cause overlaps/gaps- City and area without MTR (excludes city, Capreol, Levack and Dowling)	16	4.0	4.0	3.2
	O11A	Emergency service providers are not coordinated effectively	12	2.4	2.4	2.4
	O11B	Serious staff and/or citizen injuries while enroute to the scene	16	3.2	3.2	3.2
	O12	Workforce planning processes are inadequate to ensure sustainability	12	3.0	3.0	3.0
	O13	Communications Systems fail	12	3.6	3.6	3.6
	O14	Information systems are inadequate to manage resources efficiently and effectively	12	2.4	2.4	2.4
	O15	Information systems are inadequate to identify, assess and mitigate risks effectively	12	2.4	2.4	2.4
	O16	Equipment failures compromise the effectiveness of services	16	0.8	0.8	0.8
	O17	Fleet may fail and compromise service delivery	14	0.9	0.9	0.9
	O18	Building deficiencies may compromise service delivery	10.5	5.1	5.1	3.9
Financial	F1	Paramedic services are not sustainable/affordable	16	2.6	2.6	2.6
	F2	OT costs are not being managed effectively	8	2.4	2.4	2.4
	F3	Labour costs are not sustainable/affordable	12	1.9	1.9	1.9
	F4	Equipment costs not sustainable/affordable	12	2.4	2.4	2.4
	F5	Training costs not being managed effectively	12	1.3	1.3	1.3
	F6	Purchases are not competitive/economical	8	1.2	1.2	1.2
	F7	Opportunities for cost recovery are not pursued effectively	12	1.3	1.3	1.3

***Information provided in this report relies on professional judgment and speculative assessments about potential effects if the risks identified here are realized.*

		Risk Subject	Unmitigated Risk (/16)	Mitigated Risk (/16)	Mitigated Risk Evolving Paramedic Opportunities (/16)	Optimized Risk (/16)
Financial	F8	Education and training not leveraged sufficiently to reduce Paramedic risk	12	1.9	1.9	1.9
	F9	Opportunities to share services and costs not pursued effectively	8	3.4	3.4	3.4
	F10	Unsustainable costs incurred from unrealistic expectations of public	8	2.0	2.0	2.0
	F11	The investment in fleet has been insufficient for effective Paramedic services	12	1.5	1.5	1.5
	F12	The investment in buildings has been insufficient for effective Paramedic services	12	1.5	1.5	1.5
	F13	Lack of effective asset management systems compromises budget decisions	12	3.6	3.6	3.0
	F14	Lack of effective LT financial planning processes in CGS compromises capital budget decisions	12	3.6	3.6	3.0
	F15	Ethical breaches in workplace by Paramedic Staff	12	1.1	1.1	1.1
	F16	Wasteful spending by Paramedic staff	12	0.1	0.1	0.1
	F17	Facilities costs are not sustainable/affordable	12	3.6	3.6	3.0
	F18	Financial impact of Paramedic Headquarters in wrong location	14	9.0	9.0	2.7
Legislative	L1	Presumptive legislation imposes unaffordable costs	12	3.0	3.0	2.6
	L2	New legislation imposes additional costs what are unaffordable	9	2.7	2.7	2.7
	L3	Other emergency providers downloading responsibilities	9	3.2	3.2	3.2
	L4	Opportunities to minimize overlaps with other providers not pursued	12	2.4	2.3	2.3
	L5	Lawsuits form failure to adequately provide Paramedic Services	16	3.2	3.2	2.7
	L6	Non-compliance with City policies	8	2.0	2.0	2.0

***Information provided in this report relies on professional judgment and speculative assessments about potential effects if the risks identified here are realized.*

Auditor General Risk Assessment Summary - Fire Services

		Risk	Unmitigated Risk (/16)	Mitigated Risk (/16)	Optimized Model Risk (/16)
Reputation	R1	Old trucks may result in breakdowns and incidents	10.5	8.5	3.8
	R2	Volunteer response is inconsistent, and may compromise service	12.0	10.8	4.9
	R3	Response to coroner's report may be inadequate	9.0	6.5	3.7
	R4	Fire Prevention and Education Services are inadequate	10.5	8.5 10.5	3.8
	R5	Fire response capability may be inadequate	11.3	4.8 10.2	1.2
	R6	Medical response capability may be inadequate	7.5	5.4 7.5	2.4
	R7	Technical Rescue (Water rescue, Trench Rescue, Confined Space Rescue) response capability may be inadequate	10.5	8.5 10.5	3.8
	R8	HAZMat response capability may be inadequate	11.3	10.2	2.5
	R9	Fire Service levels do not meet the expectations of the public	10.5	7.6	3.4
	R10	Fire association(s) lobbies against proposals to rationalize services	8.8	6.3	4.0
	R11	Failure to deliver or implement reasonable optimization plan	6.0	6.0	6.0
	R12	The City is not engaging the residents sufficiently to identify their service level expectations	6.0	6.0	6.0
	R13	Disaster Events	7.5	6.1	1.5
	O1	Fire stations are in wrong locations	15.0	13.5	2.2
	O2	Fire stations lack essential functionality	14.0	12.6	2.0
	O3	Volunteer staff are ineffective in terms of skills (training, knowledge and experience)	10.5	9.5	4.3
	O4	Volunteer staff response is unreliable	12.0	10.8	4.9
	O5	Insufficient management capacity to administrator and manage staff effectively	6.0	6.0	6.0

***Information provided in this report relies on professional judgment and speculative assessments about potential effects if the risks identified here are realized.*

		Risk	Unmitigated Risk (/16)	Mitigated Risk (/16)	Optimized Model Risk (/16)
Operational	O6	Old fleet is discounted by Fire Underwriters making insurance unaffordable for rural residents	4.0	4.0	4.0
	O7	24 hour shift creates potential liabilities from tired staff at the scene of an emergency incident.	9.0	7.3	7.3
	O8	Excessive calls transferred to Fire Services from Ministry	5.0	5.0	5.0
	O9	Ineffective/inefficient deployment of FT staff in response to calls for service	6.0	6.0	6.0
	O10	Service agreements with other EMS providers cause overlaps/gaps	9.0	7.3	3.3
	O11	Emergency service providers are not coordinated effectively	6.0	6.0	6.0
	O12	Serious staff and/or citizen injuries occur while enroute to the scene	11.3	9.1	4.1
	O13	Communication systems fail	6.0	6.0	6.0
	O14	Information systems security can be compromised	6.0	6.0	6.0
	O15	Workforce planning processes are inadequate to ensure sustainability	6.0	6.0	6.0
	O16	Labour management and bargaining processes are inadequate to ensure sustainability	7.5	7.5	7.5
	O17	Information systems are inadequate to manage resources efficiently and effectively	10.0	5.6	4.6
	O18	Information systems are inadequate to identify, assess and mitigate risks effectively	10.0	5.6	4.6
	O19	Turnover of senior staff	6.0	6.0	6.0
	O20	Death of a staff members in workplace	10.6	8.6	6.9
	O21	Operational equipment (non-fleet) may fail and compromise service delivery	9.0	7.3	3.3
	O22	Fleet may fail and compromise service delivery	10.5	8.5	3.8
	O23	Building deficiencies may compromise service delivery	9.0	8.1	3.6
	O24	24 hour shift creates potential liabilities from tired staff en route to an emergency incident.	8.8	7.1	7.1

