November 2021

Richmond Hill Fire & Emergency Services

Fire Master Plan

Emergency Management & Training Inc.

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Acknowledgements

Richmond Hill Council

Dave Barrow – Mayor
Joe DiPaola and Carmine Perrelli – Deputy Mayors / Regional and Local Councillors
Greg Beros – Ward 1 Councillor
Tom Muench – Ward 2 Councillor
Castro Liu – Ward 3 Councillor
David West – Ward 4 Councillor
Karen Cilevitz – Ward 5 Councillor
Godwin Chan – Ward 6 Councillor

Richmond Hill Fire & Emergency Services Chief Officers

Steve Kraft – Fire Chief (Project Director) (Retired)
Bryan Burbidge – Deputy Fire Chief – Support (Project Team) (Acting Fire Chief)
Tom Raeburn – Deputy Fire Chief - Operations (Project Team)
Fred Downing – Training Chief
Tullio Tarquini – Prevention Chief

Resource Staff

Mary-Anne Dempster – City Manager
Darlene Joslin – Commissioner of Community Services
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Andrew Crawford – Planning Department
Brian DeFreitas – Planning Department
Christine Lee – Planning Department
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Tim Sparks – Richmond Hill Professional Firefighters Association, IAFF Local 1957

DEFINITIONS

Immediate	Recommendations that should be addressed urgently due to the legislative or health and safety requirements
Short-term	Recommendations that should be addressed within 1 – 3 years
Mid-term	Recommendations that should be addressed within 4 – 6 years
Long-term	Recommendations that should be addressed within 7 – 10 years
The City	The City of Richmond Hill
The Department	The Richmond Hill Fire and Emergency Services
AED	Automatic External Defibrillator
AHJ	Authority Having Jurisdiction
ALS	Advanced Life Support
APCO	Association of Public-Safety Communications Officials
ASA	Acetylsalicylic Acid
AVL	Automatic Vehicle Locators
BCIN	Building Code Identification Number
BLS	Basic Life Support
CAD	Computer Aided Dispatch
CAFI	Canadian Association of Fire Investigators
CAO	Chief Administrative Officer
CASA	Canadian Automatic Sprinkler Association
CBRNE	Chemical Biological Radiological Nuclear Explosive
CEMC	Community Emergency Management Coordinator
CERB	Central Emergency Reporting Bureau
CFAA	Canadian Fire Alarm Association
CFAI	Commission on Fire Accreditation International
CISC	CRTC Interconnection Steering Committee
CO	Carbon Monoxide
CPR	Cardio-Pulmonary Resuscitation
CPSE	Centre for Public Safety Excellence
CRA	Community Risk Assessment
CRTC	Canadian Radio-television & Telecommunications
CSA	Canadian Standards Association
DPG	Dwelling Protection Grade
DRD	Drag Rescue Device
E&R	Establishing & Regulating (By-law)
EAP	Employee Assistance Program
EMCPA	*Emergency Management & Civil Protection Act*
EMS	Emergency Medical Services
EM&T	Emergency Management & Training Inc.

EOC	Emergency Operation Centre
ERP	Emergency Response Plan
ESL	English as a Second Language
EVT	Emergency Vehicle Technician
FESO	Fire and Emergency Services Organization
FMP	Fire Master Plan
FPA	Fire Hall Protected Areas
FPO/PFLSE	Fire Prevention/Public Fire Life Safety Educator
FPPA	*Fire Prevention & Protection Act*
FUS	Fire Underwriters Survey
GPM	Gallon Per Minute
GPS	Global Positioning System
GTA	Greater Toronto Area
Haz-Mat	Hazardous Materials
HFSC	Home Fire Sprinkler Coalition
HRFPHR	Health Related Fitness Program Human Resources
IAFF	International Association of Firefighters
IC	Incident Command
IDLH	Immediate Danger to Life & Hazard
IP	Internet Protocol
IRIC	Initial Rapid Intervention Crew
IRM	Integrated Risk Management Approach
IT	Information Technology
L/m	Litre Per Minute
LPAT	Local Planning Appeal Tribunal
MDT	Mobile Data Terminal
MPAC	Municipal Property Assessment Corporation
MVC	Motor Vehicle Collision
NAFI	National Association of Fire Investigators
NFPA	National Fire Protection Association
NG 9-1-1	Next-generation 9-1-1
NIOSH	National Institute for Occupational Safety & Health
NIST	National Institute of Standards and Technology
OAFC	Ontario Association of Fire Chief
OBC	Ontario Building Code
OBOA	Ontario Building Officials Association
OFC	Ontario Fire Code
OFMEM	Office of the Fire Marshal and Emergency Management
OHSA	*Ontario Health and Safety Act*
OSI	Occupational Stress Injuries

PFPC	Public Fire Protection Classification
PPE	Personal Protective Equipment
PSAPs	Public Safety Answering Points
PTSD	Post-Traumatic Stress Disorder
RFP	Request for Proposal
RHFES	Richmond Hill Fire & Emergency Services
RHPFFA	Richmond Hill Professional Firefighters Association
RIC	Rapid Intervention Crew
SCBA	Self Contained Breathing Apparatus
SOG	Standard Operating Guidelines
SOP	Standard Operating Procedure
SRA	Simplified Risk Assessment
SWOT	Strengths, Weaknesses, Opportunities, Threats
TSP	Telecommunications Service Provider
VOIP	Voice Over Internet Protocol
VSA	Vital Signs Absent
WSIB	Workplace Safety and Insurance Board
YRP	York Regional Police
YRPS	York Regional Paramedic Service

Executive Summary

This document has been prepared in response to the Richmond Hill Fire & Emergency Services (RHFES) request for consulting services to develop a Fire Master Plan (FMP) that will provide a framework to guide future policy, organizational, capital and operational planning decisions.

Every fire department should be guided by a master/strategic plan. A FMP traditionally focuses on the identification of fire hazards and planning an appropriate suppression force response. Today hazard or risk assessment has expanded well beyond the fire problem in the community to include emergency medical incidents, technical rescue incidents, hazardous materials incidents, and many other emergency situations. To help mitigate these emergencies as much as possible, more emphasis is being placed on fire prevention and control systems as communities attempt to effectively reduce fire related losses.

Current challenges faced by the RHFES are similar to those faced by many rural/urban interface fire departments in Ontario. Increased rigour from statutory and standards requirements related to fire fighter health and safety, increased skills, competency requirements and an increased emphasis on prevention and public education are examples of common themes.

This document includes plans for future needs relating to equipment, facilities, human resources, fire prevention, emergency planning and training, as well as the many external influences that impact the fire service.

Objectives

The FMP will include an analysis of current and forecasted fire protection service delivery needs and develop clear and concise recommendations including a detailed 10-year implementation strategy for Council and staff.

Scope of Work

The review included but was not limited to the following key areas. A more detailed overview of the scope of work can be found in the overview section.

Administration Division

Evaluate all aspects of RHFES and determine optimal service levels for fire protection service delivery to meet the current and future needs and circumstances of the community including:

- Fire protection delivery for legislative compliance
- *Fire Protection and Prevention Act*, Ontario Regulation 378/18 Community Risk Assessments (CRA)
- Section 21 Guidance notes
- *Occupational Health and Safety Act* and City by-laws
- *National Fire Protection Association* (NFPA) standards
- *Ontario Fire Marshal's Public Fire Safety Guidelines*
- Review current administrative processes, workflow & management practices
- Department communications strategies
- Identify enhanced processes for technology including future computer and information technology needs, system redundancies, failsafe backups, data and records management systems, incident reporting, computer aided dispatch and mobile data terminals
- Assess Mutual Aid and Automatic Aid Agreements with neighboring municipalities
- Develop a comprehensive CRA in accordance with the *Fire Protection and Prevention Act (FPPA), 1997 – Ontario Regulation 378/18* – CRAs. The CRA must include a review of all Mandatory Profiles outlined in *Regulation 378/18* including:

Geographic profile: The physical features of the community including the nature and location of features such as highways, waterways, railways, canyons, bridges, landforms and wildland-urban interfaces.

Building stock profile: The types of buildings in the community, the uses of the buildings in the community, the quantity of each type of building, the quantity of buildings of each use and any building-related risks known to fire services.

Critical infrastructure profile: The capabilities and limitations of critical infrastructure including electricity distribution, water distribution, telecommunications, hospitals and airports.

Demographic profile: The composition of the community's population, respecting matters relevant to the community, such as population size and dispersion, age, gender, cultural background, level of education, socioeconomic make-up and transient population.

Hazard profile: The hazards in the community, including natural hazards, hazards caused by humans and technological hazards.

Public safety response profile: The types of incidents responded to by other entities in the community and those entities' response capabilities.

Community services profile: The types of services provided by other entities in the community and those entities' service capabilities.

Economic profile: The economic sectors affecting the community that are critical to its financial sustainability.

Past loss and event history profile: The community's past emergency response experience including the following analysis:

- The number and types of emergency responses, injuries, deaths and dollar losses.
- Comparison of the community's fire loss statistics with provincial fire loss statistics.
- Conduct a detailed trend analysis including issues and best practices regarding fire and emergency services to identify opportunities for continuous improvement, service optimization and innovation.
- CRA must be in the form that the Fire Marshal provides or approves.

Note: Each profile is to be interpreted as extending only to matters relevant to fire protection services.

Fire Prevention and Public Education Division

Assess and evaluate Public Fire Safety Education and Fire Safety Standards and Enforcement focusing on strategic deployment of resources, technological changes, efficiencies and effectiveness with respect to inspection services, data gathering and current service delivery against applicable standard(s)/ legislation analysis of data analytics for decision support for public education.

Fire Suppression Division

Detailed review of service delivery levels against accepted applicable standards, legislation and industry best practices. Assessment of all specialized service delivery and identification of opportunities for efficiencies and enhancements.

- Evaluation of all station locations including a comprehensive study for the future Fire Hall 8-7 identified in RHFES Master Fire Plan dated 2016.
- Considering factors should include, but are not limited to:
    - GIS Locations of current stations relating to response capabilities
    - Roadways including attributes such as one-way streets and turn restrictions
    - Building and population densities
- Identifying, analyzing, evaluating and prioritizing risks to public safety and the age and infrastructure of all facilities.
- Comprehensive examination of response times for each station against standards, legislation and best practices.
- Identify projected long-range needs and implementation strategies and timelines.
- Review of current and emerging technologies that may be employed to effectively and efficiently improve current and future services.

Training and Professional Development

- Evaluate division staffing level, workload, and a Shift Training Instructor model to determine current and future staffing needs in said division.
- Evaluate professional qualifications and standards to determine current and future training needs for all positions within the Fire Services.
- Consideration of *National Fire Protection Act (NFPA)* professional qualifications, standards, documentation requirements and succession planning.
- Review present-day service delivery against applicable standard(s) and legislation.
- Identify opportunities for enhancement and effectiveness of training practices to improve training delivery methods, infrastructure, props, tools, facilities, staffing, divisional organization, and deployment and the enhancement of the training environment.

Mechanical Division, Apparatus and Equipment

- Analyze long-range strategy for vehicle acquisition and equipment replacement.
- Assess and evaluate fire apparatus, vehicle and equipment condition, maintenance programs, replacement schedules and plans relative to existing and expected service demands, budget process, budget reserve and preventative maintenance requirements.
- Review applicable fire apparatus maintenance and repair standards, legislation and best practices to identify opportunities to increase efficiencies.
- Review potential partnership, roles and responsibilities with the Public Works/Operations fleet section.
- Conduct an analysis on current and future staffing needs.

Communications (Dispatch) Division:

- Evaluate all aspects of Fire Communications and compliance of *NFPA 1221 Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.*
- Evaluate all SOPs, Operational formats including Call Taker Dispatch systems, Communications Technology - radio system, telephone systems including business, cell phone, and Emergency 911 / Next-generation 911 (NG9-1-1) current and future optimization and infrastructure requirements shall be reviewed.
- Conduct an analysis on current and future staffing need.

Emergency Planning:

- Review of plans and systems against applicable standards, legislation, and best practices.
- Evaluate present emergency planning processes and responsibilities and identify opportunities for increasing efficiencies and effectiveness including oversight and management of Emergency Planning by Fire Services Management Team.
- Identify Corporate Emergency Planning to ensure corporate compliance with applicable legislation and will further ensure that adequate and appropriate levels of emergency planning are being achieved.

Based on the RFP criteria and through meetings with the Fire Chief, Deputy Chiefs and other stakeholders, the consulting team was able to complete a thorough review of elements that are working well and those requiring improvement within the RHFES.

To assist in prioritizing the recommendations, they have been categorized according to short-term (1-3 years), mid-term (4-6 years), and long-term (7-10 years) targets based on growth, trends, regulatory requirements and financial capabilities of The City of Richmond Hill (the City). This plan will set the foundation for strategic decision making for the provision of fire and rescue services within the City.

Rec #	Recommendation	Suggested Timeline
1	RHFES to explore potential community partnerships when they begin the process of acquiring land and building a new fire station in the northeast quadrant of the City.	Short-term (1-3 years)
2	The E&R By-Law should be updated and reviewed annually to meet current industry standards and the level of operations of the RHFES.	Immediate (0-1 year)
3	Establish an SOG Committee with representation of all Divisions of the department. It is further recommended that the Department's SOGs be reviewed and updated regularly.	Short-term (1-3 years)
4	RHFES work in conjunction with developers in promoting the advantages of installing residential fire sprinklers.	Short-term (1-3 years)
5	The Management Team regularly access the FUS Municipal Fire Portal to communicate improvements and/or upgrades. This data could relate to new fire apparatus replacements, new fire stations, new construction, hydrants in new sectors, etc.	Short-term (1-3 years)
6	RHFES identify and develop opportunities for Shift Instructors to be assigned full-time to the Training Division on temporary assignments. These secondments serve multiple purposes and will enhance delivery of discipline specific training.	Short-term (1-3 years)
7	Conduct an internal review of staffing and workflow within the Training Division. Gaps should be identified and addressed. To ensure consistent and high-quality delivery of training, an increase in the number of full-time training officers may be warranted.	Short-term (1-3 years)
8	Realign the reporting structure for the Training Division be under the Deputy Fire Chief (Operations). This realignment supports enhanced intra-departmental coordination leading to greater efficiencies and effectiveness of training programs.	Short-term (1-3 years)
9	Revenue generation initiatives implemented and managed through the Training Division be used to further enhance capacity through financial support of full-time or temporary staffing increases.	Mid-term (4-6 years)

Rec #	Recommendation	Suggested Timeline
10	RHFES qualify District and Platoon Chiefs to NFPA 1021 Level II (Fire Officer-II). This certification supports management of multi-unit responses in the field, in addition to adding valuable curriculum to overall RHFES succession planning.	Short-term (1-3 years)
11	Training Division identify and develop an officer training program consistent with NFPA qualifications.	Mid-term (4-6 years)
12	Secure resources to ensure annual Live Fire Training is provided to all personnel. Staffing and workload adjustments in the Training Division may be required to support development and implementation of a robust program in accordance with NFPA 1403: *Standard on Live Fire Training Evolutions*.	Immediate (0-1 year)
13	Develop and implement a formal succession planning program within the RHFES. Given the size and scope of the RHFES, numerous opportunities for career development could be identified and supported in conjunction with defined qualifications, certifications and training to support future success of interested personnel.	Mid-term (4-6 years)
14	The Fire Prevention Division monitor provide risk assessment reports at least annually on activities conducted to better align current RHFES baselines and to ensure progress towards industry best-practice benchmarks and the CRA.	Short-term (1-3 years)
15	RHFES increase the role of suppression staff in support of fire prevention and public education efforts. This does not negate the need for long term planning for full-time Fire Prevention Division personnel but could augment and enhance the services currently being delivered.	Mid-term (4-6 years)
16	Align inspection efforts in the Fire Prevention Division with industry best practises. This would be utilized as a benchmark for the Prevention Division to develop a plan on what can be accomplished with present staffing, along with presenting options for increasing inspection frequencies to meet established benchmarks.	Short-term (1-3 years) and ongoing
17	Expand the current initiative to train and qualify all firefighters to NFPA 1031 and 1035.	Mid-term (4-6 years)
18	RHFES continue to conduct an annual appraisal and report on Fire Prevention Division programs to define successes and identify any gaps. Use of data analytics should support and inform this process.	Short-term (1-3 years) and ongoing
19	Support all Fire Prevention Division personnel to gain qualification as certified fire investigators.	Mid-term (4-6 years)
20	Develop a staffing plan for the Fire Prevention Division to ensure staffing levels and subsequent workflows can be managed appropriately. This staffing plan should also review the current shift	Short-term (1-3 years)

Rec #	Recommendation	Suggested Timeline
	pattern and explore options to move to 7 days per week coverage matching community needs.	
21	RHFES promote four (4) of its Communications Operators to the role of Acting Communications Supervisor to ensure continuous supervision in the Communications Centre.	Immediate (0-1 year)
22	RHFES monitor sick time related to PTSD or other mental health illness and the impacts that may be placed upon staffing, shift scheduling, shift coverage and any financial implications.	Ongoing
23	RHFES to reduce the frequency of utilizing firefighters to act in the role of Communications Operator due to staffing shortages. This should not be implemented until such time that additional staffing is hired for the Communications Centre.	Immediate (0-1 year)
24	RHFES hire additional personnel either part-time or full-time to cover staff shortages in the Communications Centre to ensure a minimum staffing of two (2) Communications Operators and one Supervisor are on duty at all times.	Short-term (1-3 years)
25	RHFES explore opportunities of revenue generation to offset the expense of the Communications Centre by acquiring new clients to be dispatched from of its Communications Centre.	Short-term (1-3 years)
26	Add an additional Chief Officer for the oversight of the Communications Division. Member will be outside of the bargaining unit.	Short-term (1-3 years)
27	Hire an EVT to assist in the completion of repairs and initiate a preventive maintenance program to maintain the fire department's fleet of vehicles.	Short-term (1-3 years)
28	Purchase a medium duty service vehicle for the Mechanical Division.	Short-term (1-3 years)
29	Update PPE/Bunker gear cleaning and inspections SOG and include instruction on the proper re-installation of the DRD.	Immediate (0-1 year)
30	The RHFES maintain the minimum of four firefighters on every fire apparatus, each shift. This would bring RHFES in line with the recommendations regarding the staffing of fire apparatus as identified in the National Institute of Standards and Technology study and NFPA 1710, which are outlined in Section 5.	Immediate (0-1 years)
31	Hire an additional 20 firefighters to be deployed on an additional engine.	Short-term (1-3 years)
32	RHFES add a seventh station in the northeast quadrant of the City and hire an additional 20 firefighters to be assigned to Station 8-7.	Mid-term (4-6 years)

Rec #	Recommendation	Suggested Timeline
33	RHFES to hire an additional 20 firefighters based on the call volume, additional building stock such as high rises and the current approved land developments. Consideration should be given to the deployment of these firefighters to staff a second aerial device in the city.	Long-term (7-10 years)
34	Implement the position/rank of District Chief within the Operations Division for each Platoon. In conjunction with the opening of Station 8-7.	Mid-term (4-6 years)
35	Continue a commitment to meet effective response times. This includes the following: • Achieve a goal of 80 seconds fire fighter turn-out time. • Four (4) firefighters arriving on scene within a four-minute travel time. • Sixteen (16) firefighters arriving on scene within an eight-minute travel time.	Ongoing
36	RHFES work in conjunction with the RHFES Medical oversight to review delegated medical acts including, but not limited to the administration of glucagon and ASA.	Short-term (1-3 years)
37	RHFES and the Richmond Hill Council lobby the OFMEM and Ministry of Health to expand the simultaneous notification program to include Fire Services of York Region.	Short-term (1-3 years)
38	RHFES and the City's facility services complete a building condition and needs assessment of all RHFES Fire Stations to see if they are viable structures to be renovated and upgraded or replaced, to be more in-line with current industry standards to ensure compliance with provincial legislation, and applicable standards.	Short-term (1-3 years)
39	RHFES should work with the City's facility services to examine space requirements and options to create a headquarters that includes Administration, Fire Prevention, Training, Communications, Mechanical and CEMC/EOC. Options could include leasing, purchasing, or building a new headquarters.	Immediate (0-1 year)
40	Purchase a multi-purpose apparatus to fill the role as a command centre for air, light, decontamination, and rehab apparatus.	Short-term (1-3 years)
41	The City of Richmond Hill conduct an electrical audit of the fire stations and make changes to ensure the station has complete electrical power during a power outage.	Immediate (0-1 year)
42	RHFES maintain their Superior Tanker Shuttle Accreditation for the City of Richmond Hill.	Ongoing

Rec #	Recommendation	Suggested Timeline
43	Continue to review and update the Emergency Plan for Richmond Hill annually as per the *Emergency Management & Civil Protection Act* of Ontario.	Short-term (1-3 years)
44	Move the primary EOC to the Operations Centre and the secondary EOC to Fire Station 8-5.	Immediate (0-1 year)
45	RHFES enter into discussions with neighbouring fire services regarding Aid Agreements to provide or receive assistance at an incident until such time as the department has adequate resources of their own at the scene.	Short-term (1-3 years)
46	RHFES explore opportunities to provide technical rescue responses to municipalities outside the jurisdiction of Richmond Hill be included in the updated version of the Establishing & Regulating By-Law.	Short-term (1-3 years)

Table of Contents

Overview

Project Initiation

In 2020, the City issued a Request for Proposal (RFP) on behalf of its Fire Department (the Department). As the successful bidder, Emergency Management & Training Inc. (EM&T) has worked collaboratively with the City and the RHFES in the gathering of data and development of this FMP. EM&T would like to thank all staff and the community for their input.

Review Process and Scope

EM&T has based its review process on the City's initial RFP and the response document submitted by EM&T.

The specified areas noted in the project's RFP were reviewed by utilizing best practices, current industry standards and applicable legislation as the foundation for all work undertaken. EM&T also used both quantitative and qualitative research methodologies to develop a strong understanding of current and future needs and circumstances of the community, as well as the customer service demands of the public.

Based on the review of the RHFES's facilities, equipment, staffing, programs and related data, EM&T is submitting a total of 46 recommendations for consideration and implementation.

Performance Measures and Standards

This FMP update has been based upon (but not limited to) key performance indicators that have been identified in national standards and safety regulations such as:

- *The Office of the Fire Marshal and Emergency Management (OFMEM) Public Safety Guidelines*
- OFMEM Comprehensive Fire Safety Effectiveness Model
- *The Fire Protection and Prevention Act*
    - *O.Reg. 378/18 – Community risk assessments*
- The National Fire Protection Association (NFPA) standards
    - NFPA 1221 addresses recommended standards in relation to communications/dispatching services
    - NFPA 1710 addresses recommended standards for career fire departments
    - NFPA 1730 addresses recommended standards for fire prevention and education activities

- The Commission on Fire Accreditation International (CFAI), which is a program that evaluates a fire department based on related NFPA standards, local legislation and industry best practices (the parent organization for CFAI is the Centre for Public Safety Excellence (CPSE))
- OFMEM's Integrated Risk Management program
- The *Ontario Health and Safety Act (OHSA)*, National Institute for Occupational Safety and Health (NIOSH)
- Ontario Fire Service – Section 21 Guidelines
    - The Section 21 Committee is based on Section 21 of the *Ontario Occupational Health and Safety Act*. This committee is charged with reviewing industry safety concerns and developing recommended guidelines to reduce injuries for the worker.

Project Consultants

Although several staff at EM&T were involved in the collaboration and completion of this FMP, the overall review was conducted by:

- Darryl Culley, President, Emergency Management & Training Inc.
- Brian Hutchinson, Fire & Emergency Services Consultant
- Rick Monkman, Fire & Emergency Services Consultant

Together, the team has amassed a considerable amount of experience in all areas of fire and emergency services program development, review and training. The EM&T team has worked on projects that range from fire service reviews, strategic plans, CRAs and development of emergency response programs for clients.

SECTION 1 – Community & Fire Department Overview

1.1 Community Overview

1.2 Fire Department Composition

1.3 Community Growth

Section 1: Community & Fire Department Overview

1.1 Community Overview

The City of Richmond Hill was incorporated in 1872 and is located in south central York Region, which replaced York County on January 1, 1971. Richmond Hill is one of the nine municipalities that makes up the Region. The City is home to a population of approximately 210,000 (2020) residents with projected population levels.

The City's population is forecasted to grow to roughly 242,200 people by 2031. With a land area of approximately 101.11km², the community is primarily residential with many of its residents commuting to the City of Toronto to its south. There are significant residential areas within the city, as well as agricultural lots, natural areas and environmentally sensitive areas. The Oak Ridges Moraine is the most significant geographical feature of the City with its elevation being the greatest in the City. The moraine accounts for a third of the City's land area and is a significant environmentally protected area within the Greater Toronto Area (GTA).

The City is bounded by the Bloomington Sideroad to the north, Ontario Highway 7 to the south, Bathurst Street to the west and Ontario Highway 404 to the east. The City is approximately 4 km (3 miles) from the city limits of the City of Toronto. The City extends 14 km (9 miles) north-south and 7 km (3.5 miles) east-west.

Based on the 2016 Census, of the population of 195,022, 60% of the residents are visible minorities. The languages spoken are primarily English, Cantonese, Mandarin, Persian, Russian, Italian, and Korean. With there being such a large immigrant population, this presents a vast array of cultures who celebrate a significant number of events during the year.

FIGURE #1: Map of Richmond Hill

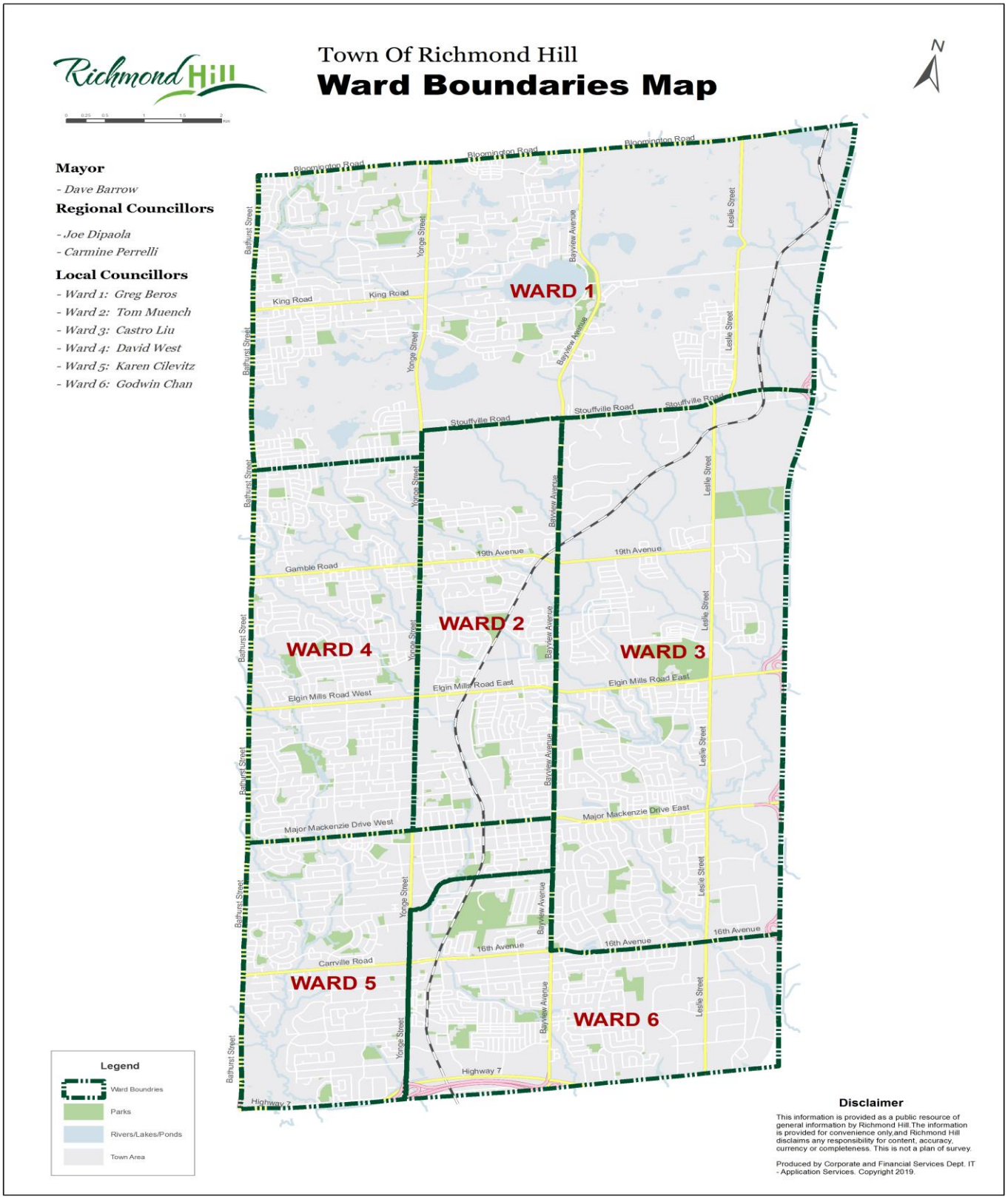


FIGURE #2: Map of Regional Municipality of York

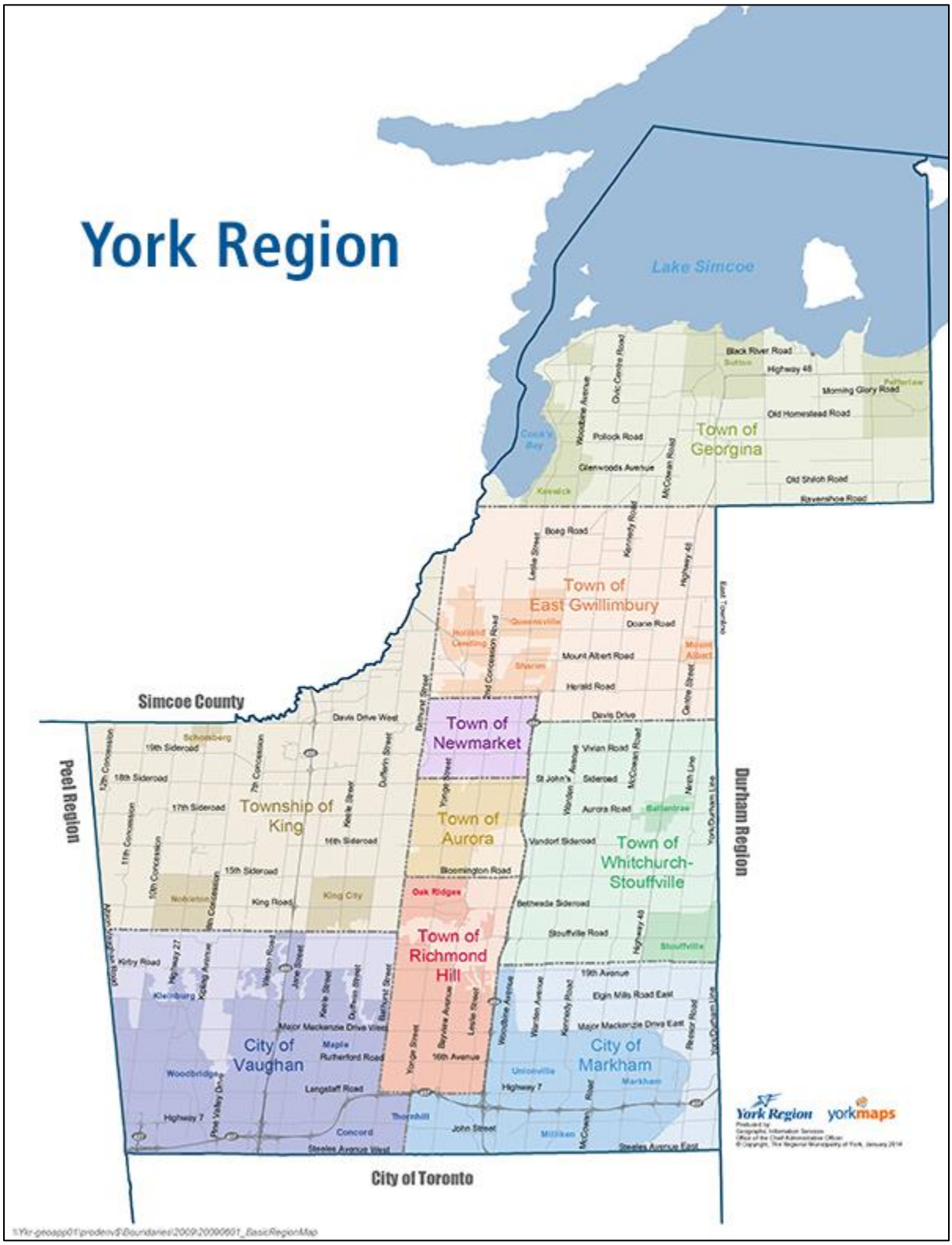
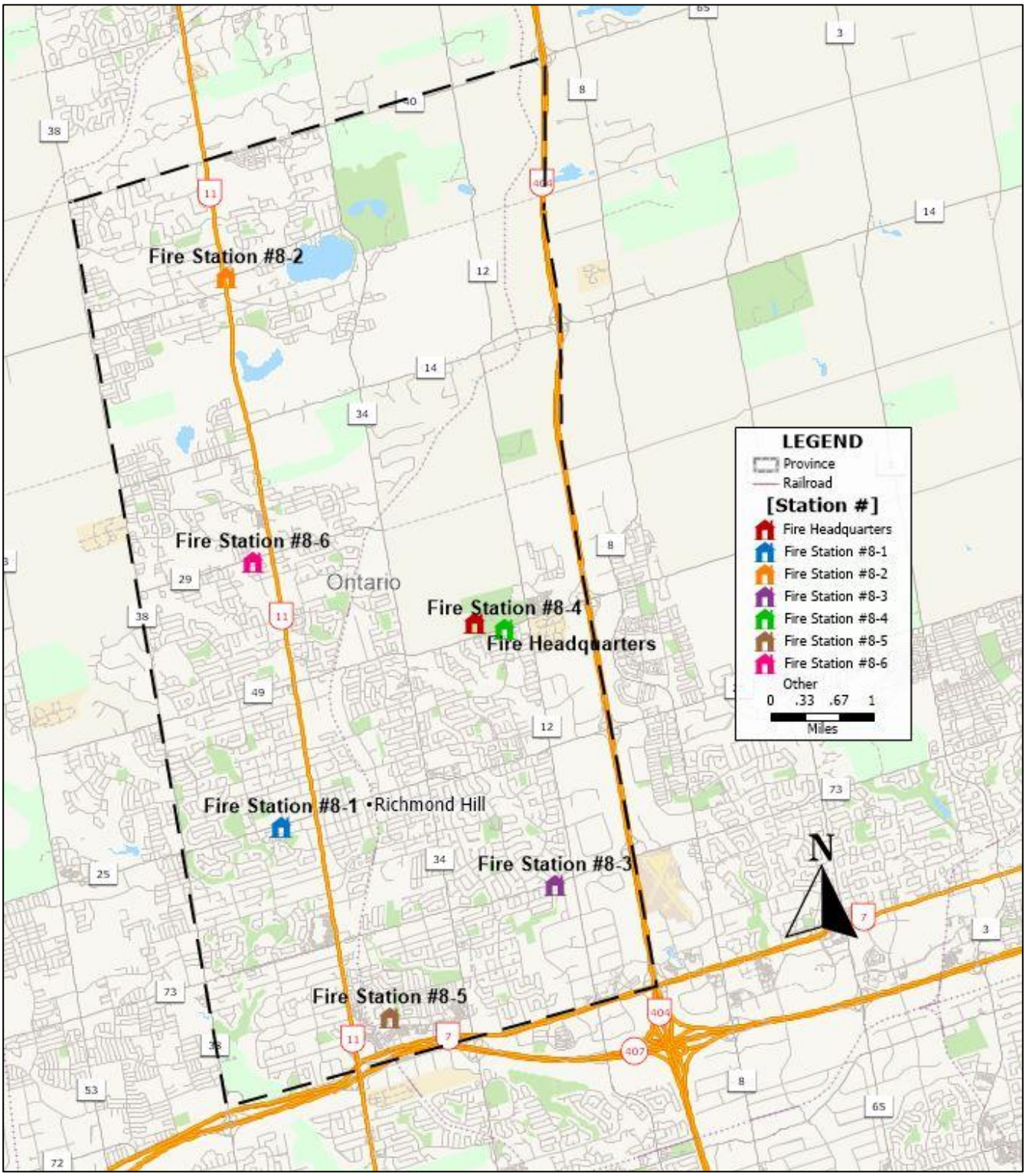


FIGURE #3 Map of Richmond Hill with the Fire Station Locations



1.2 Fire Department Composition

This FMP for the RHFES analyzes and identifies current and probable community fire risks and needs over the next 10 years and beyond. This will greatly assist the Fire Chief with future planning relating to staffing and response, fire and life safety programming, and asset management.

The RHFES currently provides fire protection services from six fire stations located in the community, including:

- Headquarters – 1200 Elgin Mills Road East
- Station 8-1 – 191 Major Mackenzie Drive
- Station 8-2 – 13067 Yonge Street
- Station 8-3 – 1371 16th Avenue
- Station 8-4 – 1365 Elgin Mills Road
- Station 8-5 – 150 High Tech Road
- Station 8-6 – 101 Gamble Road

The RHFES responds to approximately 5,500 to 6,000 calls for service per year. These incidents include fire related incidents, medical assist, water rescue, fire alarms, technical rescue and motor vehicle collisions (MVC).

The Department staff are all full-time and includes:

- One Fire Chief
- Two Deputy Fire Chiefs
- One Training Chief
- One Prevention Chief
- Two Fire Prevention Captains
- One Plans Review Inspector
- Four Fire Prevention Inspectors
- Two Public Fire Life Safety Officers
- Four Communications Officers (Supervisors)
- Eight Communications Operators
- 152 Firefighters
- Two Training Officers
- One Emergency Vehicle Technician
- Three Administrative Assistants
- One Community Emergency Management Co-Ordinator

Each station has a complement of captains and firefighters who respond out of the six fire stations. The total firefighting force for the Fire Suppression/Operations Division consists of 152 firefighters.

The organizational chart noted in FIGURE #4 reflects the general reporting structure within the Fire Department in its present form.

During the process of evaluating operations and the present structure of the department it is believed by EM&T that the Organizational Chart should be amended to reflect what is identified in FIGURE #5. This is further discussed in numerous sections throughout the document.

FIGURE #4 Fire Department Organizational Chart

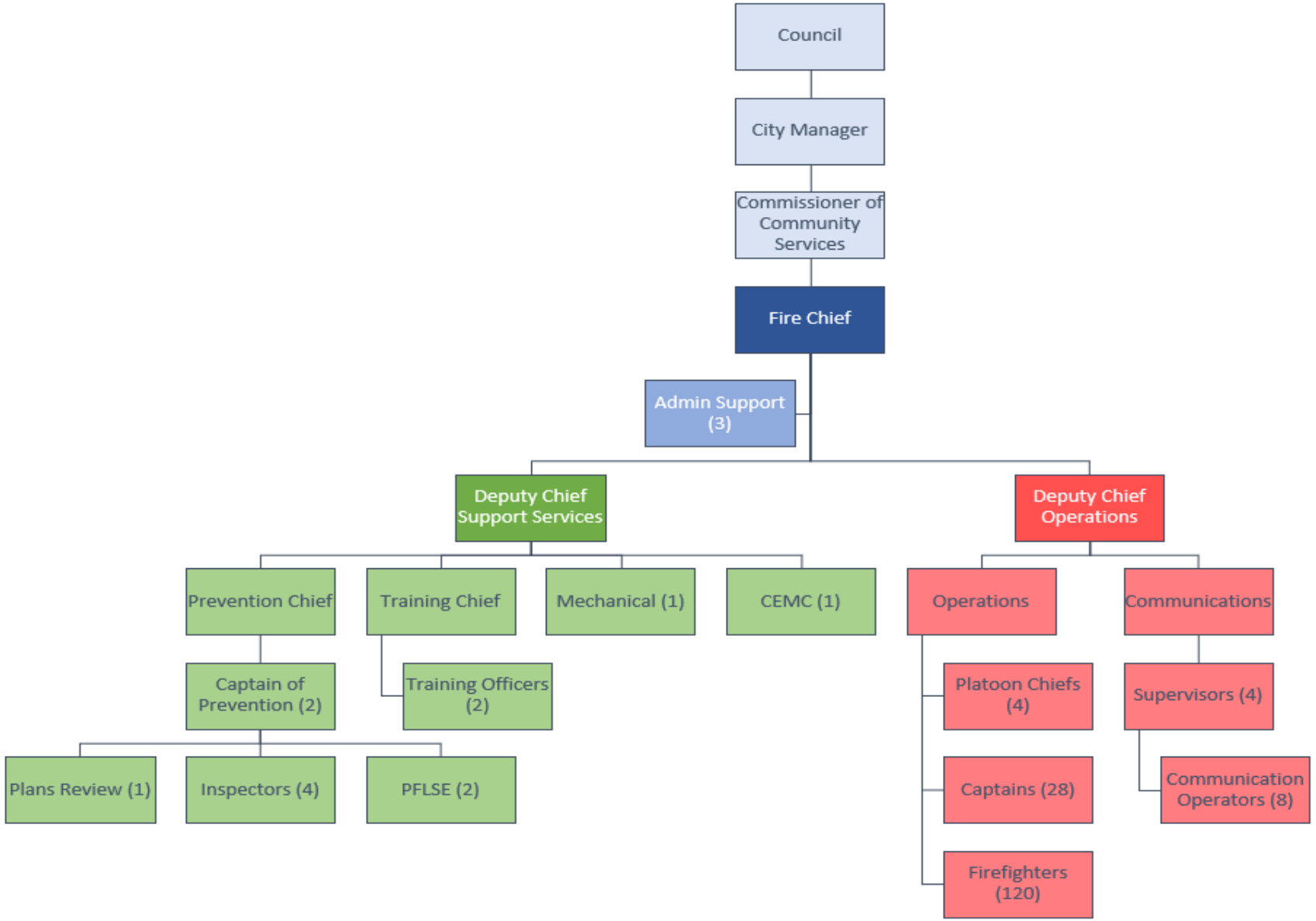
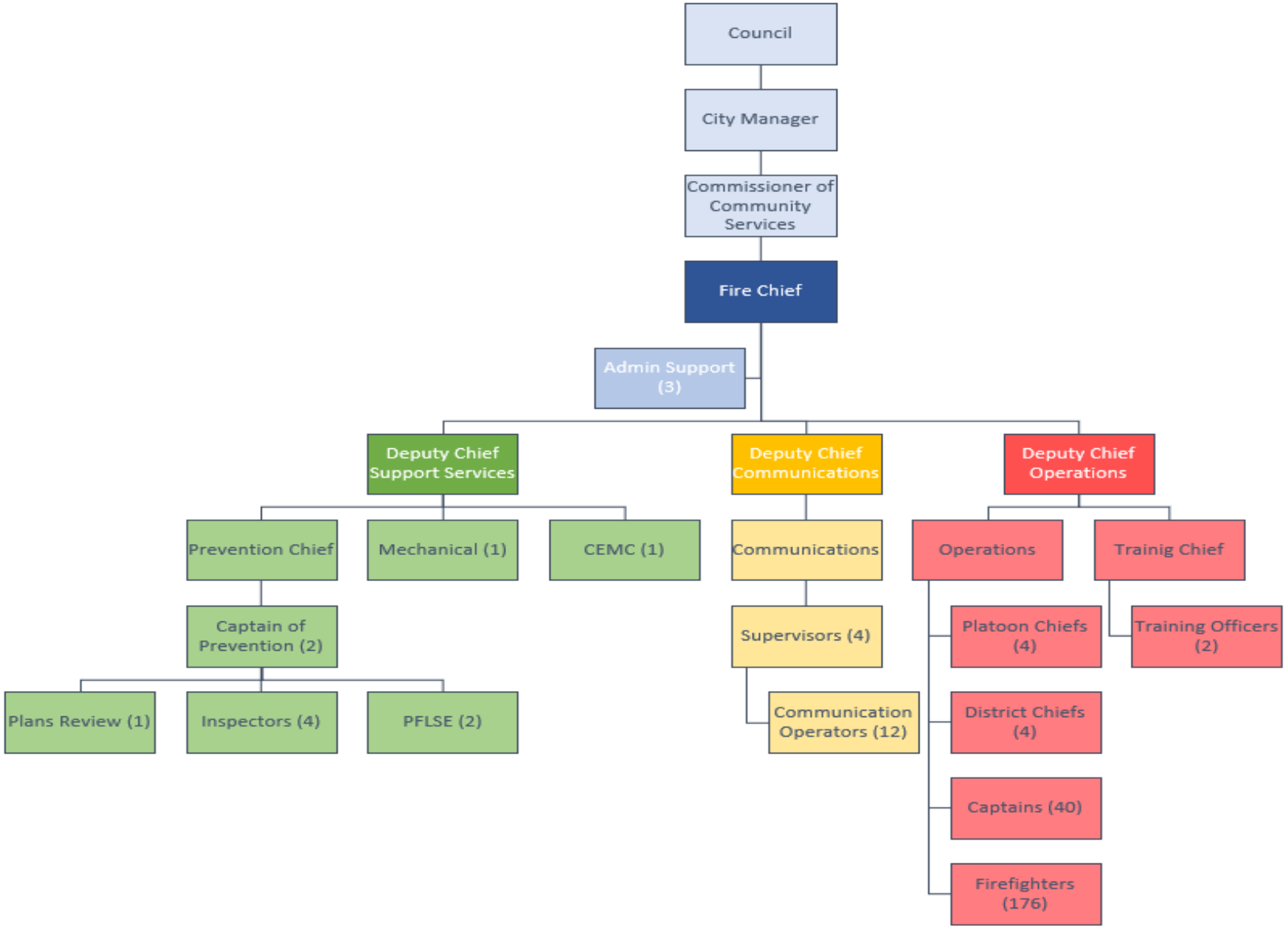


FIGURE #5: Proposed Fire Department Organizational Chart



This current reporting arrangement allows for a sufficient level of involvement by the Fire Chief within the senior management structure of the City and also allows for a high-level of administrative oversight of the day-to-day operations of RHFES.

The fire service has developed a vision, mission and core values statement for their organization to follow for all to view. The RHFES has developed and received Council's approval for new vision, mission, and values & behavioural indicators statements.

The following are the vision, mission, and core values statements:

***VISION STATEMENT**:*

"We are committed to protecting the lives and property of our community through excellence in prevention, education, training, and emergency response."

***MISSION STATEMENT**:*

"We are the leader and innovator of Fire Service Excellence, creating the standard for fire safe communities."

VALUES & BEHAVIOURAL INDICATORS STATEMENT:

***Honesty:** Be fair and transparent when dealing with others in accordance with fire service standards and procedures. Do not steal property or ideas. Safeguard property that come into one's care and return it to the rightful owner. Always speak the truth.*

***Dependable:** Always do what you say you will do. Be punctual, complete tasks on time and be prepared.*

***Respect:** Always be polite and demonstrate good manners and courtesy when dealing with others. Be observant and considerate of the diversity in our community. Always observe rank within fire services.*

***Professional:** Always be attentive to appearance and care of our uniform. Continuously upgrade your knowledge, skills, and abilities. Always demonstrate a positive attitude.*

***Accountability:** Accept responsibility for your words and actions. Admit mistakes. Be attentive to all aspects of the job.*

***Innovative:** Generate and introduce new ideas. Demonstrate an openness to try new things. Adapt/embrace changes in technology.*

Integrity: *Act consistently with what one says and commits to. Be transparent, and honest at all times. Lead by example.*

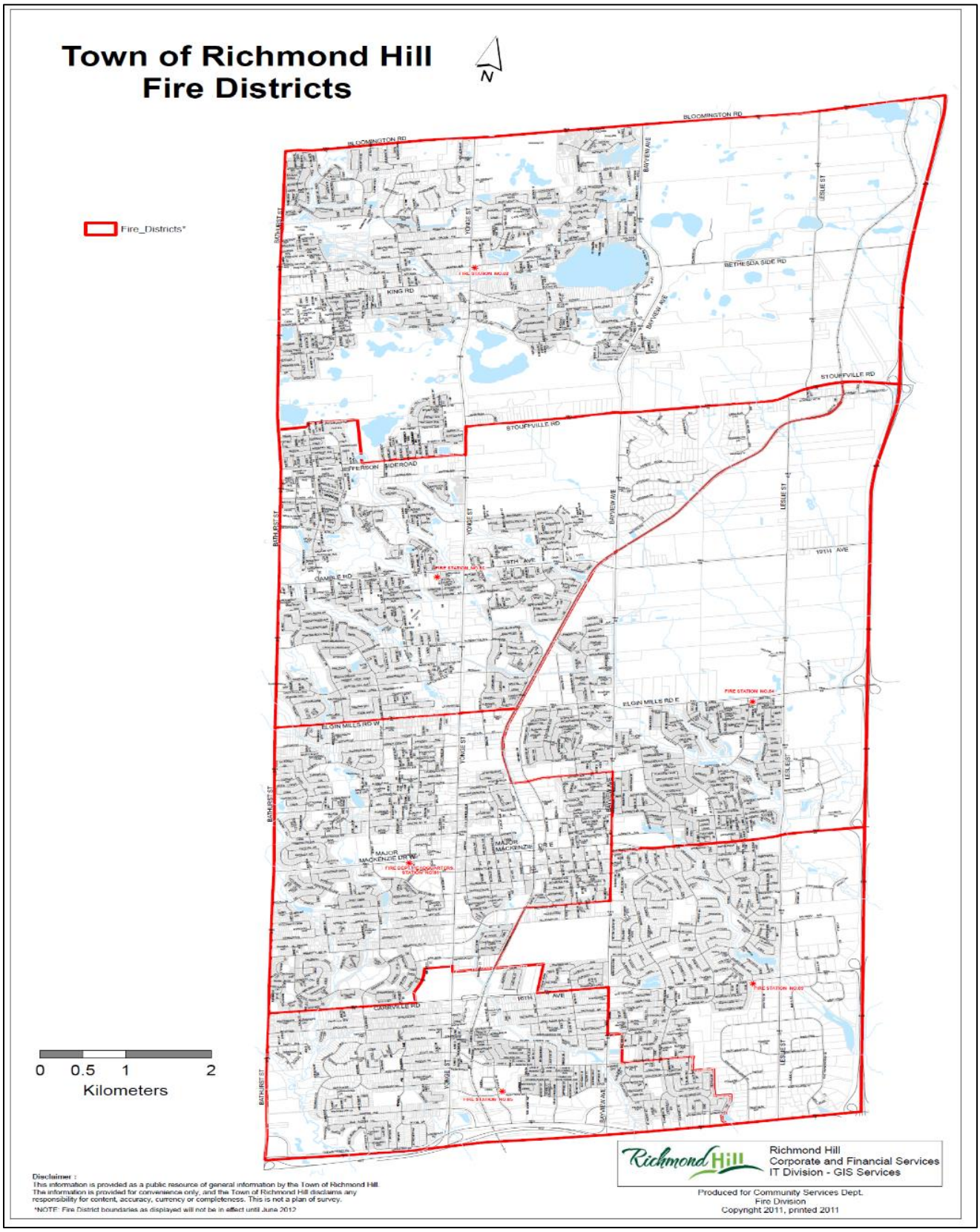
Teamwork: *Act in the best interest of the overall good of the department. Seek input and ideas of others. Actively involve all ("we" not "I" approach).*

Courage: *Respectfully challenge authority and take calculated risks. Always do the right thing no matter what the outcome might be.*

Empathy: *Listen to others, seek to understand and put yourself in their shoes.*

Time, collaboration and effort have been invested in developing these core values and behavioural indicators, mission and vision statements. Having them posted at each fire station will help ensure new firefighters and the community understand where RHFES's focus is.

FIGURE #6: Richmond Hill Municipal Boundaries and Fire Station Response Boundaries



1.3 Community Growth

According to the Richmond Hill Official Plan (2020 Consolidation) and the York Region Official Plan, the City of Richmond Hill's population is forecasted to grow to roughly 242,200 people by 2031. This forecast was predicated on the assumption that by 2016, the City's population would be 216,900. However, according to Statistics Canada, the population of Richmond Hill in 2016 was approximately 195,022 (2016 census) people.

The Region of York monitors population and provides estimates for all nine of the Region's local municipalities. Its latest population estimate for Richmond Hill reflects an end of year 2020 population of 210,300 persons. While the City continues to grow in population, the rate of growth has not been in line with the projections noted in the City's Official Plan. Further, the percent increase in population growth may not translate directly into a call volume increase of the same percentage for the Department.

The Planning Departments of both Richmond Hill and York Region are collaboratively working together to revise the population growth estimates to be included in Richmond Hill's revised Official Plan ("OP Update"). Updates to both the City and Region's Official Plans are presently being undertaken and are anticipated to be completed later next year. As part of an interim growth management exercise, the City prepared an interim population forecast in 2018 in light of the completion of the 2016 Census (see TABLE #1 below).

City staff note that while this forecast provides a more recent glimpse into the base population year to reflect the 2016 Census, it is not an official population forecast for the City and it therefore should be viewed as an estimate for information purposes only in recognition of the fact that both the City and the Region are presently in the process of updating their respective official plans. The estimates presented in the City's 2018 interim forecast are therefore likely to be subject to further changes and should not be relied upon as definitive.

TABLE #1: Projected Housing and Population Growth

	2016-2021	2016-2026	2016-2031	2016-2036	2016-2041
Total New Units	8,288	16,486	23,325	30,206	36,395
Total New Population	22,011	43,586	61,204	78,702	94,894

[3]

Using both population growth and call volume growth would indicate call volumes in 2030 being approximately 7,800 to 8,400 calls annually. This estimate is subject to change depending on the rate

[3] City of Richmond Hill, Planning and Infrastructure Department

of growth the City witnesses changes in response procedures, enhancement of services provided by the Department, etc.

The current Official Plan identifies certain areas with special designations to provide for a maximum amount of growth. Through the Official Plan update work based on provincial, regional and local council direction, the City will consider permitting taller and more dense development creating capacity to accommodate more population within the City, specifically in the area of Highway 7 and Yonge Street (Richmond Hill Centre).

Intensification areas will need to be monitored for their rate of growth and the timing of it.

As apartment buildings are completed and new residents move in, this will accelerate growth. With the construction of new high-density development along the regional corridors and the future build-out of North Leslie and West Gormley secondary plan areas, the City anticipates increased growth will continue over the next decade.

To date, the tallest approved building in the City has been 30 storeys (not yet built). More recent development proposals are requesting building heights as high as 54 storeys, which are considerably higher structures with many more residents residing in them. This will present challenges to the fire service when responding to a fire in structures of this height. As buildings are completed, the Department will need to evaluate response procedures which may see the need for additional resources being obtained including additional staff, apparatus' and/or possible fire stations.

NFPA 1710, Article 5.2.4.4, High-Rise Initial Full Alarm Assignment Capability, Clause 5.2.4.4.1, in summary, states that fire services responding to a high-rise incident that is higher than 75' (23m), the total effective response force must be a minimum of 42 firefighters. This is further discussed in Section 5.

Building applications are presently being submitted for approvals. The highest buildings that have received approvals are as follows:

- Three towers (32-, 32- and 16-storeys) near Yonge Street and Carrville Road (settlement approved by Council, currently waiting for the final rulings from the **Local Planning Appeal Tribunal** (LPAT) before being approved).
- Four towers (30-, 24-, 19- and 19-storeys) near Bantry Road and Red Maple Road (currently under construction).
- Two towers (29- and 24-storeys) at the southwest corner of Yonge Street and Carrville Road (approved by LPAT, although I have heard they are looking at reapplying for higher heights).

Current applications for 40+ storey buildings are as follows:

- One tower (54 storeys) on the corner of Yonge Street and Garden Avenue.
- Two towers (45- and 42-storeys) on the northeast corner of Yonge Street and 16th Avenue.
- Two towers (43- and 38-storeys) on the southeast corner of Yonge Street and 16th Avenue.

Other locations under development consideration include:

- Bloomington and Yonge (12-storey structure plus townhouses).
- Bathurst and Highway 7 (a large development of high density).
- Major Mackenzie Drive (a large development of high density).
- Many more enquiries that are speculative at this time.

As growth continues, the development has impacts on numerous departments including Transportation, Recreation, and Fire Service Plans.

New developments offer opportunity to integrate the Fire Department in them. Examples from other communities include the building of a fire station into a low-income apartment building in Vancouver, and a fire station in the lower level of a convention centre in Montreal. Fire station partnerships can occur both in the private or municipal sector. In Toronto, Simcoe County, Peel Region and in York Region it is becoming commonplace to see both fire and Emergency Medical Services (EMS) integrated into the same structure. Some municipalities have integrated a library or a public works yard to fire stations. These concepts are discussed further in Section 6.

EMS in York Region, Ottawa, and Simcoe County have moved towards the “hub” concept. In Simcoe County, a new hub opened in the City of Barrie in 2020 that is housing the Barrie Police Service, Simcoe County Paramedic Service, and the Barrie Fire & Emergency Service’s back-up Communications Centre. Further discussion is presented in Section 6 on how RHFES could move their divisions to one location, saving on constructing multiple locations and having to purchase additional land. In some cases, the amalgamation of services to one location could see the opportunity of liquidating property no longer required and those funds being applied to the expense of the new hub.

To ensure fire protection in newly acquired land for the expansion of the city, the City of Barrie has leased two units of a commercial plaza for a temporary fire station until such time as a suitable location is found for a permanent station. This initiative has saved the taxpayers close to $2,000,000 in expenses as the property owner agreed to look after the expense of the lease hold improvements. The renovations were designed in conjunction of staff’s input from the fire department. All the amenities of a permanent fire station have been included.

Recommendation – Strategic:
It is recommended that the RHFES to explore any potential community partnerships when they begin the process of acquiring land and building a new fire station in the northeast quadrant of the City.

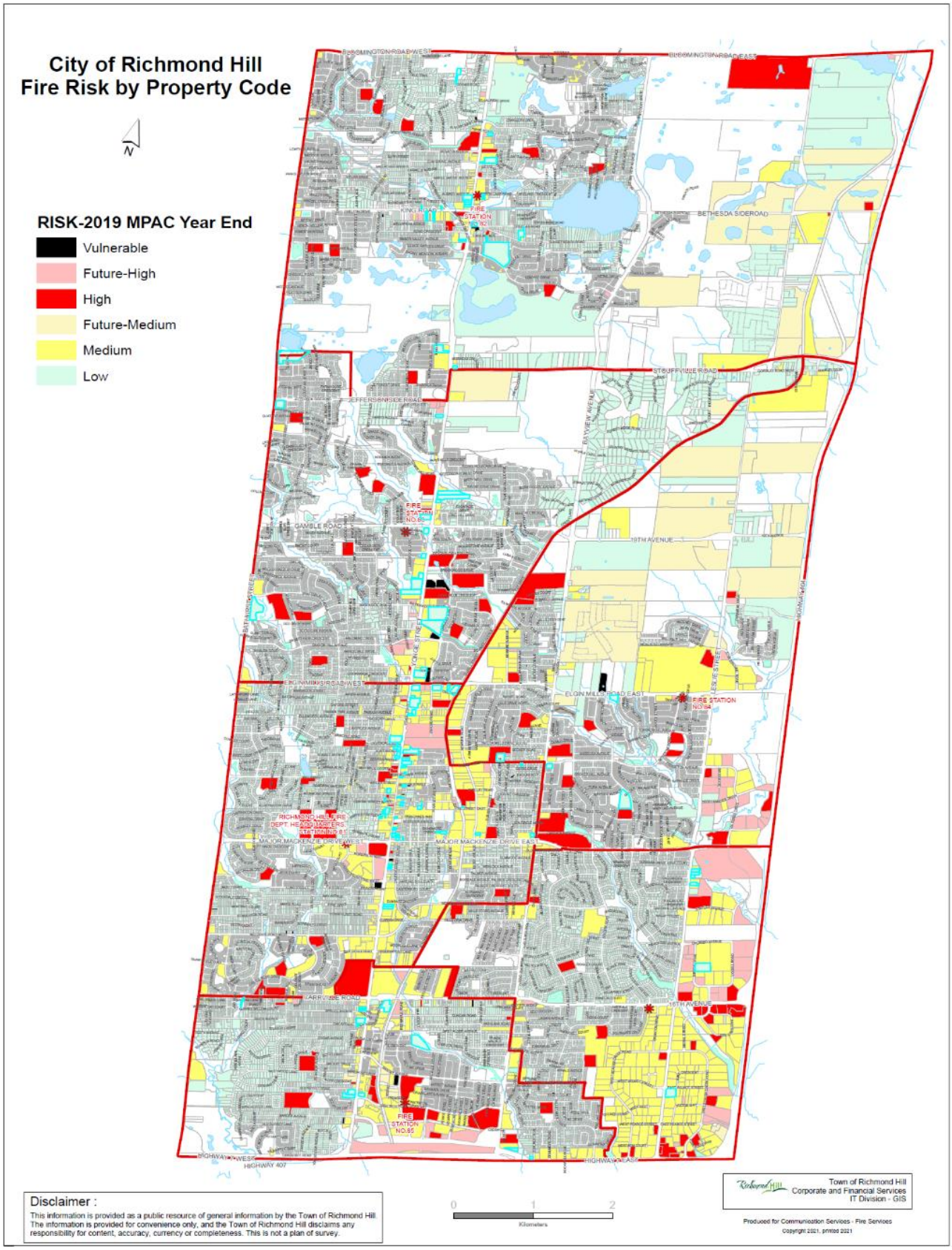
NOTE: More supporting discussion in relation to this recommendation can be found in Section 6.
How much the call volume will increase is unknown because population percentage growth or historical call growth are not the only factors related to calls for service. Other factors include:

- Population and demographic changes (e.g., aging population may increase medical calls).
- Variations in tourist populations (e.g., COVID-19 restrictions reduced the numbers of vehicles and persons visiting the City in 2020).
- Changes in policies and protocols (e.g., changes in tiered response or other dispatch protocol).
- Commercial development (e.g., both types and size of development).
- Weather events (e.g., a single weather event can increase annual call volume significantly).
- Technology changes (e.g., development of CO alarms increased calls).

To gain a more accurate understanding of anticipated call volumes, the Fire Chief needs to continue tracking annual percentage increases and report this to Council to ensure that they are aware of the increases and what challenges are affecting the Department.

The following map identifies the many occupancies that are considered as being at some level of risk if a fire were to occur. This is based on 2019 data from the Municipal Property Assessment Corporation (MPAC).

FIGURE #7: Fire Risk Levels Based on the Property Code



Key areas to monitor include medical responses which account for approximately 45% of the calls and false fire alarms which make up more than 25% of the Department's call volume in 2020.

There are two significant residential developments presently being developed which could take between five to ten years to complete due to the number of housing units involved. The North Leslie Secondary Plan in the northeast quadrant of the City is anticipating approximately 6,250 new housing units and up to 19,300 new residents upon completion. It borders 19th Avenue to the north, Elgin Mills Road East to the south, Bayview Avenue to the west, and Highway 404 to the east.

The building density will be significant as the development includes single residential row housing and some apartments. It should be noted that this housing development has received the required approvals for their plan and may proceed with the initial development of the area. See FIGURE #8.

The West Gormley Secondary Plan is a much smaller development in size than the North Leslie Plan but will be of considerable size upon its completion. This plan borders Bethesda Sideroad to the north, Stouffville Road to the south, Bayview Avenue to the west, and Leslie Street to the east. This subdivision is estimated to include up to 1,600 housing units and a population growth of 5,400 new residents.

It should be noted that there is no fire station located in the northeast quadrant of the City to protect this area. Response times to this area may increase compared to the rest of the City. The Department should monitor the call volume and response times and make changes in operations accordingly.

FIGURE #8: Map Showing North Leslie and Gormley Developments

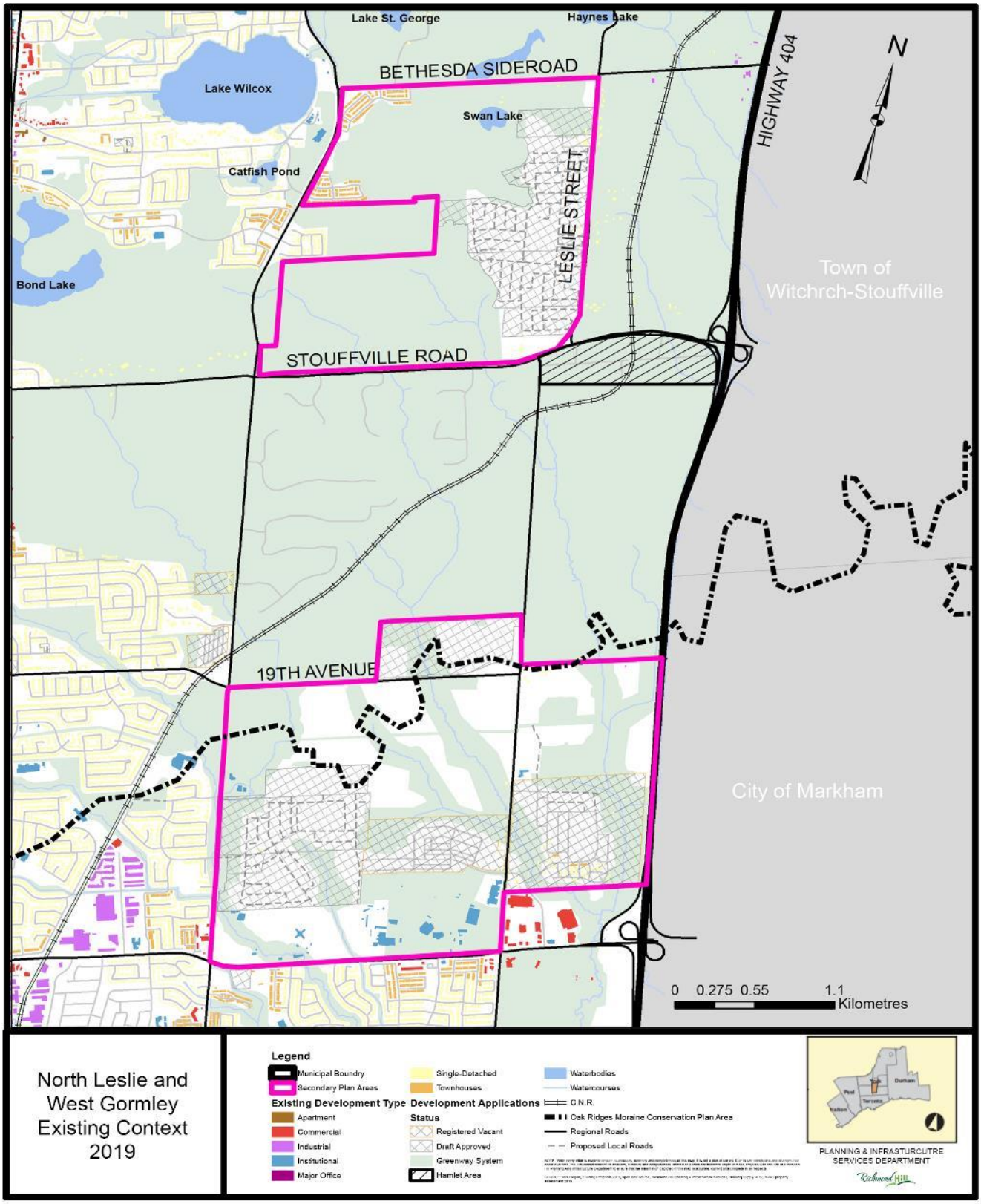


FIGURE #9: Map Identifying Development Types

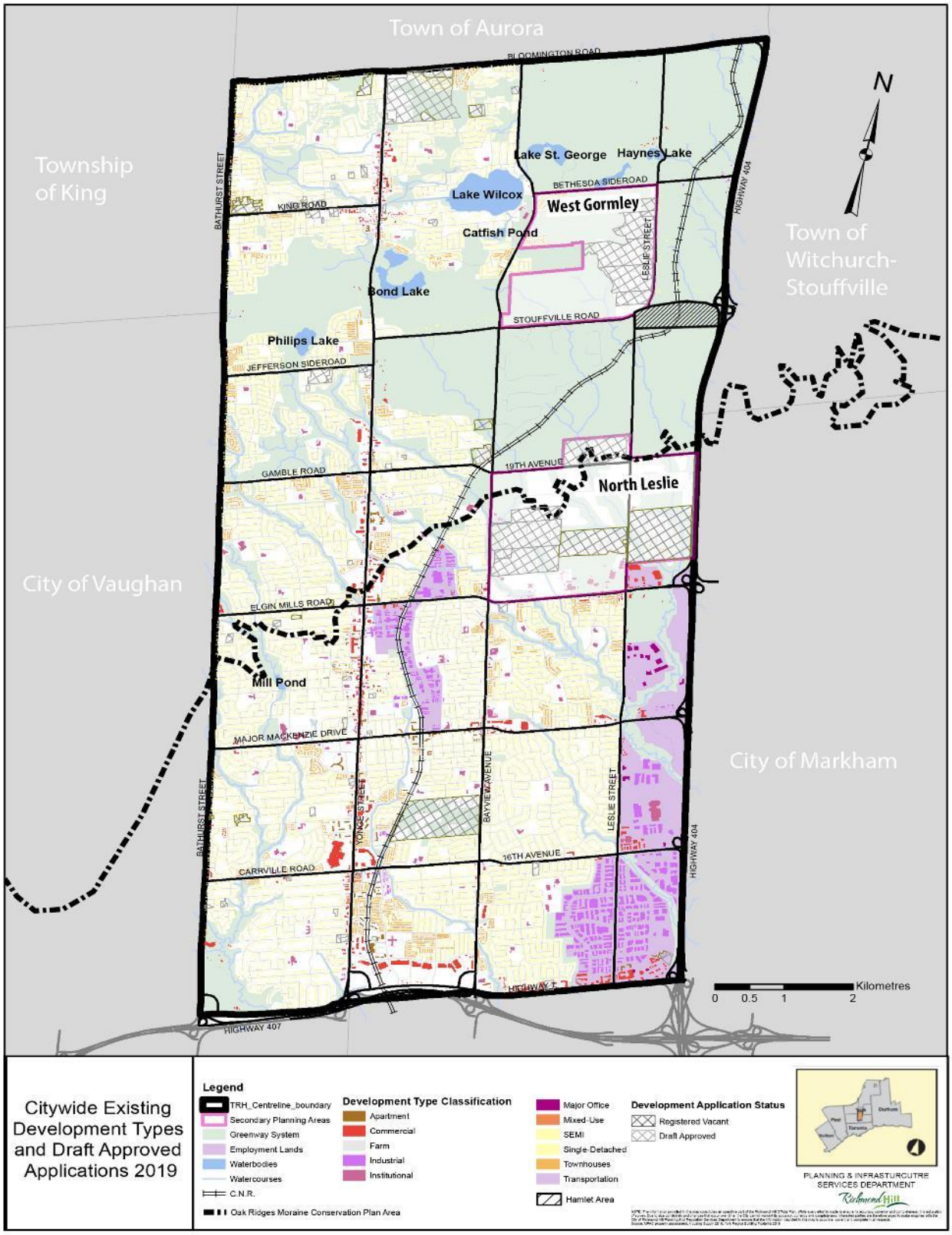
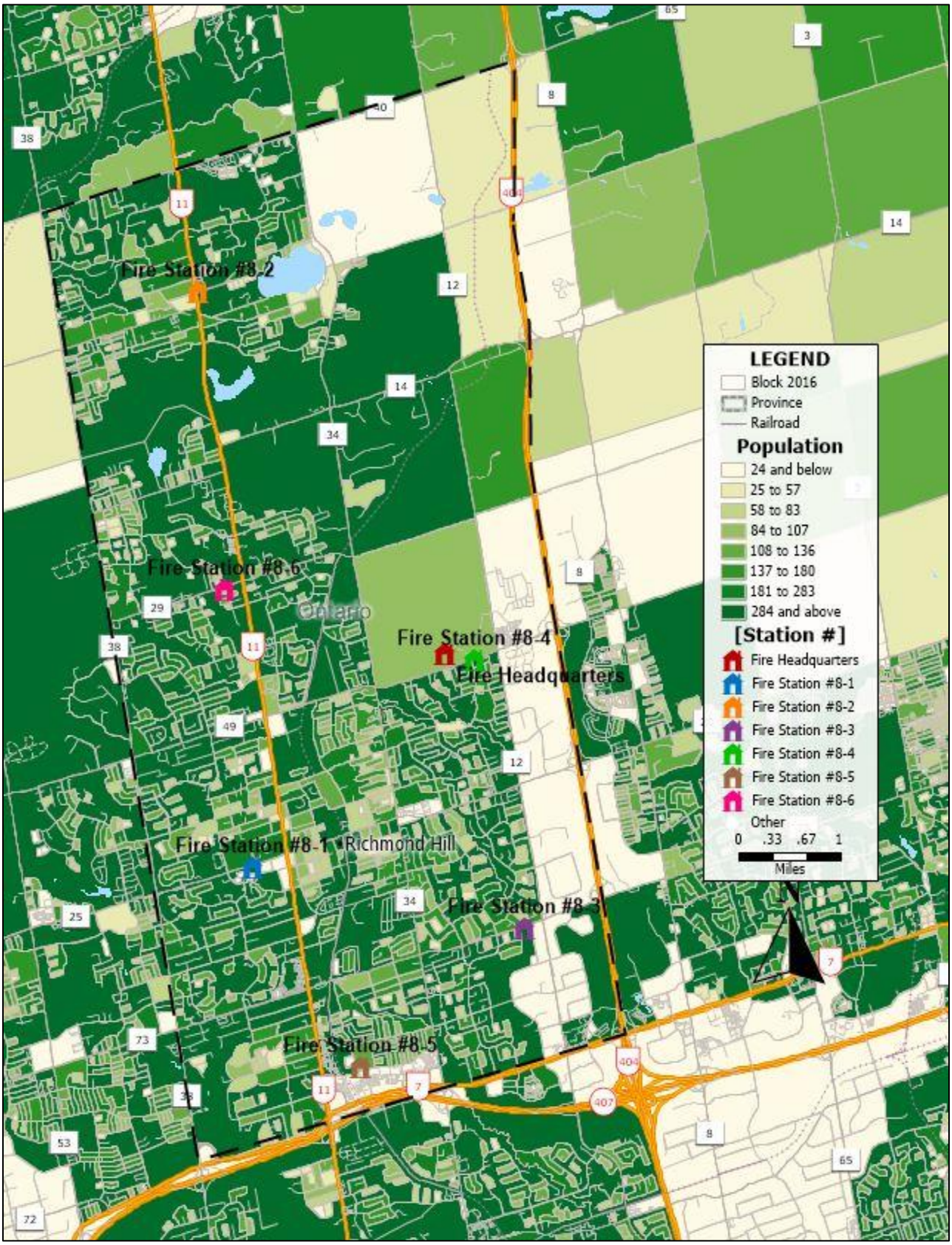


FIGURE #10: Height of Buildings in the Yonge St. Corridor

FIGURE #11: Richmond Hill Population Density Map and Fire Station Locations



Based on the 2016 population, the population density of Richmond Hill is approximately 1,928.8 residents per square kilometre. This is a mix of urban, suburban, and rural densities in the city, with the more densely populated area being along the Hwy 7 / Hwy 11 areas.

