October 2020

Sarnia Fire Rescue Services

Fire Master Plan

Emergency Management & Training Inc.

705.719.9007
info@emergencymgt.com
www.emergencymgt.com

65 Cedar Pointe Drive, Suite 144
Barrie ON, Canada L4N 9R3

Table of Contents

ACRONYMS

AA	Administrative Assistant
AED	Automatic External Defibrillator
CAD	Computer Aided Dispatch
CEMC	Community Emergency Management Coordinator
CFAI	Commission on Fire Accreditation International
CFPO	Chief Fire Prevention Officer
CISM	Critical Incident Stress Management
CRA	Community Risk Assessment
CRTC	Canadian Radio-television and Communications Commission
CSA	Canadian Standards Association
CTO	Chief Training Officer
DPG	Dwelling Protection Grade
EAP	Employee Assistance Program
EMCPA	Emergency Management & Civil Protection Act
EMS	Emergency Medical Services
EMT	Emergency Management & Training Inc.
EOC	Emergency Operations Centre
ERP	Emergency Response Plan
EVT	Emergency Vehicle Technician
FMP	Fire Master Plan
FESO	Fire and Emergency Services Organization
FLSE	Fire and Life Safety Education
FPD	Fire Prevention Division
FPPA	Fire Protection and Prevention Act
FUS	Fire Underwriter's Survey
GIS	Geographic Information System
HQ	Headquarters
IAO	Insurers Advisory Organization
ICS	Incident Command System
LEMS	Lambton Emergency Medical Service
IRM	Integrated Risk Management
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
OFC	Ontario Fire College
OFMEM	Office of the Fire Marshal and Emergency Management
OPP	Ontario Provincial Police

PFPC	Public Fire Protection Classification
PFSG	Public Fire Safety Guidelines
PWC	Personal Watercraft
RIC	Rapid Intervention Crew
SFRS	Sarnia Fire Rescue Services
SOG	Standard Operating Guidelines
SPS	Sarnia Police Service
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TSO	Training Safety Officer

EXECUTIVE SUMMARY

This Fire Master Plan consists of a review of the community and its fire service that culminates into a 10-year plan for future opportunities for organization improvements over the coming years. The plan assesses present and future population statistics and anticipated growth. It is a plan that also evaluates past and present service levels provided by the fire department, coupled with its service goals and expectations.

The overall goal of this document is to provide the fire service and the City of Sarnia with a comprehensive look at how well Sarnia Fire Rescue Services (SFRS) is meeting the needs of its staff and the community it serves. Once the plan is adopted, the next phase is implementation. Implementation will depend on the City resources and ability to move forward with the associated recommendations contained within the document.

Objectives

To ensure that they are meeting the needs of the community and their staff, SFRS recognizes that it is necessary to conduct this review of the organization for the intention of providing high-quality fire services to the residents and businesses of the community along with its visitors. With the creation of a Fire Master Plan, the City of Sarnia is evaluating all aspects of its service including the operational costs and capital budgets required to maintain or enhance the service.

Any recommendations arising from the plan will be used to develop strategies for 2020 through to 2030.

The master plan will provide the road map for the fire service to address the needs for the City and its citizens. As such, the plan should cover at a minimum:

Emergency Response

- Provide a review of the response requests and response times in comparison to requirements as outlined by NFPA standards.

Facilities

- Provide a geographical plan to fire station locations to support the community for response incorporating vulnerable occupancy locations, industrial and commercial needs, and growth of the City into new development areas.
- Provide features that will be required to be incorporated into facilities.

Apparatus Plan

- Provide an apparatus plan to provide a replacement schedule and asset management of the key apparatus for the service considering recommendations as outlined by the NFPA.

Mutual Aid Review

- Review of existing mutual aid agreements, fire service protection agreements, and provide a plan for updating such agreements.

Fire Prevention Public Education Plan

- Provide a review of Public Fire and Life Safety Education activities to ensure Sarnia Fire Rescue Services meet or exceed minimum compliance requirements of the regulations and NFPA standards and provide recommendations for improvements.
- Provide a review of Fire Prevention, Inspection and Enforcement activities to ensure Sarnia Fire Rescue Services meet or exceed minimum compliance requirements of the regulations and NFPA standards and provide recommendations for improvements.

Service Level Standards Review

- A plan for the current services provided by Sarnia Fire Rescue Services and identify any additional services that the City should consider to support the community.

Administrative Review

- A review of the administrative workflow to support Sarnia Fire Rescue Services and identify improvement opportunities.

Insurance Underwriters Review

- A review of the current insurance underwriters review and the development of a cost benefit analysis of the fire service and impact on insurance underwriters rating.

A quick reference chart of recommendations has been included in this Executive Summary. This initial recommendation chart is listing the recommendations with associated suggested timelines. A more detailed chart can be found in Section 11 of this document. The detailed chart lists the recommendations numerically and includes timelines for implementation along with estimated costs. In total, EMT is presenting 27 recommendations for consideration by the Fire Chief, CAO, and City Council. Along with the 47 general recommendations, there are additional options referenced within Section 7.3 related to other facility recommendations for enhancements/efficiencies for SFRS consideration.

Recommendation – Summary Chart

Rec #	Recommendation	Suggested Timeline
Section 1 – Community and Fire Department Overview		
1	It is recommended that the agreement with Aamjiwnaang First Nation be updated and reflect the costs of providing such service. Other fire protection services, such as public fire and life safety education and inspections, that are also provided by SFRS should be included in the agreement.	
Section 2 – Planning and Stakeholder Surveys		
2	It is recommended that the Fire Chief plan to update the FUS report.	Short-term (1-3 years)
3	It is recommended that the Fire Chief and Senior Staff review the comments received by staff within the internal survey to identify areas for improvement. • This review could come in the form of a townhall type meeting or a staff/management committee that would report to the Fire Chief with their recommendations.	Immediate (0-1 year)
4	Establish a formal service agreement and governance model with SPS for dispatching and infrastructure partnership.	Short-term (1-3 years)
Section 3 – Fire Suppression, Community Response, and Comparators		
5	SFRS staff a platform aerial apparatus as a front-line vehicle, a captain and crew of 3 firefighters will be available for all structure fires and support to other operational needs of the department determined by the Fire Chief. Current staffing on the Rescue unit would transfer to the Aerial Platform and requires the hiring of 2 new firefighters per platoon for a total of 8.	Short-term (1-3 years)
6	Recommended that the SFRS promote the installation of residential sprinkler systems.	Short-term (1-3 years)
Section 4 – Non-Suppression Staffing and Health & Wellness Programs		
7	Add a second position of Deputy Fire Chief in the very near future.	Short-term (1-2 years)
8	Hire a Chief Fire Prevention Officer to oversee the Fire Prevention Division	Short-term (1-3 years)
9	It is recommended that all Captains and those providing primary fire prevention activities be qualified as NFPA 1031 Fire Inspector 1 and NFPA 1035 Fire and Life Safety Educator Level 1.	Short-term (1-3 years)

10	It is recommended that the City allocate a dedicated IT Support person that can assist with the implementation of new and current software needs.	Short-term (1-3 years)
11	Hire a Chief Training Officer to coordinated training programs, reduce administrative workload and allow the Safety/Training Officers focus on actual training.	Mid-term (4-6 years) and ongoing
12	It is recommended that the recruit program content and duration be reviewed and amended as required.	Short-term (1-3 years)
13	That SFRS investigate medical oversight and develop, implement, and maintain a program consistent with similar municipalities fire services.	Short-term (1-3 years) and ongoing
14	A City-owned facility to accomplish other training initiatives that is indoors, and temperature controlled allowing the ability to train firefighters in all seasons without restrictions should be investigated as a long-term investment.	Long-term (7-10 years)
15	Training division staff work with partners from the petrochemical industry to develop, implement and maintain a program that covers both theory and practical industrial firefighting training.	Short-term (1-3 years)
16	To verify the training programs are meeting related NFPA (and other) training program standards, the Deputy Fire Chief identify: • What training programs are required for the services that SFRS is providing? • The number of hours that are required to meet each of those training needs based on Provincial and industry standards. • Resources required to accomplish this training. • Joint partnerships with private organizations that can be entered to achieve the training requirements. • An annual program outline at the start of each year presented to the Fire Chief, with measured goals and expectations reporting completion success rate at the end of each year.	Short-term (1-3 years)
17	The EVT should become a staff member of SFRS, dedicated to fire service vehicle and equipment. Amongst other responsibilities this position should develop, implement, and maintain a small fleet/apparatus and master equipment life-cycle planning process.	Mid-term (4-6 years)
18	It is recommended that the Fire Chief continue to reinforce the need for fire related dispatchers to meet the goals and expectations of the related NFPA standard (1221 and 1061).	Short-term (1-3 years)
19	In effort to reduce potential presumptive cancer claims and cardiac events the department should work towards addressing procedures in firefighter rehabilitation and decontamination specific to the NFPA 1500 Standards.	Short-term (1-3 years)

Section 5 – Risk Assessment and Emergency Management		
No recommendations for this section.		
Section 6 – Fire Station Locations and Condition Assessment		
No recommendations for this section.		
Section 7 – Fire Department Vehicles, Equipment Maintenance, and PPE		
20	The City should continue to maintain a vehicle replacement schedule that complies with the FUS recommendations from a first line to a reserve/second line unit.	Ongoing
21	Ensure second-line apparatus are equipped to respond to large scale events.	Immediate (0-1 year)
22	A review of Marine 1 be undertaken including examining options that are capable of being deployed any time of the year	Short-term (1-3 years)
23	Establish an integrated tracking and documentation repository of all testing and service records accessible by Fire Administration and Platoon Chiefs.	Short-term (1-3 years)
24	It is recommended that when considering procurement of new SCBA there should be consideration into the interoperability with fire service partners.	Short-term (1-3 years)
25	It is recommended that a Master Equipment Life-Cycle plan be established.	Short-term (1-3 years)
26	The fire department should examine the potential of having mechanical work on small engines, marine vessels, and other miscellaneous equipment completed by a second certified EVT mechanic.	Short-term (1-3 years)
Section 8 – Finance, Budgeting, and Capital Investment Plan		
27	Facility Maintenance and Life Cycle Planning should be outlined in a recurring plan reliably supported by the Capital Budget process.	Short-term (1-3 years) and ongoing
Section 9 – Review of Previous Master Plan		
28	The Fire Chief is to review the status of all previous 2007 Master Plan recommendations to ensure that all get carried over and are addressed or closed.	Ongoing
Section 10 – Summary		
No recommendations for this section.		

INTRODUCTION

Review Process and Scope

Emergency Management & Training Inc. (EMT) has based its review process on the City of Sarnia's initial Request for Proposal and the response document submitted by Emergency Management & Training Inc. The specific scope of work identified in the Request for Proposal was reviewed. The Fire Master Plan (FMP) review was completed by utilizing best practices, current industry standards, and applicable legislation as the foundation for all work undertaken. Emergency Management & Training Inc. also used both quantitative and qualitative research methodologies to develop a strong understanding of current and future needs and circumstances of the community.

Deliverables

Through a strategic planning process and by building upon the 2007 Master Fire Plan, EMT has developed a new Fire Master Plan for 2020 - 2030. As noted in the Executive Summary the scope of work shall include, but not necessarily be limited to a review of the following:

- Emergency Response
- Facilities
- Apparatus Plan
- Mutual Aid Review
- Fire Prevention Public Education Plan
- Service Level Standards Review
- Administrative Review
- Insurance Underwriters Review

Based on these criteria and through meetings with the Fire Chief, Fire Staff, City Council and other stakeholders, the consulting team was able to complete a thorough review of elements that are working well and areas requiring improvement within the City of Sarnia Fire Department.

Performance Measures and Standards

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

- Office of the Fire Marshal and Emergency Management's (OFMEM) Public Fire Safety Guidelines.
- *The Fire Prevention and Protection Act* and its subordinate regulations, including the Ontario Fire Code O. Reg 213/07, Mandatory Assessment of Complaints and Requests for Approval O.

Reg 365/13, Mandatory Inspection – Fire Drill in Vulnerable Occupancy O. Reg 364/13, and O. Reg 378/18 Community Risk Assessment.

- Office of the Fire Marshal and Emergency Management's (OFMEM) Integrated Risk Management program.
- The *Occupational Health and Safety Act*, with reference to the 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 *Occupational Health and Safety Act* (OHSA). This committee is charged with reviewing industry safety concerns and developing recommended guidelines to reduce injuries for the worker.
- The National Fire Protection Association (NFPA) standards:
    - NFPA 1001 – Standard for Fire Fighter Professional Qualifications
    - NFPA 1002 – Standard for Fire Apparatus Driver/Operator Professional Qualifications
    - NFPA 1021 – Standard for Fire Officer Professional Qualifications
    - NFPA 1031 – Standard for Professional Qualifications for Fire Inspector and Plan Examiner
    - NFPA 1033 – Standard for Professional Qualifications for Fire Investigator
    - 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
    - NFPA 1041 – Standard for Fire Service Instructor Professional Qualifications
    - NFPA 1061 – Professional Qualifications for Public Safety Telecommunications Personnel
    - NFPA 1072 – Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications
    - NFPA 1201 – Standard for Providing Fire and Emergency Services to the Public
    - NFPA 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems
    - NFPA 1500 – Standard on Fire Department Occupational Safety, Health, and Wellness Program
    - NFPA 1521 – Standard for Fire Department Safety Officer Professional Qualifications

  - 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 1730 – Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations
  - NFPA 1901 – Standard for Automotive Fire Apparatus
  - NFPA 1911 – Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles
- The Commission on Fire Accreditation International (CFAI), which is a program that promotes fire service excellence by evaluating 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).
  - This program has been adopted by many fire departments in Canada as a measure of best practices. Within Ontario, Guelph, Kitchener, Toronto, and Ottawa are just a few fire departments that have obtained accreditation from the CFAI.
- Fire Underwriters Survey (FUS) technical documents

Project Consultants

Although several staff at Emergency Management & Training Inc. were involved in the collaboration and completion of this Plan, the core review was conducted by:

- Darryl Culley, President Emergency Management & Training Inc.
- Gary Mosburger, Fire Service Consultant
- Rick Monkman, Fire Service 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 Emergency Management & Training Inc. team has worked on projects that range from fire service reviews, creation of strategic and master plans, and development of emergency response programs for clients.

SECTION 1 – Community and Fire Department Overview

1.1 Community Overview
1.2 Fire Service Composition
1.3 Fire Service Agreements
1.4 Mutual and Automatic Aid Agreements

SECTION 1: Community and Fire Department Overview

1.1 Community Overview

Sarnia is a city in southwestern Ontario, Canada, with approximately 72,125 residents according to the 2016 Statistics Canada data. It is the largest city on Lake Huron and in Lambton County. Sarnia is located on the western bank of the junction between the Upper and Lower Great Lakes where Lake Huron flows into the St. Clair River, forming the Canada–United States border, directly across from Port Huron, Michigan.

FIGURE #1: Sarnia Relative to Lambton County

Over the years, the City of Sarnia has witnessed many changes resulting in demographic shifts such as a growth in residential housing. As such, a thorough review of the City's and the Fire Service's future planning documents, goals and related objectives are being evaluated to ensure proper alignment with future needs.

The City of Sarnia has a high density of high-rise buildings, including residential apartment buildings, office buildings, and hotels. This is a challenge for emergency responders due to what is known as "vertical response." This is the time it takes from arrival at the location to the time it takes for emergency responders to arrive at the floor of the emergency. Fires on upper floors of high-rise

buildings also require additional firefighters to move equipment and supplies to the site of the fire and assist in evacuation/rescue.

1.2 Fire Service Composition

The SFRS provides safe and effective emergency response, fire prevention and public educational services for the residents and visitors of Sarnia. The Department consists of 128 full-time staff that are set up within four main divisions: Administration, Fire Prevention and Public Education, Training and Suppression (firefighting).

The Department provides four key services to the community:

- Fire Suppression/Rescue and Emergency Response (including medical emergencies)
- Fire Prevention, Inspection, Enforcement, and Fire Safety Education
- Training
- Emergency Management in support of the City's CEMC and in joint partnership with Sarnia Police

TABLE #1: Current Staffing Complement

The following outlines the staffing complement for the service as of budget approval in January 2019:

Division & Role	Quantity
Administration:	
Chief Officers	2
Administrative Assistants	2
Fire Prevention:	
Fire Prevention Officers	5
Public Education:	
Public Education Officer	1
Special Duties:	
Captain	1
Training Division:	
Training Safety Officers	2
Suppression:	
Platoon Chiefs	4
Captains	24
Firefighters	87
Total Staff	**128**

The Suppression division consists of a platoon system of four shifts. Fire suppression services respond from five stations that account for a total of 115 full-time firefighters. In 2019 the Department responded to 2,692 calls.

1.3 Fire Service and Mutual Aid 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 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.

In fire and emergency services, mutual aid is an agreement among emergency responders to lend assistance across jurisdictional boundaries. This may occur due to an emergency response that exceeds local resources, such as a disaster or a multiple alarm fire. Mutual aid may be an ad hoc request, occurring only as needed.

Automatic aid is a formal standing agreement or cooperative emergency agreement on a continuing basis, ensuring that resources are dispatched from the nearest fire station, regardless of which side of the jurisdictional boundary the incident is on.

The Department has a positive working relationship with the other fire departments in the surrounding jurisdictions. As such, mutual aid agreements are in place.

Presently, the City of Sarnia has several mutual aid agreements in place with:

- Port Huron (United States)
- Brooke Fire Department
- Dawn/Euphemia Fire Department
- Lambton Shores Fire Department
- Oil Springs Fire Department
- Petrolia Fire Department
- Plympton/Wyoming Fire Department
- Point Edward Fire Department
- St Clair Fire Department
- Warwick Fire Department
- Watford Fire Department

The City of Sarnia also has a fire service agreement in place with bordering Aamjiwnaang First Nation to provide fire protection, however, the agreement has not been updated in many years. It is recommended that the agreement be updated and reflect the costs of providing such service. Other fire protection services, such as public fire and life safety education and inspections, that are also provided by SFRS should be included in the agreement.

The Fire Chief has demonstrated a practical approach to ensuring that the City of Sarnia receives the best, most efficient level of fire protection possible based on the available resources. To keep this positive initiative credible, it is recommended that the Fire Chief review all fire service agreements annually to ensure they are meeting the needs of the City.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
1	It is recommended that the agreement with Aamjiwnaang First Nation be updated and reflect the costs of providing such service. Other fire protection services, such as public fire and life safety education and inspections, that are also provided by SFRS should be included in the agreement.	Staff time	Short-term (1-3 years)

SECTION 2 – Planning and Stakeholder Surveys

2.1 Three Lines of Defence

2.2 Strengths, Weaknesses, Opportunities, and Threats

2.3 National Fire Protection Association Standards

2.4 Fire Underwriters Survey

2.5 Commission on Fire Accreditation International

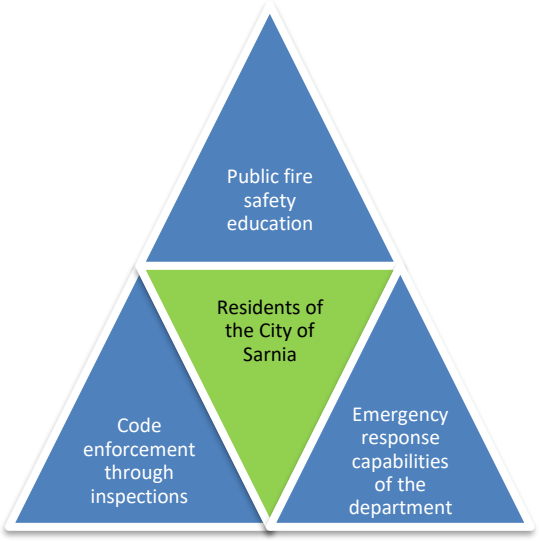
2.6 Stakeholder Surveys

SECTION 2: Planning and Stakeholder Surveys

2.1 Three Lines of Defence

The Office of the Fire Marshal and Emergency Management (OFMEM) have 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 *Act*.
3. **Emergency Response** – If the first two lines of defence fail for whatever reason, 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 NFPA. These standards are not mandated but form the foundation of recommended best practices of the fire services. These NFPA standards are also utilized by organizations such as the FUS group to conduct their assessments of a fire department and the community. The OFMEM and provincial fire schools also use them to form the foundation of their evaluation and training related programs.

2.2 Strengths, Weaknesses, Opportunities, and Threats

The strengths and weaknesses portion of a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis are based on an internal review that identifies what is working well, along with recognizing areas for improvement. The opportunities and threats portion of the SWOT are related to

external influences and how these influences affect the operations and response capabilities of a fire department.

2.2.1 Strengths

Administration:

- Current employees with experience of institutional knowledge and a full understanding of city operations all are dedicated to share the current workload to get the job done.

Training:

- This division has certified Training Safety Officers (TSOs) prepared to design, develop, and deliver core subject matter to the staff at SFRS. Many technology advances have already started to allow for online learning and certification in Fire Officer and Hazardous Materials programs, as examples.

Fire Suppression:

- Suppression staff are grandfathered (by the OFMEM based on years of experience and knowledge) and/or certified firefighters to NFPA 1001 Level 2.
- Platoon Chiefs and Captains are grandfathered and/or certified to NFPA 1021 Level 1 or Level 2.

Fire Communications:

- Multi-service integrated communications at police HQ with latest version of iCAD installed.

Fire Prevention and Public Education:

- Fire Prevention and Public Education Division has very competent employee group capable of a dynamic work environment within the division. This division has oversight of media and social media of the SFRS.

Fire Stations:

- Stations seem to be strategically located with Station 2 being recently renovated.

Equipment/Fleet Mechanical/Apparatus:

- Competent Fire Mechanic with Emergency Vehicle Technician (EVT) certification.

Information Technology and Management:

- SFRS has its own intranet for ease of finding resources by end-users. Pre-incident planning using APX Smart-Capture has begun by firefighters on modified duties.

2.2.2 Weaknesses

Administration:

- Very limited Administrative staffing reduces the ability of the leadership to be proactive. A plan to provide professional development for the Administration chiefs and support staff will prove valuable in finding efficiencies and savings of time.

Training:

- There is currently no position of Chief Training Officer to run the division; this provides challenges within the division and applies additional workload onto the Deputy Fire Chief.

Fire Suppression:

- The Standard Operating Guidelines (SOGs) need to be updated and reviewed to ensure they are comprehensive with new SOGs created to align with Section 21 Guidance Notes.
- Firefighters have had limited or inconsistent training with industrial firefighting.

Fire Communications:

- While having a multi-service dispatching centre comes with significant savings to the municipality, it also comes with its own set of challenges to ensure technology, training, and service delivery to the SFRS is maintained to a level set forth by the Fire Chief.

Fire Prevention and Public Education:

- This division lacks a supervising Chief Fire Prevention Officer (CFPO) to run the division.

Fire Stations:

- Stations are aging and need life-cycle planning for building components. Mechanical breakdowns and servicing needs are handled on an as required basis rather than proactively. There is no City Facility Maintenance oversight to ensure work is completed efficiently and effectively.

Information Technology and Management:

- Data collected by the CAD Link does not appear to provide information needed by SFRS while completing reports by officers and does not currently provide reliable and readily accessible data across all divisions for analytics. Many challenges with tablet technology utilized by fire

suppression and fire prevention staff require the needed IT support to keep the system functioning.

2.2.3 Opportunities

Administration:

- Opportunities within the Fire Administration Division should be focussed on strategy, structure, systems, and people. Creating a supportive and positive work environment for all staff while building relationships with staff, service partners, and neighbours.

Training:

- The Training Division has many opportunities to consider, starting with the internal delivery of Blue Card ICS for Senior Officers, maintenance training and drilling, all to continue to provide a high level of opportunity to current and new staffing.

Note: Blue Card is a command training and certification system that trains company and command officers how to standardize local incident operations across their organization.

Fire Suppression:

- BlueCard certification for Senior Officers in the short-term.

Communications:

- Communications software and hardware upgrades should provide significant opportunity and enhancement to the radio system being utilized.

Fire Prevention and Public Education:

- Continued improvements will provide opportunity for the division to enhance services currently being offered, while finding efficiencies with improved technology capable of using in the field.

Fire Stations:

- While many fire station projects are planned for improvement, these scheduled upgrades should be seen as an opportunity to provide more adequate facility needs. This will improve the health and safety of all personnel and the public visiting the fire stations.

Equipment/Fleet Mechanical/Apparatus:

- Create a master equipment life-cycle plan tied into the parent apparatus and stations.

Information Technology and Management:

- Fire services should be aligned with corporate IT strategies allowing users to transition into one robust RMS platform interfaced with enterprise solutions and fully utilize capabilities such as GIS mapping with data analytics for efficient resource allocation.

2.2.4 Threats/Challenges

Administration:

- Out of date Bylaws, Fire Protection Agreement, and Mutual Aid agreement should be updated.

Training:

- Training programs and the present training budget does not adequately address risks such as industrial firefighting.

Fire Suppression:

- With the absence of an ICS such as the BlueCard system, not commanding from fixed command post at known smoke or fire incidents is a significant risk to fire staff.

Communications:

- While it can be assured that three dispatchers are always available at the Police facility, a single dispatcher is not dedicated to active fire calls.

Fire Prevention and Public Education:

- While the current staffing is highly experienced and knowledgeable, the risk of some of these individuals retiring within short order requires succession planning for this division.

Fire Stations:

- Multiple building components identified in 2017 Building Condition Assessment are beyond service life and are rated as urgent or high priority; some stations are not resilient in blackouts due to a lack of or outdated emergency generators in place.