****Information provided in this report relies on professional judgment and speculative assessments about potential effects if the risks identified here are realized.**

		Risk	Unmitigated Risk (/16)	Mitigated Risk (/16)	Optimized Model Risk (/16)
Financial	F1	Fire services are not sustainable/affordable	10.5	9.5	9.5
	F2	OT costs are not being managed effectively	6.0	6.0	6.0
	F3	Labour costs are not sustainable/affordable	9.8	8.8	8.8
	F4	Equipment costs not sustainable/affordable	6.3	6.3	5.1
	F5	Training costs not being managed effectively	6.0	6.0	6.0
	F6	Purchases are not competitive/economical	6.0	6.0	6.0
	F7	Opportunities for cost recovery are not pursued effectively	6.0	6.0	6.0
	F8	Education and training not leveraged sufficiently to reduce fire risks	7.5	7.5	6.1
	F9	Opportunities to share services and costs not pursued effectively	7.0	7.0	5.7
	F10	Unsustainable costs incurred from unrealistic expectations of public	6.0	6.0	2.7
	F11	The investment in fleet has been insufficient for effective fire services	14.0	11.3	5.1
	F12	The investment in buildings has been insufficient for effective fire services	15.0	12.2	3.0
	F13	Lack of effective asset management systems compromises budget decisions	10.5	8.5	4.8
	F14	Lack of effective LT financial planning processes in CGS compromises capital budget decisions	10.5	8.5	4.8
	F15	Ethical breaches in workplace by Fire staff	6.0	6.0	6.0
	F16	Wasteful spending by Fire staff	6.0	6.0	6.0
	L1	Presumptive legislation imposes unaffordable costs	9.0	7.3	4.7
	L2	Arbitration process imposes unsustainable costs on the City	9.0	8.1	8.1
	L3	New legislation imposes additional costs that are unaffordable	6.0	6.0	6.0

****Information provided in this report relies on professional judgment and speculative assessments about potential effects if the risks identified here are realized.**

		Risk	Unmitigated Risk (/16)	Mitigated Risk (/16)	Optimized Model Risk (/16)
Legislative	L4	By-laws are not enforced effectively	6.0	6.0	6.0
	L5	Other emergency providers downloading responsibilities	7.5	7.5	7.5
	L6	Opportunities to minimize overlaps with other providers not pursued	7.5	7.5	6.1
	L7	Lawsuit from failure to adequately provide adequate fire suppression	9.0	8.1	3.6
	L8	Lawsuit from failure to adequately provide fire protection services	9.0	8.1	3.6
	L9	Non-compliance with City policies	6.0	6.0	6.0

***Information provided in this report relies on professional judgment and speculative assessments about potential effects if the risks identified here are realized.*

BY-LAW 2012 -146**A BY-LAW OF THE CITY OF GREATER SUDBURY TO ESTABLISH
AND REGULATE THE CITY OF GREATER SUDBURY
FIRE SERVICES**

WHEREAS the *Municipal Act, 2001*, S.O. 2001 Chapter 25, as amended, provides that a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under the Act;

AND WHEREAS the *Fire Protection and Prevention Act, 1997*, S.O., c.4 as amended, allows the council of every municipality to enact a by-law to establish and regulate a fire department;

**NOW THEREFORE THE COUNCIL OF THE CITY OF GREATER SUDBURY
HEREBY ENACTS AS FOLLOWS:**

Definitions

1. In this by-law, unless the context otherwise requires.

"Act" means the *Fire Protection and Prevention Act, 1997*, S.O. 1997, c. 4, as may be amended from time to time, and includes any successor legislation, and any and all regulations made under that statute, including the Ontario Fire Code;

"Approved" means approved by the Council of the City of Greater Sudbury;

"CAO" means the person appointed by Council to act as the Chief Administrative Officer for the City and includes his or her authorized designate;

"Chief, Emergency Services" means the person appointed by Council to act as the Chief of Emergency Services for the City and includes his or her authorized designate;

“Chief Fire Official” shall mean the Municipal Fire Chief or a member or members of the Fire Service appointed by the Municipal Fire Chief under the Act or a person appointed by the Fire Marshal under Act;

“City” means the municipal corporation of the City of Greater Sudbury or the geographical area, as the context requires;

“Collective Agreement” means an agreement between the City and the full-time Firefighters’ Association made under the provisions of the Act and includes any amendments thereto;

“Core Services” including Specialty Rescue Services means those Fire Protection Services which the Fire Service is to provide as directed by Council identified in Schedule D1;

“Confined Space” means any space that has limited or restricted means for entry or exit and that is not designed for human occupancy, and includes without limitation, a tank, vessel, silo, storage bin, hopper, vault, trench, excavation and pit;

“Council” means the elected Council of the City;

“Deputy Fire Chief” means a person appointed by Council as a Deputy Fire Chief and includes his or her authorized designate;

“Fire Aid Protection Agreement “ means assistance provided pursuant to an agreement under which the City agrees to provide an initial response to fires, rescues and emergencies that may occur in a part of another municipality where a fire

department in the City is capable of responding more quickly than any fire department situated in the other municipality; or the City agrees to provide a supplemental response to fires, rescues and emergencies that may occur in a part of another municipality where a fire department in the City is capable of providing the quickest supplemental response to fires, rescues and emergencies occurring in the part of another municipality;

“Fire Beats” means the pre-determined geographic response boundary assigned to a specific fire station as set out in Schedule C;

“Fire Chief” means the person appointed by Council to act as Fire Chief for the City in accordance with the Act;