In a 2018 BMA Management Consulting Inc. municipal study, which was conducted using 2018 data on cost per capita, Richmond Hill paced in the lower range of cost per capita of municipalities with a population range greater than 100,000 people. The top end is $286 per capita, whereas Richmond Hill is at $122 per capita costs.

Each municipality's results are influenced to varying degrees by several factors including:

- The nature and extent of fire risks such as the type of building construction (i.e., apartment dwellings, single family residences and institutions such as hospitals).
- Geography such as the topography, urban/rural mix, road networks, fire station locations and travel distances from those stations.
- Fire prevention and public education efforts with includes the enforcement of the Fire Code and the presence of working smoke alarms.
- Staffing model (i.e., full-time, part-time fire, or composite).
- Collective agreements (if any) and the differences in what stage of multi-year agreements municipalities are at and differences in agreements about the number of firefighters assigned to each apparatus.

Although this data is from 2018, it places Richmond Hill as the third lowest when it comes to fire department spending out of 25 municipalities in Ontario with a population over 100,000 residents.

With the City growing in population and structures, many of which are high-rises, it will be difficult to maintain this spending. Without some degree of service provision cuts it could present a higher level of risk to the City, including the risk to public safety.

TABLE #2: Fire Service Costs per Capita - Population > 100,000

Municipality	Net Cost per Capita Excl. Amort.	Net Cost per Capita Incl. Amort.
Milton	$82	$95
Markham	$108	$108
Richmond Hill	$122	$122
Brampton	$117	$123
Kitchener	$141	$145
Mississauga	$144	$149
Whitby	$152	$161
Greater Sudbury	$150	$162
Chatham-Kent	$147	$164
Burlington	$156	$165
London	$161	$169
Hamilton	$162	$170
Ottawa	$164	$170
Waterloo	$169	$175
Toronto	$172	$177
Cambridge	$176	$179
Vaughan	$174	$179
Oshawa	$177	$184
Oakville	$181	$189
Brantford	$185	$192
St. Catharines	$186	$194
Barrie	$190	$200
Kingston	$196	$213
Guelph	$205	$214
Windsor	$219	$225
Thunder Bay	$277	$286
Population >100,000 **Average** **Median**	 **$166** **$166**	 **$173** **$172**

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
1	RHFES to explore potential community partnerships when they begin the process of acquiring land and building a new fire station in the northeast quadrant of the City.	Staff time	Short-term (1-3 years)

SECTION 2 – Planning

2.1 Three Lines of Defence

2.2 Industry Standards and Best Practises

2.3 Strengths, Weaknesses, Opportunities and Threats

2.4 Establishing & Regulating By-law

2.5 Fire Services By-law, Policies, Directives and Standard Operating Procedures

2.6 Commission on Fire Accreditation International

2.7 Stakeholder Surveys

Section 2: Planning

Planning is a key function of any organization and should be done with a focus on the present needs of the community, coupled with its future growth and how this will affect the service demands on the Department. Through the work completed on their previous FMP (refer to Section 11, for further information) and the implementation of this FMP process, RHFES has clearly demonstrated a proactive approach towards its planning initiatives.

2.1 Three Lines of Defence

The OFMEM has identified "Three Lines of Defence" to be utilized by all fire departments in Ontario when planning to meet the needs of the community.

The identified three lines of defence, as noted by the OFMEM are:

1. **Education** – Fire safety education is the key to mitigating the fire and life hazards before they start. With the growth of the community, how will the municipality continue to meet the fire safety educational needs of the community?
2. **Inspections and Enforcement** – If the public education program does not prove effective, then the next step is for the fire department to enforce fire safety requirements through inspections leading to possible charges under the *Fire Protection and Prevention Act*.
3. **Emergency Response** – If the first two lines of defence fail the community, through its fire department, should be prepared to respond in an efficient and effective manner to put the fire out and/or mitigate the emergency itself. By evaluating the effectiveness of the fire stations, staff, and equipment, this report will be able to make recommendations for related efficiencies.

In conjunction with the three lines of defence, a key industry standard that outlines goals and expectations for a fire department is the National Fire Protection Association (NFPA). Adherence to these standards is not mandated but they form the foundation of the fire services recommended best practices. These NFPA standards are also utilized by organizations such as the Fire Underwriters Survey (FUS) group to conduct their assessments of a fire department and the community. The provincial Fire Marshal Offices and provincial fire schools also use them to form the foundation of their evaluation and training programs.

2.2 Industry Standards and Best Practises

In 2014, the Province of Ontario adopted a move to the NFPA Standards for training and certification courses through the OFMEM. To assist with EM&T's review, reference has been made to key NFPA Standards that identify services that should be offered and how they are to be delivered based on the composition of the Department.

RHFES provides professional development of their personnel in accordance with the numerous NFPA Standards.

2.2.1 NFPA 1710

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.

NFPA 1710 was updated in 2020. This new version states that a career fire service should have 16 firefighters on the scene within 480 seconds (8 minutes) or 17 if an aerial device is in operation. The previous standard edition asked for 14 firefighters by 480 seconds (8 minutes). For the purpose of this FMP, the pre 2020 Standard will be followed as all response data is based on that format. Going forward, the RHFES should follow NFPA 1710 (2020 Edition) requirements of 16 firefighters on the scene within 8 minutes, or 17 if an aerial is in operation.

To provide the Department a more defined focus on what the ultimate goals for emergency response criteria are, the NFPA suggests that response times should be used as a primary performance measure in fire departments.

Based on NFPA 1710, RHFES is categorized as a career fire department as described in Article 3.3.13 Career Fire Department. "*A fire department that utilizes full-time or full-time equivalent station-based personnel immediately available to comprise at least 50 % of an initial full alarm assignment"*. An initial full-alarm assignment is described in Article 3.3.40 as "*Those personnel, equipment, and resources ordinarily dispatched upon notification of a structure fire."*

NFPA 1710 (2020 edition) sets out 90th percentile standards for the first arriving apparatus for a single-family dwelling, along with the number of firefighters required to compose a full complement and when they should be on scene.

The NFPA 1710 (2020 edition) standard defines the initial full alarm assignment to a single-family dwelling as a 2,000 ft^2 (186 m^2) two-storey single-family dwelling without a basement and with no exposures present. The minimum staffing levels recommended for the initial response is seventeen (17) firefighters if an aerial device is required to respond. The NFPA 1710 standard identifies that the first arriving engine company should arrive on scene in 240 seconds/4 minutes (travel time) and 360

seconds/6 minutes (travel time) or less for the second arriving engine company for 90% of these incidents. For other than a high rise, 480 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident. If a high-rise, 610 seconds (10 minutes 10 seconds) or less travel time for the deployment of an initial alarm at a fire suppression incident.

Additional information and data regarding responses is available in Section 5.

2.2.2 NFPA 1201

One of the foundational NFPA Standards is Standard 1201 as it sets out criteria for providing fire and emergency service to the public.

Section 4.3.5 notes:

- The Fire and Emergency Services Organization (FESO) shall provide customer service-oriented programs and procedures to accomplish the following:
    1. Prevent fire, injuries and deaths from emergencies and disasters.
    2. Mitigate fire, injuries, deaths, property damage and environmental damage from emergencies and disasters.
    3. Recover from fires, emergencies and disasters.
    4. Protect critical infrastructure.
    5. Sustain economic viability.
    6. Protect cultural resources.

To accomplish this an FESO must ensure open and timely communications with the Chief Administrative Officer (CAO) and governing body (Council) to create a master plan for the organization and ensure there are mutual aid and automatic aid programs in place with an asset control system and maintenance program.

To provide a fire department clearer focus on what the ultimate goals for emergency response criteria are, the NFPA suggests that response times should be used as a primary performance measure in fire departments. NFPA 1710 refers to the goals and expectations for career fire departments and has been incorporated into the evaluation of the Department's response and staffing needs. More discussion in relation to these two standards will be presented in sections 3 and 4.

2.3 Strengths, Weaknesses, Opportunities and Threats (SWOT)

This FMP document is the result of conducting a SWOT analysis on the community which has resulted in a list of recommendations for the City's Council, City Manager, Commissioner of Community Services, and the Fire Chief to consider and implement.

The strengths and weaknesses portion of this SWOT are based on an internal review of the Department to identify existing efficiencies, along with recognizing areas for improvement. The opportunities and threats portion are related to external influences and how these influences affect the operations and response capabilities of the Department.

2.3.1 Strengths

The City benefits from having six fire stations that are staffed and well-equipped for response to emergencies. These stations are staffed by a team of dedicated, motivated and community-focussed career firefighters who have expressed through the completion of the internal surveys that they are quite proud of the level of service they provide to the community. For the most part the fire stations and equipment are adequate and the firefighters believe that they are well-equipped to effectively carry out their responsibilities. Concerns were shared about the age of some of the fire stations and the need for them to be upgraded or replaced.

The Department has clear organizational vision, mission and values and behavioural indicator statements with a strong commitment to excellence.

The greatest strength of the Department is its people. They are dedicated, professional and genuinely care about the City, its residents and the level of service provision. They have an excellent picture of RHFES's current and future needs.

RHFES has strong relationships with neighbouring fire departments and a long history of cooperative services. There is a mutual aid plan and other agreements in place to help meet the fire safety needs for the community of Richmond Hill.

The Fire Prevention Division is proactive within the community regarding education, fire safety inspections and enforcement, as resources allow.

Over the years the RHFES has developed an excellent reputation with the community by displaying professionalism among all services provided. This reputation continues to grow as the years pass and the residents appreciate efforts put forth by members of RHFES.

2.3.2 Weaknesses

Due to the rapid growth of the City along with increased traffic flow, a reorganization of the fire station response zones should be conducted. Future consideration should be given to the location and viability of a new station 8-7 which has been previously identified as a requirement in the 2016 FMP. More information on the proposed new station is noted in sections 5 & 6.

When an apparatus or piece of equipment is out of service, the duration of downtime could become a hinderance to the Department and the crews must make do with spare apparatus or equipment that they may not be accustomed to. This could present an issue with health and safety if firefighters are operating a piece of equipment they are not trained to use. RHFES resolves such issues by purchasing the same apparatus and chassis with the same pumps and ancillary equipment. Standardization of the fire fleet and equipment is becoming a common practise. There are significant cost savings to be had as there will be less training required and a significant savings in repair costs.

It has been identified that there is a requirement for enhanced succession and mentoring programs for officer development. As officers leave the Department, a wealth of knowledge and experience leaves with them. A comprehensive succession plan should be established including the opportunities to attend officer training courses and mentoring from existing officers.

2.3.3 Opportunities

RHFES has a mutual aid program in place in which RHFES may call on neighbouring fire departments for assistance whenever local resources are exhausted and there is an inability to handle the incident with the Department's resources efficiently. Discussions should take place between all the fire services of York Region regarding the implementation of automatic aid and response agreements. There are duplications of services between several departments that are not called upon very often. For example, there may be opportunities for each municipality to focus on one technical rescue discipline and respond to another area under an agreement. The Fire Chief has tried on many occasions to implement automatic aid agreements, but there has been little interest of doing so by other York Region Fire Services.

Continued planning and co-operation with neighbouring municipalities is a cost-effective option for such things as automatic aid and fire service agreements. This type of planning will ensure that Richmond Hill has the resources needed during any large-scale incident that may exhaust local resources. Such planning does not need to involve just emergency services. The RHFES could also involve local partnerships to assist in the mitigation and recovery from significant events.

The enhancement of service provision when responding on tiered medical calls could be improved through the development of an official Tiered Medical Agreement. Other enhancements include the administration of glucagon and acetylsalicylic acid (ASA). York Region fire services are lobbying the OFMEM and Ministry of Health for the inclusion of York Region into the simultaneous notification program, which is currently operating in numerous communities in Ontario.

As previously mentioned, there are many members of the Department that have great ideas on how to move the Department forward. The simplest way is for the establishment of committees to address areas of operations of the Department. The assignment of research and development of new initiatives, policies and programs will also reduce the workload on numerous levels of officers in the

Department. Examples of committees include and are not limited to apparatus specifications, SOGs, uniforms, etc.

While some staff express concern about morale, there is the opportunity to celebrate the successes such as a crew saving a citizen's life using a defibrillator, the saving of a life during a structure fire, the birth of a baby or exceptionally well performance during a technical rescue. Organize a staff celebration night to thank the crews and their families for what they provide to the community.

Staff have stated that they want to be more informed on what is occurring within their fire department. They take pride in the types and level of service they provide the citizens of the City. Explore opportunities to improve lines of communication between management, the staff and Council.

2.3.4 Threats/Challenges

The City's population is expected to grow very quickly in the coming years with many high-rises and residential housing units. With this growth comes increased traffic, businesses, and call volumes. Through ongoing planning and data assessments, RHFES will be able to better adjust to such changes. When reviewing population growth, the immigrant demographic must be taken into account as members of established residents in the City move closer to each other. Many of those come from abroad and present different challenges, such as language barriers. This could equate to a greater focus on fire safety education that comes in numerous languages, which can put a strain on the resources of the Fire Prevention Division.

The fire service has many standards and regulations and they are being updated, changed and developed on an ongoing basis. This ever increasing demand continues to add pressure on Department management to keep pace due to training requirements, equipment upgrades and the costs incurred to remain current with the industry's standards and best practices.

The current forms of funding for fire services in the province are becoming challenging to sustain and to allow for the implementation of new programs or increase the level of service provision. New initiatives should be considered such as community partnerships with businesses, sponsorships of programs, and the invoicing of more call types including a third-party invoicing for all calls. The increase of staffing due to service demands is one of the largest challenges for the City as between 95% and 97% of the Department's budget goes towards salaries and benefits. With the addition of stations and apparatus there is a direct need for increased staffing of firefighters as well as addressing the staffing needs of Fire Prevention, Communications, Training, Administration and Mechanical Divisions.

Changes in climate and inclement weather incidents such as freezing rain, ice storms and flooding are becoming more common; they need to be part of the response program for each community. This

change in climate conditions along with the resulting frequency and severity of incidents, has created the need for a larger response component to these types of emergencies. This is another reason for ensuring strong ties with other communities regarding mutual and automatic aid programs. These challenges support the necessity for exercising and updating the community's emergency preparedness program annually.

More information in relation to community risks and recommendations for mitigation will be highlighted within EM&T's CRA document.

RHFES adopted the use of response time measurements as a guide to evaluate their capabilities in relation to the previously noted NFPA standards. RHFES's E&R By-law does not specify what response time criteria is expected of its department. This does not restrict RHFES from tracking and reporting on its level of service on a year-to-year basis. In fact, this is a good practice for the Fire Chief to continue as they have in the past. It allows for a proper assessment of response types, number of responses and a thorough evaluation of response times to assess if the department can keep up to the demands of the community.

There are a number of other challenges that affect the operations of the department such as:

- The ongoing COVID-19 pandemic of 2020-2021.
- The turn-over of staff through retirements or moving to other locations results in an increase in the number of fire fighter recruit classes and their effects on the budget and training.
- Changes to the culture of the fire service.
- Seems to be operational disconnection between crews. The cause of this should be explored.
- Maintaining the financial support from Council while they face challenges from other departments of the City and the residents for more services, such as community centres and libraries.
- Legislative changes from the Provincial Government and their effects on the entire municipality. Certifications within the fire department and meeting the ever-changing Standards and Regulations and their effects on the budget.
- Effects of collective bargaining on the department both operationally and financially.
- Maintaining residents' expectations of the fire service.
- Demands for increased public education delivery.
- Technological changes and upgrades are ongoing including changes to software and hardware. There are computer programs within the City's operations that fail to communicate with each other which effects an inconsistent flow of operations. Computer systems should communicate with each other and share the data they contain.

2.4 Establishing & Regulating By-Law

The current E&R by-law NO. 19-95 was updated in 1995, making this a very outdated document. Many parts of the E&R document do not line up with the expectations of the *Fire Protection and Prevention Act*.

To assist the Fire Chief in meeting the needs and expectations of Council, the E&R by-law should note that the Department shall respond to a variety of incidents designed to protect the lives and property of the inhabitants of Richmond Hill.

There are no references to response time expectations in accordance with the NFPA Standards.

E&R by-laws should be reviewed yearly and updated to reflect such things as new legislation, changes in the types and level of response and training expectations.

Recommendation – Strategic:
It is recommended that the E&R by-law be updated and reviewed annually to meet current industry standards and the level of operations of the RHFES.

Consideration should also be given to such guidelines and standards as:

- Section 21 Guidelines for the Fire Services
- OFMEM Guidelines in relation to staffing and response recommendations
- Related NFPA Standards that deal with:
    - Training
    - Fire prevention and public safety programs
    - Fire department response goals and objectives

By incorporating these guidelines and standards, RHFES will be ensuring that staffing, training programs, fire prevention initiatives, and response to the community adhere to the industry's best practices.

2.5 Fire Services By-law, Policies, Directives, & Standard Operating Procedures

Fire department policies and guidelines have enormous value for a department. In fact, they can be seen as the key foundation to a department's success. The backbone of any fire service is its policies, SOPs and SOGs, which govern and provide direction on its operations.

- **A policy** is a high-level statement that expects consistent compliance. There is very little to no leeway permitted with a policy.
- **A guideline** is a standard with an acceptable level of quality or attainment on how to act in a given situation with non-mandatory controls.

- **A procedure** is a standard with an acceptable level of quality or attainment in a series of detailed steps to accomplish an end. There are step-by-step instructions for implementation.

RHFES's SOGs, while numerous and encompassing, are not current and thorough. To ensure all of the SOGs are current, the Deputy Fire Chiefs should review and revise existing policies and SOGs regularly and develop new policies and SOGs as required. For example, some fire departments review a third of the SOGs annually so that the entire document is reviewed every three years.

The review of the SOGs is a very involved process and the Deputy Chiefs should not take this task on by themselves. The establishment of an SOG Committee that establishes its own Terms of Reference would be a great asset to the Department in many ways; the SOGs would be updated and current, staff are more involved in the Department's operations, and provides a safer environment for members of the Department to work in.

Recommendation – Operational:
It is recommended that an SOG Committee be established with representation of all Divisions of the Department. It is further recommended that the Department's SOGs be reviewed and regularly.

A good source of information is the Section 21 Guidance notes that are kept current by a provincial team of fire service personnel. The Section 21 Committee is part of the *OHSA* initiative for fire fighter safety.

The health and safety of the firefighters is paramount and therefore it is important to maintain an active joint Health & Safety Committee. It was noted that the committee has been meeting frequently as required under the *OHSA*. The *OHSA* specifies that some members of the committee are to be certified at the two levels of health and safety certification, minutes of meetings are to be posted, workplace inspections are to be completed and MSDS binders are to be made available and updated. The RHFES is compliant in all of these requirements.

For a fire department to operate in a safe and efficient manner it is imperative that all members adhere to all policies, SOGs, and SOPs and those that fail to do so should be held accountable.

2.6 Commission on Fire Accreditation International

"When a fire department applies a model of risk assessment to help determine their level of emergency services commitment, they have moved from being reactive to being proactive." – quote from the CFAI overview information.

The NFPA standards represent the benchmark to strive for in the fire service industry. Many of these standards have been adopted by the OFMEM. The CFAI is an organization that has incorporated all

national and local standards into an accreditation process, which has become the model for best practices for all fire departments.

Benefits of Accreditation:

- A system for risk assessment, decision making and continuous improvement
- A plan for sustainment and self-assessment
- Agency performance objectives and performance measure
- Verification by peers

The CFAI program revolves around 10 categories:

1. **Governance and Administration** – organizational reporting structure, establishing and regulating by-law requirements, etc.
2. **Assessment and Planning** – evaluating the organization in relation to future planning.
3. **Goals and Objectives** – goals of the fire service, existence of a strategic plan.
4. **Financial Resources** – adequate funding in place to effectively meet the needs of internal and external stakeholders.
5. **Programs** – fire prevention, fire suppression, training and emergency management.
6. **Physical Resources** – consider the state of the fire stations and whether they are in the best location to respond to the community in a timely manner.
7. **Human Resources** – staffing of the organization in all divisions and how the fire service works with the municipality's Human Resources Department.
8. **Training and Competency** – review of all training programs based on what the fire department is mandated to provide.
9. **Essential Resources** – water supply, communications/dispatch and administrative services.
10. **External Systems Relations** – mutual aid, automatic aid, third-party agreements, etc.

There are nine accredited agencies in Canada, with three in Ontario, including Guelph, Toronto, and Ottawa. There is great value in pursuit of accreditation, but the fire department leadership has, to be advocates and champions. RHFES may not be ready as, yet, but should still, keep it in mind.

The RHFES should review the opportunity for accreditation. There have been a number of improvements to previous operations and the implementation of new processes. The Department is moving forward at a good pace and not exceeding its capabilities.

2.7 Stakeholder Surveys

To obtain a clear understanding of how well RHFES is meeting the needs of its staff and the community, surveys or video meetings were conducted with some members of Council, the internal staff, and the external stakeholders of the City.

Due to the COVID-19 pandemic EM&T met with many stakeholders via telephone or video conference to assist with the completion of this review. Community and firefighters' surveys were completed to obtain a wide range of input. The community survey was advertised through local media and was available on the City's website in the form of an electronic survey.

2.7.1 Council Surveys

Council had the opportunity to complete a survey by way of a virtual meeting or by completing the survey on-line. A total of three Councillors took advantage of participating in either forum.

The questions and responses are listed:

Do you think the public is getting value for their dollar in relation to fire services?

- Most people would say yes but have not had any contact with the RHFES until they actually required them.

Do you feel the community is adequately protected by the present fire stations?

- Many of the respondents felt that yes, the community is adequately protected; however, some thought that more fire equipment is needed for condo buildings that are 10-15-20 floors.

Based on future growth of the community, do you feel that the fire department can keep up to the demands in its present state?

- Some respondents did not feel that the department can keep up with growth.
- Others did feel that they are well protected for growth, but it may mean re-locating fire stations.
- Maybe behind on hiring firefighters, need to add each year to keep up the pace, large expenses in one year could be a shock to the financial system, should come up with a plan that meets the needs.

What do you see as the greatest strengths of the Richmond Hill Fire & Emergency Services?

- Ability to reach fire call locations
- Do not know enough about the department to say

What do you believe to be the top three risks/issues facing the fire service?

- Wages and cost of the fire service, the ever-changing environment of Richmond Hill
- Depth of response, response times, building structures such as more and higher hi-rises which creates more complexity when fighting a fire.
- Traffic, the number of firefighters available if a large fire, do not have ladder equipment for taller buildings.

Do you see an opportunity for the fire service to develop strategic partnerships with other organizations in relation to costs and service efficiencies? If so, with who and why?

- Yes, should explore them further.
- Yes, there is help from neighbouring fire halls.

Can you share any input received from your constituents in relation to the fire service, whether they are cost related, service related, or fire safety and education related?

- No feedback, FDs tend to do things that the community supports, the public are satisfied.

2.7.2 Internal Surveys

During the FMP process, feedback was gathered from internal staff which included operations, administration, communications, mechanical, training, and fire prevention.

The information received from the internal surveys identified the following:

- 94% of those that responded indicated that RHFES is a good fire service to work for.
- Many of the staff are proud of the service that they offer to the community, appreciate the effort put forth by the members and believe that the community feels that they are served by a professional and dedicated group of firefighters.
- Some facilities require updates and renovations, if not replacement.
- Training was a common issue within the responses as many would like more opportunities to receive training and a wider variety such as officer training, professional (non-fire related) and succession planning opportunities.
- The firefighters would like to be more involved with public education.
- The top four concerns identified by the staff are:
    - Perceived lack of support from Council
    - Perceived lack of funding
    - Morale
    - Aging stations, accommodations and amenities
- The top four services that they feel are priority to the community are:

  - Firefighting
  - Medical responses
  - Auto extrication
  - Public assistance and non-emergency responses

- Responses addressing what the Department might look like in 5 years included:
  - Improved fire stations - some should be replaced
  - Additional stations, apparatus and staff
  - More fire prevention, public education and hands-on training
  - Additional fire prevention and training staff
  - A second aerial in service
  - Return to the grass roots of training rather than relying on computers for training
  - Improved uniforms
  - Regionalized fire service and municipalities
  - Enhanced use of social media
  - Review the way medical responses are handled, for example smaller response vehicles and crew
  - Shared facilities with other emergency or city services
  - Improved lines of communication with more transparency
  - Opportunities for staff to help drive the direction the department takes
  - Fire – Medics (firefighters that are also trained as paramedics)
  - Succession planning program
  - Eliminating firefighters working in communications
  - Enhanced level of response to Hazardous Materials (Haz-Mat) incidents. For example, technician level training with product identification equipment, leaks kits, non-sparking hand tools, etc.

2.7.3 External Surveys

Input from the community is vital in giving the Department an accurate indication of how the public perceives the Department and suggesting areas for improvement from those with first-hand interaction with the service.

Responses were submitted by 51 respondents. Of the respondents 63% said they had the opportunity to interact with the fire department staff. This occurred at either an MVC or during a fire inspection, both at 15% of respondents. Much of the information received from the external surveys identified the following:

- Very professional, reliable and competent staff
- Engaged with the community
- Excellent service provision
- Firefighters are community focused and committed to serve

- Those that have attended a public education event found it to be very informative and all questions were answered well
- Most preferred to receive fire safety messaging via email followed by Twitter

The following input was received:

- The top four services noted by external respondents are:
    - Fire Fighting
    - Medical assist and response
    - Auto extrication
    - Hazardous material response
- Over the next five years the respondents would like to see the following programs prioritized in the following order in relation to improving fire safety in the community:
    - Increased fire prevention inspections and enforcement of infractions (74%)
    - Increase the fire safety education initiatives and resources (68%)
    - Build additional fire stations (52%)
- Responses addressing the following question, “Over the next five years if you could implement up to three things to improve how the current services are provided by the RHFES, what would those things be?” included:
    - Additional fire stations to improve response time
    - Increase in the number of firefighters
    - Increased level of public education on fire safety and prevention to the public on multiple platforms
    - Enhanced communications with the community about dangers and prevention
    - Ensure the seniors demographic is educated on fire safety
    - Increased funding
    - Additional fire apparatus
    - Ensure training and equipment is sufficient for high-rise fires and rescues
    - Increased community outreach at community events
    - Increased public education in the schools
    - Additional training for firefighters
    - Improvements in dispatching technology, equipment and responsiveness
    - Engagement with the public, both in person and through social media outlets
    - Increased diversity during recruitments
    - Training on mental health, including their own
    - Regional fire service
    - Improved hazardous materials response capabilities
    - Fire safety education to those living in condos and apartments
    - Child seat clinics
    - Better terms in the collective agreement to protect the taxpayers

- Stop the overtime and reduce sick time

Overall, the internal and external surveys were quite positive about the services being offered by RHFES. The primary focus we heard (both internally and externally) was ensuring that the Department continues to expand as the community grows, so that RHFES can continue to provide a quality service to the community.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
2	The E&R By-Law should be updated and reviewed annually to meet current industry standards and the level of operations of the RHFES.	Staff time	Immediate (0-1 year)
3	Establish an SOG Committee with representation of all Divisions of the department. It is further recommended that the Department's SOGs be reviewed and updated regularly.	Staff time	Short-term (1-3 years)

SECTION 3 – Risk Assessment

3.1 Current and Future Needs

3.2 Community Risk Assessment

3.3 Integrated Risk Management Approach

3.4 Residential Fire Sprinklers

3.5 Fire Underwriters Survey

Section 3: Risk Assessment

3.1 Current and Future Needs

The population of the City is forecasted to grow considerably by 2031, due to an increase in development. With a land area of approximately 101.11 km^2 (39.04 mi^2.), the community contains an abundance of developed areas including single family, multi-unit, low rises and high rises. In the coming years many additional high rises will be evident throughout the City. There are environmentally sensitive areas such as the Oak Ridges Moraine with some parcels of rural lands. Several significant residential developments are proceeding forward.

3.1.1 Municipal Responsibilities

It is Council that sets the level of service within the community. The *FPPA*, 1997, S.O. 1997, c. 4, outlines the responsibilities of a municipality and providing a framework for protecting citizens from fire:

2. (1) Every municipality shall:

> *(a) Establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention; and*
> *(b) Provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.*[5]

Further, the *FPPA* provides a description for the methods of providing services.

Methods of Providing Services

> *(2) In discharging its responsibilities under subsection (1), a municipality shall:*
>
> > *(a) Appoint a community fire safety officer or a community fire safety team; or*
> > *(b) establish a Fire Department.*

The City has established a Fire Department as outlined in Section 2.2(b) of *FPPA, 1997, S.O. 1997*, c. 4. The level of service that must thereby be provided is further outlined in Section 2.1(b) of the *FPPA*. The level of service to be provided is determined by the needs and circumstances of the community and can be derived from conducting an FMP for Council. The 'needs' can be defined by the type of buildings, infrastructure and demographics of the local area which in turn can be extrapolated into the types of services that would be offered and needed. The 'circumstances' are considered the ability to afford the level of service to be provided.

[5] https://www.ontario.ca/laws/statute/97f04

Together the needs and circumstances assist in identifying a level of service for the community. This combination meets the expectations of the public for safety and the affordability of this level provided.

The City is currently experiencing rapid but controlled growth, which is leading to an infill of vacant lands and the redevelopment of others. While the majority of this growth is residential in design, it brings commercial and industrial prospects. This increase impacts the service delivery of the Department, effecting the need for service along with the population.

RHFES is concerned that future challenges in meeting reasonable response times could occur as call volumes increase. This creates a possible risk to the community and as such the Fire Chief will need to monitor response times including how often a full response assignment was not amassed. This type of information can be utilized to identify any future needs and/or considerations for the incorporation of any additional apparatus and fire stations.

3.2 Community Risk Assessment

The first and most effective way to reduce injuries, death and property damage due to fire is through public education, inspections and enforcement. The Fire Prevention Program addresses these key components of fire safety which starts with conducting a CRA; a completed CRA for the City and the RHFES has been prepared by EM&T as a supplementary document.

3.2.1 Community Risk Assessment Profile

Risk assessment is the process used to identify the level of fire protection required within the boundary of the City. It is a means of measuring the probability and consequence of an adverse effect to health, property, organization, environment or community as a result of an event, activity, or operation.

Council has the authority to establish the level of fire protection within the City. The Fire Chief is responsible for informing Council of risks existing within the City. It is based on this information that Council is able to make an informed decision on the level of service to be achieved.

The Province of Ontario *Regulation 378/18* CRA states, “a CRA is a process of identifying, analyzing, evaluating, and prioritizing risk to public safety to inform decisions about the provision of fire protection.” Effective July 1, 2019 the regulation states that every municipality shall complete a CRA by 2024 with renewal to occur every 5 years. The municipality is required to review the document annually.

There are two basic risk categories associated with the fire service – **operational risk** and **organizational risk**. Operational risk is the responsibility of RHFES to determine the risks within its

community and devise strategic, tactical, and task-orientated plans to mitigate incidents. Organizational risk is a function and responsibility of Council to determine the disciplines, level of service, staffing, stations and approval of the Department's business plan based on the overall risk assessment of the municipality.

The accumulation and analyzation of these factors will assist in applying this information to identify potential risk scenarios that may be encountered. It is during the assessment of the information gathered which includes the likelihood of these scenarios occurring and subsequent consequences that will assist in answering the following questions:

- What could happen?
- When could it happen?
- Where could it happen?
- Who could it happen to?
- Why could it happen?
- How likely could it happen?
- How bad would it be if it happened?
- What can be done to mitigate or prevent any or all the above?

The answers to these questions will frame the basis for formulating and prioritizing risk management decisions to reduce the likelihood of incidents from occurring and to mitigate the impact of incidents when they occur.

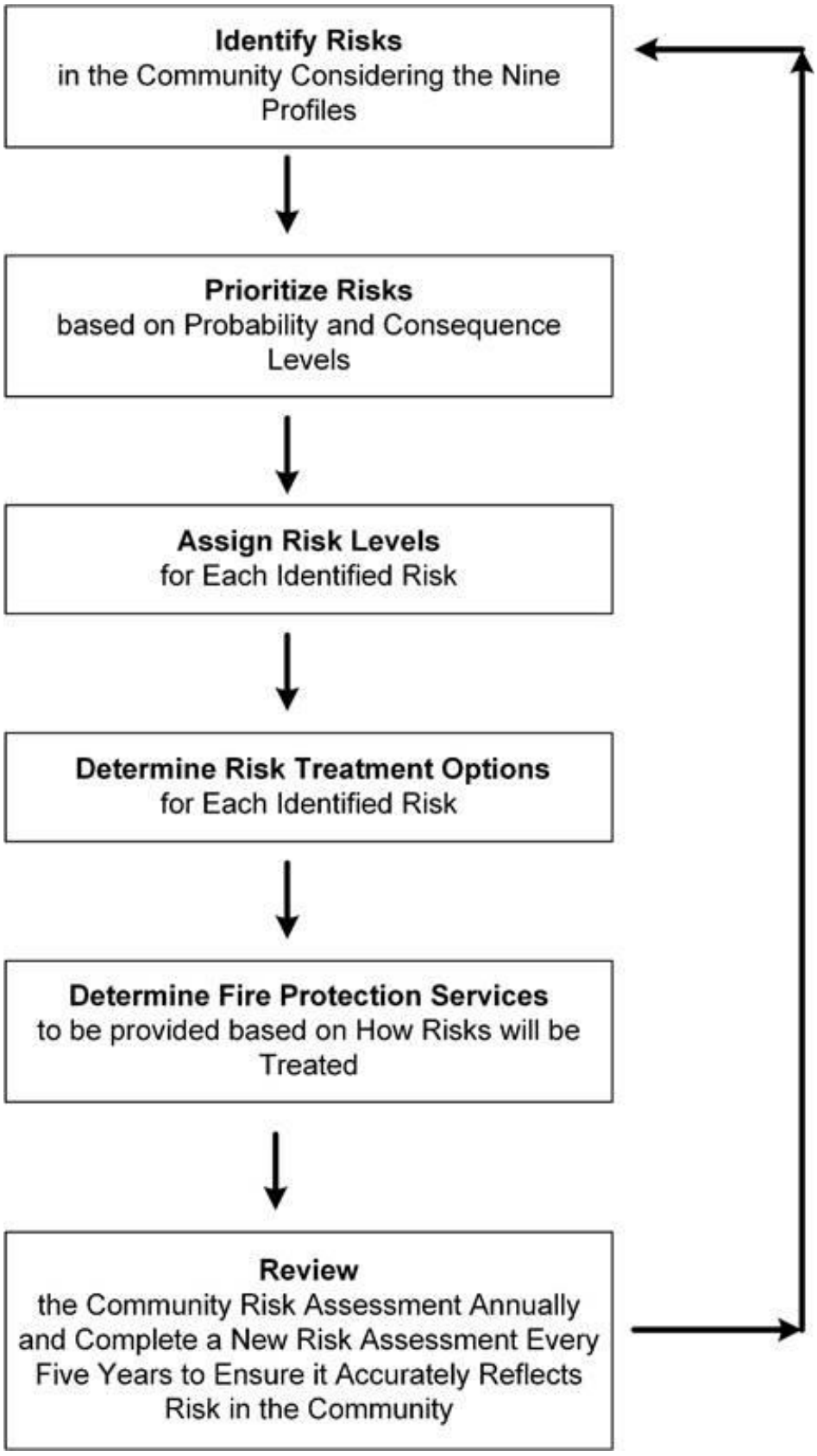
The CRA may identify gaps and areas where actual conditions vary from the desired outcomes. Data to be reviewed for each mandatory profile include:

- *Demographics Profile* – age, gender, educational attainment, socioeconomic makeup, vulnerable individuals or occupancies, transient population, ethnic and cultural considerations.
- *Critical Infrastructure Profile* – the facilities and services that contribute to the interconnected networks, services and systems that meet vital human needs, sustain the economy and protect public safety and security.
- *Geographic Profile* – waterways, highways, canyons, railroads, wildland-urban interface, bridges and other specific features of the community.
- *Building Stock Profile* – potential high-risk occupancies (whether residential, commercial or industrial), building density, building code classifications, age of the structure(s), occupancies that could be a high life safety risk, and aging / historic buildings.
- *Public Safety Response Profile* – resource distribution within the community including their deployment and usage, types of incidents responded to and the frequency of such incidents including the seasonal variations and time of day.

- *Community Service Profile* – existing planning and zoning committees, schools, seniors' organizations, ratepayers' associations, mental-health organizations, faith-based groups, cultural/ethnic groups, etc.
- *Hazard Profile* – human, technological, or natural hazards.
- *Economic Profile* – infrastructure, local employers, industries, institutions, community's tax base and local attractions.
- *Past Loss/Event Profile* – consideration to the impact and frequency of an event; identify large acute events which have a low frequency but a high impact, or small chronic events which have a high frequency with a low impact.

In the interpretation phase of the data collected for the nine profiles, only matters that are relevant to fire protection services are considered. The following flow chart as outlined in OFMEM Regulation 378/18, outlines the process whereby risks are to be identified from past events while also reviewing future growth trends within the municipality relating to demographics and building stock.

FIGURE #12: Community Risk Assessment Flow Chart



The probability or likelihood of a fire occurring within a community is estimated based on previous occurrences and the frequency of such events. It is this review of previous events including the fire loss data, learning from what may have occurred in other jurisdictions, and discussions with those who may have been in attendance of the event that will assist in laying a baseline for evaluation. The judgement of professionals with such experiences must not be missed during this process and may paint a more in-depth picture of what may have occurred in the past.

These evaluations are based on five levels of probability as outlined in the Ontario Fire Marshals Comprehensive Fire Safety Effective Model:

Rare – Level 1

- May occur in exceptional circumstances
- No incidents in the past 15 years

Unlikely – Level 2

- Could occur at some time, especially if circumstances change
- Five to 15 years since last incident

Possible – Level 3

- Might occur under current circumstances
- One incident in the past five years

Likely – Level 4

- Will probably occur at some time under current circumstances
- Multiple or recurring incidents in the past five years

Almost Certain – Level 5

- Expected to occur in most circumstances unless circumstances change
- Multiple or recurring incidents in the past year

When an event occurs, whether minor or major in intensity, what are the consequences of it? The use of professional judgement and reviews of past events are important means for establishing the quantification levels. To establish this level, four components are to be considered:

1. Life Safety – any injuries or loss of life to anyone involved, public and firefighters (includes actual or potential situations).
2. Property Loss – the dollar loss relating to public and private buildings, contents, irreplaceable assets, significant and symbolic landmarks and critical infrastructure.
3. Economic Impact – monetary loses associated with income, business closures, downturn in tourism, tax assessment value and loss of employment.

4. Environmental Impact – harm to humans, vegetation and animals; the decline in quality of life due to air, water and soil contamination as a result of either the fire or fire suppression operations.

The consequences are categorized according to 5 severity levels.

- Level 1 – Insignificant – no or insignificant consequences to life safety, value of property loss, impact on the local economy or the general living conditions.
- Level 2 – Minor – potential life safety risk to occupants is low, minor property loss, disruption to business or general living conditions.
- Level 3 – Moderate – a threat to life safety of occupants, a moderate loss of property, the threat to the loss of business along with a potential threat to the environment.
- Level 4 – Major – large dollar loss with significant property loss, large threat to local commerce and tourism along with impacts to the environment that would result in short-term evacuation.
- Level 5 – Catastrophic – significant loss of life, multiple properties with significant damage, long-term disruption of business, employment and tourism along with environmental damage resulting in long-term evacuations of residents and businesses.

The different levels of risk treatment are:

1. **Avoid the Risk** – *Implementation of programs to prevent fires or emergencies from occurring.*
2. **Mitigate the Risk** - *Programs and initiatives implemented to reduce the probability and/or consequences of a fire or emergency.*
3. **Accept the Risk** – *After identifying and prioritizing a risk, it is determined that there are no specific programs or initiatives to be implemented to address this risk.*
4. **Transfer the Risk** – *The fire department has chosen to transfer the impact and/or management of the risk to another organization or body outside the agency.*

The following table indicates some of the top risks or issues/concerns found within Richmond Hill.

TABLE #3: Top Risks or Issues/Concerns for Richmond Hill

NOTE: The following features are not identified in the order of their level of risk.

Top Risk or Issues/Concerns	Preferred Treatment Option(s)
Bodies of water	**Large tributaries within the city flow into the Rouge, Don, and Humber rivers.** • Implement water safety public education initiatives through brochures and signage near bodies of water. • Review water rescue requirements under present legislation, regulations and costs. • Promote water safety programs through swimming organizations and other first responders such as the York Regional Police (YRP) and York Region Paramedic Services (YRPS). • Fire services develop response protocols, Standard Operating Guidelines and enhance level of service provision. • Promote seasonal safety measures for both in or on the water through signage along the shore and submissions to local media outlets. • Promote safety equipment that should accompany those that venture onto the ice such as whistles, wearing of flotation suits, air horns, throw ropes, etc. • RHFES does not have the means to mitigate marine vessel fires offshore.
Richmond Hill Fire & Emergency Services ***New developments will bring an increase in populous and building stock.*** ***High-rises, up to 54 floors***	**The city has seen considerable growth over the past number of years, and it is forecasted that this trend will continue.** • There are two significant residential developments in the North Leslie Secondary Plan and the West Gormley Secondary Plan. • A combined total of close to 8,000 housing units upon completion. • Estimated population growth of approximately 25,000 residents. • There are three locations which have received final approvals which permit the building of nine high rises that will be between 16 and 32 stories. • There are currently three applications for apartment developments of above 38 stories, possibly as high as 54 stories. These are in the process of obtaining the necessary approvals.

Top Risk or Issues/Concerns	Preferred Treatment Option(s)
	• High-rise fires in structures of this size can be very physically taxing of the firefighters if the fire fighter dedicated elevator is not operational. • Difficulty in shuttling firefighters and equipment to the upper floors if there is only one fire fighter elevator; it becomes very time consuming. • Fires in structures with 40 floors will add a significant strain on current RHFES resources. • Will require additional staffing, possibly additional stations and apparatus.
Structure Fires	• Increased public education focusing on preventive maintenance of electrical and mechanical equipment. • Promote the dangers of unattended candles during festive seasons or ethnic traditions. • Where smoking related items is the cause of fire, continue public education (PE) programs to bring to the public's attention the dangers of careless smoking using statistics. • Provide information on the importance of having working smoke alarms and carbon monoxide detectors in the home. • Continue to encourage and practice home escape plans through discussions with children during school visits. • For new home builds or major renovations, promote residential sprinkler systems. • Before the wood burning season begins, promote the need to have chimneys cleaned and inspected. • Take advantage of speaking engagements that include senior citizens to discuss safe cooking procedures and what to do in the event of a grease fire. • Work with local industry and commercial establishments on the advantages of maintaining electrical and mechanical equipment and continued good housekeeping practices. • Focus a home inspection program on residences furthest away from a fire station. • Develop plans on initiating and continuing regular fire inspections based on the frequency outlined in the FUS inspection schedule. • Enforcement of Fire Code violations.

Top Risk or Issues/Concerns	Preferred Treatment Option(s)
	• Monitor both undetermined and arson fires to see if there is a trend. • Work with YRP and OFMEM to come to a fire cause conclusion and address as required. • YRP investigators continue to work collaboratively with RHFES and the OFMEM to determine fire cause public education after the fire programming is provided to areas of the community where fires have occurred. • Develop programs so those that must complete community service may do so by assisting the fire department at community functions, public education programs and fire prevention related engagements. • Fire prevention staff should better utilize the Children's Safety Village in cooperation with YRP and YRPS. This could include sponsorships with business stakeholders in the community. • Educate children on dangers of playing with smoker's articles and what to do if their clothing catches fire. • Option to provide cooking fire public education to high school students in cooking classes, etc.
Richmond Hill Fire & Emergency Services	**From 2016 to 2019 there was a fluctuation of approximately $4 million from year to year in property loss.** • Additional training provided to fire investigators to try to reduce the number of "unknown cause" fires. • Monitor high dollar loss fires to see if trends are developing. *Note: Undetermined fire cause – in the circumstances where all fire causes have been eliminated and the investigator is left with no hypothesis that is evidenced by facts of the investigation, the investigator must conclude that the fire cause or specific casual factors, remains undetermined (per NFPA 921). Nevertheless, ongoing training for investigators should be in place.
Illegal Second Unit/ Apartments	**With many students and new residents living in the city there could be illegal second units and apartments.**

Top Risk or Issues/Concerns	Preferred Treatment Option(s)
	• Second units are covered under the Ontario Building Code (OBC) and Ontario Fire Code (OFC) standards, through the *Strong Communities through Affordable Housing Act*, 2011.[6] • Units are enforced under OFC Div. B., 9.8.[7] Inspections are taking place for those second units that have been identified. • May lack basic fire safety measures. • Some residences may not meet OFC requirements. • May be operating in areas that are not zoned for that purpose. • Property owners may be either unaware of or do not acknowledge fire safety requirements and their responsibilities. • Language barriers are possible. • The City should establish a means of people notifying the City of locations that may be illegally operating. • Conduct a public education awareness program through media outlets publicizing the risks. • The City should complete the Draft Comprehensive Zoning by-law which will permit second units, but also identify local requirements to meet specific needs in the municipality.
Richmond Hill Fire & Emergency Services	**Continue monitoring response times to ensure compliance with NFPA 1710 (2020 Edition).** This includes the following: • Achieve a goal of 80 seconds fire fighter turn-out time. • Continue working towards meeting the goal of having four firefighters arriving on scene within four minutes of travel time. • Continue to achieve a goal of having sixteen (16) firefighters arriving on scene within an eight-minute travel time.

3.2.2 Future Needs

Understanding the community and its needs allows the Fire Chief and staff to be proactive with education and enforcement programs to the community. When fires occur within the community, the firefighters can be ready to battle the fires because they are trained not only in the basics of firefighting, but in understanding any unique and/or special hazards that are found within the community. These hazards must be identified in a risk assessment so the Fire Chief can ensure

[6] https://www.ontario.ca/laws/statute/s11006

[7] https://www.ontario.ca/laws/regulation/070213

preventative and mitigative programs are in place. As the community grows in population and building stock, the frequency of and the need for service will grow.

According to the new provincial legislation and continued growth within the City, there will be a continuing need for additional staff time spent in fire prevention and public education activities. 3

3.2.3 Provincial Community Risk Statistics

While no recent simplified risk assessment was available, the Fire Chief and his staff can work with City staff to obtain an updated listing of building stock within the community, along with identifying other hazards such as railway crossings, major highways, and the addition of any high-rise structures.

The first set of statistics noted is of the most recent provincial data found on the OFMEM's website, which can be compared with the most recent RHFES statistics. Unfortunately, 2020 is not available but the following provides a good indication of fire statistics in the province.

Provincial - Loss fires by Property class

From 2015 to 2019, there were 53,796 fires with loss reported to the OFMEM.

- 73% of these fires occurred in residential occupancies
- 28% occurred in vehicles
- 5% occurred on structures/properties not classified by the Ontario Building code – this includes many non-structure property types – land, outdoor storage, and some structures ranging from barns to weather stations
- 8% of loss fires occurred in Industrial occupancies
- 4% in assembly occupancies
- 4% in mercantile occupancies
- 3% in business and personal services occupancies
- 2% in care and detention occupancies

The distribution of fire occurrence across property type has been relatively unchanged over the years.

Provincial - Loss Fires Property class: Structures only

From 2015 to 2019, there were 34,793 structure fires with loss reported to the OFMEM.

- Fires in residential occupancies account for 74% of structure loss fires.
- 5% in properties not classified by the OBC
- 8% in industrial occupancies
- 4% in assembly occupancies

- 4% in mercantile occupancies
- 3% in business and personal services occupancies
- 2% in care and detention occupancies

This distribution of fire incidents across structure property types has been consistent over many years.

Provincial - Structure Loss Fires: Ignition source

Nine percent of the structure loss fires were suspected to be arson or vandalism (intentionally set).

Between 2015 and 2019 the ignition sources in other (not intentionally set) structure loss fires were:

- 18% cooking
- 9% electrical distribution equipment (wiring)
- 8% heating/cooling
- 10% miscellaneous (natural causes and chemical reactions)
- 14% open flame tools/smoker's articles
- 5% appliances
- 8% other electrical/mechanical
- 5% exposure fires
- 1% processing equipment
- 10% miscellaneous
- 23% reported as undetermined.

The number of fire fatalities in Ontario increased by 65% between January 1, 2019 and May 4, 2019 and at the same time period in 2020. In 2019, there were 31 fire fatalities and in 2020 there were 51. This, in part, is being attributed to people staying home due to the COVID-19 pandemic, in which many worked from their residence or remained at home as directed by Government Agencies.

3.2.4 Richmond Hill Community Risk Statistics

The following information was obtained from the OFMEM, as well as documents received and taken from the past reports supplied to EM&T. The data offers an overview of the areas of concern within the City. For ease of review, the data has been listed from the highest to lowest level of concern. This information will assist the Fire Chief and staff with fire prevention and public safety awareness initiatives.

Fire Loss by Occupancy Classification

The analysis indicates that between 2016 to 2019 approximately 75% of the fires reporting a loss occurred in Group C - residential occupancies.

City of Richmond Hill Loss by Property Classification

Based on the information received, the following building classifications for property loss are noted in order of occurrence type:

- Group C – Residential occupancies (75%)
- Other occupancies not classified within the OBC (i.e., farm buildings) (5.75%)
- Group F - Industrial occupancies (4.5%)
- Group E - Mercantile occupancies (4%)
- Group D - Business and personal services occupancies (4%)
- Group A – Assembly occupancies (3.75%)
- Group B – Institutional care or detention occupancies (0.25%)

City of Richmond Hill Reported Fire Cause

Assessing the possible cause of the fires reported is an important factor in identifying any potential trends or areas that may be considered for introducing additional public education or fire prevention initiatives as part of the community fire protection plan.

The leading causes of fire were:

- Misuse of ignition source/material first ignited
- Mechanical/Electrical failure
- Undetermined
- Other unintentional
- Arson
- Other
- Design/construction/maintenance deficiency
- Vandalism
- Children playing

City of Richmond Hill Ignition Source Class

The leading causes for ignition sources were:

- Undetermined
- Miscellaneous
- Open flame tools, smoker’s articles.
- Cooking equipment
- Appliances
- Heating equipment, chimney, etc.
- Other, electrical/mechanical

- Lighting equipment
- Electrical equipment
- Exposure
- Processing equipment

To assist the Department in its fire safety goals it is recommended that the Department staff meet with relevant local community groups to form a partnership for organizing fire safety and public education events that can be tailored to the unique needs and challenges within the community. These events can be based on the previous fire cause information supplied. An example of community groups would be a local group that wish to promote fire safety in the community or any local Lions Clubs (or other clubs) that want to support fire safety initiatives.

In 2016 the "Targeted Residential Fire Risk Reduction"[8] report was released. This report was prepared by Len Garis, Sarah Hughan and Amanda McCormick through the University of the Fraser Valley School of Criminology and Criminal Justice and the Centre for Social Research. The focus of the report was based on previous studies in England, Scotland, Sweden and Norway. Those reports found that targeted home visits for public education efforts produced "promising results". By shifting public education efforts by way of door-to-door campaigns away from an entire community and towards identified at-risk households, not only are the campaigns more efficient but the effectiveness has measurable outcomes. The study team reviewed the 2011 Statistics Canada Census and National Household Survey and the numbers presented were an estimate of households and at-risk populations intended to provide an approximation. The identified five areas for "at risk" criteria:

1. Age >65
2. Age <6
3. Lone Parent
4. Unemployed
5. Mobility (movers)

The team evaluated and determined "the top 10th percentile" of areas within municipalities that would be most at risk for fires to occur in their home. From this they created dissemination areas (areas which represent populations of between 400-700 persons) and focused on single-family detached dwellings. The project did not focus on residents of condominiums, apartments or townhouses. Surrey Fire Rescue Service used this data to create a "Home Safe" program that focused on installing smoke alarms in these identified homes.

[8] https://www.researchgate.net/publication/307599464_Targeted_Residential_Fire_Risk_Reduction_A_Summary_of_At_Risk_Areas_in_Canada

The data shows that in the three measurable categories (at risk areas, private single detached dwellings, and at-risk population), Richmond Hill is both above and below some of the averages at both the provincial and federal levels. Federally and provincially the number of at-risk dissemination areas per total dissemination areas ratio is roughly 1 in 8. Richmond Hill has a ratio of 1 in 9. Within the percentages of at-risk private single detached dwellings and at-risk population, provincial and federal levels sit 22 points below Richmond Hill. TABLE #5 details the data as sorted within the report.

TABLE #4: Richmond Hill At-Risk Comparison

Garis et al Report Criteria	Richmond Hill	Ontario	Canada
Number of At-Risk Dissemination Areas	22	2,630	7,198
Total Dissemination Areas	207	19,964	56,154
Percent of At-Risk Dissemination Areas	**10.63%**	**13.17%**	**12.82%**
Number of Private Single Detached Dwellings in At-Rik Dissemination Areas	11,045	501,990	1,320,785
Total of Private Single Detached Dwellings	36,405	2,712,000	7,301,825
Percent of At-Risk Private Single Detached Dwellings	**30.34%**	**18.51%**	**18.09%**
Population of At-Risk Dissemination Areas	30,292	1,420,807	3,585,822
Total Population	123,399	7,488,061	19,325,962
Percent of At-Risk Population	**31.03%**	**18.97%**	**18.55%**

Based on this data, it would benefit the City to focus its resources on targeting its public education campaigns. The Public Education Officers would be able to concentrate public education programs where they are needed most and better prioritize program scheduling. The data used in the Garis et al Report is nearing 10 years old, but a focus on local planning data would provide a clearer picture of the current state of the City as it pertains to its at-risk populations.

All target audience public education programs should be fluent and adaptive to the changing needs of the community. The City is involving more data analytics in its operations. By including identification of at-risk groups, the Department could better utilize available personnel resources and improve efficiency of programs. They would likely find ways to cross reference the data and metrics obtained in other areas of fire safety (i.e., tracking fire calls with areas targeted at public education).

3.3 Integrated Risk Management Approach

The Ontario Fire Marshal's Communiqué 2014-12 introduced the Integrated Risk Management (IRM) Web Tool to the fire service. The document notes:

"The IRM Web Tool was developed as part of a commitment made by the OFMEM to the Ontario Association of Fire Chief's (OAFC) and other stakeholders. The IRM Web Tool can be used by all Ontario's municipalities and fire departments to determine building fire risks in their respective communities by taking into account building characteristics (building factors) and the three lines of defence against fire:

- Line one: Public Education
- Line two: Fire Inspections and Enforcement
- Line three: Emergency Response

The IRM Web Tool is built around the three lines of defence and intended for municipal and fire service decision-makers. The tool was designed to assist municipalities in fulfilling the responsibilities prescribed in Section 2 of the *FPPA*, 1997.

The concept of the IRM Web Tool is a "building by building" assessment and its goal is to go beyond simply taking stock of buildings within the community; it was intended to be a holistic approach that is meant to combine all of a fire department's efforts in relation to:

- Fire prevention and education initiatives, which includes updated community reviews through the use of the OFMEM Simplified Risk Assessment.
- Fire station locations and the ability to respond in an efficient and effective manner.
- Identification of hazardous situations and locations within the community.
- Training and equipping of the firefighters to execute their duties in a safe and efficient manner.

The IRM approach is a combination of all facets of the fire service that is meant to combine a review of building stock, fire safety and prevention related issues to be addressed, ability to effectively and efficiently respond to emergencies, and how well equipped and trained the firefighters are to deal with emergencies within the community.

NFPA 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations defines the risks in three categories and provides examples for each. These risk categories are:

- **High-Risk Occupancy** – An occupancy that has a history of high frequency of fires or high potential for loss of life or economic loss. Alternatively, an occupancy that has a low or moderate history of fire or loss of life, but the occupants have an increased dependency in the built-in fire protection features or staff to assist in evacuation during a fire or other emergency

(e.g., apartment buildings, hotels, dormitories, lodging and rooming, assembly, childcare, detention, educational and health care).

- **Moderate-Risk Occupancy** – An occupancy that has a history of moderate frequency of fires or a moderate potential for loss of life or economic loss (e.g., ambulatory health care and industrial).
- **Low-Risk** – An occupancy that has a history of low frequency of fires and minimal potential for loss of life or economic loss (e.g., storage, mercantile and business).

Conducting a review of every building within the City may not be practical. Utilizing NFPA 1730 definitions of risk categories may guide Council in deciding the focus and service level within the community. Council should determine, with input from the Fire Chief, an acceptable level of risk to manage within the community based on its needs and balanced with the circumstances to deliver the services.

In both NFPA Standards, public education is a key component of having a successful Community Risk Reduction Plan.

3.4 Residential Fire Sprinklers

The NFPA, along with the OAFC, are strong supporters of residential sprinkler systems to reduce the risk to life and property from fire.

In a recent NFPA on-line article it was noted that because fire sprinklers react so quickly they can dramatically reduce the heat, flames, and smoke produced in a fire. Properly installed and maintained fire sprinklers help save lives, reduce damage, and make it safer for firefighters.

Fire sprinklers have been around for more than a century protecting commercial and industrial properties and public buildings. What many people do not realize is that the same life-saving technology is also available for homes, where roughly 85% of all civilian fire deaths occur.

Facts about home fire sprinklers

Unfortunately, due to the lack of Canadian statistics, we must rely on American statistics. Since there are so many similarities in building construction, however, the statistics are an accurate reflection of the Canadian experience.

Automatic sprinklers are highly effective and reliable elements of total system designs for fire protection in buildings. According to an American Housing Survey, 8% of occupied homes (including multi-unit) had sprinklers in 2010-2014 up from 4.6% in 2009.

Source: *U.S. Experience with Sprinklers*[9]

- 85% of all U.S. fire deaths occur in the home.
- The civilian death rate of 1.4 per 1,000 reported fires was 81% lower in homes with sprinklers.
- The civilian injury rate of 25 per 1,000 reported fires was 31% lower in homes with sprinklers. Many of the injuries occurred in fires that were too small to activate the sprinkler or in the first moments of a fire before the sprinkler operated.
- The average fire fighter injury rate of 13 per 1,000 reported home fires was 789% lower where sprinklers were present.
- Where sprinklers were present flame damage was confined to the room of origin in 97% of the fires compared to 74% of fires without sprinklers.
- Home fire sprinklers can control and may even extinguish a fire in less time than it would take the fire department to arrive on the scene.
- Only the sprinkler closest to the fire will activate spraying water directly on the fire. In 84% of home fires where the sprinklers operate, just one sprinkler operates.
- If you have a fire in your home the risk of dying is cut by about one-third when smoke alarms are present (or about half if the smoke alarms are working), while automatic fire sprinkler systems cut the risk of dying by about 80%.
- In a home with sprinklers the average property loss per fire is cut by about 70%, compared to fires where sprinklers are not present.
- The cost of installing home fire sprinklers averages $1.35 per sprinklered square foot.

The Home Fire Sprinkler Coalition (HFSC) is a leading resource for accurate non-commercial information and materials about home fire sprinklers for consumers, the fire service, builders, and other professionals.

By working with the developers and the public in promoting the installation of home sprinkler systems, the RHFES would be demonstrating a pro-active approach to educating the public on another viable option for homeowners to help reduce the risk from fire. As such, it is recommended that RHFES investigate this safety initiative as part of their fire prevention and public education initiatives.

[9] https://www.nfpa.org/News-and-Research/Data-research-and-tools/Suppression/US-Experience-with-Sprinklers

Recommendation – Strategic:
It is recommended that RHFES work in conjunction with developers in promoting the advantages of installing residential fire sprinklers.

3.5 Fire Underwriters Survey

The FUS is a national organization that provides data on public fire protection for fire insurance statistical work and underwriting purposes of subscribing insurance companies. Subscribers of FUS represent approximately 85% of the private sector property and casualty insurers in Canada.

FUS Certified Fire Protection Specialists conduct detailed field surveys of the fire risks and fire defences maintained in built up communities including incorporated and unincorporated communities of all types across Canada. The results of these surveys are used to establish a Public Fire Protection Classification (PFPC) for each community. While the FUS is not involved in setting rates, the information provided through the Fire Insurance Grading Index is a key factor used in the development of commercial lines property insurance rates. The PFPC is also used by underwriters to determine the amount of risk they are willing to assume in each community or section of a community.

The overall intent of the PFPC system is to provide a standardized measure of the ability of the protective facilities of a community to prevent and control the major fires that may be expected to occur. This is done by evaluating, in detail, the adequacy, reliability, strength, and efficiency of the protective facilities and comparing the level of protection against the level of fire risk in the built environment.

The FUS also uses PFPC information to develop the Dwelling Protection Grade (DPG), which is utilized by personal lines insurers in determining property insurance rates for detached dwellings, with not more than two dwelling units. The DPG is a measure of the ability of the protective facilities of a community to prevent and control the structure fires in detached dwellings by evaluating the adequacy, reliability, strength and efficiency of the protective facilities and comparing the level of protection against the level of fire risk associated with a typical dwelling.

The fire insurance grading system used does not consider past fire loss records, but rather fire potential based on the physical structure and makeup of the built environment. When a community improves its PFPC or DPG insurance rates may be reduced and underwriting capacities may increase. Every insurance company has its own formula for calculating their underwriting capacities and insurance rates; however the PFPC and DPG classifications are extremely useful to insurers in determining the level of insurable risk present within a community.

3.5.1 Fire Underwriters Survey – Town of Richmond Hill 2013

Fire Insurance Grades are established by FUS to reflect the ability of a community to prevent, control and mitigate probable commercial, industrial and residential fire risks. To complete this task, the specialists at FUS perform a detailed analysis of the overall fire protection by adding four key areas: fire department, water supplies, fire prevention and emergency communications. The RHFES underwent an assessment by the FUS most recently in 2013.

The PFPC is a numerical grading system scaled from 1 to 10. Class 1 represents the highest grading possible and Class 10 indicates that little or no fire protection is in place. The PFPC grading system evaluates the ability of the community's fire protection programs to prevent and control major fires that may occur in commercial or industrial risks.

RHFES made improvements to the PFPC grading between 1991 and the most recent FUS completed in 2013 as seen in the table below.

TABLE #5: RHFES PFPC Grading

RHFES Fire Station Area	FUS 1991	FUS 2013
Fire Station 8-1	4	4
Fire Station 8-2	4	3
Fire Station 8-3	4	3
Fire Station 8-4	4	3
Fire Station 8-5	4	3
Fire Station 8-6	N/A	3
Fire Station Protected Area (rural areas without hydrants)	9	9
Remainder	10	10

The DPG is based on a scale of 1 to 5, with 1 being the best. This grading reflects the ability of a community to handle fires in smaller structures such as detached single-family dwellings. The RHFES achieved the highest possible ranking for all areas served by fire hydrants, with areas served by three fire stations receiving lower grades due to the absence of fixed water supply provided by hydrants. These areas are noted as Fire Hall Protected Areas (FPA) in the table below.

TABLE #6: RHFES Dwelling Protection Grades (DPG)

Fire Station Area	FUS 1991	FUS 2013
Fire Station 8-1	1	1
Fire Station 8-2	3A	1
Fire Station 8-2 (FPA)	3B	3B
Fire Station 8-3	1	1
Fire Station 8-4	1	1
Fire Station 8-4 (FPA)	3B	4
Fire Station 8-5	1	1
Fire Station 8-6	N/A	1
Fire Station 8-6 (FPA)	N/A	3B

The improvements made to the DPG as noted above can be partly attributed to the RHFES becoming accredited through FUS in the Superior Tanker Shuttle Service for the delivery of alternative water supply systems in 2019. Achievement of this accreditation for Fire Station 8-2, Fire Station 8-4 and Fire Station 8-6 is noteworthy and the RHFES should be applauded for this significant accomplishment. RHFES should continue supporting the Superior Tanker Shuttle Service accreditation and prepare for re-accreditation in 2024 which is discussed further in Section 7.

Historically, community assessments were conducted by FUS on a predetermined basis, varying from 10 to 25 years. Best practice and changing industry standards suggest that moving to a grade update every five years would better reflect ongoing changes to fire protection and communities at large. The FUS has also introduced the FUS Municipal Fire Portal that provides RHFES the ability to access and update data relevant to Richmond Hill and forward updates in a timely fashion. By accessing this system regularly, the RHFES can provide frequent updates from which FUS Specialists will analyze and publish grade updates as deemed necessary. It is recommended that the Assistant Chief (Fire Prevention) and respective Deputy Chief regularly access and provide input to the FUS Municipal Fire Portal.

Recommendation – Operational:

It is recommended that the Management Team regularly access the FUS Municipal Fire Portal to communicate improvements and/or updates. This data could relate to new fire apparatus replacements, new fire stations, new construction, hydrants in new sectors, etc.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
4	RHFES work in conjunction with developers in promoting the advantages of installing residential fire sprinklers.	Staff time	Short-term (1-3 years)
5	The Management Team regularly access the FUS Municipal Fire Portal to communicate improvements and/or upgrades. This data could relate to new fire apparatus replacements, new fire stations, new construction, hydrants in new sectors, etc.	Staff time	Short-term (1-3 years)

SECTION 4 – Department Staffing & Programs

Section 4: Department Staffing & Programs

4.1 Overview

Within the scope of work noted in the original RFP document, staffing needs was identified as a priority in which EM&T was to review the capabilities of existing staffing and identify future needs for each of the Divisions including Suppression, Communications, Mechanical, Training, Prevention and Administration.

When considering the overall staffing needs for the Department some of the key questions that should be considered are:

- *Is there a proper level of senior staff to manage the Department and its divisions?*
- *Is there adequate administrative support staff to assist with such things as records management and addressing day-to-day operations of the Department?*
- *Is there a need for other support staff for vehicle and facility maintenance?*

This section will discuss the following divisions:

- Administration
- Training & Education
- Fire Prevention and Public Education
- Fire Suppression
- Communications
- Mechanical

Based on the *FPPA*, 1997, section 6(3) "A Fire Chief is the person who is ultimately responsible to the council of a municipality that appointed him or her for the delivery of fire protection services." As noted earlier in this document, the Fire Chief of RHFES reports to the City's Commissioner of Community Services in a council-manager style of government. This reporting system allows for the Fire Chief to present reports and updates to Council.

The Fire Chief serves as the head of the Department and is supported by:

- Deputy Fire Chief – Support
- Deputy Fire Chief - Operations
- Three full-time Administrative Assistants

It should be noted that within the Communications Division section of this report, a recommendation has been made to increase the number of Deputy Fire Chiefs to three. The new position would be responsible for the Communications Division.

4.2 Administration Division

The Administration Division is comprised of senior staff and administrative staff. In Richmond Hill this includes the Fire Chief, two Deputy Fire Chiefs, and three Administrative Assistants. Over the past year there has been a change of personnel in key administrative positions of RHFES in the role of Deputy Fire Chief - Operations. The placement of qualified and dedicated personnel in these key roles ensures stability within the Department.

FIGURE #5: Proposed Fire Department Organizational Chart, identified the addition of another Deputy Fire Chief who will be responsible for the Communications Division and the transfer of the Training Division to the Deputy Fire Chief – Operations. With the recent hiring of a full-time CEMC, this position reports to the Deputy Fire Chief – Support. The proposals are discussed at length within the Training and Communications sections.

Such stability will permit the development of policies, planning, operational changes, acquisition of equipment, etc., that provides focus on the direction the Department is heading. Goals and outcomes are being developed along with achievable timelines for their completion. Stability within the Administration Division will also improve morale of the members of the Department.

4.2.1 Commission on Fire Accreditation International

The CFAI Accreditation program has a specific section that evaluates the administration component of a fire department. In this section the following points are noted:

> Category 9C: Administrative Support and Office Systems
>
> Administrative support services and general office systems are in place to conduct and manage the agency's administrative functions such as organizational planning and assessment, resource coordination, data analysis/ research, records keeping, reporting, business communications, public interaction and purchasing.

With the growing demands of the RHFES the administrative staff (Fire Chief, Deputy Chiefs and Administrative Assistant) are struggling to meet the daily demands of the Department, ensuring that all departmental data and documents are kept up to date.

4.3 Training and Education Division

A fire service is only capable of providing effective levels of protection to its community if it is professionally trained (and equipped) to deliver these services. Firefighters must be prepared to apply a diverse and demanding set of skills in a safe manner to meet the needs of a modern fire service. Whether assigned to Operations, Training, Fire Prevention (Community Risk Reduction), or

Administration, staff must have the knowledge, skills and abilities necessary to provide reliable fire protection.

Regarding training and professional development*, NFPA 1201 – Providing Fire and Emergency Services to the Public* notes:

- **4.11.1 Purpose.** ***"****The FESO shall have training and education programs and policies to ensure that personnel are trained and that competency is maintained to effectively, efficiently, and safely, execute all responsibilities."*[10]

NFPA 1500 Standard on Occupational Safety, Health, and Wellness Program states that:

- ***5.1.1.*** *"a fire department shall establish and maintain a training, education, and professional development program with a goal of preventing occupational deaths, injuries, and illnesses*."[11]

It also states that… "training programs should include but not be limited to the following: community risk reduction (fire prevention, public education, investigation, etc.), health and safety, fire suppression, emergency medical, human resources (leadership, supervision, interpersonal dynamics, equal employment opportunity, etc.), incident management system, hazardous materials, technical rescue, information systems and computer technology, position-specific development (fire fighter, company officer, chief officer, telecommunicator, investigator, inspector, driver/operator, etc.)."[12]

The expectations of knowledge and skill placed on the modern fire fighter are higher than they have ever been. Community fire protection demands a high level of training and qualification in all aspects of prevention, suppression management and administration. The broad spectrum of disciplines and the skills they carry is challenging. When the decisions made may literally be life or death, the reliance on a strong education and skillset is of the utmost importance.

4.3.1 Staffing Levels & Workload

The RHFES Training Division is comprised of a small team of dedicated individuals with one Training Chief supported by two Training Officers. These three RHFES Training Division personnel are responsible for the development and implementation of training programs for the 170+ members of RHFES.

The use of on-duty Shift Training Instructors to deliver assigned training at the fire station level is a key component of overall programming at RHFES, accounting for up to 30% of training conducted. These Shift Training Instructors are engaged on a regular basis to provide active feedback, program

[10] https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1201
[11] https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1500
[12] NFPA 1500 Annex A.5.1.1

review, and, where appropriate, program revision. The value that these personnel bring to the overall effectiveness of the RHFES training programs should not be underestimated. By leveraging the well-developed skills and experience amongst this training cadre, the RHFES would be well served in furthering the efforts of the overall training program. Providing for Shift Training Instructors to be seconded temporarily to the Training Division for delivery of discipline-specific training would provide career development opportunities, add depth and breadth to program development, and additionally enhance capacity for overall program delivery. It is recommended that opportunities for temporary assignment to the Training Division for the Shift Training Instructors be developed and implemented.