Equipment/Fleet Mechanical/Apparatus:

- Backup Fire Mechanic required EVT certifications.

Information Technology and Management:

- The City does not provide clear strategies of who supports and maintains IT requirements including tablets and future applications.

All these identified challenges need to be monitored, evaluated, and reported to Council by the Fire Chief to ensure that Fire Department is meeting the needs and expectations of the community.

2.3 National Fire Protection Association Standards

In 2013, the Province of Ontario adopted a move to the NFPA Standards and away from the Ontario Fire Service Standards. To assist with Emergency Management & Training Inc.'s review and related recommendations, reference has been made to a key NFPA standard that identifies the services that should be offered and how they are to be delivered based on the composition of a fire department.

NFPA Standard 1201 – Standard for Providing Fire and Emergency Services to the Public

Section 4.3.5 notes:

- The Fire and Emergency Services Organization 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, a Fire and Emergency Services Organization (FESO) must ensure open and timely communications with the Chief Administrative Officer and governing body (Council), create a

masterplan for the organization, and ensure there are mutual aid and automatic aid programs in place, along 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 goals and expectations for Career Fire Departments and has been incorporated into the evaluation of the fire department's response and staffing needs. More discussion in relation to these two standards will be presented in Sections 4 and 5.

2.4 Fire Underwriters Survey

FUS 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. The insurance rates are based on the score that a community receives founded on such things as the fire department assessment. This assessment included a review of apparatus, distribution of companies/fire stations, staffing, training, maintenance, pre-incident planning, etc.

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 and the results of these surveys are used to establish a Public Fire Protection Classification (PFPC) for each community. While FUS is not involved in rate making matters, 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 capacity of risk they are willing to assume in a given 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 Dwelling Protection Grade 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.

Retention of a good rating should be a focus for the Fire Chief and the City as this is utilized for setting insurance rates. This insurance rating not only influences the residents in relation to savings on their home and business insurance rates but can also affect the City in relation to properties that they own and insure.

The most recent review was completed in 1991 making it almost 30 years old; a FUS review is typically only relevant for 5 years. It is recommended that the Fire Chief contact FUS to update the Department's rating.

2.5 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 CFAI overview information.

In the fire service, the NFPA standards are considered by many as the benchmark to strive for. Many of these standards have, to a large degree, been adopted and supported by numerous fire departments. The CFAI is an organization that has incorporated all national and local standards into an accreditation process, effectively becoming the model for best practices in fire services. This best practice is seen as a model of fire service excellence.

To accomplish this excellence model, the CFAI program revolves around 10 categories:

1. **Governance and Administration** – Includes such things as 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** – What are the goals of the fire service? Do they have a strategic plan in place?
4. **Financial Resources** – Does the organization have sufficient funding in place to effectively meet the needs of internal and external stakeholders?
5. **Programs** – Includes fire prevention, fire suppression, training, and emergency management.

6. **Physical Resources** – What is the state of the fire stations and are they located in the best location to respond to the community in a timely manner?
7. **Human Resources** – Includes staffing of the organization in all branches as well as 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** – This section covers such things as water supply, communications/ dispatch and administrative services.
10. **External Systems Relations** – Includes such topics as mutual aid, automatic aid, third party agreements, etc.

These categories will be discussed within each related section of this Fire Master Plan document.

2.6 Governance and Establishing & Regulating By-law

The Establishing & Regulating (E&R) By-Law was updated in 2020 and meets the expectations of the *Fire Protection and Prevention Act.*

The by-law should be reviewed annually and updated to reflect changes of services.

2.7 Stakeholder Surveys

To get a clear understanding of how well SFRS is meeting the needs of its staff and the community, surveys were conducted with the internal staff of the SFRS, members of Council, and external stakeholders of the City.

To assist with the completion of the staff surveys, information meetings were held during the months of September and October 2019. The community survey was advertised through local media and was set up on the Department's website (in the form of an electronic survey). Meetings were also held in October with members of Council and with the Chief Administrative Officer (CAO).

2.7.1 Internal Surveys

During the FMP process, feedback was gathered from internal staff, which included firefighters, Administration, Training, Communications, and Fire Prevention. The following is a summary of the feedback received.

1. **Suppression:**

    a. Reserve Apparatus: (needs to be fully stocked with equipment) – many of responses had this as their first priority.

b. Seniority System – Updated to a new system, See Article 12.08 in CA – Promotional Qualifications do not include skill testing
c. Response Times: Consideration to adding another fire station in the Blackwell/Modeland Road area.
d. Water Rescue: Many staff wanted a new fire boat with additional training. Several staff suggested eliminating the large watercraft and adding a second Personal Watercraft.
e. Mentorship Program – Need a defined program for those being qualified to be Captain, or Platoon Chief.
f. Special Disciplines (Water, Hazmat, Tech Rescue): Too many disciplines to be proficient in any. Consider a new model where all staff are certified/trained in a single, primary discipline to the technician level.
    I. Break the disciplines into the following categories: Hazmat+Tech Rescue; Water/Ice + Tech Rescue.
    II. Designate Special Team Stations, eliminate the annual crew/station rotation.
g. Decontamination Program – after fires, Occupational Disease (cancer) Prevention, this needs more focus and policy.
h. Pre-planning by crews – Made accessible within the FDM or Data Management System.

2. **Training:**

a. Training budget needs to be increased.
b. Re-structure the division to include a CTO (70% - design and develop programs, 30% - delivering the program). Define the roles and responsibilities of division staff.
c. On shift trainers (Platoon Training Instructors)
d. Officer Development – Requires a complete overhaul, add Blue Card.
e. Expand training capacity in the following areas (Rail, Industrial, Elevator, Highrise, Airport).
f. Develop drilling plans for officers to complete with their crews on multiple subjects (basics).
g. Recruit Program – needs to be longer, more focussed on SFRS process, not just 1001 program.
h. Certify all staff who complete programs in certain disciplines.

3. **Dispatch/Communications:**

a. Radios are a significant concern, lots of dead areas. Not reliable.

b. Quality control measures since these are Sarnia Police dispatchers, they do not know the fire world. Inconsistency in dispatching is an ongoing problem.
c. Update protocol for responses.

4. **IT/Data Management/GPS:**

a. FDM does not meet the needs of all divisions.
b. Target Solutions is ok, but having things in multiple areas makes it difficult, significant cost to have this per year ($17,000).
c. Tablet technology should allow for GPS on trucks.
d. Mapping capacity should be improved for crews to quickly determine the area of a call. (Grid Mapping) response zone #'s.
e. Add printers in stations for response information or pre-planning information.
f. Add response reports for all vehicles responding to calls not just the Incident Command Report & SIR.

5. **Fire Prevention Division:**

a. Data Management System for FPOs needs are not available for Fire Code Referencing.
b. Succession Planning – Current staff will all retire around the same time.
c. SOGs need to be updated or created to reflect the immediate needs.

It is recommended that the Fire Chief engage with staff to review their comments. This review could come in the form of a staff/management committee that would report to the Fire Chief with their recommendations.

2.7.2 External Surveys and Council Input

Input from the community and members of City Council is vital as it gives the Fire Department an accurate indication of how the public perceives the Department and suggests areas for improvement from those with first-hand interaction with Department personnel. In total, there were 152 external surveys completed and submitted.

In general, the respondents are very satisfied with the level of service provided and level of professionalism demonstrated by the Fire Department.
When community members were asked about what services they believed were most important, they responded with the following order:

- Firefighting
- Rescue
- Emergency Management and Planning

- Fire Prevention and Public Education

Along with the top ranked services, respondents prioritized the following:

- The Fire Department responds as quickly as possible to an emergency.
- How efficiently the Department works with other agencies.
- Community training by the Department.
- The cost of the Fire Services to the community (taxpayer).

All the comments noted by the respondents are consistent with what EMT has noted when conducting these types of surveys for other communities. In short, most residents and businesses want to see a fire service that is robust enough to meet the needs of the community it serves, while being as cost-effective as possible.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
2	It is recommended that the Fire Chief plan to update the FUS report.	$60,000	Short-term (1-3 years)
3	It is recommended that the Fire Chief and Senior Staff review the comments received by staff within the internal survey to identify areas for improvement. • This review could come in the form of a townhall type meeting or a staff/management committee that would report to the Fire Chief with their recommendations.	Staff time	Immediate (0-1 year)
4	Establish a formal service agreement and governance model with SPS for dispatching and infrastructure partnership.	Staff time	Short-term (1-3 years)

SECTION 3 – Fire Suppression, Community Response and Comparators

SECTION 3: Suppression Division, Community Response and Comparators

3.1 Suppression Division

The Suppression Division is comprised of four platoons working out of five fire stations, 24-hours a day, 7 days a week. There is a minimum daily complement of 23 personnel under the command of a Platoon Chief with a Captain on all frontline apparatus. There is a total of 28-29 firefighters per platoon.

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

- Does Sarnia Fire Rescue have an approved response criterion as a baseline?
    - Has Council given direction to the Fire Chief regarding expected response times that are to be met by the Fire Department?
    - If so, is the Department meeting this response criterion on a consistent basis or is it struggling to meet the response times and perhaps falling behind?
- What change in population, demographics, and industry is occurring that may precipitate the need for a modification in stations and staffing?

As already noted, there are four main standards and industry best practices that need to be considered:

- First, there are industry standards/best practices in the form of the NFPA's 1710 and 1730 standards, which offer guidance regarding response times, staffing, fire prevention, and code enforcement.
- Second, the Department must consider the Public Safety Guidelines that are created and distributed by the OFMEM. These Guidelines advise fire services on aspects of delivering fire prevention, fire suppression, and fire station location programs.
- Third, the FUS, which is endorsed by the insurance industry as a tool for measuring the ability of a fire service in meeting the response time, staffing, and water supply needs of a community.
- Fourth, the CFAI, a program that has a fire service complete three key documents, including:

    1. A community risk assessment and standards of cover document
    2. A self-assessment manual based on the 10 categories that make up the program review

3. A strategic plan for the service (The Master Fire Plan can be considered the strategic plan for the service.)

3.1.1 NFPA 1710 – Career Fire Departments

To accomplish the NFPA Standard, a fire 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). However, most homes in Sarnia have basements and are often built close enough to each other to create that "exposure" for potential fire spread, which must be considered by the Fire Department in its response efforts.

Based on a review of the response data supplied, along with discussions with the Fire Chief, Sarnia Fire Rescue is witnessing a varying level of success in meeting the NFPA response criteria. This conclusion is illustrated in *Section 3.3 Emergency Response Data*. By utilizing this information in conjunction with the supplied response maps created by Emergency Management & Training Inc., we can see the effect of road networks, traffic levels, and traffic control systems on response times by emergency responders.

The travel time objectives for units responding on the first alarm indicate that the first unit should arrive within (240 seconds) or 4 minutes travel time and (360 seconds) 6 minutes for arrival of the second company. Section 5.2.4.1.1 (8) states that the initial fire unit shall have the capacity to implement an initial rapid intervention crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established (4). Total effective response force with a minimum of 16 (17 if an aerial device is used).

In relation to response times, section 4.1.2.1, the fire department shall establish the following performance objectives:

- 240 seconds (4 minutes) or less travel time for the arrival of the first arriving engine company at a fire suppression incident.
- 360 seconds (6 minutes) or less travel time for the arrival of the second company with a minimum staffing of 4 personnel at a fire suppression incident.
- For other than high-rise, 480 seconds (8 minutes) or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident.
- For high-rise, 610 seconds (10 minutes) or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident.

- 240 seconds (4 minutes) 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.

The 90th percentile travel time for the City is 00:06:11, or 6 minutes, 11 seconds. The chart below shows the 90th percentile travel times from each station. These numbers are directly related to the size of the area that each station covers. It is important to note that Sarnia has a significant rural and industrial area.

Travel times - 2019	90th Percentile
East Street	0:04:56
Churchill Road	0:10:16
Colborne Street	0:06:09
Wellington Street	0:06:23
Telfer Road	0:08:12

The response times include both the "assembly" time (also called turnout time) which is the time from when the firefighters are paged until they are mobile, along with the travel time to the location of the call. The 90th percentile for the whole fire department is 00:07:31, or 7 minutes, 31 seconds. Broken down by station the response times are noted below:

Response times -2019	90th Percentile
East Street	00:06:27
Churchill Road	00:11:18
Colborne Street	00:07:18
Wellington Street	00:07:19
Telfer Road	00:09:25

When considering the response times and related needs for a community, the fire response curve (FIGURE #2) presents the reader with a general understanding of how quickly a 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 ways, which can increase or suppress the burn rate through fire control measures within the structure.

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

- The distance between the fire department and response/incident location

- The layout of the community
- Impediments such as weather, construction, traffic jams, lack of direct routes (rural roads)
- Dispatch time
- Turnout time (time from firefighters being dispatched to leaving the station)
- Travel time for the firefighter to drive to the scene
    - Response time includes dispatch time, turnout time, and travel time to the scene

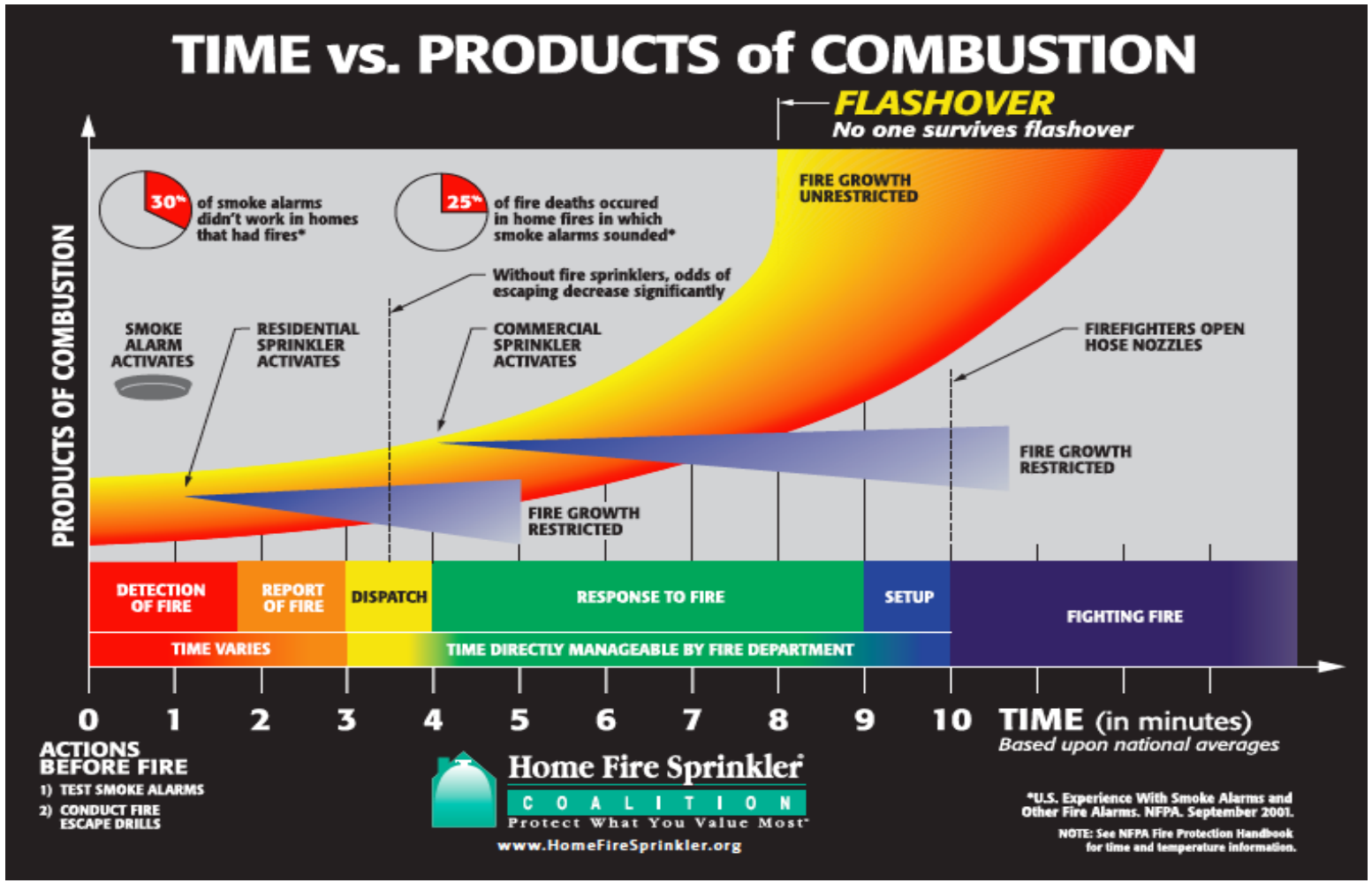
Other time measurements include:

- Effective Response Force is the time to gather an adequate number of firefighters to effectively fight the fire
- Intervention time is the time where the firefighters take action on the scene (such as agent applied, patient contact, rescue initiated)

The criticalness of immediate initiation of fire suppression activities is illustrated in the following fire propagation diagram. The curve within the chart notes the following time variables:

- Detection of fire – 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 – 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 firefighters to get to the fire truck and respond.
    - Travel time – the time from when the crew advises dispatch that they are enroute 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 – (intervention time) time on scene extinguishing the fire.

FIGURE #2: Fire Response/Propagation Curve



Note: Figure #2, obtained from the Home Fire Sprinkler Coalition, identifies when a residential fire activates and prevents fire growth and flashover.

Based on fire growth, as demonstrated in the diagram and the previously noted associated timelines, the overall goal of any fire department is to arrive at the scene of the fire and/or incident as quickly and as effectively as possible. If a fire truck arrives on scene in eight minutes or less, with a recommended crew of four or more firefighters, there is increased opportunity to contain the fire by reducing further spread of the fire 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 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 (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. A team of four also allows for adherence to the recommended “two-in, two-out” rule, referring to the presence of two firefighters inside the structure with two outside ready to go in as back-up.

Not having enough firefighters at an emergency scene can create an unsafe situation for the firefighters or, in a worst-case scenario, it can cause a delay in conducting fire suppression, lifesaving, and/or rescue operations. The NFPA 1710 standard on firefighting notes that for a typical two-storey, single-family dwelling (without a basement), the required response of 16 (17 if an aerial device is used) firefighters on scene is necessary to effectively battle the fire. Sarnia Fire Rescue can meet these staffing requirements, but it leaves Sarnia vulnerable on a consistent basis as only one engine is left to cover the rest of the city.

Currently, SFRS utilizes a platform aerial apparatus on an as needed basis and is not staffed as a front-line vehicle. EMT believes that staffing this platform aerial as a front-line vehicle with a captain and crew of 3 firefighters would provide availability for all structure fires and support to other operational needs of the department determined by the Fire Chief.

An aerial is an appropriate first call apparatus on fires, pre-fire conditions, and fire alarms which account for approximately 19% of the annual calls. Rescue calls account for 9% of the current call volume.

Many fire services, including SFRS, are adding basic extrication equipment (e.g. jaws of life) to front run pumpers as the equipment becomes lighter and more compact (e.g. electric instead of hydraulic), resulting in fewer calls where heavy extrication is required.

Current staffing on the Rescue unit would be transferred to the Aerial Platform operating out of Station 1 and would require the hiring of 2 new firefighters per platoon for a total of 8. This staffing reallocation would provide an improved level of service to the City, and an immediate support mechanism for partners in the chemical industry. This staffing recommendation is in accordance with the NFPA 1710 Standard for Truck Companies.

It must also be noted that SFRS responds to more than just fires. For example, motor vehicle collisions can create a medical or fire emergency that also needs to be addressed urgently. Hence the reason to be as efficient and effective as possible in responding to calls for assistance.

The OFMEM's Comprehensive Fire Safety Effectiveness Model notes the following considerations:

- The fire department should strive to provide an adequate, effective, and efficient fire suppression program designed to control/extinguish fires for the purpose of protecting people from injury, death, or property loss.
    - Does your fire department have a comprehensive training program and evaluation system for all positions?
    - Does the fire department have a system to ensure that an adequate number of trained personnel respond to all emergencies within a reasonable time?
    - Is your fire department provided with adequate resources to safely and effectively handle the risks it will be called upon to mitigate?
    - Does the fire department use standard operating guidelines (SOGs) to define expected fire department actions for the wide variety of situations it might encounter?
    - Does your fire department have automatic response agreements to guarantee an adequate level of personnel at all times?

The Fire Department should review these questions annually to confirm if it has and continues to implement effective measures to meet the OFMEM Guideline considerations.

3.2 Home Fire Sprinklers

The NFPA, along with the Canadian Automatic Sprinkler Association and the Ontario Association of Fire Chiefs, 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 concluded that due to its rapid activation, sprinklers 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. However, since there are so many similarities in building construction, the statistics are an accurate reflection of the Canadian experience.

While not a substitute for firefighting services, as an emergency response is still required, automatic sprinklers are highly effective and reliable elements of total system designs for fire protection in buildings.

The Home Fire Sprinkler Coalition Canada (HFSCC)[1] is a leading resource for accurate, non-commercial information and materials about home fire sprinklers for consumers, the fire service, builders, and other professionals.

Their information highlights that:

- Home fire sprinklers can contain and may even extinguish a fire in less time than it would take the fire department to arrive on the scene.
- Nationwide more than 300 people die in fires each year.
- Fire sprinklers save lives, reduce property loss and can even help cut homeowners insurance premiums.
- Installing both smoke alarms and fire sprinklers system reduces the risk of death in a home by 82%.
- Only the sprinkler closest to the fire will activate, spraying water directly on the fire. Ninety percent of fires are contained by the operation of just one sprinkler.

[1] https://homefiresprinklercanada.ca/

- Nationally, on average, residential fire sprinkler systems add 1% to 1.5% of the total building cost in new construction. That equates to $5,000 to $10,000 on a new home costing $500,000 or more.
- The cost of installing home fire sprinklers averages $1.35 per sprinklered square foot.

By working with the developers and the public in promoting the installation of home sprinkler systems, the SFRS 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 SFRS investigate this safety initiative as part of their fire prevention and public education initiatives.

3.3 Emergency Response Data

The following chart identifies a comparison of response types and the response breakdown for 2019. To view more data for 2018 and 2017, refer to Appendix “C”.

Fire department response time is a function of various factors including, but not limited to:

- The distance between the Fire Department and response location
- The layout of the community
- Impediments such as weather, construction, traffic, and road networks
- Notification time
- Assembly time of the firefighters, both at the fire station and at the scene of the incident

The Fire Department has taken significant steps since the 2007 FMP in staffing front-line engine and ladder apparatus with four firefighters from its original three which has had an immediate impact in relation to the 90th percentile criterion (“the initial apparatus shall arrive on the scene of the alarm within four minutes of receipt of the alarm in at least 90% of all occurrences”). Having this response time target in place, SFRS has an identified benchmark to utilize when reporting to City Council on performance goals and objectives. It is important to restate that it is Council that sets the level of service within the community. This level of service must be based off the local needs and circumstances.

Along with the following response data, the cluster map (FIGURE #3), which utilizes all types of calls that SFRS has responded to in the past year, offers an overview of where these calls occur within the City.

The cluster map identifies that the bulk of the calls are within the most densely populated areas. It also confirms that the fire stations are for the most part well situated within the City, but some adjustments are being recommended by EMT to improve response coverages.