“Fire Coordinator” means the person appointed by the Fire Marshal, under the authority of the Act to coordinate the mutual aid plan, or the person appointed by the Fire Marshal to act in the absence of the Fire Coordinator;

“Fire Services” means the City of Greater Sudbury Fire Services;

“Firefighter’s Association” means Local 527 of the International Association of Firefighters (IAFF);

“Fire Protection Agreement” is a contract between the City and one or more other municipalities, agencies, individuals, or a company that clearly defines the responsibilities, terms, conditions, and all other aspects of the fire services purchased, provided and/or required;

“Fire Protection Services” means Core Services and Specialty Rescue Services which includes fire suppression, fire prevention, fire safety education, communications and support services, training of persons involved in the provision of fire protection services, rescue and emergency services and the delivery of all those services as directed by Council identified in Schedule "D1";

“Limited Services” means a standard of Fire Protection Services significantly differentiating from the norm as a result of extenuating circumstances, such as environmental factors, obstructions, remote and/or island properties, private road ways, lanes and drives;

“Member” means any person employed in or appointed to the Fire Services and assigned to undertake Fire Protection Services, and includes Officers, full time and Volunteer Firefighters but does not include administrative support staff;

“Mutual Aid” means a program to provide/receive assistance in the case of a major emergency in a municipality, community or area where resources in a municipality, community or area have been depleted, but does not include Fire Aid;

“Officer” means any Member with the rank of lieutenant, captain or higher;

“Section” means a section of the Fire Services reporting to a Deputy Fire Chief, and allocated responsibility for performance of a particular function, and includes Administration, Emergency Operations, Fleet Services, Training, Fire Prevention, Public Education and includes such other Sections as may be Approved from time to time;

“Specialty Rescue Services” shall mean rescue response in a situation of ice/water rescue; auto extrication; hazardous materials response and together with Core Services form part of Fire Protection Services as directed by Council identified in Schedule D1;

“Volunteer Accord” means the working agreement governing Volunteer Firefighters and includes any amendments thereto; and

“Volunteer Firefighter” means a member who provides Fire Protection Services for or on behalf of the Fire Service, under the direction of the Fire Chief, either voluntarily or for a nominal consideration, honorarium, training or activity allowance.

General Authority

2.-(1) The Fire Services is hereby continued under the name of “City of Greater Sudbury Fire Services”, a Division within the Emergency Services Department of the City. The Fire Chief shall continue as the head of the Fire Services.

(2) The Fire Services shall provide Fire Protection Services within the City, subject to such conditions and limitations as may be Approved or result from budgetary constraints or be imposed by another By-law of the City.

(3) In addition to the Fire Chief, the Fire Services shall consist of Deputy Fire Chief(s) and such number of other members as may be deemed necessary by Council and employed or appointed by the City, and shall be structured as illustrated in the Organizational Chart, as defined and amendable by the Chief of Emergency Services, Schedule “A”, forming part of this By-law.

- (4) The Chief Emergency Services, with the prior written approval of the CAO, may reorganize or eliminate Sections or establish other Sections or may do any or all of these matters or any combination thereof as may be required to ensure the proper administration and operation of the Fire Service.
- (5) The Fire Services shall be organized into Sections such as Administration, Emergency Operations, Fleet Services, Training, Fire Prevention and Public Education.
- (6) The mandate, vision and primary goals of the Fire Services shall be those contained in Schedule "B", forming part of this By-law.
- (7) The Fire Services shall provide twenty-four fire stations, each staffed by career firefighters, volunteer firefighters or a composite of both in conformance with the approved Fire Beats and Fire Station Map, Schedule "C", forming part of this By-law.
- (8) The Fire Services shall respond to requests for assistance and emergencies in conformance with the Approved Core Services and Specialty Rescue Services in accordance with the levels set forth in Schedule "D1", forming part of this By-law.
- (9) Nothing in this by-law will restrict the Fire Service to providing only Core Services or limit the provision of Fire Protection Services.
- (10) The provisions of this By-law are subject to the provisions of the Act and all other applicable federal and provincial legislation, City By-laws and the provisions of the Collective Agreement and the Volunteer Accord.

Chief, Emergency Services

3.-(1) The Chief, Emergency Services, is the person responsible to Council, reporting through the CAO for the proper administration and operation of the Emergency Services Department, including the Fire Services.

(2) In the event of the absence or incapacity of the Fire Chief and each Deputy Fire Chief, the Chief, Emergency Services may designate a senior officer on duty, any other member of the Fire Services or Emergency Services Department and in doing so shall have all the powers and may perform all the duties of the Fire Chief.

Fire Chief

4.-(1) The Chief, Emergency Services shall be responsible to recommend to Council for appointment by By-law, a person to act as Fire Chief and one or more persons to act as a Deputy Fire Chief in the absence or incapacity of the Fire Chief.

(2) The Fire Chief shall exercise all powers and duties mandated by the Act, any other applicable legislation and City By-laws, including but not limited to:

- (a) duties assigned as an Assistants to the Fire Marshal as designated under the Act ;
- (b) duties assigned as the Chief Fire Official as appointed under the Act;
- (c) appointing a member or members of the Fire Services as Chief Fire Official;
- (d) enforcing compliance with the Fire Code made under the Act;
- (e) duties assigned as the Fire Coordinator; and

- (f) entering into such Fire Protection Agreements that may be referred to as Fire Aid Protection or Mutual Aid Agreements as referenced in By-law 2009-80.
- (3) The Fire Chief is the person ultimately responsible to Council, reporting through the Chief, Emergency Services and the CAO for the proper administration and operation of the Fire Services including the delivery of Fire Protection Services and the proper management of the Fire Services in accordance with the Act and this By-law.
- (4) The Fire Chief shall ensure all proper measures for prevention, control and suppression of fires, the protection and saving of life and property and emergency management are taken.
- (5) The Fire Chief shall ensure that all proper measures for life safety education and fire prevention are taken.
- (6) The Fire Chief shall:
 - (a) ensure standards for delivery of Fire Protection Services are contained in the departmental standard operating procedures, guidelines and documentation;
 - (b) develop such standard operating procedures and guidelines, general orders and departmental rules as necessary to implement the approved policies and to ensure the appropriate care and protection of all Fire Services personnel and equipment; and

- (c) ensure that the Fire Services' procedures, guidelines, orders and rules do not conflict with the provisions of any applicable by-law, statute or regulation.
- (7) The Fire Chief shall submit to the Chief, Emergency Services for review and Approval, proposed changes to the delivery of Core Services or Specialty Rescue Services as set out on Schedule D, as and when required for the efficient and effective delivery of Fire Prevention Services.
- (8) The Fire Chief shall periodically review all policies, guidelines, orders, rules and operating procedures of the Fire Services and make such changes as may be required.
- (9) The Fire Chief shall be responsible to prepare and submit to the Chief, Emergency Services the Fire Services' annual budget for Approval and to prepare such reports as are requested by the Chief, Emergency Services, CAO or Council.
- (10) The Fire Chief shall prepare and submit to the Chief, Emergency Services an annual report to be presented to Council in each following calendar year. The annual report shall include but not be limited to:
 - (a) overview of the Fire Services' goals;
 - (b) description of the organization;
 - (c) Fire Protection Services provided;
 - (d) level of service to be provided; and
 - (e) supporting statistical data.