Recommendation – Strategic:
It is recommended that the RHFES identify and develop opportunities for Shift Instructors to be assigned full-time to the Training Division on temporary assignments. These secondments serve multiple purposes and will enhance delivery of discipline-specific training.

During EM&T's review of the training and education programs, it was evident that the RHFES Training Division personnel are endeavouring to ensure that all required training programs are being addressed to the best of the Department's ability. As an example of the innovative and proactive approach being employed, in 2020 RHFES personnel received Technical Rescue training placing them and the RHFES in the top tier for this discipline in the Region.

If not for the commitment and dedication of the RHFES Training Officers and Shift Training Instructors, this significant achievement would not have been possible. A by-product of this initiative will see the RHFES Trench Rescue training included in the newest edition of the Jones & Bartlett Trench Rescue manual. Jones & Bartlett Learning is considered internationally to be one of the leading providers of training and educational resources for fire service professionals and fire science students. This is a significant achievement of which the RHFES should be justifiably proud.

While the Training Division continues to make solid progress, the fact remains that the small team of two Training Officers are responsible for extensive programming that serves as the foundation for all other RHFES activities. These responsibilities include, but are not limited to:

- Overseeing seven technical rescue disciplines meeting appropriate NFPA Standards
- Developing annual maintenance training for various divisions in the Department
- Managing recruit fire fighter training
- Creating exams and delivering NFPA certification programs through the Regional Training Centre
- Liaising with Ontario Fire College to access additional programs that enhance fire fighter and citizen safety
- Measuring success of programs through scenario-based and skills testing to assess competencies for all personnel annually

- Maintaining the RHFES Training Tower for internal and outside agency use

This current model would appear to present challenges to the delivery of appropriate training to all RHFES personnel with the level of commitment and expertise that is required. The current staffing model and approach has been in place since 2005 and a review of staffing levels and workload would be appropriate.

It is recommended that a workflow assessment/gap analysis be undertaken to contrast current program delivery outcomes to RHFES stated target outcomes. Staffing to address any identified gaps through full-time Training Officers and/or temporary secondments should be undertaken in the short- to mid-term.

Recommendation – Operational:
It is recommended that an internal review of staffing and workflow within the Training Division be conducted. Gaps should be identified and addressed. To ensure consistent and high-quality delivery of training, an increase in the number of full-time training officers may be warranted.

To complete the evaluation of the Department's training programs and related successes or challenges in meeting the training needs of all personnel, EM&T is recommending the following for the RHFES Training Division:

- Continue to support training and certification to the NFPA Standards for each rank and position within RHFES.
- The Training Chief in collaboration with the two Training Officers should annually review training programs and costs to ensure that all efficiencies are identified and programs are supported in a fiscally responsible manner.
- Continue engagement and collaboration with regional partners to assess feasibility of joint training ventures and opportunities for revenue generation at the Training Facility.
- Realign the Training Division under the Deputy Fire Chief (Operations). Current reporting structure sees the Training Division report to the Deputy Chief (Support Services). As training is the foundation of operations, this realignment would provide opportunities for greater coordination with increased effectiveness and efficiencies.

Recommendation – Operational:
It is recommended that the reporting structure for the Training Division be realigned under the Deputy Fire Chief (Operations). This realignment supports enhanced intra-departmental coordination leading to greater efficiencies and effectiveness of training programs.

4.3.2 Training Facilities

The RHFES has a training facility within the municipality's borders to conduct regular hands-on programs such as live fire training and other specialized programs that require more training props outside of those available at the fire stations. This training facility benefits the Department by ensuring that all personnel are professionally trained to do their jobs. With the facility being in the City, staff do not need to leave the community for most of their required training. While the use of on-shift instructors facilitates approximately 30% of training being delivered at the fire stations, the vast majority of training for RHFES personnel (70%) is conducted on-site at the Training Tower facility.

The Training Tower also provides RHFES with revenue generation through rental agreements with several partner agencies, including but not limited to Seneca College, Ontario Fire Academy, Central York Fire Services, and Markham Fire and Emergency Services. Revenue generated for the previous three years are as follows:

- 2018 - $114,675
- 2019 - $141,086
- 2020 - $61,900

While revenue was trending upwards, the decline in 2020 is due to cancellations associated with the COVID-19 pandemic and its impact on training for various agencies. It is anticipated that with the closing of the Ontario Fire College, revenue generation will continue to grow as course offerings are increased through the Regional Training Centre.

While the revenue currently generated is used to offset the budgetary needs of the Training Division, there may be opportunities for the Training Chief to identify staffing or equipment needs that could be supported through enhanced revenue generation. Greater levels of revenue generation will equate to more staff time coordinating this effort, which should not detract from the primary mission of the RHFES Training Division to deliver training internally.

Recommendation – Strategic:
It is recommended that revenue generation initiatives implemented and managed through the Training Division be used to further enhance capacity through financial support of full-time or temporary staffing increases.

Any training props should meet *NFPA 1402, Standard on Facilities for Fire Training and Associated Props*. *4.3.3 Commission on Fire Accreditation International.*

The CFAI Accreditation program has a specific section that evaluates the training component of a fire department. In this section the following points are noted:

- Category VIII: Training and Competency
    - *Training and educational resource programs express the philosophy of the organization they serve and are central to its mission. Learning resources should include a library; other collections of materials that support teaching and learning; instructional methodologies and technologies; support services; distribution and maintenance systems for equipment and materials; instructional information systems, such as computers and software, telecommunications, other audio-visual media, and facilities to utilize such equipment and services. If the agency does not have these resources available internally, external resources are identified, and the agency has a plan in place to ensure compliance with training and education requirements.*

The Fire Chief, Deputy Fire Chief, and Training Chief are aware of the program needs and facility requirements and have indicated that the Assistant Chief Training is tracking much of this; however, to verify in a more formal manner that the Training Division is meeting the related NFPA program recommendations the Training Chief, should identify:

- What training programs are required in relation to the services that RHFES is providing.
- The number of hours that are required to meet each of those training needs.
- Resources required to accomplish this training.
- Joint partnerships with bordering fire departments and private organizations that can be entered to achieve the training requirements identified by the Training Officer.
- An annual program outline at the start of each year to the Fire Chief with noted goals and expectations and completion success rate.

To complete the evaluation of the Department's training programs and related successes in meeting the training needs of the firefighters, EM&T is recommending the following:

- Continue to support training and certification for each rank and position within RHFES.
- The Deputy Chief of Support along with the Training Chief should annually review training programs and costs to ensure that all efficiencies are identified to keep costs fiscally responsible.
- Continue to work with regional partners to run joint training courses as identified in the Stabilization and Growth Plan.

4.3.4 Certification

The Training Division is responsible for ensuring that all firefighters and officers meet the requirements for the appropriate NFPA Standards and other recognized industry standards such as Canadian Standards Association (CSA), *Occupational Health and Safety Act* (OHSA) Section 21, etc.

Firefighters, fire officers and fire prevention officers undergo written and practical exams established by the Training Division, under direction from the Fire Chief, to meet the required standards.

Recruits. Recruit firefighters currently undergo a 14-week training program that aligns with NFPA 1001 Fire Fighter I & II. The recruit program additionally achieves three other certifications meeting NFPA Standards. This is done to ensure they are maintaining the necessary skills to perform their duties safely and effectively as firefighters. In comparison to industry best practices within comparable fire service agencies, the RHFES recruit program should be meeting the expectations for skill development and fire fighter safety.

Firefighters. Firefighters complete a refresher course that also aligns with the NFPA Fire Fighter I & II, every three years with theory and practical evolutions. This is in addition to the wide variety of disciplines currently managed within the RHFES.

Company Officers. RHFES trains all Company Officers to NFPA 1021 Level I (Fire Officer-I). This is accomplished through the regional training center with the assistance of the Ontario Fire College. Company Officers complete an online refresher course every 3 years. This level equates to the supervision and management of single-resource incidents. As RHFES Company Officers often oversee multiple apparatus in advance of the arrival of a Platoon Chief, moving them to a higher level of training/certification would be appropriate.

Recommendation – Operational:
It is recommended that RHFES qualify District and Platoon Chiefs to NFPA 1021 Level II (Fire Officer-II). This certification supports management of multi-unit responses in the field, in addition to adding valuable curriculum to overall RHFES succession planning.

Platoon Chiefs and Exempt Chief Officers. Given the level of responsibility and oversight that falls within the scope of Platoon Chiefs and Assistant Fire Chiefs, ensuring appropriate certification at this level is an industry best practice. It is recommended that Platoon Chiefs and Assistant Chiefs be qualified to NFPA 1021 Level III (Fire Officer-III). The positions of Deputy Chief and Fire Chief should be qualified to NFPA 1021 Level IV (Fire Officer-IV).

Recommendation – Operational:
It is recommended that the Training Division identify and develop an officer training program consistent with NFPA qualifications.

Live fire training is a critical part of the instruction and ongoing certification for firefighters. It teaches them how to fight fires safely and effectively in a controlled setting under supervision. This aspect of

training reinforces for Company Officers and firefighters how to think clearly and act calmly under the stress of an emergency situation when lives are at stake, and every second counts.
Following a review of the RHFES annual training program it is apparent that live fire training has not been completed for some time now. The Training Division does schedule this to occur on an annual basis, however, it has been removed from the training plan for various reasons for the past few years. Currently, only recruit firefighters receive live fire training.

The fire service continues to be tasked with a wide array of responsibilities and the RHFES is no different. The importance of maintaining and building on the fireground knowledge, skills and abilities that derives from live fire training should not be underestimated. Firefighter and civilian safety rely on effective and efficient fireground activities and live fire training is central to that approach. It is recommended that the Training Division, with support from RHFES leadership, ensures that annual live fire training occurs. Any impediments to delivering this training should be identified and addressed in the short-term.

Recommendation – Operational:
It is recommended that RHFES secure resources required to ensure annual live fire training is provided to all personnel Staffing and workload adjustments in the Training Division may be required to support development and implementation of a robust program in accordance with NFPA 1403: Standard on Live Fire Training Evolutions.

4.3.5 Succession Planning

Succession Planning in the fire service can often be a daunting undertaking. There is no question that a proactive and forward-looking agency such as the RHFES would be well served to develop and implement a succession planning program across all divisions of the organization. Succession programs are about identifying and creating opportunities for personnel to be exposed to the roles and responsibilities of senior positions. This can support their advancement to senior positions within the organization when opportunities for advancement arise. These programs are also effective at providing not only career development, but often help to boost morale as personnel relate to the Department being vested in their success and that of their co-workers.

In the RHFES FMP 2016, the issue of succession planning was identified as a gap to be addressed. Recommendation #26 stated:

> *"That the RHFES develop a formal succession planning process that recognizes the importance and provides the opportunities for mentoring, secondments, job shadowing and cross training within the department, and where external opportunities may be identified."*

The RHFES has a satisfactory succession program in place for the Operations Division, primarily focused on progression to the Company Officer (Captain) and Platoon Chief ranks. Within Fire Prevention, Training and Communications and for positions advancing beyond Platoon Chief, there is currently no formal succession planning program in place. To develop the RHFES leaders of tomorrow, the Fire Chief would be well served to begin the process of building a department-wide succession planning program. The following steps should be undertaken to formalize this initiative:

- Identify roles and responsibilities of Chief Officers.
- Determine qualifications necessary to succeed in these roles.
- Identify training and certifications that will meet the desired qualifications.
- Determine a methodology for selecting and supporting RHFES personnel to participate in the program.

A succession planning program provides a holistic approach to providing development opportunities across the organization. Building tomorrow's leaders of RHFES should start today. It is recommended that research be undertaken to identify the industry's best practices with subsequent development and implementation of an RHFES succession planning program.

Recommendation – Operational:
It is recommended that a formal succession planning program be developed and implemented within the RHFES. Given the size and scope of the RHFES, numerous opportunities for career development could be identified and supported in conjunction with defined qualifications, certifications, and training to support future success of interested personnel.

4.4 Fire Prevention and Public Education

EM&T has conducted a review of the existing fire prevention program, identifying strengths, gaps and areas for growth and improvement. Fire prevention and public education are the foundation to creating a safe community and this should be the initial focus of a fire service to create an effective, manageable program.

NFPA 1035 *Standard on Fire and Life Safety Educator, Public Information Officer, Youth Fire Setter Intervention Specialist and Youth Fire Setter Program Manager Professional Qualifications* (3.3.11) identifies fire and life safety education as a "comprehensive community fire and injury prevention program designed to eliminate or mitigate situations that endangers lives, health, property or the environment."

Both fire prevention and public education are the first line of defence in relation to the 'Three Lines of Defence' presented by the OFMEM; the more resources assigned to this endeavour, the more proactive a community and its fire department are regarding safety.

Inspection and enforcement is the number two line of the 'Three Lines of Defence' in preventing fires before they begin. Fire prevention and education combined with inspection and enforcement are the most effective methods of reducing injuries and death associated with fires and associated emergencies.

After reviewing data provided by RHFES, it was confirmed that there is an annual inspection and public education program in place. The Fire Prevention Chief (Assistant Fire Chief) oversees all facets of the program in conjunction with the Deputy Fire Chief, Support Services and the Fire Chief to ensure that the Fire Prevention Division is meeting their goals.

RHFES has a full-time Fire Prevention Division that reports to the Deputy Fire Chief – Support Services. The Fire Prevention Division is staffed with ten (10) personnel including one (1) exempt Chief Officer. The Prevention Chief oversees a team of nine (9) with two (2) Fire Prevention Officers (Captains); one (1) Fire Prevention Technologist; four (4) Fire Inspectors; and two (2) Public Educators. The Prevention Chief oversees all prevention and education activities and sets overall program goals. Through their leadership, the Fire Prevention Division manages all community outreach, data analytics, commercial building plans, new developments and acts as the primary for fire investigations.

The City has high-risk structures that require constant monitoring by the FPOs. These include Apotex, a global pharmaceutical company; Hillcrest Mall, a regional shopping centre with more than 100 retail stores; and the Sheraton Hotel, to name just a few.

The Fire Prevention Division has also identified high-risk audiences and targeted these for their fire prevention and public education efforts. These efforts have focused on engaging the numerous care facilities throughout the City with resources dedicated to conducting monthly mandatory inspections, supervising fire drills and supporting the training of onsite staff. The Division also devotes time and energy to engaging new Canadians and English as a Second Language (ESL) residents by printing public education materials in various languages. Innovative programs the Division can be proud of include the Smoke Alarm Program, their School Program and the various partnerships with local businesses.

The collection and collation of data within the RHFES appears to be thorough. The application of this data is to align with the industry's best practices, to identify any gaps and to plan for the future is the logical next step. The RHFES Fire Prevention Division should look to bring meaning to the data in a way that all internal and external stakeholders can better understand the goals and objectives being measured against the data being compiled.

Recommendation – Operational:
It is recommended that the Fire Prevention Division monitor and provide Risk Assessment reports, at least annually, on activities conducted to better align current RHFES baselines and to ensure progress towards industry best practice benchmarks and the CRA.

For the most part, the Fire Prevention Division of the Department is divided into three intertwined disciplines: code enforcement and inspections, origin and cause investigation, and public education. All of these are legislated by the FPPA.

4.4.1 Code Enforcement/Inspections

For a Community Risk Reduction Plan to be successful, ongoing fire inspections are a necessity. It is the inspections that will identify deficiencies and contraventions of either the Fire Code or OBC before they cause a fire.

The two Fire Prevention Officers (FPOs) address Fire Code violations and fire safety hazards within the authority of the *FPPA* and applicable regulations and Fire Marshal directives. As Captains within the Division, these personnel also provide supervision, leadership and act as a resource for the Fire Inspectors, Public Educators and the Fire Technologist.

The four Fire Inspectors oversee community life safety issues concerning fire code inspections and enforcement of the Fire Code. Fire inspections of all types of occupancies in the municipality, with the intent of compliance with the Fire Code, is crucial to the protection of persons and property from the hazards of fire. The reduction of risks from fire and other life safety hazards with detection and reporting through the inspection process is necessary for the creation of a fire safe community, occupant safety and building preservation. Inspections also provide assurances that fire detection equipment in buildings meet code standards, are present and operational and that firefighting equipment in buildings have been tested to the standards. They also manage issuing orders, filing court documents and carrying out inspections.

The one Fire Prevention Technologist (Plans Examiner) is responsible for review of development applications (site plan, subdivisions, official plan amendment, minor variances) and building permit review for the fire protection features related to mainly tenant applications and large buildings (no houses). For this position, 5-10% of time may involve actual inspections on site.

The Fire Prevention Division may not be currently meeting its target inspection frequencies. Improved data collection and regular reporting from the Division through the Prevention Chief will provide clarity on current performance and for identifying RHFES baselines and establishing benchmarks for the Division. Efforts are underway to implement changes to processes and programs that may result in significant time and resource savings which could help to achieve target goals. For example,

uploading application forms online, online payment, movement to a paperless division (digitizing processes), possible reduced involvement in building permit inspections and possible reduced involvement in multiunit complaints are all initiatives that should free up inspection time. These efforts should continue to receive the time and resources required for timely implementation as the number of required inspections will only increase in time with changes to care facilities, increased population, etc.

Recommendation – Operational:
It is recommended that RHFES increase the role of suppression staff in support of fire prevention and public education efforts. This does not negate the need for long-term planning for full-time Fire Prevention Division personnel but could augment and enhance the services currently being delivered.

Through the utilization of the FUS Inspection Frequency Chart (TABLE #7), the Prevention Chief can measure requirements to meet inspection benchmarks developing a plan with what can be accomplished with its present staffing complement, along with presenting options for increasing inspection frequencies. The utilization of this inspection chart can also prove beneficial in the Fire Chief's review for staffing needs.

TABLE #7: FUS Suggested Inspection Frequency Chart

Occupancy Type	Benchmark
Assembly (A)	3 to 6 months
Institutional (B)	12 months
Single Family Dwellings (C)	12 months
Multi-Family Dwellings (C)	6 months
Hotel/Motel (C)	6 months
Mobile Homes & Trailers (C)	6 months
Seasonal/Rec. Dwellings (C)	6 months
Commercial (F)	12 months
Industrial (F)	3 to 6 months

Recommendation – Operational:
It is recommended that inspection efforts in the Fire Prevention Division align with industry best practises. This would be utilized as a benchmark for the Prevention Division to develop a plan on what can be accomplished with present staffing, along with presenting options for increasing inspection frequencies to meet established benchmarks.

It is acknowledged that the FUS suggested frequency chart can be difficult to address, therefore priority should be focused on the vulnerable occupancies (e.g., nursing homes, retirement homes,

group homes, etc.), institutional buildings, assemblies, multi-residential and industrial buildings. The RHFES Fire Prevention Division has made significant efforts to address these most vulnerable occupancies. That said, there would seem to be opportunities to support the Fire Prevention Division in meeting the inspection frequencies noted in the FUS, in NFPA 1730 and recommended in the 2016 FMP with the use of suppression personnel.

While suppression personnel are already utilized to support public education and community engagement activities, they could be better supporting the RHFES prevention efforts through targeted inspections in their respective fire station response areas. Increased familiarization of response districts and a better understanding of fire prevention duties is a benefit of enhanced engagement of suppression personnel in this field. To ensure these inspections are carried out in a knowledgeable manner, it is recommended that efforts to train all suppression personnel to the Fire Inspector I qualification should be concluded in the mid-term.

Recommendation – Operational:
It is recommended that RHFES expand the current initiative to train and qualify all firefighters to NFPA 1031 and 1035.

The Deputy Fire Chief (Support Services) and Prevention Chief Officer would be well served by tracking the time spent on each of the fire prevention activities (ranging from site plan reviews, routine inspections, licensing, complaints, requests, etc.). By identifying the time spent on each project and collating this into approximate baseline times, the Fire Prevention Chief can then use the hours spent as a model figure in applying future initiatives.

The Prevention Chief is highly encouraged to review the number of inspections and associated orders/fines issued on the concept of recidivism; that by which businesses are requiring more inspections, more follow-up and therefore more time of the FPO versus those which require minimal assistance or interaction of the FPO. A business or owner with tendencies to ignore the primary concepts of fire prevention may tend to preoccupy the FPO unnecessarily. It is recommended that the Fire Prevention Division report annually on activities being conducted to reset baselines and indicate success or challenges with achieving benchmarks.

Recommendation – Operational:
It is recommended that RHFES continue to conduct an annual appraisal and report on Fire Prevention Division programs to define successes and identify any gaps. Use of data analytics should support and inform this process.

4.4.2 Origin and Cause

The fire service in Ontario is mandated to determine the origin and cause of fires. The results of these investigations assist in identifying trends which are used in the development of building and fire codes, public education and fire prevention initiatives. Typically fire investigation is a part of the FPO's role. The *FPPA* requires the RHFES to investigate and determine the origin and cause of all fires. For a member to be successful, the office requires Fire Investigators to have successfully completed NFPA 1033, the standard for Fire Investigation and become a certified fire investigator. The two FPOs of the RHFES have successfully completed this standard.

Knowledge from determining origin and cause assist in targeting groups or causes to better educate the public on fire safety. Another purpose is to ensure fire code compliance (i.e., were there working smoke alarms). It is recommended that all Fire Prevention Division personnel be qualified as per NFPA 1033 as certified fire investigators. This will provide mobility within the Fire Prevention Division, add depth to the office capacity regarding investigations and support career development and succession planning.

Recommendation – Operational:
It is recommended that RHFES support all Fire Prevention Division personnel to gain qualification as certified fire investigators.

4.4.3 Public Education

The Fire Prevention Division has a successful program that teaches fire safety to all ages and in a variety of formats and settings. The two (2) Public Educators are responsible for running education activities and creating and/or delivering education programs. RHFES is committed to delivering a full array of fire prevention services and public education programs with available resources. Numerous partnerships with local businesses, media outlets and other City entities such as the library have been established that aid in the delivery of this public education programming. The RHFES continues to be proactive in this regard, identifying and implementing opportunities for increased effort in promoting public education. It is recommended that efforts be increased to leverage social media platforms and develop partnerships with internal and external stakeholders that would support advancement of public safety messaging campaigns.

Further to what has already been noted by the NFPA and FUS, the CFAI outlines the following regarding fire prevention and public education:

> *A public education program is in place and directed toward reducing specific risks in a manner consistent with the agency's mission and as identified within the community risk assessment*

and standards of cover. The agency should conduct a thorough risk-analysis as part of activities in Category 2 to determine the need for specific public education programs.

The utilization of existing resources is a cost-effective option for the promotion of fire prevention and public education programs. To accomplish this, some fire departments have trained suppression staff to conduct inspections or assist in public education. This not only brings more resources to the table but also enhances the level of fire safety awareness by those trained staff.
Currently the RHFES utilizes suppression personnel to support the smoke alarm program, the school program, fire station tours, community event appearances and distributing public safety material. Opportunities exist to enhance these programs and to implement innovative approaches with support from within RHFES directed towards the Fire Prevention Division. It is recommended that consideration be given to training all Suppression personnel to Fire & Life Safety Educator I.

4.4.4 Determination of Current Staffing Requirements

To assist fire departments in the determination of present and future staffing needs, *NFPA 1730* Standard on *Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation and Public Education Operations* outlines a five-step process within Annex 'C' of the standard. Ultimately, Council determines the level of Fire Prevention based off the local needs and circumstances of the community.

Note: Annex 'C' is not part of the requirements of this NFPA document but is included for informational purposes only.

The five-step process involves a review of the following items:

1. Identifying the scope of desired services, duties and desired outputs.
2. Review of the Fire Prevention Division's overall time demands in its efforts to offer services.
3. Review of hours presently documented, coupled with the hours required to meet annual goals of the branch.
4. Actual availability of branch personnel factoring in vacation and other absences.
5. Estimating total number of personnel required based on the previous four steps.

By completing this process, it will assist the RHFES Fire Prevention Division in further identifying what services it not only wants to offer, but what can be delivered based on present staffing levels and shift schedules. More information on this staffing equation can be found in the NFPA 1730 Standard.

Based on general recommendations by the FUS group, the FPO per population ratio should be approximately one FPO per 15 to 20 thousand population minimum. The City had a 2021 population of 210,030 up 13.2% from the 2011 population of 185,541. This growth rate was higher than the provincial five-year average of 4.6%. Based on this data the RHFES Fire Prevention Division would

ideally be staffed with between 10 and 14 personnel. With the anticipation that growth rates will continue within the municipality, this could put population rates beyond the FUS recommendations in a short period of time. The workload placed upon Fire Prevention Division personnel may exceed their capacity within one to three years if growth continues at the current rate. It is recommended that the Prevention Chief undertake a short-term (1-3 years) staffing plan to pre-empt potential negative workflow impacts in the future.

TABLE #8 Fire Prevention Staffing

MUNICIPALITY	POPULATION	FIRE PREVENTION DIVISION	FPO PER RESIDENTS
Barrie	145,614	9	1 per 16,179
Central York	147,124 (62,900 + 84,224)	7	1 per 21,017
Richmond Hill	**210,300**	**10**	**1 per 21,030**
Vaughan	323,281	14	1 per 23,091
Markham	342,970	14	1 per 24, 497

In relation to Fire Prevention staffing hour requirements, an initial assessment needs to be completed by the Prevention Chief to identify hours presently spent on inspections, along with identification of the annual goal. RHFES Fire Prevention Division currently captures this data, which should be reviewed to determine current capacity in the division. By doing this assessment, future hourly requirements can be consolidated into a report to the Fire Chief, City Manager and Council. Efforts to enhance interoperability between Suppression and Fire Prevention would aid in identifying and addressing risks to the community.

Suppression personnel are on-duty 24/7/365 and scheduling some Fire Prevention personnel in this same manner should be evaluated as a means of improving the quantity and quality of Fire Prevention efforts in the community. A daytime shift pattern that mirrors that of Suppression could see an increase in work production per year and may also prove beneficial for recruitment and retention within this Division. Enhanced alignment between Fire Prevention and Suppression with greater interoperability and utilization of Suppression personnel in support of Fire Prevention Division goals would be supported by this altered shift schedule. It is recommended that the RHFES assess the feasibility of moving to 7 days/week Fire Prevention Division staffing.

Recommendation – Operational:
It is recommended that RHFES develop a staffing plan to be developed for the Fire Prevention Division to ensure staffing levels and subsequent workflows can be managed appropriately. This staffing plan should also review the current shift pattern and explore options to move to 7 days per week coverage matching community needs.

4.4.5 Succession Planning

Succession programs are about creating opportunities for members of the organization to advance to senior positions. These opportunities must be applied fairly and consistently. Currently the RHFES does not have a formal succession planning process in place overall or within the Fire Prevention Division. In the absence of the Prevention Chief the two FPOs at the rank of Captain are provided long-term assignments to act in the capacity of the Prevention Chief. Providing backfill opportunities for the Fire Inspectors and/or Public Educators to temporarily act in the capacity of the Fire Prevention Officers (Captains) during their absence would also prove beneficial.

Additionally, there is ongoing support for staff development and Fire Prevention Division personnel can pursue certification through the Ontario Fire College which includes NFPA certifications to 1031, 1033, 1035, 1041, Ontario Building Code certification (BCIN in Fire Protection) and CFAI. There is also support for personnel to attend other course work and seminars offered by Fire Training Division, Richmond Hill University groups such as CASA, CFAA, NAFI, NFPA, OBOA, OFMEM and industry groups. It is recommended that all personnel in the Fire Prevention Division be encouraged to qualify as certified fire investigators and to pursue other relevant qualifications as appropriate.

The Deputy Chief (Support Services) and Prevention Chief should look to formalize expectations, responsibilities and training competencies for the Prevention Chief acting assignments. The potential of acting opportunities as the Captain (Fire Prevention) should be considered for further staff development to enhance the depth and breadth of knowledge within the Division. Clarity in this regard would support a more focused effort on professional development within the Fire Prevention Division and would enhance future career progression and succession planning.

4.5 Suppression

The RHFES responds with seven apparatus that are staffed with career firefighters. These include five Engines, one Aerial and one Rescue for emergency incidents. The are other apparatus available will respond dependant on the call type. The NFPA 1710 (5.2.3) defines operating units as fire company staffing requirements based on minimum levels necessary for safe, effective, and efficient operations.

Terminology

A ***First Due Response Zone*** is defined by NFPA 1710 (3.3.28) as the geographic area surrounding a fire station in which a company from that station is projected to be the first to arrive on the scene of an incident.

The ***Geographic Isolation*** is defined by NFPA 1710 (3.3.32) as the first due response zone or jurisdiction with staffed resources where over 80% of the response area is outside of a 10-minute travel time from the next closest staffed suppression apparatus.

The ***Geographic Restriction*** is defined by NFPA 1710 (3.3.33) as the defined condition, measure or infrastructure design that limits response and/or results in predictable response delays to certain portions of the jurisdiction.

An ***Engine Company's*** primary function is to pump and deliver water and perform basic fire fighting at fires and search and rescue functions. NFPA 1710 recommends a minimum of four on-duty members for an Engine Company and in a first due response zone with a high number of incidents, geographical restrictions, geographical isolation or urban areas as identified by the AHJ, an Engine Company shall be staffed with a minimum of five on-duty members. Further to this, NFPA 1710 states that a first due Engine Company with tactical hazards, high-hazard occupancies or dense urban areas as identified by the AHJ, these companies shall be staffed with a minimum of six on-duty members.

A ***Ladder/Quint Company's*** primary function is to perform the variety of services such as forcible entry, ventilation, search and rescue, aerial operations for water delivery and rescue, utility control, illumination and overhaul and salvage work. NFPA states that a Ladder Company shall be staffed with a minimum of four on-duty members. In a first due response zone with a high number of incidents, geographical restrictions, geographical isolation or urban areas as identified by the AHJ, the Ladder Company shall be staffed with a minimum of five on-duty members. In first due response zones with tactical hazards, high-hazard occupancies or dense urban areas as identified by the AHJ, a Ladder Company shall be staffed with a minimum of six on-duty members.

A ***Mobile Water Supply Tanker*** is an apparatus whose primary function is to pick up, transport and deliver water to the scene of a fire or other incident that requires a dedicated water source. A tanker shall be staffed with a minimum of two on-duty members.

NFPA 1710 identifies other types of companies that are utilizing specialized equipment and apparatus shall be provided to assist Engine and Ladder companies as per the fire departments standard operating procedures. These companies shall be staffed with the minimum number of members to deal with the tactical hazards, high-hazard occupancies, high-incident frequencies, geographical restrictions and other pertinent factors identified by the AHJ.
There is no identified standard dictating how many firefighters are required within a given population or whether the Fire Department needs to be composed of full-time, composite (blend of full-time and volunteer firefighters) or volunteer staff.

Some municipalities have referred to other similar sized municipalities as a guide for staffing numbers and types (i.e., career or volunteer). It must be kept in mind that every community is unique in its geographical composition, population demographics and size of residential, commercial and industrial sectors.

It is evident that call volumes for the RHFES will increase simply based on the influx of people, traffic, tourism, commercial establishments, industry and housing over the next 10 years. A careful monitoring of call volumes and response times is critical when it comes to determining if the Department is keeping up with its response expectations.

To make an informed decision on suppression staffing requirements, consideration is dependent on the following points:

- Does the Department have an approved response criterion as a baseline?
    - Has Council given direction to the Fire Chief (based on the Chief's recommendations) on expected response times that are to be met by the Department?
        - If so, is the Department meeting this response criterion on a consistent basis or is it struggling to meet the response times and falling behind?
- What local and national standards and guidelines exist to help direct the Fire Department in its decisions relating to station location and staffing models?
    - Specifically, NFPA 1710 along with reference to the CFAI "industry best practices" recommendations.
- What increase or decrease in population and industry is occurring that may precipitate more or less fire stations and staffing?
- What increases to the building stock of the City will impact the number of calls for service each year going forward?

For fire departments in Ontario, reference can be made to the Public Safety Guidelines that are created and distributed by the OFMEM. These guidelines advise fire services on all aspects of delivering fire prevention, fire suppression and fire station locations.

RHFES is diligently trying to meet the NFPA 1710 Standard in relation to response times. Based on response data review and discussions with the Fire Chief, RHFES is having difficulty meeting the response criteria of 14 firefighters in eight minutes. This is further discussed in section 5.1.2.

4.6 Communications

RHFES dispatches its fire apparatus through their own Communications Centre located at 191 Major Mackenzie Drive West, which is also the location of Station 8-1. There are 12 full-time employees (four supervisors and eight communications operators), working two 10-hour tours followed by two 14-hour tours, then four days off in an ongoing rotation. When an issue arises and the RHFES Communications Centre cannot function, operations are then transferred to Vaughan Fire & Rescue's Communications Centre, which is RHFES back-up Communications Centre and vice versa.

The RHFES's Communications Centre dispatches for five other fire services in the York Region; Whitchurch-Stouffville, Central York, East Gwillimbury, Georgina Island and Georgina Fire Services. The dispatching of outside fire services is an excellent means of revenue generation and should continue and further, if possible, expand its client base.

The Communications Operators are responsible for:

- Answering 9-1-1 calls.
- Answering ten-digit calls.
- All fire related dispatch procedures.
- Incident related dispatching procedures and ongoing communications with the scene commander.
- Coordination of Mutual Aid support, as required.
- Contacting and initial dispatching of other agencies such as Police, Ambulance, Hydro, Gas, etc.
- Documenting of related data required by the Office of the OFMEM such as time of call, turnout of firefighters, drive time, etc.
- Maintaining the Versadex CAD database.
- Back-up communications centre for Vaughan Fire & Rescue if their communications systems experience a failure.
- Answering after-hour calls on the City's after-hour phone lines.

A minimum of two communications operators are on duty 24-hours a day, 365 days a year and they report to their supervisor under the direction of the Deputy Fire Chief of Operations. There are times during any given shift that a supervisor is not on duty and if a situation or questions arise, they are to contact the on-duty suppression Platoon Chief for direction. Not having a Supervisor on duty during every shift places added responsibility and possible liability upon the operators that are on duty.

Having a Supervisor on duty during each shift will provide the appropriate direction on the operations of the centre and be able to resolve any issue that may arise without delay. Having a Supervisor on duty each shift will ensure continuity of the operations of the centre and ensure compliance under the *OHSA's* supervision requirements.

There are instances whereby the Supervisor must take the role as Communications Operator due to short staffing or high call volume. When the Supervisor is dispatching this takes them away from

their role as a Supervisor which includes administration duties and ensuring that call taking and dispatching timelines are met in accordance with the NFPA Standards.

Recommendation – Strategic:
It is recommended that the RHFES promote four (4) of its Communications Operators to the role of Acting Communications Supervisor to ensure continuous supervision in the Communications Centre.

During the development of the document, the process of the implementation of having acting supervisors in the Communications Division began.

Being a Communications Operator is inherently stressful; dealing with upset callers in traumatic situations, having to deal with rude clients over the phone, answering after-hours calls, dispatching other fire departments as well as their own fire department, and it takes a toll on personnel. It is not uncommon for communications centres to have personnel off on stress leave due to Post Traumatic Stress Disorder (PTSD). This impacts the budget requiring additional Communications Operators to cover for the personnel off on sick leave and WSIB fees many increase if it is deemed to be a work-related illness. The City has an Employee Assistance Program, along with a Peer Support Team, to aid those suffering from PTSD or other mental illnesses.

The following are options to assist in reducing risk of mental fatigue and/or stress of the communications operators:

- Schedule breaks away from the radio/phone console.
- Present opportunities to eat lunch away from the dispatch console.
- Present a chance to get some fresh air.
- Have an exercise bicycle available for use during quiet time.

Recommendation – Operational:
It is recommended that the RHFES monitor sick time related to PTSD or other mental health illness and the impacts that may be placed upon staffing, shift scheduling/coverage and any financial implications.

When there are staffing shortages in the Communications Centre, firefighters may be reassigned from Operations to work as Communications Operators. These individuals are used on an as needed basis and have received training on working in the Centre. In these situations, additional firefighters may be called in on overtime to backfill for those assigned to the Communications Centre. Even though the firefighters meet the requirements to do the job when working in the Centre, they do not have the level of experience to be placed in such a position, due to the infrequency of working in the Centre.

This practice also reduces the number of firefighters available to respond to any incoming emergency calls, if staffing is below the minimum requirements.

Firefighters do not fill the role of communications operator on a regular basis reducing their level of experience and competence in performance of their tasks, which could lead to mistakes occurring. The level of confidence the fire fighter has in their dispatching abilities may also come into question. It falls on the other communications operator, if not a fire fighter, to monitor the activities of the fill-in dispatcher to ensure they perform as required.

There have been instances in the past where two firefighters are assigned to the communications room for the shift with no supervision. This practice places the firefighters in a position to make decisions that may not be in compliance with the operation procedures of the Centre, thereby placing themselves at risk of making dispatching errors. It should be noted that only trained firefighters in dispatching procedures, and the operations of the Communication Centre, are permitted to work in there.

RHFES is under contract to provide dispatching services for other fire services and these fire services and their citizens deserve a competent and confident dispatcher on duty serving their needs.
The RHFES should discontinue the practise of using firefighters to fill in the role of Communications Operators which has been identified in previous Master Fire Plans. If there is a staffing shortage in the Communications Centre, off duty Communications Operators including Supervisors should be called in on overtime.

Recommendation – Strategic:
It is recommended that the RHFES to reduce the frequency of having firefighters act in the role of Communications Operator in the event of staffing shortages. This should not be implemented until such time that additional staffing is hired for the Communications Centre.

The hiring of additional communications personnel should be reviewed. The Communications Centre should maintain a minimum of two communications operators and one supervisor on duty at all times.

Recommendation – Strategic:
It is recommended that the RHFES hire additional personnel, either part-time or full-time, to cover staff shortages in the Communications Centre ensuring a minimum staffing of two Communications Operators and one Supervisor are on duty at all times.

Dispatch is supported by a CAD (computer aided dispatch) software program (Versadex) that effectively assists with timely dispatch. It is reported that the system is reasonably reliable with

infrequent operation interruptions and has a timely system support.

There is one Communications Supervisor that is responsible for the CAD's operation and updates. Opportunities of additional training in its operation should be provided to not only that supervisor, but to additional supervisors. If the primary individual is off-duty, there lacks redundancies within the Centre to ensure the system remains functional by having others capable to take over the role of maintaining its operation. There should be a reference manual available on the CAD's operation, including how to make changes, correct issues, etc.

The Communications Supervisors are an excellent resource that could be utilized more frequently to assist in the Centre's daily operations. An example is they could each develop training exercises ranging from mapping, call taking and dispatching procedures, operational needs that may be requested from the Incident Command (IC) at fires, how to handle any many call types, etc.

The RHFES ensures that the Communications Operators continue to work towards meeting the requirements of NFPA 1061 and receive their certifications. Once they have received their Pro Board certifications they should continue their training and certification opportunities through the Association of Public-Safety Communications Officials, (APCO) Canada.

The Communications Centre follows NFPA 1221, Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems, which is used to identify dispatching service criteria.

NFPA 1221, Sections 7.2, 7.3 and 7.4

7.2.1 – Telecommunicators shall meet the qualification requirements of NFPA 1061 – Professional Qualifications for Public Safety Telecommunications Personnel, as appropriate for their position.

7.3.1.1 – The Authority Having Jurisdiction shall ensure that there are enough telecommunicators available to effect the prompt receipt and processing of alarms and events needed to meet the requirements of Section 7.4.

7.4.1 – 95% of alarms received on emergency lines shall be answered within 15 seconds and 99% of alarms shall be answered within 40 seconds. *(For documentation requirements, see 12.5.2.)*

7.4.1.1 - Compliance with 7.4.1 shall be evaluated monthly using data from the previous month.

The Deputy Chief should continually review the performance of the communications operators to ensure they meet NFPA 1221, Section 7.4.

NFPA 1221 will be referenced if any questions arise regarding activities that are to take place within a fire service communication centre such as communication operator qualifications, radio communications, telephone communications, back-up communication centre or power requirements

and staffing.

It has been reported that NFPA 1225, *Standards for Emergency Services Communications,* which is the combination of both NFPA 1061 and 1221, will be approved within a year. This new standard and the integration of the Next-Generation 9-1-1 (NG9-1-1) will have far reaching impacts on emergency service communications, both operationally and financially.

In Canada, the NG9-1-1 system standards are to be implemented in all communication centres across the country by March 30, 2024. It is anticipated the start-up costs for NG9-1-1 could be from $250,000 and $500,000 to have the ability to receive emergency texts and pictures of the scene from the caller. It is further estimated that the annual costs of operating the NG9-1-1 varies from $80/capita to 25% of the original capital expenditures to bring the system in operation.

Communication centres are the fire service's lifeline; they take the call for assistance from the citizens on what the citizen considers as being the worst day of their lives, gather the necessary information, dispatch the firefighters and apparatus and maintain radio communications with responding firefighters and apparatus up to the point where all have returned to quarters. firefighters

It has been noted within the fire service, that due to the high costs of implementing and yearly operation costs associated with NG-911, fewer departments will be looking after their own dispatching requirements and entering into agreements with other fire services for their needs.

Table #9 indicates comparisons of numerous Communications Centres and what they charge clients, per capita, for dispatching services.

TABLE #9: Communication Centres Comparisons

Communications Centre	***Cost per capita (2020)***
Barrie Fire & Emergency Service	***$2.65***
Brantford Fire Department	***$3.50***
Orillia Fire Department	***$2.10***
Owen Sound Police Service	***$4.50 to $6.50***
St Catharines Fire Department	***$2.13***
Richmond Hill Fire & Emergency Services	***$2.76***
Tillsonburg Fire Department	***$2.25***

Recommendation – Strategic:
It is recommended that the RHFES explore opportunities of revenue generation to offset the expense of the Communications Centre by acquiring new clients to be dispatched from its Communications Centre.

To ensure smooth operation of a communication centre requires up-to-date policies, guidelines and procedures. During a review of the Communications Centre's operations, it was found that this was not always the case; there lacks defined procedures on how the Centre is to operate. Currently each Supervisor has their own way of doing things and when they ask for guidance from the Platoon Chiefs, they too have different ways of doing things. To reduce the risk of mistakes that could lead to liabilities, a defined operational manual should be developed and implemented so that each individual knows their role and responsibilities while at work within the Centre. Consistency in operation is of paramount importance and lack of such could result in incidents that may have been prevented if a manual were available for reference.

Currently the responsibility of the Communications Centre is the responsibility of the Deputy Chief of Operations. The Deputy is also responsible for the Suppression requirements of the department, which is very involved and may take time away from the Deputy addressing issues in Communications in a timely manner.

The operation of the Communications Centre is a stand-alone function within RHFES whereas the operations of the other Divisions may be interwoven. There should be an individual in charge of the Communications Centre for which operations is their sole responsibility. It would be the responsibility of this individual to ensure compliance with all legislation, regulations, and standards, ensure provision of training, ensure operations of the Centre are consistent and constantly monitored, and manuals and operation aids are available and current including SOGs and policies. They would also be the contact person with the other fire services in which RHFES dispatches.
To improve management and oversight of the communications division EM&T is recommending that the RHFES hire a Chief Officer of Communications.

Recommendation – Strategic:
It is recommended that the RHFES add an additional Chief Officer for the oversight of the Communications Division. Member to be outside of the collective bargaining unit.

The Communications Centre relies heavily on electronic equipment such as computer hardware and software, radio equipment, telephone system, etc. To ensure they remain operational requires someone from Information Technology (IT) that is well versed on all of the components and needs of the room. There should be a dedicated IT staff member responsible for the electronics required to ensure the room's operations that is able to respond in a timely manner.

Conducting staff meetings regularly will assist in ensuring consistency is maintained in the Communication Centre's operations. It is during these meetings where many issues may be brought forward, consensus acquired and direction provided that will assist in daily operations.

Communications is located within a repurposed municipal building and needs upgrades to bring it to current industry standards. This is discussed further in Section 6: Facilities.

It is very costly to the taxpayer for a fire service to operate a Communications Centre. Expenses include building the structure to house it; the infrastructure for the IT components such as phone lines and computer equipment; furnishings such as dispatching desks, chairs, office equipment; maintenance; personnel; and frequent upgrades to maintain industry standards. As an example of the higher costs, RHFES has budgeted in 2021 approximately $1 million to incorporate Next-generation 911 into their centre, as mandated by the Federal Government. It remains unclear what the yearly operating costs for NG-911 will be, as early estimates range from $10,000 to $25,000 per workstation.

To offset some of the expenses, fire services such as RHFES have, under a contract, taken on the responsibility of dispatching outside fire services to generate revenue. Due to these ongoing costs, some fire services have chosen to cease responsibility for dispatching and found it less costly by having dispatch services done by a third party.

Another consideration is the joint operation of a Communications Centre. This would mean two or more communications centres amalgamating or jointly operating under one roof. Doing so will not only reduce the costs of operating the centre but create efficiencies in operations and reduce operating costs and service duplication. For these reasons, EM&T believes the RHFES should enter into discussions with Vaughan Fire & Rescue Services to explore opportunities of amalgamating or jointly operating their Communications Divisions. This should also include investigating opportunities of entering into agreements to dispatch other fire services in the province.

In 2019, the Cities of Markham, Richmond Hill, and Vaughan hired a consultant for the purpose of investigating the joining of the three Fire Communications Centres into one. The final report was presented in 2020, and while it was comprehensive, it implied significant expenditures. For those and other reasons it was not moved forward for consideration by the councils of the municipalities. It may, however, be a good reference point during discussions with Vaughan Fire, and some of the less expensive recommendations could be implemented in the interim.

There are several recommendations pertaining to the Communications Division and as such, an order of completion should be identified to ensure a smooth transition. The suggested order is:

1) The hiring of a Deputy Fire Chief – Communications.

2) A comprehensive review and analysis of current and future operational needs for the Communications Division.
3) The completion of a needs assessment for additional staffing for the Communications Division.

4.6.1 Next-Generation Communications (NG9-1-1)

The 911 Central Emergency Reporting Bureau (CERB) for Richmond Hill is the York Regional Police Service. Emergency 911 calls are directed to the police service and then directed to the emergency service that is required by the caller (i.e., police, paramedics or fire).

In June of 2017, the Canadian Radio-Television and Telecommunications Commission (CRTC) created regulations regarding the next-generation communications for 9-1-1 centers. The following is an excerpt from the CRTC website regarding the program and its benefits for enhancement to public safety communications.

> *Canadians depend on the provision of reliable and effective 9-1-1 services to seek help in an emergency. As technology and consumers' needs evolve, so do consumers' expectations, related to 9-1-1 services. In the coming years, telecommunications networks across Canada, including the networks used to make 9-1-1 calls, will continue to transition to Internet Protocol (IP) technology. This will enable Canadians to access new, enhanced and innovative 9-1-1 services with IP-based capabilities, referred to as next-generation 9-1-1 (NG 9-1-1) services. For example, Canadians could stream video from an emergency incident, send photos of accident damage or a fleeing suspect, or send personal medical information, including accessibility needs, which could greatly aid emergency responders.*
>
> *In this decision, the Commission is setting out its determinations on the implementation and provision of NG9-1-1 networks and services in Canada. This will require coordination and collaboration between numerous stakeholders, including the Commission; telecommunications service providers that provide 9-1-1 services (TSPs); 9-1-1 network providers; the CRTC Interconnection Steering Committee (CISC); federal, provincial, territorial, and municipal governments; emergency responders; and public safety answering points (PSAPs). As such, in this decision, the Commission is making a number of recommendations in which all stakeholders will have a role to play, including the establishment of a national PSAP and emergency responder coordinating body.*
>
> *The Commission has determined that an incumbent local exchange carrier (ILEC) stewardship model under Commission oversight is the most appropriate with respect to the governance and funding of NG9-1-1, such that the ILECs will be responsible for the construction, operation, and maintenance of the NG9-1-1 networks, with Commission oversight, including through Commission approval of the ILECs' tariffs.*

*The Commission **directs** all ILECs to establish their NG9-1-1 networks and to be ready to provide NG9-1-1 Voice service by **30 June 2020** wherever PSAPs have been established in a particular region.*

*The Commission also **directs** all TSPs to make the necessary changes to support NG9-1-1 Voice throughout their operating territories by **30 June 2020** wherever (i) their networks are capable of doing so, and (ii) PSAPs have launched NG9-1-1 Voice. The Commission determines that real-time text (RTT)-based NG9-1-1 Text Messaging is the second method of communication to be supported on the NG9-1-1 networks. The Commission **directs** mobile wireless service providers to provide RTT-based NG9-1-1 Text Messaging throughout their operating territories by **31 December 2020** wherever (i) their networks are capable of doing so, and (ii) PSAPs have launched NG9-1-1 Text Messaging. The Commission also requests that CISC submit to the Commission, for information, its recommended public education campaign for each new NG9-1-1 service.*

During the transition to NG9-1-1, ILECs are directed to support existing 9-1-1 voice services over the existing 9-1-1 networks in parallel with the new NG9-1-1 networks. As well, ILECs are to decommission their current 9-1-1 network components that will not form part of their NG9-1-1 networks by 30 June 2023 (delayed to 20 June 2024 due to Covid19). The existing 9-1-1 tariff rate regime for funding the current 9-1-1 networks will remain in place during the transition, along with new incremental tariffed rates that will be established for NG9-1-1. These rates will be in effect until current 9-1-1 networks are decommissioned, at which time final NG9-1-1 network access tariff rates will be established.

Finally, the Commission is imposing obligations related to (i) ensuring the reliability, resiliency, and security of the NG9-1-1 networks; (ii) reporting on NG9-1-1 network outages; and (iii) ensuring privacy in an NG9-1-1 environment.

[Goals and Outcomes of Implementation]

1. *Effective and timely access to emergency services in Canada is critical to the health and safety of Canadians and is an important part of ensuring that Canadians have access to a world-class communication system.*
2. *Canadians currently have access to either Basic 9-1-1 or Enhanced 9-1-1 service through wireline, wireless, and voice over Internet Protocol (VOIP) telephone services wherever a 9-1-1 call centre, also known as a public safety answering point (PSAP), has been established. Canadians in areas where a PSAP has not yet been established are typically required to dial seven- or ten-digit telephone numbers to seek emergency services from responders such as police, fire, or ambulance.*
3. *In the coming years, telecommunications networks across Canada, including the networks used to make 9-1-1 calls will continue to transition to Internet Protocol (IP) technology. This*

transition will have a major impact on the networks, systems, and arrangements used to provide 9-1-1 services, and will be a complex and costly undertaking that will occur gradually over a number of years.

4. *In paragraph 7 of Telecom Regulatory Policy 2014-342, the Commission indicated that Canadians should have access to new, enhanced, and innovative 9-1-1 services with IP-based capabilities, otherwise referred to as NG9-1-1 services. As such, the Commission announced its intention to conduct a comprehensive examination of NG9-1-1 in order to establish an NG9-1-1 regulatory framework.*
5. *With NG9-1-1, Canadians in need of emergency services could ultimately send a text message or transmit photos, videos, and other types of data to 9-1-1 operators, in addition to making traditional voice 9-1-1 calls using wireline, wireless, or VoIP telephone services. For example, they could stream video from an emergency incident, send photos of accident damage or a fleeing suspect, or send personal medical information, which could greatly aid emergency responders.*[14]

4.7 Mechanical

RHFES operates its own in-house Mechanical Division to complete repairs and testing to its vehicles and equipment under the direction of the Deputy Fire Chief – Support. Repairs are completed by a certified Emergency Vehicle Technician (EVT) at the City's main fleet complex, under a separate operation. A single service bay has been allocated to complete repairs and has enough room for either two engines or one aerial device. Having a single-bay results in some vehicles being stored outside, but efforts are made to ensure apparatus are kept indoors. The Mechanical Division requires a second repair bay to execute repairs.

Repairs to fire apparatus may at times result in extended lengths of down time before it is ready to be placed back in service if parts are not readily available or additional apparatus require repairs at the same time. When a number of apparatus' are out of service at one time, the department must rely on a third party to complete the required repairs. There are some disadvantages to using a third party on a regular basis, including:

- On occasion apparatus have been left outside in the winter when sent to a third party to complete repairs, resulting in frozen pipes and valves resulting in additional repairs and cost.
- The minimum cost for a third party to complete a safety is $10,000. The Department spends over $200,000 annually for repairs completed by third parties.
- It has been found that attention to detail is lacking by third-party repair shops as they have no ties to the apparatus they are repairing. Upon their return, the Department's EVT must take

[14] https://crtc.gc.ca/eng/archive/2017/2017-182.htm

time out of their day to check the work to ensure it is completed properly, which also speaks to the attention RHFES's EVT puts in the apparatus.

The EVT works by themself; some repairs involve lifting and moving very heavy items or climbing on top of an apparatus. There are no other City employees in the immediate area to come to the EVT's aid if an accident occurred which is a health and safety concern. When the EVT is on vacation or off for other reasons, apparatuses are sent to a third-party shop.

There is enough work to justify the hiring of a second EVT for the Department. There are several advantages to doing so, including:

- Down time of the apparatus would be significantly reduced with two EVTs working on the apparatus. There would be a quicker return of front-line apparatus into service.
- Constant presence of an EVT on duty, Monday to Friday, every day, significantly reducing the necessity to send apparatus to a third party to complete the repairs.
- Significant savings by not sending apparatus to a third party for repairs.
- There would not be the extra expense of replacing gauges and plumbing when an apparatus has been left outside in the winter at a third-party repair centre.
- If a safety issue were to arise, a second person is readily available to assist.
- Someone would be available to assist with lifting heavy items.
- At present there are approximately 40 vehicles for the single EVT to address repairs and complete safeties.
- Both EVTs would be scheduled to work during the day, Monday to Friday.

Recommendation – Strategic:
It is recommended that the RHFES hire an EVT to assist in the completion of repairs and initiate a preventive maintenance program for the fire department's fleet of vehicles.

The Mechanical Division has been issued a small van to pick up parts, attend scenes to make repairs to apparatus, or even transport cans of fuel to a fire to refill the apparatus. The transportation of fuel in the back of any vehicle is not a safe practise and should be discouraged for health and safety reasons. Depending on the amount of fuel, this practise could be in contravention of the *Transportation of Dangerous Goods Act*. As an alternative, arrangements should be made to have a local fuel supplier to deliver fuel to fire scenes to refill the apparatus; this supplier will have the proper equipment and training in the transportation of fuel. Another option is the activation of mutual aid and request Vaughan Fire respond with their service truck as it carries a limited supply of fuel to refill apparatus.

The Mechanical Division requires a proper service vehicle with external compartments for tools and spare parts.

Recommendation – Strategic:
It is recommended that RHFES purchase a medium-duty service vehicle for the Mechanical Division.

As with many areas of the fire service, technology is constantly changing and the EVT should be offered opportunities to maintain their level of knowledge on vehicle repairs by attending courses and seminars.

Repairs are tracked for each vehicle assigned to RHFES in the Firehouse computer program. This is an effective method of keeping records of repairs and the associated costs to vehicles; this in turn will aid in determining replacement schedules of the fleet and budgeting.

During the review it was noted that there is a program in place for small equipment testing and evaluation. All of the equipment such as ladders, breathing apparatus, small engines, ropes and hoses are tested annually based on manufacturer's recommendations.

- NFPA 1932 Standard identifies the type and frequency of testing for ground ladders.
- NFPA 1983 outlines the testing process for life safety rope.
- NFPA 1914 outlines testing for aerial devices.
- The *Health and Safety Act* Section 21 guidance notes also make note that all equipment used by workers must be in good condition.

RHFES should be commended for ensuring that these types of testing and maintenance are being carried out.

4.8 Health & Wellness

The inherit nature of fire fighting is both stressful and physically demanding. During the review by EM&T, it was noted that not all the fire stations have been equipped with workout facilities to ensure that staff have the ability to keep fit, which helps to reduce work related injuries. The fire department should work towards adding fitness equipment to the other fire stations. An alternative for firefighters, would be the provision of access to the City's fitness facilities at the Community Centre.

Many fire departments routinely test their firefighters to meet occupational fitness tests delivered internally or by a third party. NFPA 1582 details basic expectations placed upon firefighters. In a larger commitment to firefighter health and wellness, RHFES should review the physical expectations of a firefighter for use in training and recruiting.

NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments* identifies 14 essential job tasks that detail the physical and physiological strains placed on firefighters. The standard outlines the requirements for a department medical program including certain conditions that may pose a risk to firefighting. As the core determination for the physicality of firefighting, it is important for RHFES to understand the expectations they are placing on their personnel. These job tasks are listed in the Standard as:

5.1 Essential Job Tasks and Descriptions

5.1.1 The fire department shall evaluate the following 14 essential job tasks against the types and levels of emergency services provided to the local community by the fire department, the types of structures and occupancies in the community, and the configuration of the fire department to determine which tasks apply to their department members and candidates:

1. While wearing personal protective ensembles and a self-contained breathing apparatus (SCBA) performing firefighting tasks (e.g., hose line operations, extensive crawling, lifting and carrying heavy objects, ventilating roofs or walls using power or hand tools, forcible entry), rescue operations, and other emergency response actions under stressful conditions, including working in extremely hot or cold environments for prolonged time periods.
2. Wearing a SCBA which includes a demand valve-type positive-pressure facepiece or HEPA filter mask, which requires the ability to tolerate increased respiratory workloads.
3. Exposure to toxic fumes, irritants, particulates, biological (infectious) and nonbiological hazards and heated gases, despite the use of personal protective ensembles and SCBA
4. Depending on the local jurisdiction, climbing six or more flights of stairs while wearing a fire protective ensemble, including SCBA, weighing at least 50 lb (22.6 kg) or more carrying equipment/tools weighing an additional 20 to 40 lb (9 to 18 kg).
5. Wearing a fire protection ensemble including SCBA, that is encapsulating and insulated, which will result in significant fluid loss that frequently progresses to clinical dehydration and can elevate core temperature to levels exceeding 102.2°F (39°C).
6. While wearing personal protective ensembles and SCBA searching, finding and rescue-dragging or carrying victims ranging from newborns to adults weighing over 200 lb (90 kg) to safety despite hazardous conditions and low visibility.
7. While wearing personal protective ensembles and SCBA, advancing water-filled hose lines up to 2 ½ in. (65 mm) in diameter from fire apparatus to occupancy [approximately 150 ft (50 m)], which can involve negotiating multiple flights of stairs, ladders and other obstacles.

8. While wearing personal protective ensembles and SCBA climbing ladders, operating from heights, walking or crawling in the dark along narrow and uneven surfaces that might be wet or icy and operating in proximity to electrical power lines or other hazards.
9. Unpredictable emergency requirements for prolonged periods of extreme physical exertion without benefit of warm-up, scheduled rest periods, meals, access to medication(s) or hydration.
10. Operating fire apparatus or other vehicles in an emergency mode with emergency lights and sirens.
11. Critical, time-sensitive, complex problem solving during physical exertion in stressful, hazardous environments, including hot, dark, tightly enclosed spaces, that is further aggravated by fatigue, flashing lights, sirens, and other distractions.
12. Ability to communicate (give and comprehend verbal orders) while wearing personal protective ensembles and SCBA under conditions of high background noise, poor visibility and drenching from hose lines and/or fixed protection systems (sprinklers).
13. Functioning as an integral component of a team, where sudden incapacitation of a member can result in mission failure or in risk of injury or death to civilians or another team member.
14. Working in shifts that can extend beyond 12 hours.

The 14 essential job tasks explained in NFPA 1582 lay the groundwork for NFPA 1583 *Standard on Health-Related Fitness Programs for Fire Department Members.* NFPA states that *"this standard outlines a complete health-related fitness program (HRFP) for members of fire department involved in emergency operations to enhance their ability to perform occupational activities and reduce the risk of injury, disease and premature death"*. The applicable portion of the standard comes from section 4.1 wherein it states:

4.1 Program Overview

4.1.1 *The fire department shall establish and provide a HRFP that enables members to develop and maintain a level of health and fitness to safely perform their assigned functions.*

The occupational health and safety program provides direction on performing assigned functions in a safe manner. The HRFP allows members to enhance and maintain their optimum level of health and fitness throughout their tenure with the fire department. Education, one provision of a health-related fitness program, allows a means for improving health and fitness throughout the organization. The organization needs to provide the recognition and support

to ensure the promotion and success of this process. Health and fitness need to become a value within the organization just as safety is a value.

Data suggests a correlation between the following:

(1) A proactive approach to health and fitness and a decrease in debilitating occupational injuries.

(2) A reduction in workers compensation claims and a decrease in acute and chronic health problems of firefighters.

Combining the HRFP with a proactive occupational safety and health program provides a fire department with the level of quality needed for its members.

The City has included its fire department staff in the Employee Assistance Program (EAP) offered through its municipal employee benefits. This is an important piece of employee wellness, not only to members of the Department but to the members of their family. RHFES should meet with administrative staff from the City who oversees it to ensure that fire service personnel are fully aware of what benefits the EAP offers, should they need it.

In 2017, emergency services organizations were required by the Ministry of Labour to submit a PTSD Prevention Plan. This coincided with PTSD and Occupational Stress Injuries (OSI) being considered as workplace injuries and compensable through the Workplace Safety & Insurance Board (WSIB). The RHFES has an in-depth package available to its members outlining what PTSD is, the dangers it presents, training, on-going support, early intervention, WSIB claims management, recovery and return to work.

Initial awareness training for existing staff and recruits is essential in establishing minimum levels of resiliency. Through their PTSD Prevention Plans, departments are expected to outline a full spectrum plan. They are encouraged to address four pillars of managing a PTSD/OSI event: prevention, peer support, treatment/recovery and return to work programs.

It should be noted that not all EAP services include accredited availability of trained mental health professionals (psychologists/psychiatrists) and some only offer limited assistance through counselling and therapy.

4.8.1 Cancer Prevention

In recent years there has been a more intensive review of cancer prevention and a correlation of the disease to fire fighting. The focus has been on contamination control surrounding fire incidents. From pre-fire, incident duration, to cleaning and decontamination post-fire, all aspects of prevention are currently under review by all levels of fire service management. Departments are limiting

opportunities for cross contamination and secondary exposure of carcinogens involved in fire scenes. It is suggested that, as part of a larger commitment to fire fighter health and wellness, RHFES begin work on a cancer prevention program. This may include items such as, but not limited to:

- Post-fire decontamination of Personal Protective Equipment (PPE)
- Fire fighter hygiene at fire scenes
- PPE during handling of contaminated gear/equipment
- Documenting potential exposures
- Reducing exposures to diesel exhaust

The stations are equipped with diesel exhaust systems to reduce exposure to vehicle exhaust. Diesel exhaust has been a proven contributor to health issues when people are exposed to it over long duration. By having these systems in each station, the health concern is greatly reduced. The Ministry of Labour through its Section 21 Committee sets out fire service guidance notes. Guidance Note 3-1, Reducing Exposure to Diesel Exhaust, states:

> **Actions for employers**
> Employers must:
> - make sure the fire station is adequately ventilated by either natural or mechanical means so that the atmosphere does not endanger the health and safety of workers.

In reviewing the PPE, also known as structural firefighting ensemble, it was noted that some of the gear is nearing ten years of age. A plan has been established to review PPE inventories and forecasted replacements are identified so that budgetary submissions are effectively managed. This is important to note as NFPA 1851 Standard on *Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* states in Chapter 10:

> **10.1.2** Structural fire fighting ensembles and ensemble elements shall be retired in accordance with 10.2.1 or 10.2.2, no more than 10 years from the date the ensembles or ensemble elements were manufactured.

The appendices, to that section also references that "…it is imperative that the protective elements be routinely inspected to ensure that they are clean, well maintained and still safe". RHFES has a program that PPE is inspected and cleaned in-house and that there is a cache of used gear that can accommodate a large portion of the Department. RHFES is working towards the issuance of a second set of gear to each fire fighter in the coming years.

RHFES has standard operating guidelines on PPE/Bunker Gear inspections and cleaning, which are dated and should be updated to reflect current industry standards. There is a need for instructions to ensure the correct re-assembly of the ensemble, including how to check that the Drag Rescue Device (DRD) has been properly re-installed.

Recommendation – Operational

It is recommended that RHFES update its PPE/Bunker gear cleaning and inspections SOG and include instruction on the proper re-installation of the DRD.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
6	RHFES identify and develop opportunities for Shift Instructors to be assigned full-time to the Training Division on temporary assignments. These secondments serve multiple purposes and will enhance delivery of discipline specific training.	Staff time	Short-term (1-3 years)
7	Conduct an internal review of staffing and workflow within the Training Division. Gaps should be identified and addressed. To ensure consistent and high-quality delivery of training, an increase in the number of full-time training officers may be warranted.	Staff time $120,000 per Training Officer	Short-term (1-3 years)
8	Realign the reporting structure for the Training Division be under the Deputy Fire Chief (Operations). This realignment supports enhanced intra-departmental coordination leading to greater efficiencies and effectiveness of training programs.	Staff time	Short-term (1-3 years)
9	Revenue generation initiatives implemented and managed through the Training Division be used to further enhance capacity through financial support of full-time or temporary staffing increases.	Staff time	Mid-term (4-6 years)
10	RHFES qualify District and Platoon Chiefs to NFPA 1021 Level II (Fire Officer-II). This certification supports management of multi-unit responses in the field, in addition to adding valuable curriculum to overall RHFES succession planning.	Staff time	Short-term (1-3 years)
11	Training Division identify and develop an officer training program consistent with NFPA qualifications.	Staff time	Mid-term (4-6 years)
12	Secure resources to ensure annual Live Fire Training is provided to all personnel. Staffing and workload adjustments in the Training Division may be required to support development and implementation of a robust program in accordance with NFPA 1403: *Standard on Live Fire Training Evolutions*.	$180,000 to cover staff costs such as assigning/ backfilling/ shift Instructors	Immediate (0-1 year)
13	Develop and implement a formal succession planning program within the RHFES. Given the size and scope of the RHFES, numerous opportunities for career development could be identified and supported in conjunction with	$120,000	Mid-term (4-6 years)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
	defined qualifications, certifications and training to support future success of interested personnel.		
14	The Fire Prevention Division monitor provide risk assessment reports at least annually on activities conducted to better align current RHFES baselines and to ensure progress towards industry best-practice benchmarks and the CRA.	Staff time	Short-term (1-3 years)
15	RHFES increase the role of suppression staff in support of fire prevention and public education efforts. This does not negate the need for long term planning for full-time Fire Prevention Division personnel but could augment and enhance the services currently being delivered.	Staff time	Mid-term (4-6 years)
16	Align inspection efforts in the Fire Prevention Division with industry best practises. This would be utilized as a benchmark for the Prevention Division to develop a plan on what can be accomplished with present staffing, along with presenting options for increasing inspection frequencies to meet established benchmarks.	Staff time	Short-term (1-3 years) and ongoing
17	Expand the current initiative to train and qualify all firefighters to NFPA 1031 and 1035.	$180,000	Mid-term (4-6 years)
18	RHFES continue to conduct an annual appraisal and report on Fire Prevention Division programs to define successes and identify any gaps. Use of data analytics should support and inform this process.	Staff time	Short-term (1-3 years) and ongoing
19	Support all Fire Prevention Division personnel to gain qualification as certified fire investigators.	$40,000	Mid-term (4-6 years)
20	Develop a staffing plan for the Fire Prevention Division to ensure staffing levels and subsequent workflows can be managed appropriately. This staffing plan should also review the current shift pattern and explore options to move to 7 days per week coverage matching community needs.	Staff time	Short-term (1-3 years)
21	RHFES promote four (4) of its Communications Operators to the role of Acting Communications Supervisor to ensure continuous supervision in the Communications Centre.	$25,000 - $40,000	Immediate
22	RHFES monitor sick time related to PTSD or other mental health illness and the impacts that may be placed upon	Staff time	Ongoing

Rec #	Recommendation	Estimated Costs	Suggested Timeline
	staffing, shift scheduling, shift coverage and any financial implications.		
23	RHFES to reduce the frequency of utilizing firefighters to act in the role of Communications Operator due to staffing shortages. This should not be implemented until such time that additional staffing is hired for the Communications Centre.	Overtime costs for Communication Operators $50,000 - $60,000	Immediate (0-1 year)
24	RHFES hire additional personnel either part-time or full-time to cover staff shortages in the Communications Centre to ensure a minimum staffing of two (2) Communications Operators and one Supervisor are on duty at all times.	Dependant upon the number of staff hired	Short-term (1-3 years)
25	RHFES explore opportunities of revenue generation to offset the expense of the Communications Centre by acquiring new clients to be dispatched from of its Communications Centre.	Staff costs – Revenue Generation Initiative	Short-term (1-3 years)
26	Add an additional Chief Officer for the oversight of the Communications Division. Member will be outside of the bargaining unit.	$170,000 - $180,000	Short-term (1-3 years)
27	Hire an EVT to assist in the completion of repairs and initiate a preventive maintenance program to maintain the fire department's fleet of vehicles.	$104,000	Short-term (1-3 years)
28	Purchase a medium duty service vehicle for the Mechanical Division.	$100,000 - $140,000	Short-term (1-3 years)
29	Update PPE/Bunker gear cleaning and inspections SOG and include instruction on the proper re-installation of the DRD.	Staff time	Immediate (0-1 year)

SECTION 5 – Fire Suppression

5.1 Fire Suppression/Emergency Response

5.2 Medical Response

5.3 Vehicle Technology

5.4 Radio System

Section 5: Fire Suppression

5.1 Fire Suppression/Emergency Response

RHFES is a career department and as such the NFPA 1710 standard for career fire departments is applicable for this review. It should be noted that although the NFPA is not a mandated standard, it is recognized as an industry best practice. As such, it is advisable that fire departments use NFPA standards as goals and guidelines to strive for.

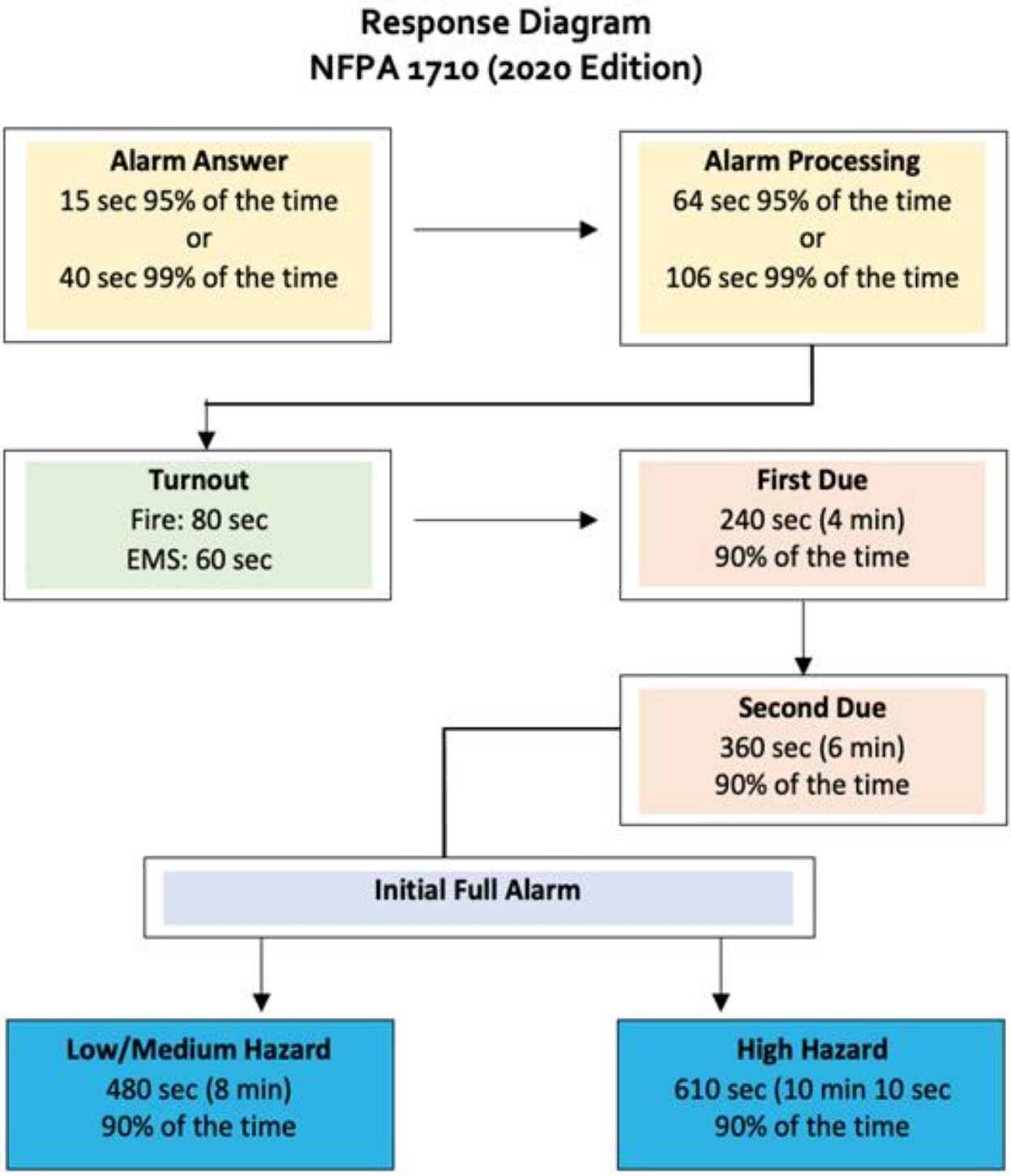
NFPA 1710 identifies other types of companies that are utilizing specialized equipment and apparatus, to assist Engine and Ladder companies as per the fire departments SOGs. These companies shall be staffed with the minimum number of members to deal with the tactical hazards, high-hazard occupancies, high incident frequencies, geographical restrictions and other pertinent factors identified by the AHJ.