FIGURE #3: Call Cluster Map

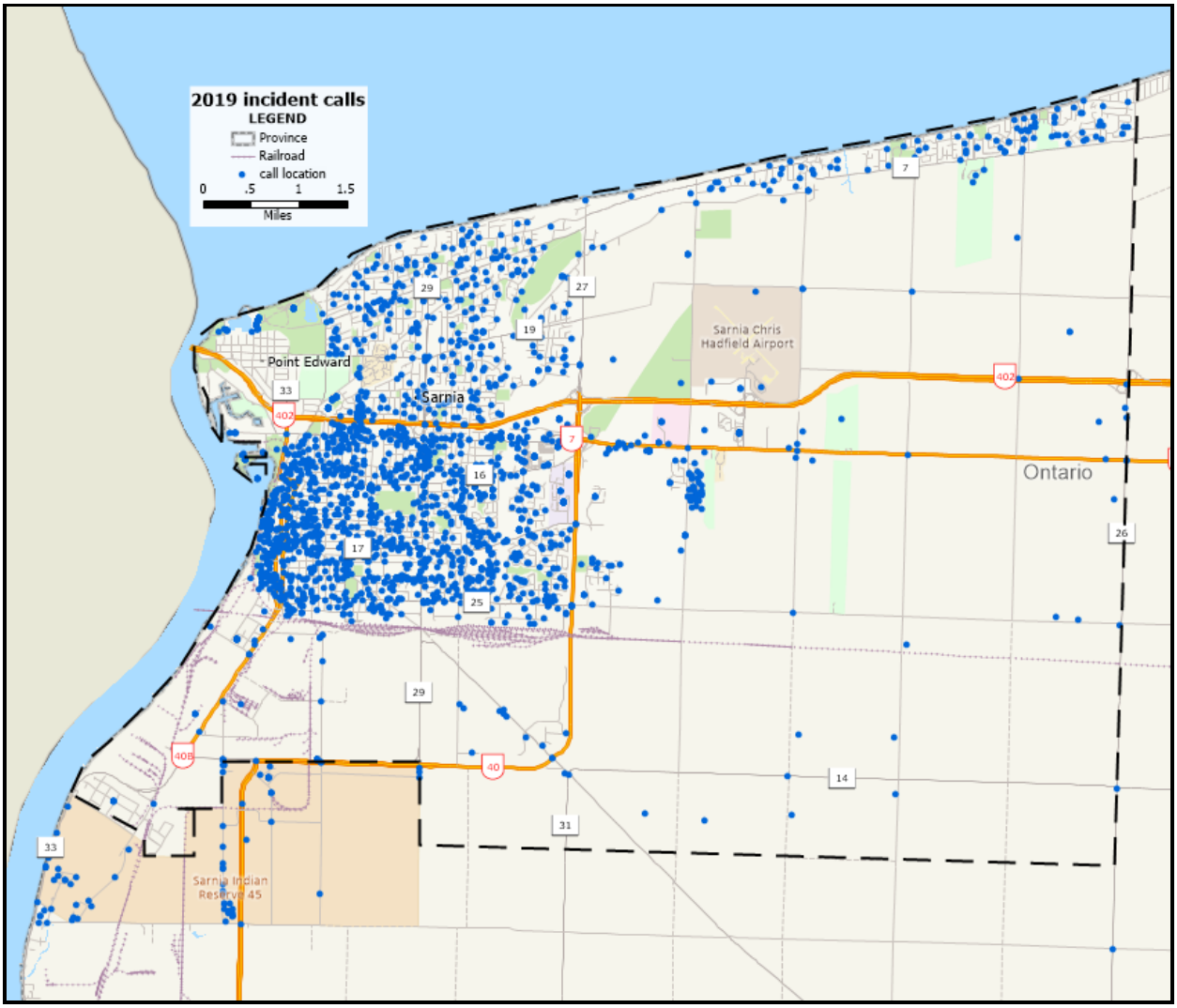
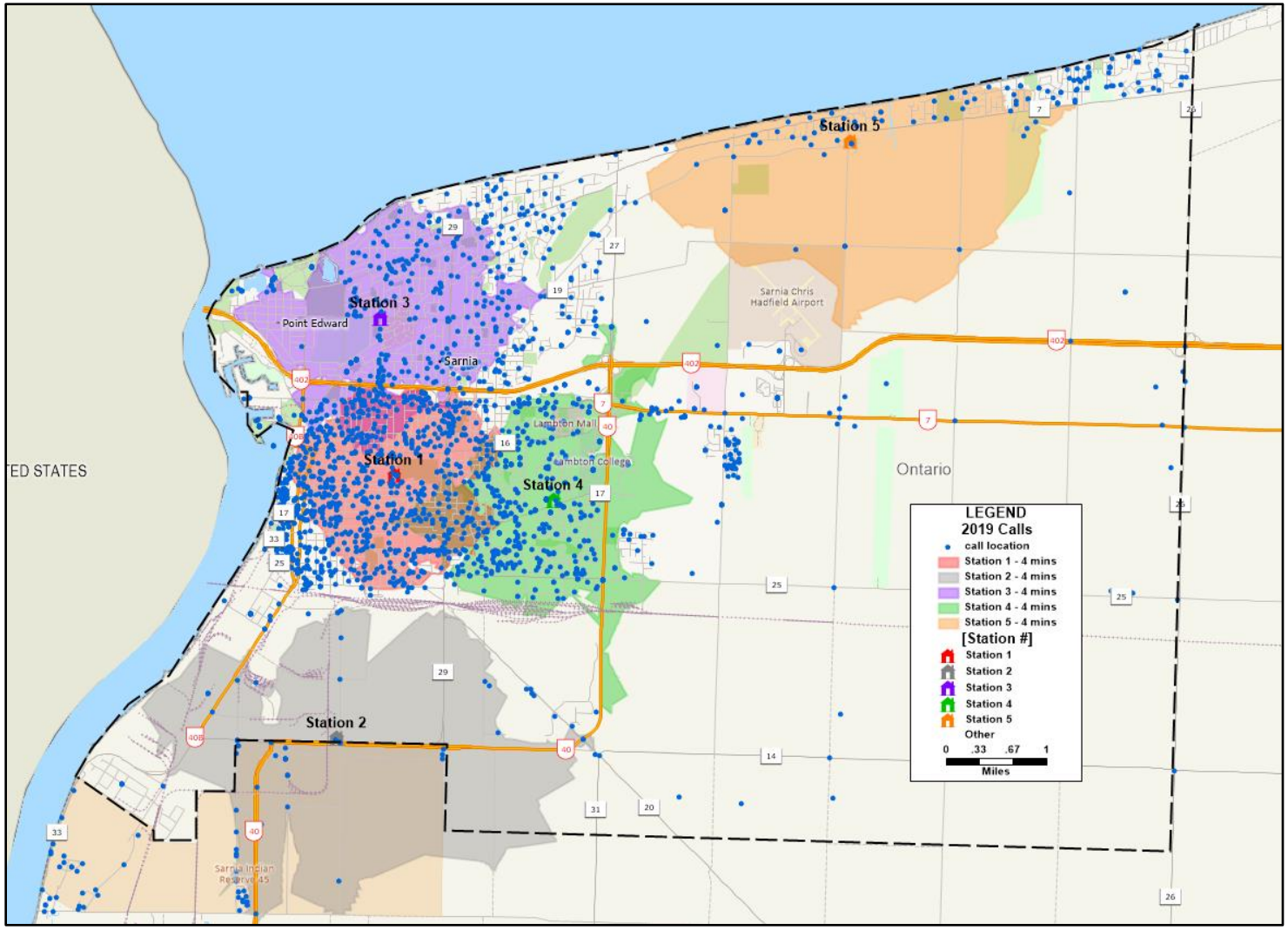


FIGURE #4: Four-Minute Travel Time from Each Fire Station

The following figure (FIGURE #4) shows the call plotting and the four-minute travel time from each of the current stations.

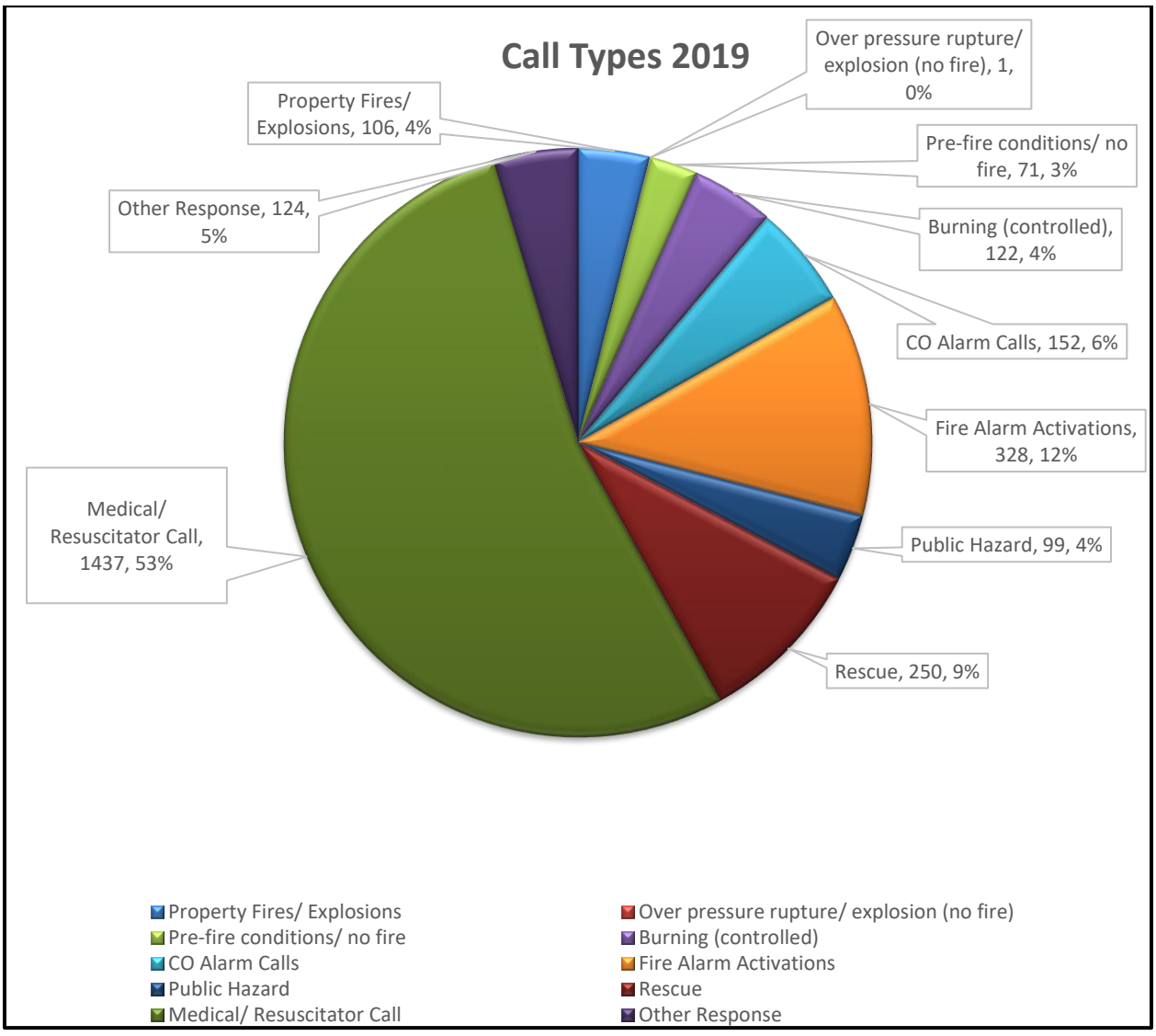


The following set of response charts (using the supplied data) help to identify the types of calls that are creating the bulk of response demands.

Note: The following chart may not reflect 100% of the yearly calls for service. This is due to the following:

- *To get a more accurate accounting of response times, some of the calls were removed from the data analysis due to identified anomalies in time stamping. For example, if an emergency response time duration took hours, it was removed based on the assumption of a data entry error.*
- *Only the emergency responses were measured, which is the recommended practice noted by the NFPA and the Commission of Fire Accreditation International*
    - *For example, a department may have noted a total of 2,000 calls for service for the year, however, only 1,700 of those calls were emergency responses.*

FIGURE #5: 2019 Call Types



As illustrated in the above chart, the top three types of calls that Sarnia Fire Rescue responds to are:

1. Medical/resuscitator, which account for 53% of the Department's overall responses.
2. Fire alarm activations, which account for 12% of the Department's overall responses.
3. Rescue, which account for 9% of the Department's overall responses.

The Fire Chief is currently monitoring call volumes and response capability, however, incorporating an overview of station location and its reliability to respond to calls within its response zone should also be reported to Council. This review would entail identifying how

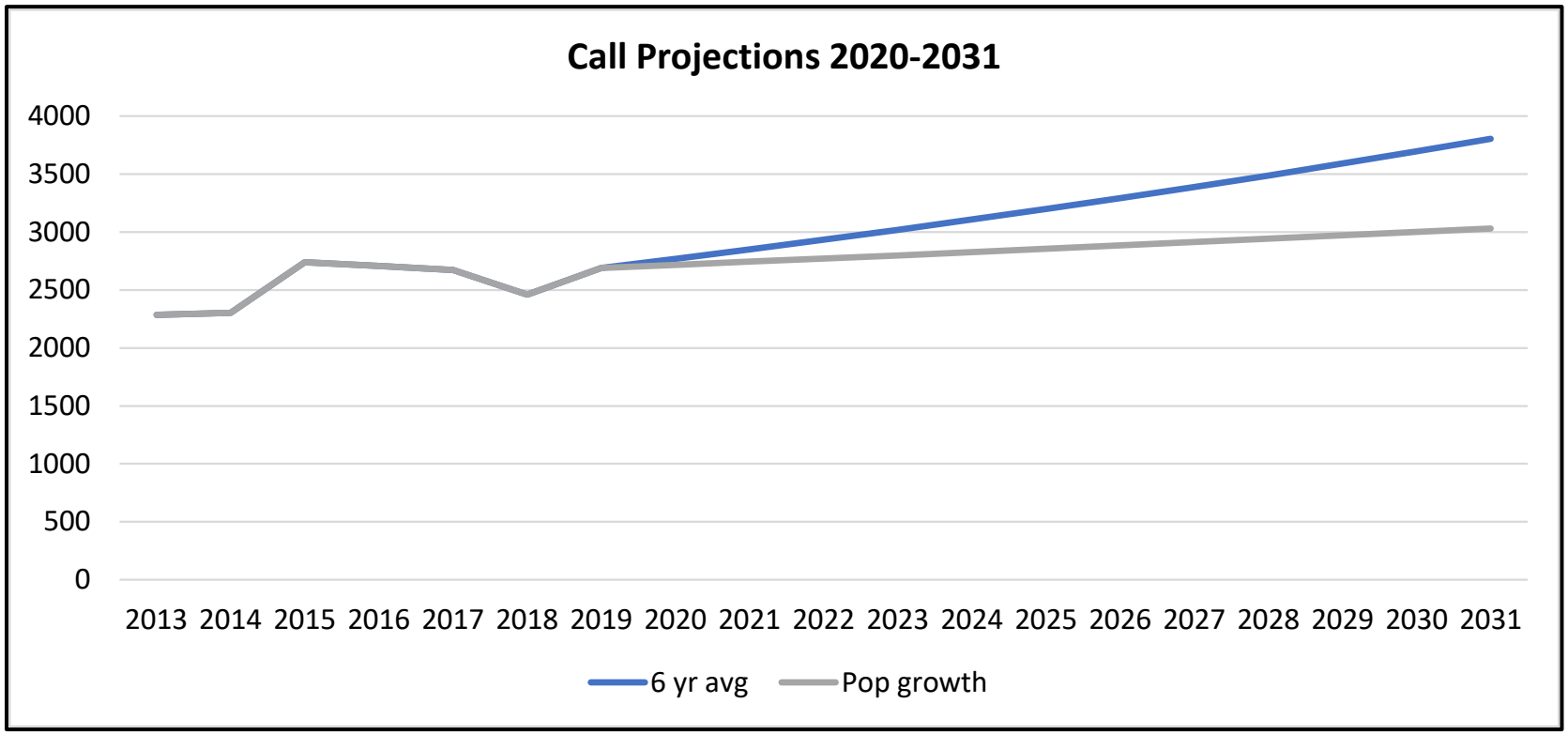
many times units from a particular fire station are available or not available (due to being tied up at other calls) for responses. This will confirm whether there is a high percentage of reliability (ability to respond to calls without a delay). It may also identify whether there is a need for more staff to be available for support or secondary calls.

3.3.1 Future Call Volume Expectations

Based on information obtained from the Planning Department, Sarnia's population is forecasted to grow by approximately 1% over the next 10 years. The fire department call volume has grown on average 2.93% per year since 2013. The chart below forecasts the call volumes to 2031 using both the population growth (estimated 3,000 calls by 2031) and the current call growth rate (estimated 3,800 calls by 2031).

There are many circumstances that could affect call volumes such as the demographics of the population, weather conditions, an increase/decrease in industry, fluctuation in population, or corporate decisions on types of responses (e.g. tiered response agreements for medical calls). Therefore, the call volumes should be monitored closely by the Fire Chief and staff, along with possible response time challenges.

FIGURE #6: Call Volume Projections



3.4 Community and Fire Department Comparators

The population in Sarnia has remained steady between the past census reports. The anticipated growth projections for the next 10 years have the City population at a continued lower growth rate than that of the rest of the Province of Ontario. Call volumes, however, are growing at a steady rate with an average of 2.93% per year (2013-2019). With the installation of more smoke/fire alarm systems in residences being connected with alarm companies (e.g. Bell and Rogers Home systems) and an aging demographic, these types of calls will continue to grow.

To assist with the planning process, a fire service needs to look at other comparable fire services within its own region to help identify similarities and possible shortcomings in its organizational structure, staffing, and equipment. In completing this type of review, it needs to be emphasized that no two communities are identical. Each community has its own unique challenges due to demographics, topography, and percentage of residential, commercial, and industrial areas, along with transportation and road network challenges.

A review of the following municipalities and their fire service was conducted: St. Catharines, Waterloo, Cambridge, Brantford, Guelph, and Niagara Falls.

These communities were chosen based on several factors including similar populations and fire department sizes, existence of colleges and universities in their municipalities, and, in some cases, the existence of a tourism industry. Another relevant reason was that these cities are used as comparators during negotiations.

A cross reference (comparators) chart is illustrated in TABLE #2. The chart offers an at-a-glance view of the data received from each fire department regarding the following topics:

- Population
- Transient population (i.e. students, tourism)
- Number of tourists visiting per year
- Population versus fire suppression staffing
- Career, composite, or volunteer
- Number of fire suppression staff
- Minimum staffing levels
- Minimum staffing on truck
- Number of fire stations
- Number of front-run vehicles
- Present shift system

- Response time criteria
- Response time goal (in place of response time criteria)
- General breakdown of call distribution
- Main tax assessment base
- Geographical overview of community
- Response time, department average – time of call to on location
- Response time, department average – travel time

TABLE #2: Community Comparators

Jurisdiction	Sarnia	St. Catharines	Waterloo	Cambridge	Brantford	Guelph	Niagara Falls
Population (2016 Census)	72,125	133,113	104,986	129,920	98,179	131,794	88,071
Transient population (i.e. students, tourism)	Day time working and College (est.) 110,000	19,000 students	60,000 students	No data	3,000 students	No data	12 million annual tourists
Number of tourists visiting per year	1,833,000 visitors to Sarnia-Lambton	125,000	No data	No data	46,000	33,350 students U of G. 120,000 tourists	12 million per year
Population to fire suppression ratio	1 FF per 627	1 FF per 978	1 FF per 1009	1 FF per 984	1 FF per 909	1 FF per 890	1 FT/ FF per 759 (supp. by 104 volunteers)
Career, composite, or volunteer	Career	Career	Career	Career	Career	Career	Composite
Staffing complement distribution	5 stations	6 FT stations	4 FT stations	5 FT stations	4 FT stations	6 FT stations	3 FT stations + 1 FT station under construction 3 Vol stations
Number of fire suppression personnel	115 FT FF (28-29 per platoon) 2 TSO	136 total 34 per platoon	104 total 26 per platoon	132 FF	108 total 27 per platoon	148 Career, (36 per platoon)	116

Jurisdiction	Sarnia	St. Catharines	Waterloo	Cambridge	Brantford	Guelph	Niagara Falls
						including dispatchers)	
Minimum staffing levels	23 per platoon	27 per platoon	21 per platoon	27 per platoon	19 per platoon	28 including 2 dispatchers	22
Minimum staffing on a truck	4 Engine/ Ladder 2 Heavy Rescue Platoon Chief has own vehicle and drives self	No data	4	4	4 per pump Min 2 on Aerial	4	4 / 3 on Aerial
Number of fire stations	5	6	4	6	4	6	6 + 1 in construction
Number of front run vehicles	3 Engines 2 Ladders 1 Heavy Rescue 1 Platoon Chief	7	5	7	4 Pumps 1 Aerial 1 Platoon Chief	7	8
Present shift system	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours
Do you have a response time criterion	No, NFPA 1710 is referenced only.	Yes, in the process of going to NFPA 1710 2017 – 6:20 initial apparatus 90% of time	Yes, 5-minute drive time	Use NFPA	NFPA 1710 4 and 8 min initial and full alarm assignment (not council approved)	No	No

Jurisdiction	Sarnia	St. Catharines	Waterloo	Cambridge	Brantford	Guelph	Niagara Falls
If no criterion, do you have a response time goal	No, will recommend criteria to Council following MFP process.	NFPA 1710	N/A	5 min travel time 90%	N/A	Yes	No
What is your main tax assessment base	Residential, commercial, Industrial	Residential, commercial	Residential, commercial, institutional	Residential/ industrial	Residential, commercial, industrial	Residential, commercial, industrial	Residential, commercial, tourism
Geographical overview of community	165 km^2 located on the lower Lake Huron and the headwaters of the St. Clair River, Hwy 402	96 km^2, Welland Canal, 12-mile creek, two major highways, and bridges	65 km^2, one major highway, inter-City spur rail line	113 km^2, Hwy 401, Grand River	72 km^2, Grand River, Hwy 403 and railway system	87 km^2, Speed River, Eramosa River, Hwy 7, railway, University of Guelph, and Conestoga College	209 km^2, 85% land-based and 15% water-based, border city, QEW, Hwy #420 and Hwy #405, railway
Number of stations per km^2	0.030	0.0625	0.0615	0.053	0.0392	0.0689	0.0330
Number of Suppression FFs per km^2	0.6969	1.4166	1.6000	1.1785	1.0588	1.6781	0.5471

3.4.1 General Findings of Comparisons Review

As expected, there are a variety of population versus staffing ratios between the communities surveyed. No definitive conclusion or recommendation can be drawn from this comparison. This data does, however, offer a snapshot of information which can be used to identify if Sarnia is in a similar situation relating to call volumes, population versus staffing, and composition of the service.

Sarnia Fire utilizes fire service agreements where required. The utilization of these fire service agreements can be attributed to several factors:

- Area of landmass – Sarnia is approximately 165 km^2 with a total of five fire stations in the City.
- Population equates to approximately 90 persons per km^2.
- Population per firefighter equates to approximately 1 firefighter per 627 people.
- The overall geographic makeup of Sarnia compared to the other fire departments is similar with a mix of residential, commercial, and industrial. Sarnia also has a college with a student population.
- Sarnia also has high-rise buildings within the community.
- The City is crisscrossed with railway and road networks.

Like the other fire departments surveyed, Sarnia Fire Rescue responds to thousands of calls per year out of its fire stations. These calls are a mix of fires, medicals, motor vehicle collisions, false alarms, and other miscellaneous calls for assistance.

Based on the review of the comparators, SFRS does have a better firefighter to population ratio (1 FF per 627 population) than most other communities. But it is the expanse and complexity of the City that has an influence on the staffing needs and specialization of the Department for the technical responses (hazmat and rescue).

Unlike communities such as the Region of Waterloo, where three career fire departments border each other (Waterloo, Kitchener and Cambridge) and can rely on each other for support, there is no other department within an hour drive that can accommodate this type of fire and specialized response to the City of Sarnia.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
5	SFRS staff a platform aerial apparatus as a front-line vehicle, a captain and crew of 3 firefighters will be available for all structure fires and support to other operational needs of the department determined by the Fire Chief. Current staffing on the Rescue unit would transfer to the Aerial Platform and requires the hiring of 2 new firefighters per platoon for a total of 8.	$800,000	Short-term (1-3 years)
6	Recommended that the SFRS promote the installation of residential sprinkler systems.	Staff time	Short-term (1-3 years)

SECTION 4 – Non-Suppression Staffing and Health & Wellness Programs

4.1 Staffing Considerations

4.2 Administration Division

4.3 Fire Prevention and Public Education

4.4 Training & Education Division

4.5 Mechanical & Maintenance

4.6 Communications/Dispatch Centre

4.7 Health & Wellness Programs

SECTION 4: Non-Suppression Staffing and Health & Wellness Programs

4.1 Staffing Considerations

Within the scope of work noted in the original Request for Proposal document, staffing needs were identified as a priority in which Emergency Management & Training Inc. was to review the capabilities of existing staffing and identify future needs for each of the following branches: Administration, Suppression, Training, Prevention, and Mechanical.

All the previously noted information should to be taken into consideration when assessing staffing levels within the SFRS. As a general guideline, when considering the overall staffing needs for the SFRS, 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 or management staff to effectively deal 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?

4.2 Administration Division

The Administration Office is located on the second floor of Station #1 at 240 East Street. The senior officers including the Fire Chief, Deputy Fire Chief, and the Administrative support staff (consisting of two Administrative Assistants) are all located at this site. Current staffing levels have made it a challenge to meet the needs of the Department, and as such it is EMT's opinion that growth in this division is required. There are only 2 non-union staff in a department of more than 125 staff.

Under the current administrative leadership staffing model, the Deputy Fire Chief position is responsible for all divisions across the entire Department. The oversight and leadership provided to all divisions by the Deputy Fire Chief has put unnecessary strain on the single position and has required the Fire Chief to become more involved in operational workings of the Department. Our review of other comparable departments has revealed that SFRS is not meeting the same level of senior management as that of other departments' leadership positions. It is recommended that the City begin the recruitment process for a second position of Deputy Fire Chief to be completed within the next year. This position would provide for increased oversight, quality assurance, and performance management.

The Chief and Deputy are frequently responding to issues, such as COVID-19, as opposed to being pro-active. For example, pre COVID-19 there was not a pandemic plan, no emergency inventory, no respiratory protection plan, and many of the SOGs were out of date. With COVID-19, the Chief and

Deputy have put these in place, but there is the need for adequate management staffing to keep them monitored, reviewed, and revised. Having a second Deputy Chief would be able to fill the emergency management role much more effectively.

The CFAI 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 with adequate staff but efficient and effective office systems make it a challenge 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.

Based on the review conducted by EMT it would appear that the present Administration Division has a significant challenge with its FDM system and IT Support to meet the needs of the Department. It is recommended that the City allocate a dedicated IT Support person that can assist with the implementation of new and current software needs.

4.3 Fire Prevention and Public Education

As noted earlier in this document, fire prevention and public education are seen as the first line of defence by the OFMEM in ensuring community fire safety. The NFPA 1035 standard, section 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." Subsequently, the more resources assigned to this endeavour, the more proactive a community and its fire department are regarding public safety.

NFPA 1201 - Standard for Providing Fire and Emergency Services to the Public notes the following in relation to community risk:

- **Section 4.3.1:** The Fire and Emergency Service Organization (FESO) shall carry out a program to develop public awareness and cooperation in management of risk, based on analysis of relevant loss records and potential hazards in the identifiable physical and social sectors of the community.

During interviews, it was confirmed that the Fire Prevention Division (FPD) consists of five Fire Prevention Officers and one person assigned specifically to fire and life safety education (FLSE). The Division does not have a Chief Fire Prevention Officer (CFPO) who can deal with the day to day

supervision and support of the unit; all personnel report directly to the Fire Chief. The previous master plan had recommended that the CFPO position be implemented within the Department, but this has not happened.