(11) The Fire Chief shall enforce all municipal by-laws respecting fire protection and emergency measures.

(12) The Fire Chief shall, subject to the terms and conditions of the Collective Agreement or Volunteer Accord, reprimand, or suspend any member for infraction of any provisions of this by law, policies, general orders and departmental rules that, in the opinion of the Fire Chief would be detrimental to discipline or the efficiency of the Fire Services.

(13) The Fire Chief may delegate the performance of any one or more of his or her functions under this By-law to one or more persons from time to time as the occasion requires and may impose conditions upon such delegation and may revoke any such delegation. The Fire Chief may continue to exercise authority granted hereunder despite any such delegation.

(14) Each Section of the Fire Services is the responsibility of the Fire Chief and is under the direction of the Fire Chief or a Member designated by the Fire Chief. Designated Members shall report to the Fire Chief on Sections and activities under their supervision and shall carry out all orders of the Fire Chief.

Deputy Fire Chief(s)

5.-(1) The Fire Chief shall recommend to the Chief, Emergency Services, such persons as may be required to serve as Deputy Fire Chiefs in accordance with the Organizational Chart attached as Schedule A, for consideration by the Chief, Emergency Services and recommendation for Approval.

(2) Each Deputy Fire Chief appointed by By-law shall be responsible to the Fire Chief for the proper administration and operation of each Section assigned to him to her in accordance with the Organizational Chart attached as Schedule A, for the Members assigned to each such Section and shall report to the Fire Chief with respect to all matters regarding each Section under his or her control. A Deputy Fire Chief shall follow the Orders of the Fire Chief.

(3) In the absence or incapacity of the Fire Chief, Deputy Fire Chief(s) as determined by the Chief, Emergency Services shall have all the powers and may perform the duties of the Fire Chief.

Members

6.-(1) Every person appointed as a Member of the Fire Services to provide Fire Protection Services shall be on probation for a period of 12 months, during which period the probationary Member shall be evaluated and take such special training and examination as may be required by the Fire Chief.

(2) The Fire Chief may dismiss without recourse, any probationary Member appointed to provide Fire Protection Services who fails any evaluation, any special training or examination required by the Fire Chief or who the Fire Chief, in his or her sole discretion, deems to be unsuitable for the duties of a Member.

(2) The expenses incurred by such necessary actions under 7(1)(b) or (c) may be recovered in the manner provided through the *Municipal Act, 2001* and the Act.

Calls Outside of the City

8.-(1) The Fire Services shall not respond to a call with respect to a fire or emergency outside the limits of the City except with respect to a fire or emergency:

- (a) that, in the opinion of the Fire Chief, threatens property in the City or property situated outside the City that is owned or occupied by the City;
- (b) In a municipality with which an agreement has been entered into to provide Fire Protection Services which may include a Fire Aid Protection agreement or a Mutual Aid agreement;
- (c) on property with respect to which an agreement, which may include a Fire Protection agreement, has been entered into with any person or corporation or agency to provide Fire Protection Services;
- (d) at the discretion of the Fire Chief, in a municipality authorized to participate in any county, district or regional mutual aid plan established by a Fire Co-Ordinator appointed by the Fire Marshal pursuant to the Act or any other similar reciprocal plan or program on property beyond the City;
or
- (e) at the discretion of the Fire Chief when immediate action is necessary to preserve life or property and the appropriate department is notified to respond and assume command or establish alternative measures, acceptable to the Fire Chief.

- (3) The Fire Chief may designate a Member to act in the place of an Officer in the Fire Service during such Officer's absence, and such Member, when so acting, has all of the powers and shall perform all duties of the Officer replaced.
- (4) Council shall determine working conditions and remuneration for all persons who are firefighters defined in Part IX of the Act in accordance with the provisions of Part IX of the Act.
- (5) If a medical specialist finds a Member is physically unfit to perform assigned duties and such condition is attributed to, and a result of employment in the Fire Services, the Fire Chief may assign the Member to other duties within the Fire Services.
- (6) Volunteer Firefighters shall be entitled to receive the Approved remuneration in accordance with the Volunteer Accord.

Fires and Emergencies

7.-(1) Proper measures for the prevention, control and extinguishment of fires and the protection of life and property, shall be taken by the Fire Services and may include:

- (a) suppressing any fire by extinguishing it and may enter private property if it is necessary to do so;
- (b) pulling down or demolishing any building or structure to prevent the spread of fire; or
- (c) any other necessary actions such as boarding up or barricading of buildings or property to guard against fire or other danger, risk or accident; when unable to contact the property owner and

(2) The Fire Chief shall inform Council of the delivery of any Fire Protection Services outside the City pursuant to this Section 8, within a reasonable time thereafter.

(3) Nothing in Section 8 shall impose a duty on the Fire Services to respond to a fire or emergency outside of the limits of the City.

Levels of Service

9.-(1) Despite Subsection 2(8) and Schedule "D1", the Core Services and Specialty Rescue Services forming part of Fire Protection Services may be delivered as Limited Services where the Fire Chief determines that it is necessary in the circumstances, for reasons such as the reliance on Volunteer Firefighters, the topographic and geographic configuration of the City, the level and amount of equipment available to the Fire Services and budgetary constraints.

(2) The City of Greater Sudbury accepts no liability for the delay or inability to supply the services set out in Schedule "D1" of this by-law due to the provision of its Approved Fire Protection Services as Limited Services or due to the existence of unsafe conditions encountered en route, impeded access to property, and/or environmental factors/constraints.