In NFPA 1710 (2020 Edition) Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments, in Chapter 4.1 the Fire Department Organizational Statement Clause 4.1.2.1 States that:

The fire department shall establish the following performance objectives for the first-due response zones that are identified by the AHJ.

1. *Alarm handling time completion in accordance with 4.1.2.3.*
2. *80 seconds turnout time for fire and special operations response and 60 seconds turnout time for EMS response.*
3. *240 seconds or less travel time for the arrival of the first engine company at a fire suppression incident.*
4. *360 seconds or less travel time for the arrival of the second company with a minimum staffing of 4 personnel at a fire suppression incident.*
5. *For other than high-rise, 480 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident.*
6. *For high-rise, 610 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident.*
7. *240 seconds or less travel time for the arrival of a unit with first responder with automatic external defibrillator (AED) or higher-level capability at an emergency medical incident.*
8. *480 seconds or less travel time for the arrival of an advanced life support (ALS) unit at an emergency medical incident, where this service is provided by the fire department provided a first responder, with an AED or basic life support (BLS) unit arrived in 240 seconds or less travel time.*

FIGURE #13: Response Diagram Based on NFPA 1710 Standards



When career departments receive a call for service, firefighters are at times in the station when the call comes in. They must get into their bunker gear, board the apparatus and then respond; this is known as the 'turnout' time. The NFPA Standard for career fire departments uses 80 seconds as the

benchmark turnout time 90% of the time. Based on the 2020 data the ability for RHFES to meet the 80 second turn-out time 90% of the time ranged from 89.79% to just over 94.40% (see TABLE #11). RHFES and its staff are to be commended for the noted annual improvements in turn out times and for meeting the NFPA standard over the past three years.

TABLE #10: 2014 - 2020 80-Second Turnout Times

Station and Apparatus	2014	2015	2016	2017	2018	2019	2020
Station 8-1 Engine 811	48.5%	63.2%	74.5%	91.8%	92.4%	93.60%	91.01%
Station 8-1, Rescue 819	Not in Service	61.8%	71.4%	87%	88.2%	90.59%	90.38%
Station 8-2, Engine 821	28.5%	31.3%	73.3%	72.7%	91.2%	92.47%	92.70%
Station 8-3, Engine 836	27.1%	61.8%	77.3%	90.7%	91.5%	91.94%	89.79%
Station 8-4, Engine 841	35.2%	50.4%	86.1%	84.4%	89.7%	91.12%	94.05%
Station 8-5, Engine 851	33.3%	51.3%	93.9%	96.6%	93.1%	93.65%	93.15%
Station 8-6, Engine 861	24.3%	69.6%	83.3%	82.1%	91.7%	92.76%	94.40%
Average Turn-Out Times	**32.8%**	**55.6%**	**78.8%**	**86.5%**	**90.6%**	**92.5%**	**91.1%**

The following table indicates the number of firefighters currently assigned to each station and apparatus.

TABLE #11: Staffing Assigned to Each Station

Station	Station Address	Apparatus	Assigned Staffing	Minimum On-Duty
8-1	191 Major Mackenzie Drive	Platoon Chief	1	1
		Engine	5	4
		Rescue	5	3
8-2	13067 Yonge Street	Engine	5	4
8-3	1371 16th Avenue	Aerial	5	4
8-4	1365 Elgin Mills Road East	Engine	5	4
8-5	150 High Tech Road	Engine	5	4
8-6	101 Gamble Road	Engine	5	4
Total Apparatus Staffing Per Shift			**36**	**28**

The overall goal of any fire department is to arrive at the scene of the incident as quickly and as effectively as possible. If a fire truck arrives on scene in four minutes or less with a recommended crew of four or more firefighters, there is increased opportunity to contain the fire by reducing further spread to the rest of the structure. Alternatively, if the first fire attack team arrives with fewer than four firefighters on board, it is limited to what operations it can successfully attempt.

Based on studies and evaluations conducted by the National Institute of Standards and Technology (NIST) and the NFPA, no interior attack is to be made by the firefighters until sufficient personnel arrive on scene. The expectation is that a minimum of three firefighters and one officer arrive on scene to make up the initial fire suppression team. This team of four can effectively do an assessment of the scene, secure a water source (e.g., fire hydrant), ensure the fire truck is ready to receive the water and get the fire pump in gear, as well as unload and advance the fire hose in preparation for entry into the structure.

In 2010 and 2020, the NIST in the United States conducted a study on fire crew efficiencies and the tasks that may be completed during a residential structure fire with different sized crews.

The following research questions guided the experimental design of the low-hazard residential fireground experiments documented in this report:

1. How does crew size and stagger affect overall start-to-completion response timing?
2. How does crew size and stagger affect the timings of task initiation, task duration and task completion for each of the 22 critical fireground tasks?
3. How does crew size affect elapsed times to achieve three critical events that are known to change fire behavior or tenability within the structure?
    a. Entry into structure?
    b. Water on fire?
    c. Ventilation through windows (three upstairs and one back downstairs window and the burn room window).
4. How does the elapsed time to achieve the national standard of assembling 16 firefighters at the scene vary between crew sizes?

The experiments were conducted in a burn prop designed to simulate a low-hazard fire in a residential structure described as typical in NFPA 1710. A low-hazard occupancy is defined in the NFPA Standard as a one, two or three-family dwelling and some small businesses. Medium hazard occupancies include apartments, offices, mercantile and industrial occupancies not normally requiring extensive rescue or firefighting forces. High-hazard occupancies include schools, hospitals, nursing homes, explosive plants, refineries, high-rise buildings and other high life hazard or large fire potential occupancies.

TABLE #12: The 22 Tasks and Measurement Parameters

Assigned Tasks	Measurement Parameters
1. Stop at Hydrant, Wrap Hose	START - Engine stopped at hydrant. STOP - Fire fighter back on engine and wheels rolling
2. Position Engine 1	START - Wheels rolling from hydrant. STOP - Wheels stopped at structure
3. Conduct Size-up	START - Officer off engine (360-degree lap), transmit. STOP - Completes radio report, establish command transmission of report
4. Engage Pump	START - Driver off engine STOP - Driver throttles up pump
5. Position Attack Line	START - Fire fighter touches hose (Forward Lay) to pull it from engine. STOP - Flake, charge, and bleed complete (hose at front door prepared to advance)
6. Establish 2 In/2 Out	Company officer announces – "2 In/2 Out established" (4 persons assembled on scene OR at the call of the Battalion Chief/Company Officer)
7. Supply Attack Engine	START - Fire fighter touches hydrant to attach line. STOP - Water supply to attack engine
8. Establish RIT	Time that Company Officer announces RIT is established
9. Gain/Force Entry	START - Action started (HOLD time= 10 seconds) STOP - Door opened for entry
10. Advance Attack Line	START – Fire fighter touches hose. STOP – Water on fire STOP - Backup line charged to nozzle
11. Advance Backup Line	START - Fire fighter touches hose (stop time at front door) to pull from engine bed
12. Advance Backup	START - Fire fighter crosses Line/Protect Stairwell threshold STOP - Position line for attack at stairwell
13. Conduct Primary Search	START - Firefighters enter front door. STOP - Firefighters transmit "search complete"
14. Ground Ladders in Place	START - Fire fighter touches ladder to pull it from truck. STOP - 4 Ladders thrown: 3 ladders on the 2nd-story windows and 1 to the roof
15. Horizontal Ventilation	START- Fire fighter at 1st window to (Ground) begin ventilation (HOLD for 8 seconds)

Assigned Tasks	Measurement Parameters
	STOP - Hold time complete - window open
16. Horizontal Ventilation	START - Fire fighter grabs ladder (2nd Story) for climb. (Fire fighter must leg lock for ventilation. HOLD time at each window is 10 seconds) STOP - All 2nd-story windows open - descend ladder - feet on ground.
17. Control Utilities (Interior)	START - Radio transmission to control utilities. STOP - When Fire fighter completes the task at the prop
18. Control Utilities (Exterior)	START - Radio transmission to control utilities. STOP - When Fire fighter completes the task at the prop
19. Conduct Secondary Search	START - Firefighters enter front door. STOP - Firefighters transmit “secondary search complete”
20. Check for Fire Extension	START- Firefighters pick up (walls) check-for-extension prop. STOP- Completion of 4 sets total (1 set = 4 in and 4 out) This task may be done by more than one person.
21. Check for Fire Extension	START - Firefighters pick up (ceilings) check-for-extension prop. STOP - Completion of 4 sets total (1 set = 3 up and 5 down) This task may be done by more than one person.
22. Mechanical Ventilation	START - Firefighters touch fans to remove from truck. STOP - Fans in place at front door and started

The study found that four-person crews were able to complete 22 essential firefighting and rescue tasks in a typical residential structure fire 30% faster than a two-person crew and 25% faster than a three-person crew.[15] Having crews of four firefighters lessens the risk of injury as more personnel are available to complete assignments.

5.1.1 National Fire Protection Association (1710)

To provide the fire department clearer focus on what the ultimate goals for emergency response criteria are, the NFPA suggests that response times should be used as a primary performance measure.

When considering the response times and needs of a community, the fire response curve (FIGURE #14) presents the reader with a general understanding of how fire can grow within a furnished residential structure over a short period of time. Depending on many factors, the rate of growth can be affected in several different ways which can increase or suppress the burn rate through fire control measures within the structure.

When we review the response time of a fire department it is a function of various factors including, but not limited to:

- The distance between the fire stations and response location
- The layout of the community
- Impediments such as weather, construction, traffic jams, lack of direct routes (rural roads)
- Notification time
- Assembly time of the firefighters, both at the fire station and at the scene of the incident.
    - Assembly time includes dispatch time, turnout time to the fire station and response to the scene. It should be noted that assembly time can vary greatly due to weather and road conditions along with the time of day.

As illustrated in the following fire propagation diagram the need for immediate initiation of fire suppression activities is critical. RHFES responds to more than just fires; motor vehicle collisions can create a medical or fire emergency that also needs immediate response. Thus, it is imperative to be as efficient and effective as possible in responding to calls for assistance.

[15] https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=904607

FIGURE #14: Fire Response/Propagation Curve

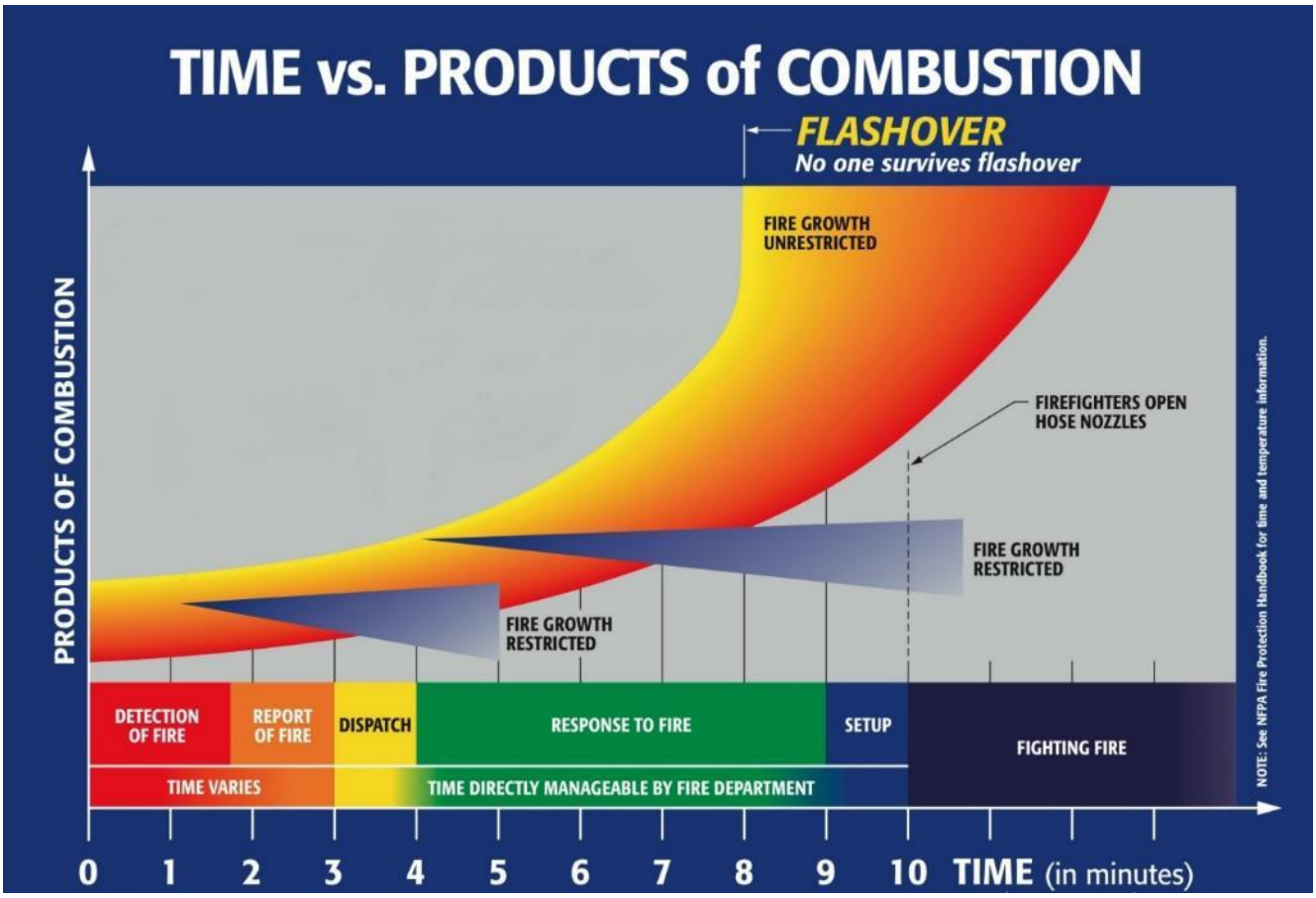


FIGURE #14 notes the following time variables:

- Detection of fire – this is when the occupant discovers that there is a fire. The fire may be in a very early stage or could have been burning for quite some time before being detected.
- Report of fire – this is when someone has identified the fire and is calling 9-1-1 for help.
- Dispatch – the time it takes the dispatcher to receive the information and dispatch the appropriate resources.
- Response to the fire – response time is a combination of the following:
    - Turnout time – how long it takes the career firefighters to get to the fire truck and respond or how long it takes the volunteer firefighters to get to the fire station to respond on the fire truck.
    - Drive time – the time from when the crew advises dispatch that they are responding until the time that they report on scene.
- Setup time – the time it takes for the fire crews to get ready to fight the fire.
- Fighting the fire – actual time it takes to extinguish the fire on scene.

The Department should endeavour to meet the stated minimum response standards based on responding to a 2,000 ft^2 single-family dwelling. The dwelling (noted in the Standard) does not have a

basement or other exposures (buildings close enough to each other to create a greater possibility for fire spread). Most homes in Richmond Hill have basements and are built close enough to each other to create an exposure risk for potential fire spread, which must be considered by the Department in its response efforts. NFPA 1710 (2020 Edition) recommends a minimum of 16 firefighters on scene for a single-family dwelling (17 if an aerial is used); having the ability to call upon additional resources by having a multiple station response to fire calls is important.

TABLE #13 outlines the minimum tasks of the firefighters at a residential structure fire and the staffing required to complete each. It should also be noted that climate plays a large role in staffing at a fire as extreme temperatures diminish the physical abilities of those fighting the fire. If this is the situation, additional resources should be called in to assist in a timely manner, especially if it involves calling in crews from another fire service through Mutual Aid Agreements.

TABLE #13: NFPA 1710 (2020), Staffing Required at a Residential Structure Fire

Function	Staffing Required
1) Establish Incident Command for the overall coordination and direction of the full alarm assignment.	**1**
2) Establish uninterrupted water supply of a minimum 400 gpm. (1,520 L/min) for 30 minutes with supply line maintained by an operator.	**1**
3) Establish effective water flow application rate of 300 gpm. (1,140 L/min) from two handlines, each of which has a minimum flow rate of 100 gpm. (380 L/min) with each handline operating by a minimum of 2 members.	**4**
4) The provision of one support member for each deployment attack and back-up line to provide hydrant hook-up and assist in laying of hose lines, utility control and forcible entry.	**2**
5) Provision of at least one victim search and rescue team with each such team consisting of 2 members.	**2**
6) Provision of at least one team consisting of at least 2 members to raise ground ladders and perform ventilation.	**2**
7) If an aerial device is used in the operations, one member to function as the aerial operator.	**1**
8) An initial rapid intervention crew (IRIC) assembled from the initial attack crew and as the initial full alarm arrives, a sustained rapid intervention crew (RIC) of 4 members. *	**4**
Total effective response force with a minimum 16 (17 is an aerial device is used). ** See asterisk below	**17**

***** *NFPA 1710 (3.3.53) defines the Rapid Intervention Crew as a dedicated crew of at least one officer and three members positioned outside the Immediate Dangerous to Life or Hazard (IDLH) Zone, trained and equipped as specified in NFPA 1407 Standard for Training Fire Service Rapid Intervention Crews, who are assigned for rapid deployment to rescue lost or trapped firefighters.*

** * NFPA 1710 (1.3.53.1) defines the initial rapid intervention crew (IRIC) as two members of the initial attack, crew, positioned outside the IDLH zone, trained, and equipped as specified in NFPA 1407, Standard for Training Fire Service Rapid Intervention Crews, who are assigned for, rapid, deployment (i.e., two/in/out) to rescue lost or trapped firefighters.*

**** NFPA 1710 (5.2.2.3) An incident safety officer shall be deployed upon confirmation of a structural fire, at special operation incidents, or when significant risk is present to the member, due to the nature of the incident. Further to this, NFPA 1710 (5.2.2.3.1) states that the safety officer meets the requirements as specified in NFPA 1521, Standard for Fire Department Safety Officer, and shall have the expertise to evaluate, hazards and provide direction with respect to the overall safety of personnel.*

With the current staffing levels of RHFES there are a minimum of 28 firefighters on duty. If a working residential structure fire were to be reported, a minimum of 16, are required at the scene, leaving 12 firefighters to protect the City. If a second residential structure fire or even a high-rise fire were to be reported, there are not enough firefighters on duty to handle two structure fires at the same time. This would require mutual aid crews to respond to either fire location, plus additional crews would be required to provide protection to the City until such time as some RHFES crews may be available to cover the City.

By activating mutual aid, this would take resources from municipalities neighbouring Richmond Hill putting their own department at risk of not having enough personnel on duty to handle a structure fire.

RHFES should have the required policies and SOGs in place to initiate the request for additional resources from neighbouring departments automatically by the Communications Division once resources become depleted.

TABLE #14 outlines the resources required for a working fire within a high-rise structure about 75’ or 23 m. NFPA 1710, Article 5.2.4.4.1 States:

Initial full alarm assignment to a fire in a building with the highest floor greater than 75’ (23 m) above the lowest level of fire department vehicle access shall provide for the following:

TABLE #14: NFPA 1710 (2020) Staffing Required for a High-Rise Fire

Function	Staffing Required
1) Establishment of a stationary incident command post outside of the hazard area for overall coordination and direction of the initial full alarm assignment with a minimum of one officer with an aide dedicated to these tasks and operations are to be conducted in compliance with the incident command system for the overall coordination and direction of the full alarm assignment.	**2**
2) Establishment of an uninterrupted water supply to the building standpipe/sprinkler connection sufficient to support fire attack operations maintained by an operator and if the building is equipped with a fire pump, one additional member with a radio to be sent to the fire pump location to monitor and maintain operations.	**1/1**
3) Establishment of an effective water flow application rate on the fire floor at a minimum of 500 gpm (1892 L/m) from two handlines, each operated by a minimum of two members to safely, and effectively, handle the line.	**4**
4) Establishment of an effective water flow application rate on the floor above the fire floor at a minimum of 250 gpm (946 L/m) from at least one handline, with each deployed handline operated by a minimum of two members to safely, and effectively, handle the line.	**2**
5) At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial attack crew and as, the initial alarm response arrives, a full and sustained rapid intervention crew established.	**4**
6) Provision of two or more search-and-rescue teams consisting of a minimum of two members each.	**4**
7) Provision of one officer, with an aide, dedicated to, establish an oversight at or near the entry point on the fire floor(s).	**2**
8) Provision of one officer, with an aide, dedicated to, establish an oversight at or near the point of entry on the floor above the fire.	**2**
9) Provision of two or more evacuation management teams to assist and direct building occupants with evacuation or shelter actions, with each team consisting of a minimum of two members.	**2**

Function	Staffing Required
10) Provision of one or more members to account for and manage elevator operations.	**1**
11) Provision of a minimum of one trained incident safety officer.	**1**
12) Provision of a minimum of one officer two floors below the fire floor to manage the interior staging area.	**1**
13) Provision of a minimum of two members to manage member rehabilitation and at least one of the members to be trained to the ALS level.	**2**
14) Provision of an officer and a minimum of three members to conduct vertical ventilation operations.	**4**
15) Provision of a minimum of one officer to manage the building lobby operations.	**1**
16) Provision of a minimum of two members to transport equipment to a location below the fire floor.	**2**
17) Provision of one officer to manage external base operations.	**1**
18) The establishment of an initial medical care component consisting of a minimum of two crews each with one member trained to the ALS level, capable of providing immediate on-scene emergency medical support, and transport that provides rapid access to civilians or members potentially needing medical treatment. NFPA 1710 asks for four, members to be assigned to this task.	**No staff required as this would be handled by YRPS**
19) **Total effective response force, a minimum of 42 (38 due to the non- implementation of #18) 43 if the building is equipped with a fire pump.**	**38**

As identified in TABLE #11, RHFES total staffing per platoon on fire apparatus is 36 and they operate with a minimum of 28 on duty. This indicates that the minimum required to operate at a working high-rise fire is not adequate, which is a health and safety concern. Additional resources may be requested (as needed) under the Mutual Aid Agreement by the IC to support the fire scene, as well as provide fire protection to the City.

The following chart provides comparators in staffing levels in all divisions of their respective departments.

TABLE #15: Comparators of Staffing of Other Fire Services in Ontario

Municipality	Population	Suppression	Fire Prev.	Training	Communications	Admin.	Apparatus & Equipment	CEMC	Maintenance	Fleet	Total FT Staff
Ajax	126,924	84	7	2	13	8	0	0	0	0	114
Pickering	96,984	96	5	3	0	2	0	3	0	0	109
Oshawa	169,500	164	11	3	17	9	0	0	0	2	206
Whitby	135,345	124	7	3	0	8	0	0	0	0	142
Richmond Hill	**195,022**	**152**	**10**	**3**	**12**	**6 + 1 (IT Tech)**	**0**	**1**	**0**	**1**	**186**
Burlington	183,314	172	8	3	11	5	0	1	3	0	203
Greater Sudbury	161,531	108	10	6	0	6	0	0	0	3	133
Cambridge	129,920	178	7	6	1	6	0	0	0	0	198
Kitchener	233,222	183	13	3	17 + 3 (Alarm Monitor)	10	3	1	0	0	232
Newmarket	84,224	140	7	3	0	5	0	0	0	0	155
Oakville	193,832	205	10	5	0	6	0	0	0	0	226
Barrie	145,614	142	8	5	10	7	0	0	0	0	172
Guelph	131,794	149	8	2	7	8	0	0	1	0	175

Notes: *Kitchener Fire also has an alarm monitoring program in place that employs 3 staff; RHFES has one staff member that is specifically assigned to tech support functions; and Oakville is opening a new station this year and their numbers will increase. All populations are from 2016 Statistics Canada Census.*

TABLE #16: Fire Fighters per 1,000 Population

Municipality	Population	Suppression Firefighters	Firefighters per 1,000 population
Markham	328,966	240	**0.72**
Vaughan	306,233	288	**0.94**
Cambridge	129,920	184	**1.42**
Guelph	131,794	149	**1.13**
Waterloo	104,986	116	**1.10**
Oakville	193,832	205	**1.06**
Pickering	96,984	96	**0.99**
Aurora /Newmarket (Central York FD)	139,669	140	0.99
Whitby	135,345	132	**0.98**
Barrie	145,614	142	**0.98**
Oshawa	169,500	161	**0.95**
Burlington	183,314	172	**0.94**
Richmond Hill (2016)	195,022	152	**0.80**
Kitchener	233,222	183	**0.78**
Richmond Hill (2020)	210,300	152	**0.72**
Ajax	126,924	84	**0.66**

The population figures for Durham Region Fire Departments came from the 2018 Durham Region Report. The other population statistics are based on the 2016 Statistics Canada Census. In 2021 there will be an updated census data that will demonstrate that the Department is further behind than this FMP states.

It is common practise for municipalities in the GTA to operate their career fire service with a ratio of between 0.9 and 1.0 firefighters per 1,000 population.

It is recommended that the RHFES add an additional apparatus which would require 20 additional firefighters. Adding 20 additional firefighters would bring the number of firefighters per thousand citizens to 0.81, which is still below the average, but moving forward.

It is important for the fire department to keep pace with the development in the community. After several years of not hiring additional suppression staff the city is in a position where there is need to monitor the response capabilities closely with the city growth.

The total number of firefighters recommended for hiring does not take into account any fire fighter retirements or those that leave the department for other reasons. This may result in an increase in the number of new recruits required by the department.

The following recommendations will enhance the level of response resources available within the City. It should be noted that the increase in personnel will add an additional 12 firefighters to each Platoon, giving a total of 48. This is still an insufficient number of staff in the event of a residential and a high-rise fire were to occur simultaneously. The RHFES will need to rely heavily upon neighbouring fire services to supplement their resources.

Recommendation – Strategic:
The RHFES maintain the minimum of four firefighters on every fire apparatus, each shift. This would bring RHFES in line with the recommendations regarding the staffing of fire apparatus as identified in the National Institute of Standards and Technology study and NFPA 1710, which are outlined in this section.

Recommendation - Strategic:
It is recommended that RHFES hire 20 firefighters to be deployed on an additional engine (short-term 1-3 years)

Recommendation - Strategic:
RHFES add a seventh station in the northeast quadrant of the City and hire an additional 20 firefighters to be assigned to Station 8-7 (mid-term 4-6 years).

Recommendation - Strategic:

Based on anticipated call volume, additional building stock including high rises, and proposed land developments, RHFES to hire an additional 20 firefighters to keep pace with projected demand.

Consideration should be given to the deployment of these firefighters to staff a second aerial device in the city (long-term 7-10 years).

During EM&Ts discussions with numerous stakeholders, it became very apparent that the role of the on-duty Platoon Chief is becoming busier and the administration portion of their workload is taking up much of their time. As the department grows in size there is an increase in the call volume and it has become difficult for the Platoon Chief to complete their necessary tasks each shift.

Many departments have an officer in the role as a District Chief, who reports to the Platoon Chief. Each shift would have a District Chief assigned to them. The main assignments of the District Chiefs are to respond to calls, assume command as required, assign crews to perform tasks, assist with investigations to find origin and cause, and ensure apparatus return to in-service status in a timely manner. The District Chief would be responsible for the day-to-day operations of the Platoon, such as liaison with the Training and Prevention Divisions on matters that directly effect the platoon.
By responding to the calls this will allow the Platoon Chief to focus on the administration portion of their position. When multiple calls for service are dispatched at the same time, the Platoon Chief would also respond to assist the District Chief at calls where the District Chief may not be able to attend.

Recommendation – Strategic:
It is recommended that the RHFES implement the position/rank of the District Chief within the Operations Division for each Platoon (mid-term 4-6 years). In conjunction with the opening of Station 8-7.

5.1.2 Diversity

Richmond Hill has a very diverse demographic within the city. While RHFES does have some members from different ethnic backgrounds, there is always room to promote the ethnic diversity of the City's residents during the hiring process. The department should involve staff members who are of different ethnic backgrounds during the recruitment process, to encourage members of the community who may not normally consider a career within the fire service and that they too are welcome to apply.

5.1.3 Response Data

The following series of charts identify a comparison of response types and the response breakdown among the six fire stations.

There needs to be a review of the future growth statistics and demographics of the community to understand where the potential needs will be and where some efficiencies can be made. RHFES response times should be monitored based on the OFMEM definition which is from "dispatch time to time of arrival at the incident"; from the time the call is received, to when the fire station tones activate, to when the firefighters get on the fire trucks and arrive at the emergency scene location.

Performance measurements that the fire department currently monitor:

- Response time: the total time from receipt of call (on 9-1-1) to the time the fire vehicle arrives at the incident location.
- Firefighter turnout time: time from page until the first vehicle is responding.

- Drive time: time tracked from when the fire vehicle has left the station until arrival at the incident location.

In reviewing the time it takes to arrive at an incident once leaving a fire station, it was found that the majority of the time the apparatus arrives in less than seven minutes in 2020. The following map indicates the areas the crews may arrive within a four-minute drive time.

Note: *In monitoring time measurements, the 90th percentile criterion is the recommended practice that is endorsed by the NFPA and CFAI. This data is more accurate since it is evaluating the times based on 90% of the calls as opposed to averaging the times at the 50th percentile. For example:*

- *9 out of 10 times the fire department arrives on scene in 10 minutes or less, which means that only 10% of the time they are above that 10-minute mark,*
- *as opposed to 5 out of 10 times (average) the fire department arrives on scene in 10 minutes or less, which means that 50% of the time they are above the 10-minute mark.*

The travel time grids are calculated using the GIS software Caliper Maptitude, which uses the road network with the posted speed limits, factoring in direction of travel, traffic lights and stop lights. While the posted speed limit is used, it is understood that at times fire apparatus responding to calls may exceed the speed limit if it is safe to do so, thus reducing the response time. Correspondingly, there will be times due to weather conditions, construction and traffic congestion that the fire apparatus will be travelling at speeds lower than the posted speed limit (even using emergency lights and sirens). Therefore, using the posted limit is a reasonable calculation in determining travel distance.

In figures 15 and 16, it identifies the 4-minute drive time from each station. This indicates the ability for the first apparatus to arrive on scene within 4 minutes of leaving the station.

FIGURE #15: Current 4-Minute Drive Time Map

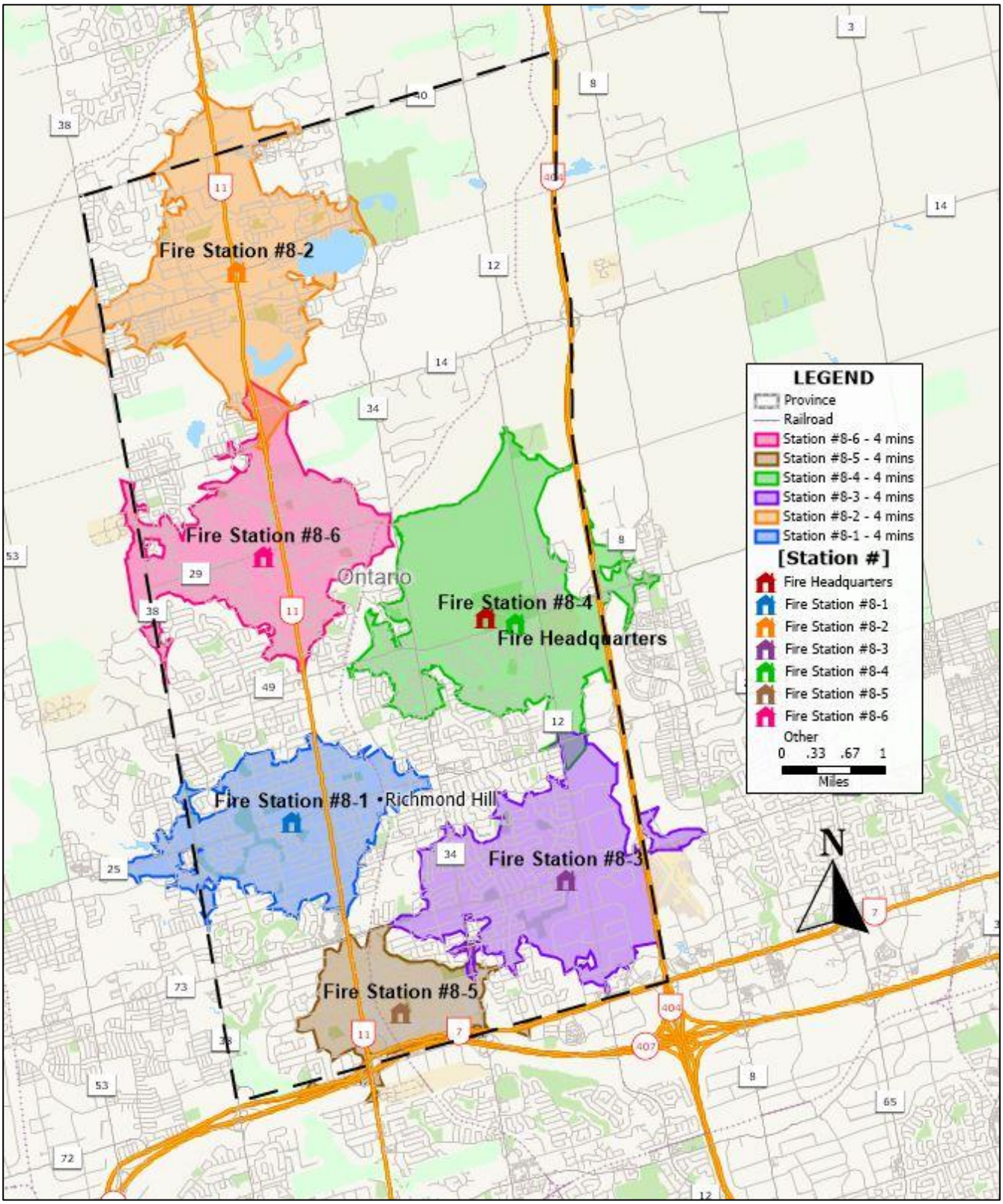


FIGURE #16: 4-Minute Drive Time with Addition of Fire Station 8-7

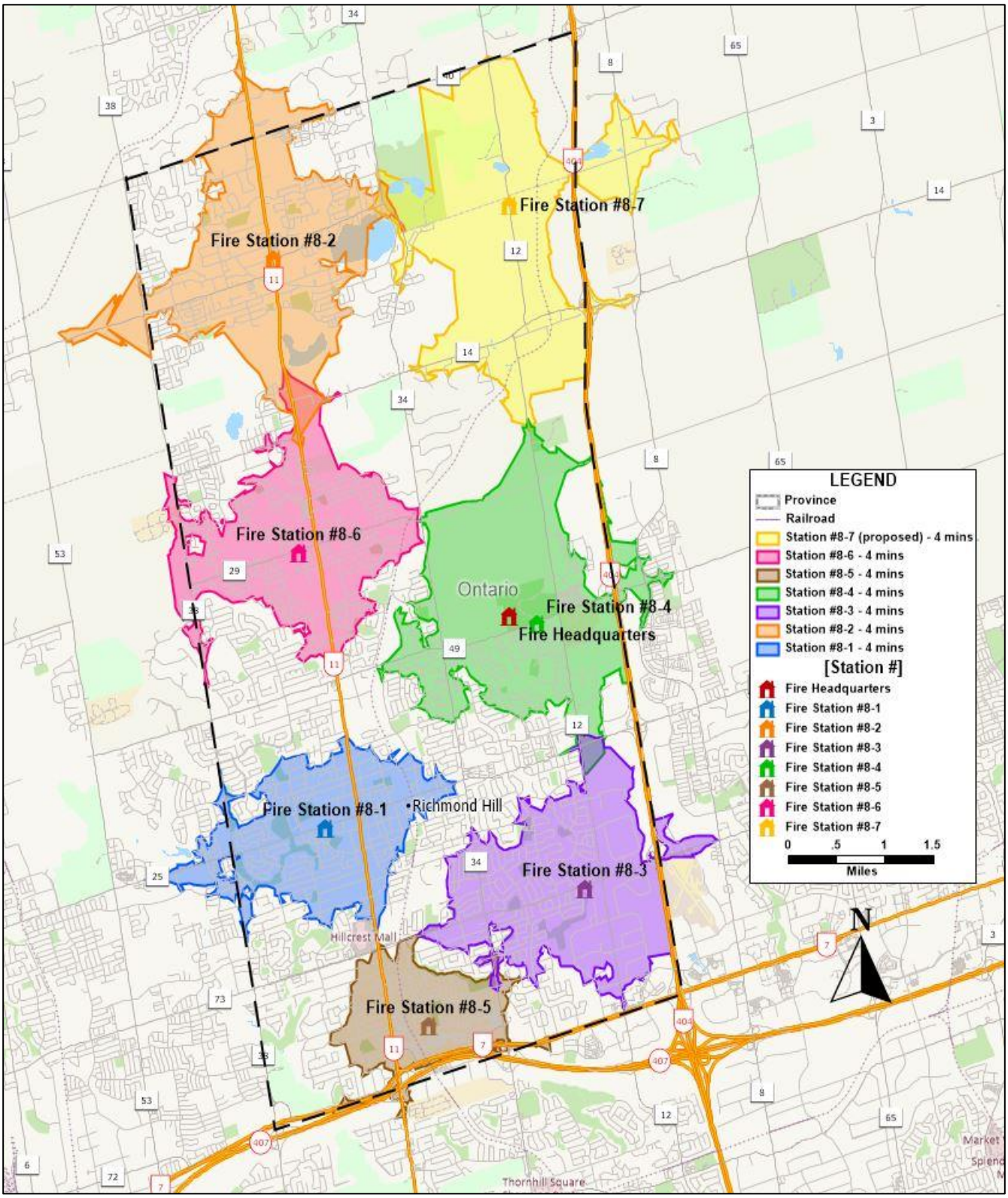


FIGURE #17: Current 8-Minute Drive Time Map

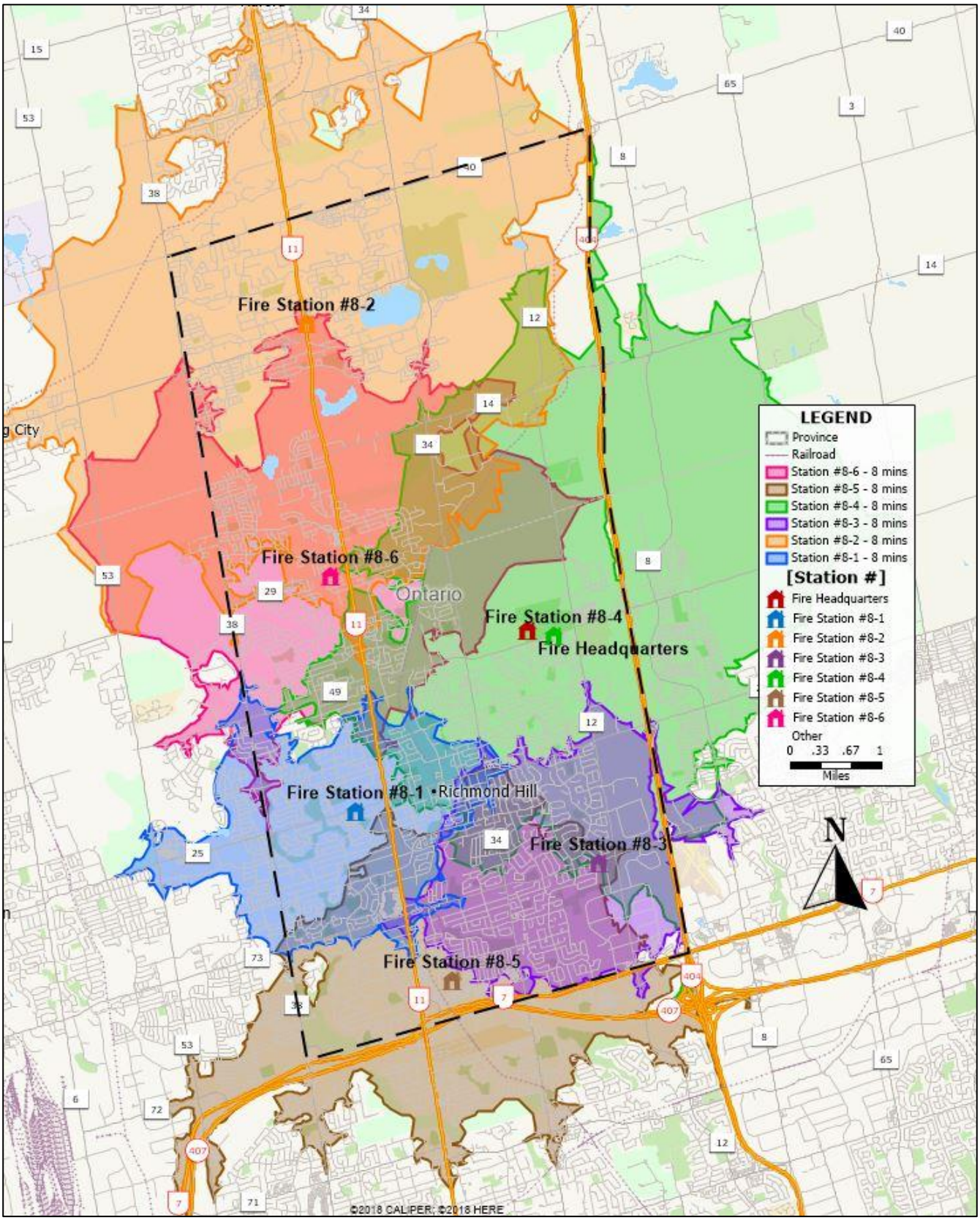
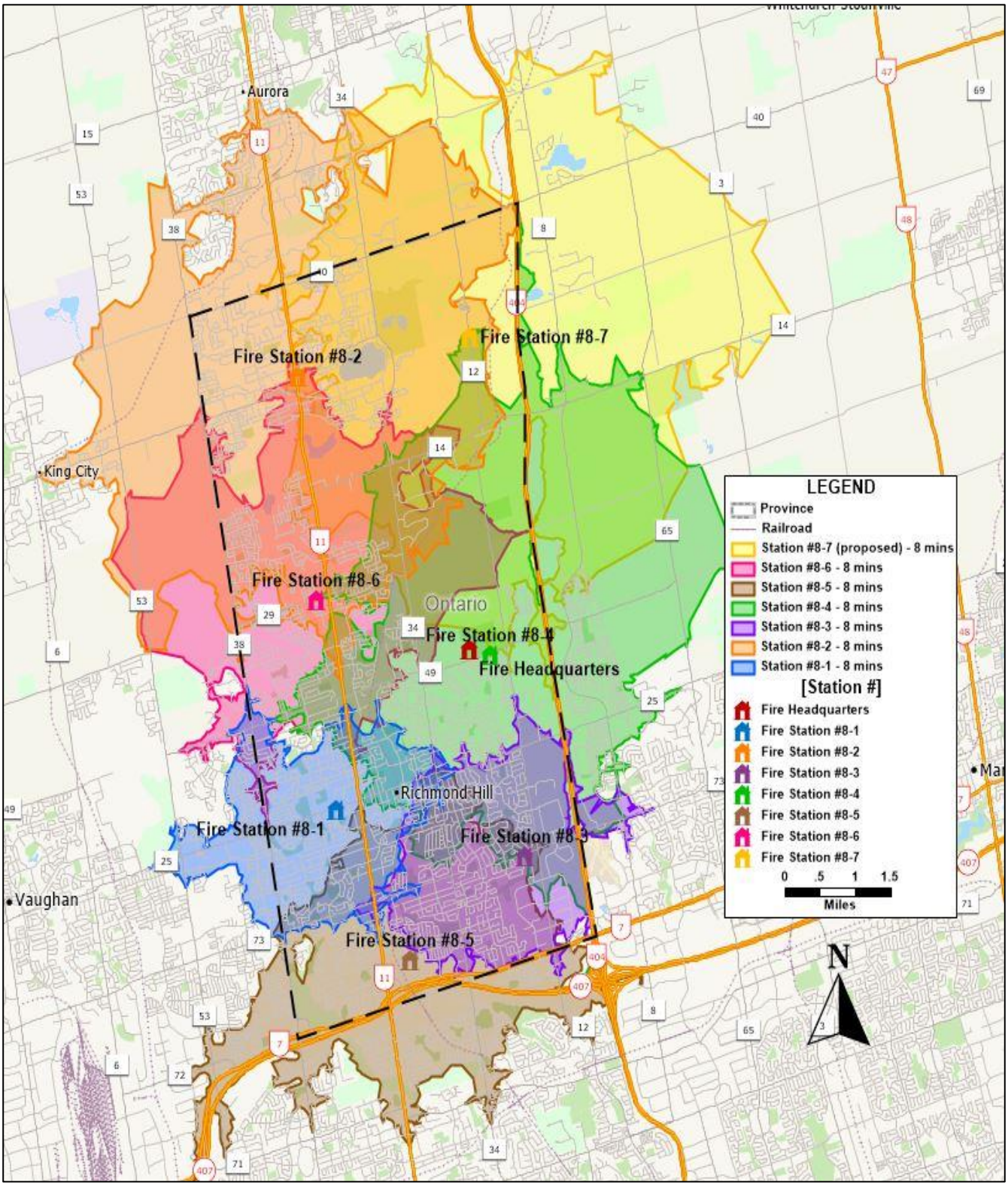


FIGURE #18: 8-Minute Drive Time with Addition of Fire Station 8-7

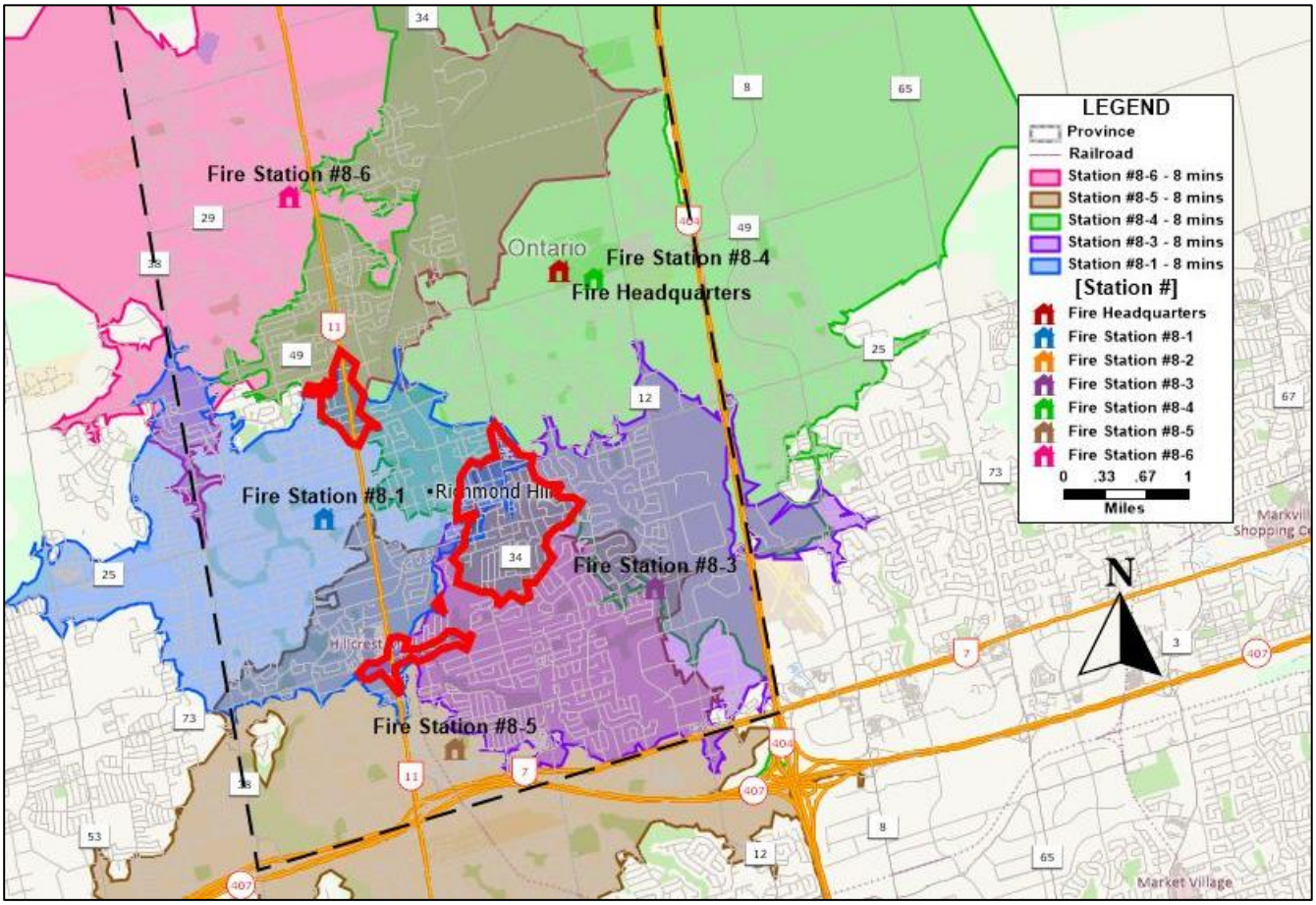


The drive time maps identify the level of coverage based on the physical locations of the stations relative to the NFPA recommended response times. As illustrated, except for areas in the northeast, the entire City is within an 8-minute drive time of at least one fire station.

With the addition of a new fire station in the northeast quadrant of the City, the RHFES would have a station in each area of the city.

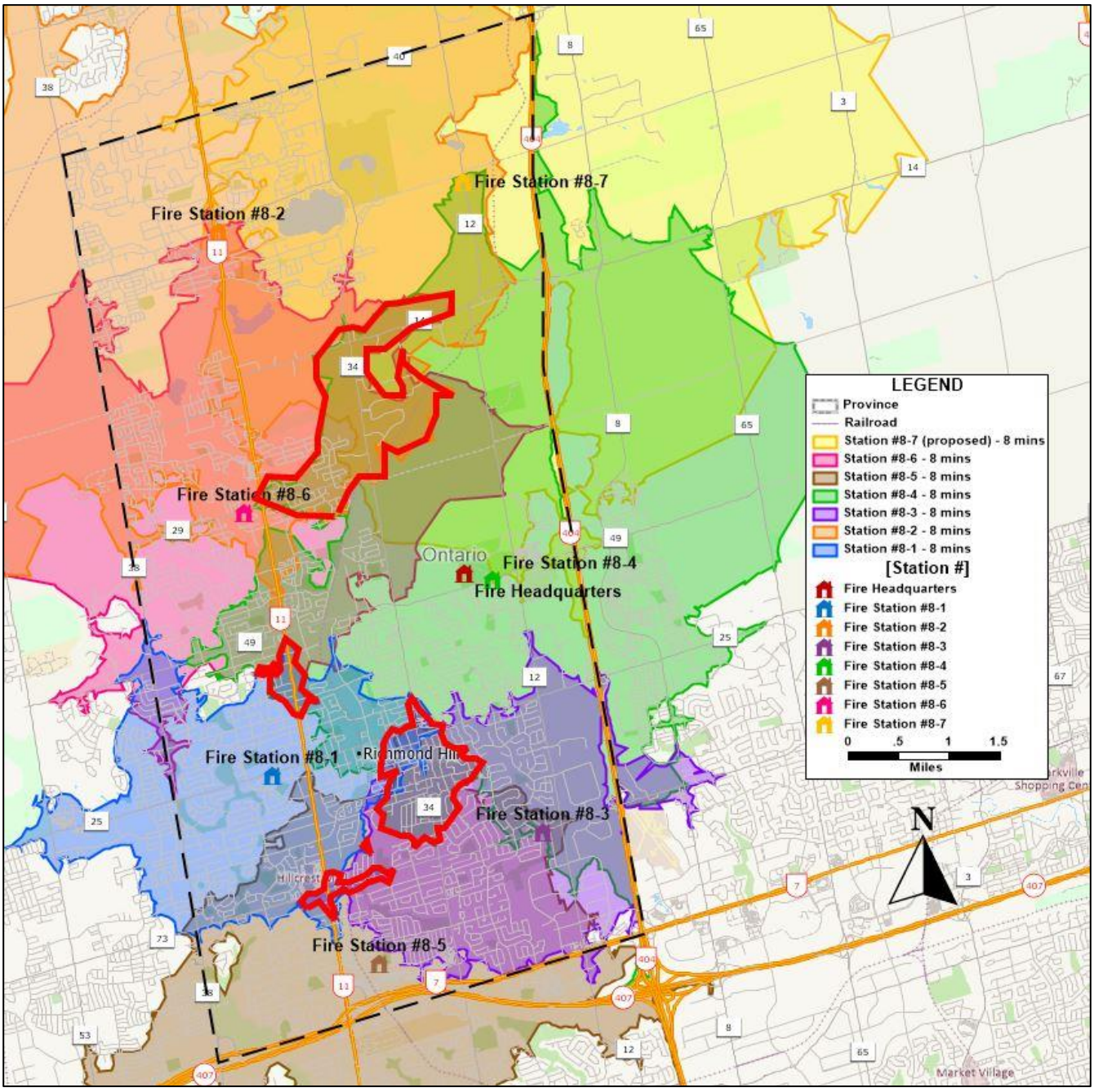
The 8-minute travel time is used to identify the locations where there can be an "Effective Firefighting Force" within 8 minutes as identified by NFPA 1710. The NFPA 1710 Standard requires 16 firefighters (17 if an aerial device is being used) at a single detached house fire within 8 minutes of leaving the station. The following figures indicate those areas prior to Station 8-7 being built and after Station 8-7 is built. The RED outlined areas are those where the Effective Firefighting Force can be deployed reliably based on Station 8-1 being staffed with 2 apparatus.

FIGURE #19: Effective Firefighting Force – Current Stations



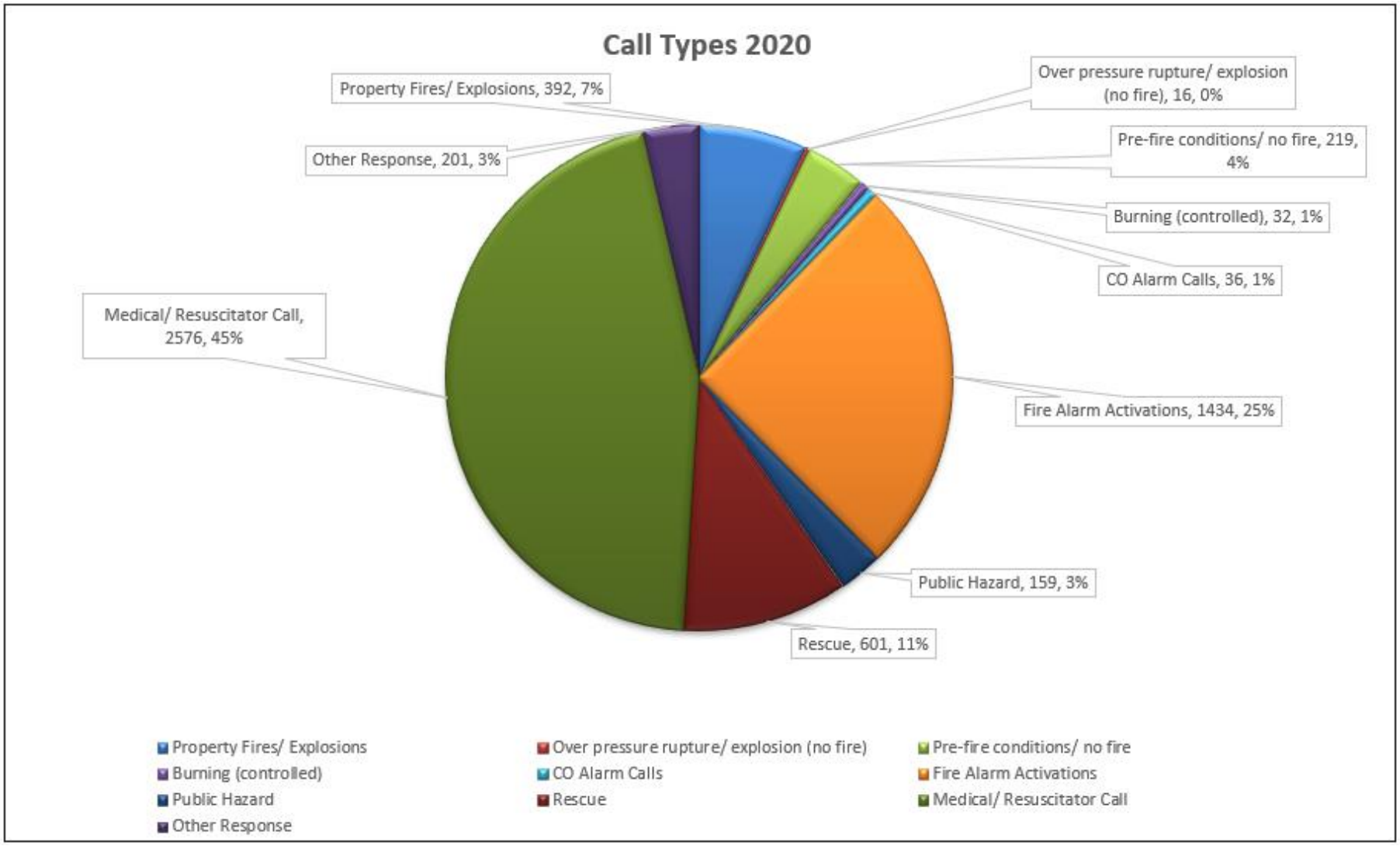
The RED outlined areas are those where the Effective Firefighting Force can be deployed reliably based on Station 8-1 being staffed with 2 apparatus and station 8-7 being built and staffed with an apparatus.

FIGURE #20: Effective Firefighting Force – Addition of Station 8-7



The following set of charts (through the use of the supplied data) help to identify the types of calls that are creating the bulk of response demands and which station(s) are called upon the most for these responses.

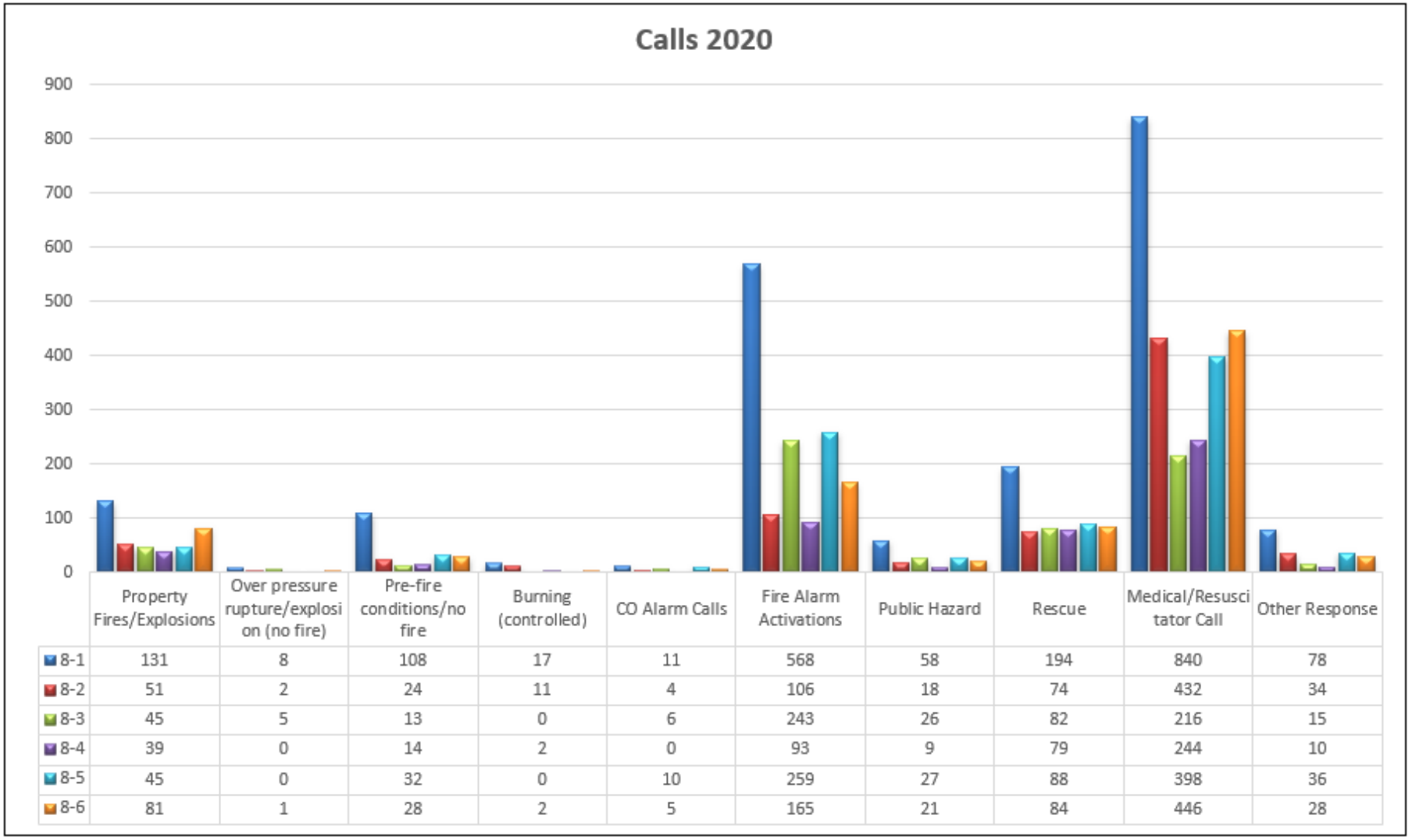
FIGURE #21: Call Types in 2020



Data for 2019 is available in Appendix C.

FIGURE #19 breaks the call types down by station. The majority, of the call types are medicals, fire alarms or other rescues. With so many fire alarm activations, many of them are false alarms caused by faulty equipment or testing of alarm systems without notifying the answering service, etc. The Fire Chief has taken measures to assist in reducing the number of false fire alarm calls that the crews are called out in the form of invoicing for unnecessary call outs.

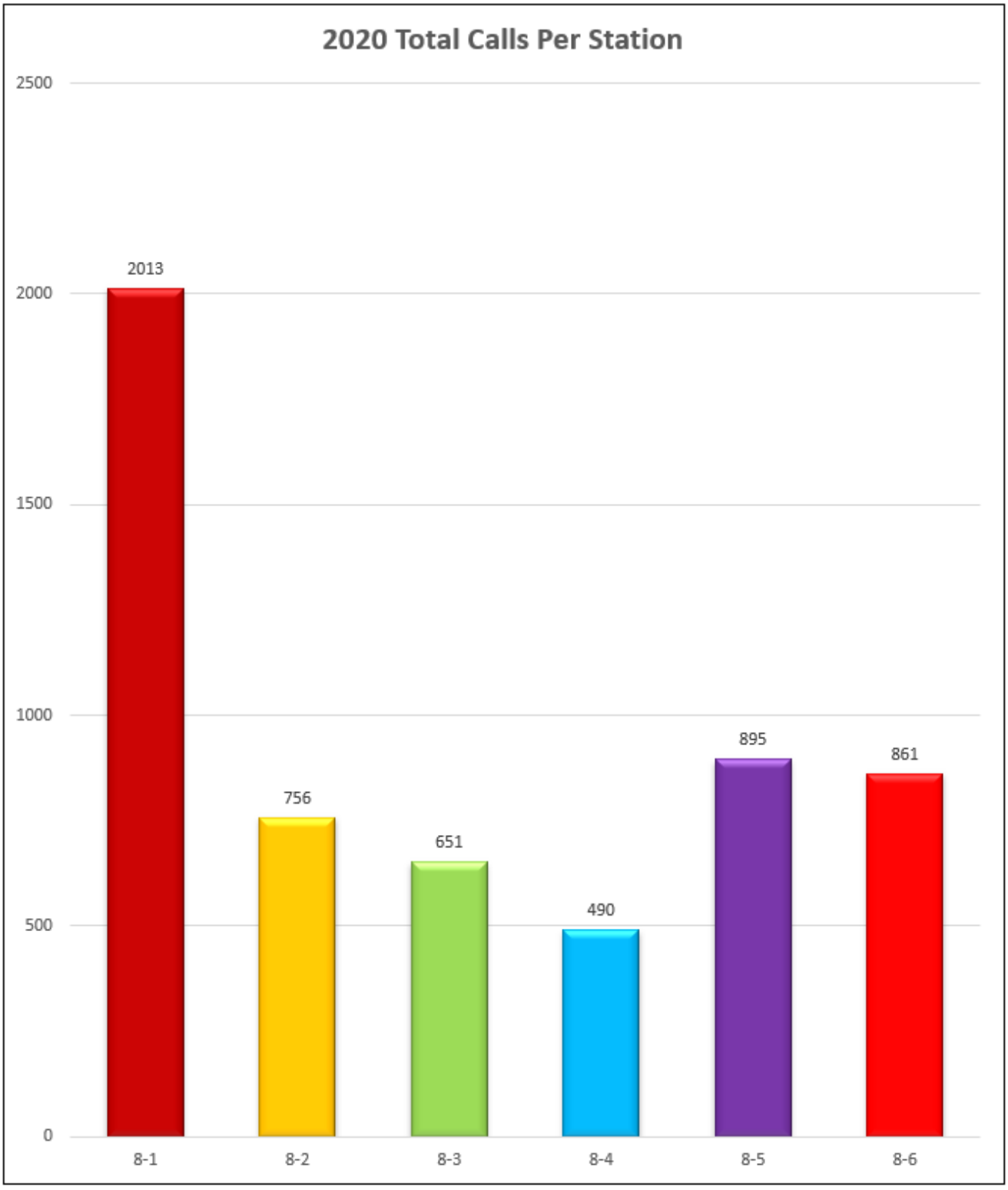
FIGURE #22: 2020 Call Types by Station



	Property Fires/Explosions	Over pressure rupture/explosion (no fire)	Pre-fire conditions/no fire	Burning (controlled)	CO Alarm Calls	Fire Alarm Activations	Public Hazard	Rescue	Medical/Resuscitator Call	Other Response
8-1	131	8	108	17	11	568	58	194	840	78
8-2	51	2	24	11	4	106	18	74	432	34
8-3	45	5	13	0	6	243	26	82	216	15
8-4	39	0	14	2	0	93	9	79	244	10
8-5	45	0	32	0	10	259	27	88	398	36
8-6	81	1	28	2	5	165	21	84	446	28

Data for 2018 and 2019 is available in Appendix C

FIGURE #23: 2020 Total Calls Per Station



A chart illustrating the total calls per station for 2018 and 2019 may be viewed in Appendix C.

NFPA 1710 calls for the first engine company, with a crew of four firefighters, to arrive at a fire suppression incident in 240 seconds (four minutes) or less. The following figures identify RHFES's ability to meet that benchmark of 90th percentile. The 90th percentile means the crews arrived in four minutes or less, 90% of the time. Over the last six years it has become more apparent that the RHFES is lessoning its ability to meet the 90th percentile.