The staffing requirements for the Fire Prevention Division need to be based on the needs and the circumstances within the community. There are two recognized authorities, FUS and the Insurers Advisory Organization (IAO) Inc., that provide guidance on determining the level of staffing for a Fire Prevention Division. The NFPA does not set a standard for fire prevention staffing to population.

Based on recommendations by the FUS group, the fire prevention officer (Inspector) per population ratio should be approximately one Fire Prevention Officer (Inspector) per 15,000 population, at minimum. With a population of approximately 74,000 and a total complement of five personnel, the FPD is sufficiently staffed for inspection purposes.

4.3.1 Determination of Current Staffing Requirements

To ensure that the FPD has adequate staffing to meet the fire safety and education demands of the community, NFPA 1730 outlines a five-step process within the NFPA standard's Appendix "C" to review staffing workloads and needs.

This sample staffing exercise is not part of the requirements of the standard but forms a guide for informational purposes and when used in conjunction with the FUS or IAO recommendations for staffing it will clearly articulate if the needs of the community are being adequately addressed. It is important to restate that it is Council that sets the level of service within the community. This level of service must be based off the local needs and circumstances.

> ***Note:*** *Appendix C of the NFPA standard is not a part of the actual requirements of the NFPA standard but is included for informational purposes and can also be found in Appendix "A" of this FMP.*

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

Step 1: Scope of service, duties, and desired outputs
Step 2: Time Demand
Step 3: Required Personnel Hours
Step 4: Personnel Availability and Adjustment Factor
Step 5: Calculate Total Personnel Required

More information on this staffing equation can be found within the NFPA 1730 standard. The FPD should assess the previous five steps and evaluate their present level of activity and the future goals of the divisions.

It appears that the Fire Prevention staff are managing to conduct all mandated inspections; however, to assist in meeting future goals and needs, the FPD should more closely track the actual time spent on each of the Fire Prevention Inspector activities (ranging from site plan reviews, routine inspections, licensing, complaints, and requests, to name a few). By identifying the time spent on each project and collating this into baseline (approximate) times, the FPD can use those hours spent as a figure in applying future initiatives.

In addition to the NFPA Standards, the CFAI outlines the following criteria 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 to determine the need for specific public education programs**.**

To assist with meeting the fire prevention inspection goals and objectives, there is an interim opportunity for greater utilization of the fire suppression staff for fire prevention and public education. During weekdays from 9:00 am to 7:00 pm, fire suppression staff could be better utilized to conduct general residential fire safety inspection/education programs. To accomplish this in a manner that ensures knowledgeable inspections, it is recommended that all Captains and those providing primary fire prevention activities be qualified as NFPA 1031 Fire Inspector 1 and NFPA 1035 Fire and Life Safety Educator Level 1. This brings more resources to the table and enhances the level of fire safety awareness by those trained staff.

This certification is not meant to take the suppression officers away from their key responsibilities of emergency response and crew supervision. It is designed to enhance fire prevention inspection opportunities and give the officers more knowledge and ability to identify any possible fire prevention concerns and/or infractions. Utilizing Fire Suppression Captains is a supplemental/support opportunity to promote more fire prevention activities.

<u>Current Condition</u>

During the interviews, it was communicated that the Fire Prevention Division had set up a plan in 2019 to identify what can be accomplished. This is a very positive endeavour by the Division. Workflows should be created and managed by the CFPO to identify what can be accomplished

within the workweek and what goals and objectives relating to fire prevention are not being addressed.

It was also noted that the Prevention Officers are pressed for workspace in the present facility (Headquarters). One option is to have one or more staff stationed at a current or future fire station. This would accomplish two things; it would free up office space in the present location and it would also give the Fire Prevention Officers and Suppression staff more day to day interaction to discuss any fire prevention concerns. A challenge is that it separates the fire prevention officers from each other when many tasks are shared. This should be considered by the Chief and Chief Fire Prevention Officer as part of the overall service delivery plan.

4.3.2 FUS Suggested Inspection Frequency Chart

The following chart is being provided to assist the FPD with a guideline reference for the recommended inspection frequency noted by the Fire Underwriters group. Through the utilization of the FUS chart as a benchmark, the Prevention Division can develop a plan on what can be accomplished with its present staffing complement, along with presenting options for increasing inspection frequencies (through utilization of fire officers), and the determination of what is required to meet the FUS benchmarks.

TABLE #3: FUS 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

It is acknowledged that the FUS suggested frequency chart can be difficult to address for most fire departments, 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.

4.4 Training and Education Division

A fire service is only capable of providing effective levels of protection to its community if it is properly trained and equipped to deliver these services. Firefighters must be prepared to apply a diverse and demanding set of skills to meet the needs of a modern fire service. Whether assigned to Administration, Fire Prevention, or Fire Suppression, firefighters must have the knowledge and skills necessary to provide reliable fire protection.

The Training Division is comprised of two Safety/Training Officers that are dedicated to delivering high-quality learning to all SFRS staff. The Training Division provides new recruits with the basic skills necessary to extinguish fires, perform rescues, provide medical assistance, protect the environment, offer public education, and ensure public safety. New recruits spend two weeks under the guidance of the Training Division, prior to being assigned to a platoon in the Suppression Division. Once a new recruit is assigned to Suppression, the Training Division is responsible for providing the necessary resources required to become proficient not only in firefighting, but also Medical Responses including, but not limited to, first aid, CPR, and defibrillation (AED). The internal firefighter surveys suggest that the two-week training time may not be adequate for the knowledge, skills, and abilities for the number of competencies that are required.

It is recommended that the recruit program content and duration be reviewed and amended as required.

Fire Rescue Service instructors facilitate the learning of Hazardous Material Response, High and Low Angle Rope Rescue, Ice/Water Rescue, and Auto Extrication.

A great deal of administrative duties have been delegated to the Safety/Training Officer position which has strained the ability to perform regular training to front-line staff. The implementation of a supervisory position for this division would help to reduce this administrative workload and allow the Safety/Training Officers more time to focus on actual training. Therefore, it is recommended that the position of a Chief Training Officer be hired in the next 4-6 years.

SFRS currently has no Medical Director for medical oversight with AED and Narcan. This is a very important position to have to ensure proper oversight of the program. As such, it is recommended that SFRS investigate medical oversight and develop, implement, and maintain a medical oversight program consistent with similar municipality fire services in the short-term.

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.

During EMT's review of the training and education programs, it was evident that Sarnia Fire Rescue staff are endeavouring to ensure that all required training programs are being addressed to the best of the Department's ability. The Department utilizes the training facility at Lambton College 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. A City-owned facility to accomplish other training initiatives that is indoors, and temperature controlled allowing the ability to train firefighters in all seasons without restrictions should be investigated as a long-term investment. The Department provides fire protection support to the petrochemical industry but SFRS does not receive any specialized training specific to this type of firefighting. Training division staff working with partners from the chemical industry need to develop, implement, and maintain a program that covers both theory-based and practical industrial firefighter training opportunities for all staff.

NFPA 1201 – Providing Fire and Emergency Services to the Public notes, in relation to training and professional development, that:

- 4.11.1 *The Fire Department Organization shall have training and education programs and policies to ensure that personnel are trained, and that competency is maintained in order to effectively, efficiently, and safely execute all responsibilities.*

The Deputy Chief and Safety/Training Officer are aware of the program needs and facility requirements and have indicated that the Safety/Training Officer is tracking much of this. However, to verify in a more formal manner that each training program is meeting the related NFPA program recommendations, the recommended position of Chief Training Officer should formally:

- Identify what training programs are required for the services that Sarnia Fire Rescue is providing.
    - Each area needs to be evaluated regarding the present (and future) services to be provided by the Fire Service, such as suppression, EMS, hazardous materials response, etc.
- Identify the number of hours that are required to meet each of those training needs based on Provincial and/or industry standards.
    - What are the recommended training hours required and what refresher programs need to be conducted, and when?
- Identify the resources required to accomplish this training.
    - Does the training program require a full training tower for live fire and rescue scenarios, or can this be accomplished in other ways?

- Continue to strengthen joint partnerships with bordering fire departments and private organizations to achieve the training requirements identified.
    - What joint training can be accomplished to promote cost efficiencies?
- Present an annual program outline at the start of each year to the Fire Chief, with measured goals and expectations reporting on the completion success rate at the end of each year.
    - Management of and to ensure fiscal responsibility to the training budget allotment.

The training program should include a training plan for all firefighters such as:

- NFPA 1001 – Firefighter levels one and two within the first year
- NFPA 1002 – Driver operator qualifications within the second or third year
- NFPA 1006 – Technical rescue & Water & Ice at the awareness, operations & technician levels
- NFPA 1021 – Fire Officer level one and two training for all suppression officers
- NFPA 1072 – Hazardous Materials response at the awareness, operations & technician levels
- NFPA 1041 – Fire Instructor level one and two for those delivering drilling and instructing courses within the department

4.4.1 Commission on Fire Accreditation International

The CFAI 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.*

Through consultation meetings, it was concluded that the Training Division is on the right track with its program development and training goals. Implementing a more formal evaluation of the training needs will assist in optimizing goal outcomes.

4.5 Mechanical/Maintenance

The City Maintenance Division consists of two personnel who perform the servicing and maintenance tasks on all fire service mobile, portable, and some stationary equipment. The apparatus and vehicles consist of frontline engines, ladders, rescue, aerial platform, tanker, administrative vehicles, service trucks, and back-up units. The stationary equipment includes stand-by generators and portable equipment such as smaller pumps, chainsaws, Jaws of Life, lawn mowers, snow blowers, outboard motors, and boats.

SFRS Respiratory Protection Program is overseen by a dedicated and certified firefighter who ensures the maintenance of breathing air cascade system, air quality sampling, fill stations, face fit testing, SCBA flow testing, hydrostatic testing and air exchanges as per CSA Standards.
CSA Standard Z94.4 Selection, use and care of respirators
CSA Standard Z180.1 Compressed breathing air and systems

The Mechanical work is completed out of the City Maintenance Facility on Devine Street. It has its own work bays, office, and parts storage to meet the needs of the City. The Fire Department currently shares an EVT Mechanic with the Public Works Department and a second Public Works Mechanic is currently working on getting the EVT specialty training and certification. Not only will these two personnel be familiar with each piece of equipment, they are also available for large-scale emergencies that may require refueling and on-site maintenance of the vehicles and equipment. The present staffing and utilization of the Mechanical EVT staff is proving to be an effective and efficient use of city staff and facilities. Having the EVT as a staff member of the fire department would ensure priority of fire department apparatus as well as reduce the risk of current or future EVTs leaving for another fire service.

There is a high demand for mechanics who have their EVT certification, and they are frequently offered a premium pay as part of the fire department staff, greater than that received by mechanics working directly for municipal works garages. It is therefore recommended that the full time EVT become a fire department staff member and compensated as EVTs in other fire services.

4.6 Communications/Dispatch Centre

The Communications Office is operated by Sarnia Police Service and is located at the Sarnia Police Headquarters facility. This is a good use of resources for the City and may prove to be advantageous when emergency services are required to switch over to the Next-Generation 9-1-1 system. The secondary communications centre is located at the Central Ambulance Communications Centre. Both facilities are in good condition and are equipped with emergency backup power.

When assessing the status and reliability of the Communications Centre, the following NFPA recommended standards need to be considered.

NFPA 1221 (Standard for Providing Fire and Emergency Services to the Public) notes the following in relation to Emergency Response Facilities (ERF):

- **6.1 General**. A primary and a secondary means of dispatch notification shall be provided at the ERF and comply with 6.1.1 and 6.1.2.
- **6.1.1** The primary means of dispatch notification at the ERF shall be compatible with the primary means of dispatch notification that is provided at the communications center.
- **6.1.2** The secondary means of dispatch notification at the ERF shall be compatible with the secondary means of dispatch notification that is provided at the communications center.

Further, under **Section 7.3.1** There shall be a minimum of two telecommunicators on duty and present in the communications centre at all times.

NFPA 1061 (Standard for Public Safety Telecommunications) set out training standards and competencies for fire dispatchers.

Overall, the primary and backup Communications rooms are well set up for the number of staff that work in this area. However, being that this is a police communications centre, the dispatchers are not necessarily expected to meet or be trained to the associated NFPA standards, nor is a dispatcher solely dedicated to the fire service, which means they are often double tasking during a major event. Further, the firefighters have identified that there are a number of areas in the city with poor radio coverage.

The Fire Chief should work with the police service to closely monitor and address the SFRS dispatching and radio coverage needs.

4.6.1 Next Generation Communications (NG9-1-1)

In June of 2017 the Canadian Radio-television and Telecommunications Commission (CRTC) created regulations regarding the Next-Generation Communications for 9-1-1 centres.

Goals and Outcomes of NG 9-1-1 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 next-generation 9-1-1 (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.*

Next Generation 9-1-1 - Considerations:

- July 2024 is a key date to work with. Therefore, the Fire Chief must ensure that SFRS in joint cooperation with Sarnia Police, ensure their future communications and equipment needs will be met. For example, will video that callers stream to the communications centre be forwarded to the responding apparatus?
- Sarnia Police Service will need to work with all related stakeholders, including SFRS as a client, to ensure that the community and its fire service is able to meet the CRTC timelines for implementation of the next generation telephone and communications systems.
- At this time no costs are estimated for this endeavour as much of the logistics are still being worked out by the upper level stakeholders (PSAPs, central dispatch centres and regional steering groups). Communication system upgrades will, however, have a financial impact on every community which may be downloaded to clients such as SFRS.

4.7 Health & Wellness Program

Health and wellness of staff is a key focus for all municipalities and Sarnia is no exception. During the review by EMT, it was noted that all of the stations have been equipped with workout facilities to ensure that staff have the ability to keep fit, which helps to reduce work related injuries.

Along with this fitness equipment, each station is equipped with diesel exhaust systems to reduce exposure to vehicle exhaust. Diesel exhaust has been contributed to health-related issues when people are exposed to it over a long duration. By having these systems in each station, the health concern is greatly reduced.

Over the years the quality of the firefighters' gear has improved and continues to meet all recommended standards, along with being tested on a regular basis. This ensures that SFRS staff are properly equipped and protected from the vast majority of environments and related exposures that they may come in contact with during the execution of their duties. In efforts to reduce potential presumptive cancer claims and cardiac events, the Department should work towards addressing procedures in firefighter rehabilitation and firefighter decontamination specific to the NFPA 1500 Standards.

From a mental health perspective, the Department has provided training for a Critical Incident Stress Management (CISM) Team. This staff assists in defusing and debriefing support after an incident has occurred. SFRS is working with Canadian Mental Health and the vetting of a chaplain is underway to swiftly assist any of the members who may be dealing with personal and/or emotional challenges. This program helps to identify and address issues before they become critical in nature. If there is a need to move a situation to a higher level, the Department has an Employee Assistance Plan in place with a local health services group that offers confidential counselling to the members of SFRS.

All of the previously noted initiatives have helped to promote a more supportive environment for all of the staff at Sarnia Fire Rescue. As such, the City's management, senior fire management and the Sarnia Professional Firefighters Association are to be commended for their ongoing efforts in relation to ensuring the health and safety of the SFRS staff.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
7	Add a second position of Deputy Fire Chief in the very near future.	$130,000-150,000	Short-term (1-2 years)
8	Hire a Chief Fire Prevention Officer to oversee the Fire Prevention Division	$135,000	Short-term (1-3 years)
9	It is recommended that all Captains and those providing primary fire prevention activities be qualified as NFPA 1031 Fire Inspector 1 and NFPA 1035 Fire and Life Safety Educator Level 1.	Staff time	Short-term (1-3 years)
10	It is recommended that the City allocate a dedicated IT Support person that can assist with the implementation of new and current software needs.	Staff time	Short-term (1-3 years)
11	Hire a Chief Training Officer to coordinated training programs, reduce administrative workload and allow the Safety/Training Officers focus on actual training.	$135,000	Mid-term (4-6 years) and ongoing
12	It is recommended that the recruit program content and duration be reviewed and amended as required.	Costs will be based on how much additional training time is added.	Short-term (1-3 years)
13	That SFRS investigate medical oversight and develop, implement, and maintain a program consistent with similar municipalities fire services.	$25,000	Short-term (1-3 years) and ongoing
14	A City-owned facility to accomplish other training initiatives that is indoors, and temperature controlled allowing the ability to train firefighters in all seasons without restrictions should be investigated as a long-term investment.	Refer to Station Location Review	Long-term (7-10 years)
15	Training division staff work with partners from the petrochemical industry to develop, implement and maintain a program that covers both theory and practical industrial firefighting training.	Staff time	Short-term (1-3 years)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
16	To verify the training programs are meeting related NFPA (and other) training program standards, the Deputy Fire Chief identify: • What training programs are required for the services that SFRS is providing? • The number of hours that are required to meet each of those training needs based on Provincial and industry standards. • Resources required to accomplish this training. • Joint partnerships with private organizations that can be entered to achieve the training requirements. • An annual program outline at the start of each year presented to the Fire Chief, with measured goals and expectations reporting completion success rate at the end of each year.	The costs are mostly related to staff hours unless outside facilities or trainers need to be accounted for	Short-term (1-3 years)
17	The EVT should become a staff member of SFRS, dedicated to fire service vehicle and equipment. Amongst other responsibilities this position should develop, implement, and maintain a small fleet/apparatus and master equipment life-cycle planning process.	Salary increase may be $15,000	Mid-term (4-6 years)
18	It is recommended that the Fire Chief continue to reinforce the need for fire related dispatchers to meet the goals and expectations of the related NFPA standard (1221 and 1061).	Staff time, APCO courses, and certification costs	Short-term (1-3 years)
19	In effort to reduce potential presumptive cancer claims and cardiac events the department should work towards addressing procedures in firefighter rehabilitation and decontamination specific to the NFPA 1500 Standards.	Staff time	Short-term (1-3 years)

SECTION 5 – Risk Assessment and Emergency Management

5.1 Risk Assessment

5.2 Community Risk Assessment Profile

5.3 Risk Summary

5.4 Emergency Management Program

SECTION 5: Risk Assessment and Emergency Management

5.1 Risk Assessment

The most effective ways to reduce injuries, death, and property damage due to fire are through public education, inspections, and enforcement. The Fire Prevention Program addresses these key components of fire safety which starts with conducting a community risk assessment (CRA).

5.2 Community Risk Assessment Profile

Risk assessment is the process utilized to identify the level of fire protection required within the boundary of the City of Sarnia. 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 their municipality. The Fire Chief is responsible in informing Council of all risks existing within the City of Sarnia. It is based on this information that Council will be able to make an informed decision on the level of service to be achieved.

The *Fire Protection and Prevention Act*, 1997, S.O. 1997, c.4, outlines the responsibilities of a municipality, 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.

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

2. (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 of Sarnia has established a Fire Department as outlined in Section 2.2(b) of the *Fire Protection and Prevention Act*, 1997, S.O. 1997, c. 4. The level of service that therefore must be provided is further outlined in Section 2.1(b) of the *Act*. The needs analysis, once conducted, will assist in determining the level of service to be established for the municipality.

The Province of Ontario Regulation 378/18 Community Risk Assessment (CRA) states, "a community risk assessment is a process of identifying, analyzing, evaluating and prioritizing risk to public safety to inform decisions about the provision of fire protection." Effective July 1st, 2019, the regulation states that every municipality shall complete a CRA by 2024 with renewal to occur every five years, thereafter. 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 the City of Sarnia Fire Rescue Service to determine the risks within its community and plan 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 business plan based on the overall risk assessment of the municipality.

It is the accumulation and analyzation of these factors that 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:

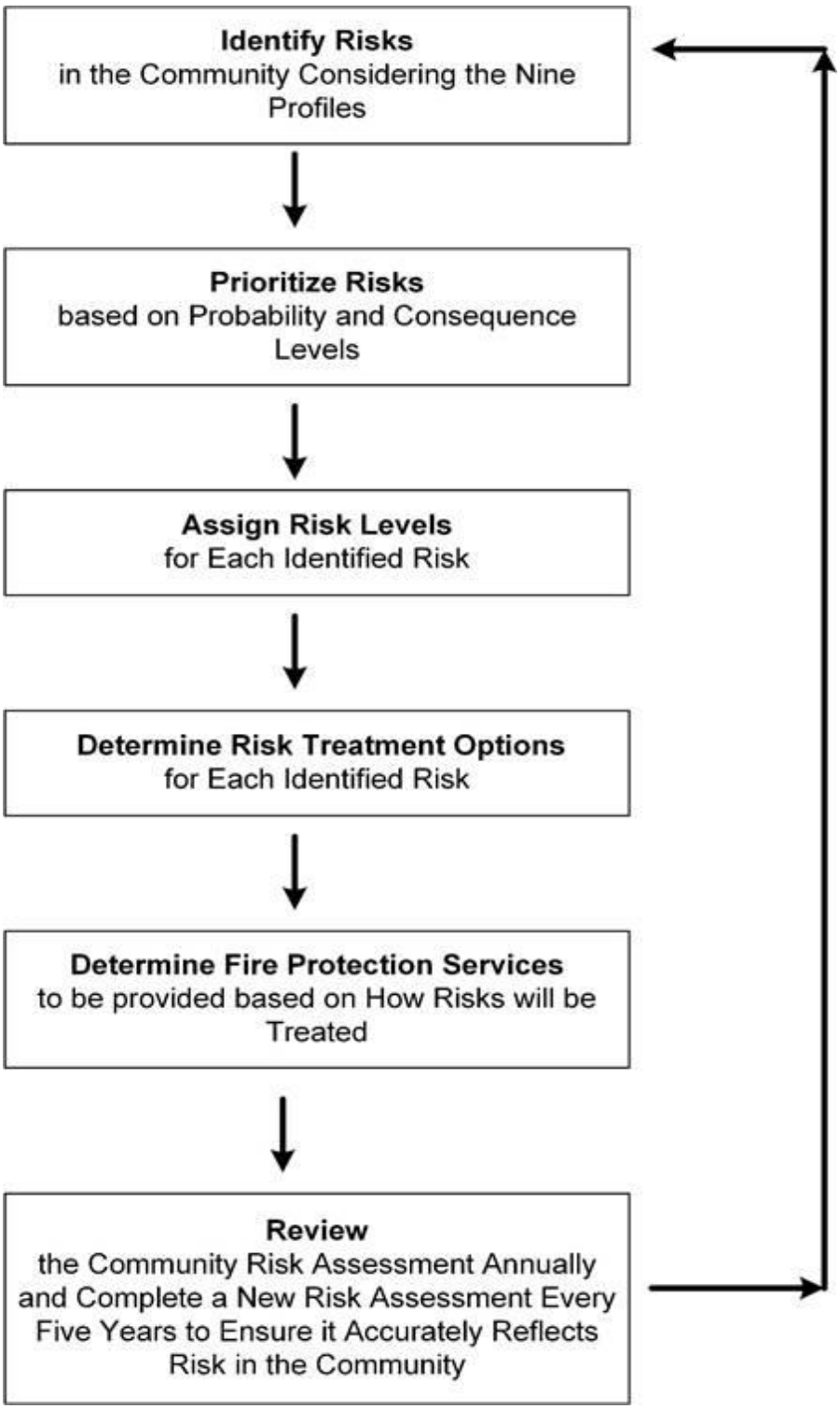
- What could happen?
- When could it happen?
- Where could it happen?
- Who could it happen to?
- Why could it happen?
- How likely could it happen?
- How bad would it be if it happened?
- What can be done to mitigate or prevent any or all the above?

Once these questions are answered, they will frame the basis for formulating and prioritizing risk management decisions to reduce the likelihood of these incidents from occurring and to mitigate the impact of these incidents when they occur.
Once gathered, this information will assist in the completion of the CRA, which may identify gaps and areas where actual conditions vary from the desired outcomes. Data to be review 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 and other landforms, 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, historic buildings.
- *Public Safety Response Profile* – means of resource distribution within the community, 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.
- *Hazard Profile* – human, technological, or natural hazards.
- *Economic Profile* – infrastructure, local employers and industries, institutions, community's tax base, 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, defines 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.

TABLE #4: 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 is 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
- 5 to 15 years since last incident

Possible – Level 3

- Might occur under current circumstances
- 1 incident in the past 5 years

Likely – Level 4

- Will probably occur at some time under current circumstances
- Multiple or recurring incidents in the past 5 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 in establishing 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/symbolic landmarks and critical infrastructure.
3. Economic Impact – monetary loses associated with income, business closures, downturn in tourism, tax assessment value, loss of employment.

4. Environmental Impact – harm to humans, vegetation, and animals; the decline in quality of life due to air/water/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 or 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 loss of business or could pose a threat to the environment.
- Level 4 – Major – large dollar loss with significant property loss, large threat to local commerce and tourism, impacts the environment that would result in short term evacuations.
- 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.

TABLE #5 is an excerpt of the CRA findings and suggested means of handling certain types of incidents. This table does not illustrate all the risks identified but those of life safety and high property loss. The CRA in its entirety is within a separate document.

The different levels of treatment risks 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 or outside the agency*

5.3 Risk Summary

The following summary outlines the top risks to life safety and property along with the suggested means of reducing or the mitigation of the noted risks. It is the Preferred Treatment

Options in which Council and the Fire Chief will identify as areas that need to be addressed through public education, Fire Code enforcement, or within the level of fire service provision. It is these decisions that will form the basis of the City of Sarnia Community Risk Reduction Plan.

As with any plan, a thorough review coupled with sound strategic planning will reap successes in the form of fewer fires, reduced fire related injuries, lower dollar property loss through ongoing fire prevention initiatives, early warning detection systems and proactive inspections and public education.