Refusal to Leave

10. No person shall refuse to leave the vicinity of a fire when directed to do so by a Member present at the fire or by the Greater Sudbury Police Services.

Conduct At Fires

11.-(1) During a fire or emergency incident, the Fire Services shall have the authority to set and establish scene limits and/or boundaries. During the time the Fire Services are present at the site, during the time after the fire has been extinguished and until the Fire Services has removed its apparatus and equipment and rendered the location and vicinity safe from fire or other hazards, no person shall, either on foot or with a vehicle of any kind, enter or remain upon or within:

- (a) the portion of any street or lane upon which the site of the fire abuts or upon any street or lane for a distance of fifteen (15) metres on each side of the property damaged by fire or;
- (b) any additional street or lane or part of a street or any additional limits in the vicinity of the fire as may be prescribed by the Fire Chief or the next ranking officer present at the fire or emergency incident.

(2) The provisions of Paragraph 11(1)(a) shall not apply to a person who resides in a dwelling on any street or lane or within any prescribed additional limit or to any person so authorized to enter or remain by an Officer of the Fire Services or by a Greater Sudbury Police Services officer.

Recovery of Costs – Additional Expenses

12.-(1) The Fire Chief may require occupancy owners or persons within or outside the City to pay costs or fees for fire and emergency response or other administrative services provided to them. Invoicing for response services or recovery of fees will be conducted in accordance with the City's Miscellaneous User Fees By-law.

(2) If as a result of a Fire Services' response to a fire or emergency incident, the Fire Chief determines that it is necessary to incur additional expenses to; retain a private contractor, rent special equipment not normally carried on a fire apparatus or use more materials than are carried on a fire apparatus in order to suppress or extinguish a fire, preserve property, prevent a fire from spreading, control and eliminate an emergency, carry out or prevent damage to equipment owned by or contracted to the City, assist in or otherwise conduct fire cause investigation or determination or otherwise carry out the duties and functions of the Fire Service and/or to generally make "safe" an incident or property, the owner of the property requiring or causing the need for those additional expenses shall be charged the full costs to provide the additional service including all applicable taxes. Property shall mean personal and real property.

Penalty

13.-(1) Any person who violates Section 10 or 11 of this By-law is, upon conviction, guilty of an offence and shall be liable to a fine, subject to the provisions of the *Provincial Offences Act*, R.S.O. 1990, c. P.33, as amended.

Interpretation

14.-(1) Whenever this By-law refers to a person or thing with reference to gender or the gender neutral, the intention is to read the By-law with the gender applicable to the circumstances.

(2) References to items in the plural include the singular, as applicable.

(3) The words "include", "including" and "includes" are not to be read as limiting the phrases or descriptions that precede them.

- (4) Headings are inserted for ease of reference only and are not to be used as interpretation aids.
- (5) Specific references to laws in the By-law are printed in italic font and are meant to refer to the current laws applicable with the Province of Ontario as at the time the By-law was enacted, as they are amended from time to time.
- (6) Any reference to periods of time, stated in numbers of days, shall be deemed applicable on the first business day after a Sunday or Statutory holiday if the expiration of the time period occurs on a Sunday or Statutory holiday.
- (7) The obligations imposed by this By-law are in addition to obligations otherwise imposed by law or contract.

Severability / Conflict

15.-(1) If any section, subsection, part or parts of this By-law is declared by any court of law to be bad, illegal or ultra vires, such section, subsection, part or parts shall be deemed to be severable and all parts hereof are declared to be separate and independent and enacted as such.

(2) Nothing in this By-law relieves any person from complying with any provision of any Federal or Provincial legislation or any other By-law of the City.

Short Title

16. This By-law may be referred to as the "Fire Services By-law".

Schedules

17. The following schedule is incorporated into and forms a part of this By-law:

Schedule "A" Organizational Chart - Fire Services

Schedule "B"	Mandate of the Fire Services
Schedule "C"	Fire Beats and Stations
Schedule "D1"	Core Services and Delivery Areas – Services Available
Schedule "D2"	Core Services and Delivery Areas – Services NOT Available

Repeals

18. By-law 2010-16 of the City of Greater Sudbury and all amendments thereto are hereby repealed.

Conflicts

19. Where a provision of this By-law conflicts with the provisions of another By-law in force in the City, the provision that establishes the higher standard to protect the health, safety and welfare of the general public shall prevail.

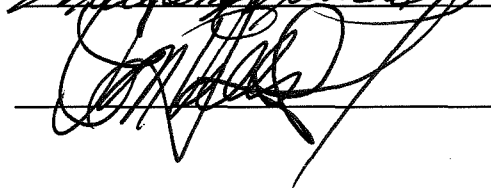
Enactment

20. This By-law shall come into force and take effect immediately upon the final passing thereof.

READ AND PASSED IN OPEN COUNCIL this 10th day of July, 2012.