FIGURE #24: 4-Minute Travel Time Average From 2015-2020

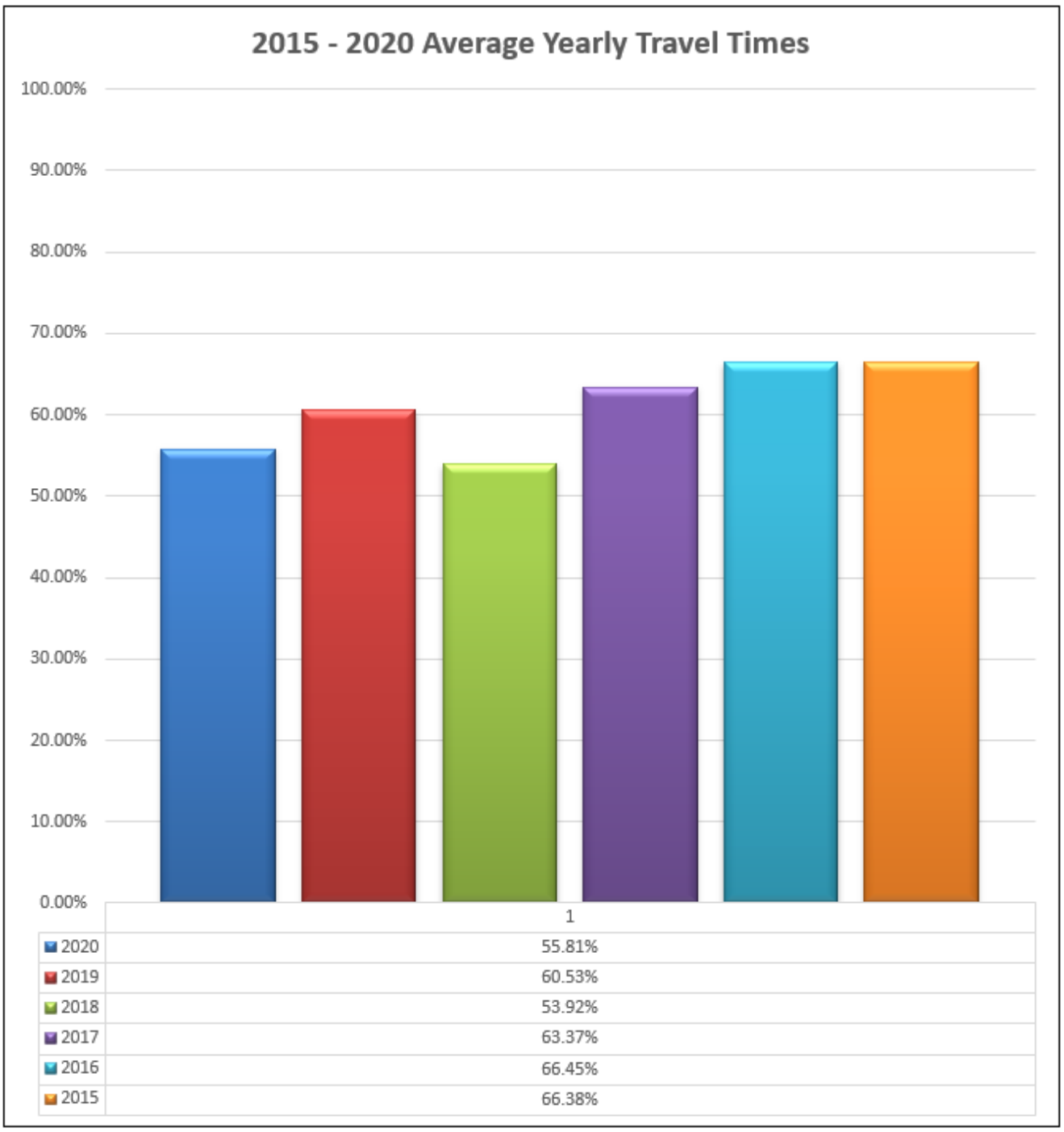


FIGURE #25: 2015 4-Minute Travel Time by Station

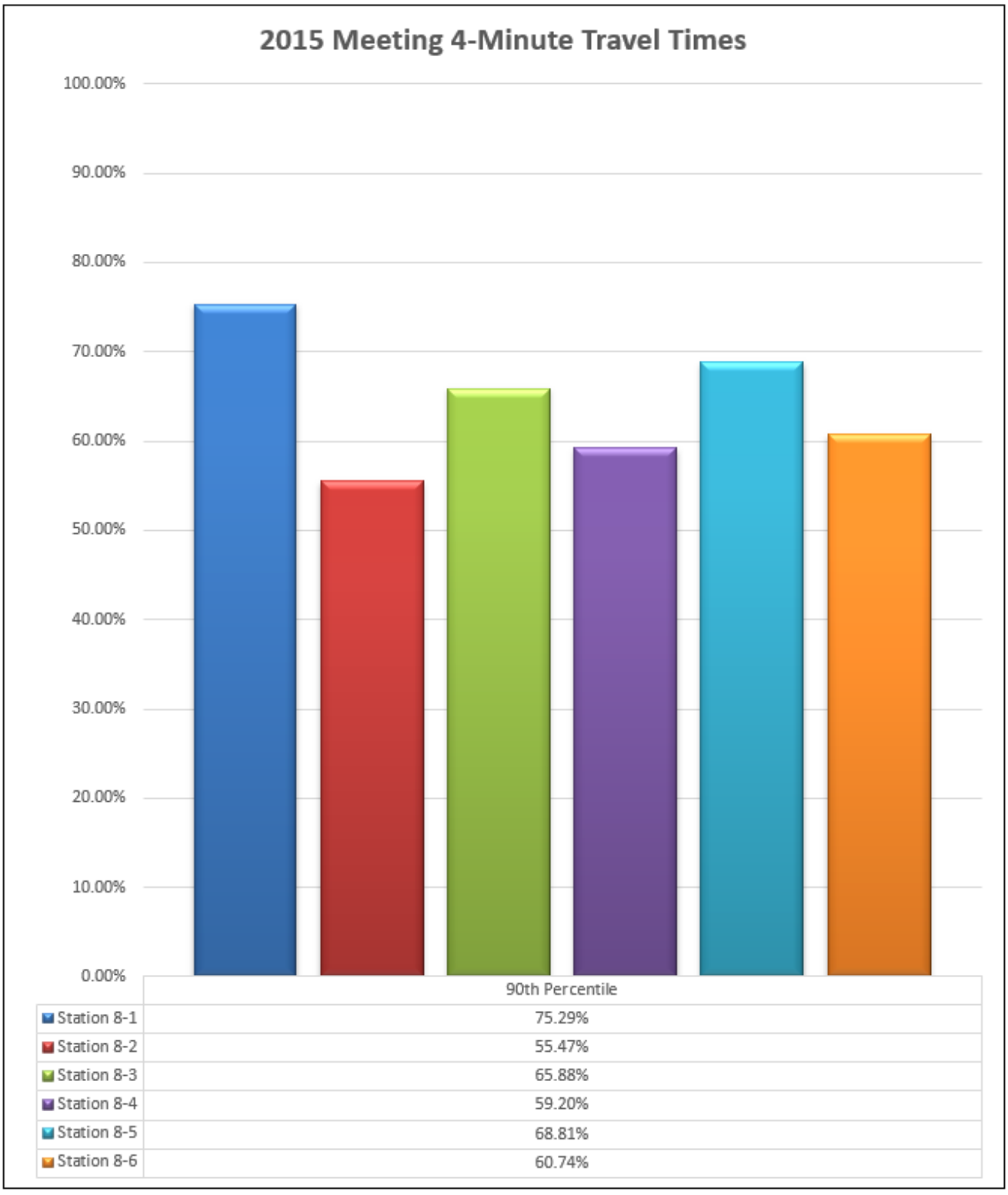


FIGURE #26: 2016 4-Minute Travel Time by Station

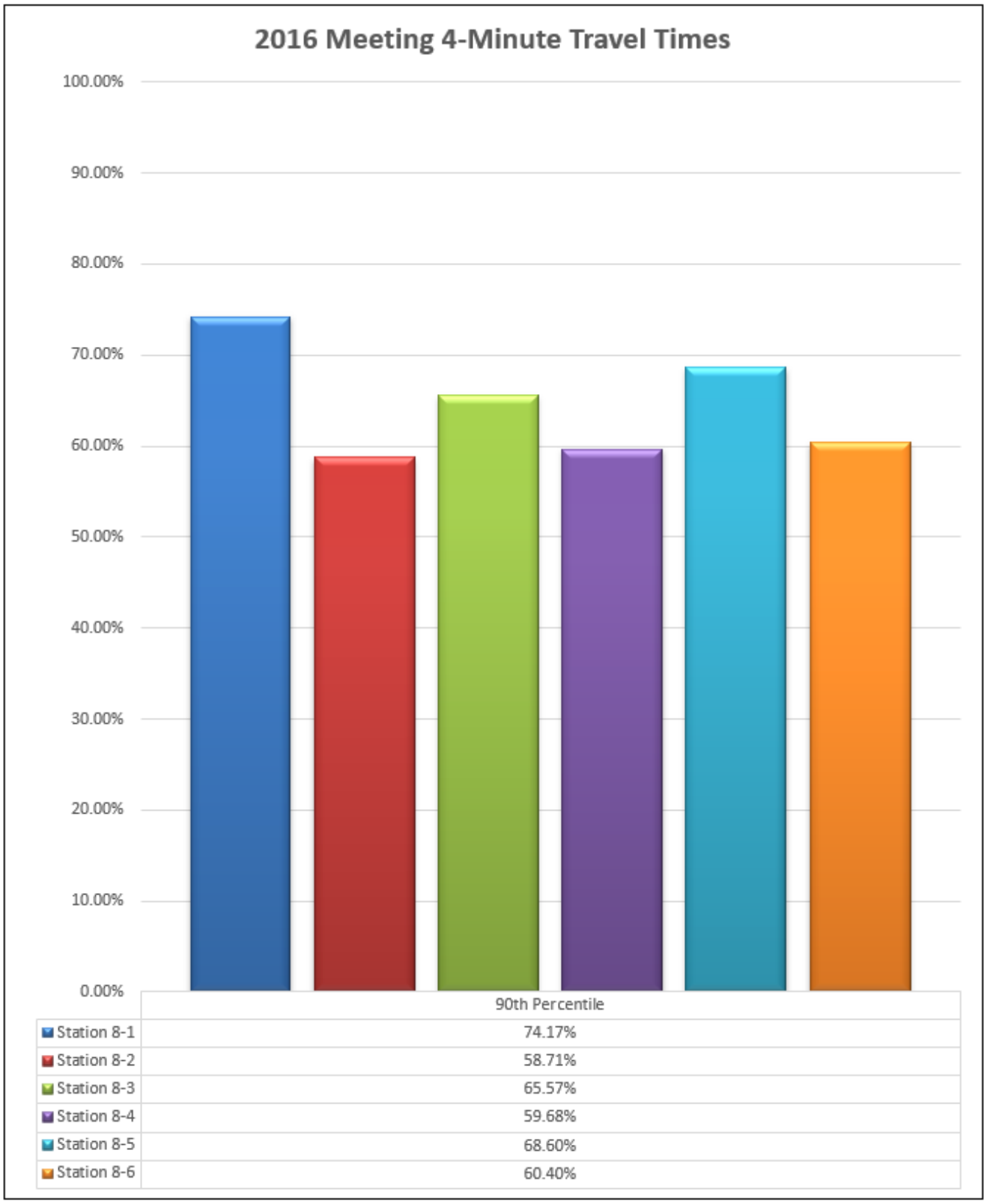


FIGURE #27: 2017 4-Minute Travel Time by Station

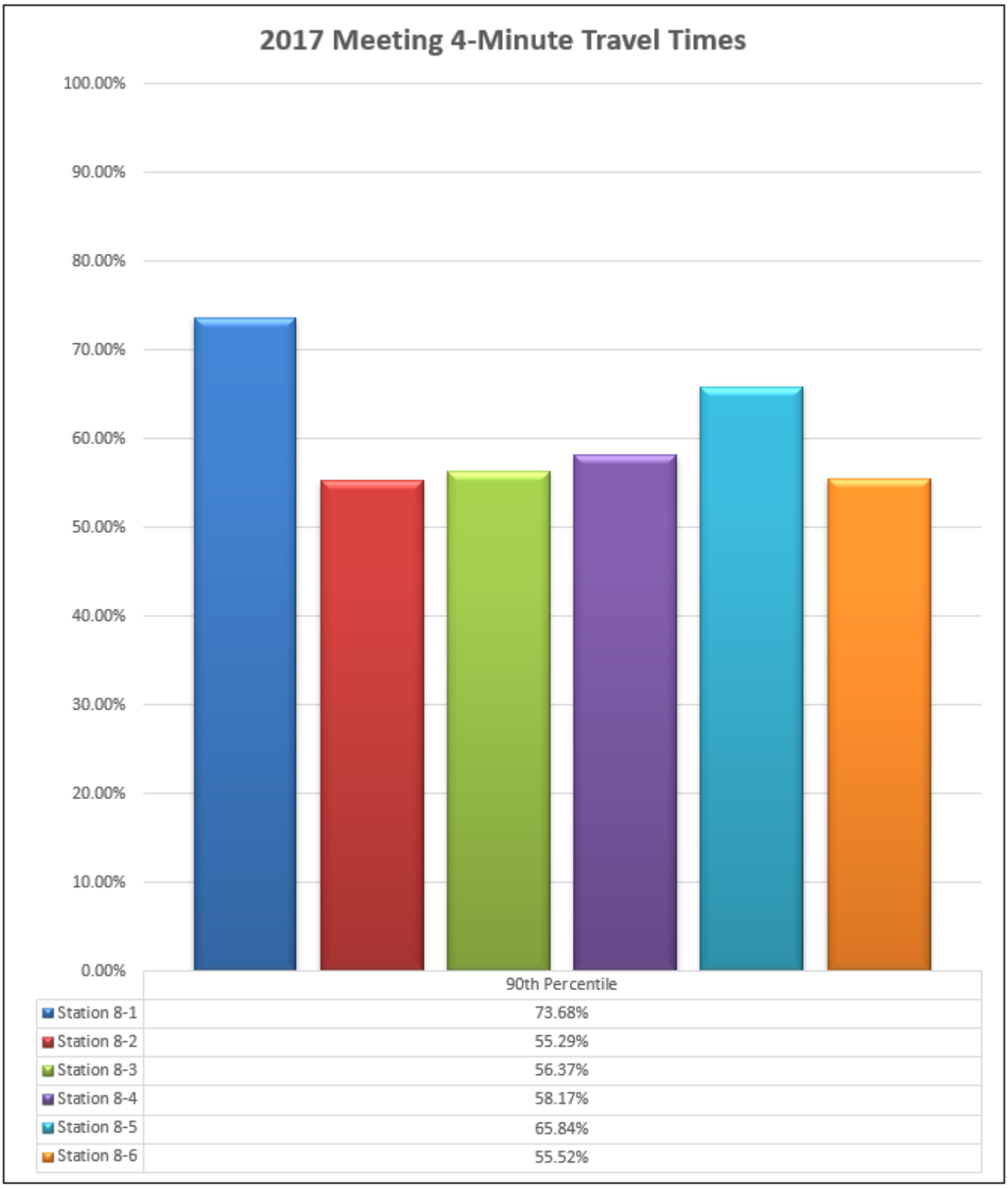
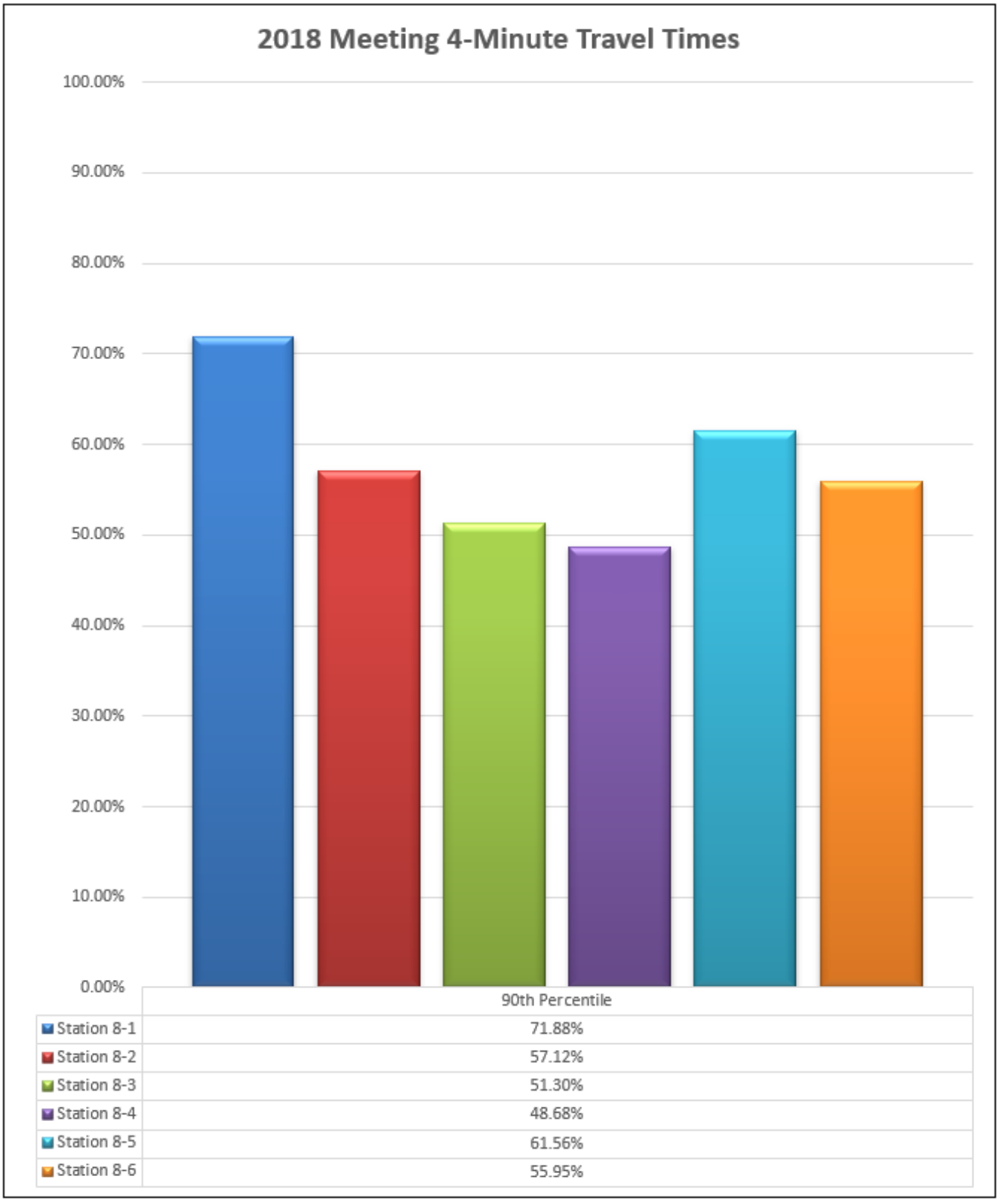


FIGURE #28: 2018 4-Minute Travel Time by Station



	90th Percentile
Station 8-1	71.88%
Station 8-2	57.12%
Station 8-3	51.30%
Station 8-4	48.68%
Station 8-5	61.56%
Station 8-6	55.95%

FIGURE #29: 2019 4-Minute Travel Time by Station

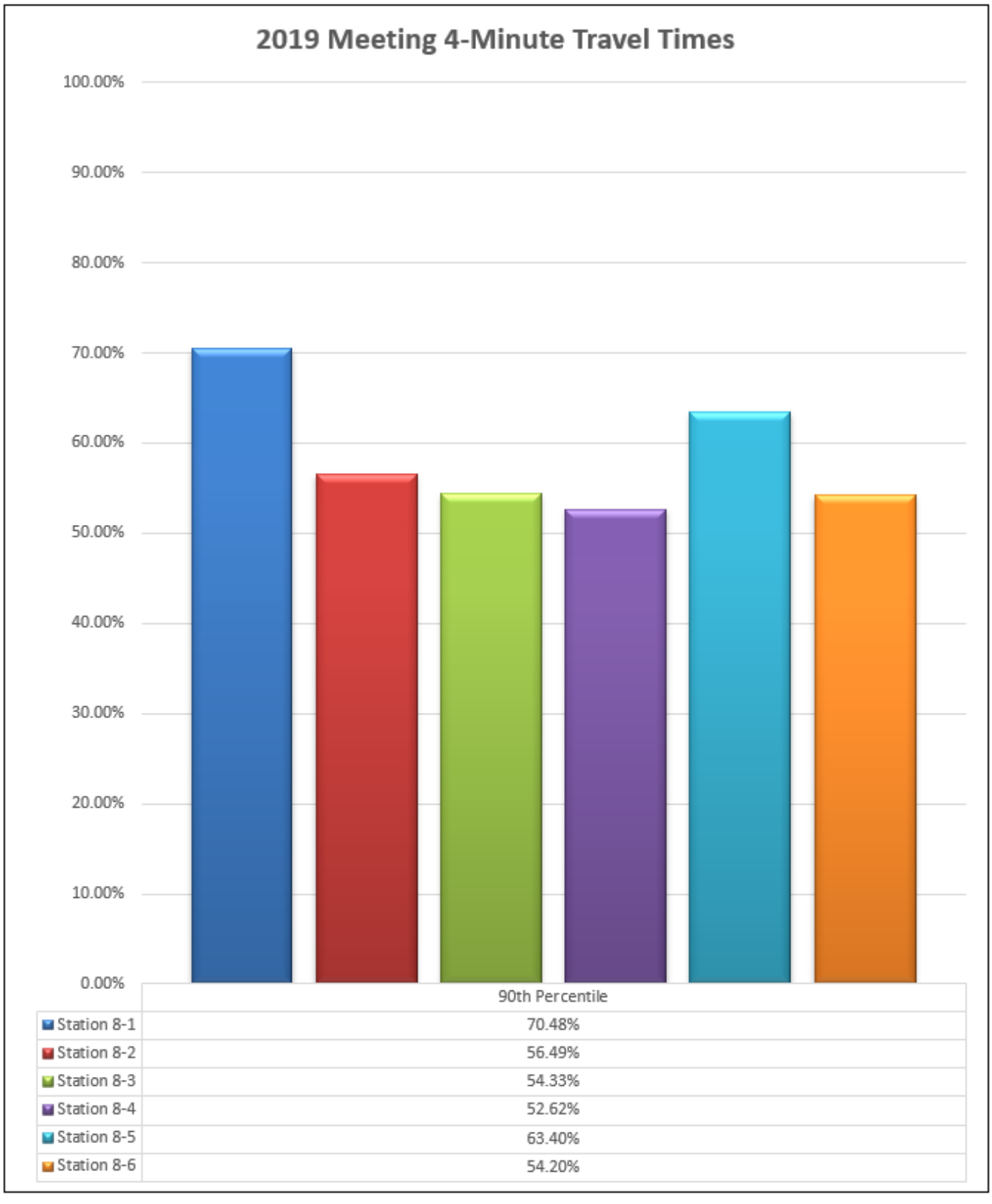


FIGURE #30: 2020 4-Minute Travel Time by Station

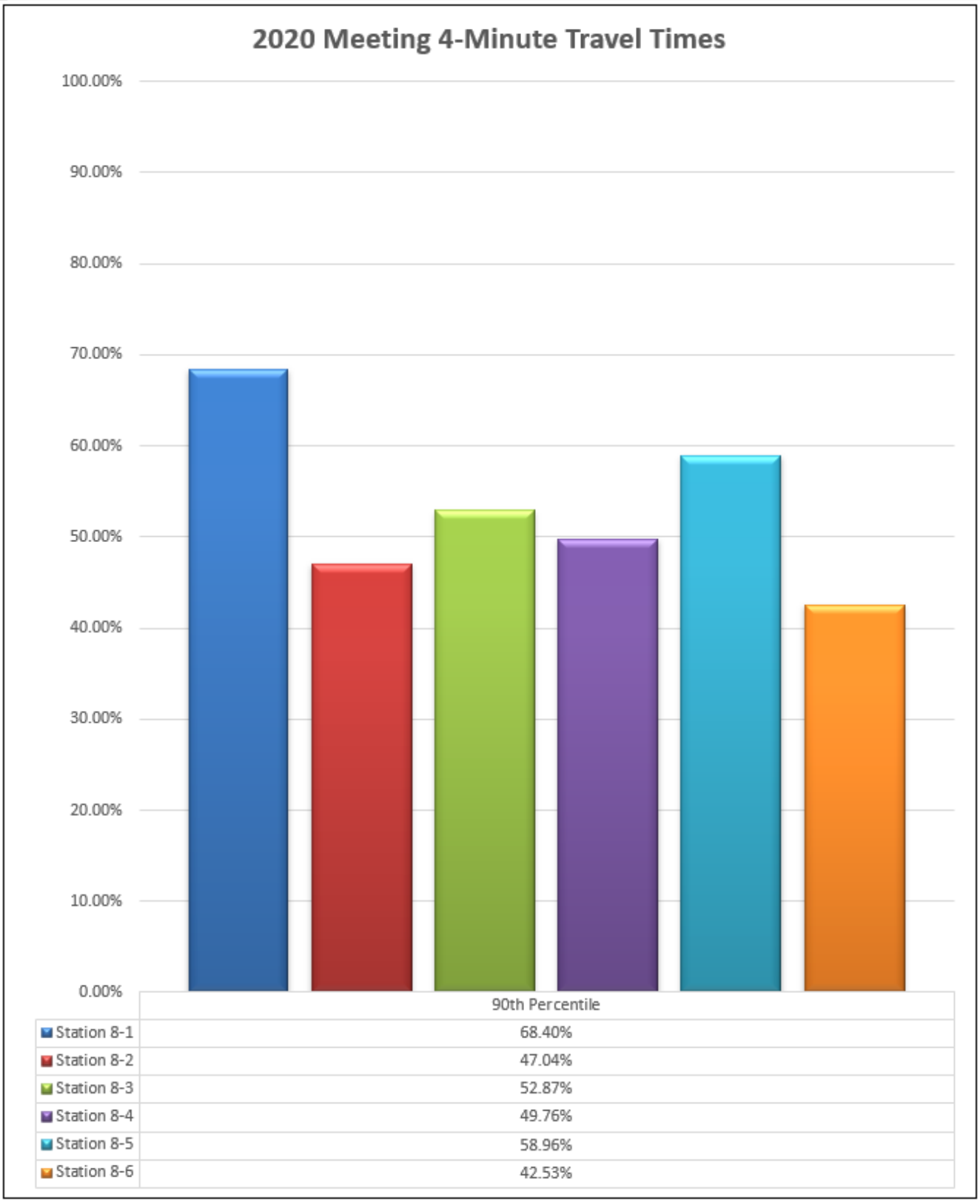
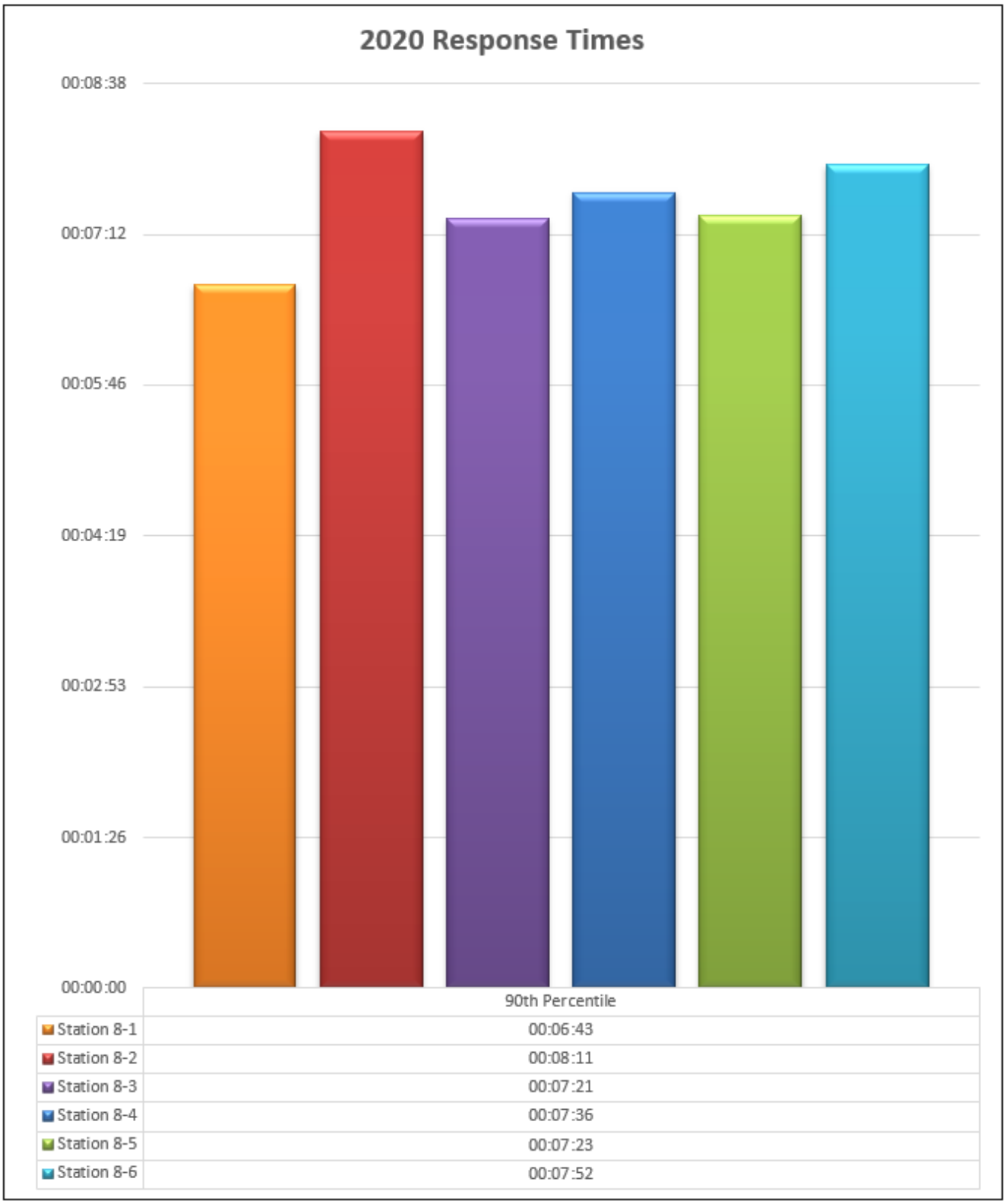


FIGURE #31: 2020 Total Response Times by Station

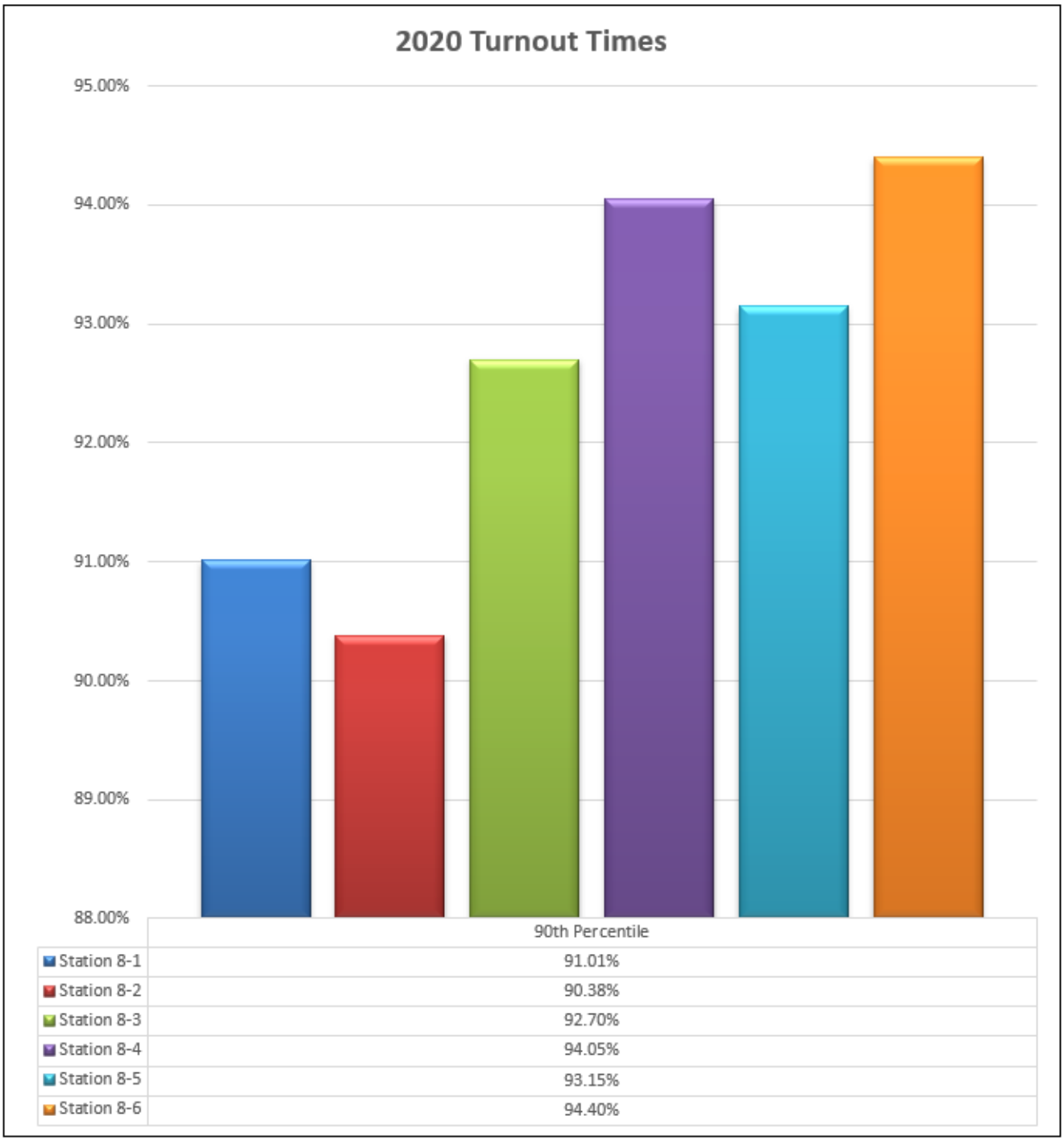


	90th Percentile
Station 8-1	00:06:43
Station 8-2	00:08:11
Station 8-3	00:07:21
Station 8-4	00:07:36
Station 8-5	00:07:23
Station 8-6	00:07:52

The total response time Identifies the time it takes for the first arriving apparatus to arrive at an incident from the time the call taker begins taking the call, to the time the crew arrives.

The turn-out time is measured from the when the alarm goes off in the station, to the time the apparatus is in continuous motion towards the location of the incident. NFPA 1710 states that the turn-out time is to be 80 seconds, 90 percent of the time.

FIGURE #32: 2020 Turnout Times by Station

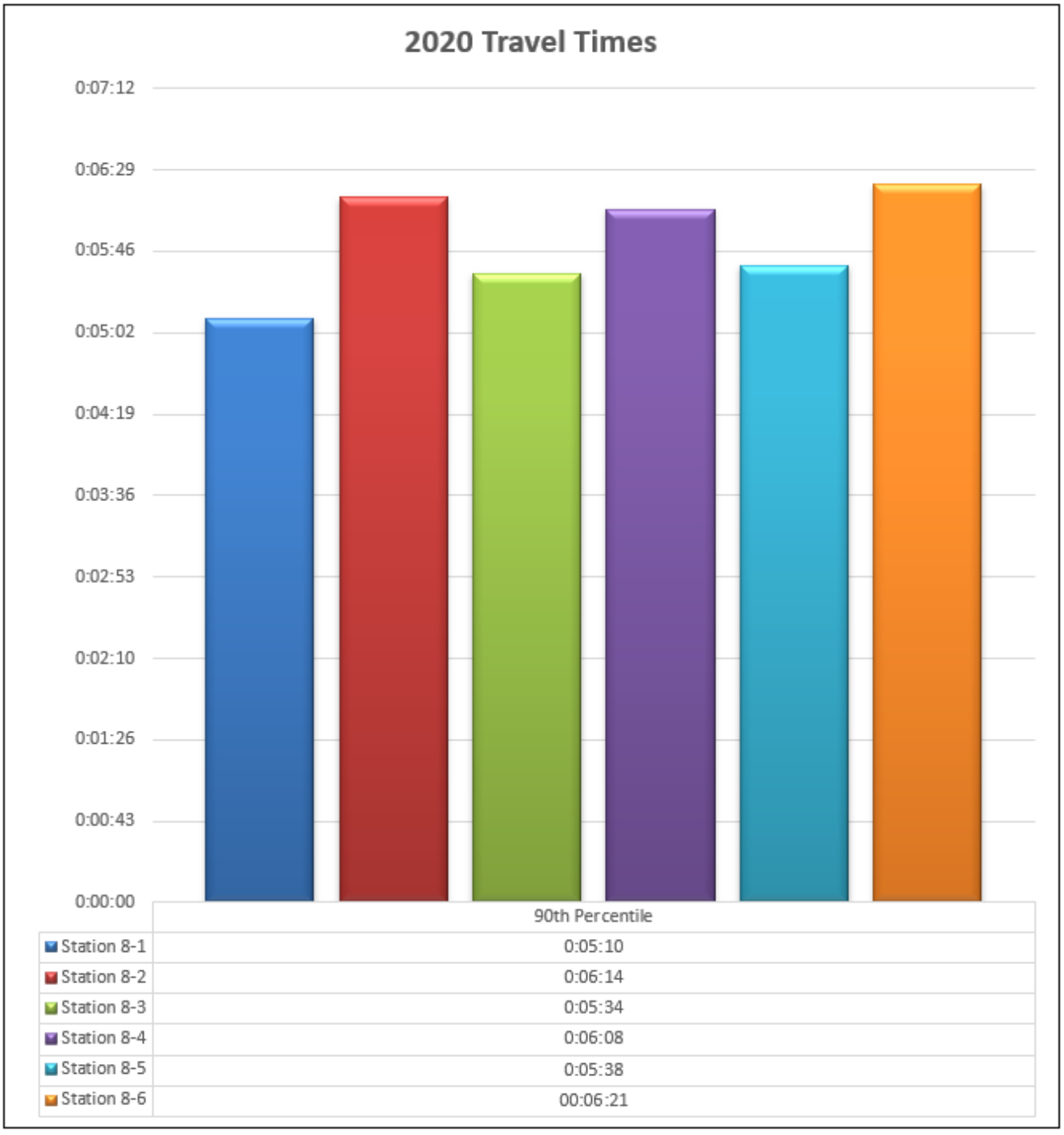


The 2018 and 2019 data may be viewed in Appendix C.

The following charts outline the 90th percentile travel times for each station. The travel time is measured from the time the apparatus leaves the station to the time it arrives at the incident.

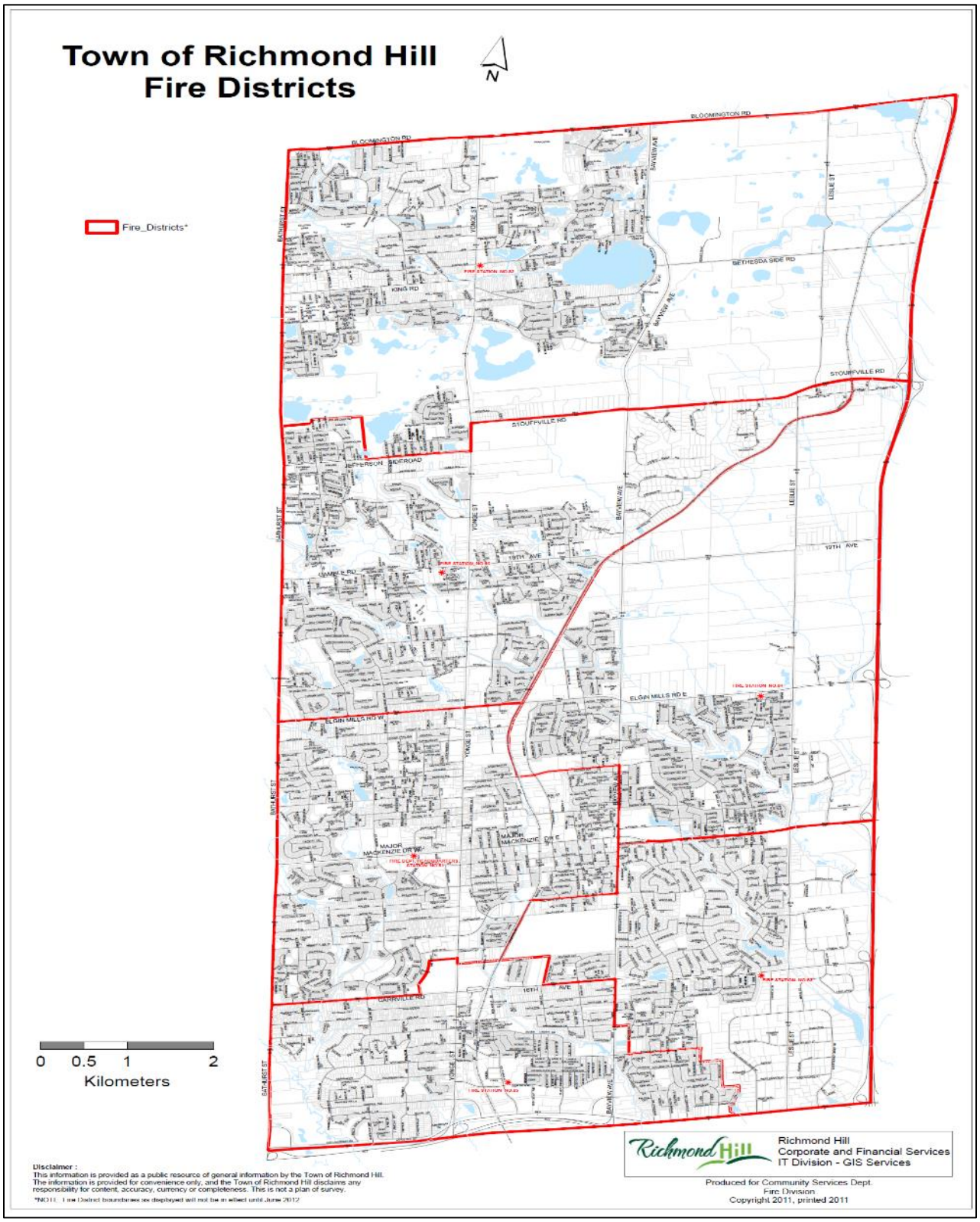
According to NFPA 1710, travel time should be targeted at 4 minutes.

FIGURE #33: 2020 Travel Times by Station



The 2018 and 2019 data may be viewed in Appendix C.

FIGURE #34: Response Zone Map



Although the NFPA response times are not mandated, it would be beneficial for the Fire Chief to have a response time goal supported by Council as a benchmark. It is recommended that the Fire Chief present a response time goal for the approval of Council, which may reference NFPA 1710 (2020 Edition) – the expectation of 16 staff in 8 minutes (90th percentile), for structures other than high rises, and that performance measures are continuously monitored. The response time for high rises is 10 min 10 sec (610 seconds) or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident.

Recommendation – Strategic:

It is recommended that RHFES continue its commitment to meet effective response times. This includes the following:

- ***Achieve a goal of 80 seconds fire fighter turn-out time.***
- ***Four (4) firefighters arriving on scene within four minutes of travel time.***
- ***Sixteen (16) firefighters arriving on scene within an eight-minute travel time.***

5.2 Medical Response

Currently, nearly 50% of the calls for assistance the RHFES attends are medical related. The RHFES administers naloxone to individuals who have overdosed on opioids. The firefighters are also trained and permitted to administer epinephrine in the form of Epi-Pens to individuals suffering from anaphylactic shock.

The Department, in consultation with their medical advisor and YRPS, should discuss whether crews be permitted to administer glucagon to those suffering a diabetic event. Anyone who is diagnosed with diabetes are at risk of having a diabetic emergency due to the lack of food intake, including fasting. The administration of glucagon will aid in reducing the symptoms of the diabetic emergency.

Another over the counter drug which should be included in the conversations with the Department's medical advisor and YRPS is the administration of ASA for those suffering from chest pain exhibiting the signs of a cardiac emergency. It is widely advertised on media outlets for the public to administer a small dosage tablet under the tongue of a person with chest pain.

Recommendation – Operational:
It is recommended that RHFES work in conjunction with the RHFES Medical Oversight to review delegated medical acts including but not limited to the administration of glucagon and ASA.

The fire services of York Region are responding to tiered medical calls under a formal agreement with YRPS. The agreement includes the types of medical emergencies they will respond to.

The RHFES should monitor response and arrival times of paramedic services and communicate any concerns to the Paramedic Chief. The RHFES does document when the Department arrives at the scene of a medical emergency prior to the paramedics along with the time the firefighters make contact with the patient to begin treatment.

To promote teamwork and to understand the role each emergency service plays at the scene of a tiered medical event, RHFES should promote and take advantage of any joint training opportunities.

The RHFES, in co-operation with the other members of the York Region Mutual Aid Plan, should promote dialogue with the Ministry of Health and Long-Term Care, Emergency Health Services Branch, and the OFMEM for the inclusion of the Region's fire services into the simultaneous notification pilot program. The inclusion of these fire services into this program will reap a marked improvement in response times to tiered medical calls. The community will in turn experience a higher level of service provision to medical calls.

Central Ambulance Communications Centre (CACC) Georgian which is located in Barrie, dispatches the YRPS and is already a member of this program and has the infrastructure in place to expand this service.

Recommendation – Strategic:
It is recommended that the RHFES and the Richmond Hill Council lobby the OFMEM and Ministry of Health to expand the simultaneous notification program to include Fire Services of York Region.

In the United States fire departments have fire/medics on engine companies. They are a fully accredited fire fighter and a paramedic. One of their responsibilities is to determine whether the patient needs to go to a hospital or a local clinic and whether an ambulance is required to transport them. It has been found that this model has lessened the demands of emergency departments and medical transport services. It is unknown how often a patient is transported to a medical facility in an emergency response (Code 4). Some may be transported non-emergency, in which no emergency lights are activated, or siren used (Code 3).

As a means of enhancing their community outreach, the RHFES could partner with the YRPS and assist in the instruction of Cardio-Pulmonary Resuscitation (CPR) and the use of a AED as part of the public access defibrillator program.

5.3 Vehicle Technology

The RHFES has endeavored to advance the technological perspective on the apparatus through the acquisition of iPads. These units are data enabled and will permit the responding crews to acquire information about the incident they are responding to directly from the Communications Centre

including mapping, responding apparatus, pre-incident plans, hydrant locations and access to the internet. Some data terminals are capable of opening the overhead doors of the fire stations rather than a small remote control that can become lost. The City's Information Technology and Resource Division supports the operating systems.

The iPads will have the capability to provide any pre-incident plans that are completed for a particular location. These plans will provide information such as a footprint of the structure, man and overhead doors, electrical panels, gas valves, hazardous materials storage area, sprinkler and fire hose connections, fire hose cabinets, etc. The Incident Command will use this information to direct their crews to specific areas of a structure to perform an assigned task and improve the situational data.

RHFES should enhance their current pre-incident plan program with the completion of additional plans. Resources should be allocated that enable the quality and quantity required of the plans developed to be consistent and current.

Focus should be on vulnerable occupancies, industry, main streets with commonly joint buildings, marines, assembly occupancies, campgrounds, fuel storage and retail such as propane and gasoline and any structures with known hazardous materials. It would aid in the completion of additional plans if an individual were to be the co-ordinator of the program and direct crews on which structures to complete. They would also be responsible for drawing the diagrams and uploading information into the computer system. All pre-incident plans should be completed in compliance with NFPA 1620, *Standard for Pre-Incident Planning*.

Apparatuses are outfitted with Automatic Vehicle Locators (AVL). An AVL is a device that makes use of the Global Positioning System (GPS) to enable an agency, such as fire departments and paramedic services, to remotely track the location of its vehicle fleet using the Internet. Having the AVL system connected to the CAD in Communications aids in ensuring the closest staffed apparatus is dispatched to the emergency.

The apparatus themselves now include computer systems in their operation, including the fire pump. As with any computer system training, firefighters must understand and/or document error codes so the apparatus may be repaired and returned to service in a timely manner.

5.4 Radio System

Radio systems have many technological advancements every year, making it difficult for fire services to maintain current standards. Some of these technologies are:

Simplex vs Repeater Radio Signals

A simplex radio system is best explained as radios that talk directly to each other (i.e., radio to radio). Radio signal strength using a simplex system is not as strong as using a repeater; a repeater system receives a radio message and then rebroadcasts it at a higher strength, thus providing better coverage. Most fire services operate a repeater system for the enhanced radio signal.

Analogue vs Digital

An analogue signal weakens as it travels further way from the radio that sent the signal; a digital radio signal maintains the same strength no matter how far the signal goes.

The RHFES radio system is operating on digital technology with repeaters installed in numerous apparatuses. As new apparatus is ordered a repeater is included in its outfitting. Repeaters are necessary when operating within structures that contain high amounts of steel within them as the steel prevents radio transmissions from entering or leaving a structure which is paramount for firefighters to have good radio communications. Poor radio communications are a significant health and safety concern.

The RHFES operates the region's 700 MHz radio system which operates using a trunked radio system. A trunked radio system is a digital two-way system that uses a digital control channel in which channel frequencies are automatically assigned to users. Non-trunked systems must manually select channels for use, which can entail an inefficient process.

A few years ago, RHFES replaced a number of radios with newer versions and should continue to monitor new technologies and how they could be applied to RHFES such as radio telemetry, which identifies the location of each fire fighter on the fire ground. This feature becomes a very important tool when a "Mayday" is announced and a fire fighter's safety is in jeopardy.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
30	The RHFES maintain the minimum of four firefighters on every fire apparatus, each shift. This would bring RHFES in line with the recommendations regarding the staffing of fire apparatus as identified in the National Institute of Standards and Technology study and NFPA 1710, which are outlined in Section 5.	Overtime Costs	Immediate (0-1 years)
31	Hire an additional 20 firefighters to be deployed on an additional engine.	$2.5 to $3.5 M	Short-term (1-3 years)
32	RHFES add a seventh station in the north-east quadrant, of the City, and hire an additional 20 firefighters to be assigned to Station 8-7.	$5.5 – $6.6M	Mid-term (4-6 years)
33	RHFES to hire an additional 20 firefighters based on the call volume, additional building stock such as high rises and the current approved land developments. Consideration should be given to the deployment of these firefighters to staff a second aerial device in the city.	$3.5 - $4.5M	Long-term (7-10 years)
34	Implement the position/rank of District Chief within the Operations Division for each Platoon. In conjunction with the opening of Station 8-7.	$550,000 - 600,000	Mid-term (4-6 years)
35	Continue a commitment to meet effective response times. This includes the following: • Achieve a goal of 80 seconds fire fighter turn-out time. • Four (4) firefighters arriving on scene within a four-minute travel time. • Sixteen (16) firefighters arriving on scene within an eight-minute travel time.	Staff time	Ongoing
36	RHFES work in conjunction with the RHFES Medical oversight to review delegated medical acts including, but not limited to the administration of glucagon and ASA.	Staff time plus costs of medications	Short-term (1-3 years)
37	RHFES and the Richmond Hill Council lobby the OFMEM and Ministry of Health to expand the simultaneous	Staff time and any upgrades to CAD	Short-term (1-3 years)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
	notification program to include Fire Services of York Region.	$100,000 - $150,000	

SECTION 6 – Facilities

Section 6: Facilities

This section will assess facility needs and station locations. It will review existing facilities and provide recommendations for future locations relative to current and future service delivery demands and applicable standards. Consideration of potential needs for relocation or additional stations will be made.

6.1 Fire Stations Review

Fire stations should be positioned to offer the most efficient and effective response to the community they serve. Centering them within a determined response zone that is simply based on "timed" responses is not always the best option to implement. Fire station locations depend on many factors such as key risks within the response zone, future growth of the community and station staffing (full-time or volunteer firefighters). Another consideration is the geographical layout of the community that can include natural barriers or divides such as water that may make it necessary to have some stations located within proximity of each other.

OFMEM Public Fire Safety Guideline – PFSG 04-87-13 (found in Appendix E) on *Fire Station Location* states that fire stations should be situated to achieve the most effective and safe emergency responses. Distance and travel time may be a primary consideration; however, if a basic expectation of response time is set by the community's decision makers, then a more realistic level of service and fire station location criteria can be identified.

Fire stations are a focal point of the community, demonstrating a sense of pride in what the municipality has accomplished in public safety. The longevity of a fire station ranges from 35-45 years dependent on its condition and the expense of any required upgrades to comply with current industry standards for career fire services.

Current industry standards for the design and construction of a fire station for a career department have identified the need for additional enhancements, amenities, and features when compared to what a volunteer fire service would require. The following is a partial list of what is required when building a fire station for a career fire department:

- Post disaster engineered structure
- Emergency back-up power supply
- Gender neutral washrooms, locker rooms, showers, and dormitory
- Barrier free
- Positive pressure bunker gear storeroom
- Vehicle exhaust extraction system
- Water runoff separation tanks in the apparatus floor
- Emergency eye wash and decontaminations station
- Offices for the station officer and firefighters

- Study room
- Communications office (radio system to receive fire calls)
- Technologies room (i.e., phone, computer, radio, etc.)
- Kitchen
- Drive through apparatus bays
- Lounge
- Fitness room
- Tool/repair room
- Station supply storeroom
- Clean maintenance room for cleaning/disinfecting and repairing items such as face masks, self contained breathing apparatus (SCBA), medical equipment, etc.
- Bunker gear extraction machine and dryer
- Domestic washing machine and clothes dryer
- Training/meeting room
- Emergency shut-off to cooking equipment

During a review of the RHFES existing facilities it was identified that many of these features are lacking, some of which are environmental or health and safety issues. Each fire station along with the Administration Centre, Communications Centre and Mechanical Repair Centre, are reviewed in this chapter.

Some of the fire stations do not have separation tanks for oils, chemicals or sand connected to the water drains in the apparatus floor. This permits harmful contaminants to enter the City's drainage system without first being separated. A hazardous waste permit must be obtained from the Ministry of Environment by the company transporting the waste to have the system cleaned out.

One of the stations has an emergency shut-off valve/switch to the cooking equipment. This shut-off may be activated when a call is received to ensure that the power or gas supply to the cooking equipment is terminated until the crew returns from the call and deactivates the valve/switch.

There have been a few incidents where a fire station caught fire due to cooking appliances being left on when the crew leaves for a call. The switch should deactivate any electrical outlets on the kitchen back-splash, removing power from not only the oven, but appliances such as toasters, kettles, and microwaves as well. RHFES should review opportunities to have these safety devices installed. Some fire services have a natural gas BBQ; this should also be incorporated into the emergency shut off.

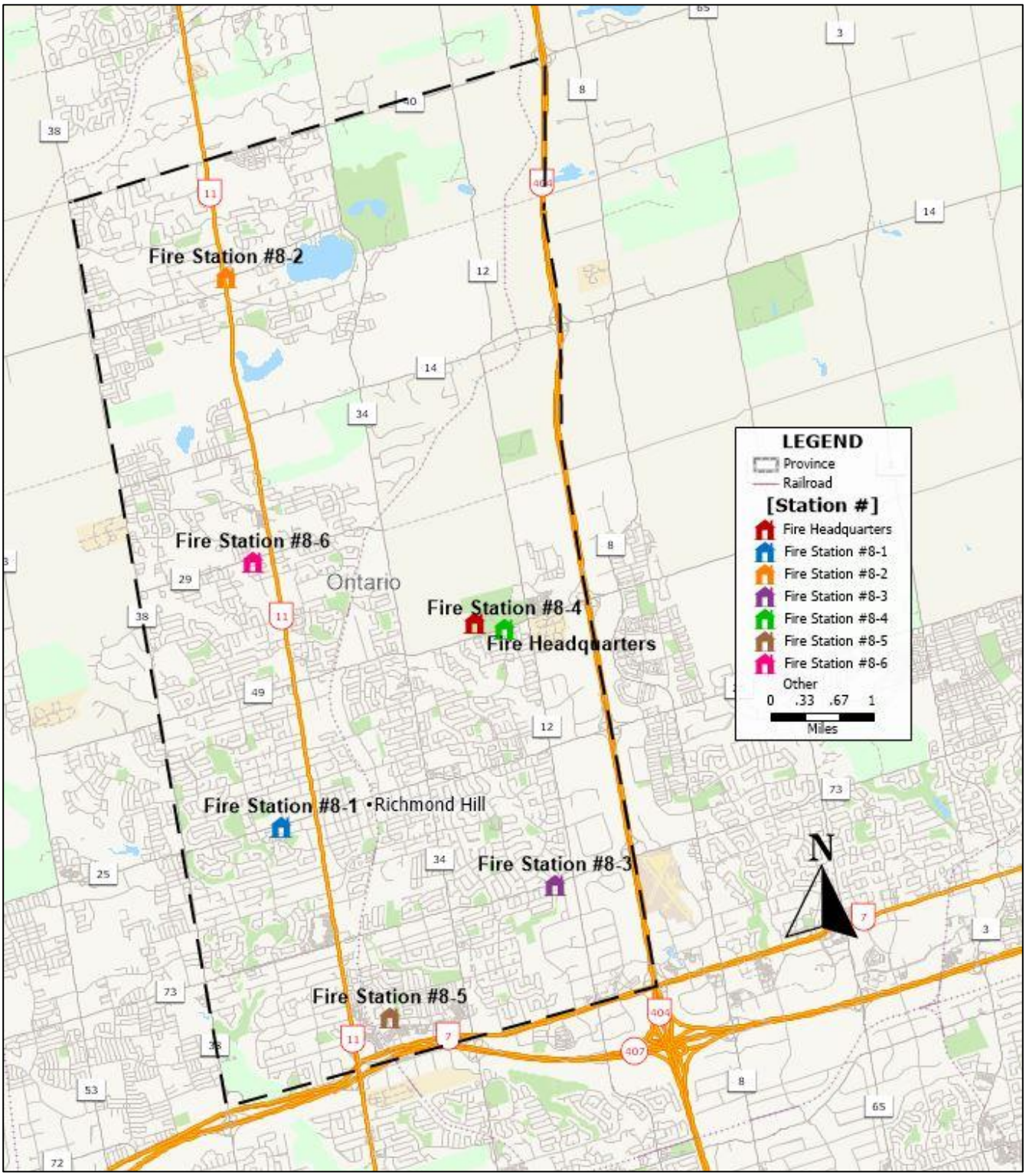
While some of the stations have a dedicated bunker gear storeroom, none of them have the proper negative pressure ventilation system. This system will draw out any off gassing of chemicals that could be present in the building and prevent them from entering the crew's living quarters.

It was found that one station does not have female/gender neutral quarters/facilities. This has prevented people from being assigned to some stations. The lack of such facilities places the City at risk of being exposed to possible legal action. The RHFES should review all options available to ensure the stations are capable of allowing all members of the Operations Division to work out of any one of the stations.

As it was not a requirement when some of the stations were built, many did not have post disaster features installed at the time of construction. The addition of such features would be cost prohibitive as they are normally part of the original design and not completed after structure completion.

Recommendations regarding the facilities may be found at the end of this section.

FIGURE #35: RHFES Station Locations



6.2 Fire Station Locations and Suitability for Growth

6.2.1 Station #8-1

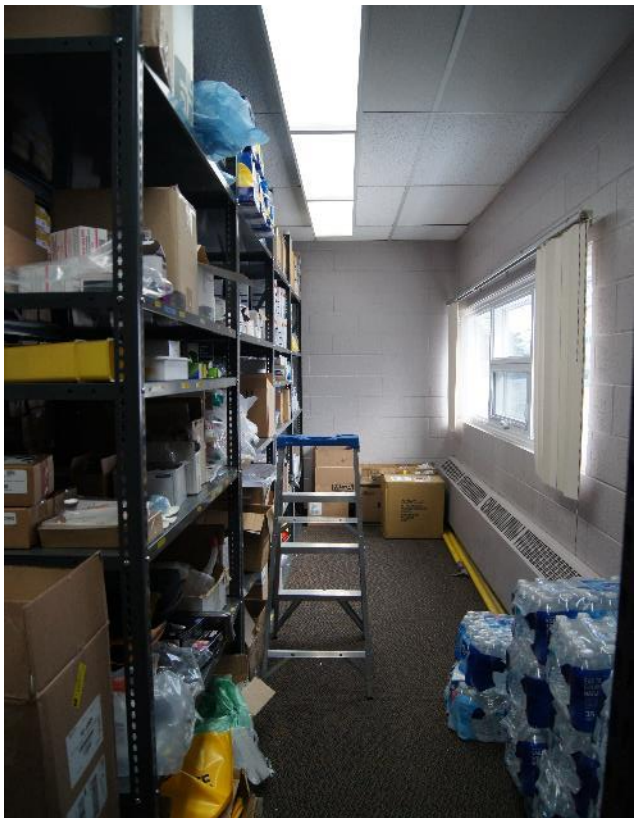
Station #8-1 is located at 191 Major Mackenzie Drive West and serves the main thoroughfare, residential and commercial areas of the City. The station which opened in 1978 is 42 years old. It has two drive-through apparatus bays; however, they cannot be used as the back of the bays are being used for storage. There are four apparatus bays across the front of the station and apparatus must back into the station. The fitness area is at the rear of the apparatus bays and is not a conducive area for that purpose as the firefighters could be exposed to the exhaust gases of the apparatus. The station is equipped with bunker gear storage areas through the building, as well as storage rooms, equipment maintenance room, breathing air bottle refilling station, kitchen, lounge and washrooms without showers. The facility also has a couple of offices. The Communications Division of RHFES is also housed at this location.

The station lacks post disaster construction which is an engineered feature found in newer fire stations, proper oil separation tanks in the apparatus floor, gender neutral locker rooms, gender neutral dormitory, and adequate space. It was also brought to EM&T's attention that there was vermiculite previously present in this station. It was removed by an approved company that specializes in the removal of these types of hazards that may be found in older structures. Inspections are carried out on a regular basis and repairs rendered as required. There is not the presence of any asbestos. This station's life span is quickly coming to an end.

There is a high fire load in the records storage room. The Department works with Records Management at City Hall each year to dispose of files no longer required.


811
20


RECORD ROOM



6.2.2 Station #8-2

Located at 13067 Yonge Street, Station #8-2 was built in 1996. The station is located on one of the busiest streets in the City. It is a two-bay, drive-through fire station; however, one bay is not functional as such due to equipment being stored there. The marine rescue equipment is stored at this station and occupies an entire bay. One of the Department's tankers is also located in this station. The bunker gear storage area is not a negative pressure room.

Even though there is an emergency generator on site, it does not energize the entire building during a power failure. This could lead to injuries due to staff not able to properly see areas of the building. An electrical audit should be completed to see what needs to be done to properly energize the entire electrical system.


NO PARKING
NO PARKING


821

6.2.3 Station #8-3

Station #8-3 is located at 1371 16th Avenue in the rapidly growing area of the City with many high-rises. Built in 1989, it houses the lone aerial device in the city along with the spare aerial. While it has two drive-through bays, only one is being used as the rear portion of the other bay is being used as a fitness area. There is only one fire apparatus that responds out of this station. The station has a separate bunker gear room, equipment maintenance room, washrooms with showers, a couple offices for the station officers, kitchen, etc. This station is well located and able to serve the City for many years.

Like Station 8-2, there is an emergency generator on site that does not energize the entire building during a power failure. This could lead to injuries due to staff not able to properly see areas of the building. An electrical audit should be completed to see what needs to be done to properly energize the entire electrical system.

This station lacks gender neutral accommodations.

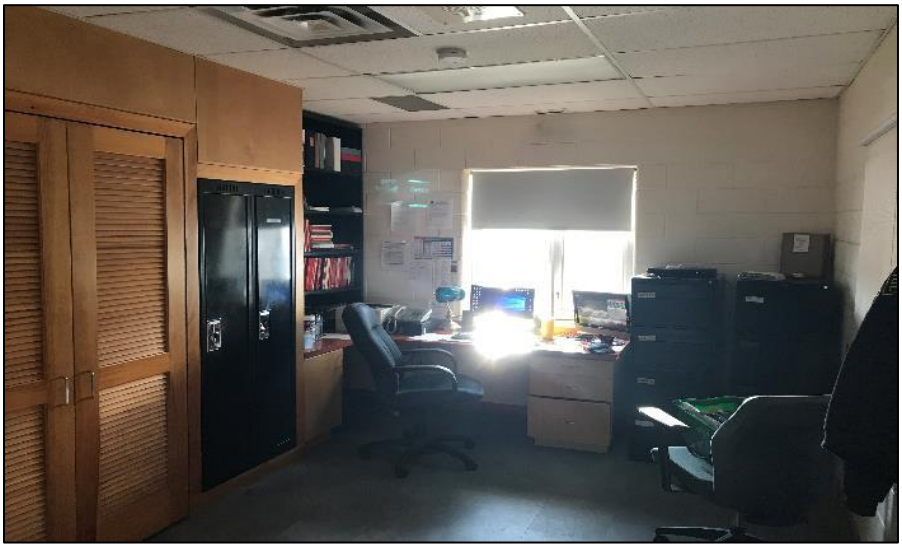

896

6.2.4 Station #8-4

Station #8-4 is located at 1365 Elgin Mills Road East. The station has two drive-through apparatus bays with only one used for that purpose. Bunker gear is stored within its own room. The station has offices, dormitory (also used as a fitness room), kitchen and a lounge. There should be a dedicated fitness room.

Overall, the station is in good condition, and with some renovations and upgrades it will serve the City for many more years.

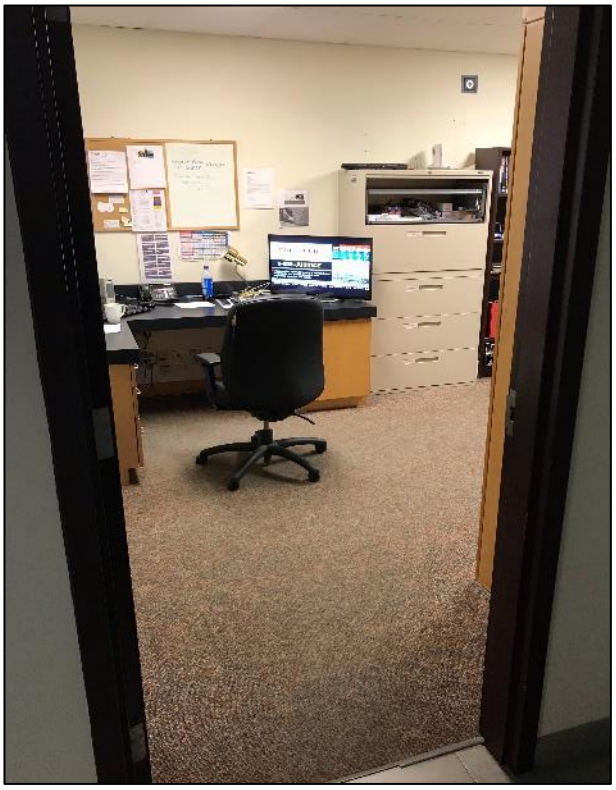

841

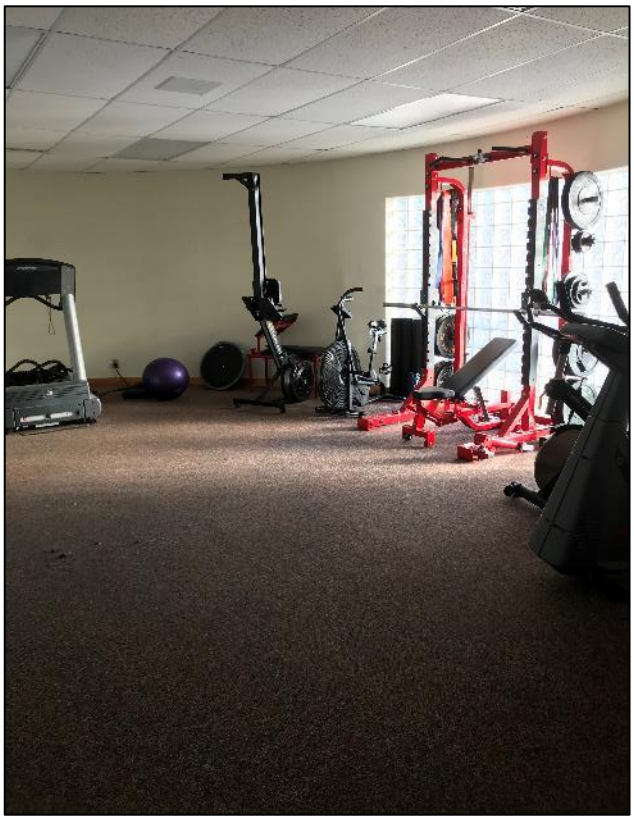


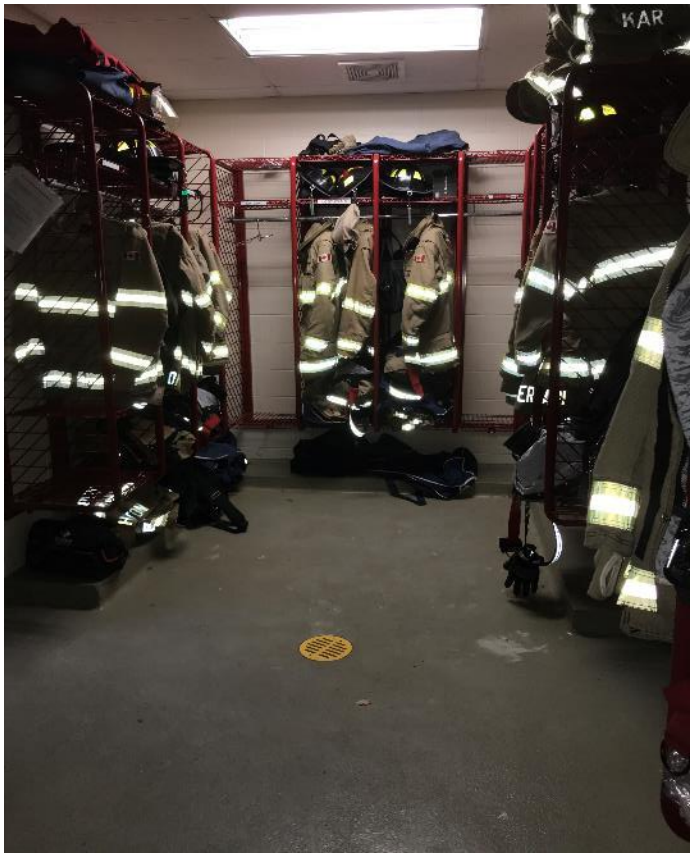
6.2.5 Station #8-5

Station #8-5 is located at 150 High Tech Road serving the southwest quadrant of the City; it has mostly residential areas with numerous high-rises and major roadways such as Highway 7 to service. Built in 2001, this station has two apparatus bays that are double deep. It has many amenities that are well suited for the crews including both male and female dorms, a lounge and a large fitness area.

The station is well equipped with a separate bunker gear room, equipment maintenance room, washrooms with showers, a couple offices for the station officers, kitchen, etc. This station is well located and equipped to serve the City for many years.







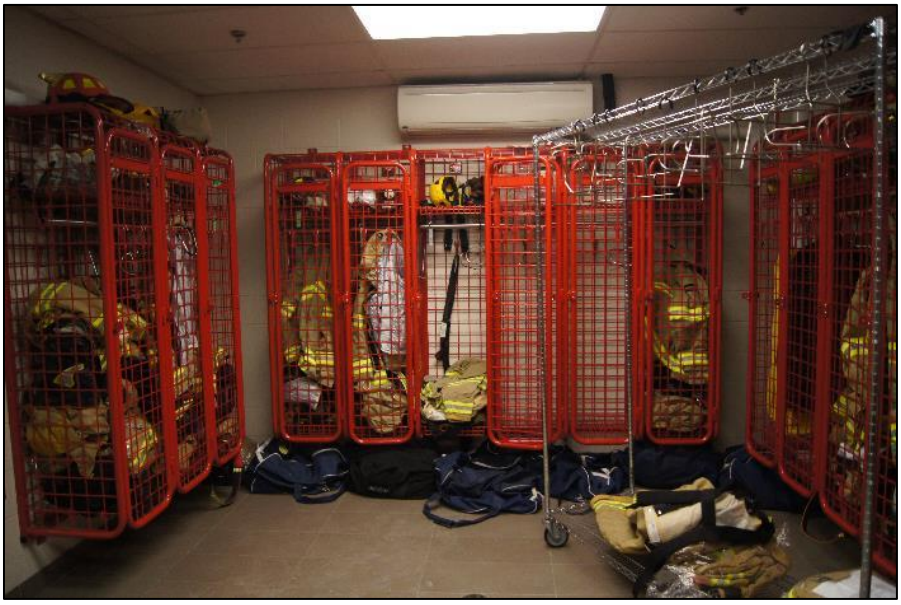

AMBULANCE

6.2.6 Station 8-6

Station #8-6 is located at 101 Gamble Road serving the Yonge Street corridor in the mid-way point of the City. It is a residential area with single family dwellings, high-rises and the commercial sections along Yonge Street. Built in 2012, this station is the newest of all the stations. It has two apparatus bays that are double deep and drive-through. It has many amenities that are well suited for the crews including both male and female dorms, a lounge and a large, well-equipped fitness area.

The station is well equipped with a separate bunker gear room, equipment maintenance room, washrooms with showers, offices for the station officers, kitchen, a lounge, dining area, etc. This station is well located and equipped to serve the City for many years. Overall, this is a well-designed fire station.

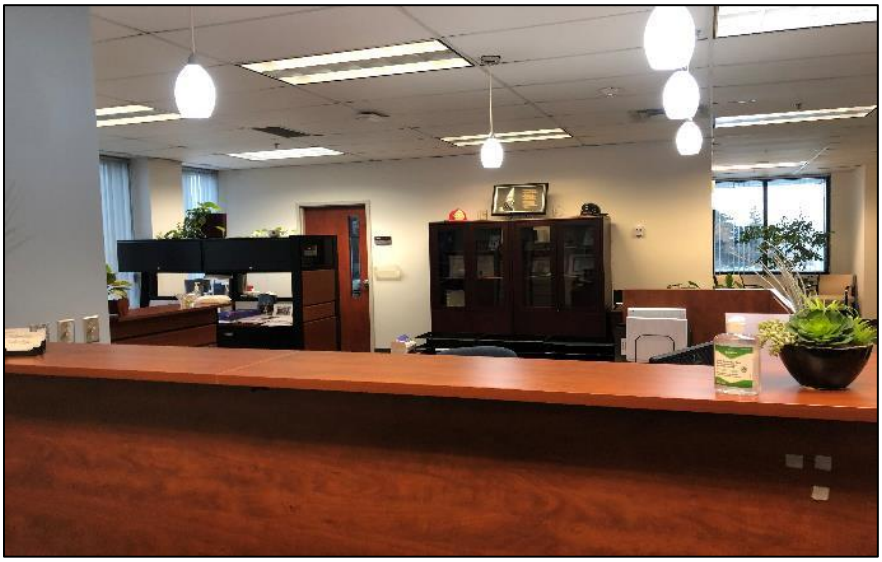

864



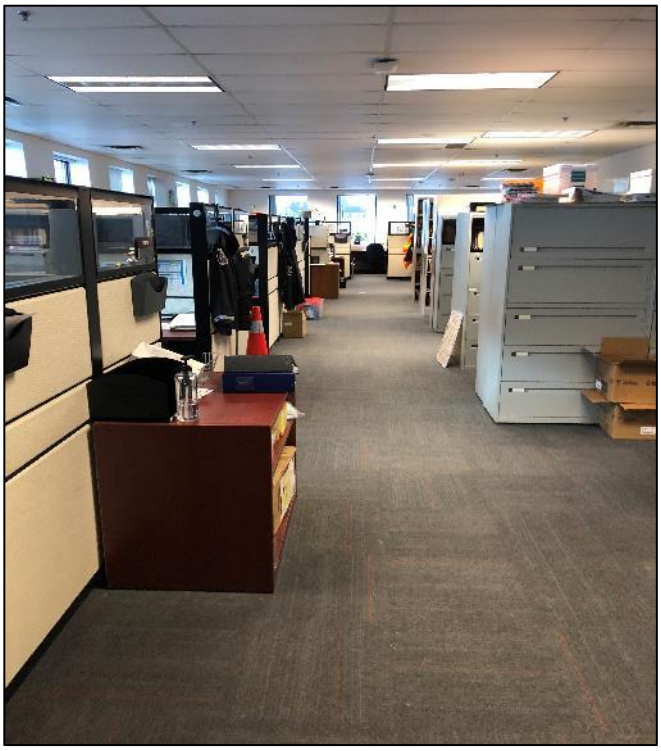
6.2.7 Headquarters

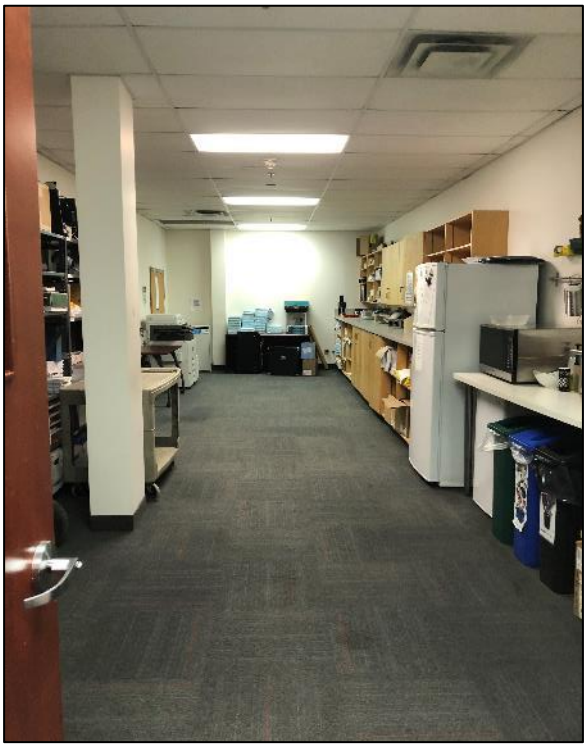
Headquarters is located at 1200 Elgin Mills Road East. The office space is where the department's Administration, Fire Prevention and Training Divisions are located. The structure is located within one of the City's complexes where multiple city departments are located. The building uses various corridors and there is limited space for expansion. The space is made up of cubicles and a small boardroom that can accommodate six people and a larger one that can accommodate 12 to 15 people. The building was originally used by the power utilities company, until they moved and it was repurposed for the Department's use as an Administration Centre.