TABLE #5: Community Risk Assessment Summation

Top Risk or Issues/Concerns	Preferred Treatment Option(s)
Bodies of water	**Lake Huron and the St. Clair River border the City on two sides. There are also some wetlands.** • 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 Sarnia Police Service (SPS), Ontario Provincial Police (OPP) and Lambton Emergency Medical Service (LEMS). • Fire service, develop response protocols, Standard Operating Guidelines and enhance level of service provision. • Promote seasonal safety measures for both in or on the water through submissions to local media and social media outlets. • Promote safety equipment that should accompany those that venture onto the ice, such as whistles, ice picks, wearing of flotation suits, air horns, throw ropes, etc. • Monitoring the number of tour boats on the water ways, increases the risk of maritime accident with mass casualties • Monitoring large vessels coming into the harbour and traveling the river and great lakes • Assessing the capacity to fight shipboard fires
Technical Rescues – Trench/Confined Space	**SFRS presently performs technical rescues such as ice/water (both shore based and marine vessels), confined space, auto extrication,**

Top Risk or Issues/Concerns	Preferred Treatment Option(s)
	low and high angle rescues, heavy machinery extrication. SFRS does not perform trench rescues. • Enter into agreement for the provision of these services with outside agencies or fire services.
Structure Fires	• Increased public education focusing on preventive maintenance of electrical/mechanical equipment. • Promote the dangers of unattended candles. • Where fires are linked to smoking as the cause, enhance PE programs to bring to the public's attention the dangers of careless smoking; use statistics on the number of fires caused by smoker's articles. • Provide information on need to have working smoke alarms and carbon monoxide detectors in the home. • Develop and practice home escape plans through discussions with children during school visits. • For new home builds or major renovations, promote residential sprinkler systems. • Provide training on the use of fire extinguishers. • 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/mechanical equipment and continued good housekeeping practices. • Initiate a home inspection program focussing 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. • Monitor undetermined and arson fires to see if there is a trend.

Top Risk or Issues/Concerns	Preferred Treatment Option(s)
	• Work with SPS and OFMEM to come to a fire cause conclusion and address as required. • If ongoing young fire starters in community, work with youth groups to help deter them from occurring. • Start a junior firefighter's program to work with troubled youth • Develop programs so those that must complete community service may do so by assisting the fire department at community functions/ public education/ fire prevention engagements. • Continue to educate school children on the importance of having a home escape plan (could include a video contest of families practicing theirs). • Educate children on dangers of playing with smokers' articles and what to do if their clothing catches fire. • Monitor fire causes closely as a number are either reported as arson or undetermined. Initiate more in-depth fire cause investigations.
Property Loss	**From 2017 to 2018 there has been an increase of $1 to 1.5 million in fire related property loss from structure fires.** • SFRS should assign resources to complete thorough fire investigations to try to reduce the number of "unknown cause" fires. • Monitor high dollar loss fires to see if trends are developing.
Illegal Second Suites/ Apartments	**With many college students living in the city, there could be unidentified illegal secondary suites and apartments** • May lack basic fire safety measures • Some residences may not meet Ontario Fire Code requirements • Operating in areas that are not zoned for that purpose • Property owners that are either unaware of or indifferent to fire safety requirements and their responsibilities • Language barriers are possible • SFRS conduct a blitz looking for such locations

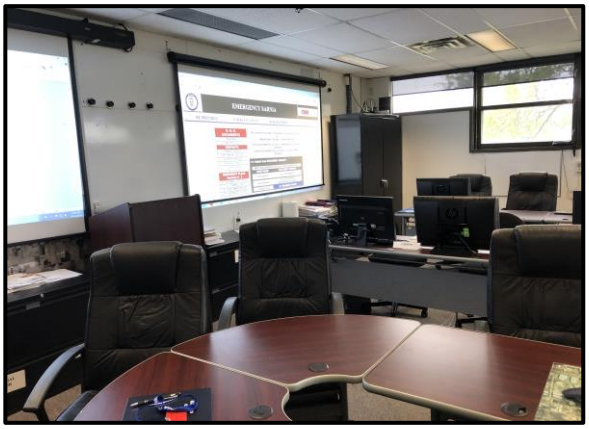
Top Risk or Issues/Concerns	Preferred Treatment Option(s)
	• Conduct a public education awareness program through media outlets publicizing the risks • Initiate a method for the public to anonymously report suspected locations with illegal suites/apartments

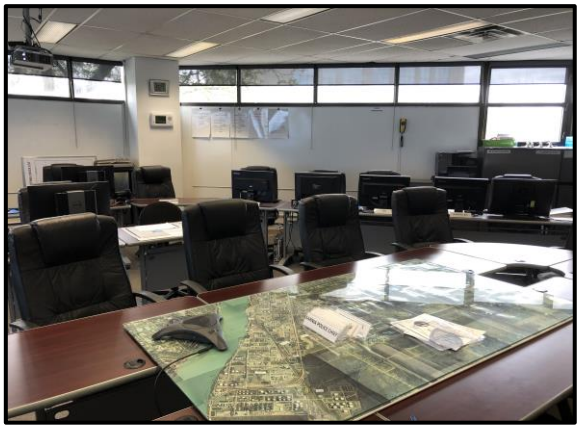
More information relating to a CRA has been supplied to SFRS in the form of a full CRA stand-alone document. This CRA was supplied in this stand-alone format so that SFRS can submit the completed form to the OFMEM. This will ensure that SFRS is meeting the new Ontario Regulation.

5.4 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 Community Emergency Management Coordinator (CEMC).

The Community Emergency Management Coordinator (CEMC) is a City employee supported by the Fire Chief and Chief of Police who are both Alternate CEMCs. The main Emergency Operations Centre (EOC) for Sarnia is located at Sarnia Police Service Headquarters at 555 Christina St. North. As can be seen in the following photos, this is a dedicated EOC and is a very functional space that can be organized, as needed, by the EOC group.





It would appear that the EOC, its configuration, and operations are in good shape. The Alternate EOC is located at the east end of the City in the Research Park which is a good idea to ensure that both facilities are geographically separated. Both facilities appear to be meeting the

minimum needs of the City, however, space allocation within the rooms is very tight. In any discussion on building a new headquarters, it would be appropriate to consider including an expanded EOC.

5.4.1 Emergency Management Plan

In 2018, the City of Sarnia updated By-law 150-2004 Emergency Plan to ensure that the City is meeting the goals and expectations of the EMCPA. In the new By-law, it is noted that the intent of the Emergency Plan is to ensure:

a) The earliest possible response to an emergency with services required, and the establishment of overall control of emergency operations.

b) Earliest possible population control to minimize crowd assembly.

c) To maintain order at the site so emergency operations are not impeded, and casualties are avoided.

d) Immediate action to defuse sources of potential danger in the area of the incident.

e) Prompt evacuation of any building considered being in a hazardous situation.

f) Controlled evacuation and balanced distribution of casualties to hospitals.

g) Total or partial evacuation of the area.

h) Immediate rescue of persons affected by the incident and protection for the emergency service personnel involved.

i) Essential social services as required for persons affected by the incident and emergency services personnel involved.

j) Authorization of expenditures.

k) Factual official information at the earliest time to: all Officials involved in the emergency operations.

l) To provide officials with a level of familiarity essential to a methodical and coordinated response.

These goals and expectations of the Plan should be utilized as a guideline with annual review by the members of the Emergency Operations Team to ensure that the Plan is being implemented in a fashion that is meeting the goals identified.

The CEMC is currently working on updating the emergency plan for 2021 including the use of IMS, identifying key members for different types of emergencies, and the call out system.

Recommendation(s)

Rec #	Recommendation	Estimate Cost	Timeline
No recommendations in this section.			

SECTION 6 – Fire Station Locations and Condition Assessment

6.1 Fire Station Locations

6.2 Fire Station Condition Assessment

SECTION 6: Fire Station Locations and Condition Assessment

Prior to the construction of the FMP, EMT completed a Fire Station Location and Condition Assessment report. This assessment resulted in several recommendations to assist in the optimization of the Fire Service. For review of those findings, please refer to the *Fire Station Location and Condition Assessment, August 2020.*

SECTION 7 – Fire Department Vehicles, Equipment Maintenance, and PPE

7.1 Vehicles

7.2 Equipment and PPE

SECTION 7: Fire Department Vehicles, Equipment Maintenance, and PPE

7.1 Vehicles

When assessing a fire department's ability to respond and meet the needs of the community, the FUS utilizes the age of a fire truck as one of its guidelines. In the following chart, the highlighted areas define what Sarnia should be considering when it comes to forecasting its fire truck replacements.

7.1.1 Vehicle Replacement Recommendations

The FUS is reviewed by insurance companies. Where the fire department adheres to the recommended replacement timelines through an identified capital replacement schedule, the department will retain its fire rating relative to the individual topic of review.

(**Green** area reflects Sarnia vehicle expectations for the community)

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 conditionally, when apparatus condition is acceptable, and apparatus successfully passes required testing*
3. *Major cities are defined as an incorporated or unincorporated community that has:*
    a. *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.*

By establishing a regular vehicle replacement schedule, the City is demonstrating due diligence towards ensuring a dependable response fleet for the fire department and the community it serves. This in turn will keep the community's fire rating in good stance, which subsequently reflects on commercial and residential insurance rates.

Another 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. This standard includes guidance on retirement criteria for fire apparatus. This standard recommends that all front-run vehicles are replaced on a 15-year cycle.

A brief survey of other fire services found that some departments are replacing their front-run units as early as 12 years up to a maximum of 20 years. Vehicles that are kept longer than 20 years are "second-line" units that are put into service on a very sporadic basis.

There is no national standard that legally mandates the replacement of emergency vehicles. It must be kept in mind, however, that it is critical to replace apparatus before they become unreliable. Over the long-term, delaying replacement is inadvisable as it equates to increased operating and maintenance costs, as well as a decrease in vehicle reliability.

It was noticed during the EMT field visits that the second-line apparatus are not adequately equipped to be put into service when there are large scale events that require the need for additional staff and equipment. Keeping these vehicles properly equipped allows for an immediate response for major events or multiple concurrent calls when off duty staff are called in.

For the most part, the SFRS is well equipped with pumper trucks, aerial, rescues, and tankers. There also appears to be sufficient support vehicles and equipment to meet the general needs of the Department.

Concern was expressed by some firefighters that the current Marine 1 – Rescue boat is not designed for rough water making rescues very challenging and at times unsafe. As such, it is EMT's recommendation that a review of Marine 1 be undertaken including examining options that are capable of being deployed any time of the year.

A Personal Watercraft (PWC) is also utilized for any quick response needs during most months of the year. This PWC offers a quick response ability for the department, when needed.

Replacement schedules are identified in the capital forecast for the fire trucks and large cost items.

7.2 Equipment and PPE

Tracking the completion of annual testing should be an organizations' priority to ensure the functionality of equipment for the front lines. Tracking will allow the fire department to confirm that apparatus and equipment testing can be scheduled accordingly to minimize front-line unavailability of apparatus.

During EMT field visits it was learned that the department has taken steps to obtain a second set of bunker gear for each firefighter. This is a significant step for the health and wellness of the firefighters in Sarnia.

As noted in Section 4.5 Mechanical & Maintenance, the SFRS CSA Z94 Respiratory Protection Program is overseen by a dedicated and certified firefighter. The state of the SCBA is in fair condition but is nearing end of life. It is recommended that when considering procurement of

new SCBA there should be consideration into the interoperability with fire service partners when the selection process has commenced.

During the visits and interviews conducted by EMT, it was noted that a formal asset management program is not being fully utilized and as such Fire Administration should take immediate action to establish an 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 could include utilizing the capabilities of the City Works software being implemented in other city departments.

While some equipment is repaired by the current EVT mechanic, a majority of the stationary equipment such as stand-by generators, breathing air compressors, fill stations and portable equipment such as smaller pumps, chainsaws, Jaws of Life, lawn mowers, snow blowers, personal watercraft, and boats are primarily serviced by third party companies. The fire department should examine the potential of having this work completed by a second fully certified EVT mechanic.

Annual service testing for fire hose, fire apparatus pump testing, ground ladders and aerial apparatus testing is done internally by SFRS and is sent out for repair or disposal by a third-party company.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
20	The City should continue to maintain a vehicle replacement schedule that complies with the FUS recommendations from a first line to a reserve/second line unit.	No costs associated	Ongoing
21	Ensure second-line apparatus are equipped to respond to large scale events.	$40,000-$50,000	Immediate (0-1 year)
22	A review of Marine 1 be undertaken including examining options that are capable of being deployed any time of the year	All season craft $400,000-$500,000	Short-term (1-3 years)
23	Establish an integrated tracking and documentation repository of all testing and service records accessible by Fire Administration and Platoon Chiefs.	$25,000	Short-term (1-3 years)
24	It is recommended that when considering procurement of new SCBA there should be consideration into the interoperability with fire service partners.	Staff time	Short-term (1-3 years)
25	It is recommended that a Master Equipment Life-Cycle plan be established.	Staff time	Short-term (1-3 years)
26	The fire department should examine the potential of having mechanical work on small engines, marine vessels, and other miscellaneous equipment completed by a second certified EVT mechanic.	Savings expected (no estimate available)	Short-term (1-3 years)

SECTION 8 – Finance, Budgeting, and Capital Investment Plan

8.1 Operating and Capital Budgets

SECTION 8: Finance, Budgeting, and Capital Investment Plan

8.1 Operating and Capital Budgets

The Sarnia Fire Rescue Services 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.

SFRS's capital forecast fluctuates annually based on the equipment that has been identified for replacement.

During the review of the budget process for both for operating and capital, it was found that SFRS is well-configured to meet the general needs of the Department. This would also indicate an adequate level of support by Council and the City's senior management team in relation to assisting the Fire Department in meeting its service goals.

When reviewing this section, one of the key areas that EMT looks for are 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, and
- Station maintenance

Capital Budget Line Items:

- Vehicle replacement, and
- Equipment replacement (for large cost items that are not covered in the operating budget)

Operating Budget

A review of the operating budget for Sarnia Fire Rescue Services shows that all general expenses and related revenues are accounted for.

Capital Forecasts

There is a replacement plan for the fire trucks noted in the capital forecast. The Fire Chief identified that the goal of this plan is to mirror industry standards of 15- and 20-year replacement cycles, depending on the vehicle's function. As such, the City of Sarnia and its Fire Department should be commended for its efforts in endeavouring to adhere to this industry standard.

Along with the replacement schedule, FUS recommends that there should be at least one spare fire truck for every eight related units. For example:

- one pumper truck for every eight,
- one spare aerial truck for every eight,
- one spare tanker truck for every eight, etc.

This would mean that if there are eight or less of a certain type of vehicle, you should have a replacement unit in reserve, or access to one, if one of those units goes out of service.

Facility Maintenance and Life Cycle Planning should be outlined in a recurring plan reliably supported by the Capital Budget process.

Based on the review by EMT, it would appear that the Fire Chief and his staff are working hard to ensure that equipment is being replaced and/or upgraded on a regular cycle and also on an as needed basis. Some of the Department's fleet is at or near the recommended replacement age, but the Fire Chief is aware of this and is working with Council and City staff secure replacements as required.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
27	Facility Maintenance and Life Cycle Planning should be outlined in a recurring plan reliably supported by the Capital Budget process.	The costs are mostly related to Facility Maintenance staff hours	Short-term (1-3 years) and ongoing

SECTION 9 – Review of Previous Master Plan

9.1 Sarnia Fire Rescue Service Fire Master Plan (2007)

SECTION 9: Review of Previous Master Plans

9.1 Sarnia Fire Rescue Service Fire Master Plan (2007)

In 2007, a Fire Master Plan was completed for Sarnia Fire Rescue Services. The following excerpt is an overview of the recommendations made at that time.

Administration

1. Based on the management workload of the department and comparisons to similar sized communities it is recommended that a second position of Deputy Chief or Assistant Deputy be implemented.

   The position was filled following the 2007 Master Plan and then a decision was made to reduce to one Deputy Chief. This has reduced strategic capacity and organizational effectiveness and the position should be reinstated.

Status: Remains outstanding

2. In order to provide sufficient support to address the existing day-to-day functions of the department and the clerical support required for a growing department the part-time secretary position should be expanded to full-time. In addition, a full-time administrative assistant should be hired to assist staff in Fire Prevention and Public Education and Training.

Status: Remains outstanding

3. A comprehensive space needs assessment should be undertaken to determine the requirements and the ways to accommodate current and future staffing needs.

Status: Remains outstanding

4. The Fire Service should continue to create and update standard operating guidelines (SOGs), procedures and policies for the department. A new analyst position (temporary, term, or contract) could be added to further the development and implementation of these SOGs. This will relieve management of much of the day-to-day duties related to this work while allowing the department to expand its policy structure and records management (e.g. track performance measures, produce

Annual Report). This position could also assist with the training component of FDM upgrades and help implement enhanced information technology, while building capacity throughout the department.

Status: Remains outstanding

Fire Prevention and Public Education

1. Review the Fire Prevention agreements in place with Lambton Shores and the Aamjiwnaang First Nations Reserve to determine whether these should be revised.

Status: Ongoing

2. Introduce a procedure to monitor the level of fire prevention programs in the industrial sector and develop a strategy to provide additional staff who would be dedicated to addressing the needs and risks associated with the industrial sector.

Status: Ongoing

3. Introduce a basic training program for new employees in the division and document certification levels expected of fire prevention officers.

Status: Completed

4. Include the completion of the Ontario Fire Marshal Fire Prevention Effectiveness Model (Public Fire Safety Guideline 04-39-12) as part of division responsibilities and include annual reviews of programs and activities delivered.

Status: Completed

5. Establish an evaluation committee to report on an FDM computer system upgrade and/or related training requirements. This committee would also identify City programs and resources that could be of assistance to the development of fire safe community.

Status: Ongoing

6. Develop fire prevention, public education and fire cause determination policies for the department and include within municipal by-laws.

Status: Ongoing

7. Investigate the need to have fire prevention officers formally designated as Building Code Inspectors under part three of the Ontario Building Code (OBC).

Status: Ongoing

8. Initiate a process to ensure that standard operating guidelines, procedures, and policies are developed, reviewed and followed by the fire prevention division.

Status: Completed

9. Develop policies with Building Services and Legal Services to ensure that fire code and building code infractions are not overlooked and enforcement procedures are followed.

Status: Ongoing

Fire Suppression

1. Staff front line apparatus up to four firefighters per truck, consistent with industry best practices and industry performance measures. This requires hiring 12 full-time firefighters to keep sufficient staff on duty on all four shifts.

Status: Completed

2. Add a half-company of firefighters and an auxiliary vehicle to Station 4. This requires hiring 12 full-time firefighters to keep sufficient staff on duty on all four shifts. Purchase an auxiliary vehicle for Station 4 to address depth of response issues. Vehicle type should match trends in call types. Options include mini-pumper, air-supply unit or command unit.

Status: Remains outstanding

3. Add a full company to a new Station 6 located in the vicinity of Blackwell Sideroad and Confederation Road once development has sufficiently advanced. Purchase a new rescue pumper for the new Station 6.

Status: Outstanding

Training

1. Analysis of FDM's information management system to identify the additional functionality that is needed, and the funding required for programming fees and related staff training.

Status: Ongoing

2. Development of a process that enables fire officers to directly input training records into a records management program.

Status: Ongoing

3. Allocation of sufficient funding to ensure that succession goals of the Sarnia Fire Rescue Service are complimented with recognized officer training courses.

Status: Ongoing

4. Immediate development of a process to ensure that necessary standard operational guidelines, procedures and policies are identified, prioritized and completed.

Status: Ongoing

5. Set aside an adequate amount from the training budget for a computer-based distance learning centre and a training resource library.

Status: Ongoing

6. Participation in the joint examination of the live fire training options available to address the issues with the current arrangements and facilities. As part of this process, give consideration to a new facility, perhaps in conjunction with a future station location. This would have implications for the acquisition of sufficient land to accommodate a future training facility.

Status: Not completed

7. Monitor the service provided by the Canadian Coast Guard with respect to the City's shorelines and water-based emergencies. If a better level of service is required, the City could consider expanding the type of water rescue response that SFRS provides.

Status: Ongoing

8. Clarify the role and any specialty training requirements and funding sources for service within border areas (e.g. tunnels, bridges) and at the Sarnia airport.

Status: Ongoing

Fleet Review

1. Purchase a new quint to replace Engine 5. Use Engine 5 as a reserve vehicle and retire Engine 4.

Status: Vehicles meet current needs

2. Purchase a new quint to replace Engine 2 and use Engine 2 as a reserve vehicle.

Status: Vehicles meet current needs

3. Purchase an auxiliary vehicle for Station 4 to address depth of response issues. Vehicle type should match trends in call types. Options include mini-pumper, air-supply unit or command unit.

Status: Vehicles meet current needs

4. A group comprised of department mechanics and firefighters should have input into vehicle specifications to ensure that operating and maintenance needs are met. Demonstrator models should only be considered if minimum requirements are met. The department should consider whether there is a financial advantage to capitalizing the purchase of related small equipment required for the new vehicle.

Status: Completed

5. Monitor the small vehicle replacement plan to ensure that adopted replacement schedules are being followed.

Status: Completed

Communication Technology

1. Establish a working group to review the goals and objectives for fire department dispatching and work to resolve any issues through improved call handling procedures and training.

Status: Ongoing

2. Establish a working group including relevant City departments to examine the opportunities available to the City with an 800 MHz radio system.

Status: Ongoing

3. Appoint a champion to the area of fire department information technology and form a working group to explore software solutions for the department's records management and information technology problems. Establish any required training and financial implications to identified solutions.

Status: Ongoing

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
28	The Fire Chief is to review the status of all previous 2007 Master Plan recommendations to ensure that all get carried over and are addressed or closed.	Unknown	Ongoing

SECTION 10 – Summary

10.1 Conclusion and Recommendations

SECTION 10: Summary

10.1 Conclusion and Recommendations

During the review conducted by Emergency Management and Training Inc., it was demonstrated that the SFRS staff are truly dedicated to the community they serve. Council, the CAO, and the Fire Chief are sincerely committed to ensuring the safety of the community and the firefighters. Based on the present staffing, equipment and fire stations locations, Sarnia Fire Rescue Services is endeavoring to offer the most efficient and effective service possible.

EMT is submitting a total of 27 recommendations for consideration. All costs and associated timelines are approximate estimates that can be implemented through prioritization between the Fire Chief, CAO, and Council.

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 frequent reviews of the recommendations, and bringing forward updates to Council annually or sooner, if required.

Recommendation(s)

FMP Recommendations for Sarnia Fire Rescue Services			
Rec #	**Recommendation**	**Estimated Costs**	**Suggested Timeline**
Section 1 – Community and Fire Department Overview			
1	It is recommended that the agreement with Aamjiwnaang First Nation be updated and reflect the costs of providing such service. Other fire protection services, such as public fire and life safety education and inspections, that are also provided by SFRS should be included in the agreement.	Staff time	Short-term (1-3 years)
Section 2 – Planning and Stakeholder Surveys			
2	It is recommended that the Fire Chief plan to update the FUS report.	$60,000	Short-term (1-3 years)
3	It is recommended that the Fire Chief and Senior Staff review the comments received by staff within the internal survey to identify areas for improvement. • This review could come in the form of a townhall type meeting or a staff/management committee that would report to the Fire Chief with their recommendations.	Staff time	Immediate (0-1 year)
4	Establish a formal service agreement and governance model with SPS for dispatching and infrastructure partnership.	Staff time	Short-term (1-3 years)
Section 3 – Fire Suppression, Community Response, and Comparators			
5	SFRS staff a platform aerial apparatus as a front-line vehicle, a captain and crew of 3 firefighters will be available for all structure fires and support to other operational needs of the department determined by the Fire Chief. Current staffing on the Rescue unit would transfer to the Aerial Platform and requires the hiring of 2 new firefighters per platoon for a total of 8.	$800,000	Short-term (1-3 years)
6	Recommended that the SFRS promote the installation of residential sprinkler systems.	Staff time	Short-term (1-3 years)
Section 4 – Non-Suppression Staffing and Health & Wellness Program			

7	Add a second position of Deputy Fire Chief in the very near future.	$130,000-150,000	Short-term (1-2 years)
8	Hire a Chief Fire Prevention Officer to oversee the Fire Prevention Division	$135,000	Short-term (1-3 years)
9	It is recommended that all Captains and those providing primary fire prevention activities be qualified as NFPA 1031 Fire Inspector 1 and NFPA 1035 Fire and Life Safety Educator Level 1.	Staff time	Short-term (1-3 years)
10	It is recommended that the City allocate a dedicated IT Support person that can assist with the implementation of new and current software needs.	Staff time	Short-term (1-3 years)
11	Hire a Chief Training Officer to coordinated training programs, reduce administrative workload and allow the Safety/Training Officers focus on actual training.	$135,000	Mid-term (4-6 years) and ongoing
12	It is recommended that the recruit program content and duration be reviewed and amended as required.	Costs will be based on how much additional training time is added.	Short-term (1-3 years)
13	That SFRS investigate medical oversight and develop, implement, and maintain a program consistent with similar municipalities fire services.	$25,000	Short-term (1-3 years) and ongoing
14	A City-owned facility to accomplish other training initiatives that is indoors, and temperature controlled allowing the ability to train firefighters in all seasons without restrictions should be investigated as a long-term investment.	Refer to Station Location Review	Long-term (7-10 years)
15	Training division staff work with partners from the petrochemical industry to develop, implement and maintain a program that covers both theory and practical industrial firefighting training.	Staff time	Short-term (1-3 years)
16	To verify the training programs are meeting related NFPA (and other) training program standards, the Deputy Fire Chief identify: • What training programs are required for the services that SFRS is providing? • The number of hours that are required to meet each of those training needs based on Provincial and industry standards.	The costs are mostly related to staff hours unless outside facilities or trainers need to be accounted for	Short-term (1-3 years)

	• Resources required to accomplish this training. • Joint partnerships with private organizations that can be entered to achieve the training requirements. • An annual program outline at the start of each year presented to the Fire Chief, with measured goals and expectations reporting completion success rate at the end of each year.		
17	The EVT should become a staff member of SFRS, dedicated to fire service vehicle and equipment. Amongst other responsibilities this position should develop, implement, and maintain a small fleet/apparatus and master equipment life-cycle planning process.	Salary increase may be $15,000	Mid-term (4-6 years)
18	It is recommended that the Fire Chief continue to reinforce the need for fire related dispatchers to meet the goals and expectations of the related NFPA standard (1221 and 1061).	Staff time, APCO courses, and certification costs	Short-term (1-3 years)
19	In effort to reduce potential presumptive cancer claims and cardiac events the department should work towards addressing procedures in firefighter rehabilitation and decontamination specific to the NFPA 1500 Standards.	Staff time	Short-term (1-3 years)
Section 5 – Risk Assessment and Emergency Management			
No recommendations for this section.			
Section 6 – Fire Station Locations and Condition Assessment			
No recommendations for this section.			
Section 7 – Fire Department Vehicles, Equipment Maintenance, and PPE			
20	The City should continue to maintain a vehicle replacement schedule that complies with the FUS recommendations from a first line to a reserve/second line unit.	No costs associated	Ongoing
21	Ensure second-line apparatus are equipped to respond to large scale events.	$40,000-$50,000	Immediate (0-1 year)
22	A review of Marine 1 be undertaken including examining options that are capable of being deployed any time of the year	All season craft $400,000-$500,000	Short-term (1-3 years)

23	Establish an integrated tracking and documentation repository of all testing and service records accessible by Fire Administration and Platoon Chiefs.	$25,000	Short-term (1-3 years)
24	It is recommended that when considering procurement of new SCBA there should be consideration into the interoperability with fire service partners.	Staff time	Short-term (1-3 years)
25	It is recommended that a Master Equipment Life-Cycle plan be established.	Staff time	Short-term (1-3 years)
26	The fire department should examine the potential of having mechanical work on small engines, marine vessels, and other miscellaneous equipment completed by a second certified EVT mechanic.	Savings expected (no estimate available)	Short-term (1-3 years)
Section 8 – Finance, Budgeting, and Capital Investment Plan			
27	Facility Maintenance and Life Cycle Planning should be outlined in a recurring plan reliably supported by the Capital Budget process.	The costs are mostly related to Facility Maintenance staff hours	Short-term (1-3 years) and ongoing
Section 9 – Review of Previous Master Plan			
28	The Fire Chief is to review the status of all previous 2007 Master Plan recommendations to ensure that all get carried over and are addressed or closed.	Unknown	Ongoing
Section 10: Summary			
No recommendations for this section.			