Mayor

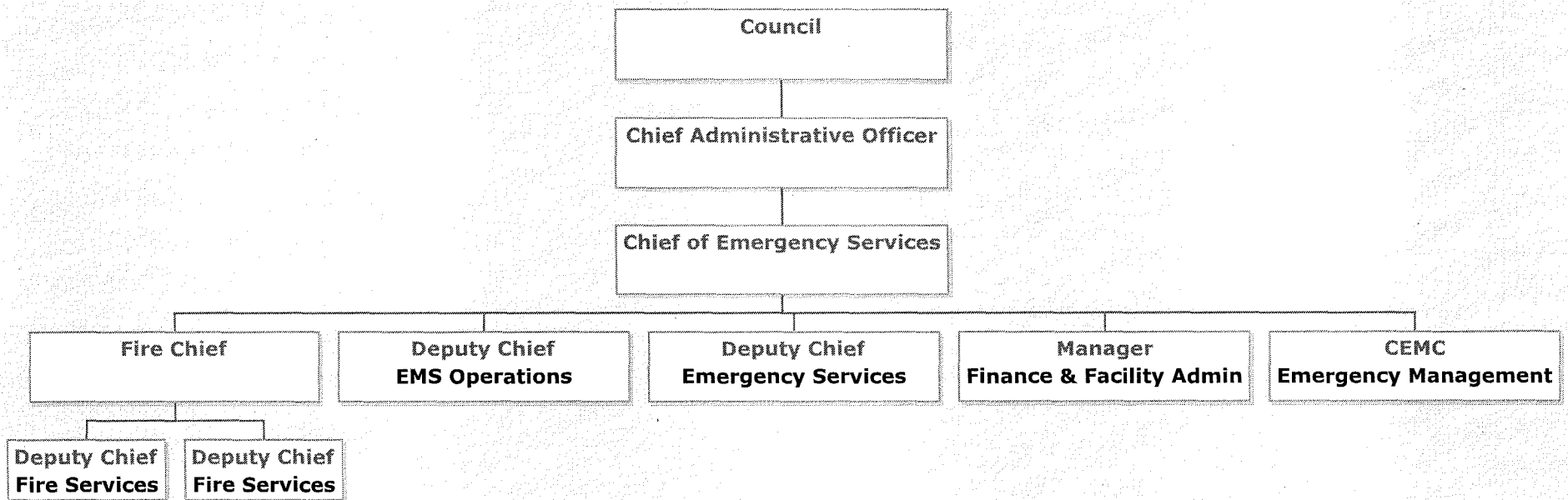


Clerk

SCHEDULE "A" TO BY-LAW 2012-146

Fire Regulating By-Law

(Emergency Services Governance Structure - For illustration purposes only)



Schedule "B" TO BY-LAW 2012-146

Mandate of the Fire Services

The mandate of the Greater Sudbury Fire Services is to provide fire protection services and emergency response, public fire and life safety education and fire prevention initiatives to protect the lives and property of the citizens, businesses and visitors to the City of Greater Sudbury

Vision

The vision of the Greater Sudbury Fire Services is to be a well planned, well trained and a well equipped emergency response agency where the safety and well being of all involved in any emergency response is paramount.

Primary Goals of the Fire Services

The primary goals of the Fire Services;

- Provide appropriate public fire and life safety education and other fire prevention programs and measures as legislated by the *Fire Protection and Prevention Act*,
- Provide exceptional training to its members through well planned programs followed by appropriate testing and documentation,
- Provide effective, timely and adequately staffed emergency response and assistance as appropriate to the needs and circumstances of the municipality and as required by the *Fire Protection and Prevention Act, 1997* and other applicable legislation.

Fire Beats and Fire Stations

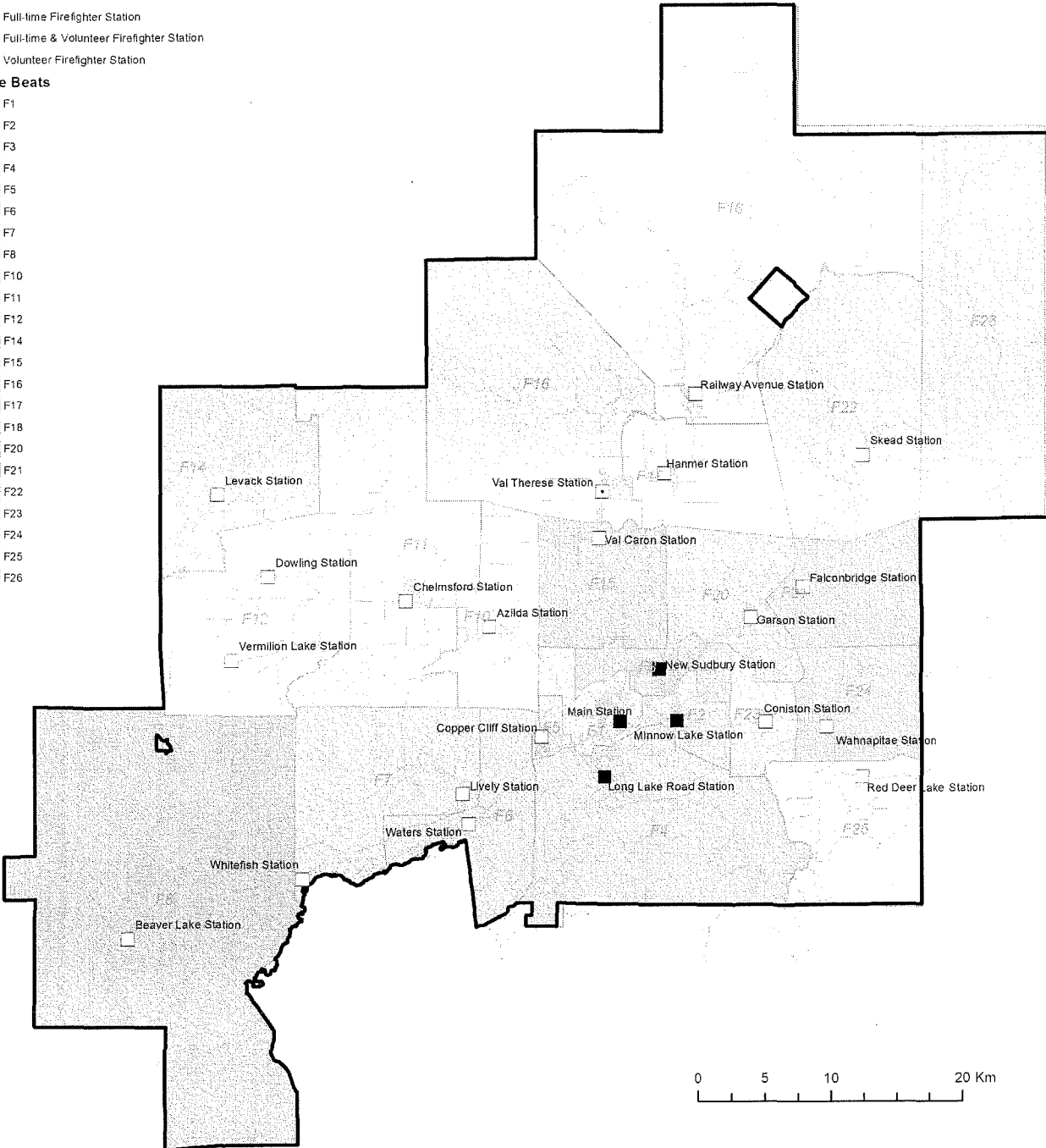


Legend

- Full-time Firefighter Station
- Full-time & Volunteer Firefighter Station
- Volunteer Firefighter Station

Fire Beats

- F1
- F2
- F3
- F4
- F5
- F6
- F7
- F8
- F10
- F11
- F12
- F14
- F15
- F16
- F17
- F18
- F20
- F21
- F22
- F23
- F24
- F25
- F26



Schedule "D1" TO BY-LAW 2012-146

(Part 1 of 5)



Emergency Services

Fire Services — Services at a glance

Fire Services Division Station Location and Services Available (as of March 2012)