Presently, the space is adequate but lacks capacity to grow and the location presents a number of challenges. The space is not easily accessible by the public or firefighters.




Directory
FIRE
ADMINISTRATION
RICHMOND HILL
Help Others
In the Community
Stay Safe

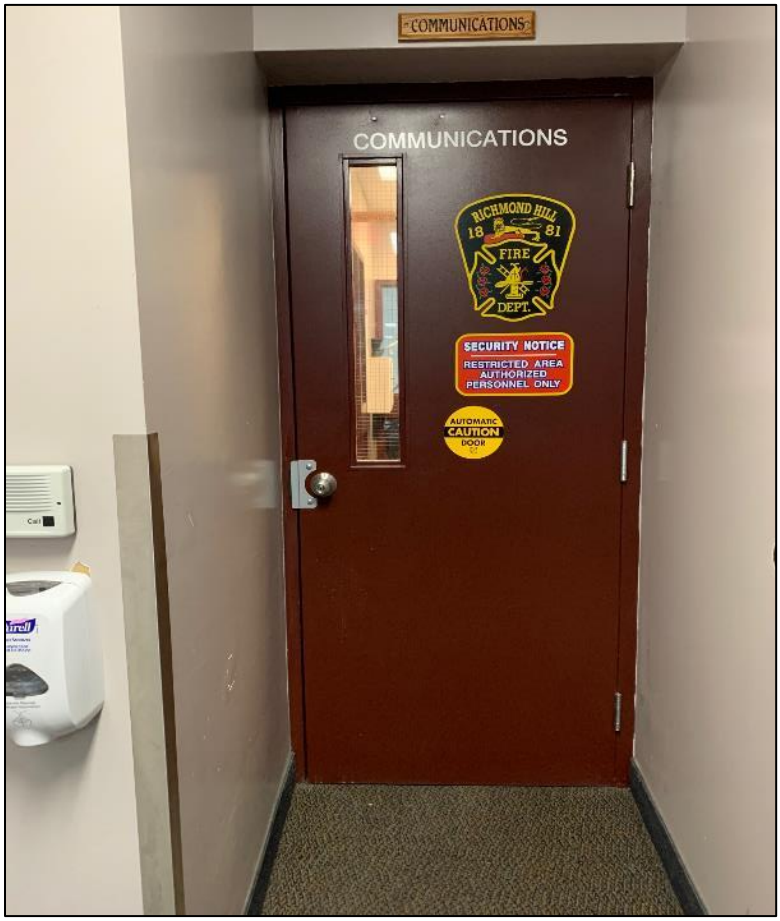


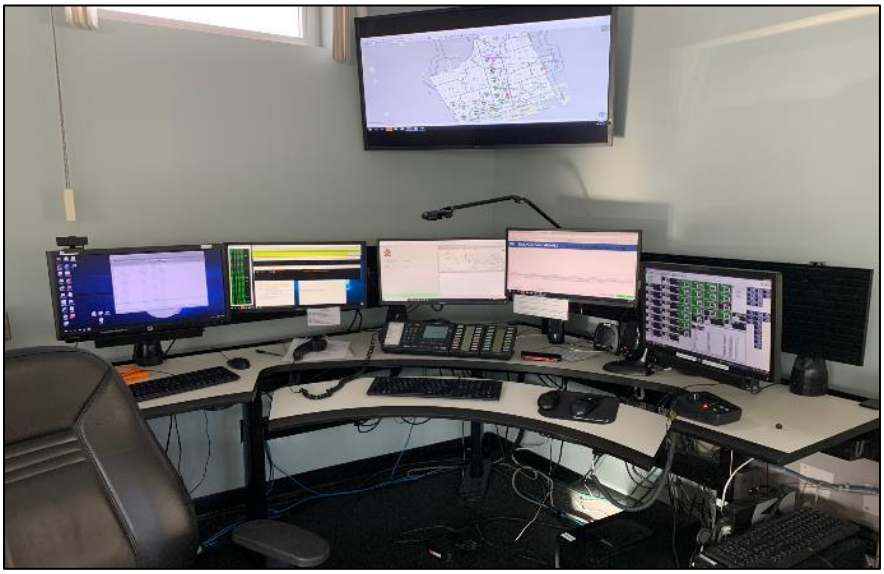


6.2.8 Communications

The Communications Division has been located within Station 8-1, at 191 Major Mackenzie Drive West since, it was built. NFPA 1221, *Standard for the Installation, Maintenance, and use of Emergency Services Communications System*s is used when designing a modern Communications Centre.

While the Communications Centre is spacious, some amenities are outdated. A double-door secure door system is required for secure entry, and is present at the centre. Windows in the communications centre should be bullet resistant to Level 4 as defined in ANSI/UL 752, *Standard for Bullet Resistant Equipment*, and be non-transparent so persons outside cannot view the dispatch area.





6.2.9 Mechanical

The mechanical division is located at the fleet repair complex for the City but is not a part operationally with the city's mechanical division. There is a rolling set of doors that separate the two entities. Further discussion of the operation and concerns within the repair bays are noted in Section 7 of this FMP.

6.3 Type of Buildings and Options for Fire Stations

Traditionally, emergency response stations have been stand-alone structures. Municipalities have been shifting to integrating services into shared use buildings with emergency service response stations being built into community centres, libraries, public works buildings, etc.

It is common across Canada to have different emergency services co-located; this has included fire and police, fire and paramedics, or all three in the same building. These stations normally have separate quarters within the same building, with separate entrances and facilities. This permits each service to operate independently while taking advantage of the efficiencies of a single structure.

Municipalities are looking for opportunities to create more efficient use of space and financial resources and integrate municipal services within the community. There are several models that are being used in different jurisdictions including public/private partnerships, partnerships with non-profit organizations, and leasing of available commercial space.

As technology, community demographics, and operational requirements evolve, maintaining an ability to be flexible in the station design, construction, and location will benefit the community in the long-term.

Leasing reduces the initial capital outlay, placing building maintenance responsibility on the landlord and allows the City the flexibility to move, should there be a change in community development.

The following is the new City of Vancouver Fire Station #5 that is being integrated into a community housing project run by the YWCA. The two floors make up the fire station with the upper four floors of the six-storey building providing 31 affordable housing units for single mothers and their children.

While the fire station was funded by the City, the YWCA housing portion of the building received funding from the City, Province and Federal governments as well as the YWCA who launched a capital fundraising campaign. Having the two services integrated provides a sense of safety and security for the single mothers and their children.

In Calgary, plans are underway to build a multi-use building *(pictured below)* that includes an affordable housing tower, a market condo tower, offices and retail complex along with a fire station and paramedic station (paramedic services are operated by the Province of Alberta). This is a public/private partnership.

In Montreal, a fire station *(pictured below)* is built into the ground floor of the Palais des Congress de Montreal, a convention centre that includes a transit hub and retail space. This was a public/private project including the city and the province.

The City of Barrie has leased the end unit of a commercial strip mall as a fire station *(pictured below)*. The unit was constructed by the landlord to meet the city's requirements.

6.4 Fire Facilities Summary

After reviewing the fire station facilities, administration, communications, and mechanical, EM&T would like to make the following recommendations to bring the buildings up to industry standards and serve the City of Richmond Hill for many more years.

During the evaluation process EM&T found that the Divisions of RHFES are spread out in several locations. Administration, Training, Prevention and Mechanical are at one location; communications at another; mechanical at another; and both the Primary and Secondary EOCs are located in fire stations. The Department would function more efficiently if all the Divisions were located at one location allowing access for both the public and the firefighters to any of the Divisions. The city should examine the options and benefits of bringing these divisions together into one location. Options could include leasing, purchasing, or building a new headquarters. The city should consider acquiring adequate land for Station 8-7 that a headquarters and training centre could be built on the one lot.

An electrical audit would identify that the emergency generators are not properly energizing the entire stations when there is a power failure. The emergency power supply should be installed in such a manner to ensure the entire building is energized. As mentioned previously, this condition is found in stations 8-2 and 8-3.

A building condition and needs assessment should be undertaken to determine if some of the fire stations should be replaced while others should receive renovations to update the features to accommodate all members of the fire department. As mentioned in Section 1, any properties that cannot be repurposed by the City for other City Departments should be liquidated and those funds put towards the costs of new construction. Some of the stations are situated on property that may permit additions to the stations including a second storey, additional apparatus bays and rooms.

Recommendation – Strategic:
RHFES and the City's facility services complete a building condition and needs assessment of all the RHFES fire stations to see if they are viable structures to be renovated and upgraded or replaced, to be more in-line with current industry standards and to ensure compliance with provincial legislation and applicable standards.

Recommendation – Strategic:
RHFES should work with the City's facility services to examine space requirements and options to create a headquarters that includes Administration, Fire Prevention, Training, Communications, Mechanical, and CEMC/EOC.

All stations should be evaluated to ensure compliance with provincial legislation, standards, and regulations. This would include and not be limited to functioning oil separation tanks in the apparatus bays; bunker gear stored in negative pressure rooms; gender neutral dormitories, locker rooms and showers; barrier free; installation of decontamination showers and eye wash stations in the apparatus bays; and discontinued use of fitness equipment in the apparatus bays.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
38	RHFES and the City's facility services complete a building condition and needs assessment of all RHFES Fire Stations to see if they are viable structures to be renovated and upgraded or replaced, to be more in-line with current industry standards to ensure compliance with provincial legislation, and applicable standards.	$100,000 for engineering firm	Short-term (1-3 years)
39	RHFES should work with the City's facility services to examine space requirements and options to create a headquarters that includes Administration, Fire Prevention, Training, Communications, Mechanical and CEMC/EOC. Options could include leasing, purchasing, or building a new headquarters.	Staff time Cost based on staff report	Immediate (0-1 year)

SECTION 7 – Apparatus & Equipment

Section 7: Apparatus & Equipment

7.1 Fire Apparatus - New and Replacement Schedules

This section assesses the general state of the Department's apparatus, vehicles and equipment—reviewing existing vehicles and equipment condition, maintenance programs, capital replacement schedules and plans relative to existing and expected service demands.

When assessing a fire department's ability to respond and meet the needs of the community, FUS considers the age of a fire truck as one of its guidelines. It was noted that RHFES endeavours to keep fire vehicles on a 15 to 20-year replacement cycle to keep them within the FUS recommendations and create a benchmark for forecasting fire truck replacements.

7.1.1 FUS – Vehicle Replacement Recommendations

The *Major Sized Cities/Communities* section (bold red) is the recommendation for vehicle replacement for a city the size of Richmond Hill. This allows for up to a 15-year replacement cycle in which the fire vehicle can then be utilized as second-line response status. The Department should continue ensuring that all first-line units be replaced by a new or younger unit when it reaches 15 years of age.

TABLE #17: FUS Vehicle Replacement Chart

Apparatus Age	Major Cities [3]	Medium Sized Cities [4] or Communities Where Risk is Significant	Small Communities [5] and Rural Centres
0 – 15 Years	**First Line**	First Line	First Line
16 – 20 Years	**Reserve**	Second Line	First Line
20 – 25 Years [1]	**No Credit in Grading**	No Credit in Grading or *Reserve* [2]	No Credit in Grading or *Reserve* [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 [1]	**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 a recognized testing agency on an annual basis to be eligible for grading recognition (NFPA 1071)*
2. *Exceptions to age status may be considered in small to medium sized communities and rural centre when apparatus' condition is acceptable and apparatus' successfully pass required testing.*
3. *Major cities are defined as an incorporated or unincorporated community that has:*
    a. *a populated area (or multiple areas) with a density of at least 400 people per square kilometre; AND*
    b. *a total population of 100,000 or greater.*
4. *Medium Communities are defined as an incorporated or unincorporated community that has:*
    a. *a populated area (or multiple areas) with a density of at least 200 people per square kilometre; AND*
    b. *a total population of 1,000 or greater.*
5. *Small Communities are defined as an incorporated or unincorporated community that has:*
    a. *no populated areas with densities that exceed 200 people per square kilometre; AND*
    b. *does not have a total population in excess, of 1,000.*

FUS is reviewed by insurance companies. Provided that the department adheres to the recommended replacement timelines through an approved capital replacement schedule, it will retain its fire rating for vehicle replacement.

To ensure the vehicles are being replaced on a regular schedule, the City is also demonstrating due diligence towards ensuring a dependable response fleet for the Department and the community it

serves. This will keep the community's fire rating in good stance, which can also reflect on commercial and residential insurance rates.

Some fire services are no longer operating stand-alone rescue apparatus but instead using more versatile Pumper-Rescues or a smaller Rapid Response type of apparatus. A rapid response vehicle is similar in design to an urban interface wildland apparatus. Rapid response apparatus have been found to be very versatile and cost effective and some models are able to carry up to five firefighters.

7.1.2 NFPA – Vehicle Replacement Recommendations

A standard that supports a regular replacement schedule of fire vehicles is the NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*. Like the FUS recommendations this standard includes guidance on retirement criteria for fire apparatus. This standard recommends that all front-run vehicles are replaced on a 15 to 20-year cycle depending on the community size. These replacement recommendations are for fire vehicles with pumps. For general purpose fire department vehicles, most communities refer to their municipality's vehicle replacement policies.

Although there is no national standard that legally mandates the replacement of emergency vehicles, it must be kept in mind that it is critical to replace these and other apparatus before they become unreliable. Delaying the replacement is inadvisable as it will add to the overall maintenance costs of the apparatus and can have an adverse effect on insurance costs based on the fire department's FUS rating.

It is becoming quite common in fire services to standardize their fleet and ancillary equipment. By doing so, the department may realize savings in training hours and repairs as the variety of parts for repairs is lessened and the time to train firefighters on the apparatus is reduced. Additionally, the firefighters would be able to operate any apparatus in the fleet if they have the same chassis and pump.

Ancillary equipment is standardized such as the hose, nozzles, chainsaws, circular saws, extrication tools, SCBA, ventilation fans, foam equipment, etc. Again, there are savings in repairs and time required for training.

The RHFES is operating well-equipped engines, aerial ladders, rescues and tankers. There also appears to be enough support vehicles and equipment to meet the general needs of the Department. Replacement schedules are identified in the capital forecast for the fire trucks. It is worth noting that some fire departments place their tanker trucks on a 20-year replacement cycle due to the lack of use and mileage put on these specific units. To help with replacement forecasting, this is a vehicle type that can be considered a second line vehicle and may not require replacement at the 15-year mark.

In relation to vehicle replacement and refurbish, the industry standard for the design and replacement of vehicles is the NFPA 1901 and in Canada departments also use ULC S-515-12. It is recommended that these and other related NFPA standards relating to vehicle design, replacement and refurbishing be utilized.

When a new apparatus is ordered it should include all of the required ancillary equipment, which helps ensure this equipment also follows a regular replacement schedule. Further, when the apparatus is moved to a reserve status it remains fully equipped. Once an apparatus is permanently taken out of service the ancillary equipment could be placed in storage to be used to replace damaged items or liquidated.

RHFES has three spare fire apparatus available - two engines and an aerial device. At the time of this document's writing, one of the spare engines was no-longer in service due to a major breakdown.

TABLE #18: List of Apparatus Operated by RHFES

	UNIT #	FLEET #	YEAR	FOAM / ENGINE	V.I.N.	LICENSE #	Purchase Date	Replacement Year	Lifespan
1	E811	8903	2015	SPARTAN GADIATOR/SPARTAN ERV	4S7AU2D96**FIRE CHIEF079760**	**AM58438**	**2015-12-09**	**2031**	15 YEAR
2	E851	8904	2015	SPARTAN GADIATOR/SPARTAN ERV	4S7AU2D98**FIRE CHIEF079761**	**AM58435**	**2015-12-09**	**2031**	15 YEAR
3	SP1	8940	2006	SPARTAN GADIATOR CLASSIC/ SMEAL	4S7AU2J99**6C054033**	**786 5TV**	**2006-09-27**	**2021**	15 YEAR
4	E861	8987	2012	SPARTAN GADIATOR/SPARTAN ERV	4S7AU2E99**CC075793**	**AC63654**	**2012-09-17**	**2027**	15 YEAR
5	E821	8995	2014	SPARTAN GADIATOR/SPARTAN ERV	4S7AU2D92**EC078135**	**AJ5 3784**	**2014-10-24**	**2029**	15 YEAR
6	E841	8996	2014	SPARTAN GADIATOR/SPARTAN ERV	4S7AU2D94**EC078136**	**AJ53800**	**2014-10-24**	**2029**	15 YEAR
AERIALS									
7	A836	8905	2016	Inferno HD107 Rear Mount Aerial	1F9507732**FH1040191**	**AP83788**	**2016-10-11**	**2031**	15 YEAR
8	SP2	8980	2010	Spartan / Smeal 32m	4S7AX2F95**AC072201**	**768 OZS**	**2010-04-01**	**2025**	15 YEAR
HAZ MAT									
9	H848	8912	2018	FREIGHTLINER/ MAXI	**3ALACYFE3JDJJ3547**	**AY31073**		**2033**	15 YEAR
RESCUES									
10	TR819	8915	2006	SPARTAN EVOLUTION	4S7AV2J95**6C054530**	**01 FS 30**	**2006-09-01**	**2021**	15 YEAR
11		8990	2012	2TINGA / CHALLENGER 1600	CA-CN-YLZ00023G012	**K8557R(Trailer)**	**2012**	**2027**	15 YEAR
12		8991	2012	MELTRAIL / TUNNEL HULL	2M91B1112P161014	**K8557R(Trailer)**	**2012**	**2027**	15 YEAR

	UNIT #	FLEET #	YEAR	FOAM / ENGINE	V.I.N.	LICENSE #	Purchase Date	Replacement Year	Lifespan
13	WR829	8992	2013	SPRINTER 2500 CSRGO VAN	WD3BE7CC5**D578284 2**	**AE64797**	**2013-07-26**	**2020**	7 YEAR
TANKERS									
14	T864	8933	2004	FREIGHTLINER / DEPENDABLE	1FYACYDC8**5HN9914 4**	**889 7NJ**	**2004-11-01**	**2019**	15 YEAR
15	T824	8934	2004	FREIGHTLINER / DEPENDABLE	1FYACYDC6**5HN9914 3**	**901 8NJ**	**2004-11-01**	**2019**	15 YEAR
16	T844	8994	2013	International / DEPENDABLE	1HTWCAZR4**DJ19569 3**	**AF67097**	**2014-02-01**	**2028**	15 YEAR
MOBILE COMMAND POST									
17	CMD80	8923	2000	FLEETWOOD BOUNDER	3FIRE CHIEFNF53S3XJA2048 9	**109 3HF**	**1999-11-01**	**2014**	15 YEAR
TRAILERS									
18		8911	2018	(ATV) 8216ALSL7K	5LEB1UF28J1184724	**P3510Z**			
19	R850T	8950	2005	TECHNICAL RESCUE TRAILER	2B9EA426X5B112020	**C83 50F**	**2005-08-01**		
20	FPT	8951	2005	WELLS CARGO ROAD FORCE TRAILER	1W42D0C156111537 7	**C49 11S**	**2006-05-01**		
21	FPT	8955	2006	FIRE SAFETY HOUSE TRAILER	1SSTT35T0611SS066	**C96 48D**	**2006-05-01**		
22	TR1	8979	2010	HAZ MAT TRAILER	38156915		**2010-06-10**		
UTILITY									
23		8909	2016	ATV POLARIS	4XARAA760GT73444 7	**AM58438**	**2017-09-21**		
24	U 810	8975	2010	Chev 3500 - Reg Cab - Plow	1GC3KZBGXAF136477	**948 5YH**	**2010-01-19**	**2017**	7 YEAR
24		8916	2020	FORD F 250	1FT7W2BN8LED8092 5	**BD66606**	**2020-07-30**	**2027**	7 YEAR
CHIEF'S									

	UNIT #	FLEET #	YEAR	FOAM / ENGINE	V.I.N.	LICENSE #	Purchase Date	Replacement Year	Lifespan
25	CH 8-1	8998	2017	Ford Expedition	1FMJU1JTXHEA64161	**CRNW795**	**2017-03-31**	**2024**	7 YEAR
26	CH 8-2	8906	2017	Ford Expedition	1FMJU1JT8HEA64160	**CBNM796**	**2017-03-31**	**2024**	7 YEAR
27	CH 8-3	8907	2015	Ford Explorer	1FM5K7D87FGC17999	**AK 55445**	**2015-03-23**	**2022**	7 YEAR
INCIDENT SAFETY OFFICER									
28	CH 8-5	8908	2015	Ford Explorer	1FM5K7D88FGC18000	**AK 55442**	**2015-03-23**	**2022**	7 YEAR
PLATOON CHIEF'S									
29	CAR 8-4	8978	2018	FORD F 150	1FTEW1E58JFB90417	**AX51487**	**2018-07-17**	**2025**	7 YEAR
MECHANICAL									
30	MIRO	8993	2013	DODGE - GRAND CARAVAN	2C4RDGBG4DR729595	**CJJJ 699**	**2013-10-29**	**2020**	7 YEAR
PREVENTION VEHICLES									
31	*PYLE/AN*	*8984*	*2012*	*CHEVROLET-EQUINOX*	*2GNFLEE51C6329425*	***CJJJ 921***	***2012-05-01***	***2019***	*7 YEAR*
32	RAYAN	8986	2013	Chev TAHOE	1GNSK2E09DR116426	**CJJJ 923**	**2012-07-31**	**2020**	7 YEAR
33	SPARE	*8976*	*2010*	*Chev - HHR*	*3GCAADB1AS607439*	***689 6YK***	***2010-04-14***	***2017***	*7 YEAR*
34	*Vince*	*8983*	*2012*	*CHEVROLET - 2500 4X4*	*1GT12ZCG9F173514*	***AZ 34030***	***2012-02-10***	***2019***	*7 YEAR*
35	*Shanyn*	*8997*	*2014*	*DODGE - GRAND CARAVAN*	*2C4RDGBG2ER315295*	***CJJJ 924***	***2014-10-28***	***2021***	*7 YEAR*
36	*CHRIS*	*8900*	*2015*	*Ford- FUSION (HYBRID)*	*3FA6P0UXFR240416*	***CJJJ 926***	***2015-02-10***	***2022***	*7 YEAR*
37	*TULLIO*	*8901*	*2015*	*Ford- FUSION (HYBRID)*	*3FA6P0UU1FR240417*	***CJJJ 931***	***2015-02-17***	***2022***	*7 YEAR*
38	*DAN*	*8985*	*2012*	*CHEVROLET-EQUINOX*	*2GNFLEE54C6331699*	***CJJJ 922***	***2012-05-01***	***2019***	*7 YEAR*
39	SPARE	8988	2013	CHEVROLET SUBURBAN 4X4 LS	1GNSK5E73DR161179	**AZ 34031**	**2012-06-05**	**2019**	5 YEAR

	UNIT #	FLEET #	YEAR	FOAM / ENGINE	V.I.N.	LICENSE #	Purchase Date	Replacement Year	Lifespan
TRAINING									
40	TR 2	8971	2008	CHEVROLET - 3500 4X4	1GCHK33K68F215726	**354 8WH**	**2008-08-01**	**2015**	7 YEAR
41	TR 3	8902	2015	DODGE - GRAND CARAVAN	2C4RDGBG8FR633813	**CJJJ 925**	**2015-02-12**	**2022**	7 YEAR

During the process of drawing the specifications of a new apparatus, an Apparatus Committee (the Committee) should be organized including the establishment of its Terms of Reference. Members of the Committee should include the Deputy Chief of Support, Deputy Chief of Operations, the Department's EVT, a Platoon Chief, a Captain, and firefighters who may have a vested interest in the specifications. By having a committee, all aspects of the specifications will be considered including the purpose and function of the apparatus, the power plant, pump size, compartment sizes, ancillary equipment, hose loads, chassis safety features including air bags and health and safety concerns such as clean cab technologies and enhanced chassis stabilization to lesson the risk of a roll over.

Some municipalities in Ontario are choosing to lease some of their fleet vehicles such as cars, vans and pick-up trucks. Lease payments can be more manageable and less impactful on their budgets. At the end of the lease agreement, they return the vehicle and pick-up a new replacement. Taxes are paid monthly on the cost of lease instead of paying a lump sum at the time of delivery. Maintenance costs have been reduced as the vehicle comes with a minimum of a three-year warranty; all of which impacts the budget to a lesser degree.

In the United States, departments have turned to leasing their fire apparatus, on a five to ten year lease, when they are replaced by new apparatus. This practise reduces costly repairs of aging equipment as well as one-time capital costs. Several Canadian fire services are exploring lease options.

7.1.3 Command Unit

The Command Centre Unit is 21 years old and is not used very often at fire scenes as a command post. Due to its age and the lack of use, the Department should complete a review on the value of completing upgrades to technologies onboard and examine the mechanical fitness; it might be more advantageous to liquidate the unit. It has been used, on rare occasions, as a rehab unit, which allows firefighters to acquire some rest and refreshments, especially during extreme weather conditions.

Within this FMP, firefighter wellness is addressed and should be included at fire scenes. Fighting fires at times may be very taxing on the health of firefighters and a physical break at the scene is warranted. Most rehab units have air conditioning, heaters, showers, washroom facilities and a sink to wash their hands before the ingestion of any fluids or food. The firefighters bunker gear should be removed to help prevent the absorption of chemicals and the by-products of combustion. During hot summer months the core of a firefighters body needs to be cooled down before illnesses such as heat exhaustion or heat stroke come into affect.

Even though the Command Centre has been used as a rehab unit in the past, it does not have the facilities to provide the means of establishing a proper and efficient rehab process to reduce the risks of future illnesses, such as cancer. There is a generator, air conditioning, washroom, refrigerator, etc.

on board. To bring it to the level it would need to be as a rehab unit could be cost prohibitive due to the age of the vehicle, cost of renovations and its mechanical condition.

The RHFES should invest in the acquisition of a multi-purpose vehicle that will fill the role of multiple vehicles in one unit. The unit's core function could include being a command centre, air bottle refill centre, decontamination unit, rehabilitation unit, and offers scene lighting at night. The apparatus should include an exterior decontamination shower, internal showers, hand washing, microwave, kitchenette, hot/cold running water, washroom, seating, A/C, onboard generator, air compressor for refilling SCBA bottles and spare air bottles for self contained breathing apparatus.

Once in service it could be offered to aid other fire services as a revenue generation opportunity. Not many fire services have an air, light and command apparatus nor a proper rehab vehicle. This vehicle would not only be a significant asset to the York Region Fire Services but could be used for other departments as well.

Recommendation – Strategic:
It is recommended that the RHFES purchase a multi purpose apparatus to fill the role as a command centre, air, light, decontamination, rehab apparatus.

As a potential method of saving funds on the cost of the rehab unit, the Department might be able to repurpose the chassis from an engine or aerial device or review opportunities of purchasing a used conventional chassis with a wheelbase and gross vehicle weight ratio to accommodate the associated compartments, generator, air bottle refill station, etc.

7.1.4 Elevated Devices

The RHFES elevated devices currently in service are aerial ladders**.** Their primary purpose is the rescue of residents from high locations and to fight fires from above or to be used as an extension outward as a water way. They require high-capacity fire pumps and the nozzles at the end of the ladder have either a 3,500 L (750 gallon) or 5,000 L (1,000 gallon) per minute output.

Many departments are purchasing apparatus that have a platform with a railing around it at the end of the ladder in which two or more firefighters may stand in and direct the water stream from inside the "bucket". This style apparatus is very versatile in their applications on the fire ground and make rescues easier and much safer. The risk to firefighters is reduced as the railing and associated side panels help to protect them, along with safety belts to prevent them from falling.

The single most advantageous feature of aerial-platforms is that two discharge nozzles may be installed on the platform allowing for two high volume water streams being discharged on the fire at the same time. The nozzles are independent of the other and may be aimed at different directions

and have assorted water flow patterns. Technically the Department would be operating two elevated water devices by using one aerial. Any future aerial purchases by RHFES should include consideration of any advantages of the purchase of an aerial-platform versus an aerial.

7.1.5 Damage of Salt Brine

Over the last number of years municipalities are using salt brine on the roads in the winter to reduce the adhesion of snow and ice to road surfaces. This mixture is causing significant damage to fire apparatus and advancing the rusting of the vehicle's body. Once the frame rail of an apparatus begins corroding it may in time split, creating very expensive repairs and in some instances making the vehicle un-road worthy. RHFES Mechanical Division should wash the underbody of every fire apparatus each spring and have the body sprayed with an anti-rusting agent to slow the rusting process and reduce the repair costs associated with this issue.

7.2 Maintenance & Equipment

RHFES tracks the completion of annual equipment testing to ensure the functionality of equipment for the front lines. Scheduling of the testing allows the Department to confirm that apparatus and equipment testing can be done to minimize frontline apparatus being unavailable.

7.2.1 Bunker Gear

Every year, firefighters in ever-increasing numbers are being diagnosed with cancer. A contributing factor to their illness has been proven to be the contaminants that adhere to the bunker gear during fire fighting operations. After a fire, the bunker gear should be packaged and sent for cleaning to reduce this risk. RHFES stations have commercial washing machines made specifically for this type of cleaning.

While bunker gear is being cleaned, the fire fighter requires a replacement set. Ensuring that the cleaning of gear is a high priority after fires and that firefighters have access to properly fitting bunker gear during the cleaning process will assist the Department in meeting its decontamination and hygiene program. The Department is in the process of assigning a second set of bunker gear to each fire fighter, so they have a clean set to place in service.

When used for interior structural firefighting, bunker gear has a life span of 10 years as stated in NFPA 1851, *Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

Further to contaminating the bunker gear, toxins also contaminate the firefighter's uniform.

7.2.2 Asset Management Program

Fire Administration has an established asset management program and specifically a master equipment life-cycle plan to ensure that equipment replacement is occurring where applicable. It is a common practice to tie this equipment to the parent apparatus. This will be accomplished through the Firehouse computer program.

Many pieces of equipment have a predetermined life span as established in either the NFPA Standards and/or the OH&S Sections 21 Guidance Notes. When it comes to the end of the life span, the items must be decommissioned, replaced with new items, and then disposed of in a manner that ensures they could not be used by any other outside interests for liability reasons. The asset management program should be designed to trigger notifications when an item is approaching the end-of-life span and plans should be in place for replacement (i.e., identified in the budget).

7.2.3 Generators

When there is a power interruption there is an automatic power back up system available at each of the stations. Even though there are generators installed, not all of them are providing power for the entire station and this is a health and safety concern. Each station should have 100% of the building with power and the lack of total power coverage could lead to injuries. Injuries of staff could further result in lack of staff responding to a call, time away from work, and possible investigations by both the Ministry of Labour and the WSIB of Ontario.

Recommendation – Strategic:
It is recommended that the City of Richmond Hill conduct an electrical audit of the fire stations and make changes to ensure the station has complete electrical power during a power outage.

7.2.4 New Technologies

Technology is ever evolving within the fire service, with new pieces of equipment being added to the resources used by an incident commander. One such technology which has proven to be a valuable tool is the use of drones. Police services have been using them for some time to locate missing persons or document accidents and crime scenes.

With the City advancing high rises to new heights, the addition of a drone to RHFES' equipment list would prove very valuable to the Incident Commander. The drone could be sent up to the fire floor to get a good view of events occurring before the first firefighters arrive. It would also provide an advantage point for the Incident Commander to see how the fire attack is progressing. Some drones are capable of recording transmissions.

New technologies are being developed each year to protect the firefighters; these include the use of robotics to fight fires, which are being actively used in Europe and Asia.

New SCBA have built in telemetry systems that, like some portable radios, identify the location of the fire fighter. New technology SCBAs can transmit GPS data, the amount of air in the SCBA cylinder, monitor the heart rate, level of exertion the fire fighter is being exposed to, and body temperature.

As the technology progresses it is important to monitor the benefits and opportunities to integrate these devices into the fire service.

7.3 Hydrants

The City supplies water to the populated areas and has installed approximately 4,600 fire hydrants of which 400 are considered critical hydrants and are tested each month to ensure operability. These are situated in areas of the City that are considered high risk areas in which vulnerable occupancies, schools, community centres, hospitals, youth residences and medical treatment centres are located.

All fire hydrants should be inspected and tested as required, in Articles 6.6.5.2. through 6.6.5.7. of Ontario Regulation 213/07 of the *Municipal Act*. NFPA 24, *Standard for the Installation of Private Fire Service Mains Their Appurtenances,* along with NFPA 291, *Recommended Practises of Fire Flow Testing and Marking of Hydrants* are also followed. The City ensures every hydrant is flushed each year. The failure of a hydrant to operate as required may present catastrophic results and expose the City to risk of litigation.

Water reservoirs in the City are operated and maintained by the Region of York. These include both inground and above ground reservoirs. The minimum water main size permitted to be installed in Richmond Hill is 150 mm (6”). In 2017, the City initiated a 10-year road improvement and water main replacement program in the older parts of the city.

When a fire hydrant is out of service, repairs should be completed in an expedited manner, notifying the fire department of such breakages and the anticipated time to complete the required repairs.

During winter months some hydrants will have markers installed beside for ease of location amongst snowbanks. It would aid firefighters year-round to locate a hydrant at night with reflectors being installed on the 65mm ports and be colour coded to the hydrant’s flow rate.

There are no dry hydrants within the City’s boundaries.

7.3.1 Couplings and Hose

Modern fire hydrants have three ports for attaching a fire hose when required. The two ports on the side are 65 mm (2 ½") in diameter and the large steamer port on the front may vary in size from 100 mm to 150 mm (4" to 6"). Normally the large steamer port has threads on it, in which fire services attach large diameter water supply hose ranging in size from 100 mm to 150 mm. The water supply hoses do not have threads but Storz couplings or lug locks in which to attach the hoses together. To attach a hose with these couplings to a hydrant requires the fire service to use an adaptor to allow the hose to be attached.

Many municipalities, including Richmond Hill, are now ordering new or replacement fire hydrants with Storz couplings on the large steamer ports, eliminating the need for an adaptor. If an adaptor is not available to be used on the hydrants the firefighters are unable to attach the hose to the steamer port and may have to resort to finding a smaller adaptor and attach it to the 65 mm (2.5") port.

It is the policy of the City that any new hydrant installations include steamer ports and have the Storz connection on them.

7.4 Superior Tanker Shuttle Accreditation

Many fire services have attained their Superior Tanker Shuttle Accreditation and in doing so, FUS reduces insurance rates within that community which represents a small savings to the residents. The Tanker Shuttle Accreditation demonstrates that the fire department can aggressively attack rural fires maintaining a consistent large volume of water flow in areas without fire hydrants. Part of the process is to ensure tankers have adequate, nearby locations with which to refill using regular hydrants, dry hydrants, cisterns, streams, or the lake (preferably with a dry hydrant).

The improvements made to the DPG as noted above can be partly attributed to the RHFES becoming accredited through FUS in the Superior Tanker Shuttle Service for the delivery of alternative water supply systems in 2019. Achievement of this accreditation for Fire Station 8-2, Fire Station 8-4 and Fire Station 8-6 is noteworthy and the RHFES should be applauded for this significant accomplishment. It is recommended that the RHFES continue supporting the Superior Tanker Shuttle Service Accreditation and prepare for re-accreditation to occur in 2024.

Recommendation – Strategic:
It is recommended that the RHFES maintain their Superior Tanker Shuttle Accreditation for the City of Richmond Hill.

The RHFES should reference NFPA 1231, *Standard on Water Supplies for Suburban and Rural Fire Fighting* to see what enhancements could be achieved in their operations.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
40	Purchase a multi-purpose apparatus to fill the role as a command centre for air, light, decontamination, and rehab apparatus.	$800,000 - $1 million	Short-term (1-3 years)
41	The City of Richmond Hill conduct an electrical audit of the fire stations and make changes to ensure the station has complete electrical power during a power outage.	$5,000 - $10,000	Immediate (0-1 year)
42	RHFES maintain their Superior Tanker Shuttle Accreditation for the City of Richmond Hill.	$3,000 - $6,000	Ongoing

SECTION 8 – Emergency Management

8.1 Emergency Management Program

Section 8: Emergency Management

8.1 Emergency Management Program

As mandated by the *Emergency Management and Civil Protection Act* (EMCPA) all municipalities in Ontario must have an emergency response plan and an emergency planning program. For every community in Ontario there must also be an identified CEMC. Currently this duty falls to the full-time CEMC who began employment with the City in early 2021. The Fire Chief, along with both Deputy Fire Chiefs, are the Alternate CEMCs for the City and all three officers have completed the required training for the position.

Work is required to update the Emergency Response Plan (ERP) along with emphasis on annual training exercises to ensure that the ERP is reviewed and practiced on a regular basis. The most recent ERP document is dated 2010. The Provincial Emergency Management Office notes that all emergency plans are to be reviewed and updated annually.

Recommendation – Operational:
It is recommended that Richmond Hill's CEMC continue to review and update the Emergency Plan for the City as per the Emergency Management & Civil Protection Act of Ontario.

After review of the current ERP, consideration should be gen to the inclusion of emergency plans from outside agency's being included in the appendix such as flood plans. These agencies may include conservation authorities, railway emergency response plans, major industry, and EMS.

The primary and secondary Emergency Operations Centres (EOC) are multi purpose spaces that were not designed for the functionality of an operational EOC. The primary EOC is located at the RHFES Station 8-5, while the secondary EOC is at Station 8-1 which lacks technology. One could be established in the City's Operation's Centre, where it would be better suited and readily accessible to the City's many Departments.

Both current locations have a standby generator for emergency power in the event of a power loss. It should be noted that within this FMP, in Section 6 there is discussion of establishing both the primary and secondary EOCs at a different location where they will be more functional. It would be beneficial to move the primary EOC to the Operations Centre as other City Departments are established in that building and the RHFES Training Division could also access the room for the purpose of training staff. There is room at the Operations Centre suitable for this purpose and would not require much in the line of renovations aside from IT installations.

The secondary EOC should no longer be at Station 8-1 where the technological and other necessities in the operation of an EOC are not present. Station 8-5 would become the secondary EOC instead of

the primary. Funds are budgeted in 2021 to perform upgrades at this location to make it more efficient and those funds could be directed elsewhere, such as moving the primary EOC.

Recommendation – Strategic:
It is recommended that the primary EOC be moved to the Operations Centre and the secondary EOC be moved to Station 8-5.

There are sufficient staff currently working in the CEMC office to ensure the City is in compliance with provincial legislation.

The office has developed an integrated response program comparable to NFPA 3000, Standard for an Active Shooter/Hostile Event Response (ASHER) Program, which will be delivered to city staff in the future. Due to the pandemic, training initiatives will need to be delayed until such time as it is safe to deliver them.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
43	Continue to review and update the Emergency Plan for Richmond Hill annually as per the *Emergency Management & Civil Protection Act* of Ontario.	Staff time	Short-term (1-3 years)
44	Move the primary EOC to the Operations Centre and the secondary EOC to Fire Station 8-5.	$200,000 - $300,000	Immediate (0 to 1 year)

SECTION 9 – Mutual Aid, Automatic Aid, and Fire Protection Agreements

9.1 Mutual Aid, Automatic Aid & Fire Protection Agreements

Section 9: Mutual Aid, Automatic Aid, and Fire Protection Agreements

Mutual aid, automatic aid and fire protection agreements are programs used to:

- Support a community's fire department at times when local resources are exhausted.
- Offer quicker response coverage to areas that may be closer to a bordering a fire department's response area than that of the host department.
- Create an automatic response by bordering fire departments to properties that are closer to their fire stations than that of the host fire department.

9.1. Mutual and Automatic Aid

RHFES is a member of the Region of York Mutual Aid Plan and Agreement which includes the fire services of Richmond Hill, Vaughan, Markham, Central York, King Township, Georgina Township, Whitchurch-Stouffville and East Gwillimbury.

The Region's Mutual Aid Plan is established to aid in the mitigation of any emergency situation that may arise and identify and provide the resources available to respond to the situation. It is updated annually with the updated version forwarded to the OFMEM.

Mutual aid is meant as a reciprocal agreement whereby one department aids another at a major incident. Mutual aid should not be used as a means of supplementing short comings in fire protection. The Council of the responding fire service may serve notice that the municipality of which they are responding to has identified an exposure risk and should take appropriate action to make corrections. Numerous times each year RHFES activates mutual aid to assist them at a fire in the form of tankers or aerials.

Automatic Aid and Response Agreements are an appropriate means of identifying areas of the home department's response capabilities and fill in any gaps that exist. This may include responses to remote areas of a municipality or the provision of a technical rescue team. RHFES does not have any such agreements in place and in efforts to do so has been met with the lack of interest from other fire services.

Some of the other fire services in York Region have fire stations that are close to the border of Richmond Hill. These stations, if available at the time, could respond into Richmond Hill to assist RHFES at an incident until RHFES has adequate resources at the scene. RHFES could reciprocate this in aiding the fire service for which the agreement is with.

Recommendation – Operational:
RHFES enter into discussions with neighbouring fire services regarding Aid Agreements to provide or receive assistance at an incident until such time as the department has adequate resources of their own at the scene.

As mentioned previously, RHFES has a well established and trained technical rescue program and should promote their availability to other fire services outside of York Region that may not have such capabilities. This would be an excellent source of revenue generation when stand-by and response fee structures are established.

Recommendation – Operational:
It is recommended that the RHFES explore opportunities to provide technical rescue responses to municipalities outside of Richmond Hill.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
45	RHFES enter into discussions with neighbouring fire services regarding Aid Agreements to provide or receive assistance at an incident until such time as the department has adequate resources of their own at the scene.	Staff time and possibly a standby fee	Short-term (1-3 years)
46	RHFES explore opportunities to provide technical rescue responses to municipalities outside the jurisdiction of Richmond Hill be included in the updated version of the Establishing & Regulating By-Law.	Staff time – revenue generation initiative	Short-term (1-3 years)

SECTION 10 – Finance, Budgeting & Capital Investment Plan

10.1 Operating & Capital Budgets
10.2 Development Charges Program
10.3 Fees By-Law

Section 10: Finance, Budgeting & Capital Investment Plan

10.1 Operating & Capital Budgets

RHFES has an annual operating budget that appears to offer the Fire Chief the funds required to manage and support the Department's staff, facilities, and equipment in an effective manner at its current level of protective services. The Fire Chief and his administrative team are constantly reviewing ways of finding cost saving efficiencies for the Department.

RHFES's capital forecast fluctuates annually based on the equipment that has been identified for replacement.

During the review of the budget process for both operating and capital, it was evident that RHFES is well configured in both areas to support the department at its current level of protective services. This would also indicate an adequate level of support by Council and the City's senior management team for assisting the Department in meeting its service goals.

When reviewing this section, one of the key areas that EM&T looks for is whether actual operating expenditures are identified and tracked by the Department. During the review of the operating budget it was noted that all key accounts and operating sections are identified, such as:

Operating Budget Line Items:

- Staffing related costs
- Training
- Fire Prevention and related Fire Safety Education
- Vehicle and equipment maintenance
- Communications

Capital Budget Line Items:

- Vehicle replacement
- Radio and CAD replacements and upgrades
- Apparatus ancillary equipment such as hoses, nozzles, AEDs, hand tools, etc.
- Station equipment
- Personal protective equipment
- Equipment replacement (for large cost items that are not covered in the operating budget)

Operating Budget

A review of the operating budget for RHFES shows that all general expenses and related revenues are accounted for. To assist in offsetting the operating expenditures of the Department, the RHFES should take advantage of any opportunities in acquiring grants for training and equipment purchases. Many fire departments have taken advantage of the available grants and have saved the municipality thousands of dollars. For example, natural gas suppliers have often provided up to $5,000 to fire departments to be used towards the purchasing of training materials. Some manufacturers of smoke and CO alarms have been known to make donations of their products to fire departments to distribute to residences that may lack them.

Capital Forecasts

RHFES has proposed a 15 to 20-year replacement cycle for the fire trucks that is based on the FUS and NFPA recommendations for frontline vehicles. RHFES should continue to reference NFPA 1901 and ULC S-515-12 and other related NFPA standards relating to vehicle design, replacement, ancillary equipment and refurbishing.

Based on budgetary considerations there are increases in replacement cycles. The Fire Chief should continue working with the Finance Department to ensure that the vehicle replacement cycle be adhered to as closely to the FUS recommendations as possible.

Along with the replacement schedule, FUS recommends that there should be at least one spare fire truck for every eight units. For example:

- one spare pumper truck for every eight
- one spare aerial truck for every eight
- one spare tanker truck for every eight, etc.

This applies even when there are less than eight units; there should be a replacement vehicle designated for up to eight vehicles for back up if one of those units goes out of service.

TABLE #19: Amount of Funds Budgeted for Operational and Capital Purchases

Year	Operational, Does Not Include Revenues	Capital
2018	$26,475,193	$1.915,000
2019	$26,839,968	$1,126,650
2020	$28,204,900	$543,200
2021	$28,144,400	$300,000

The COVID-19 Pandemic in 2020 adversely affected revenues for municipalities, affecting 2021 budget outcomes.

10.2 Development Charges Program

The City has enacted a Development Charges By-Law (47-19) and the current by-law became effective on May 28, 2019. Fees are charged to those that wish to develop land and these funds are dedicated to specific services the City provides in a reserve account for that service. The said funds must be used for capital projects that are necessitated by the development of lands and that have increased the need of enhanced service provision in that area of the City.

Within Schedules B and C of the by-law, it outlines the amount of funds that will be dedicated towards fire protection and these amounts are dependent on the type of development taking place (i.e., detached residential vs. apartments vs. commercial).

10.3 Fees By-Law

A means of generating revenue to offset the operating costs of Department is through a fees structure for services provided by the Department.

The City has a Fire Service User Fees and Services Schedule embedded within the Consolidated Tariff of Fees by-law for the invoicing of services provided by the RHFES. The fees schedule for RHFES is very current and all encompassing.

Another form of revenue generation is the invoicing of all fire responses to the appropriate insurance companies through a third-party. Many fire services in the province have implemented such means to aid in offsetting the cost of operating the fire service.

Within insurance policies for both vehicles and structures, there are provisions for the payment of services provided by fire departments. Residents would need to submit the invoice to their insurance company to address payment.

Recommendation(s)

No recommendations noted for this section.

SECTION 11 – Review of Previous MFP

Section 11: Review of Previous FMPs & Reports

11.1 Building from the Previous FMPs & Reports

Listed below are the recommendations submitted in the 2016 MFP. Some of the recommendations have been or are in the process of being actioned, as appropriate. The current status of each recommendation is noted in the column on the right of TABLE #22.

The recommendations were reviewed; direction may be contained within this document that provides further documentation, clarity and possibly new recommendations.

TABLE #20: Operational Recommendations From 2016 MFP

Rec #	Recommendation	Current Status
1	*That the ongoing human resource support needs of the RHRES be monitored and that consideration be given to additional staff resources as may be required.*	*Staff are monitoring the amount of time required to manage human resource issues and when necessary, bring forward a business case that supports hiring staff to support the fire service's human resources needs.*
2	*That the draft mission statement and vision statement of the RHFES be approved subject to the consideration and approval of this Fire and Emergency Services Master Plan by Council.*	***COMPLETED Staff do not believe Council needs to approve the Mission, Vision and Values of RHFES.***
3	*That consideration be given to enhancing the site planning, signage and public access to the current RHFES Headquarters facility.*	*Minor changes made, still ongoing.*
4	*That subject to the consideration and approval of the recommendations of the Fire and Emergency Services Master Plan by Council that the E&R by-law No. 19-95 be revised and updated to reflect the direction of Council in respect to the delivery of fire and emergency services.*	*No action taken yet.*
5	*That the Fire Chief develop and implement a process whereby all by-laws applicable to the delivery of fire and emergency services be reviewed and updated on a regular basis.*	*Currently being performed collectively. Fire Services is involved in this review.*
6	*That the RHFES take a leadership role to further investigate opportunities for regular joint training sessions with Regional mutual aid partners to enhance the operational efficiency and effectiveness of mutual aid responses.*	***COMPLETED – RHFES is a Regional Training Centre and offers training to other fire services. Some "show and tell" training performed with neighbouring depts. for specialty technical rescue disciplines.***
7	*That the current fire service dispatch agreements be reviewed with the Dispatch Advisory Committee in considering updating the performance objectives to those contained within the 2016 Edition*	***COMPLETED – Consultants used to review dispatch centres of Richmond Hill, Vaughan and Markham. Result was "Status Quo".***

Rec #	Recommendation	Current Status
	of the NFPA 1221 "Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems."	
8	*That upon consideration and approval of this Fire and Emergency Services Master Plan by Council that the FIRE CHIEF be directed to identify a strategy to update SOPs on a regular basis.*	***COMPLETED - SOPs and SOGs reviewed periodically.***
9	*That upon consideration and approval of this Fire and Emergency Services Master Plan by Council that the FIRE CHIEF be directed to identify a strategy to develop the proposed Annual Report.*	*Decision made to provide annual update to Council. One update provided in 2019, nothing in 2020 and an update will be provided in 2021.*
12	*That subject to Council's consideration and approval of the proposed Fire and Emergency Services Master Plan a Fire Prevention Policy be created utilizing the framework of PFSG 04-45-12 "Fire Prevention Policy" for consideration and approval by Council and attached as an appendix to the updated E&R by-law.*	***COMPLETED – but not incorporated into the E&R by-law.***
14	*That a revised SOP be developed for home smoke alarms, carbon monoxide detectors and home escape planning and be included within the proposed Fire Prevention Policy for consideration and approval by Council.*	***COMPLETED***
15	*That the Town of Richmond Hill update the comprehensive CRA on an annual basis as part of the RHFES business planning and annual reporting process.*	***COMPLETED – Legislation stating this must be completed by 2024. Part of updated FMP.***
16	*That the OFMEM Technical Guideline OFM-TG-01-2012 "Fire Safety Inspections and Enforcement" be considered in updating SOP 911 – Fire Safety Enforcement and included within the proposed Fire Prevention Policy for consideration and approval by Council.*	***COMPLETED***

Rec #	Recommendation	Current Status
17	*That Standard Operating Procedure 509 – Fire Investigation Unit be updated to reflect the direction of OFMEM Communique #2015-002.*	***COMPLETED***
19	*That all firefighters be trained and qualified to Fire Inspector I or equivalent qualifications*	*All new firefighters are trained to this Standard. Existing firefighters will be trained when time permits.*
23	*That an SOP be developed in regards, to scheduling the use of the Training Centre to ensure that the training needs of the RHFES are being met.*	***COMPLETED***
24	*That the RHFES develop a comprehensive annual training plan that includes the required scheduling to encompass the NFPA 1001 Standard – Level I and Level II requirements.*	***COMPLETED***
25	*That the proposed Comprehensive Annual Training Program include scheduled live fire training for all RHFES crews.*	***COMPLETED***
26	*That the RHFES develop a formal succession planning process that recognizes the importance and provides the opportunities for mentoring, secondments, job shadowing, cross training within the department and where external opportunities may be identified.*	*No action to date.*
27	*That the proposed Comprehensive Annual Training Program include components of formal computer training and Firehouse software training for all officers.*	***COMPLETED***
28	*That as part of reviewing and updating all current SOPs consideration be given to documenting the required Training Division procedures.*	*No action taken.*
29	*RHFES develop SOPs for fire suppression responses referencing the Province of British Columbia Structure Firefighters Competency and*	*No action taken – not relevant for RHFES.*

Rec #	Recommendation	Current Status
	Training Playbook (B.C. Playbook) to designate the critical fireground tasks to be completed.	
35	*RHFES continue to sustain their Superior Tanker Shuttle Accreditation for rural areas of the Town of Richmond Hill.*	***COMPLETED***
38	*That consideration be given to the RHFES sustaining a major apparatus reserve capacity, to include a minimum of two engines and one aerial (quint).*	***COMPLETED – RHFES has a minimum of 2 reserve apparatus (not new apparatus; the reserve vehicles are ones that were replaced once they were 15 years old).***
41	*That consideration be given to the Communications Division staff resource options presented within the proposed FESMP.*	*No action taken.*

TABLE #21: Council Recommendations From 2016 MFP

Rec #	Recommendation	Current Status
10	*That Council approve the strategic priorities identified within the proposed Fire and Emergency Services Master Plan to guide the development and delivery of fire and emergency services within the Town of Richmond Hill including:* *i. The utilization of a comprehensive CRA in determining the level of existing and projected fire safety risks within the municipality as the basis for developing clear goals and objectives for all fire and emergency services to be provided by the City of RHFES.* *ii. The optimization of the first two lines of defence including public education and fire prevention and the utilization of fire safety standards and fire code enforcement to provide a comprehensive fire protection program within the City, based on the results of the comprehensive Community Risk Assessment; and* *iii. Emphasis on strategies that support the sustainability of fire and emergency services that provide the most effective and efficient level of fire protection services resulting in the best value for the community.*	***(Do not delete this paragraph) A recommendation was submitted to Council that identified the hiring of suppression staff. The recommendation was not supported by Council. Instead, Council requested that the FMP be updated to reflect more accurate information (call volume, response times, population, growth, etc.).*** ***Staff have been hired over the past four years. Fire Master Plan currently under review.***
11	*That consideration be given to implementing the position of Emergency Management Coordinator to provide a dedicated staff resource to sustain the Town of Richmond Hill's emergency management program.*	***COMPLETED***
13	*That subject to the consideration and approval of the proposed public fire safety education activities and program cycle objectives by Council that they be included within the proposed Fire Prevention Policy and proposed E&R by-law.*	***(Do not delete the first 4 words) Not started as yet but will be included in the revised Establishing & Regulating By-Law.***

Rec #	Recommendation	Current Status
18	*That subject to the consideration and approval of the proposed fire inspection performance objectives by Council that they be included within the proposed Fire Prevention Policy and proposed E&R by-law.*	***(Do not delete the first 4 words) Not started as yet but will be included in the revised Establishing & Regulating By-Law.***
20	*That the City consider hiring one additional Fire Prevention Inspector with Level II qualifications in the immediate term.*	***COMPLETED***
21	*That the City consider hiring a second additional Fire Prevention Inspector with Level II qualifications within the short-term implementation of this FESMP.*	***Not started***
22	*That the City consider hiring a third additional Fire Prevention Inspector with Level II qualifications within the mid-term implementation of this FESMP.*	***Not started***
30	*That RHFES should continue to strive to achieve a goal 80 seconds or less for turnout time of firefighters to 90% of emergency incidents.*	***COMPLETED – 96% compliance***
31	*That the RHFES should continue to strive to achieve a goal of the first arriving crew of four firefighters arriving on scene within a four-minute travel time.*	***Response times are getting (DELETE "slower") longer in duration and becoming increasingly difficult to meet the 4-minute, response time.***
32	*That RHFES should continue to strive to achieve a goal of 14 firefighters arriving on scene within an eight-minute travel time.*	***No change***
33	*That RHFES should continue to strive to achieve a depth of response deployment goal to all fire related emergency calls including four firefighters to low risk occupancies, 14 firefighters to moderate-risk occupancies and 24 firefighters to high-risk occupancies.*	***No change***
34	*That the proposed RHFES emergency response performance objectives identified within the proposed Fire and Emergency*	***Not started***

Rec #	Recommendation	Current Status
	Services Master Plan be considered and approved by Council and included within the new E&R by-law.	
36	*The City should consider the use of automatic aid agreements as a strategy in addressing the identified gap in existing depth of response fire suppression capabilities of the RHFES.*	***Review performed but no actions taken at this time.***
37	*That the Fire Chief be directed to develop a multi-year phased implementation plan for Council's consideration in responding to the proposed staffing, apparatus and additional station contained within the Fire and Emergency Services Master Plan.*	***Approach was provided to Council in a detailed staff report with multiple phases for implementation. The only phase that was completed was Phase 1.***
39	*That the City review and update the capital financing strategy to include two additional engines within the 10-year capital financing strategy, with consideration given to related development charges.*	***Not required***
40	*That the City begin the procurement process for land acquisition to accommodate the proposed Fire Station 8-7 identified within the proposed FESMP.*	***Delayed due to growth slowing down.***

11.2 Conclusion

After reviewing the previous plan, EM&T has found that many of the recommendations have either been completed or in the process of being completed. Unfortunately, there are a number that have not been initiated with some still in the process of completion.

The majority that have not been implemented will incur a cost factor which Council must take into consideration. It is through communication from the Fire Chief that will aid Council in this decision making process.

SECTION 12 – Summary

12.1 Conclusion

12.2 Recommendations & Estimated Costs

Section 12: Summary

12.1 Conclusion

RHFES staff are truly dedicated to the community they serve. The Fire Chief is sincerely committed to ensuring the safety of the community and the firefighters. Based on the present staffing, equipment and fire station locations, the RHFES is endeavoring to offer the most efficient and effective service possible.

The Administrative and Leadership Team have brought several operational changes and new objectives in the spirit of improving operations, fiscal responsibility and service delivery to the residents and visitors to Richmond Hill.

Many of the recommendations will require the support of Council with input from the Fire Chief. Priorities on these projects should be established to spread out the budgetary implications over time. Council though, to aid them in their decision process, should engage the Fire Chief and the Leadership Team in fruitful discussion to ensure they understand the intricacies of operating an efficient and effective fire service that is compliant with Legislation Standards and Regulations.

To aid Council in understanding the needs of the Department and understand the issues may require as an example, the Fire Chief could provide a tour of facilities to properly explain the deficiencies and answer any questions they might have. This might also be a great opportunity for Council to meet the many firefighters they normally do not interact with and vice versa. Another means of enhancing the already good relations between Council and the Department is by Councillors doing a “ride along” with a crew of firefighters for a few hours to see what they do and their interactions with the citizens. Time could also be spent with the other Divisions of the Department to better understand the responsibilities of each.

Change can be difficult to accept when some things have been done the same way for many years. It will be inherent upon the leadership team to educate the members of the Department on why the changes are being made, what to expect, what the proposed outcomes will be and a timeline to reach that point. Adjustments may be required along the way.

Members of the Department also have a responsibility in working towards the outcome. Where challenges exist, it is important for the staff to not only provide their opinion, but to bring forth potential options and solutions.

In closing, both the MFP of 2016 and this FMP have identified the need for additional staffing in all Divisions, apparatus, and fire stations. Automatic Aid agreements with neighbouring municipalities is a good interim measure as a means of providing additional resources but should not be relied upon as a long-term measure. By relying on neighbouring municipalities for support takes away from the need to protect their own municipality. The need for additional resources is quickly becoming not only a health and safety issue, but one of public safety.

All costs and associated timelines to the following recommendations are approximations.

Most FMPs are 7-10-year documents with a review to be conducted at the five-year point. Due to some of the specific recommendations made in this document, it is advisable that the Fire Chief view this as a "living document", conducting more frequent reviews of the recommendations and bringing forward updates to Council, as required.

12.2 Recommendations & Estimated Costs

The following chart provides further overview of the recommendations found throughout this report along with any estimated costs that may be incurred.

Rec #	Recommendation	Estimated Costs	Suggested Timeline
Section 1 – Community and Fire Department Overview			
1.3 Community Growth			
1	RHFES to explore potential community partnerships when they begin the process of acquiring land and building a new fire station in the northeast quadrant of the City.	Staff time	Short-term (1-3 years)
Section 2 – Planning			
2.4 Establishing & Regulating By-law			
2	The E&R By-Law should be updated and reviewed annually to meet current industry standards and the level of operations of the RHFES.	Staff time	Immediate (0-1 year)
2.5 Fire Services By-law, Policies, Directives & Standard Operating Procedures			
3	Establish an SOG Committee with representation of all Divisions of the department. It is further	Staff time	Short-term (1-3 years)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
	recommended that the Department's SOGs be reviewed and updated regularly.		
Section 3 – Risk Assessment			
3.4 Residential Fire Sprinklers			
4	RHFES work in conjunction with developers in promoting the advantages of installing residential fire sprinklers.	Staff time	Short-term (1-3 years)
3.5.1 Fire Underwriters Survey – Town of Richmond Hill 2013			
5	The Management Team regularly access the FUS Municipal Fire Portal to communicate improvements and/or upgrades. This data could relate to new fire apparatus replacements, new fire stations, new construction, hydrants in new sectors, etc.	Staff time	Short-term (1-3 years)
Section 4 – Department Staffing & Programs			
4.3.1 Staffing Levels & Workload			
6	RHFES identify and develop opportunities for Shift Instructors to be assigned full-time to the Training Division on temporary assignments. These secondments serve multiple purposes and will enhance delivery of discipline specific training.	Staff time	Short-term (1-3 years)
7	Conduct an internal review of staffing and workflow within the Training Division. Gaps should be identified and addressed. To ensure consistent and high-quality delivery of training, an increase in the number of full-time training officers may be warranted.	Staff time $120,000 per Training Officer	Short-term (1-3 years)
8	Realign the reporting structure for the Training Division be under the Deputy Fire Chief (Operations). This realignment supports enhanced intra-departmental coordination leading to greater efficiencies and effectiveness of training programs.	Staff time	Short-term (1-3 years)
4.3.2 Training Facilities			

Rec #	Recommendation	Estimated Costs	Suggested Timeline
9	Revenue generation initiatives implemented and managed through the Training Division be used to further enhance capacity through financial support of full-time or temporary staffing increases.	Staff time	Mid-term (4-6 years)
4.3.4 Certification			
10	RHFES qualify District and Platoon Chiefs to NFPA 1021 Level II (Fire Officer-II). This certification supports management of multi-unit responses in the field, in addition to adding valuable curriculum to overall RHFES succession planning.	Staff time	Short-term (1-3 years)
11	Training Division identify and develop an officer training program consistent with NFPA qualifications.	Staff time	Mid-term (4-6 years)
12	Secure resources to ensure annual Live Fire Training is provided to all personnel. Staffing and workload adjustments in the Training Division may be required to support development and implementation of a robust program in accordance with NFPA 1403: *Standard on Live Fire Training Evolutions*.	$180,000 to cover staff costs such as assigning/ backfilling/ shift Instructors	Immediate (0-1 year)
4.3.5 Succession Planning			
13	Develop and implement a formal succession planning program within the RHFES. Given the size and scope of the RHFES, numerous opportunities for career development could be identified and supported in conjunction with defined qualifications, certifications and training to support future success of interested personnel.	$120,000	Mid-term (4-6 years)
4.4 Fire Prevention and Public Education			
14	The Fire Prevention Division monitor provide risk assessment reports at least annually on activities conducted to better align current RHFES baselines and to ensure progress towards industry best-practice benchmarks and the CRA.	Staff time	Short-term (1-3 years)
4.4.1 Code Enforcement/ Inspections			

Rec #	Recommendation	Estimated Costs	Suggested Timeline
15	RHFES increase the role of suppression staff in support of fire prevention and public education efforts. This does not negate the need for long term planning for full-time Fire Prevention Division personnel but could augment and enhance the services currently being delivered.	Staff time	Mid-term (4-6 years)
16	Align inspection efforts in the Fire Prevention Division with industry best practises. This would be utilized as a benchmark for the Prevention Division to develop a plan on what can be accomplished with present staffing, along with presenting options for increasing inspection frequencies to meet established benchmarks.	Staff time	Short-term (1-3 years) and ongoing
17	Expand the current initiative to train and qualify all firefighters to NFPA 1031 and 1035.	$180,000	Mid-term (4-6 years)
18	RHFES continue to conduct an annual appraisal and report on Fire Prevention Division programs to define successes and identify any gaps. Use of data analytics should support and inform this process.	Staff time	Short-term (1-3 years) and ongoing
4.4.2 Origin and Cause			
19	Support all Fire Prevention Division personnel to gain qualification as certified fire investigators.	$40,000	Mid-term (4-6 years)
4.4.4 Determination of Current Staffing Requirements			
20	Develop a staffing plan for the Fire Prevention Division to ensure staffing levels and subsequent workflows can be managed appropriately. This staffing plan should also review the current shift pattern and explore options to move to 7 days per week coverage matching community needs.	Staff time	Short-term (1-3 years)
4.6 Communications			
21	RHFES promote four (4) of its Communications Operators to the role of Acting Communications Supervisor to ensure continuous supervision in the Communications Centre.	$25,000 - $40,000	Immediate
22	RHFES monitor sick time related to PTSD or other mental health illness and the impacts that may be	Staff time	Ongoing

Rec #	Recommendation	Estimated Costs	Suggested Timeline
	placed upon staffing, shift scheduling, shift coverage and any financial implications.		
23	RHFES to reduce the frequency of utilizing firefighters to act in the role of Communications Operator due to staffing shortages. This should not be implemented until such time that additional staffing is hired for the Communications Centre.	Overtime costs for Communication Operators $50,000 - $60,000	Immediate (0-1 year)
24	RHFES hire additional personnel either part-time or full-time to cover staff shortages in the Communications Centre to ensure a minimum staffing of two (2) Communications Operators and one Supervisor are on duty at all times.	Dependant upon the number of staff hired	Short-term (1-3 years)
25	RHFES explore opportunities of revenue generation to offset the expense of the Communications Centre by acquiring new clients to be dispatched from of its Communications Centre.	Staff costs – Revenue Generation Initiative	Short-term (1-3 years)
26	Add an additional Chief Officer for the oversight of the Communications Division. Member will be outside of the bargaining unit.	$170,000 - $180,000	Short-term (1-3 years)
4.7 Mechanical			
27	Hire an EVT to assist in the completion of repairs and initiate a preventive maintenance program to maintain the fire department's fleet of vehicles.	$104,000	Short-term (1-3 years)
28	Purchase a medium duty service vehicle for the Mechanical Division.	$100,000 - $140,000	Short-term (1-3 years)
4.8.1 Cancer Prevention			
29	Update PPE/Bunker gear cleaning and inspections SOG and include instruction on the proper re-installation of the DRD.	Staff time	Immediate (0-1 year)
Section 5 – Fire Suppression			
5.1.1 National Fire Protection Association (1710)			
30	The RHFES maintain the minimum of four firefighters on every fire apparatus, each shift. This would bring RHFES in line with the	Overtime Costs	Immediate (0-1 years)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
	recommendations regarding the staffing of fire apparatus as identified in the National Institute of Standards and Technology study and NFPA 1710, which are outlined in Section 5.		
31	Hire an additional 20 firefighters to be deployed on an additional engine.	$2.5 to $3.5 M	Short-term (1-3 years)
32	RHFES add a seventh station in the northeast quadrant of the City and hire an additional 20 firefighters to be assigned to Station 8-7.	$5.5 – $6.6M	Mid-term (4-6 years)
33	RHFES to hire an additional 20 firefighters based on the call volume, additional building stock such as high rises and the current approved land developments. Consideration should be given to the deployment of these firefighters to staff a second aerial device in the city.	$3.5 - $4.5M	Long-term (7-10 years)
34	Implement the position/rank of District Chief within the Operations Division for each Platoon. In conjunction with the opening of Station 8-7.	$550,000 - 600,000	Mid-term (4-6 years)
5.1.3 Response Data			
35	Continue a commitment to meet effective response times. This includes the following: • Achieve a goal of 80 seconds fire fighter turn-out time. • Four (4) firefighters arriving on scene within a four-minute travel time. • Sixteen (16) firefighters arriving on scene within an eight-minute travel time.	Staff time	Ongoing
5.2 Medical Response			
36	RHFES work in conjunction with the RHFES Medical oversight to review delegated medical acts including, but not limited to the administration of glucagon and ASA.	Staff time plus costs of medications	Short-term (1-3 years)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
37	RHFES and the Richmond Hill Council lobby the OFMEM and Ministry of Health to expand the simultaneous notification program to include Fire Services of York Region.	Staff time and any upgrades to CAD $100,000 - $150,000	Short-term (1-3 years)
Section 6 – Facilities			
6.4 Fire Facilities Summary			
38	RHFES and the City's facility services complete a building condition and needs assessment of all RHFES Fire Stations to see if they are viable structures to be renovated and upgraded or replaced, to be more in-line with current industry standards to ensure compliance with provincial legislation, and applicable standards.	$100,000 for engineering firm	Short-term (1-3 years)
39	RHFES should work with the City's facility services to examine space requirements and options to create a headquarters that includes Administration, Fire Prevention, Training, Communications, Mechanical and CEMC/EOC. Options could include leasing, purchasing, or building a new headquarters.	Staff time Cost based on staff report	Immediate (0-1 year)
Section 7 – Apparatus & Equipment			
7.1.3 Command Centre			
40	Purchase a multi-purpose apparatus to fill the role as a command centre for air, light, decontamination, and rehab apparatus.	$800,000 - $1 million	Short-term (1-3 years)
7.2.3 Generators			
41	The City of Richmond Hill conduct an electrical audit of the fire stations and make changes to ensure the station has complete electrical power during a power outage.	$5,000 - $10,000	Immediate (0-1 year)
7.4 Superior Tanker Shuttle Accreditation			
42	RHFES maintain their Superior Tanker Shuttle Accreditation for the City of Richmond Hill.	$3,000 - $6,000	Ongoing

Rec #	Recommendation	Estimated Costs	Suggested Timeline
Section 8 – Emergency Management			
8.1 Emergency Management Program			
43	Continue to review and update the Emergency Plan for Richmond Hill annually as per the *Emergency Management & Civil Protection Act* of Ontario.	Staff time	Short-term (1-3 years)
44	Move the primary EOC to the Operations Centre and the secondary EOC to Fire Station 8-5.	$200,000 - $300,000	Immediate (0 to 1 year)
Section 9 – Mutual Aid, Automatic Aid, and Fire Protection Agreements			
9.1 Mutual and Automatic Aid			
45	RHFES enter into discussions with neighbouring fire services regarding Aid Agreements to provide or receive assistance at an incident until such time as the department has adequate resources of their own at the scene.	Staff time and possibly a standby fee	Short-term (1-3 years)
46	RHFES explore opportunities to provide technical rescue responses to municipalities outside the jurisdiction of Richmond Hill be included in the updated version of the Establishing & Regulating By-Law.	Staff time – revenue generation initiative	Short-term (1-3 years)

SECTION 13 – Appendices

Appendix A: Definitions and References
Appendix B: Stakeholder Surveys
Appendix C: Historical Response Data
Appendix D: Community Outreach
Appendix E: Five-Step Staffing Evaluation Process
Appendix F: OFMEM Public Fire Safety Guidelines
Appendix G: Provincial CRA Guideline
Appendix H: FUS Technical Document on Elevated Devices

Section 13: Appendices

Appendix A: Definitions and References

Automatic Aid Agreements – *Fire Protection and Prevention Act*, 1997 (FPPA 1997)

4. For the purposes of this *Act*, an automatic aid agreement means any agreement under which,

a) a municipality agrees to ensure the provision of an initial response to fires, rescues and emergencies that may occur in a part of another municipality where a Fire Department in the municipality is capable of responding more quickly than any Fire Department situated in the other municipality; or

b) a municipality agrees to ensure the provision of a supplemental response to fires, rescues and emergencies that may occur in a part of another municipality where a Fire Department situated in the municipality is capable of providing the quickest supplemental response to fires, rescues and emergencies occurring in the part of the other municipality. 1997, c. 4, s. 1 (4).

- *Automatic aid is generally considered in other jurisdictions as a program designed to provide and/or receive assistance from the closest available resource, irrespective of municipal boundaries, on a day-to-day basis.*

Commission of Fire Accreditation International Community Definitions:

- Suburban – an incorporated or unincorporated area with a total population of 10,000 to 29,999 and/or any area with a population density of 1,000 to 2,000 people per square mile
- Rural – an incorporated or unincorporated area with a total population of 10,000 people, or with a population density of less than 1,000 people per square mile.

National Fire Protection Association (NFPA) Documents:

- NFPA 1201 - Standard for Providing Fire and Emergency Services to the Public
- NFPA 1500 – Standard on Fire Department Occupational Safety and Health Program, 2013 editions
- NFPA 1720 – Standard for the Organization and Deployment of Fire Suppression Operations, Medical Operations, and Special Operations to the Public by Career Departments
- 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.

Municipal Responsibilities (FPPA 1997)

2. (1) Every municipality shall,

a) establish a program in the municipality which must include public education with respect to Fire safety and certain components of Fire prevention; and
b) provide such other Fire protection services as it determines may be necessary in accordance with its needs and circumstances.

Mutual Aid

a) Mutual aid plans allow a participating Fire Department to request assistance from a neighbouring Fire Department authorized to participate in a plan approved by the Fire Marshal.
b) Mutual aid is not immediately available for areas that receive fire protection under an agreement. The municipality purchasing fire protection is responsible for arranging an acceptable response for back-up fire protection services. In those cases where the emergency requirements exceed those available through the purchase agreement and the backup service provider, the mutual aid plan can be activated for the agreement area.

Public Fire Safety Guidelines:

- PFSG 04-40A-12, Fire Prevention and Public Safety Education; Simplified Risk Assessment March 2001
- PFSG 04-41-12, Fire Prevention and Public Safety Education; Community Fire Safety Officer/Team, January 1998
- PFSG 04-87-13 on Fire Station Location, September 2004

Shared Responsibilities (FPPA 1997)

FPPA notes that.