SECTION 11 – Appendices

Appendix A – Definitions and References
Appendix B – Survey Samples
Appendix C – Five Step Staffing Evaluation
Appendix D – Response Data 2019, 2018, and 2017
Appendix E – FUS Aerial Technical Bulletin
Appendix F – Community Risk Assessment Guideline
Appendix G – Office of the Fire Marshal Guidelines

SECTION 11: 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 1710 – Standard for the Organization and Deployment of Fire Suppression Operations, Medical Operations, and Special Operations to the Public by Career Departments

Municipal Responsibilities (FPPA 1997)

2. (1) Every municipality shall,

a) establish a program in the municipality which must include public education with respectto 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 backupservice 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 04-08-13 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

Appendix B: Survey Sample

Sarnia Fire Rescue Service
Fire Master Plan – Internal Staff Survey

Emergency Management & Training Inc. (EMT) have been hired to prepare a Fire Master Plan for the Sarnia Fire Rescue Service (SFRS). Your feedback is necessary in assisting EMT in developing this document for the fire department. The intent of this document is to provide a 10-year, community-driven plan 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. As such, we ask that you complete the survey online. The results will be collated into one document for our use in developing the master plan.

The survey will be open until February 14th, 2020

Questions:

1. Sarnia Fire Rescue Services (SFRS) provides a wide range of services to the community. From a job satisfaction point of view, what are the things that make you most proud of the SFRS (i.e. the level of professionalism, community involvement or making a positive difference within the community)?

2. How do you think SFRS is perceived in the community?

3. Based on the types of calls that Sarnia Fire Rescue Service (SFRS) responds to, do you believe that you are well equipped to efficiently and effectively carry out your duties?

- ☐ Yes
- ☐ No (if no, what improvements can be made)

4. SFRS provides a wide range of services to the community. From your perspective, in relation to the duties you perform within SFRS, do you believe that you are receiving the required training to perform your duties in an efficient and effective manner?

- ☐ Yes
- ☐ No (if no, what improvements can be made)

5. Do you believe that there is a good succession plan in place for the fire department?

- ☐ Yes
- ☐ No (if no, what improvements can be made)

6. In relation to the duties you perform within SFRS, what would you say are the top three issues facing the fire service and/or the community (regarding fire safety) today (i.e. meeting response time expectations, level of staffing to meet service demands or even meeting the fire protection and public education needs of the community)?

7. Within your scope of responsibilities in SFRS, are there any other services that you believe the fire service should provide, expand upon, or even reduce, and why (i.e. more focused fire prevention and public education programs, elevated level of service in a particular program or even more use of the fire stations for community-based fire safety related programs)?

8. Based on your area of responsibility within SFRS, if it were up to you, what would the fire service look like 10 years from today and why?

9. Do you have any additional comments you would like to add about your thoughts on the SFRS?

Thank you for completing this survey. Your feedback is greatly appreciated and will help to shape future service delivery efforts.

If you have any questions about this survey, please e-mail Lyle Quan, Consultant for Emergency Management & Training Inc. at lquan@emergencymgt.com

Sarnia Fire Rescue Service
Fire Master Plan – External Survey

In our ongoing efforts to ensure that we are meeting the needs of our community, we are creating a 10-year, community-driven master plan to guide operational improvements and enhance how Sarnia Fire's services are provided.

To accomplish this, we have engaged Emergency Management & Training Inc. (EMT), to assist us with this initiative. EMT is a local consulting firm that has worked with many fire departments in developing their fire master plans, station assessments and fire service reviews. Therefore, most of all, we need your help. So 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 all residents.

These same questions are available on our online engagement platform called *Speak Up Sarnia* at https://www.speakupsarnia.ca/.

Please take some time to complete the survey prior to January XX, 2020

Questions:

1. What is your general impression of the Sarnia Fire Rescue Service (SFRS) in relation to its level of professionalism, community safety, education and fire prevention awareness programs?

a) How do you currently receive information about fire safety, smoke alarm programs, and other programs offered by the Fire Service?

b) Do you feel that you have had enough opportunities to receive that information?

2. How important are the following statements to you:

	Extremely important	Very important	Important	Not very important	Not important at all
How quickly the Fire Department gets to me if I have an emergency	☐	☐	☐	☐	☐
Whether the Fire Department will visit my home to give me information relating to fire safety and smoke alarms	☐	☐	☐	☐	☐
How much the fire services costs me as a taxpayer	☐	☐	☐	☐	☐
How well the Fire Department works with other agencies to provide wider community safety services	☐	☐	☐	☐	☐
How often the Fire Department consults me about their services	☐	☐	☐	☐	☐
How often the Fire Department provides community training opportunities (e.g. fire extinguisher training; school safety programs; older and wiser program; smoke alarms; home escape planning)	☐	☐	☐	☐	☐
How visible the Fire Department is at local community events	☐	☐	☐	☐	☐
Contacting assistance services after an emergency, as required	☐	☐	☐	☐	☐

Timeliness to any request for services or assistance from the Fire Department	☐	☐	☐	☐	☐

3. There are nine core services delivered by the Sarnia Fire Rescue Service. Which services are most important to you? Please rank in order of priority from Extremely Important to Not Important at All.

	Extremely important	Very important	Important	Not very important	Not important at all
Fire fighting	☐	☐	☐	☐	☐
Rescue (i.e. motor vehicle accidents)	☐	☐	☐	☐	☐
Fire/Arson investigations	☐	☐	☐	☐	☐
Fire prevention and safety inspections	☐	☐	☐	☐	☐
Community outreach / Public education	☐	☐	☐	☐	☐
Hazardous materials (i.e. gas or chemical spills) and technical rescue response (i.e. water rescues)	☐	☐	☐	☐	☐
Public assistance requests / Non-emergency responses	☐	☐	☐	☐	☐
Emergency management and planning	☐	☐	☐	☐	☐
Medical assist and response	☐	☐	☐	☐	☐

4. Taking into consideration the information noted in question #3, are there any additional services that you believe should be provided in relation to fire prevention, fire safety education and response to emergencies? If so, please specify.

5. Have you directly received service from the Sarnia Fire Rescue Service?

- ☐ Yes
- ☐ No (If no, skip to question 7)

6. Could you share some details of your experience and any recommendations for service improvements?

7. This master plan review is expected to provide insight into service levels, related staffing and equipment needs within a 10-year timeline. Based on your level of interaction with Sarnia Fire Rescue Service, if you could implement up to three things to improve how the current services are provided by the SFRS, what would those things be?

For example: more public education in relation to fire safety programs, more involvement with local neighbourhood groups, or even more open house events at the fire stations to better understand the services provided by the fire service.

8. Are there any other comments/points you would like to add relating the services provided by Sarnia Fire Rescue Service we haven't touched on?

Thank you for completing this survey. Your feedback is greatly appreciated and will help to shape future service delivery efforts.

If you have any questions about this survey. Please e-mail Lyle Quan, Consultant for Emergency Management & Training Inc. at lquan@emergencymgt.com

Appendix C: 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.7.6.2 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).

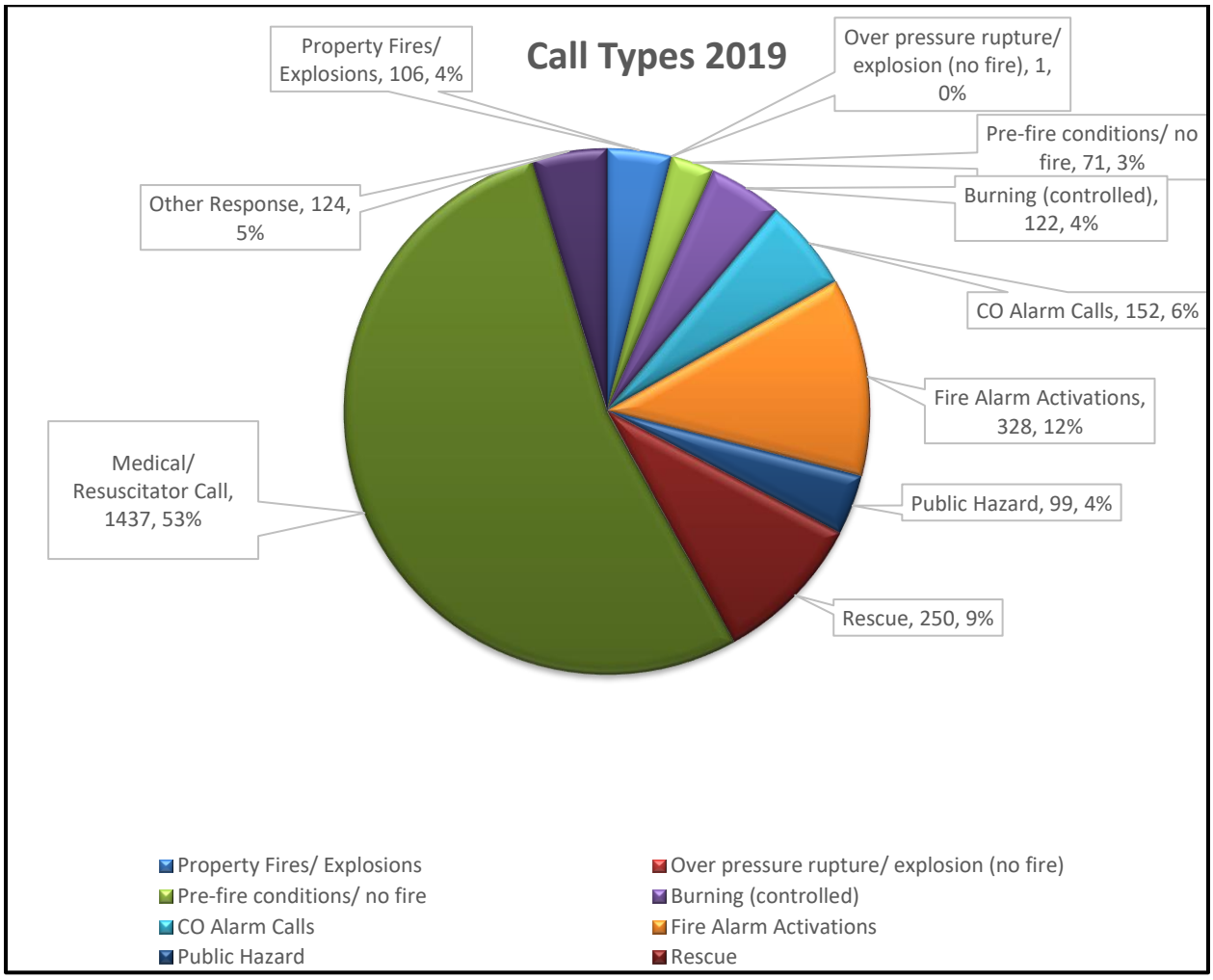
Correct calculations based on the following:

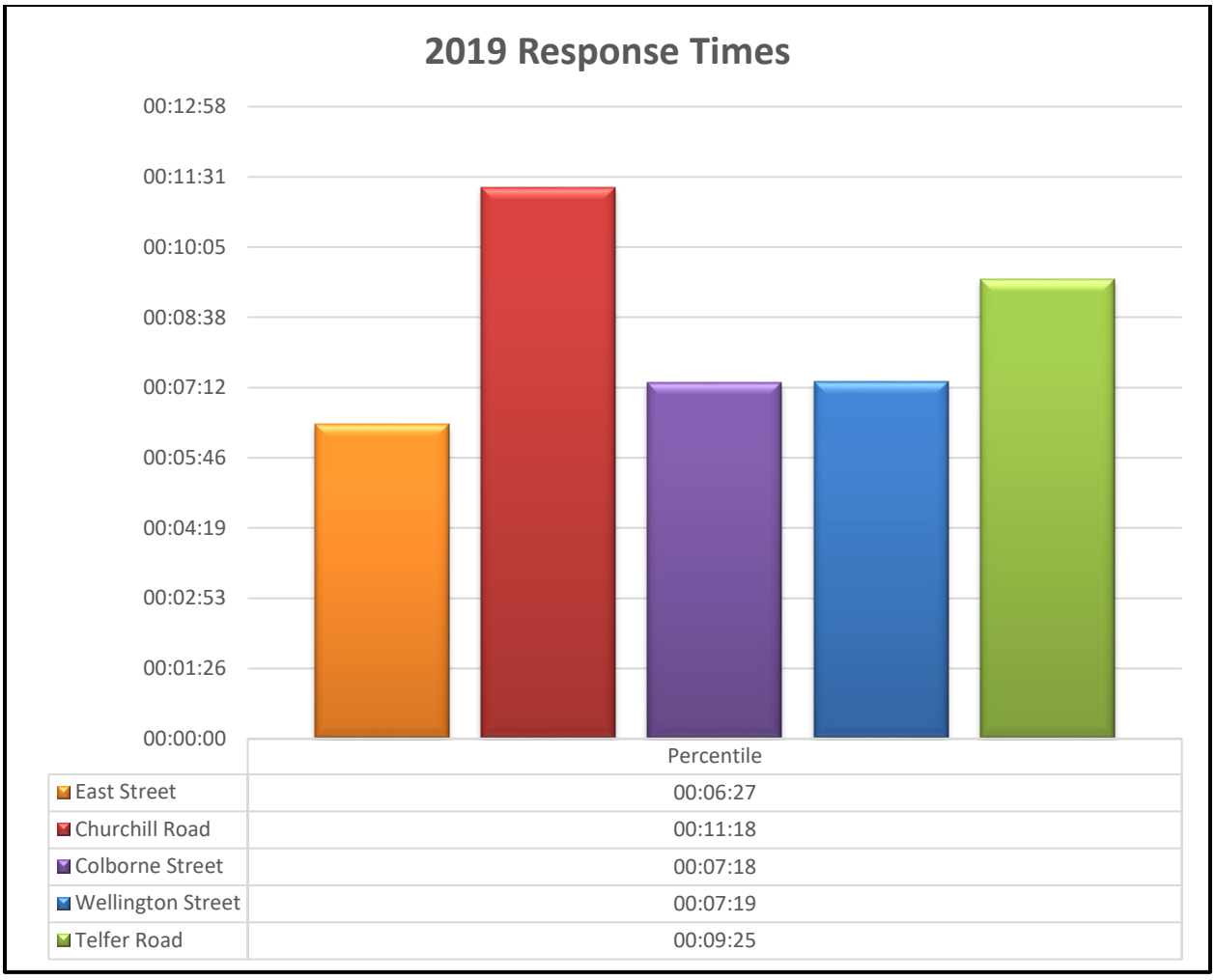
(1) Budgetary validation
(2) Rounding up/down
(3) Determining reserve capacity
(4) Impact of non-personnel resources (materials, equipment, vehicles) on personnel

More information on this staffing equation can be found within the National Fire Protection Association 1730 standard. The Fire Prevention Division should assess the previous five steps and evaluate their present level of activity and the future goals of the Branches.

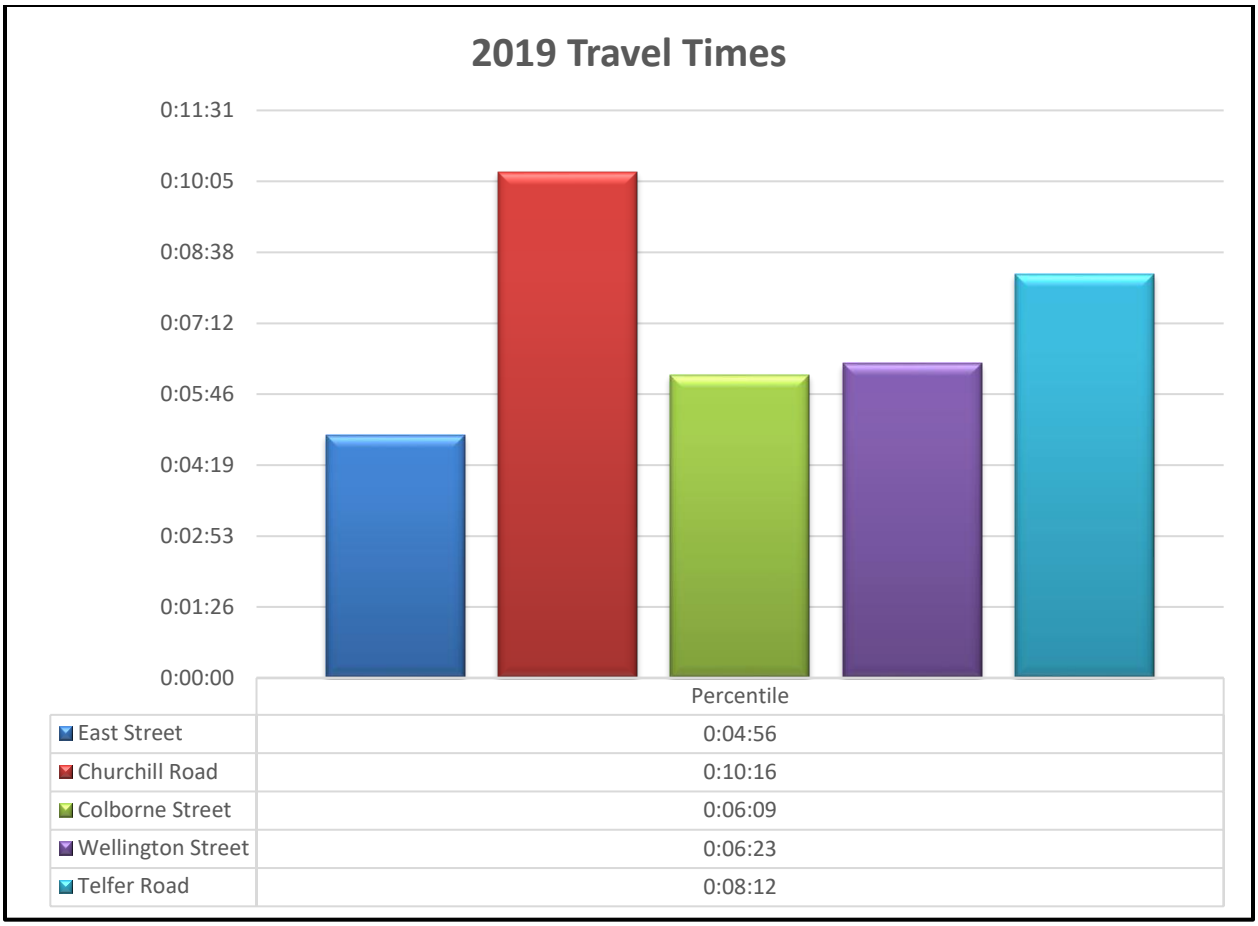
Appendix D: Response Data 2019, 2018, and 2017

2019 Response Data



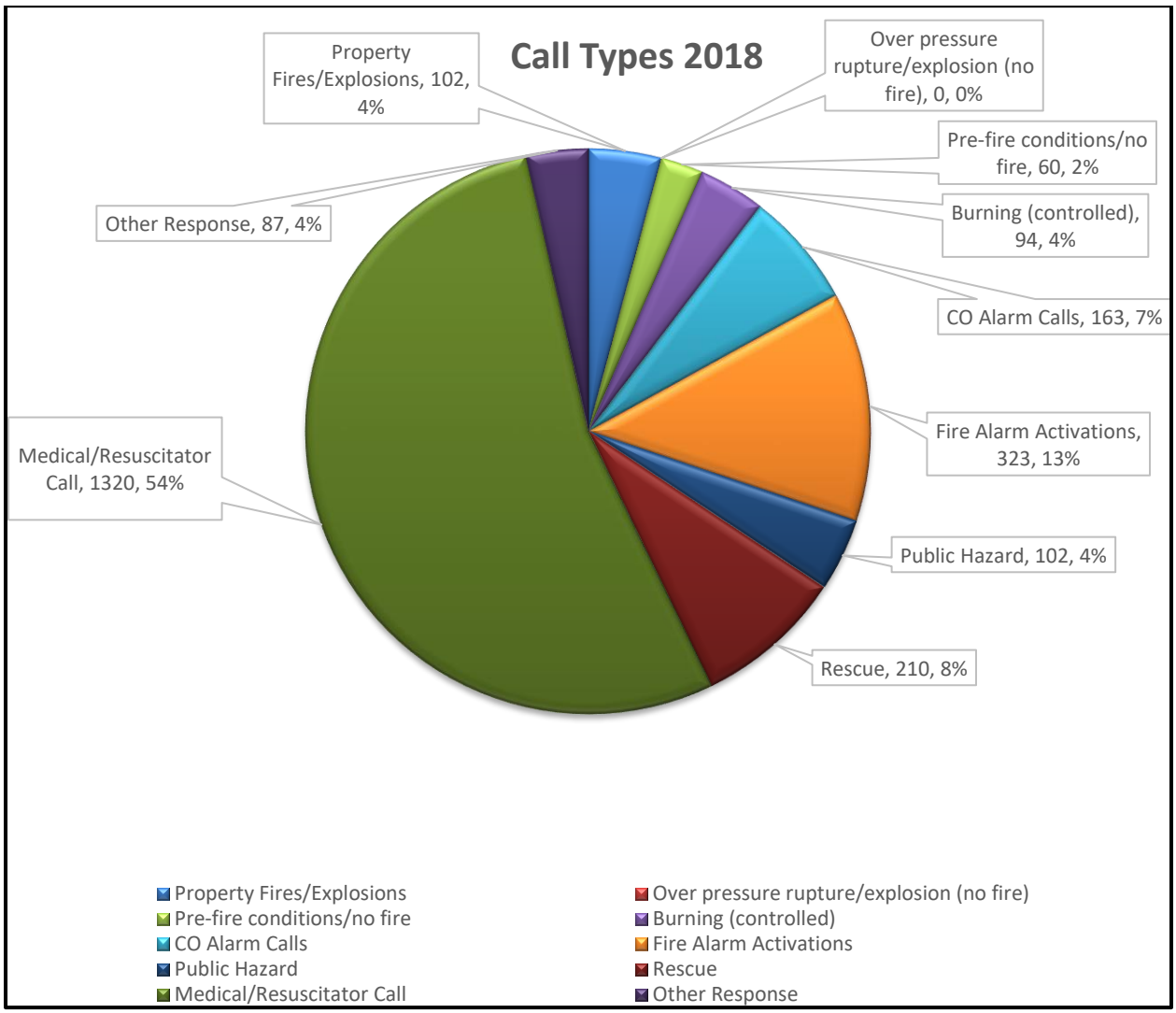


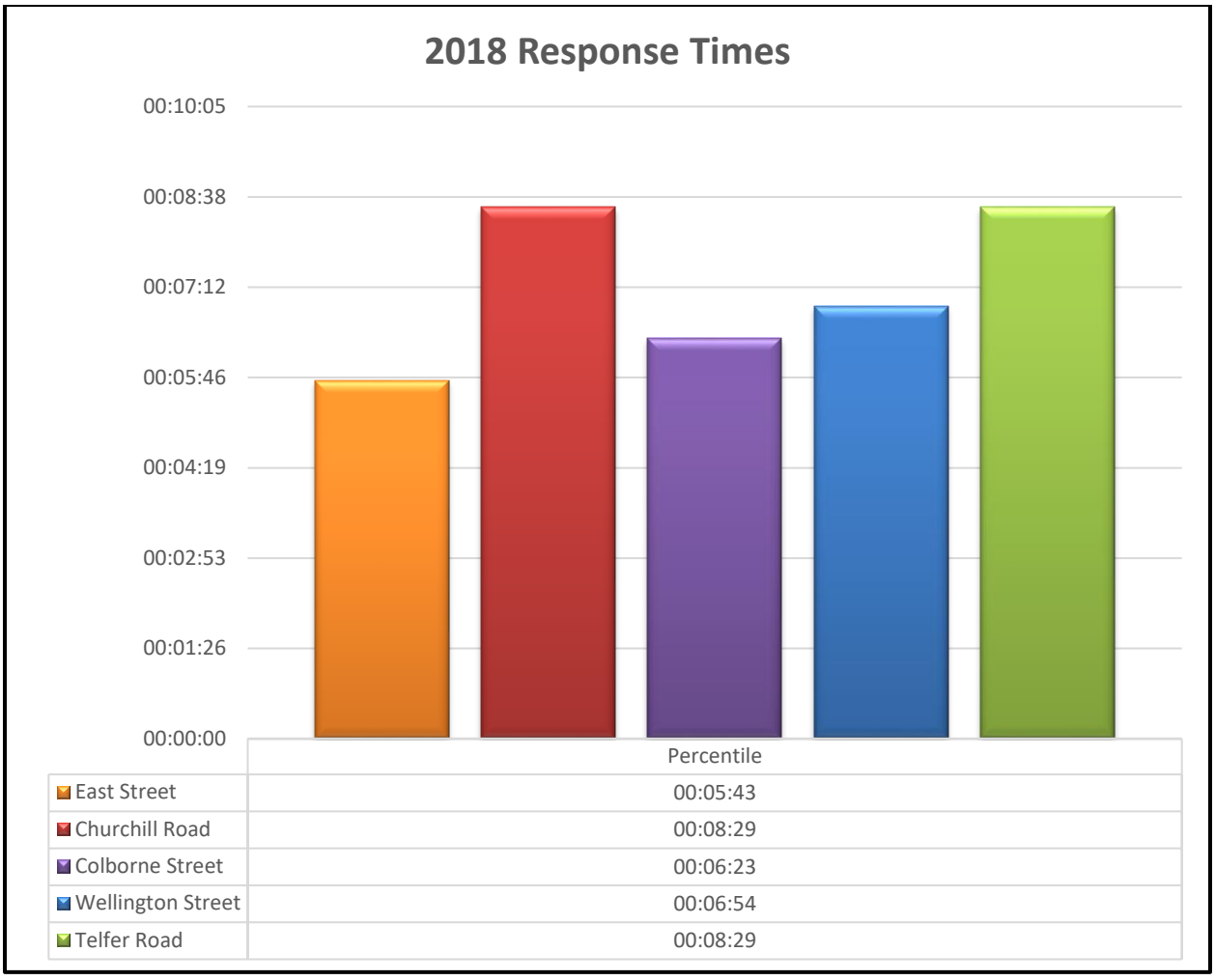
	Percentile
East Street	00:06:27
Churchill Road	00:11:18
Colborne Street	00:07:18
Wellington Street	00:07:19
Telfer Road	00:09:25