Emergency Services		Intervention											Prevention								
Fire Services Division Station Location and Services Available (as of March 2012)		Suppression – Structure & Vehicle	Suppression – Wild lands	Suppression – Tanker Shuttle	Rescue – Low Angle **	Rescue – Aerial Ladder	Rescue – Vehicle Extrication **	Rescue – Water (Shore Based) **	Rescue – Water (Marine Unit) **	Rescue – Ice & Cold Water **	Rescue – Swift Water **	Medical – First Responder	HAZMAT – Awareness Level **	Inspection	Fire Regulation Enforcement	Investigation – Regulatory Compliance	Investigation – Origin & Cause	Permitting – Fire Regulation Only	Public Fire Extinguisher Training	Youth Arson Prevention	Public Awareness & Education
No.	Location																				
1	Van Horne	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	Minnow Lake	■	■		■			■				■	■	■	■		■				■
3	Leon (New Sudbury)	■	■		■			■				■	■	■	■		■				■
4	Long Lake	■	■	■	■			■				■	■	■	■		■				■
5	Copper Cliff	□	□		□			□					□	□	□		□				□
6	Waters	□	□		□	□	□	□					□	□	□		□				□
7	Lively	□	□		□			□					□	□	□		□				□
8	Whitefish	□	□	□	□		□	□					□	□	□		□				□
9	Beaver Lake	□		□	□			□					□	□	□		□				□
10	Azilda	□	□		□		□	□	□				□	□	□		□				□
11	Chelmsford	□	□	□	□	□	□	□					□	□	□		□				□
12	Dowling	□	□	□	□			□				□	□	□	□		□				□
13	Vermillion	□	□		□			□					□	□	□		□				□
14	Levack	□	□		□			□				□	□	□	□		□				□
15	Val Caron	□	□	□	□			□					□	□	□		□				□
16	Val Therese	■	■		□		■	■				■	■	■	■		■			■	■
17	Hanmer	□		□	□			□					□	□	□		□				□
18	Capreol	□	□		□		□	□				□	□	□	□		□				□
20	Garson	□	□		□		□	□					□	□	□		□				□
21	Falconbridge	□	□	□	□	□		□					□	□	□		□				□
22	Skead	□	□		□			□					□	□	□		□				□
23	Coniston	□	□		□			□					□	□	□		□				□
24	Wahnapitae	□		□	□		□	□					□	□	□		□				□
25	Red Deer	□	□		□			□					□	□	□		□				□

Legend

- Station staffed by full-time Firefighters.
- Station staffed by full-time Firefighters & Volunteer Firefighters. Response time is subject to crew availability. Typical additional travel time is 10 minutes minimum.
- Station staffed by Volunteer Firefighters. Response time is subject to crew availability. Typical additional travel time is 10 minutes minimum.
- ** Denotes "Specialty Rescue Service"

Schedule "D1" TO BY-LAW 2012-146

(Part 2 of 5)

Fire Suppression	
Structure	Extinguishment of fire involving residential structures and commercial structures. Fire suppression shall be delivered in both an offensive and defensive mode and shall include search and rescue operations, forcible entry, ventilation, protecting exposures, salvage and overhaul as appropriate, in accordance with the CGS Fire Service's level of training, standard operating guidelines and Occupational Health and Safety Guidelines. <i>Note: Excluding Remote Structures (defined below)</i>
Vehicle	Extinguishment of fire involving private and commercial vehicles.
Wild Lands	Extinguishment fire occurring in a area in which development is essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered. Typical fire types include grass fires, bush fires, and forest fires.
Remote Structure	Extinguishment of fire involving residential or recreational properties not serviced by roads maintained by the Greater City of Sudbury, or not serviced by highway, regional, or county roads maintained by the Province of Ontario. Typical remote structures include: structures on islands such as remote camps/cottages that are only reachable by boat, structures accessible only by private roads, structures accessible only by air (float plane, helicopter).
Tanker Shuttle	Provision of an alternative water source for fire suppression where hydrants are not available. <i>Note: Not accredited by the insurance underwriters authority.</i>

Medical Aid	
First Responder	Medical assistance to the first responder level. Typical interventions include: cardiopulmonary resuscitation (CPR), automated external defibrillator, spinal and bone fracture immobilization, and administration of oxygen: as per the latest Emergency Services Agreement. <i>Note: Interventions complement and do not replace advanced medical care provided by Emergency Medical Services (EMS)</i>

Schedule "D1" TO BY-LAW NO. 2012-146

(Part 3 of 5)

Rescue	
Low Angle	Rescue of persons from areas where terrain has a slope angle from 15 to 35 degrees.
Steep Angle	Rescue of persons from areas where terrain has a slope angle from 35 to 60 degrees.
High Angle	Rescue of persons from areas where terrain has a slope angle of 60 degrees and higher where: rescuers are totally dependent upon specialized climbing/abseiling equipment, or rescuers use ropes exclusively to keep from falling or to gain access to and egress from the rescue location.
Vehicle Extrication	Rescue of persons trapped in a vehicle through the use of specialized equipment and techniques including hand tools, air bags, and heavy hydraulic tools as required.
Aerial Ladder	Rescue of persons trapped on an elevated platform or structure to maximum elevation of eight stories (approximately 80ft). <i>Note: Actual effective operating height depends on proximity of equipment to structure, and ground conditions.</i>
Extrication Industrial & Farm Equipment	Rescue of persons from farm equipment or extrication from industrial machinery through the use of specialized equipment and techniques.
Confined Space	Rescue from locations or vessels that have limited or restricted means of entry or exit. Typical confined spaces include; above or below ground tanks, sewer systems, pipes, sumps and wells.
Trench	Rescue from a collapsed ditch, or excavation (trench) involving specialized equipment and shoring techniques required for extrication.
Water Shore Based - Level 1	Rescue of persons from water by reaching or throwing rescue lines. (No water entry).
Water Surface - Level 2	Rescue of persons from the surface of the water through the use of a rescue boat.
Swift Water - Level 2	Rescue of persons from water courses with any current greater than 0.5 m/sec (1 knot).
Ice & Cold Water	Rescue of persons in water that is below 21°C (70°F) including use of shoreline techniques and rescue boats.