1. Two or more municipalities may appoint a community fire safety officer or a community fire safety team or establish a Fire Department for the purpose of providing fire protection services in those municipalities.

Volunteer FIRE FIGHTER (FPPA 1997)

- Means a FIRE FIGHTER who provides fire protection services either voluntarily or for a nominal consideration, honorarium, training or activity allowance. (“pompier volontaire”) 1997, c. 4, s. 1 (1); 2001, c. 25, s. 475 (1).”

Appendix B: Stakeholder Surveys

Internal Survey

The following survey was presented to internal stakeholders:

Emergency Management & Training Inc. (EM&T) have been hired to prepare a Fire Master Plan for the Richmond Hill Fire and Emergency Services (RHFES). Your feedback is necessary in assisting EM&T in developing this document for the fire department. The intent of this document is to provide a fire service review to guide operational improvements and enhance how services are provided throughout the community.

Please take the time to complete this survey. Your confidential responses will help to ensure focused action that continues to meet the diverse needs of our staff and residents. The results will be collated into one document for our use in developing the report.
Please complete the survey before February 5th, 2021.

Questions:

1. **What are the things that make you most proud of the RHFES (i.e., the level of professionalism, community involvement or making a positive difference within the community)?**

2. **Do you agree/disagree with the following statement and why?**
   "RHFES is a good fire service to work for."

Agree - _____ Disagree - _____

Why?

3. **What would you say are the top three issues facing the RHFES today?**

a) Lack of funding
b) Morale
c) Lack of support for families
d) Level of Training
e) Health & safety
f) Working relationships between Branches of RHFES

g) Vehicles & equipment
h) Stations/accommodations/amenities
i) Lack of support from Council
j) Involvement/relations with the public through fire prevention/public education

1. **There are 14 core services that the RHFES delivers. Which services do you believe are most valued by the community? Please rank in order of priority from 1 (most important) to 14 (least important). Please use each number only once and use all 14 numbers.**

___ Fire fighting
___ Communications (dispatch)
___ Auto extrication
___ Fire origin and cause investigations
___ Fire prevention and safety inspections
___ Community outreach / Public education
___ Low /high angle rope rescue
___ Ice/water rescue
___ Trench rescue
___ Confined space
___ Hazardous materials
___ Public assist / Non-emergency responses
___ Emergency planning
___ Medical assist and response

5. **Are there any other services that you believe the RHFES should provide and why? These may include the following: swift water rescue, home inspections, fire extinguisher clinics, residential sprinkler demonstrations, etc.**

6. **What improvements does the RHFES need to make to its services to be more efficient and what do you believe would be the outcome by implementing these efficiencies?**

7. **If it were up to you, what would the Fire Department be like 5 years from today and why?**

8. Are there any other comments/suggestions that you would like to add that would help to improve the services the RHFES delivers to the community and to the firefighters? What do you believe is working well, what isn't, working well and how could these be improved?

Thank you for completing this survey. Your feedback is greatly appreciated and will help to shape future service delivery efforts.

Rick Monkman
Fire and Emergency Services Consultant
rmonkman@emergencymgt.com

Public Survey

During the FMP process, feedback was gathered from both the community in the form or online survey and a meeting with those from the community who have utilized the services of RHFES. The following survey was presented to the external stakeholders:

Richmond Hill Fire and Emergency Services (RHFES) has a proud tradition of assisting residents and effectively responding to emergency situations. The Department responds to approximately 5,500 emergency incidents each year from 6 fire stations.

In our ongoing efforts to ensure that we are meeting the needs of our community we are creating a community-driven Fire Master Plan to guide operational improvements and enhance how the service is provided throughout the community.

To accomplish this, we have engaged Emergency Management & Training Inc. (EM&T), to assist us with this initiative. EM&T is a local consulting firm that has worked with many fire departments in developing their Fire Master Plans, station assessments, Community Risk Assessments, and fire service reviews.

To successfully gather feedback, we need your assistance and ask that you take the time to complete this survey. Your confidential responses will help to ensure focused action that continues to meet the diverse needs of all residents.
Please complete the surveys by February 5th, 2021.

Questions:

1**. What is your general impression of the Richmond Hill Fire and Emergency Services in relation to its level of professionalism, community safety, fire safety / education programs?**

2. **Have you had any interaction with RHFES staff? and if so, how did you find this interaction?**

   Yes

   No

(if no, go to question 3)

Where was this interaction, was it at a:
(select all that apply)

a) Fire
b) Medical emergency
c) Elevator rescue
d) Motor vehicle accident
e) Technical rescue i.e., ice/water, confined space, trench, low/high angle
f) Hazardous materials incident
g) School/community college setting
h) Community fair/event
i) Verbal interaction at a non-emergency incident
j) Home visit
k) Celebration event
l) Tour of a fire station/open house
m) In the mall
n) Smoke and/or CO alarm incident
o) Faulty fire alarm incident
p) Unknown odour incident
q) Natural gas/propane leak or smell
r) During a fire inspection

3. How important are the following statements to you:
Extremely important? Very important? Important? Not very important?
Not important at all?

a. How quickly the Fire Service gets to me if I have an emergency
b. Whether the Fire Service will visit my home to give me safety advice smoke/CO alarm info
c. How much the fire services costs me as a taxpayer
d. How often the Fire Service provides community training opportunities (e.g., fire extinguisher training; school safety programs; smoke alarms; fire escape planning)
e. How visible the Fire Service is at local community events
f. Timeliness to any request for non-emergency services or assistance from the Fire Service
g. Purchasing and maintaining new and applicable equipment
h. Continued and relevant training

2. **What do you think are the top three issues facing our fire service today (barriers to providing service)?**

3. **There are 10 core services delivered by the RHFES. Which services are most important to you? Please rank in order of priority from 1 (most important) to 10 (least important). Please use each number only once and use all 10 numbers.**

___ Fire fighting
___ Communications (dispatch)
___ Auto extrication
___ Medical assist and response
___ Hazardous materials and technical rescue response
___ Fire/arson investigations
___ Fire prevention and fire safety inspections
___ Community outreach / Public education
___ Public assistance requests / Non-emergency responses
___ Emergency management and planning (i.e., 72-hour survival kit for the home, clothing, funds, long term loss of power, severe weather events, disaster resulting in evacuations).

4. **Are there any additional services that you believe should be provided? If so, please specify (i.e., home inspections, fire extinguisher clinics, teach fire aid/CPR to the public, increase in fire safety messaging in the media and through social media venues, etc.).**

5. **Over the next 5 years, if you could implement up to three things to improve how the current services are provided by the RHFES, what would those things be?**

1. _____

2. _____

3. _____

6. **Could you provide any recommendations for service improvements?**

7. **What is the most effective method of receiving fire safety messaging from the fire department?**

a) Email
b) Facebook
c) Instagram
d) Twitter
e) Newspapers
f) Radio public service ads
g) Community events

8. **Over the next 5 years, what of the following should RHFES prioritize to improve fire safety in the community. Select all that you believe are important.**

a) Increase fire safety education initiatives and resources.
b) Increase fire prevention inspections and enforcement of infractions.
c) Build additional fire stations to aid in lowering the time it takes to arrive.
d) Increase visibility at community festivals and public events.
e) Improve and enhance fire safety information on the City's web site.

Thank you for completing this survey. Your feedback is greatly appreciated and will help to shape future service delivery efforts.
Would you be interested in participating in a video stakeholder meeting to discuss the Master Fire Plan? If yes, please provide your contact details below:

Name:
Email address:
Street Address:
*City: Richmond Hill**
Telephone:
**must be a resident or property owner in Richmond Hill*
If you have any questions about this survey, please e-mail Rick Monkman, Consultant for Emergency Management & Training Inc. at rmonkman@emergencymgt.com
This survey was presented to Council members:

It is important that you, as a member of Council, have an opportunity to provide the feedback you receive from your local area constituents regarding the services of the Fire Department. Your unique perspective of the services that are provided and what services should be enhanced will ensure a wholesome plan. All feedback is important and will be reviewed for inclusion into the plan or will assist in the decision making of operational enhancements.

Please take the time to complete this survey. Your confidential responses will help to ensure focused action that continues to meet the diverse needs of our personnel and residents. The results will be collated into one document for use in developing the fire master plan.
The survey will be available until February 5th, 2021.

If you would prefer an opportunity to discuss this questionnaire during a one-on-one video conference call, that too, may be arranged. Please provide a few dates and times that would be convenient for a meeting, and we will book a time and send you the appropriate video link.

Questions:

1. **Do you think the public is getting value for their dollar in relation to fire services?**

2. **Do you feel the community is adequately protected by the present fire stations?**
   a. **If so, why**

   b. **If not, why**

3. **Based on the future growth of the community, do you feel that the fire department can keep up to the demands in its present state?**

4. **What do you see as the greatest strengths of the Richmond Hill Fire and Emergency Services?**

5. **What do you believe to be the top three risks/issues facing the fire service? (barriers to response/delivery of service).**

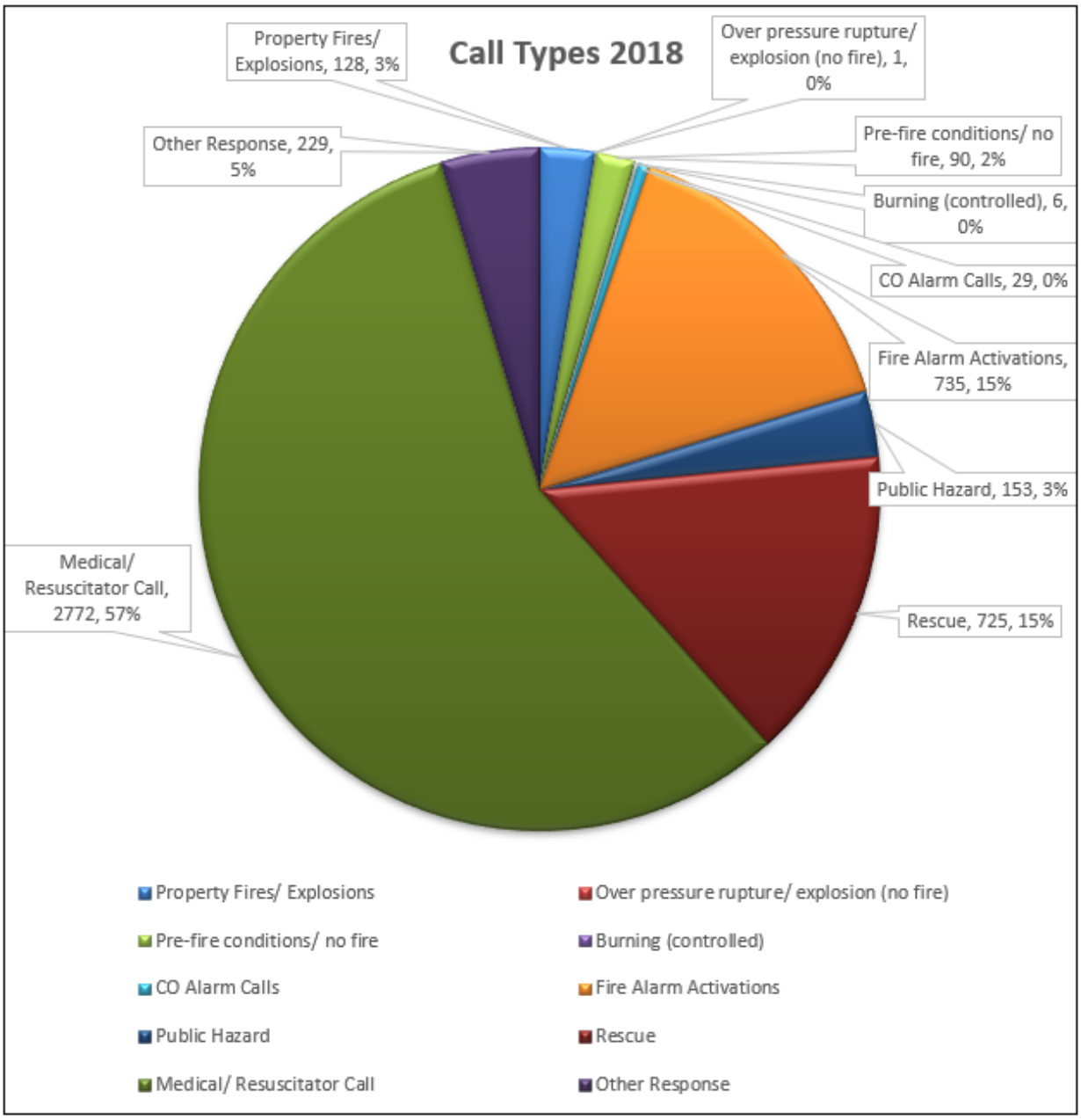
6. **Do you see an opportunity for the Fire Service to develop strategic partnerships with other organizations in relation to cost and service efficiencies? if so, with who and why?**

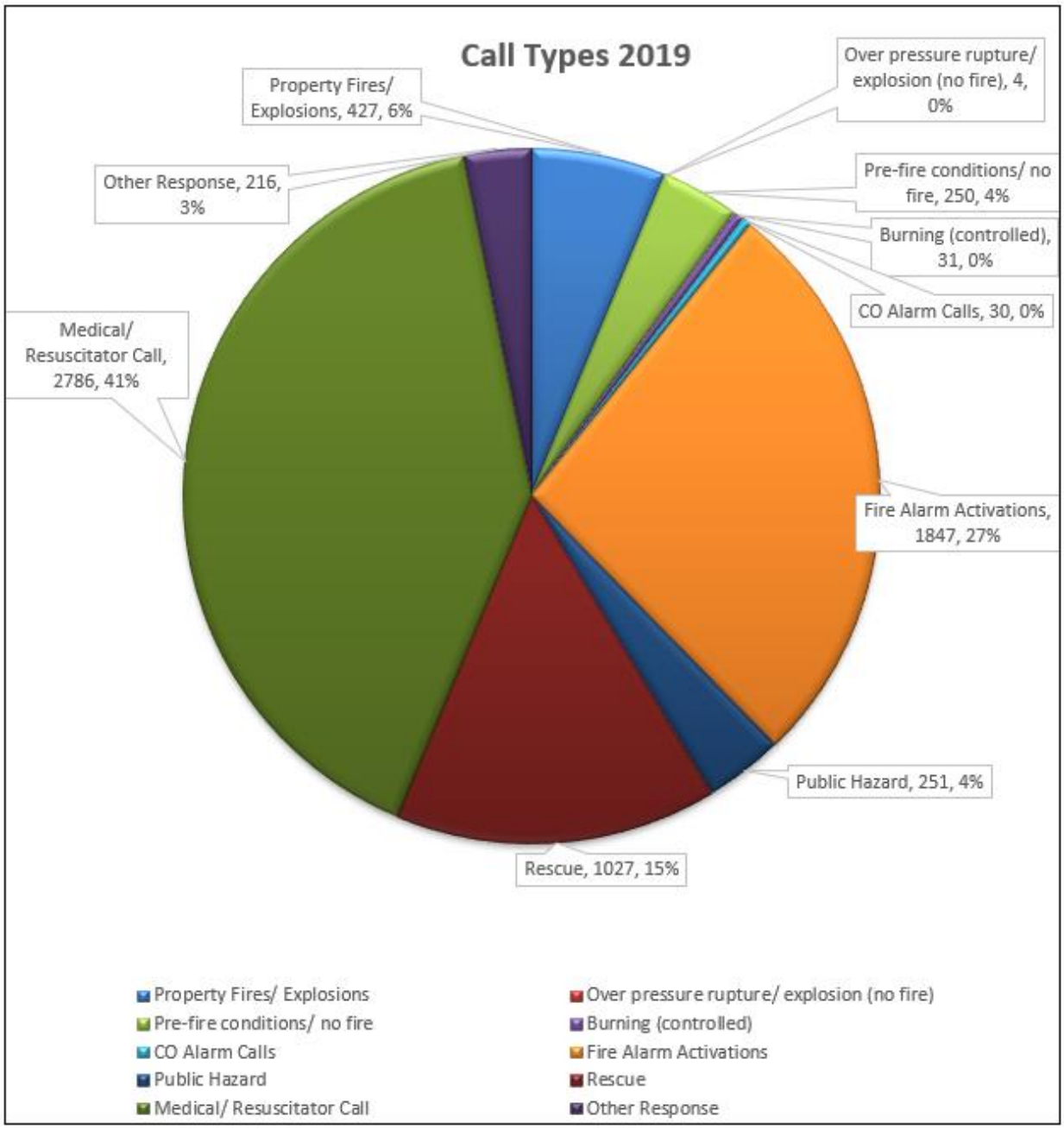
7. **Can you share any input received from your constituents in relation to the fire service, whether they are cost related, service related, or fire safety and education related?**

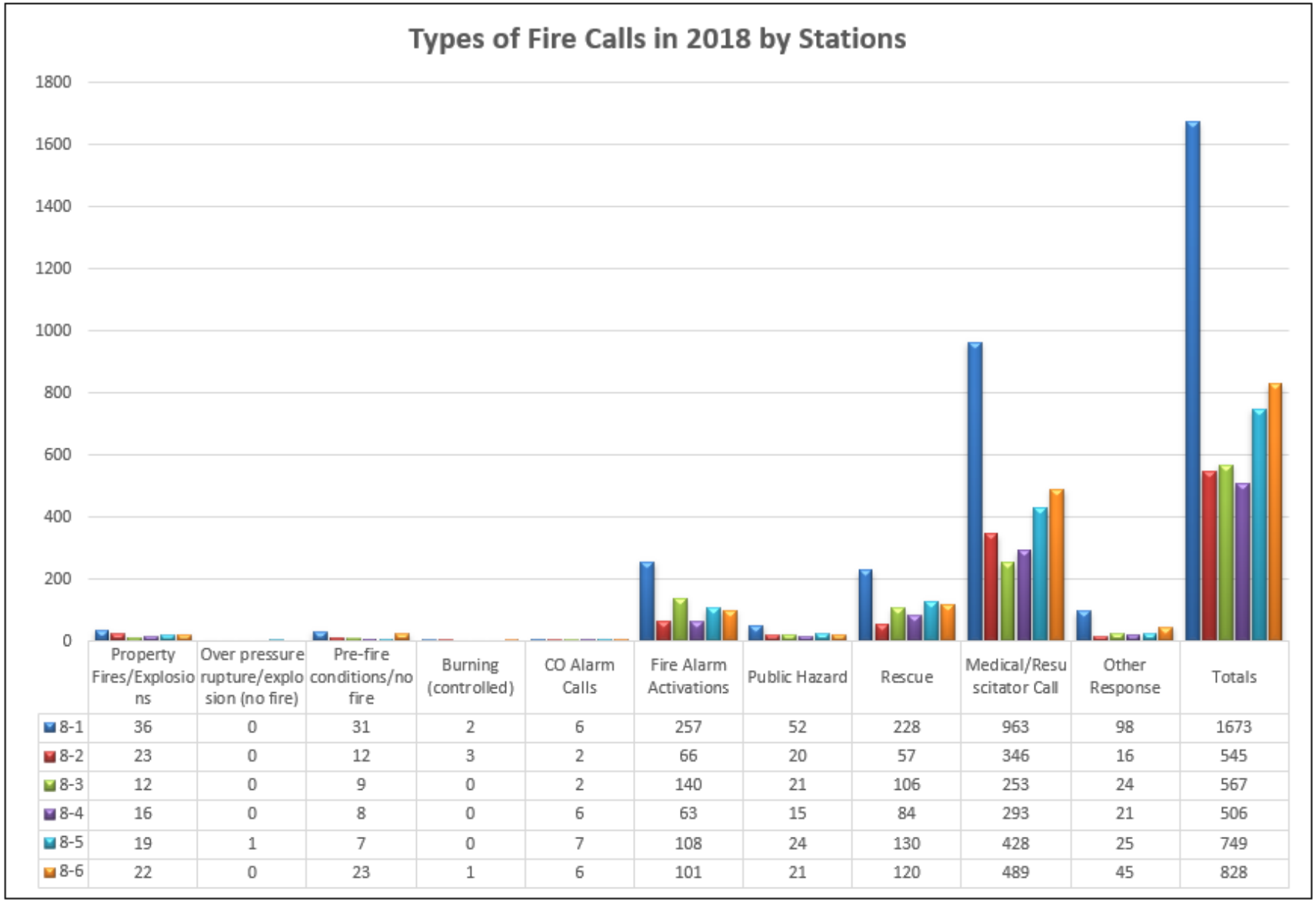
8. **Are there any other aspects or factors that you believe should be considered that we have not touched on already?**

Contact Information:
Rick Monkman
Fire and Emergency Services Consultant
E: rmonkman@emergencymgt.com
Ph: 705-818-0355

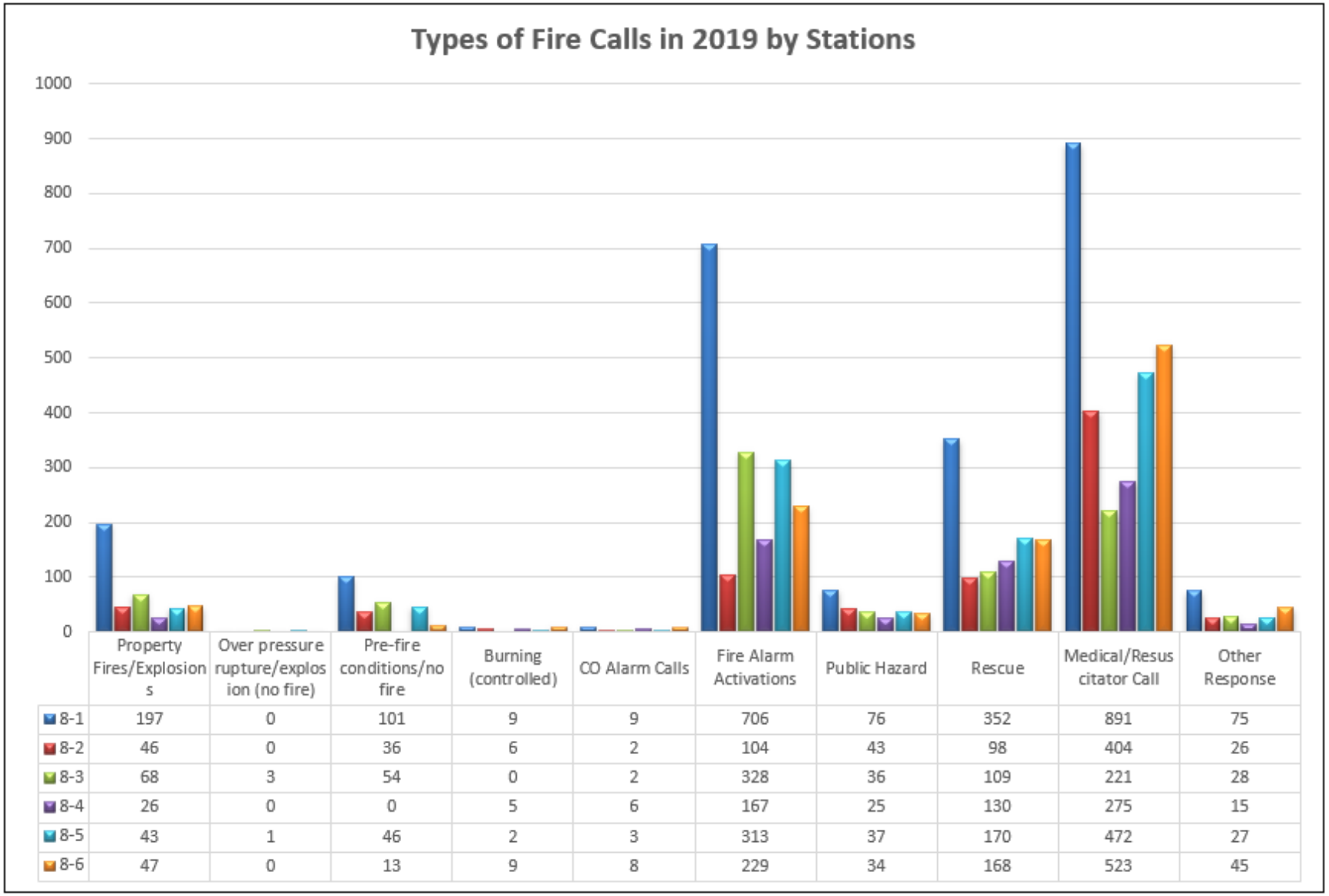
Appendix C: Historical Response Data



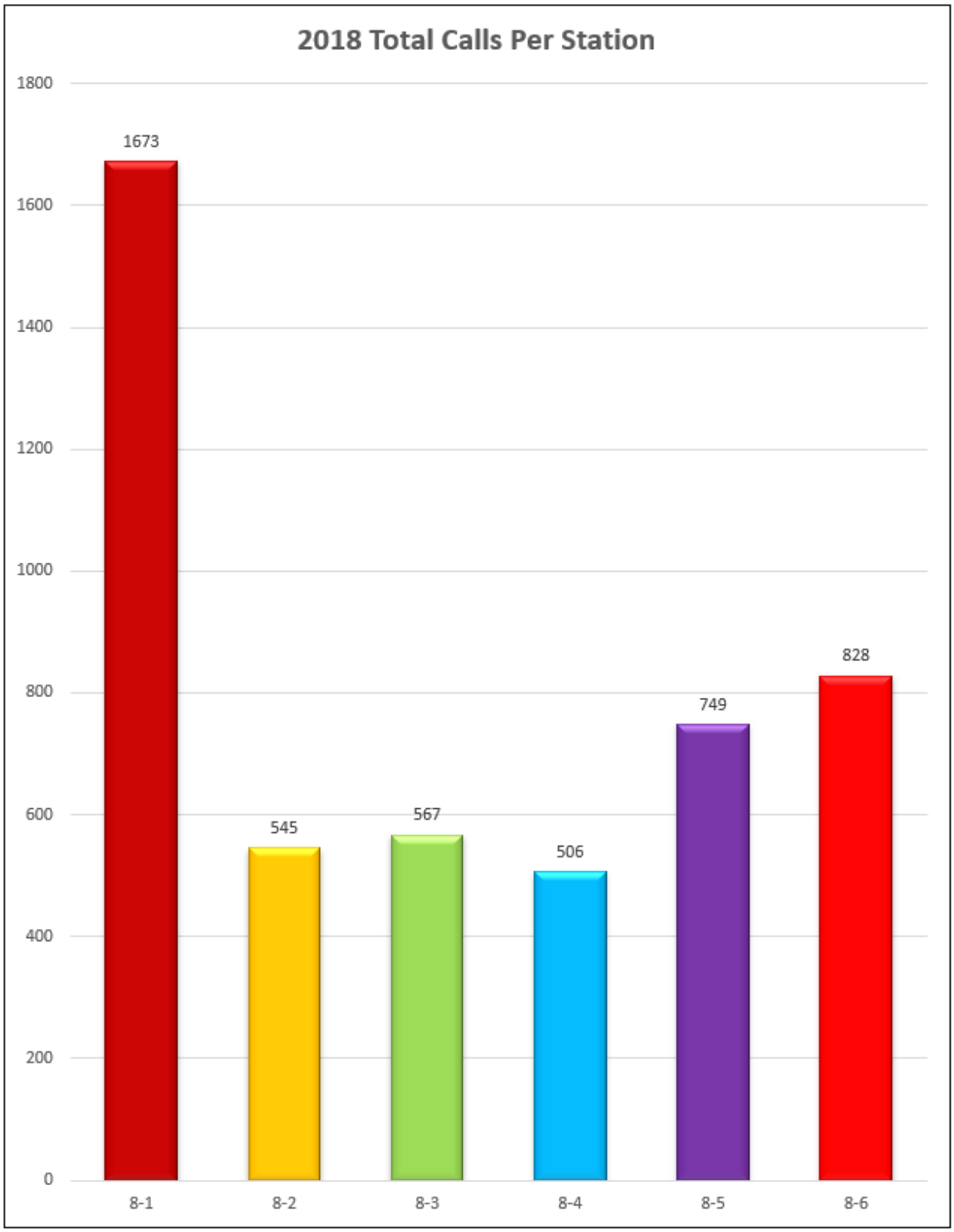

Call Types 2019
Property Fires/ Explosions, 427, 6%
Over pressure rupture/ explosion (no fire), 4, 0%
Other Response, 216, 3%
Pre-fire conditions/ no fire, 250, 4%
Burning (controlled), 31, 0%
CO Alarm Calls, 30, 0%
Medical/ Resuscitator Call, 2786, 41%
Fire Alarm Activations, 1847, 27%
Public Hazard, 251, 4%
Rescue, 1027, 15%
Property Fires/ Explosions
Over pressure rupture/ explosion (no fire)
Pre-fire conditions/ no fire
Burning (controlled)
CO Alarm Calls
Fire Alarm Activations
Public Hazard
Rescue
Medical/ Resuscitator Call
Other Response

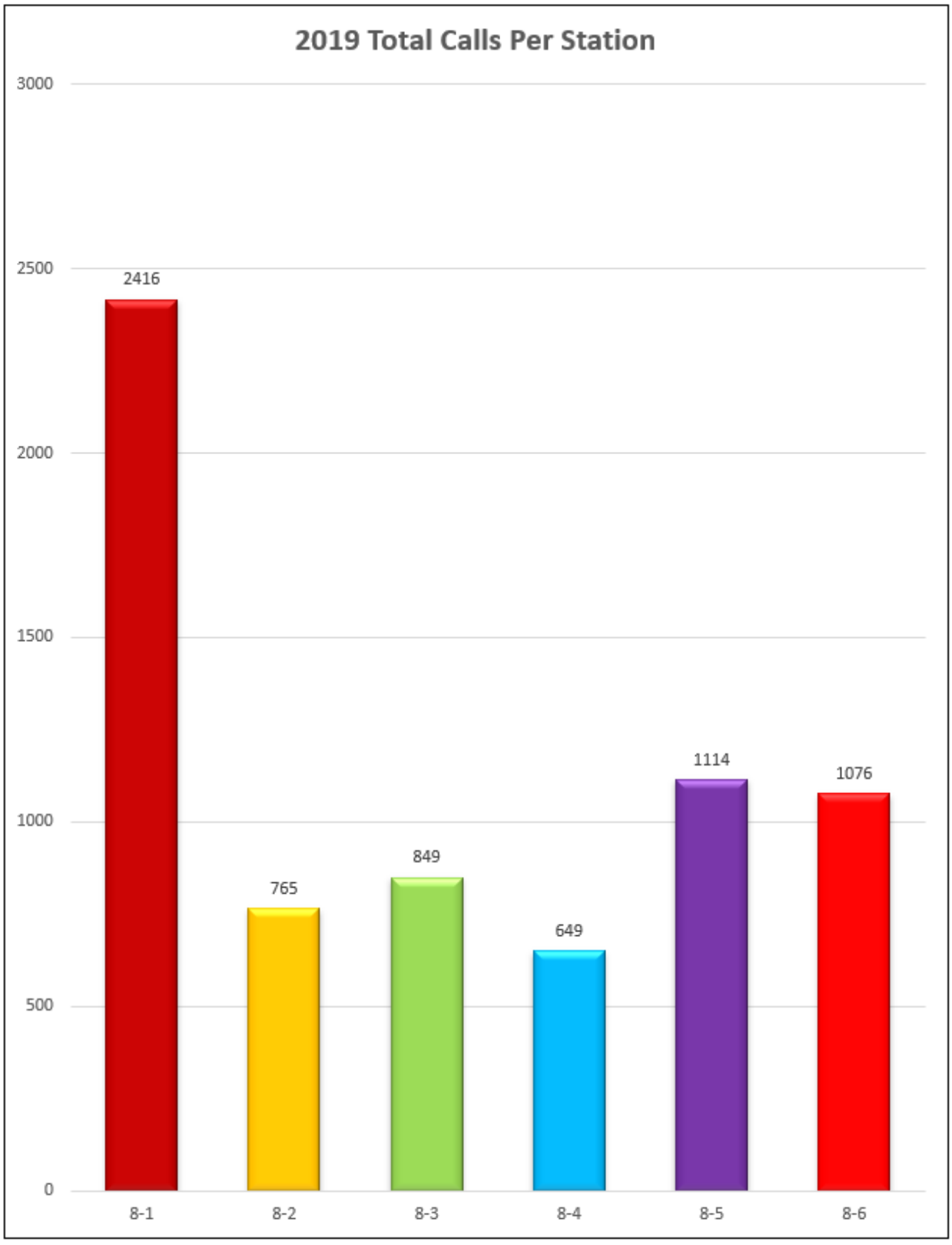


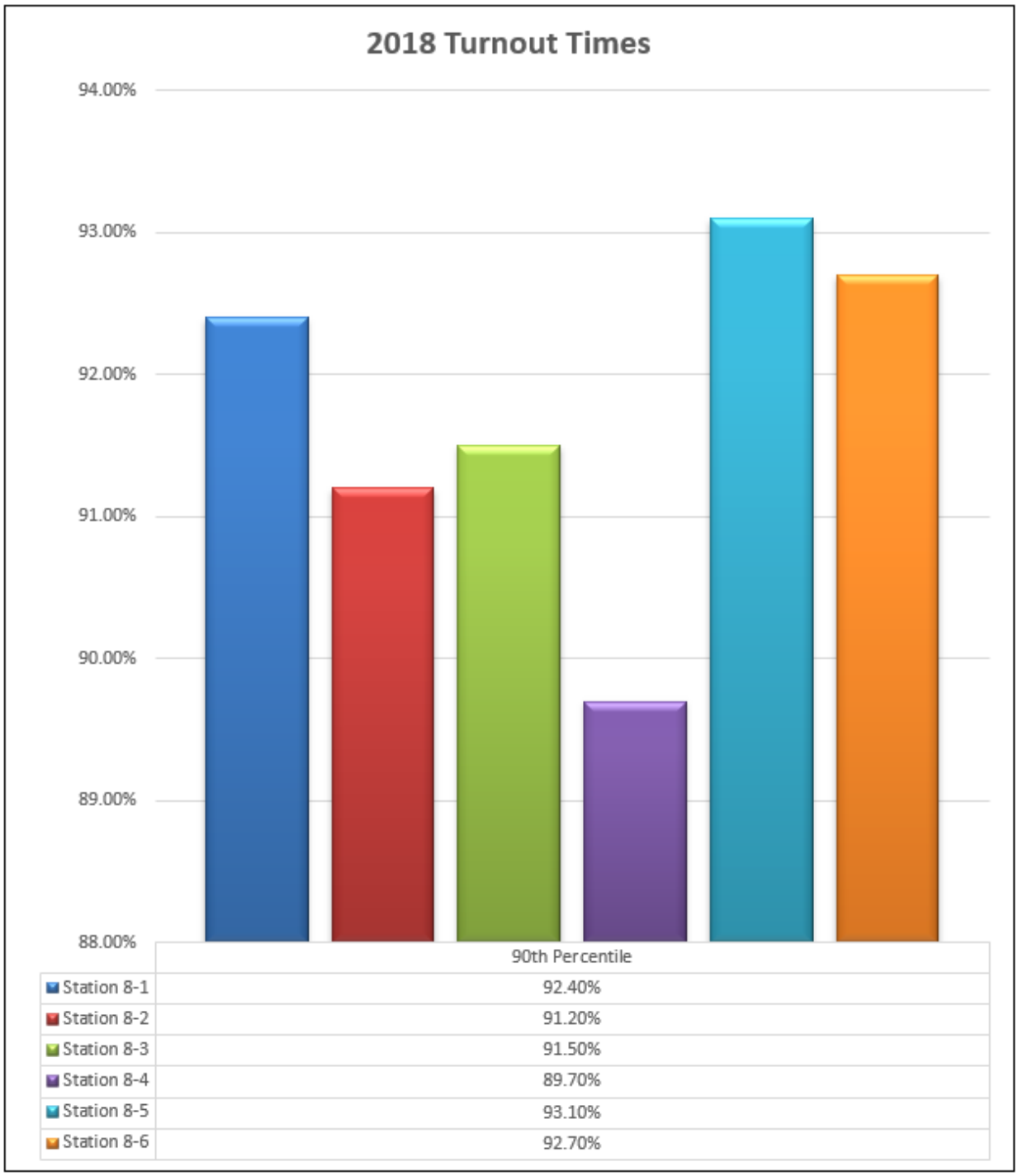
	Property Fires/Explosions	Over pressure rupture/explosion (no fire)	Pre-fire conditions/no fire	Burning (controlled)	CO Alarm Calls	Fire Alarm Activations	Public Hazard	Rescue	Medical/Resuscitator Call	Other Response	Totals
8-1	36	0	31	2	6	257	52	228	963	98	1673
8-2	23	0	12	3	2	66	20	57	346	16	545
8-3	12	0	9	0	2	140	21	106	253	24	567
8-4	16	0	8	0	6	63	15	84	293	21	506
8-5	19	1	7	0	7	108	24	130	428	25	749
8-6	22	0	23	1	6	101	21	120	489	45	828



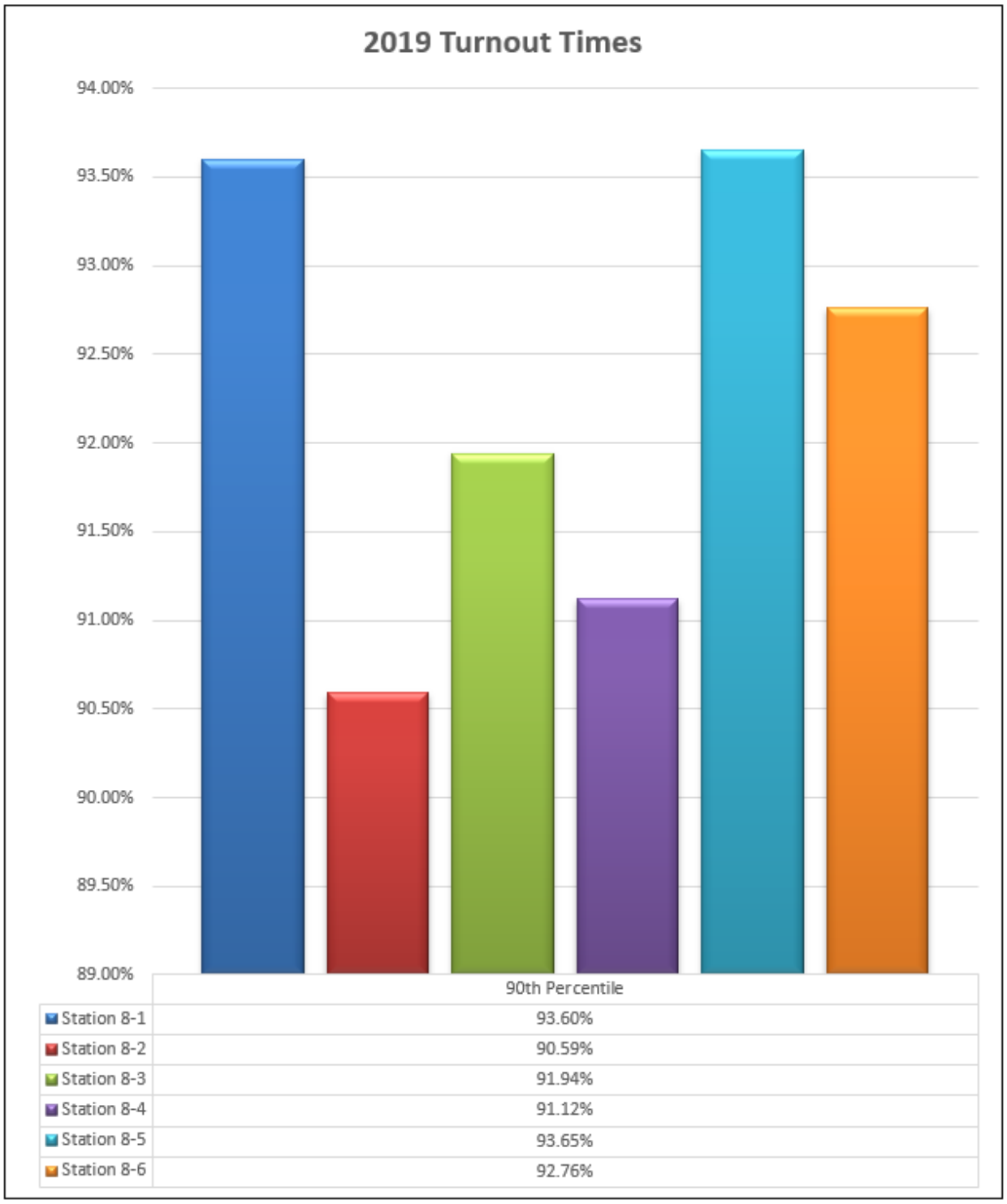
	Property Fires/Explosions	Over pressure rupture/explosion (no fire)	Pre-fire conditions/no fire	Burning (controlled)	CO Alarm Calls	Fire Alarm Activations	Public Hazard	Rescue	Medical/Resuscitator Call	Other Response
8-1	197	0	101	9	9	706	76	352	891	75
8-2	46	0	36	6	2	104	43	98	404	26
8-3	68	3	54	0	2	328	36	109	221	28
8-4	26	0	0	5	6	167	25	130	275	15
8-5	43	1	46	2	3	313	37	170	472	27
8-6	47	0	13	9	8	229	34	168	523	45

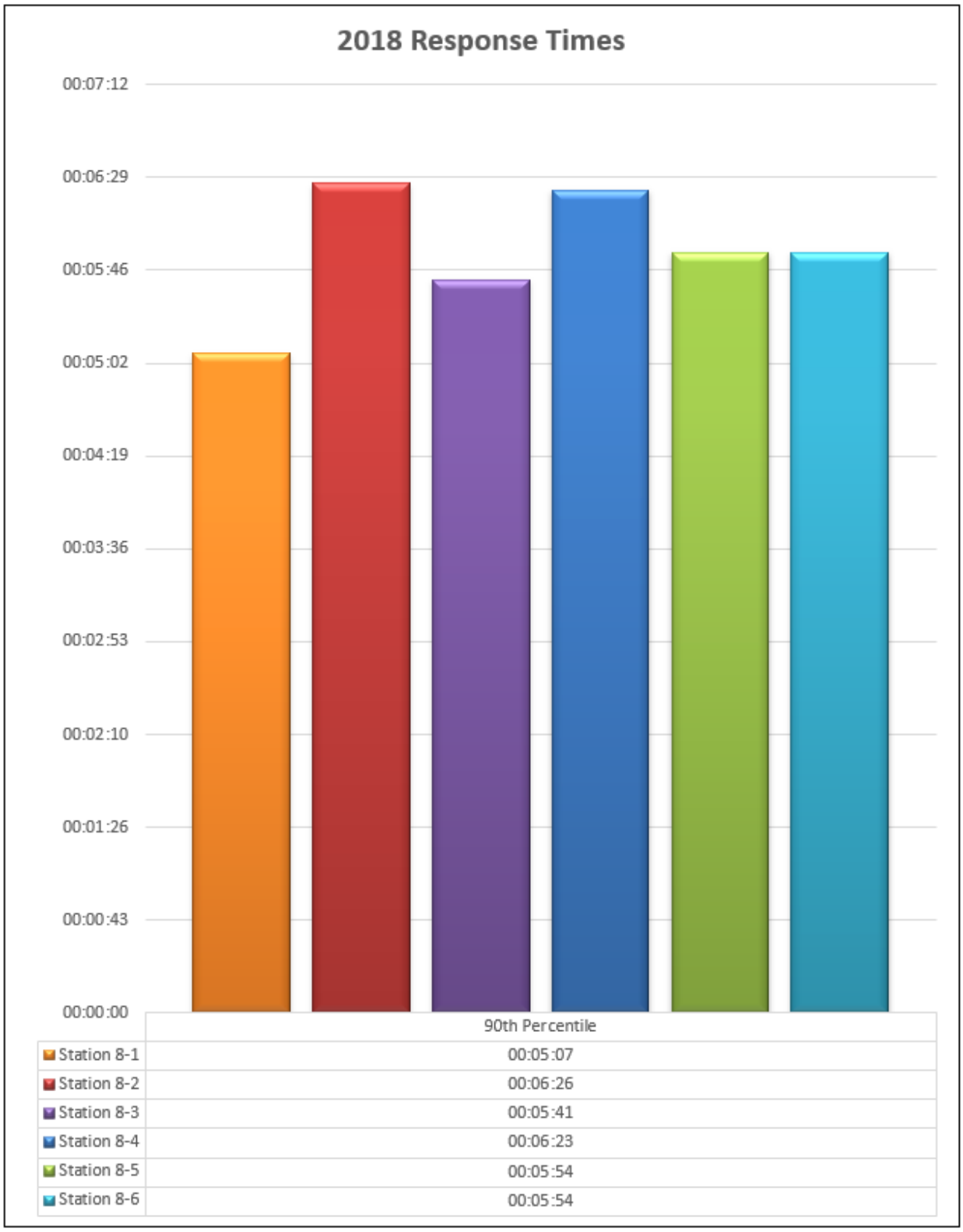

2018 Total Calls Per Station
1800
1600
1400
1200
1000
800
600
400
200
0
1673
545
567
506
749
828
8-1
8-2
8-3
8-4
8-5
8-6


2019 Total Calls Per Station
3000
2500
2000
1500
1000
500
0
2416
765
849
649
1114
1076
8-1
8-2
8-3
8-4
8-5
8-6

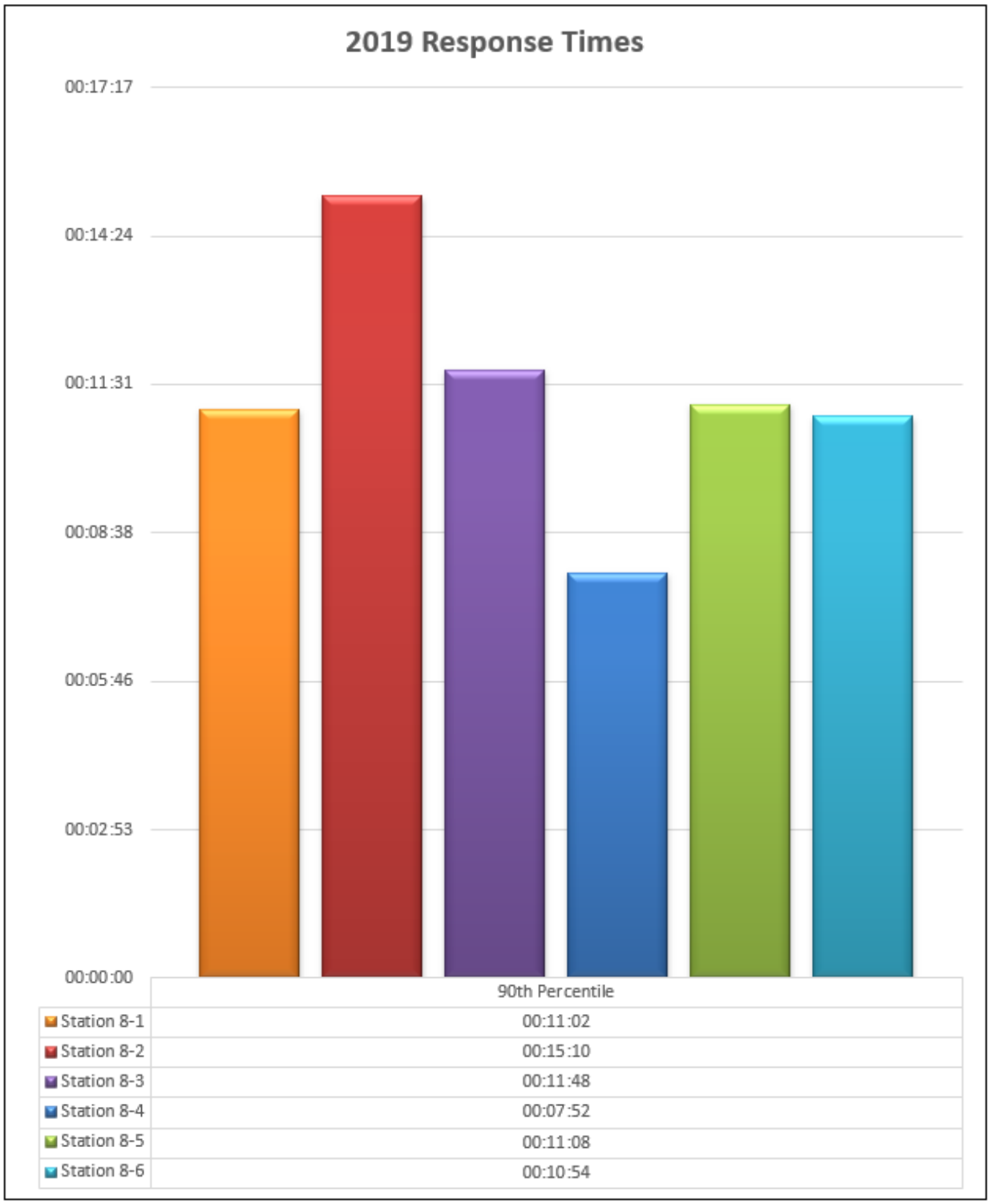


	90th Percentile
Station 8-1	92.40%
Station 8-2	91.20%
Station 8-3	91.50%
Station 8-4	89.70%
Station 8-5	93.10%
Station 8-6	92.70%

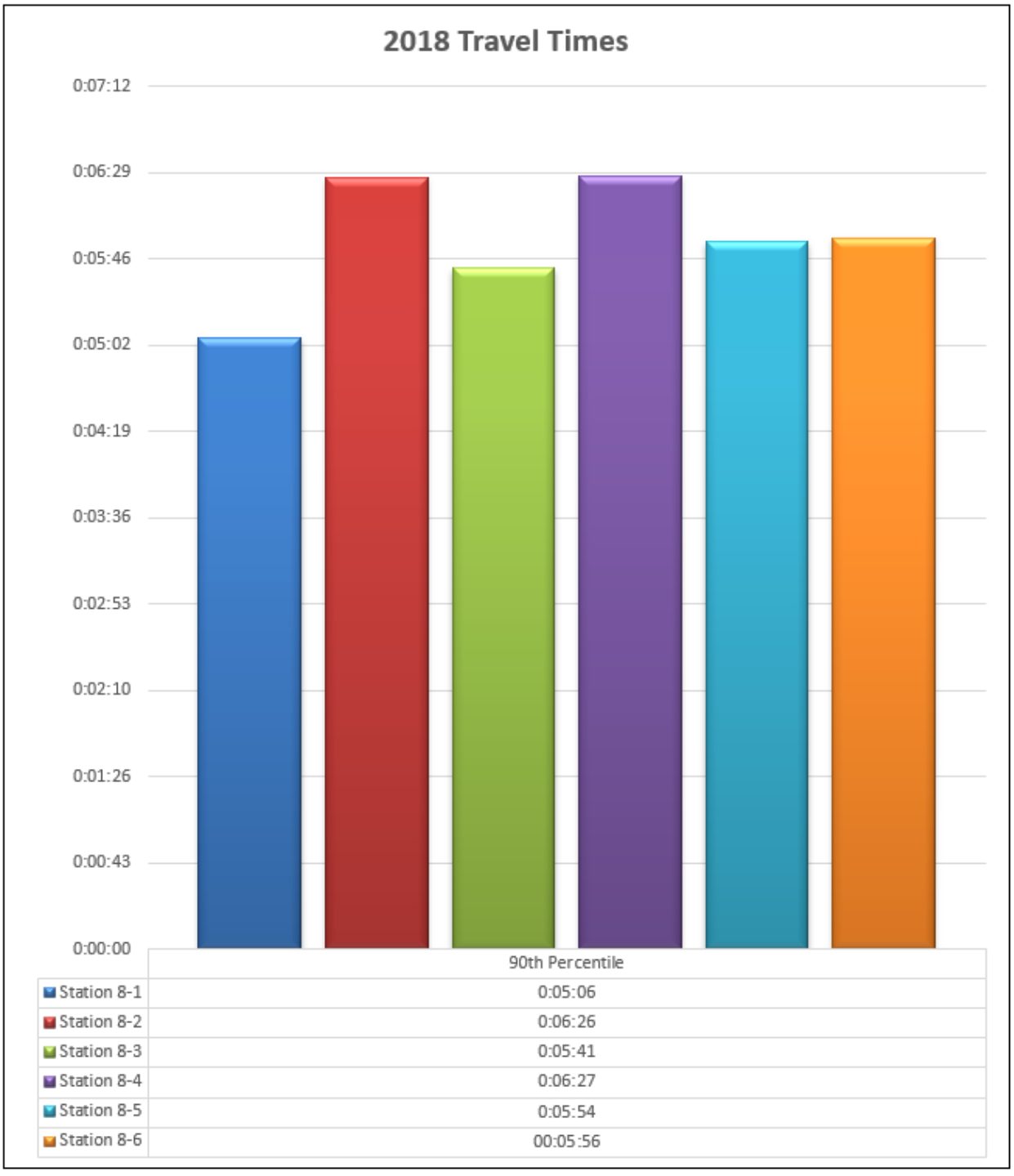

2019 Turnout Times
94.00%
93.50%
93.00%
92.50%
92.00%
91.50%
91.00%
90.50%
90.00%
89.50%
89.00%
90th Percentile
Station 8-1 93.60%
Station 8-2 90.59%
Station 8-3 91.94%
Station 8-4 91.12%
Station 8-5 93.65%
Station 8-6 92.76%



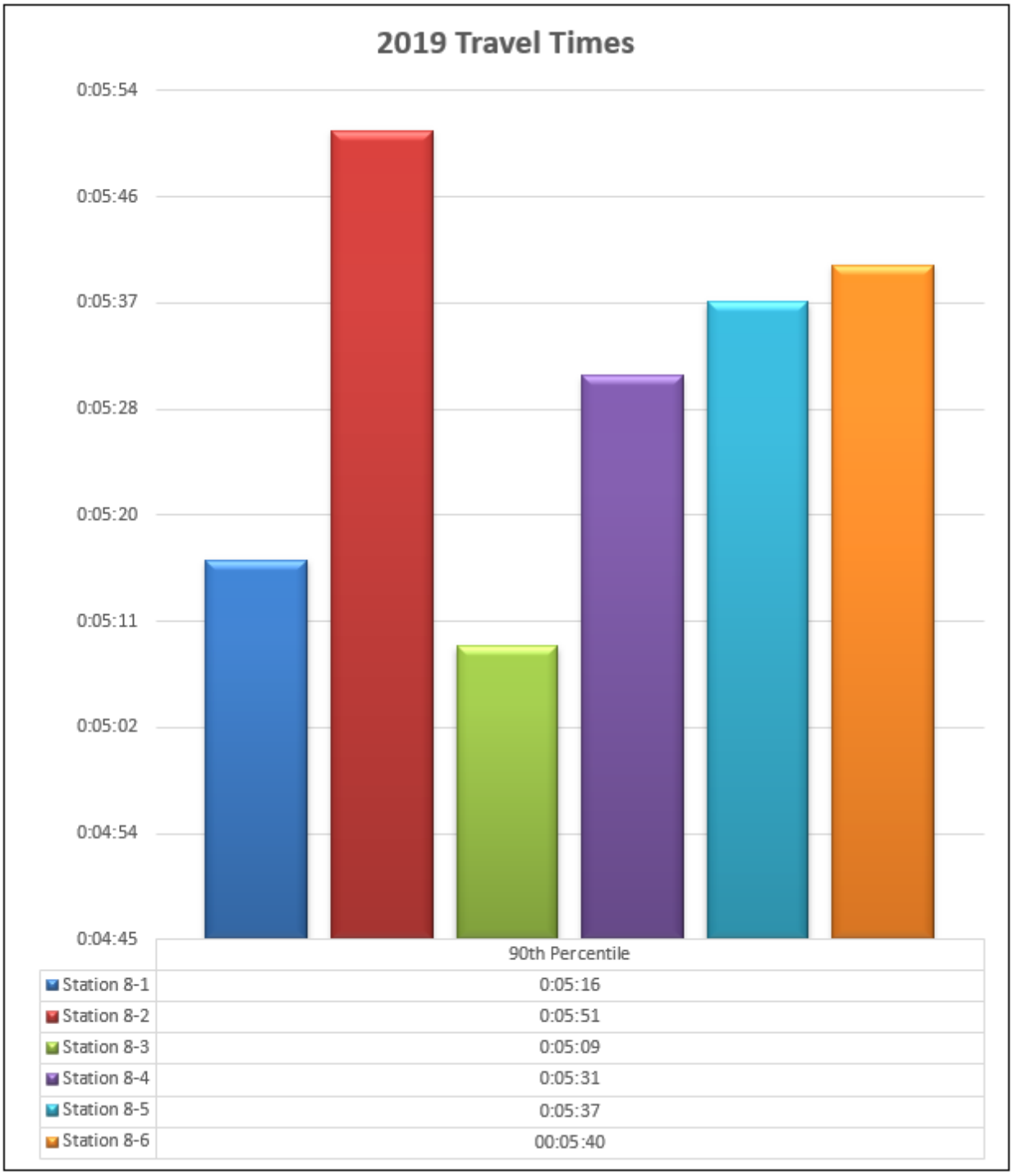
	90th Percentile
Station 8-1	00:05:07
Station 8-2	00:06:26
Station 8-3	00:05:41
Station 8-4	00:06:23
Station 8-5	00:05:54
Station 8-6	00:05:54



	90th Percentile
Station 8-1	00:11:02
Station 8-2	00:15:10
Station 8-3	00:11:48
Station 8-4	00:07:52
Station 8-5	00:11:08
Station 8-6	00:10:54



	90th Percentile
Station 8-1	0:05:06
Station 8-2	0:06:26
Station 8-3	0:05:41
Station 8-4	0:06:27
Station 8-5	0:05:54
Station 8-6	00:05:56



	90th Percentile
Station 8-1	0:05:16
Station 8-2	0:05:51
Station 8-3	0:05:09
Station 8-4	0:05:31
Station 8-5	0:05:37
Station 8-6	00:05:40

Appendix D: Community Outreach

During the many stakeholder meetings and the review of the many internal and external questionnaires, it was evident that more could be done to engage the community at large. The OFMEM is stressing the need for fire services to enhance their public education along with the number of fire inspections completed and the enforcement of violations.

It was also noted that RHFES has had many successes within its daily operations. It is these successes that should be celebrated in some form; for example, certificates, awards, recognition in front of Council or ensuring media are made aware of them so they may be shared with the citizens. These successes are not only with the Operations Division, but all Divisions, be it in the form of providing first aid instruction over the phone, use of an AED that saves a life, suggestions that saves expenses or the successful prosecution of significant fire safety violations.

The following are suggestions on engaging the community:

- Get business and/or community groups to sponsor fire safety coloring books for the children that highlight the many ethnicities of the City. Engage art classes in the school system to design them.
- Establish an “Adopt a Fire Truck” program; a community group or business supports the department financially or services at no charge such as equipment for training in exchange for their business logo to be placed on the apparatus it adopted. This type of program would require limits to the number of sponsors per apparatus, parameters on the size of the logo, the minimum amount to be donated each year, etc.
- Attend community functions and celebrations. Permit a birthday party in the fire station for a fee which includes the cost of Department and cost of staff brought in to monitor the party if the station’s crew must leave for a call.
- During the summer attend a different park each week and invite the community to come out to meet the firefighters. The community could tour the trucks, conduct games for children to win fire safety prizes, have face painting, etc. Many children would enjoy getting wet on a hot evening to cool off by way of a fire hose or water coming from an aerial.
- Work with the Water Department to establish an adopt a hydrant program which have been successful in many communities. Families would adopt the hydrant in front of their residence and their responsibility is to ensure it is clear of tall grass in the summer and snow in the winter. In return the family would receive a certificate and be permitted to paint the barrel of the hydrant in a manner that reflects a theme.

- The Department with support of community groups establish a junior fire fighter program. These programs are quite successful in the United States.
- Invite high school students to complete community hours to assist the Fire Prevention Division at a public education function or community event.
- In conjunction with YRP and YRPS develop a "*Pull to the Right*" program to educate drivers on the need to pull to the right when they hear sirens. This could involve sponsorship from the local media.
- Send out questionnaires each month to a limited number of households that required the services of RHFES with questions regarding how their call was handled, having working smoke alarms, and their interactions with those that attended the call.
- RHFES develop an "*After the Fire*" booklet that would aid residents in understanding what the Department did to extinguish the fire such as breaching walls and ceilings, who they need to call such as insurance companies, and the process of establishing a claim, how to recover documents, etc. This too could be sponsored by local businesses and insurance companies.
- Everyone is familiar with Sparky the fire services mascot. What if RHFES had their own mascot to assist Sparky at community functions? Engage the schools to design one, have fashion design classes make its costume, have a community contest to name them and have businesses sponsor the new member to the Department.
- Contact some of the ethnic or neighbourhood organizations to participate in any festival/celebrations they may have. The Board of Trade may have a list of these or City Hall as some may require a permit.

The list is endless and hopefully some of these ideas as well as others may come to fruition to aid in enhancing the RHFES community relations.

Appendix E: Five-Step Staffing Evaluation Process

Step 1: Scope of Service, Duties, and Desired Outputs

Identify the services and duties that are performed within the scope of the organization. Outputs should be specific, measurable, reproducible, and time limited. Among the elements can be the following:

- Administration
- Data collection, analysis
- Delivery
- Authority/responsibility
- Roles and responsibilities
- Local variables
- Budgetary considerations
- Impact of risk assessment

Step 2: Time Demand

Using the worksheets in Table C.2.2(a)-(d), quantify the time necessary to develop, deliver, and evaluate the various services and duties identified in Step 1, taking into account the following:

- Local nuances
- Resources that affect personnel needs

Plan Review - Refer to Plan Review Services Table A.7.9.2 of the standard to determine Time Demand.

Step 3: Required Personnel Hours

Based on Step 2 and historical performance data, convert the demand for services to annual personnel hours required for each program *[see Table C.2.3(a) through Table C.2.3(e)]*. Add any necessary and identifiable time not already included in the total performance data, including the following:

- Development/preparation
- Service
- Evaluation
- Commute
- Prioritization

Step 4: Personnel Availability and Adjustment Factor

Average personnel availability should be calculated, taking into account the following:

- Holiday
- Jury duty
- Military leave
- Annual leave/vacation
- Training
- Sick leave
- Fatigue/delays/other

Example: Average personnel availability is calculated for holiday, annual, and sick leave per personnel member (see Table C.2.4).

Step 5: Calculate Total Personnel Required

Branch of the unassigned personnel hours by the adjustment factor will determine the amount of personnel (persons/year) required. Any fractional values can be rounded up or down to the next integer value. Rounding up provides potential reserve capacity; rounding down means potential overtime or assignment of additional services conducted by personnel. (Personnel can include personnel from other agencies within the entity, community, private companies, or volunteer organizations).

Correct calculations based on the following:

(1) Budgetary validation
(2) Rounding up/down
(3) Determining reserve capacity
(4) Impact of non-personnel resources (materials, equipment, vehicles) on personnel

More information on this staffing equation can be found within the National Fire Protection Association 1730 standard. The Fire Prevention should assess the previous five steps and evaluate their present level of activity and the future goals of the Branches.

Appendix F: OFMEM Public Fire Safety Guidelines

PFSG 01-01-01

Fire Protection Review Process

Please be advised that Office of the Fire Marshal and Emergency Management Public Fire Safety Guidelines are currently under review but continue to be made available for reference purposes.

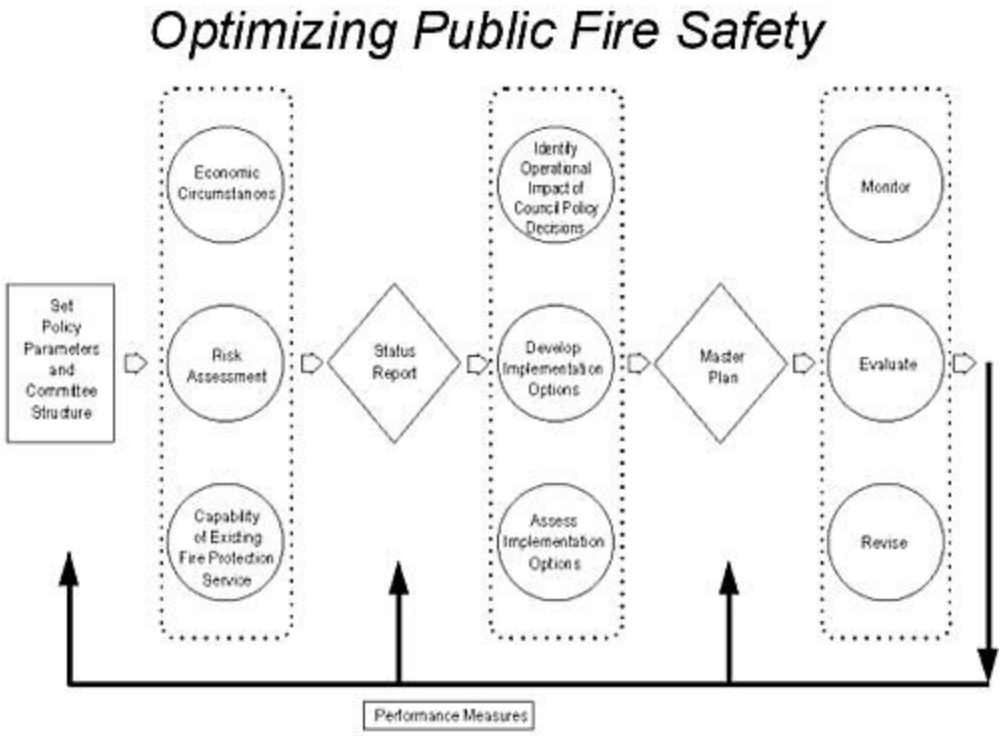
Public Fire Safety Guidelines	Subject Coding PFSG 01-01-01
Section General	Date January 1998
Subject Fire Protection Review Process	Page

Purpose:
To provide a description of a simple and practicable system to enable decision makers to make informed choices.

It ensures formal interaction between council with its policy setting responsibilities, the municipality with its corporate management objectives, and the fire department with its operational expertise.

Introduction:
The overall objective of any fire protection program is to provide the optimum level of protection to the community, in keeping with local needs and circumstances. Extensive research has demonstrated that there are a variety of factors that will have an impact on the fire department's capacity to fulfil this objective. Conversely, there are many different options that a municipality may pursue to improve the efficiency and effectiveness of its fire protection system.

Local circumstances will have a profound effect on which factors are most important for any one municipality, and what options are available for its fire protection system. Selecting among these options is an extremely complex task. Success will require a combination of specialized expertise in fire protection, and a thorough appreciation of your municipality's economic, social and political circumstances.



Overview:

Stage 1: Set Policy Parameters
Stage 2: Determine Local Circumstances
Stage 3: Status Report
Stage 4: Determine Fire Protection Strategy
Stage 5: Develop Master Fire Plan
Stage 6: Monitor, Evaluate and Revise
Stage 7: Performance Measures

Every municipality operates under a specific set of policy parameters -- basic tenets that define the role of the municipal government in the community. In essence, it is the political philosophy of the municipality.

These parameters reflect the culture of the local community and will have a profound impact on the fire protection strategy that you develop. Policy parameters include, for example:

- *Public Expectations*: Does the public expect the municipality to address its needs or is there a fairly high level of personal self reliance?
- *Service Delivery Strategy*: How open is your community to alternate forms of service delivery and financing such as out-sourcing or fee-for-service?
- *Level of Satisfaction*: Are you satisfied with the level of fire protection in your community, and the efficiency and effectiveness of the fire protection system?

- *Funding Policies*: What impacts do your funding policies and practices have on the services you deliver? How do you account for capital expenditures? Are you prepared to issue debentures?
- *Competing Priorities*: What priority does public fire safety have in your community in comparison to the other services that you provide?
- *Receptiveness to Change*: Does the public recognize the need for change, and would they accept the implications of such change?

It is extremely important that you work through these questions from a fire protection perspective, and that you include all of the key participants in the process. It need not be an excessively formal process, but everyone involved in the review should have an opportunity to discuss the broader context within which the fire department must operate.

The results of this discussion should be reflected in the "terms of reference" for the review. It will help to ensure that the review remains focused.

It will also encourage participants to be open to innovations, and conversely, it will help to ensure that staff involved in the review do not spend unnecessary time and resources analyzing options that are not viable.

Stage 2:

Analyse Local Circumstances

Separate guidelines are available that address each of the three main issues that define the local circumstances of a municipality:

- Assessing Economic Circumstances from a Fire Protection Perspective (PFSG 02-03-01)
- Assessing Fire Risk (PFSG 02-02-12)
- Assessing the Existing Fire Protection Services (PFSG 02-04-01)

The following is an overview of the issues that these three guidelines address.

Economic Circumstances:

- What are your expectations for economic growth?
- How much development do you expect to occur?
- What type of development do you expect?
- How is your population changing? (Demographics)
- If the fire department receives the bulk of its financing from the tax base;
    - Is the tax base increasing, shrinking, or relatively steady?
    - Is the tax base shifting?
- Describe the assessment.

A review of your economic circumstances should involve more than just an assessment of future demand and available resources.

A growing community creates new demand for emergency services, but the type of growth you are experiencing may require a very different kind of response. For example, growth resulting from an in-migration of newly retired residents will create very different demands than growth resulting from the recovery of the local resource industry.

There are many more ways in which your fire protection system can address new residential development than there are for older neighbourhoods. An initial investment in sprinkler and/or detection systems when new developments are being planned can reduce the need for new fire stations in the future.

Economic development and expansion may have a significant impact on the availability of resources for fire protection. It tends to be easier to attract volunteers in a self-contained community than in a similar-sized area that serves as a bedroom community for a large city. Is the make-up of your community changing?

This stage of the review is the first opportunity for you to co-ordinate your planning strategy with your fire protection strategy. Accordingly, it is very important for both fire and planning officials to work closely together on this aspect of the review, perhaps by way of a sub-committee.

Fire Risk:
The Fire Risk in your community is a function of:

- *Potential for Loss*, which depends on the extent to which buildings comply with relevant fire and building codes, how buildings are used, the public's attitude toward fire, and the use of special measures such as automatic detection and/or suppression systems.
- *Consequences of Fire*, such as the effect of a fire at a major industry on local employment, assessment and economic activity. This also includes social impacts resulting from the loss of an historic or recreational facility, or the impact of fire on a sensitive environmental area.
- *Local Infrastructure,* such as water supply, communications, the quality of roads, and physical barriers such as rivers or railroads.
- *Building Stock*, including the age of buildings, the density and type of construction, their height, and the mix of commercial, industrial and residential uses.
- Since there are so many factors that affect fire risk, it tends to vary considerably from location to location. In fact, fire risk in one part of a municipality will often be very different from in another, particularly in rural areas. Accordingly, there is no need for the fire department to provide a uniform level of service throughout the municipality. The service you provide should be tailored to the risks faced.

A thorough risk assessment can also avoid invalid comparisons between your fire department and others. A municipality with a similar population may have very different fire risks, and therefore very different fire protection needs. A good risk assessment will ensure that such comparisons are valid. By providing a valid basis for comparison, a good risk

assessment can also provide confidence that innovations introduced elsewhere can be successfully applied in your municipality.

Existing Fire Protection System:
Examining the existing fire protection system is perhaps the most time-consuming component of the assessment process. The objective is to obtain a clear picture of the nature of the fire protection system as it exists today. The following broad areas should be examined:

- *Role and Mandate:* What range and scope of services is the department expected to provide (fire suppression, rescue, hazmat, etc)? How does it relate to neighbouring fire departments (mutual-aid, automatic aid)? How does it relate to other sections of the municipality?
- *Structure and Organization*: What type of department is it (full-time, composite, volunteer)? What is its total staff, facilities, apparatus and equipment? How many layers of management?
- *Services and Support:* Briefly describe the services provided by the various functional sections of the fire department and describe the support mechanisms for these services.
- *Emergency Operations:* Describe the types and extent of emergency operations conducted by the fire department and include such things as incident command systems and operational support.
- *Financial & Resource Analysis:* Describe in detail the funding, budgeting and resource allocation of the fire department, including the individual functional divisions.
- *Fire Protection and Prevention Act*: Indicate whether or not the department/municipality is in compliance with this Act.

Stage 3:

Status Report

The purpose of this stage is to assist in the preparation of a report to council outlining the findings of the analysis of the following:

- Economic circumstances
- Risk assessment
- Capabilities of existing fire protection service
- Details of the existing circumstances
- Identify strengths, limitations, threats, and opportunities respecting the existing fire protection services.
- Elicit the expectations of the decision makers and confirm their commitment to proceeding to the master planning process.

Stage 4:

Determine Fire Protection Strategy

This stage of the process involves a review team assisting council in making a determination of the future fire protection strategy. The procedure involves analyzing economic circumstances, risk assessment and the capabilities of the existing fire protection service (including core services). This is accomplished in three levels, as follows:

- Council considerations
- Administrative considerations
- Fire department considerations

Your review should consider, and perhaps emphasize the need for residents, industry and others to accept increased responsibility for the improvement of public safety. The review must look beyond the fire department's fire fighting capability in fulfilling its responsibility to provide for public safety.