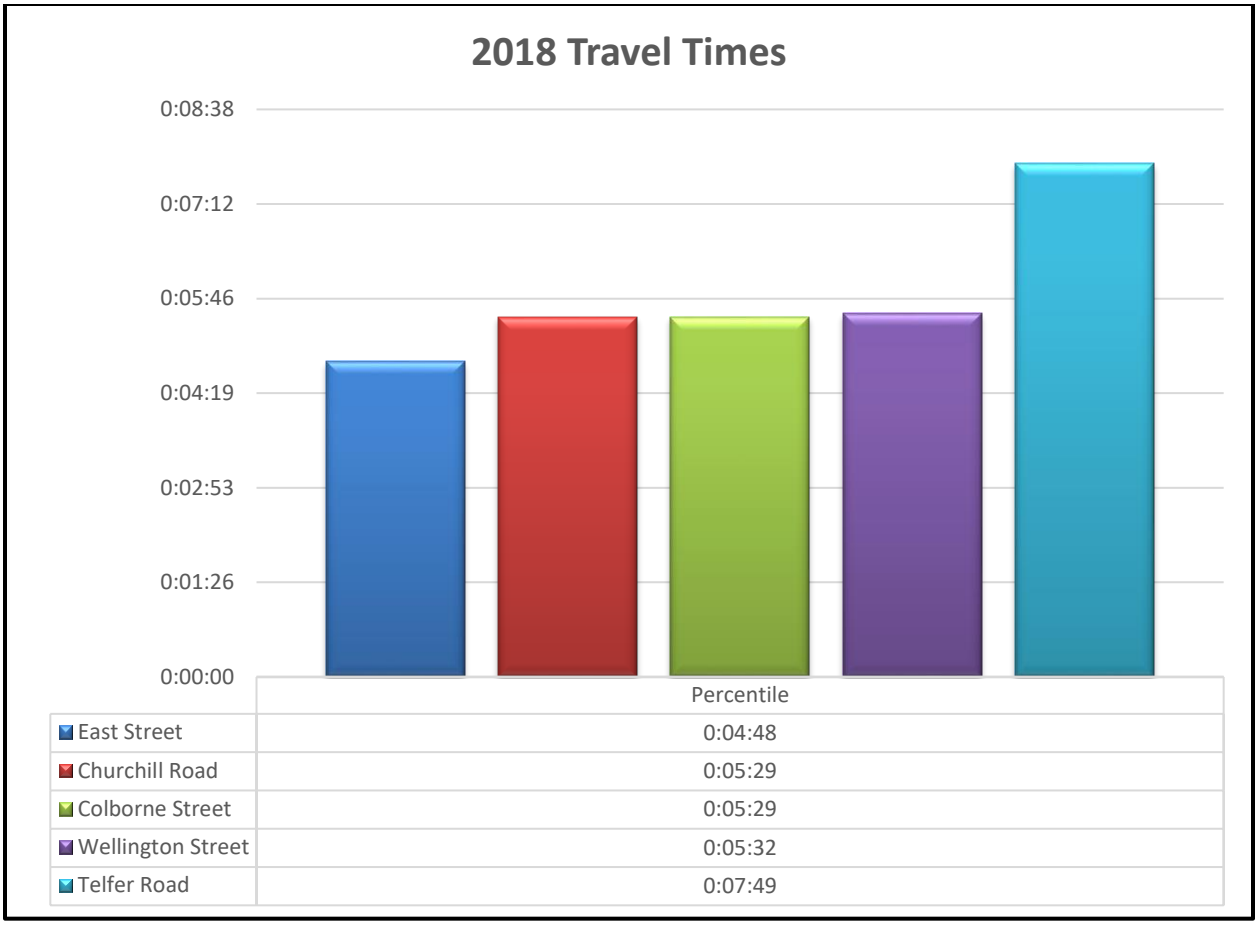
	Percentile
East Street	0:04:56
Churchill Road	0:10:16
Colborne Street	0:06:09
Wellington Street	0:06:23
Telfer Road	0:08:12

2018 Response Data



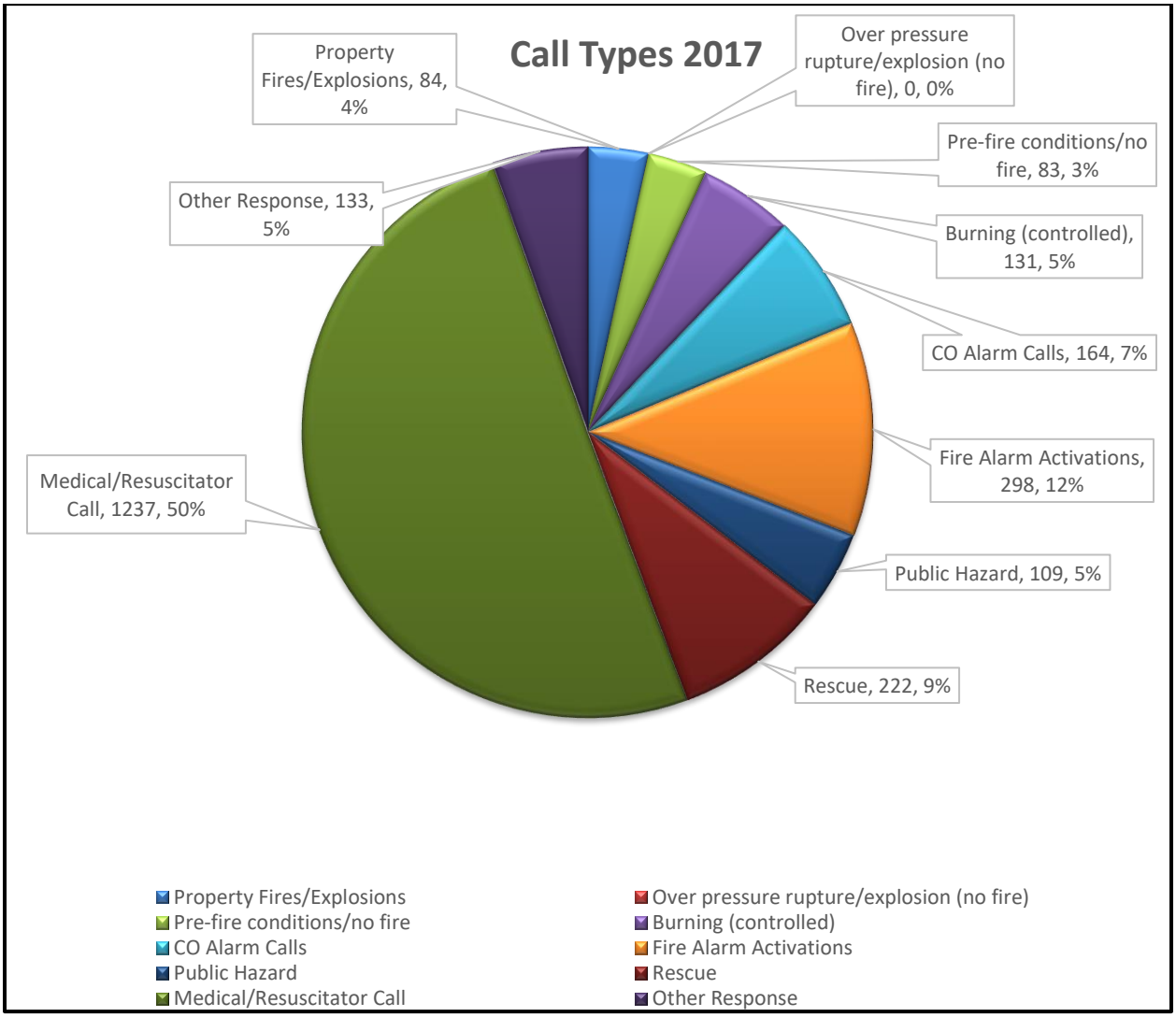


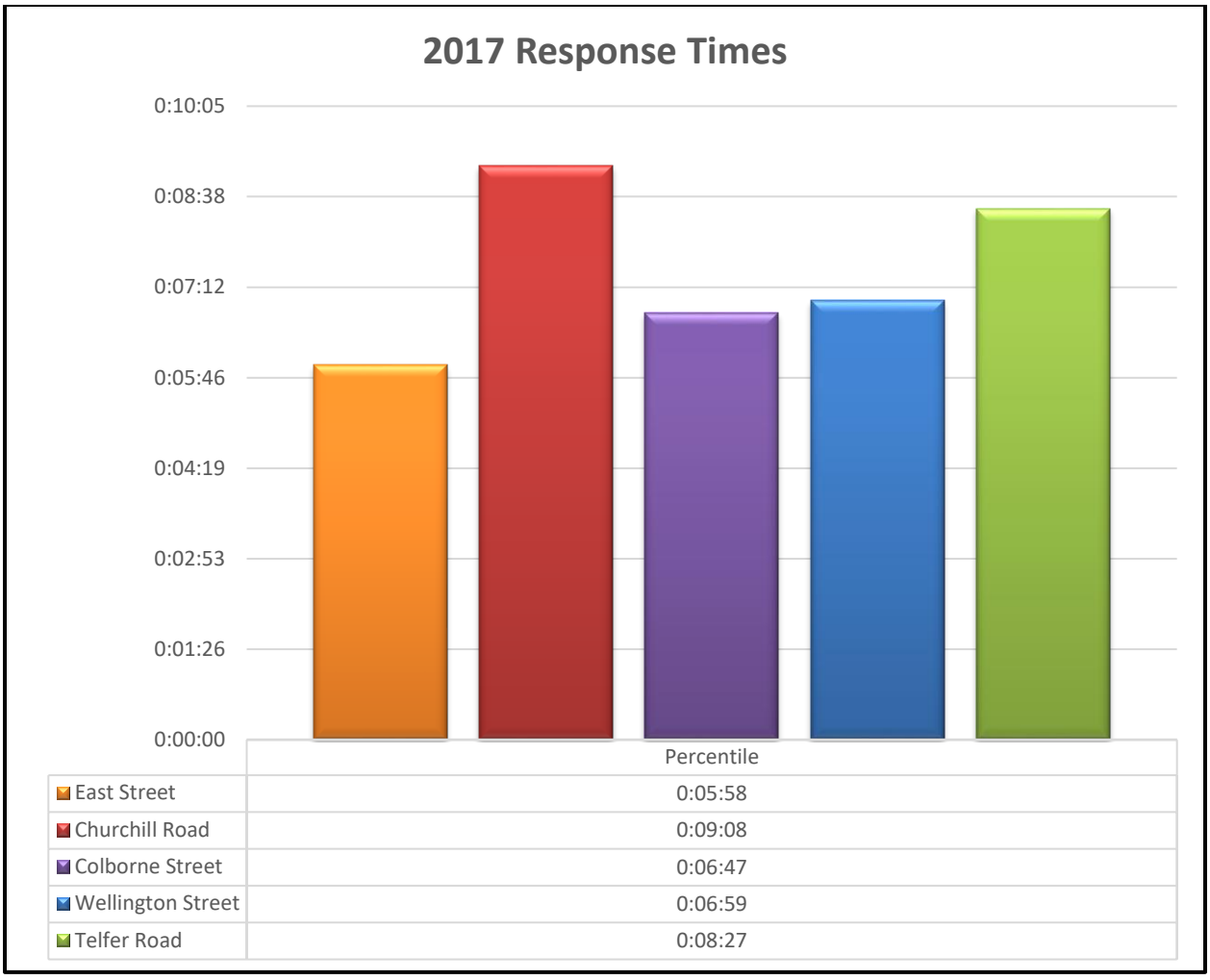
	Percentile
East Street	00:05:43
Churchill Road	00:08:29
Colborne Street	00:06:23
Wellington Street	00:06:54
Telfer Road	00:08:29



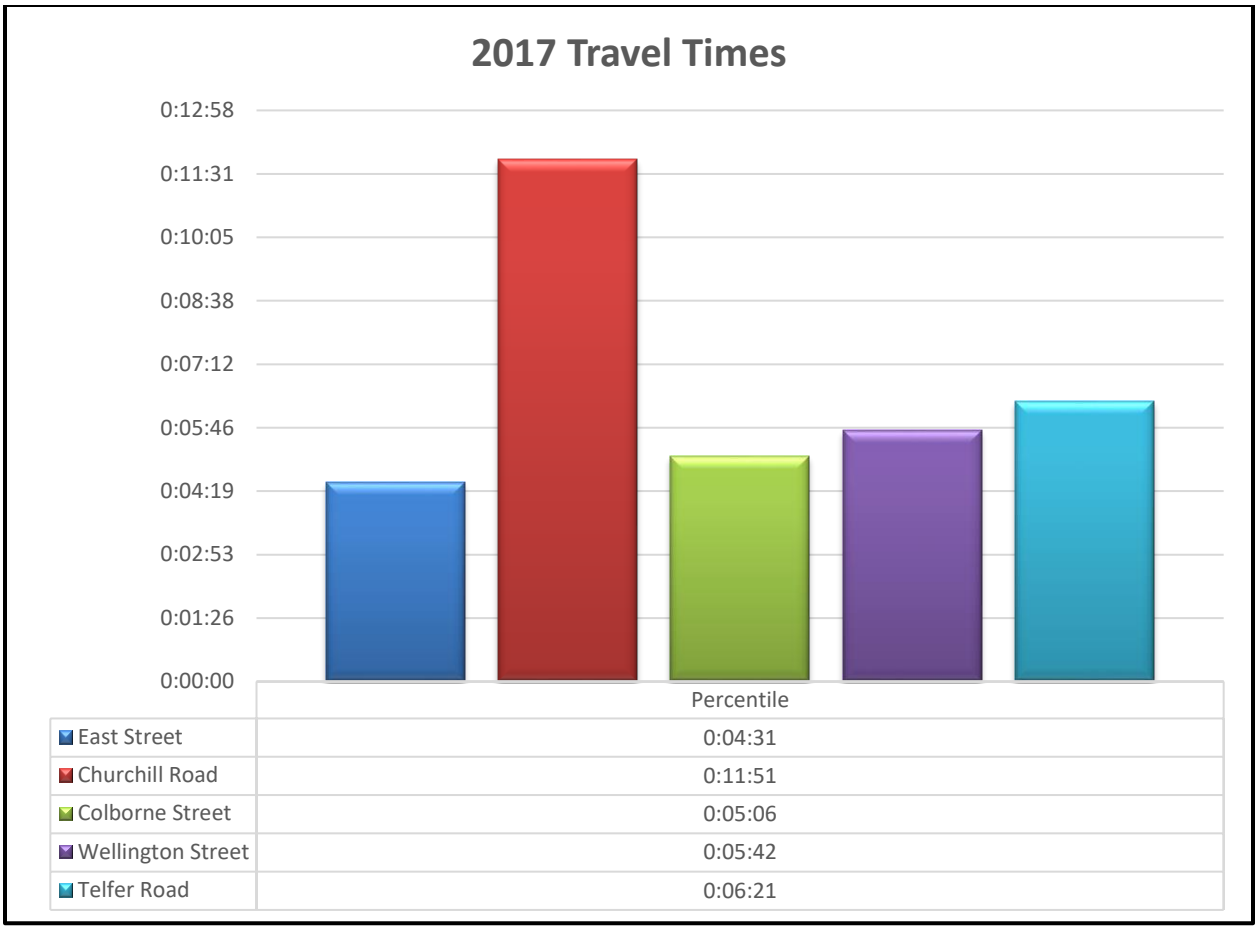
	Percentile
East Street	0:04:48
Churchill Road	0:05:29
Colborne Street	0:05:29
Wellington Street	0:05:32
Telfer Road	0:07:49

2017 Response Data





	Percentile
East Street	0:05:58
Churchill Road	0:09:08
Colborne Street	0:06:47
Wellington Street	0:06:59
Telfer Road	0:08:27


2017 Travel Times
0:12:58
0:11:31
0:10:05
0:08:38
0:07:12
0:05:46
0:04:19
0:02:53
0:01:26
0:00:00
Percentile
East Street 0:04:31
Churchill Road 0:11:51
Colborne Street 0:05:06
Wellington Street 0:05:42
Telfer Road 0:06:21

Appendix E: FUS Aerial Technical Bulletin

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).

POWERED BY opta
AN SCM COMPANY

Western region 1-877-255-5240 fus@optaintel.ca
Central region 1-800-268-8080 fireunderwriters.ca
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.

In the case of a building that is sprinklered throughout, the automatic sprinkler system should control the fire to an extent that radiation to neighbouring buildings should be minimal. Although there will be some radiation effect on a sprinklered building from a fire in a neighbouring building, the internal sprinkler system should control any fires that might be ignited in the building and thereby minimize the possibility of the fire spreading into the exposed building. NFPA 80A, "Protection of Buildings from Exterior Fire Exposures," provides additional information on the possibility of fire spread at building exteriors.

The water supply requirements for fire protection installations depend on the requirements of any automatic sprinkler installations and also on the number of fire streams that may be needed at any fire, having regard to the length of time the streams will have to be used. Both these factors are largely influenced by the conditions at the building to be equipped, and the quantity and pressure of water needed for the protection of both the interior and exterior of the building must be ascertained before the water supply is decided upon. Acceptable water supplies may be a public waterworks system that has adequate pressure and discharge capacity, automatic fire pumps, pressure tanks, manually controlled fire pumps in combination with pressure tanks, gravity tanks, and manually controlled fire pumps operated by remote control devices at each hose station.

For further information regarding the acceptability of emergency apparatus for fire insurance grading purposes, please contact:

Western Canada	Quebec	Ontario	Atlantic Canada
Fire Underwriters Survey	Fire Underwriters Survey	Fire Underwriters Survey	Fire Underwriters Survey
3999 Henning Drive	255, boul. Crémazie E	175 Commerce Valley Drive, West	238 Brownlow Avenue, Suite 300
Burnaby, BC V5C 6P9	Montreal, Quebec H2M 1M2	Markham, Ontario L3T 7P6	Dartmouth, Nova Scotia B3B 1Y2
1-800-665-5661	1-800-263-5361	1-800- 268-8080	1-877-634-8564

Appendix F: Provincial Community Risk Assessment Guideline

Community Risk Assessment Guideline

Office of the Fire Marshal and Emergency Management

TABLE OF CONTENTS

OFMEM Section: Public Safety Education at 1-800-565-1842

The reproduction of this guideline for non-commercial purposes is permitted and

encouraged. Permission to reproduce the guideline for commercial purposes must be obtained from the Office of the Fire Marshal and Emergency Management, Ontario

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.

Office of the Fire Marshal and Emergency Management

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 (OFC) 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.gc.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), 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, 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, behaviours, locations, and occupancy types of previous fires. This assists in determining the leading causes or behaviours 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 behaviours among various population groups and to focus prevention activities in high-risk neighbourhoods 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 neighbouring 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 neighbouring 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 • 5 to 15 years since the last incident
Possible	• might occur under current circumstances • 1 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

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 firefighter 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

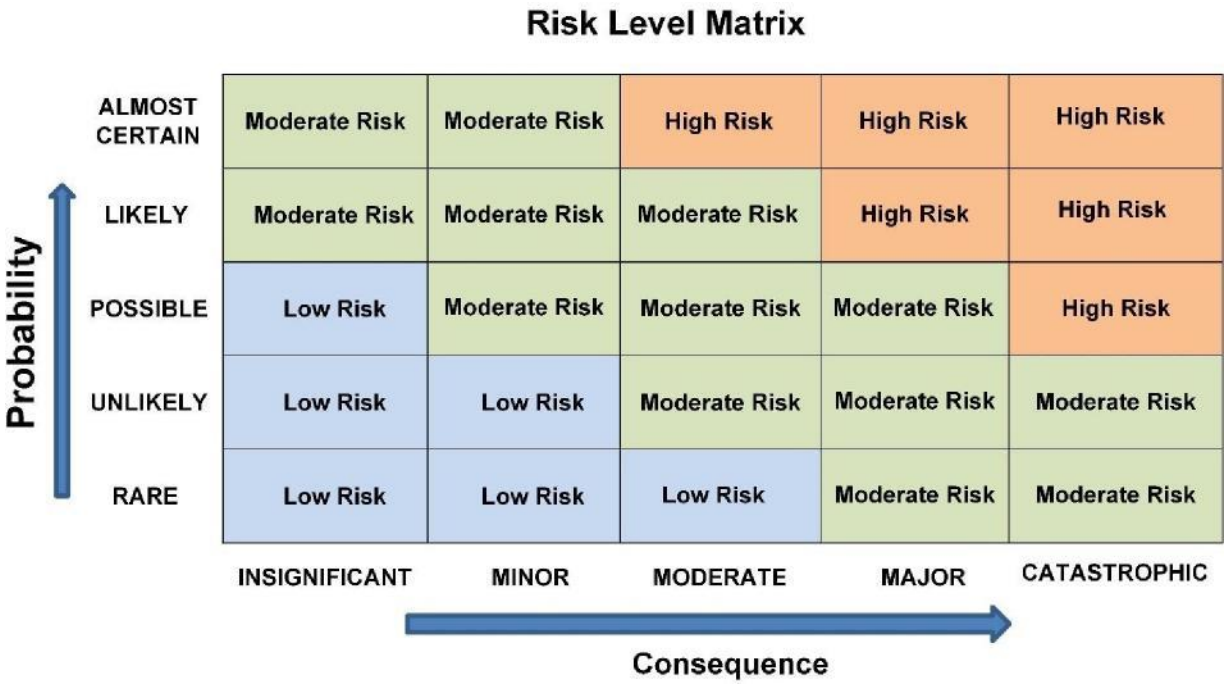
	• poses threat to small local businesses, and/or • could pose a threat to the quality of the environment
Major	• potential for a large loss of life • would result in significant property damage • significant threat to large businesses, local economy and tourism, and/or • impact to the environment would 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.



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 behaviours 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 neighbouring 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 neighbouring 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 Defence 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 Defence.

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, behaviours 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.

Geographic Profile Risks List the geographic features in your community and how they may influence the delivery of fire protection services.	
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.