Schedule "D1" TO BY-LAW 2012-146

(Part 4 of 5)

Hazardous Materials – (HazMat)	
Awareness (Level 1)	Personnel trained and able to: recognize, isolate, implement protection protocols, and notify the appropriate response team and/or agency. Personnel are also trained to provide limited emergency decontamination of persons exposed to hazard.
Operations (Level 2)	In addition to Level 1: Personnel trained and equipped to be able to take defensive actions to contain the spread of the hazardous material.
Technician (Level 3)	In addition to Level 2: Personnel trained and equipped to be able to take remove Identify, remove, pack, transport, or dispose of hazardous materials.

Inspection, Enforcement & Investigation	
Inspection	The fire inspection program ensures compliance with legislated life safety and property preservation standards as per the Ontario Fire Code. Fire inspections are completed for all commercial and multi-residential buildings. Single family residential inspection also occurs upon request by owner of if there is a complaint related to a potential violation of the Ontario Fire Code. The inspections ensure that the appropriate fire safety equipment and fire and life safety conditions are maintained.
Fire Regulation Enforcement	Enforcement action is taken in the form of a formal citation (ticket) to ensure compliance with the Ontario Fire Protection and Prevention Act. Enforcement can include prosecution under the Act.
Investigation – Regulatory Compliance	Investigation regarding possible infringement of the Ontario Fire Protection and Prevention Act that are not a result of an incident. These investigations are typically a result of a concern being raised by the public or other partner agency.
Investigation – Cause & Origin	Investigation and analysis of fire-related incidents to determine the cause of the incident and the origin of any resulting fire. Note: Investigations are conducted in collaboration with other agencies such the Ontario Fire Marshal and Police as required.

Schedule "D1" TO BY-LAW 2012-146

(Part 5 of 5)

Prevention & Permitting	
Public Fire Extinguisher Training	Public training on the proper use of fire extinguishers.
Youth Arson Prevention	Intervention with youth who have or may been involved with a fire related incident.
Public Awareness & Education	Fire and life safety information and public education programs shall be administered in accordance with the FPPA, 1997 and policies of the Fire Prevention Section. A residential home fire safety and smoke alarm awareness program is provided by the Fire Prevention and Suppression Sections.
Plan Review & Permitting	Review of proposed construction plans and/or installation of appliances that fall within the Ontario Building & Fire Code regulations. Issuance of burn permits as required by exiting by-laws and Ontario Fire Code. <i>Note: Construction related permits are issued via the Building Controls department.</i>

Emergency Dispatch & Communications	
Fire Dispatch Services	Fire calls are dispatched by the Greater Sudbury Police Services Communications Centre, which also serves as the 9-1-1 Public Safety Answering Point and handles communications and dispatch for the City's Police Services. Fire dispatch services are governed by an agreement that was enacted prior to the Greater City's amalgamation (circa 1998/99).

Schedule "D2" TO BY-LAW 2012-146

Fire Services – Services Not Available

The accompanying Table and Definitions identifies a number of Fire Protection Services that would be considered a higher level of service currently being provided in specific areas. These higher level, specific services require additional training, equipment/resources and the supporting procedures/guidelines and budgets. As a result these services are not available at this time.



Emergency Services

Fire Services – Services not available	
Intervention	Prevention
Suppression	
*Remote Structure	
Rescue	
Steep Angle	All Prevention Services required by regulation or typically offered are available.
High Angle	
Confined Space	
Elevator	
Trench	
Underwater	
Industrial & Farm Equipment	
HazMat	
Operations Level	
Technician Level	

Notes:

- * Residential or recreational properties not serviced by roads maintained by the Greater City of Sudbury, or not serviced by highway, regional, or county roads maintained by the Province of Ontario.

Fire Suppression	
Remote Structure	Extinguishment of fire involving residential or recreational properties not serviced by roads maintained by the Greater City of Sudbury, or not serviced by highway, regional, or county roads maintained by the Province of Ontario. Typical remote structures include: structures on islands such as remote camps/cottages that are only reachable by boat, structures accessible only by private roads, structures accessible only by air (float plane, helicopter).

Public Engagement

In February and March 2017, the Fire and Paramedic Services Optimization team held several employee and public information sessions. Residents and employees were invited to attend and learn about current service levels and challenges, and a summary of the proposed Fire and Paramedic Services Optimization plan. All sessions included a presentation followed by a Question and Answer period.

Three employee sessions were held, open to all emergency service staff; eight public information sessions were also held across the community.

A total of approximately 1,039 residents, staff and Councillors attended the public information sessions where the Fire and Paramedic Optimization staff team listened and responded to approximately 391 questions and comments. Many of these meetings included repeat participants, in particular, a large number of volunteer firefighters. In some cases the staff in the audience outnumbered residents from the community.

As a result of these questions and comments, several common themes emerged, as noted below. It was clear that the future and current role of volunteers, how stations closures and relocations will affect service levels and insurance, and the impact on property taxes were of the most concern to residents.

1. Volunteers (44 questions/comments)
2. Costs (39 questions/comments)
3. Infrastructure (21 questions/comments)
4. Career Firefighters (20 questions/comments)
5. Stations (20 questions/comments)
6. Report/Plan (19 questions/comments)
7. Call volume (17 questions/comments)
8. Paramedic Services (17 questions/comments)
9. Property taxes (17 questions/comments)
10. Service levels (16 questions/comments)
11. Volunteer Training (12 questions/comments)
12. Volunteer Recruitment (10 questions/comments)
13. Insurance (10 questions/comments)

Other themes included equipment, technical training, use of technology, From Home Response, Amalgamation, railways, Post Traumatic Stress Disorder (PTSD), risk and other.

Proposed Fire and Paramedic Optimization Plan - Public Sessions

March 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	27	28	1	2	3	4
	6:30-8:30 Kinsmen Hall Lively	COUNCIL	6:30-8:30 Colonial Inn Coniston CANCELED due to snowstorm			
5	6	7	8	9	10	11
	6:30-8:30 Dowling Leisure Centre Dowling (Montpellier)	COUNCIL	6:30-8:30 Centennial Arena Hanmer Lapierre/Kirwan/ Jakubo	6:30-8:30 Falconbridge Community Centre Falconbridge		
12	13	14	15	16	17	18
	6:30-8:30 St. Andrews Place Sudbury Core	6:30-8:30 Dr. Edgar Leclair CC Azilda	6:30-8:30 Wahnapitae CC Wahnapitae	6:30-8:30 TM Davies CC Lively		
19	20	21	22	23	24	25
		Special Council Meeting Update				
26	27	28	29	30		



City of Greater Sudbury
April 2016