Today's economic conditions - evidenced by reduced budgets, revenues, hiring freezes, reductions in staffing levels through attrition or otherwise, delayed apparatus and equipment purchases - forces the making of hard decisions about the resources required for local fire protection. Options and alternatives are therefore essential. For example, it may be considered appropriate to re-focus on developing fire prevention and public education programs rather than expanding fire fighting forces or consider resources in surrounding communities and how those resources might be utilized to meet your needs.

Determining the future fire protection strategy of your municipality is accomplished by way of providing options for the consideration of council. For this process to be successful, it is imperative that there be full and open consultation with all of the stakeholders. Stakeholders are the people and organizations with an interest in the fire service, including:

- Fire department staff and management
- Municipal staff and management
- Municipal administrators
- Council
- Residents
- Business
- Industry
- Planning and co-ordinating agencies and organizations
- Provincial government ministries
- County/district/regional organizations

Other municipalities:

- Schematic diagram of the model: Optimizing Public Fire Safety Highlighting Stage 3
- Police
- Ambulance

Other umbrella organizations:

- Fire Fighter Associations (full time and volunteer)
- AMO
- OA Fire Chief
- CA Fire Chief

Consultation with stakeholders during the development, assessment and operational impact of various options is necessary for three reasons. First the review team will obtain expert advice on key elements of the various options, obtaining expert advice from all stakeholders ensures that all parties to the process:

- Fully appreciate why the process is being carried out.
- Clearly understand the strategy, initiative or option that will be evaluated.
- Participate in identifying potential evaluation questions or issues, and
- help shape the options.
- Ensure a surprise-free environment for all parties to the review process.

Ensuring a surprise-free environment is necessary for the review team facilitator(s) to create a receptive, productive environment for the option evaluation process. Except in extremely rare cases, stakeholders should be aware of the option evaluation process. Nothing is more damaging to such a process than to spring it on stakeholders. They will usually react suspiciously and defensively, see the process as an intrusion, find fault with it, and actively lobby to circumvent its recommendations. Finally, the stakeholders will use the consultation as an opportunity to market the various options.

Marketing the various options and their potential is essential if it is expected that they will lead to program or service changes, particularly significant ones. Change is not an event, but a process, and usually a slow process, and conditions generally needs to be cultivated. Like a building, the foundation for change needs to be laid well in advance of its construction. Stakeholders must accept the need to change before it can occur. For the review team and its facilitator(s), creating this comfort level is an essential ingredient of success.

The review team and facilitator(s) usually consult with the stakeholders through established committees. Primary discussions between the facilitators and the stakeholders are usually conducted on an individual basis, with the committee acting as a clearinghouse. Facilitators, who almost always shun formal committees and attempt to consult by only using individual or

team interviews, enjoy limited success. While individual consultation may provide a more direct and confidential input into the process, this practice has drawbacks. It often results in stakeholders seeing the process as the product and possession of the facilitator. Stakeholders often feel that they have not participated fully and equally in planning the study. And there is the chance they can complain that the facilitators have filtered their concerns.

This review process will result in alternatives for your existing fire protection services, and options and considerations for council's vision of the future of the fire service. All options will be prioritized, assessed, costed where appropriate and clearly indicate the operational impact. Then council will be in a position to make better informed decisions for creation of your master fire plan.

Stage 5:

Develop Master Fire Protection Plan

Master fire plans, properly introduced, are a valuable tool in identifying management options for providing desired fire protection levels to a community. Ultimately, a good plan will lead to a more fire safe community. A Master Plan, paired to its essentials, presents the programs or projects, the costs, and the schedules for developing and maintaining the fire protection system that has been accepted and approved by council on behalf of the community, based on a price which the public can afford.

Master planning itself is not a new concept. Many municipalities are involved in the process with varying degrees of success. Master planning for fire protection allows each community to determine the best allocation of resources to achieve an acceptable level of fire protection.

An appropriate plan can only be developed under the following conditions:

- Schematic diagram of the model: Optimizing Public Fire Safety Highlighting Stage 5.
- The Plan forms the basis for the fire protection budget, through identification and description of time-phased programs and projects to be implemented throughout the planning period.

The Plan considers the following factors:

- The current and future fire protection environment by establishing and maintaining a comprehensive data base.
- The acceptable life and property risks by setting goals and objectives.
- The fire protection system that provides the level of service commensurate with the level of accepted risk.
- The funding required to implement the plan.
- The assignment of authority and responsibility.
- The procedures for carrying out and updating the plan.

- Defines the community fire problem and provides the future direction of the delivery of fire protection services.

The Plan will require continuous updating to provide a current picture of the needs of the community.

There are several benefits to developing a Master Fire Plan which include the following:

- Supports the Risk Management Program by identifying programs and levels of service.
- Improves public relations and promotes interest and direct involvement within the community.
- Sets standards of service the fire department is capable of providing.
- Potentially decreases costs, for fire protection and/or insurance coverage.
- Contributes to a reduction in the number of fires, fire deaths, fire injuries and property loss.
- Makes best use of available resources.
- Defines by policy of council the types, level and quality of fire protection services to be provided to the community.

Stage 6:

Monitor, Evaluate & Revise

Introduction:
This stage of the municipal fire protection review process involves three parts:

- Monitor
- Evaluate
- Revise
- Just as the type and level of fire services provided are a municipal responsibility, so are the evaluation, monitoring and revision of such services a municipal responsibility.
- They may**,** however, be subject to outside scrutiny.

Objectives:
The objectives of the Municipality, as mirrored in the fire department Master Plan, are the starting point for any evaluation. These objectives should be consistent with the review process mission statement and express what the process is to accomplish. The objectives should be both specific and measurable.

Activities:
The activities are the operational aspects of the identified objectives. Activities should be logically related to objectives.

- *Immediate Outcomes* are the effects that are expected to occur as a direct result of activities. These outcomes may include changes that affect people or processes. For example, an immediate outcome might be the improved delivery of a specific service.
- *Ultimate Outcomes* include the larger societal level changes that are expected from the activities. An example would be an expected improvement in compliance with the Fire Code. Ultimate outcomes are often dependant on immediate outcomes. In this example, success might be dependent on providing an appropriate public education program.

Monitor:
Notwithstanding it is considered prudent for municipalities to monitor programs, services and activities, the *Fire Protection and Prevention Act* includes the following:

- **PART II (7)** The Fire Marshal may monitor and review the fire protection services provided by municipalities to ensure that municipalities have met their responsibilities under this section and, if the Fire Marshal is of the opinion that, as a result of a municipality failing to comply with its responsibilities under subsection (1), a serious threat to public safety exists in the municipality, he or she may make recommendations to the council of the municipality with respect to possible measures the municipality may take to remedy or reduce the threat to public safety." and,
- **PART III FIRE MARSHAL 9**. (1) The Fire Marshal has the power, (a) to monitor, review and advise municipalities respecting the provision of fire protection services and to make recommendations to municipal councils for improving the efficiency and effectiveness of the services.".

Program monitoring is a systematic attempt to measure both of the following:
- *Program Effectiveness*: Are the programs and services reaching their intended marks?, a
- *Program delivery*: Does the service being provided match what was intended to be delivered?

Program monitoring need not always be complicated and complex, as it often can be as simple as keeping track of the activities involved and concentrates on program service outputs rather than program outcomes

Evaluate:
Programs adopted and implemented through the master fire plan should have built-in evaluation procedures. Evaluations are not simply the responsibility of municipal politicians and or administrators, but additionally, is an administrative function of the fire department.

Internal Evaluators:
As employees of the fire department, internal evaluators have intimate knowledge of the department's policies, procedures, politics and people; they know both the formal and informal channels for communicating and accomplishing tasks.

This knowledge permits them to select methods that fit the unique situation of the department. Internal evaluators long term commitment to the fire department can lend credibility to their efforts and help forge positive working relationships with managers and staff. They can build trust over time that helps reduce the anxiety normally associated with evaluation activities

Because they are employees, internal evaluators are available as an on going corporate resource. This puts internal evaluators in an excellent position to communicate relevant information in a timely fashion. It also permits internal evaluators to participate actively in long-range planning by making crucial evaluative information available for strategic planning and policy decisions. It affords internal evaluators the opportunity to consult with and provide information to various management levels within the organization, enabling them to enhance the utilization of evaluation information.

Internal evaluators are often responsible for correcting problems and advocating change rather than only identifying difficulties and making recommendations. The focus of internal evaluation often includes not only program outcomes and processes, but also the factors that influence program performance, such as structure, operations and management. The use of internal evaluators, some of whom could conceivably be part of the problem, then can become part of the solution

External Evaluators:
External evaluators are usually perceived as being more objective because they are not fire department employees and are therefore not subject to all of the pressures of organizational life.

Internal evaluators now often work in partnership with external evaluators to obtain the external evaluators' specialized skill and objectivity while retaining the internal evaluators' knowledge of the department. All evaluators, whether internal or external, have their biases.

Revise:
Consider the benefits and results of the foregoing monitoring and evaluation processes to assist in determining if any revisions are necessary. Some of the principal benefits are:

- Any gap between goals and performance.
- Cost effectiveness and efficiency of the program/service.
- How is the program operating/functioning?
- Issues that could jeopardize the program/service.
- Program/services strengths.
- Program/services weaknesses.
- To what extent are the citizens being served.
- Whether desired and/or undesired outcomes have taken place.

This information is useful for:

• Clarifying the mission, purpose and goals
• Describing the programs and services
• Facilitating the refinement and modification of program or service activities
• Fulfilling accountability requirements
• Guiding allocation of resources and personnel
• Maintaining quality of services and programs
• Program decision making, such as continue, cancel, cut back, change, expand
• Setting priorities
• Weighing costs and benefits of alternatives

Stage 7:

Performance Measures

Purpose:
The purpose of this section of the guideline is to assist in developing and using performance measures. The guide answers the following questions:

- What are performance measures?
- How can they be used?
- What is the best way of doing this?
- Where does one start?

Introduction:
Data and information collected and used by managers in the public sector usually pertain to inputs, outputs and processes. Examples of these measures are as follows:

INPUTS:

- Amount of money spent on training
- Number of staff assigned to fire prevention
- Number of staff assigned to training

PROCESS:

- Number of firefighters at O.F.C.
- Number of days to complete a project
- Length of time to conduct an inspection

OUTPUTS:

- Number of training manuals produced
- Number of inspections completed

- Number of plans reviewed
- Number of emergency responses

Many managers judge their effectiveness by counting and tabulating these inputs, processes and outputs. These are measurements of the process rather than the measurement of performance**.** They measure what was done, rather than the impact of the action.

Without meaningful performance measures that directly link the impact of your actions to clear goals and objectives, it may be difficult, if not impossible, to provide a sound and supportable justification for the continued existence of your program or service

Goals and Objectives:
It is imperative that there is a clearly stated goal and objective for every program, service, and activity. Once the goals are clarified in a meaningful way, specific objectives can then be made to operationalize the program. For example, the vague goal of improved fire safety can be made more meaningful and specific as follows:

- ***"Increased number of working smoke alarms in the home"***

With the goal specifically defined, it provides direction and guidance as to what objectives must be achieved in order to reach this goal. For example:

Goal:
Increased number of working smoke alarms in the home.

Objectives:

- Public awareness of the value of smoke alarms through media advertising
- Promotional campaign as part of Fire Prevention Week
- Provide quality smoke alarms to the public at a reduced price

Measuring Performance:
There is merit in linking the results of programs, services and activities to clearly defined objectives. It is not sufficient that the goal be achieved; it is necessary to show that the activities of the program were responsible for the achievement of the goal by establishing cause and effect. The key questions to determine the impact of actions are:

- Do you have the resources to achieve the goal?
- Why are you doing this?
- Are you achieving what you are supposed to be doing?
- How do you know?

Managers must develop meaningful performance measures and report on their success by measuring performance. Decisions on program direction can then be made based on this information.

What are Performance Measures?
The quantitative and qualitative measures which assess the effectiveness and efficiency of a product, service or process. They are the key indicators of success. Performance measures generally fall into six primary categories:

1. Time
2. Effectiveness
3. Quality
4. Efficiency
5. Costs and
6. Productivity Safety

To clarify these six categories of performance measures, each is defined as the following:

Time: Time it takes to complete a process (cycle time) or deliver a service or product.

Effectiveness: Doing the right things, meeting corporate objectives and strategic directions.

Quality: A measure of the extent to which a thing or experience (service) meets a need, solves a problem or adds value for someone (client, stakeholder, taxpayer).

Efficiency: Outputs relative to inputs; doing things right every time.

Costs & Productivity: Cost to provide a product or service; the relationships among costs, inputs and outputs.

Safety: The extent to which important assets (personnel, property, records) are safeguarded so that the organization is protected from danger of losses that could threaten its success, credibility, continuity, etc.

Why:
Why do you use performance measures?

- To demonstrate success
- To identify problems
- To evaluate goal achievement
- To determine whether or not there is performance improvement

Codes, Standards and Best Practices:
Codes, Standards and Best Practices available to assist in establishing local policy on the delivery of this service are listed below. All are available at *http://www.mcscs.jus.gov.on.ca/.*. Please feel free to copy and distribute this document. We ask that the document not be altered in any way, that the Office of the Fire Marshal be credited and that the documents be used for non-commercial purposes only. See also:

- **02-04-01** & **23**: Capabilities of Existing Fire Protection Services
- **02-03-01**: Economic Circumstances
- **02-02-12** & **03**: Fire Risk Assessment
- **03-01-13**: Preparation of Draft Report
- **04-39-12**: Fire Prevention Effectiveness Model

Firefighters

PFSG 04-87-13

Fire Station Location

Please be advised that Office of the Fire Marshal and Emergency Management Public Fire Safety Guidelines are currently under review but continue to be made available for reference purposes.

Public Fire Safety Guidelines	Subject Coding *PFSG 04-87-13*
Section: *General*	Date: *September 2004*
Subject: *Fire Station Location*	Page:

Purpose:
To assist communities in determining the best locations for their fire stations.

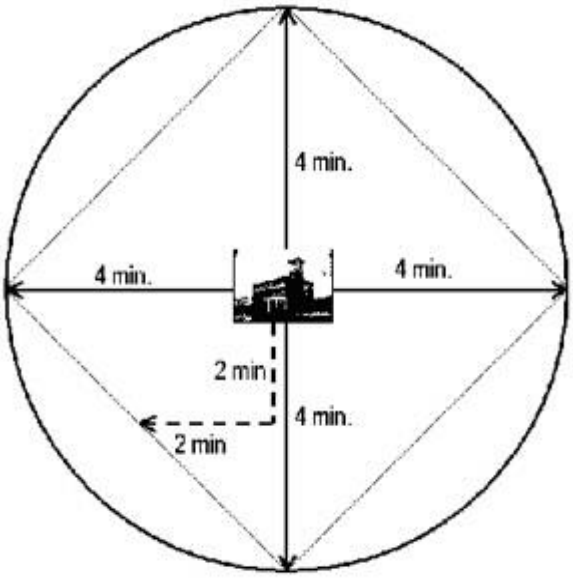
Introduction:
Fire stations should be situated to achieve the most effective and safe emergency responses. Fire stations represent a substantial municipal investment and should normally be located and designed to offer many years of service. As a community grows, it may become necessary to replace existing stations or add more stations to meet increasing public demands for emergency responses.

The best sites for fire stations will vary with local needs and circumstances and the fire protection services the municipality has selected to provide. Stations staffed by volunteer firefighters may have some different considerations than those utilizing full time firefighters.

Response Considerations:
Distance and travel time are the primary influencing factors for selecting a fire station site. Traditionally a circle was drawn around the proposed site to identify the station coverage area. Because the circle does not accommodate the normal right angle streets or roads, times will be more accurate if a diamond is used.

To plot the diamond, simply drive in each direction for the amount of time you have allowed for the response coverage, mark the point on a map and join the points using straight lines.

This procedure can then be repeated or modified for coverage that is beyond or less than the desired response times. This process will permit fire department managers to determine where response times are excessive, where impediments to the orderly movement of traffic exist and where specific high risks are located.



For example, the fire department reaches the downtown core in 3 minutes, the urban boundaries in 5 minutes, 75% of the rural area in 8 minutes and the remainder in 10 minutes. In the 8 to 10 minute areas specific additional fire prevention and public fire safety education programs may be warranted to help compensate for the longer response time.

The following diagram illustrates the differences between a circle and a diamond from a fire station that has used 4 minutes as the desired initial response time.

Please note that the circle will only reflect a true response of 4 minutes if the streets are straight from the fire station to the edge of the circle.

Computer Based Programs:
There are several computer-based programs for identifying optimum locations for fire stations. While there are differences including data required, input and appearance, each of these programs identifies optimum fire station locations.
To determine optimum locations for fire stations using these programs, information such as the following must be entered:

- Relative fire risk values for various areas, occupancies or properties
- Desired response times for each identified fire risk
- Information regarding the road network in the community including reasonable travel speeds, one-way streets, rail crossings, etc.
- Emergency vehicles and personnel necessary to assemble fire attack teams

With the program tailored to the specific needs of a community, many fire response factors may be analyzed including:

- Existing and proposed station locations based on desired response times
- Best and alternate emergency response routes to specific locations

- Ability of pumper, aerial, rescue and support crews to cover all parts of the community based on desired response times
- Emergency response times for first, second and additional vehicles and personnel
- Areas for potential automatic aid responses

A benefit of using a computer program is the ability of fire or municipal staff and council to evaluate fire station location needs (based on objective criteria).

Other Considerations:
Fire stations should be located where they can serve the majority of the protection area they are assigned rather than for a specific hazard. For example, it may seem wise to place the fire station across from a nursing home. However, if the majority of responses are to the residential or commercial areas at the other side of the coverage area, the station should be situated closer to that area but still have the ability to arrive at the nursing home in the desired time.
Many volunteer stations are located in or very close to the geographic centre of the populated area of the community. This may increase response time when the volunteers have to come through the traffic to get to the station and then respond back through traffic to the emergency. Response times could be reduced by locating stations closer to the edge of the urban centre. Fire fighter response procedures could be altered to have some of the volunteers respond to the station for equipment while others go directly to the scene.

The practicability of sharing a facility should be assessed. It may be appropriate to locate the fire station with other emergency agencies or other municipal departments.

Municipalities may wish to consider the “temporary” placement of a station in a leased or rented building to address rapid growth in a specific area. An example of this could be the placement of a station in a vacant commercial or industrial unit for a period of time. At the same time, records should be kept to assess the efficiency and effectiveness of response from this location, so that Council may make an informed decision when it comes time to decide whether the location should be made “permanent”.

Desirable Fire Station Site Criteria:
The following is an initial check list for the selection of any fire station site:

1. It may be advisable to have stations located a short distance up a side street rather than on a main street where the heaviest traffic exists. Access to and from site must have:

    - Reasonable access to a major street or road
    - Appropriate sight lines (no hills, physical obstacles)
    - No traffic impediments at any time of day
    - Ability to have a second access to the site
    - Maintained access (snow clearance, etc.)

2. Assembly time for volunteers must not be negatively impacted.
3. Impact on adjacent properties needs to be considered.

4. Size of site must accommodate all expected activities of the fire service and allow for future expansion. (Parking, training, apparatus maintenance and equipment testing, etc.)
5. Proximity to municipal services and required utilities (water, sewer hydro, telephone, gas)
6. Costs including:
    - Acquisition of land
    - Site preparation
    - Building (leasing/renting may also be a consideration)

Codes, Standards, Best Practices:

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See also PFSG:

04-01-12: Selecting Fire Suppression Capability
04-03-12: Service Providers
04-06-13: Codes, Standards, Acts, Regulations, Best Practices

PFSG 04-64-12

Communications Centre/Resource Centre

Please be advised that Office of the Fire Marshal and Emergency Management Public Fire Safety Guidelines are currently under review but continue to be made available for reference purposes.

Public Fire Safety Guidelines	Subject Coding PFSG 04-64-12
Section Communications/Resource Centre	Date January 1998
Subject Communications Centre/Resource Centre	Page

Purpose:
To identify considerations for fire services managers operating or exploring potential communication/resource centres.

Service Delivery Implications:
A communications system directly impacts on the ability of a fire department to provide effective fire protection to the municipality. An effective system can result in reduced intervention time thereby reducing injuries, loss of life and property due to fires and other emergencies. An effective system contributes to a safer working environment for emergency responders and contributes to the timely response to non-emergency contact with the public. The main components of a communications system are:

- An efficient means by which the public can contact the fire department
- An efficient method of alerting the members of the department of the emergency
- An effective method of communicating within the fire department under both emergency and non-emergency conditions
- An ability to communicate with other fire departments in neighbouring municipalities regarding the potential need for mutual aid or to monitor the level of on-going emergency activity
- An ability to communicate with other agencies
- An ability to provide information, data and other resources during emergencies and on a day to day basis

Service Delivery Options:

The communications services may be:

- Delivered locally by the municipality as part of the local fire department operations
- Purchased from another emergency service
- Purchased from a private communications centre
- Purchased from another municipality, including a county, district or region
- Staffed by dedicated communication/dispatch personnel
- Through a local telephone system
- Through basic or enhanced 9-1-1
- Through fire department monitoring of industry, business, residential, institutions, and the elderly, handicapped and medically at risk

Policy Requirements:
Every authority providing fire protection services shall ensure that communications is provided without interruption in its jurisdiction(s) 24 hours a day.

Quality Management Standards:
All personnel assigned communication/dispatch duties shall be trained to standards set by an appropriate standards setting body.

Quality and Performance Measures:
All authorities providing communications/dispatch/resource services should maintain the following measures of quality and performance. They should analyze and assess:

- Ease of access for operational supervisors
- Time frames for receiving and dispatching emergency calls
- Time frames for receiving and responding to general inquiries
- Availability of data from other agencies
- Thoroughness of emergency response data

Related Functions/Considerations:
Emergency communications centres often provide support functions for the fire department. These may include:

- Maintaining and repairing communications systems and components (both routine, emergency and back-up)
- Providing technical support
- Provide input for communications equipment specifications
- Interface capability with other data systems

Codes, Standards, Best Practices:

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PFSG 04-64A-12

Communications Best Practices

Communications Best Practices

Please be advised that Office of the Fire Marshal and Emergency Management Public Fire Safety Guidelines are currently under review but continue to be made available for reference purposes.

Public Fire Safety Guidelines	Subject Coding PFSG 04-64A-12
Section Communications/Resource Centre	Date March 2001
Subject Communications Best Practices	Page

Purpose:
To assist municipalities and fire service managers in the development of best practices and procedures which record benchmark times.

Introduction:
This guideline is a suggested model for fire department communications benchmarks. A key factor in determining the effectiveness of the delivery of fire protection is measuring the performance of the fire service in relation to the time the original call was received in relation to functions implemented on the fire ground or emergency scene.

Process:
While many benchmark times may be gathered and customised to meet local needs and circumstances, it is recommended that, as a minimum the following times and information be recorded mechanically or electronically by every communications centre;

- Date and time call originated
- Date and time call originally answered (9-1-1 or local)
- Date and time call conferenced (9-1-1)
- Date and time call answered by downstream agency (9-1-1)
- Date and time alarm dispatched
- Date and time alarm acknowledged
- Date and time each apparatus mobile
- Date and time each apparatus on scene

- Number of personnel on each apparatus
- Date, time and name of officer assuming command
- Date and time agent was applied
- Date, time and name if command is transferred
- Date and time "All Clear", *if applicable*
- Date and time "Under Control", *if applicable*
- Date and time "Loss Stopped", *if applicable*

Wherever possible fire service communication centre clocks should be synchronised with other public safety agencies serving the same area.

Service Delivery Implications:
There is a need to manage each of the components of the call-taking process in order to improve performance and efficiency to reduce the total intervention time at a fire emergency.

- A reliable communications system directly impacts on the ability of a fire department to provide effective fire protection to a service area.
- An effective system can result in reduced intervention time thereby reducing injuries, loss of life and property due to fires and other emergencies.
- An effective system contributes to a safer work environment for emergency responders and contributes to the timely response to non-emergency assistance to the public.

Policy Requirements:
Specific communications centre policy should be developed to establish:

- The maximum time allowed to answer incoming emergency lines
- The maximum time allowed to record and commit initial emergency incident data
- The maximum time allowed to alert fire crews
- The maximum time crews are allowed to depart station
  The maximum time allowed prior to initiating a second alert or implementing automatic/mutual aid if a station fails to answer or respond to an alarm
- Identified circumstances that would allow communicators to automatically call for additional assistance without direction from the incident commander.
- See NFPA 1221, for the percentage and time expectations for completion of tasks.

Codes, Standards, Best Practices:
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See also;

PFSG **04-64-12:** Fire Service Communications Centres
NFPA 1221

PFSG 04-65-03

Please be advised that Office of the Fire Marshal and Emergency Management Public Fire Safety Guidelines are currently under review but continue to be made available for reference purposes.

Public Fire Safety Guidelines	Subject Coding PFSG 04-65-03
Section Communications/Resource Centre	Date March 2001
Subject Fire Service Communications Centres	Page

Purpose:
To assist municipalities and fire service managers in development and provision of fire service communication centres.

Introduction:
At the present time fire service communications services are delivered through a myriad of systems. These include dedicated fire service communications centres, other municipal communications centres such as local police, third party government communications centres such as OPP and Central Ambulance Communications Centres and third party private communications systems such as answering services and private telephone companies. Fire phones and telephone inter-connect systems are also used to a limited degree.

Development:
Since their inception, fire service communications systems have continued to evolve. Advances in technology have taken fire service communications to increasingly complex integrated multi-line telephone systems including 9-1-1, and multi channel radio systems supported by computer aided dispatch (CAD) and geographic information systems (GIS). Adequate technical support must be provided to maintain and improve these systems.

Related Functions:
If it is not possible for a fire department to provide dedicated fire service communicators, it is strongly recommended that a qualified third party agency provide the service.

Because of the increasingly specialized nature of fire service communications, it may not be possible for private third party providers to continue to deliver fire service communications services.

Fire department managers must have input into the operation and management of the selected communications delivery system. They must have the ability to address issues as they develop. Also, fire department concerns must form an integral part of the long-term planning process for the communications centre.

In those cases where multiple agencies combine to deliver this service, there is a need for a clear and concise operating agreement between the parties. The structure of the management committee should be incorporated into the operating agreement between the various agencies participating in the centre.

The following are areas of consideration for inclusion in agreements:

- Parties involved
- Intent of agreement
- Extent of the fire department management role
- Services to be purchased/provided
- Define area(s) to be protected including map of the area(s) served, (if streets or roads are used as boundaries, are properties on and accessible from both sides of the street or road included?)
- Apparatus and equipment to respond, personnel to respond - minimum and/or maximum number including any variations for different occurrences
- Arrangements for extra assistance, if needed
- Costing arrangements, including;
    - Annual costs
    - Any administrative fees
    - Payment schedule including any special arrangements relative to ancillary services
- Provisions for failing to supply the services, or any part thereof
- Authority to contact communicators directly by specific persons
- Provisions for amending the agreement
- Provisions for terminating the agreement
- Arbitration (dispute resolution) clause(s) in case of disagreement regarding the intent of any provision of the agreement

The fire department should seek advice and input in development of the agreement from its municipal solicitor.

Because of increasing complexity of fire services communications, wherever possible, dedicated fire service communicators should provide services. The call takers must elicit proper and full information from the caller, provide appropriate instructions to the caller, and transfer appropriate information to the responders.

Regardless of how the service is delivered, it is critical that all fire service communicators receive training that reflects the unique nature of fire service communications. While a number of agencies provide training for communicators, fire service communicators must also be trained to:

- Support the incident management system used by the fire service
- Support the accountability and entry control systems used by the fire service
- Support the functions of the safety officer at an emergency incident
- Support personnel working in a potentially violent situation

Codes, Standards, Best Practices:
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See also:
PFSG
04-64-12: Communications Centre/Resource Centre
04-64A-03: Communications Best Practices
Ontario Fire Service Communicator Standard
NFPA 1221

Appendix G: Provincial Community Risk Assessment Guideline

OFMEM-TG-02-2019

Community Risk Assessment Guideline

Office of the Fire Marshal and Emergency Management

Abstract

The Office of the Fire Marshal and Emergency Management (OFMEM) has developed this guideline to assist municipalities and fire departments in a territory without municipal organization, to conduct community risk assessments and use its community risk assessment to inform decisions about the provision of fire protection services, in accordance with *Ontario Regulation 378/18* (*O.Reg. 378/18*), and the *Fire Protection and Prevention Act 1997 (FPPA).*

For further information or assistance contact the Public Safety Education Manager at 1-800-565-1842.

This guideline provides:

- An outline of recommended best practices to conduct a community risk assessment in order to make informed decisions about the provision of fire protection services.
- Descriptions of the nine mandatory profiles outlined in *O. Reg. 378/18* that must be addressed in the community risk assessment, including examples of where this data and information can be obtained.
- Worksheets that can be used or modified to document and analyse data/information related to the nine mandatory profiles that must be addressed in the community risk assessment in accordance with *O. Reg. 378/18*, and,
- Worksheets that can be used or modified to assist in assigning risk levels and identifying preferred treatment options.

1.0 SCOPE

This document has been prepared by the Office of the Fire Marshal and Emergency Management to assist municipalities and fire departments in territories without municipal organization to conduct community risk assessments to meet the requirements of Ontario Regulation 378/18.

2.0 INTRODUCTION

Community risk assessments allow fire departments to make informed decisions about the types and levels of fire protection services they will provide based on identified risks.

Risk is defined 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.

By identifying all fire and life safety risks in their community and prioritizing them based on the probability of them occurring and the impact they would have if they occurred, fire departments are able to determine which risks to address and how best to address them. Risk assessments allow fire departments to ensure their levels of service, programs and activities for public fire safety education, Fire Code inspections and enforcement, and emergency response directly address the identified risks and are most effective at preventing and mitigating them.

The *Fire Protection and Prevention Act, 1997 (FPPA)* mandates that every municipality in Ontario shall establish a program which must include public education with respect to fire safety and certain components of fire prevention and provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances. In the fire service, these elements are commonly referred to as the Three Lines of Defence:

1. Public Fire Safety Education
2. Fire Safety Standards and Enforcement
3. Emergency Response

In order to meet these obligations, municipalities need to make informed decisions with respect to the types and levels of fire protection services they provide. This requires an understanding of the risks facing the community that can be identified through a community risk assessment. Once identified, the risks can be prioritized to assist in making informed decisions about risk treatment options and the provision of fire protection services.

Ontario Regulation 378/18: Community Risk Assessments (O. Reg. 378/18) requires that every municipality and every fire department in a territory without municipal organization complete a community risk assessment and use it to inform decisions on the provision of fire protection services. The Community Risk Assessment is an in-depth and comprehensive assessment to inform fire protection service levels and requires the identification, analysis, evaluation and prioritizing of risk, based on nine mandatory profiles.

The regulation outlines a standard set of information profiles that must be considered when conducting a community risk assessment. The information and data gathered to address each of the profiles will assist in determining and prioritizing the risks to public safety in the

community and determining the fire protection services to be provided by municipalities and fire departments in territories without municipal organization to address those risks.

The mandatory profiles identified in *Schedule 1 of O. Reg. 378/18* were determined from examining various current industry models on risk assessment. Many of these models provide comprehensive coverage pertaining to identification of data and information relating to community risks. However, it should be noted that these risk assessment models may or may not include all of the nine mandatory profiles as identified in *Schedule 1 of O. Reg. 378/18*. Municipalities and fire departments in territories without municipal organization may use other tools, models or guidelines to conduct their community risk assessments provided that their final community risk assessment meets all the requirements outlined in *O. Reg. 378/18.,* including consideration of each of the nine mandatory profiles identified in Schedule 1 of the regulation (see Appendix E).

The Guideline provides suggestions as to how to record and analyze the data/information using the sample worksheets that are provided in the Guideline. Municipalities and fire departments in territories without municipal organization have flexibility to include any additional information (e.g., maps, charts, diagrams) they deem appropriate to best assist them in analyzing their data and information in order to make informed decisions on fire protection services.

The Emergency Management and Civil Protection Act (EMCPA) requires every municipality to conduct an all-hazards risk assessment, which informs continuous improvement of emergency management programs and improves public safety. A completed Hazard Identification Risk Assessment (HIRA) may provide some of the information/data required to fulfil the needs of a Community Risk Assessment under *O. Reg. 378/18,* although there will be specific fire related information that is not contained in the HIRA that will be gathered as part of this process. The HIRA and the Community Risk Assessment are separate processes but should be viewed as complementary to one another.

Note: For the purposes of this guideline, the terms "fire department" and "fire departments" will be considered to include every municipality and every fire department without municipal organization.

3.0 CONDUCTING A COMMUNITY RISK ASSESSMENT

3.1 Identifying Risks – Mandatory Profiles

The first step in conducting a community risk assessment is to identify the various fire and life safety risks in the community. This can be done by gathering data about the make-up of the community and the activities occurring there.

O. Reg. 378/18 requires fire departments to consider the following profiles when completing their community risk assessment to ensure the risk assessment best considers all potential risks in the community:

1. Geographic Profile
2. Building Stock Profile
3. Critical Infrastructure Profile
4. Demographic Profile
5. Hazard Profile
6. Public Safety Response Profile
7. Community Services Profile
8. Economic Profile
9. Past Loss and Event History Profile.

Fire departments need to gather and review data and information about each of these profiles to identify the fire and life safety risks that could impact the community.

Worksheets 1 to 9 in Appendix A of this guideline can be used to record and organize the data and information for each profile. The worksheets can be filled in electronically. Fire and emergency risks and issues/concerns can be noted in the appropriate columns of each worksheet as they are identified. These worksheets can be modified or adapted to suit local needs based on available data or information.

A description of each profile, including potential sources of data and information for each, is provided below.

3.1.1. Geographic Profile

Geographic profile refers to the physical features of the community, including the nature and placement of features such as highways, waterways, railways, canyons, bridges, landforms, and wildland-urban interfaces.

Physical features of the community may present inherent risks that need to be taken into account when determining the type and level of fire protection services that should be provided by the fire department. Physical features may also impact emergency response access and response times.

Identifying any geographic features that might have implications with respect to risk or response allows fire departments to consider these issues when determining appropriate types and levels of fire protection services.

For example, a lake may have implications with respect to water and/or ice rescue services and the equipment and training that would be required to provide those services. The lake may also impact emergency response access and response times to certain areas within the community. Additionally, a lake may be a seasonal tourist attraction and the associated activities may present unique risks that could influence decisions on specific public fire safety education and Fire Code inspection and enforcement programs and activities.

Where to find/collect this information
Information related to the Geographic profile may be obtained from:

- Local knowledge of the area and by using maps of the municipality's natural (i.e., lakes, rivers, etc.) and human-made (i.e., highways, bridges, railways, etc.) features, and
- Local municipal departments (i.e., highways/roads, conservation authorities, etc.) who should have information about the location and uses of geographic and physical features of the community.

3.1.2. Building Stock Profile

Building Stock profile refers to the types, numbers, uses, and ages of the various buildings within the community.

Fire departments should consider the potential fire risks associated with different types/classifications or uses of buildings given their prevalence in the community and the presence of fire safety systems and equipment at the time of construction. Older buildings typically do not contain the same fire safety and fire protection systems required in newer

buildings. This may impact the fire risk in older buildings. Also, how buildings are used can influence the fire risks in each building. For example, industrial chemical storage facilities are likely to present higher fire risks than buildings containing commercial retail activities.

The age and type of residential buildings (e.g., high-rise vs. single family dwelling vs. town/row houses) can influence the probability and consequence of fire in those buildings.

Past inspection practices and frequencies also can be a factor when considering risk associated with any particular building occupancy classification categories. For instance, a robust inspection program in higher risk occupancies can have a positive influence on mitigating some of the inherent risks associated with that particular type of building. Conversely, a lack of historical inspection data in relation to a particular occupancy classification category also should be considered when determining risk.

These building characteristics can have significant impact on the public fire safety education, Fire Code inspection and enforcement and emergency response activities the fire department may determine are necessary to address the risks.

Where to find/collect this information

O. Reg. 378/18 does not specify which source of this information has to be referenced to complete the risk assessment. Fire departments have the flexibility to choose which source they feel will provide the optimum level of detail they are most comfortable with as an accurate reflection of the building stock in their community. Consideration should be given to consistency in terms of data sources when conducting new risk assessments and annual reviews. Information related to the Building Stock profile may be obtained from:

- Categorizing buildings in accordance with the Standard Incident Report (SIR) property classification system which corresponds with the Ontario Building Code (OBC) occupancy classification system. As the Ontario Fire Code (OFIRE CHIEF) requires that buildings be classified in accordance with the OBC, this approach makes it easy to consider issues like the type of construction and fire safety equipment/features that should be present in the different classifications of buildings, based on their size, age, design, and use.
- Municipal building departments that have information regarding the age, number, types, uses, etc. of buildings in the municipality.
- *Municipal Property Assessment Corporation* (MPAC – *www.mpac.ca)* data that assesses and classifies all properties within Ontario, and
- Fire department pre-plans that identify uses and potential risks within specific buildings or areas of the community.

3.1.3. Critical Infrastructure Profile

Critical Infrastructure profile refers to the facilities or services that contribute to the interconnected networks, services, and systems that meet vital human needs, sustain the economy, and protect public safety and security (i.e., electricity distribution, water distribution, telecommunications, hospitals, and airports).

Consideration of the presence, availability, capacity, and stability of infrastructure elements can help identify potential impacts that may result if any of these systems are compromised. Understanding how infrastructure impacts things like emergency services dispatch, communications, fire department emergency operations, overall health care or transportation can assist in determining preferred treatment options to address specific risks.

Where to find/collect this information
Information related to the Critical Infrastructure profile may be obtained from:

- Local municipal departments (i.e., public works, water and sanitation departments, etc.) and other local utility companies that have information about the location, uses, capacity, etc. of the critical infrastructure in the community, and
- A completed Hazard Identification Risk Assessment.

3.1.4. Demographic Profile

Demographic profile refers to the composition of the community's population considering such factors as population size and dispersion, age, gender, cultural background, level of education, socio-economic make-up, and transient population.

Awareness of the characteristics of the population in the community assists the fire department to determine if specific segments of the population are at high-risk of fire. This awareness allows fire departments to best identify high-risk behaviours that need to be changed, as well as specific techniques to communicate with high-risk groups.

Fire protection services, including public fire safety education and Fire Code inspections and enforcement programs, should be tailored to high-risk groups so that fire safety programs are delivered in the most relevant and meaningful ways and can have the greatest impact. For example, delivering fire safety messages using communications techniques popular with specific high-risk segments of the population increases the likelihood the messages are received by those segments and therefore are most effective at reducing the fire risk.

Where to find/collect this information
Information related to the Demographic profile may be obtained from:

- Local municipal departments that keep information regarding the demographic make-up of their populations, including trends and projections regarding how the demographics may change in the coming years. The amount of this type of information that is available from municipal departments may vary between municipalities, and
- Statistics Canada *(www.statscan.qc.ca)* census profiles of every community in Ontario, including demographic information.

3.1.5. Hazard Profile

Hazard profile refers to the hazards in the community, including natural hazards, hazards caused by humans, and technological hazards. This may include but not be limited to hazardous materials spills, floods, freezing rain/ice storms, forest fires, hurricanes, tornadoes, transportation emergencies (i.e., air, rail or road), snowstorms, windstorms, extreme temperature, cyber-attacks, human health emergencies, and energy supply (i.e. pipelines, storage and terminal facilities, electricity, natural gas and oil facilities, etc.).

Fire departments should consider all potential hazards that pose a significant risk to or may have a significant impact on the community, and to which fire departments may be expected to respond.

Where to find/collect this information
Information related to the Hazard profile may be obtained from:

- Local municipal or government departments (i.e., public safety, police, emergency management, etc.) with information about the natural and technological hazards within the community and the risk they pose.
- Local historical incident data related to emergency incidents, and
- A completed Hazard Identification Risk Assessment.

3.1.6. Public Safety Response Profile

Public Safety Response profile refers to the agencies and organizations in the community (i.e., police, EMS, rescue) that may respond to certain types of incidents.

The fire department should consider other public safety response agencies (i.e., police, EMS, rescue) that might be tasked with or able to assist in the response to emergencies or in mitigating the impact of emergencies. This will assist the fire department to prioritize community risks and to determine the level of fire protection services it provides. For example, the presence of a private fire and rescue service at a local industrial facility may influence decisions about the type and the level of fire protection services a municipal fire department may provide to that facility.

Where to find/collect this information
Information related to the Public Safety Response profile may be obtained from:

- Local municipal departments (i.e., police, EMS, emergency management, etc.), and
- Private companies or industrial facilities who may have information about the response capabilities of other entities within the community.

3.1.7. Community Services Profile

Community Services profile refers to community agencies, organizations or associations that can provide services that support the fire department in the delivery of public fire safety education, Fire Code inspections and enforcement, or emergency response.

Community service agencies may be able to provide services in-kind, financial support, provisions of venues for training, increased access to high-risk groups in the community, or temporary shelter for displaced residents following an incident.

Where to find/collect this information
Information related to the Community Services profile may be obtained from:

- General local knowledge.
- Local municipal departments (i.e., social services);
- Community service agencies (i.e., agencies providing English as a second language services, resettlement agencies, agencies working with older adults, the Canadian Red Cross, etc.) who have information about the various services provided by community organizations and their clients within the community.

3.1.8. Economic Profile

Economic profile refers to the economic sectors affecting the community that are critical to its financial sustainability.

When prioritizing risk in the community, the fire department should consider the impact of fire and other emergencies on the industrial or commercial sectors that provide significant economic production and jobs to the local economy. This will assist in determining the type and level of fire protection services provided in these sectors in the community.

For example, if a town has a large industrial or commercial occupancy that has a significant impact on the local economy, the fire department may consider increasing its public fire safety education and Fire Code inspection and enforcement activities to reduce the probability of a significant incident requiring a large-scale emergency response.

Where to find/collect this information
Information related to the Economic profile may be obtained from:

- Local municipal departments (i.e., economic development, employment, and social services) that have information about the economic sectors that are critical to the community's economic well-being. This will help determine the economic impact (e.g., loss of business or jobs) if a fire occurs in a specific occupancy or area of the community.

3.1.9. Past Loss and Event History Profile

Past Loss and Event History profile refers to the community's past emergency response experience, including analyzing the following:

a) The number and types of emergency responses, injuries, deaths, and dollar losses.
b) A comparison of the community's fire loss statistics with provincial fire loss statistics.

Fire departments should evaluate previous response data to identify trends regarding the circumstances, behaviors, locations, and occupancy types of previous fires. This assists in determining the leading causes or behaviors resulting in fires, and high-risk locations and occupancies. Public fire safety education and Fire Code inspection and enforcement programs can then be designed to specifically target high-risk behaviors among various population groups and to focus prevention activities in high-risk neighborhoods or locations. This targeted

approach allows public fire safety education and Fire Code inspection and enforcement programs to directly address fire risks, thereby increasing their fire prevention effectiveness.

Where to find/collect this information

Information related to the Past Loss and Event History profile may be obtained from:

- Standard Incident Reports completed by the fire department. These can be obtained through fire department records or by emailing the Office of the Fire Marshal and Emergency Management (OFMEM) at *OFMstatistics@ontario.ca.*
- Trends and statistics about fire causes and fire and life safety issues across the province located on the OFMEM's website, and
- Information, available on request from the OFMEM, relating to fire losses in neighboring communities.

For those communities where trends are not easily identifiable due to a lack of fire incidents, it may be helpful to look at trends across the province or in neighboring municipalities that are similar in size and make-up.

It is suggested that a minimum of three (3) years' worth of data is analyzed in order to identify any potential patterns or trends and to avoid random events from unduly skewing the data.

4.0 PRIORITIZING RISKS

The mandatory profiles allow fire departments to identify the features and characteristics of their community that may impact fire and life safety risks. Once risks have been identified they should be prioritized. This section discusses how risks can be prioritized based on the probability of the risk happening and the consequence if the risk occurs. **Table 1: Probability Levels** and **Table 2: Consequence Levels** can be used to help determine the probability and consequence of each risk identified on the worksheets. The probability and consequence of each risk can then be noted in the appropriate columns on the relevant worksheets in Appendix A.

As noted in the introduction, risk is defined 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.

4.1 PROBABILITY

The probability or likelihood of a fire or emergency within a community is often estimated based on the frequency of previous experiences. A review of past events involves considering relevant historical fire loss data, learning from the experiences of other communities, and consulting members of the community with extensive historical knowledge. Professional judgment based on experience should also be exercised in combination with historical information to estimate probability levels. The probability of an event can be categorized into five levels of likelihood:

Table 1: Probability Levels

Description	Specifics
Rare	• May occur in exceptional circumstances • No incidents in the past 15 years
Unlikely	• Could occur at some time, especially if circumstances change • Five to 15 years since the last incident
Possible	• Might occur under current circumstances • One incident in the past 5 years
Likely	• Will probably occur at some time under current circumstances • Multiple or recurring incidents in the past 5 years
Almost Certain	• Expected to occur in most circumstances unless circumstances change • Multiple or recurring incidents in the past year

Assign a probability level to each identified risk or hazard on the relevant worksheets in Appendix A.

4.2 CONSEQUENCE

The consequence of a fire or emergency is the potential losses or negative outcomes associated with the event. The application of professional judgment and reviews of past occurrences are important methods used for determining consequence levels. Estimating the consequence level of an incident or event should involve an evaluation of four components:

a. **Life Safety**: Injuries or loss of life due to occupant and fire fighter exposure to life threatening fire or other situations.

b. **Property Loss**: Monetary losses relating to private and public buildings, property content, irreplaceable assets, significant historic/symbolic landmarks and critical infrastructure.

c. **Economic Impact**: Monetary losses associated with property income, business closures, a downturn in tourism and/or tax assessment value, and employment layoffs.

d. **Environmental Impact**: Harm to human and non-human (i.e., wildlife, fish and vegetation) species of life and a general decline in quality of life within the community due to air/water/soil contamination as a result of the incident and response activities.

The consequence of an event can be categorized into five levels based on severity:

Table 2: Consequence Levels

Description	Specifics
Insignificant	• No life safety issue • Limited valued or no property loss • No impact to local economy, and/or • No effect on general living conditions
Minor	• Potential risk to life safety of occupants • Minor property loss • Minimal disruption to business activity, and/or • Minimal impact on general living conditions
Moderate	• Threat to life safety of occupants • Moderate property loss • Poses threat to small local businesses, and/or • Could pose a threat to the quality of the environment
Major	• Potential for a large loss of life • Would result in significant property damage • Significant threat to large businesses, local economy and tourism, and/or • Impact to the environment would result in a short term, partial evacuation of local residents and businesses
Catastrophic	• Significant loss of life • Multiple property damage to a significant portion of the municipality • Long-term disruption of businesses, local employment, and tourism, and/or • Environmental damage that would result in long-term evacuation of local residents and businesses

Assign a consequence level to each identified risk or hazard on the relevant worksheets in Appendix A.

5.0 ASSIGNING RISK LEVEL

Assigning a risk level assists fire departments in prioritizing risks, which helps to determine how to address or treat each risk. The **Risk Level Matrix** in this section can assist fire departments to determine risk levels based on the probability and consequence levels of each identified risk. Risks can be assigned as low risk, moderate risk or high risk. The risk levels for each risk can be noted in the **Assigned Risk Level** column on the relevant worksheets in Appendix A.

The matrix below can be used to determine the assigned risk level.[1] Plot the assigned probability and consequence levels on the relevant worksheets in Appendix A to assign a risk level for each identified risk.

Risk Level Matrix

Probability	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC
ALMOST CERTAIN	Moderate Risk	Moderate Risk	High Risk	High Risk	High Risk
LIKELY	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	High Risk
POSSIBLE	Low Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk
UNLIKELY	Low Risk	Low Risk	Moderate Risk	Moderate Risk	Moderate Risk
RARE	Low Risk	Low Risk	Low Risk	Moderate Risk	Moderate Risk

Consequence

6.0 RISK TREATMENT OPTIONS

Once risk levels have been assigned, fire departments can determine how best to treat each risk and the resources required to do so. Options for treating risks include the following:

1. Avoid the Risk
2. Mitigate the Risk
3. Accept the Risk
4. Transfer the Risk

6.1 Avoid the Risk

Avoiding the risk means implementing programs and initiatives to prevent a fire or emergency from happening.

For example, public fire safety education initiatives aim to change people's behaviors so that fires may be prevented, and people react appropriately when fires do occur. Fire Code inspections and enforcement help to ensure that buildings are in compliance with the Ontario Fire Code.

6.2 Mitigate the Risk

Mitigating the risk means implementing programs and initiatives to reduce the probability and/or consequence of a fire or emergency.

For example, a routine Fire Code inspection and enforcement program to ensure Fire Code compliance helps to reduce the probability and consequence of a fire.

A pre-planning program involving fire suppression crews allows the fire department to gain knowledge about specific buildings in the community and their contents, fuel load, fire protection systems, etc. This information can be provided to the fire inspection staff who can ensure the building is compliant with the Fire Code. Also, it can assist suppression crews to plan fire suppression operations should a fire occur in a building. These activities can reduce the probability and consequence of a fire.

6.3 Accept the Risk

Accepting the risk means that after identifying and prioritizing a risk, the fire department determines that no specific programs or initiatives will be implemented to address this risk. In this treatment option, the fire department accepts that the potential risk might happen and will respond if it occurs.

For example, typically fire departments do not implement programs to prevent motor vehicle collisions. Yet it is generally accepted that collisions will happen and that the fire department will respond when they do. Similarly, environmental hazards (e.g. ice storms) and medical calls cannot be prevented by a fire department program or initiative, yet fire departments typically respond when these emergencies occur.

When accepting risks, fire departments should consider their capacity (i.e. equipment, personnel, training, etc.) to respond.

6.4 Transfer the Risk

Transferring the risk means the fire department transfers the impact and/or management of the risk to another organization or body. Contracting public fire safety

education, Fire Code inspection and enforcement, or emergency response services to a neighboring municipality or another organization are examples of transferring the management of risks to another body.

For example, a community may enter into a fire protection agreement with a neighboring community with respect to any or all of the three lines of defence.

7.0 SETTING THE TYPE AND LEVEL OF FIRE PROTECTION SERVICES

When setting the type and level of fire protection services, all Three Lines of Defense should be considered in terms of the impact each will have on the probability or consequence of identified risks. Once fire departments have determined the preferred treatment option for each risk, they can plan and implement activities that address those risks. Things to consider include the fire department's current resources, staffing levels, training, equipment and authority versus those that may be required to implement the preferred treatment options.

After considering these issues, the preferred treatment option (e.g. avoid the risk, mitigate the risk, accept the risk, or transfer the risk) can be noted in the **Preferred Treatment Option** column of worksheet 10 in Appendix A.

Fire departments should also ensure that operational policies and standard operating guidelines address the levels of service and activities required to address each risk. This includes setting goals and objectives, and determining resources, training, equipment, activities, and programs required across each of the Three Lines of Defense.

The process of making informed decisions about the provision of fire protection services should include careful consideration of the following:

- Implementation of public fire safety education, Fire Code inspections and enforcement, and emergency response activities that are appropriate to address the causes, behaviors or issues associated with identified risks.
- Capabilities and capacity of the fire department (e.g. financial and staffing resources, training, equipment, authority, etc.) that may be required to implement preferred treatment options.
- Strategic partners with common interests, available resources, or skill sets that could assist in addressing risks using the applicable risk assessment profiles.
- Establishing and Regulating By-laws, operational policies and standard operating guidelines that reflect the fire protection services to be provided to address the identified risks.
- Establishment of goals and objectives, strategies, timelines, and evaluation for the proposed fire protection services to be provided.

- Communication with municipal council and the public to outline the types and levels of fire protection services that will be provided.

8.0 REVIEW

O. Reg. 378/18 requires fire departments to complete a new community risk assessment at least every five years. The regulation also requires that fire departments review their community risk assessment at least once every 12 months to ensure it continues to accurately reflect the community and its fire and emergency risks. The purpose of this review is to identify any changes in the mandatory profiles that may result in a change in risk level, or a change in the type or level of fire protection services the fire department determines necessary to address the risks. This review is intended to ensure that the fire protection services provided continue to be evidence-based and linked to the identified risks.

This review process may or may not involve a close examination of all of the nine community profiles, depending on whether any changes related to the profiles have occurred since the completion of the risk assessment or the last review. For example, changing demographic profiles (e.g. an aging population or an increase in the number of immigrants) or changing geographic profiles (e.g. the planned construction of a new highway) may impact the risks identified in the community risk assessment and the fire department activities and resources required to address them. A review may or may not result in any changes to the assigned risk levels or fire protection services.
However, a review can provide evidence-based justification for decisions that may impact the delivery of fire protection services. Fire departments should maintain documentation that the reviews required by O. Reg. 378/18 have been conducted. This documentation should include:

- Any changes to any of the mandatory profiles;
- Any changes to assigned risk levels or fire protection services that occur as a result of the review, and
- Any other information the fire department deems appropriate to the review or any resultant changes to fire protection services.

If no significant changes occur in the community within a 12-month period, and no changes are required to the profiles or fire protection services, then a review could simply consist of documentation to that effect.

Appendix A: Profile Worksheets

Worksheet 1: Geographic Profile

List the physical features of the community that impact the risk of and response to fire and other emergencies, including large bodies of water, highways/road networks, waterways, railways, canyons, bridges, landforms, and wildland-urban interfaces.

Geographical Profile Risks

Geographic Feature	Potential Impact on the Delivery of Fire Protection Services
Example: **Large body of water**	• Impacts training, equipment for response activities • Impacts response times/travel time to calls • Recreational/tourist activities impact public fire safety education and Fire Code inspections and enforcement activities
Example: **Railway tracks**	• Impacts station location • Impacts response protocols

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 2: Building Stock Profile

The building stock profile should consider the characteristics of the buildings in the community. This can include the use of the buildings, building density, building age and construction, and building height and area. This information will assist fire departments to identify the issues/concerns that will impact the delivery of fire protection services. *(See following page)*

Occupancy Classification		**Issues/Concerns** (i.e., age of buildings; use of buildings; building density, height and area; historic and culturally significant buildings; etc.)	**Probability**	**Consequence**	**Assigned Risk Level**
Group A	Assembly				
Group B	Detention Occupancies				
	Care and Treatment/ Care				
Group C	Single Family				
	Multi-unit residential				
	Hotel/Motel				
	Mobile Homes & Trailers				
	Other				

Group D & E	Business & Personal Service/ Mercantile				
Group F	Industrial				
Other	Occupancies not classified in OBC such as farm buildings				

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 3: Critical Infrastructure Profile

Consider the community's critical infrastructure including electricity distribution, water distribution, telecommunications, hospitals, and airports and how they relate to fire and other emergency risks in the community.

Critical Infrastructure Profile Risks
List the critical infrastructure in your community and the fire and other emergency issues/concerns relating to each.

Identified Critical Infrastructure	Issues/Concerns
Example: Electricity distribution	Hydro lines go down
Example: Hospital	Large number of immobile people at risk if a fire occurs
Example: Telecommunications	Telephone lines/cell towers go down

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 4a: Demographic Profile

Consider the characteristics of your community's demographic profile to identify potential fire safety issues/concerns. This will help the fire department prioritize its overall risk and decisions about the provision of fire protection services. For example, traditionally older adults, young children, recent immigrants, and people with disabilities are at the highest risk of fire. Knowing if your community has a high number of people in any of these demographic groups helps your fire department prioritize your public fire safety education and Fire Code inspection and enforcement programs.

Demographic profile characteristics to consider include age, culture, education, socio-economics, transient populations or other unique population characteristics in your community.

The following population distribution chart can assist with identifying high-risk or vulnerable demographic groups in your community.

Ages of population	# of People	% of Total Population
0-4		
5-9		
10-14		
15-19		
20-24		
25-29		
30-34		
35-39		
40-44		
45-49		
50-54		
55-59		
60-64		
65-69		
70-74		
75-79		
80-84		
85 and over		
Total Population		

Consider the following questions to help identify the demographic groups within your community and the associated fire safety issues/concerns:

1. Are there specific age groups that make up a large portion of your community? If yes, who are they?
2. Are there groups whose language and/or cultural practices impact fire safety in your community? If yes, who are they?

3. Are there transient populations in your community (e.g., post-secondary school students, migrant workers, seasonal tourists, etc.)? If yes, who are they?
4. Are there specific socio-economic groups and/or circumstances that impact fire safety in your community? If yes, who/what are they?
5. Are there demographic groups within your community that have cognitive or physical disabilities served by community service agencies? If yes, who are they?
6. List any other unique demographic groups or characteristics in your community that impact fire safety.

Worksheet 4b: Demographic Profile

Use the answers to the questions above to list the identified demographic groups in the first column of the worksheet below.

Demographic Profile Risks

List the demographic groups of concern in your community and the fire and other emergency issues/concerns relating to each group.

Identified Demographic Group	**Issues/Concerns**
Example: Large immigrant population	• Language barriers • Cultural traditions that present fire safety concerns
Example: Large seniors population	• Large number of seniors residential buildings High • number of seniors receiving assistance/care from personal support worker organizations
Example: Large population of summer tourists	• How does the fire department reach this audience with fire safety messages if they don't live in the community

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 5: Hazard Profile

List potential hazards in the community including but not limited to hazardous materials spills, floods, freezing rain/ice storms, forest fires, hurricanes, tornadoes, transportation emergencies (i.e., air, rail or road), snow storms, windstorms, extreme temperature, cyber-attacks, human health emergencies, and energy supply (i.e. pipelines, storage and terminal facilities, electricity, natural gas and oil facilities).

Hazard Profile Risks
List the hazards in your community and the fire or other emergency risk of each.
Assign probability, consequence and risk levels to each risk identified.

Identified Hazard	**Probability**	**Consequence**	**Assigned Risk Level**
Example: Ice Storm *(power interruptions/ disruptions in communications/delayed access)*	Possible	Minor	Moderate
Example: Flood (*obstructed access/increased calls for rescue/assistance*)	Possible	Minor	Moderate

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 6: Public Safety Response Profile

Consider other public safety response agencies (i.e., police, EMS, rescue) that might be tasked with or able to assist in the response to emergencies or in mitigating the impact of emergencies. Also consider the types of incidents each is able to respond to and any issues or concerns that may impact fire department response.

Public Safety Response Profile Risks

List the other public safety response agencies in your community and the incidents they respond to.

Identified Public Safety Response Agency	Types of Incidents They Respond to	What is Their Role at the Incident	Issues/Concerns
Example: Ontario Provincial Police	• MVC's • Fire Scenes	• Scene control, traffic control	None
Example: EMS	• Medical Calls	• Take control upon arrival	What level of service will the fire department provide before and after EMS' arrival
Example: Industrial fire brigade	• Internal incidents on private property	• suppression	Fire department may not need to provide full response/may provide more of a

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 7: Community Services Profile

Consider community service agencies, organizations or associations that provide services that support the fire department in the delivery of public fire safety education, Fire Code inspection and enforcement and emergency response. This may include services in-kind, financial support,

provisions of venues for training, increased access to high-risk groups in the community, and temporary shelter for displaced residents following an incident.

Community Services Profile Risks
List the community service agencies and the types of services they can provide.

Community Service Agencies	**Types of Assistance they Can Provide**	**Issues/Concerns**
Example: Canadian Red Cross	Temporary shelter, clothing, food following an incident	None
Example: Lions Club	Services in-kind (e.g., funding / physical labour / facilities)	None
Example: Meals on Wheels / Home Support Workers	Access to homebound populations	None

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 8: Economic Profile

Consider the industrial or commercial sectors that provide significant economic production and jobs to the local economy and the impact to the community's economy if a fire or other emergency occurred in occupancies housing those sectors.

Economic Profile Risks
List the industrial or commercial occupancies that provide significant economic production and jobs in the community. List the fire or other emergency risks in each

occupancy. Assign probability, consequence, and risk levels for each risk identified.

Identified Occupancy	**Key Risk**	**Probability**	**Consequence**	**Assigned Risk Level**
Example: Vulnerable Occupancies	Fire	Possible	Minor	Moderate
Example: Paper Mill	Fire	Possible	Major	Moderate

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 9a: Past Loss and Event History Profile

Consider previous response data to identify trends regarding the deaths, injuries, dollar loss, and causes of fire in various occupancy types. This assists in determining the leading causes of fires and high-risk locations and occupancies. In the absence of fire loss data, local knowledge may be the most reliable predictor of fire risk in your community.
Also, provincial statistics can assist in determining the types of occupancies and locations where fire losses, injuries and deaths most commonly occur.

Municipal Fire Losses, Deaths, Injuries, and Causes

Occupancy Classification		Year: _____					Year: _____					Year: _____				
		# of Fires	$ Loss	# of Injuries	# of Deaths	Causes	# of Fires	$ Loss	# of Injuries	# of Deaths	Causes	# of Fires	$ Loss	# of Injuries	# of Deaths	Causes
Group A	Assembly															
Group B	Detention															
	Care & Treatment / Care															
Group C	Residential															
	Mobile Homes & Trailers															
Groups D & E	Business & Personal Service / Mercantile															
Group F	Industrial															
Other																
Totals																

Note: The information on this worksheet should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 9b: Past and Loss and Event History

List the risks/causes for each occupancy type and the non-fire emergency risks identified in the tables on Worksheet9a. Assign probability, consequence and risk levels to each cause/risk identified.

Occupancy Type/Location	**Causes**	**Probability**	**Consequence**	**Assigned Risk Level**
Example: Group F - Industrial	Hazardous materials spill	Possible	Major	Moderate
Example: Group C – residential high density (high-rise)	Fire	Almost Certain	Moderate	High
Example: Group C – residential low density (single family dwellings)	Fire	Almost Certain	Minor	Moderate

Past Loss and Event History Profile Risks

Note: The information on Worksheet 9b should be considered in conjunction with the information on all other worksheets, and not in isolation. Worksheet 10 allows fire departments to consider all of the information on all worksheets together in order to make decisions about the provision of fire protection services in their municipality/community.

Worksheet 10: Identifying Treatment Options for the Top Risks in the Community

The preferred treatment options identified for each risk in the last column of this worksheet can be used to assist the fire department to set its type and level of fire protection services. Refer to the Setting the Type and Level of Fire Protection Services section of this guideline.

Identifying Treatment Options for the Top Risks in the Community
Using Worksheets 1 to 9 identify the top risks or issues/concerns for each of the nine profiles, and identify the preferred treatment option for each.

Mandatory Profiles	**Top Risk or Issues/Concerns**	**Preferred Treatment Option** (refer to the Risk Treatment Options section for suggested treatment options and considerations)
Geographic Profile	Examples: Body of water impacts training, equipment for response	Accept Risk - Implement water/ice rescue training protocols, SOGs, and activities
	Body of water impacts response time	Accept Risk - Implement appropriate response protocols, SOGs, and activities
	Body of water – recreational/tourist activities	Avoid and Mitigate Risk – public education and hotel inspection programs required
	Railway impacts station location	Accept Risk - Implement appropriate response protocols, SOGs, and activities
	Railway impacts response protocols	Accept Risk - Implement appropriate response protocols, SOGs, and activities
Building Stock Profile		
Critical Infrastructure Profile		

Mandatory Profiles	**Top Risk or Issues/Concerns**	**Preferred Treatment Option** (refer to the Risk Treatment Options section for suggested treatment options and considerations)
Demographic Profile		
Hazard Profile		
Public Safety Response Profile		
Community Services Profile		
Economic Profile		
Past Loss and Event History Profile		

Appendix B:

How the Risk Levels in the Risk Level Matrix were Determined

The risk levels in the Risk Level Matrix on page 15 were determined using the following methodology. The probability and consequence levels outlined in Table 1: Probability Level (page 13) and Table 2: Consequence Level (pages 14-15) have different definitions, but are given the same weighted numerical values[2] (see the numerical values in red below) to reflect the fact that ***probability and consequence are equally important***. While it is human tendency to place more weight on consequence than probability, using the same weighted numerical values ensures that probability and consequence are given equal value. This approach is consistent with current risk management industry practices. The risk levels in the Risk Level Matrix were determined by multiplying the numeric values for probability and consequence.

Risk Level Matrix

Probability	INSIGNIFICANT 1	MINOR 10	MODERATE 100	MAJOR 1,000	CATASTROPHIC 10,000
ALMOST CERTAIN 10,000	Moderate Risk 10,000	Moderate Risk 100,000	High Risk 1,000,000	High Risk 10,000,000	High Risk 100,000,000
LIKELY 1,000	Moderate Risk 1,000	Moderate Risk 10,000	Moderate Risk 100,000	High Risk 1,000,000	High Risk 10,000,000
POSSIBLE 100	Low Risk 100	Moderate Risk 1,000	Moderate Risk 10,000	Moderate Risk 100,000	High Risk 1,000,000
UNLIKELY 10	Low Risk 10	Low Risk 100	Moderate Risk 1,000	Moderate Risk 10,000	Moderate Risk 100,000
RARE 1	Low Risk 1	Low Risk 10	Low Risk 100	Moderate Risk 1,000	Moderate Risk 10,000

Consequence

Low Risk:	probability x consequence = **1**; 10; or 100
Moderate Risk:	probability x consequence = 1,000; 10,000; or 100,000
High Risk:	probability x consequence = 1,000,000; 10,000,000; or 100,000,000

[2] The numeric scale used here is taken from Dillon Consulting, *The Corporation of the City of Mississauga, Community Risk Identification: Introduction and Methodology,* July 2017.

Appendix C:

ONTARIO REGULATION 378/18

made under the

FIRE PROTECTION AND PREVENTION ACT, 1997

COMMUNITY RISK ASSESSMENTS

Mandatory use

1. Every municipality, and every fire department in a territory without municipal organization, must,

(a) complete and review a community risk assessment as provided by this Regulation; and

(b) use its community risk assessment to inform decisions about the provision of fire protection services.

What it is

2. (1) A community risk assessment is a process of identifying, analyzing, evaluating and prioritizing risks to public safety to inform decisions about the provision of fire protection services.

(2) A community risk assessment must include consideration of the mandatory profiles listed in Schedule 1.

(3) A community risk assessment must be in the form, if any, that the Fire Marshal provides or approves.

When to complete (at least every five years)

3. (1) The municipality or fire department must complete a community risk assessment no later than five years after the day its previous community risk assessment was completed.

(2) If a municipality, or a fire department in a territory without municipal organization, comes into existence, the municipality or fire department must complete a community risk assessment no later than two years after the day it comes into existence.

(3) A municipality that exists on July 1, 2019, or a fire department in a territory without municipal organization that exists on July 1, 2019, must complete a community risk assessment no later than July 1, 2024.

(4) Subsection (3) and this subsection are revoked on July 1, 2025.

When to review (at least every year)

4. (1) The municipality or fire department must complete a review of its community risk assessment no later than 12 months after,

(a) the day its community risk assessment was completed; and

(b) the day its previous review was completed.

(2) The municipality or fire department must also review its community risk assessment whenever necessary.

(3) The municipality or fire department must revise its community risk assessment if it is necessary to reflect,

(a) any significant changes in the mandatory profiles;

(b) any other significant matters arising from the review.

(4) The municipality or fire department does not have to review its community risk assessment if it expects to complete a new community risk assessment on or before the day it would complete the review.

Commencement

5. This Regulation comes into force on the later of July 1, 2019 and the day it is filed.

Schedule 1:
Mandatory Profiles

1. Geographic profile: The physical features of the community, including the nature and placement of features such as highways, waterways, railways, canyons, bridges, landforms and wildland-urban interfaces.

2. Building stock profile: The types of buildings in the community, the uses of the buildings in the community, the number of buildings of each type, the number of buildings of each use and any building-related risks known to the fire department.

3. Critical infrastructure profile: The capabilities and limitations of critical infrastructure, including electricity distribution, water distribution, telecommunications, hospitals and airports.

4. Demographic profile: The composition of the community's population, respecting matters relevant to the community, such as population size and dispersion, age, gender, cultural background, level of education, socioeconomic make-up, and transient population.

5. Hazard profile: The hazards in the community, including natural hazards, hazards caused by humans, and technological hazards.

6. Public safety response profile: The types of incidents responded to by other entities in the community, and those entities' response capabilities.

7. Community services profile: The types of services provided by other entities in the community, and those entities' service capabilities.

8. Economic profile: The economic sectors affecting the community that are critical to its financial sustainability.

9. Past loss and event history profile: The community's past emergency response experience, including the following analysis:

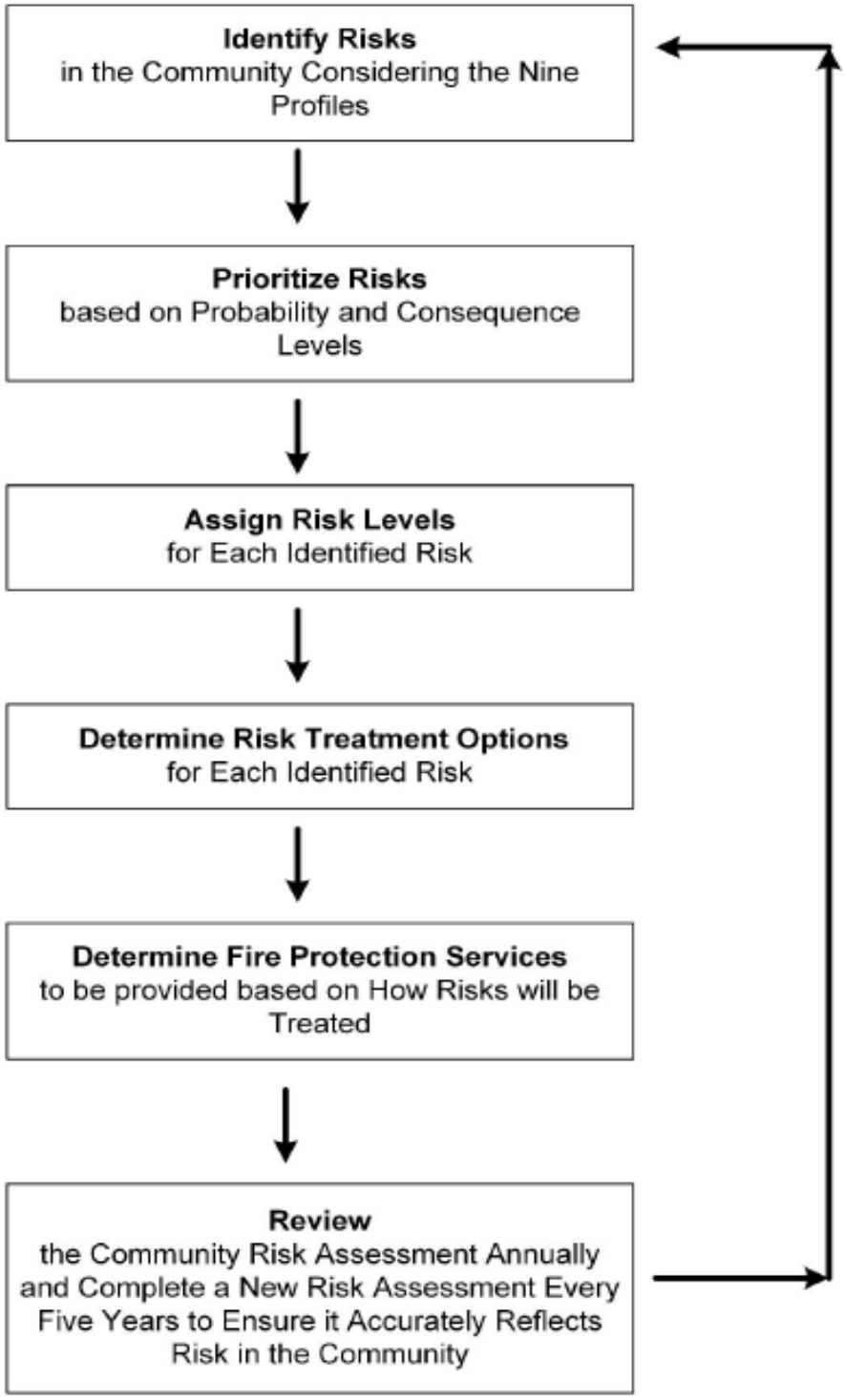
1. The number and types of emergency responses, injuries, deaths and dollar losses.

2. Comparison of the community's fire loss statistics with provincial fire loss statistics.

Note: Each profile is to be interpreted as extending only to matters relevant to fire protection services.

Appendix D:

Community Risk Assessment: Flow Chart



Appendix H: FUS Technical Document on Elevated Devices

Fire Underwriters Survey™

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 of

1.) Forcible entry;
2.) Utility shut-off;
3.) Ladder placement;
4.) Ventilation;
5.) Salvage and Overhaul;
6.) Lighting.

Response areas with 5 buildings that are 3 stories or 10.7 metres (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 metres (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 metres (100 feet).

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Eastern region 1-800-263-5361 optaintel.ca

Exception: When the height of the tallest building is 15.2 metres (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 metres (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 BC 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).

Excerpt: National Building Code 2012

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 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.

Alternatively, 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.