Building Stock Profile Risks List the building stock/occupancy types in your community and the fire and other emergency issues/concerns for each. Assign probability, consequence and risk levels to each.					
Occupancy Classification		**Issues/Concerns (i.e. age of buildings; use of buildings; building density, height and area; historic and culturally significant buildings; etc.)**	**Probability** (refer to Table 1 for suggested probability levels)	**Consequence** (refer to Table 2 for suggested consequence levels)	**Assigned Risk Level** (refer to the Risk Level Matrix for suggested risk levels)
Group A	Assembly				
Group B	Detention Occupancies				
	Care and Treatment / Care				
Group C	Single family				
	Multi-unit residential				
	Hotel / Motel				
	Mobile Homes & Trailers				
	Other				

Occupancy Classification		Issues/Concerns (i.e. age of buildings; use of buildings; building density, height and area; historic and culturally significant buildings; etc.)	Probability (refer to Table 1 for suggested probability levels)	Consequence (refer to Table 2 for suggested consequence levels)	Assigned Risk Level (refer to the Risk Level Matrix for suggested risk levels)
Groups 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** (refer to Table 1 for suggested probability levels)	**Consequence** (refer to Table 2 for suggested consequence levels)	**Assigned Risk Level** (refer to the Risk Level Matrix for
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 of 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 support response

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 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** (refer to Table 1 for suggested probability levels)	**Consequence** (refer to Table 2 for suggested consequence levels)	**Assigned Risk Level** (refer to the Risk Level Matrix for suggested risk levels)
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															

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 F	Industrial															
Other																
Totals																

Worksheet 9b: Past Loss and Event History Profile

Past Loss and Event History Profile Risks
List the causes for each occupancy type identified on the previous worksheet.
Assign probability, consequence and risk levels to each cause identified.

Occupancy Type/Location	**Causes**	**Probability** (refer to Table 1 for suggested probability levels)	**Consequence** (refer to Table 2 for suggested consequence levels)	**Assigned Risk Level** (refer to the Risk Level Matrix for suggested risk levels)
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

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		
Communit y 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.

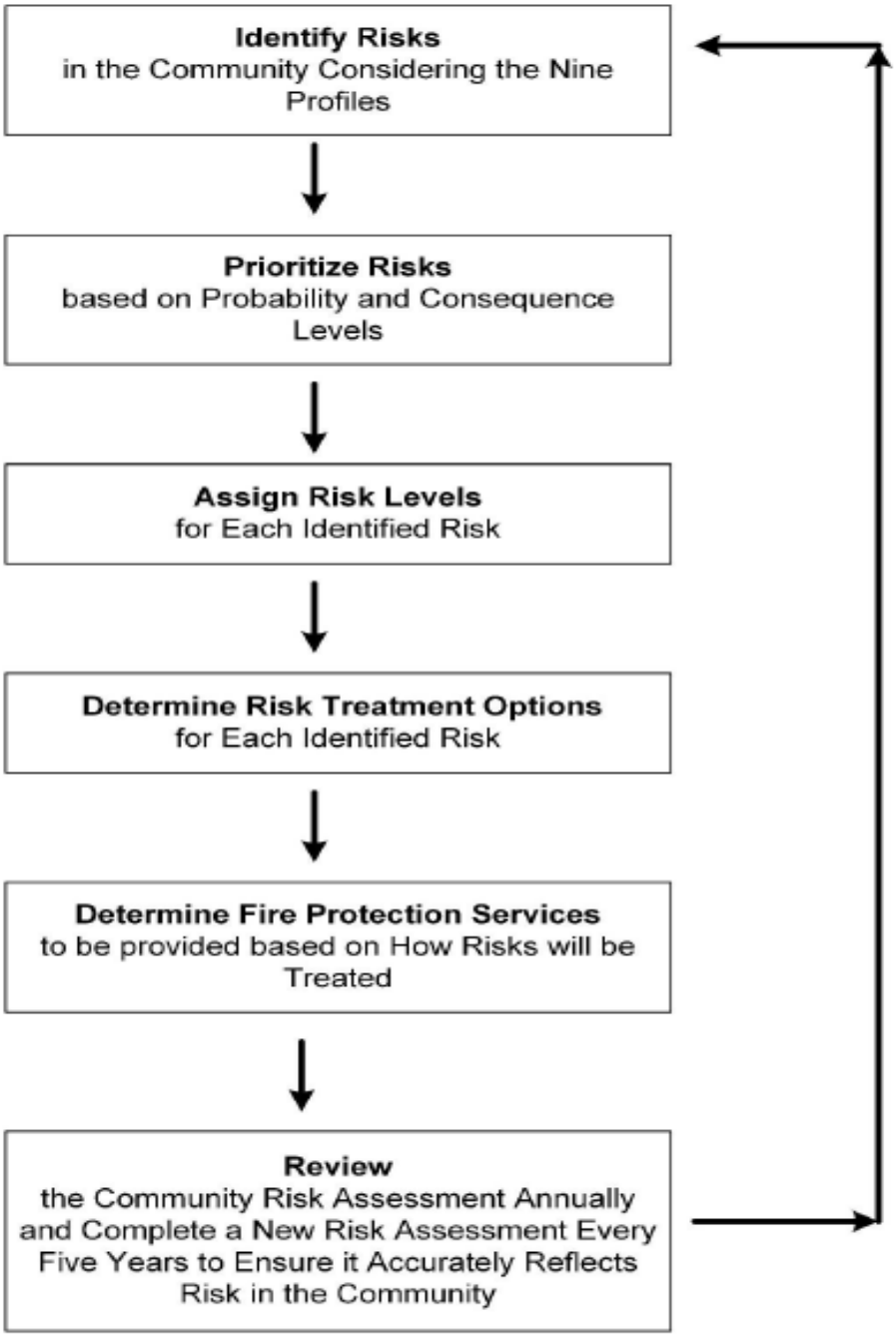
8. Economic profile: The economic sectors affecting the community that are critical to its financial sustainability.

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 E: References

DBP Management, *5 Ways to Manage Risk*, dbpmanagement.com

Dillon Consulting, *The Corporation of the City of Mississauga, Community Risk Identification: Introduction and Methodology*, July 2017

Government of Ontario, *Fire Protection and Prevention Act, 1997, S.O. 1997, c. 4*

Government of Ontario, *Ontario Regulation 378/18: Community Risk Assessments*, May 2018

National Fire Protection Association, *NFPA 1300, Standard on Community Risk Assessment and Community Risk Reduction Plan Development*, Proposed Second Draft, January 14, 2019

National Fire Protection Association Urban Fire and Life Safety Task Force, *Community Risk Reduction: Doing More With More*, June 2016

Office of the Fire Marshal and Emergency Management, *Comprehensive Fire Safety Effectiveness Model: Fire Prevention Effectiveness Model – Position Paper,* September 1997

Office of the Fire Marshal and Emergency Management, *Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model*, June 2009

Office of the Fire Marshal and Emergency Management, *Public Fire Safety Guideline 04-40A-03: Simplified Risk Assessment*, January 2006

U.S. Fire Administration, *Risk Management Practices in the Fire Service*, January 2018

Vision 20/20, *Community Risk Assessment: A Guide for Conducting a Community Risk Assessment,* Version 1.5, February 2016

Vision 20/20, *Community Risk Reduction Planning: A Guide for Developing a Community Risk Reduction Plan*, Version 4, June 2016

Appendix G: Office of the Fire Marshal Guidelines

Planning and Growth Practices

Public Fire Safety Guidelines	**Subject Coding** **PFSG 04-58-12**
Section **Fire Administration**	Date **August 1998**
Subject **Planning and Growth Practices**	Page

Under Review

Purpose:

To provide municipalities and fire departments with considerations for planning and growth practices.

Service Delivery Implications:

- Fire departments, in conjunction with council and the municipal administrators, should develop and implement a planning process.
- The process should provide information for a community wide, balanced and cost-effective fire control strategy.
- Existing conditions and anticipated community growth must be taken into consideration.
- Effective planning improves:
    - financial forecasting
    - quality and quantity of services
    - organizational performance
    - efficiency and effectiveness of the department
    - the ability to identify future service demands

Failure to consider planning and growth will lead to confusion and an inability to maintain standards of coverage

Service Delivery Options:

- Most fire protection agencies are experiencing escalating demands for emergency response and fire prevention services, fire safety education, emergency medical services, and hazardous materials control. Resources to provide these services are often limited.

- Fire departments must take the following steps to ensure proper needs analysis:

1. Identify the nature and extent of risks.
2. Establish service levels.
3. Identify the most effective use of resources to obtain the desired service level.
4. Implement a management evaluation system to review the effectiveness of the implemented levels of service.

This planning process should address the following:

- master planning
- evaluating programs and services
- projecting station locations and re-allocations
- determining staffing levels and assignments
- co-ordinating with other emergency services
- co-ordinating development with other community departments
- co-ordinating with other counties/districts/regions
- co-ordinating with private sector organizations

Strategic (Master) Plan

- The strategic or master plan is based upon a community risk management approach that:
  - considers the nature, extent and magnitude of the risks in the community
  - considers methods of providing protection for identified risks
  - considers alternative levels of protection
  - determines an acceptable level of risk
  - establishes objectives for the fire department and any additional requirements that are necessary for the community to limit the risk
  - develops and adopts a plan that will provide the established level of fire department services and other requirements
  - establishes a process to evaluate the effectiveness of the plan
  - establishes a process to periodically validate the plan

Policy Requirements:

- Those responsible for fire department planning should:
  - maintain an ongoing relationship with other agencies involved in community planning
  - keep the fire chief and other staff informed of community development plans, projected service demands, alternative approaches, and problems that might develop as change occurs.
  - These liaisons should include budget and planning agencies, redevelopment agencies, water, street, traffic, and engineering departments, and private sector developers.

Quality Management Standards:

- The fire department should have a master plan to guide its activities. It should be:

    - long term (3 to 5 years)
    - the result of a continuous planning process
    - published and updated on regular basis
    - a companion document to the budget
    - the result of input from all stakeholders
    - approved by municipal government or authority having jurisdiction

- The fire department should have a process to assess, measure and evaluate the attainment of progress towards completion of specific objectives and overall system performance.

Quality and Performance Measures: Evaluating Programs And Services

- Fire departments should have an evaluation system in place for programs and services.
- This program should be based on a cost/benefit analysis that:

    - determines need
    - develops objectives
    - develops the criteria for measuring effective accomplishment
    - generates alternatives
    - analyses and selects alternatives

- Any program of planning needs to encompass any or all aspects of the fire department's activities.
- The goal is to improve and maintain the efficiency and effectiveness of the fire department as well as providing for a responsive approach to the community's changing needs for service

Codes, Standards, and Best Practices:

Codes, Standards and Best Practices resources available to assist in establishing local policy on this assessment 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.

02-02-12 & **03** Fire Risk Assessment
02-03-01 Economic Circumstances
02-04-01 & **23** Capabilities of Existing Fire Protection Services

03-01-13 Preparation of Draft Report on Existing Fire Protection Services
04-12-13 Core Services
04-39-12 Fire Prevention Effectiveness Model
04-56-12 Use of Fire Related Statistics

Additional References: *National Fire Service Accreditation Program*

[1] Standards of Coverage - a written statement that combines service level objectives with staffing levels to define how and when a fire agencies resources will respond to a call for service.

Station Training Practices

Public Fire Safety Guidelines	Subject Coding PFSG 04-81-01
Section Training & Education	Date August 1998
Subject Station Training Practices	Page

Under Review

Purpose:

This guideline provides suggested procedures regarding the delivery of station training programs.

Introduction:

- Training and educational resource programs express the philosophy of the organization they serve and are central to its mission.
- Increased fire service expectations and evolving suppression and apparatus technology have expanded the role of fire service personnel.

Service Delivery Implications:

- A key factor in the success of fire suppression activities is the performance of members of the organization.
- This performance level is achieved and maintained through a comprehensive training program.
- One critical component of this training program is training carried out within the fire station.
- Learning resources should include a library as well as audio visual material.
- Training staff should provide services which encourage and stimulate competency, innovation, and increased effectiveness.

Service Delivery Options:

- The training program content should be coordinated with the needs of department personnel and available resources in the community.
- Training officers should:
- provide performance standards
- develop training schedules
- Within the fire station an officer or other qualified person may deliver the training program.

Policy Requirements:

- The fire department should have a training program and policy that ensures personnel are trained and competency is maintained to effectively, efficiently, and safely execute all responsibilities consistent with the department's mandate.
- The training program should be consistent with the fire department mission statement and meet its organizational needs
- The program must be consistent with legal requirements for training
- Company officers should be responsible for the on-going, in-service training of members of the company assigned to them.
- Sufficient time should be spent on company (in station) training during tours of duty in full time departments, and at convenient times for volunteers, to ensure required proficiencies are met.
- Training should be in the form of self-directed learning, classroom instruction, practice drills, familiarization tours and pre-fire planning.

Quality Management Standards:

- The effectiveness of the training program should be evaluated through fire department performance at emergency incidents as well as training simulations and exercises.

This evaluation should ensure that:

- training is uniform
- fire department procedures are followed properly

Quality and Performance Measures:

- Company officers should periodically evaluate members assigned to their company to determine:

    - training objectives have been achieved
    - the training has been effective for each member
    - elements of individual performance evaluations, when required

Codes, Standards, Best Practices:

Codes, Standards, and Best Practices resources available to assist in establishing local policy on this assessment are listed below. All are available at **www.ontario.ca/firemarshal**. 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.

Additional References:

- Ontario Firefighter and Company Officer Training Curriculums

- Ontario Firefighter and Company Officer Standards

Selection of Appropriate Fire Prevention Programs

Public Fire Safety Guidelines	Subject Coding PFSG 04-40-03
Section Fire Prevention and Public Fire Safety Education	Date March 2001
Subject Selection of Appropriate Fire Prevention Programs	Page

Under Review

Purpose:

To assist in developing or selecting programs to meet the four minimum fire prevention and public education requirements of the Fire Protection and Prevention Act.

Introduction:

Municipalities must develop a fire prevention and fire safety education program that addresses their needs and circumstances, as determined by the application of sound risk management principles.

Minimum Required Services:

Section 2. (1) of the Fire Protection and Prevention Act states:
(1) Every municipality shall,

1. establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention; and
2. provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.

Therefore, as a minimum acceptable model municipalities must provide the services listed below. The simplified risk assessment should identify the extent to which additional services may be required to meet the local needs and circumstances of specific municipalities. Municipalities may develop a different model for fire prevention and public education services provided they are able to demonstrate that their model meets the mandated requirements of the community's local needs.

3. Simplified risk assessment
4. A smoke alarm program
5. Fire safety education material distributed to residents/occupants
6. Inspections upon complaint or when requested to assist with code compliance

Simplified Risk Assessment:

A simplified risk assessment must be done for the community to determine the needs and circumstances of the municipality and to establish the level of fire prevention and public fire safety education required. Any significant risks identified through the analysis should be addressed. For example; if the risk assessment indicates a significant life or fire loss in multi-unit residential buildings, a program that will adequately improve their fire safety - such as routine inspections - would be appropriate to address the specific need of the community.
The scope and extent of the remaining three required programs can be determined by the results of the simplified risk assessment.

Smoke Alarm Program:

The objective of a smoke alarm program is the provision and maintenance of working smoke alarms and home escape planning activities for all residential occupancies in the municipality. The activities associated with the program may include any combination of the following:

- community surveys
- distribution of pamphlets or other education material
- instruction to residents regarding smoke alarms
- providing smoke alarms at reduced or no cost
- installation of smoke alarms
- inspecting premises to determine compliance with the smoke alarm provisions of the Fire Code.

Fire Safety Material:

Fire safety education material may be distributed to residents and/or occupants consistent with the community's needs and circumstances by any combination of the following activities:

- distribution of pamphlets or other education material
- public service announcements utilizing the available media
- instruction to residents/occupants on fire safety matters
- presentations to resident groups
- attendance at public events

Fire safety education material addresses such issues as preventing fire occurrence, the value of smoke alarms, planning escape from fire, and being prepared to deal with a fire incident. The OFM Regional Office can provide assistance with fire safety education material for the public. Fire safety education material may also be found on the OFM website.

Public Fire Safety Education:

For public fire safety education, the following should be established:

- the audience to be targeted
- the message that needs to be delivered to improve the fire safety situation must be determined.

- an inventory of the available or required resources and programming.
- the most appropriate method of delivering the message.
- the duration or frequency of the message delivery.

Inspections:

Inspections of properties must be done, or arranged for, by the municipality when:

- a complaint is received regarding the fire safety of a property
- a request is made to assist a property owner or occupant to comply with the Fire Code and the involvement of the Chief Fire Official is required by the Ontario Fire Code

Any inspection conducted must include notification of the property owner or responsible person and appropriate follow-up with enforcement, if necessary.

Inspection Program Considerations:

For inspections, the following factors should be considered:

- The type of inspections to be conducted and the buildings to be inspected. For example: routine inspections of all multi-unit residential buildings, new construction inspections of all buildings, smoke alarm checks of single family residential buildings.
- The methods of inspection appropriate for the circumstance. This will have implications for the amount of time required to inspect, as more comprehensive inspections require more time.
- The category of buildings being inspected, and the skills and knowledge required to inspect them. The more complicated the building, the more skill and knowledge required.
- The frequency that the properties will be subject to inspection

Program Selection:

In addition to the minimum services outlined above, programs need to be selected, developed and implemented that address any risks identified through needs analysis. Programs being considered need to be effective for the type of concerns identified. For example; a routine inspection program would be effective to address concerns for the fire safety of a group of buildings that demonstrate poor performance during fire incidents. Similarly, a public fire safety education program such as Older and Wiser would be effective where there is a lack of knowledge of fire safety behaviour by the elderly and this lack causes them to suffer significant fire losses.
Each area of program activity has a number of factors which need to be considered.

Service Delivery Options:

The Fire Prevention Effectiveness Model may also assist with informed decision making about fire prevention and public education programs. Once the needs analysis component of the model has been completed, fire department managers can decide what programs are appropriate to address their identified local risks.

There are a number of options for delivery of selected fire prevention programs. They can be provided by fire department staff - personnel dedicated to fire prevention and/or fire

suppression staff. Other persons in the community may be used. Agreements with other communities may be made for provision of services. The OFM provides assistance in delivery of fire prevention programs through the Assist Program.

Policy Requirements and Other Relevant Issues:

Any selected/mandated programs must have sufficient resources, human and others, to be effectively delivered.
Persons assigned responsibility for delivering programs must be adequately trained.
Policy decisions must be made with appropriate authority and records made of the level of service decreed.
Appropriate program guidelines must be established for each program to be delivered. Any fees for services should be discussed and decided upon at the policy level.
Legal counsel should be consulted regarding any changes to the delivery of services to the community.

Codes, Standards, and Best Practices:

Codes, Standards and Best Practices resources available to assist in establishing local policy on this assessment 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 PFSG
01-02-01 Comprehensive Fire Safety Effectiveness Model
04-12-13 Core Services
04-40A-03 Simplified Risk Assessments
04-40B-12 Smoke Alarm Programs **04-40C-12** Public Education Programs **04-40D-12** Inspection Programs

Operational Planning: An Official Guide to Matching Resource Deployment and Risk

Public Fire Safety Guidelines	Subject Coding PFSG 04-08-10
Section Emergency Response	Date January 2011
Operational Planning: An Official Guide to Matching Resource Deployment and Risk	

Under Review

1.0 Purpose

1.1 Municipalities are responsible for the funding and delivery of fire protection services in accordance with Section 2 of the *Fire Protection and Prevention Act, 1997* (FPPA).
In order to meet the intent of Section 2 of the FPPA, municipalities are expected to implement a risk management program.

The evaluation tool ***Operational Planning: An Official Guide to Matching Resource Deployment and Risk***, found in the Appendix, is to be used as part of a risk management program. The purpose of this guideline is to encourage municipalities and fire departments to use this tool so that they can make informed decisions regarding the delivery of fire suppression services.

2.0 Scope

2.1 This g**u**ideline applies to all municipalities.

3.0 Risk Management

3.1 In order to be in compliance with clause 2.(1)(a) of the FPPA, a fire department must have completed a simplified risk assessment, one of the four key minimum requirements for fire protection services. It is expected that this assessment be reviewed and updated periodically to support informed decision making and evaluation of program delivery.

4.0 Legislation

4.1 This guideline is issued under the authority of clause 9.(1)(d) of the FPPA.

4.2 Municipal Council, obligated by the FPPA to provide fire protection services, must

• establish levels of service commensurate with needs and circumstances; and

• provide fiscal resources for staffing, apparatus and equipment to support the established level of service.

4.3 Fire Chief

Person appointed by the council of a municipality, responsible for the delivery of fire protection services, and accountable to the council.

4.4 Fire Department

The fire department delivers the services as approved by municipal council and at the direction of the fire chief.
Operational Planning: An Official Guide to Matching Resource Deployment and Risk can help fire departments to

- assess and analyze fire risk;
- determine current capabilities: staffing, apparatus, equipment, etc.;
- find gaps; and
- work out options, develop recommendations and present them to municipal council using a standardized format.

4.5 Clause 2.(1)(b)

Every municipality shall provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances

4.6 Subsection 2.(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

4.7 Subsection 5.(1)

A fire department shall provide fire suppression services and may provide other fire protection services in a municipality, group of municipalities or in territory without municipal organization.

4.8 Clause 9.(1)(a)

The Fire Marshal has the power 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 those services.

4.9 Clause 9.(2)(b)

It is the duty of the Fire Marshal to advise municipalities in the interpretation and enforcement of this Act and the regulations.

4.10 Clause 9.(2)(d)

It is the duty of the Fire Marshal to develop training programs and evaluation systems for persons involved in the provision of fire protection services and to provide programs to improve practices relating to fire protection services.

5.0 References

OFM documents, programs and courses

- Comprehensive Fire Safety Effectiveness Model
- Public Fire Safety Guidelines
- Shaping Fire Safe Communities – Phases 1 and 2
- Essentials for Municipal Decision Makers [course]
- Essentials for Fire Service Leaders

[course]

- National Fire Protection Association standards
- NFPA 1710 and NFPA 1720

6.0 Appendix

Evaluation tool:
Operational Planning: An Official Guide to Matching Resource Deployment and Risk.

Workbook
(Guidelines PDF version available on request at
AskOFM) **HTML version**

Comprehensive Fire Safety Effectiveness Model Considerations

Public Fire Safety Guidelines	**Subject Coding** **PFSG 01-02-01**
Section **General**	Date **January 1998**
Subject **Comprehensive Fire Safety Effectiveness Model Considerations**	Page

Under Review

Comprehensive Fire Safety Effectiveness Model Considerations For Fire Protection & Prevention In Your Community

Fire Protection & Prevention In Your Community

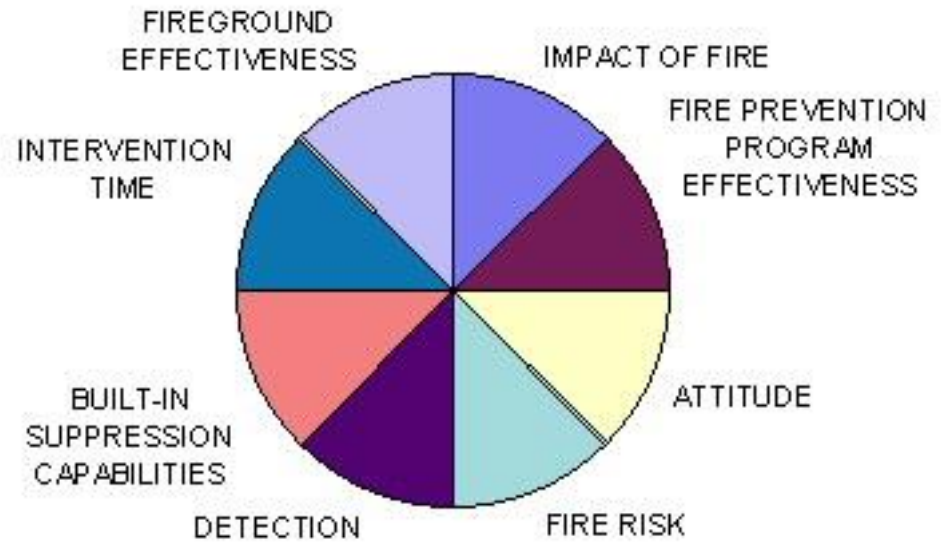
Every day, local elected leaders, managers and fire chiefs are faced with decisions relating to the provision of fire and other related emergency services for their community. Now, more than ever there are constant pressures of doing "more with less". Many government officials are hard-pressed to justify any increase in expenditures unless they can be attributed directly to improved or expanded service delivery in the community. This effort has often been hampered by the lack of criteria by which a community can determine the level and quality of fire and other related emergency services it provides to its residents. The *Comprehensive Fire Safety Effectiveness Model* is a document which can assist communities in evaluating their level of fire safety.

The provision of fire protection in Ontario is a municipal responsibility. The level and amount of fire protection provided is determined by the residents of the community through decisions made by and support provided by the local municipal council. Due to a wide variety of factors, the Ontario fire service finds itself in a period of change. Increased community expectations coupled with reduced financial resources are forcing all communities to critically assess their fire protection needs and to develop new and innovative ways of providing the most cost effective level of service. A refocus on fire protection priorities is providing progressive fire departments and communities throughout Ontario with an exciting opportunity to enhance community fire safety. There is more to providing fire protection than trucks, stations, firefighters and equipment.

The Office of the Fire Marshal has developed the *Comprehensive Fire Safety Effectiveness Model* which can be used as a basis for evaluating fire safety effectiveness in your community. This model looks at community fire protection as the sum of eight key components, all of which impact on the fire safety of the community. Deficiencies in one of the components can be offset by enhancements in another component or components.

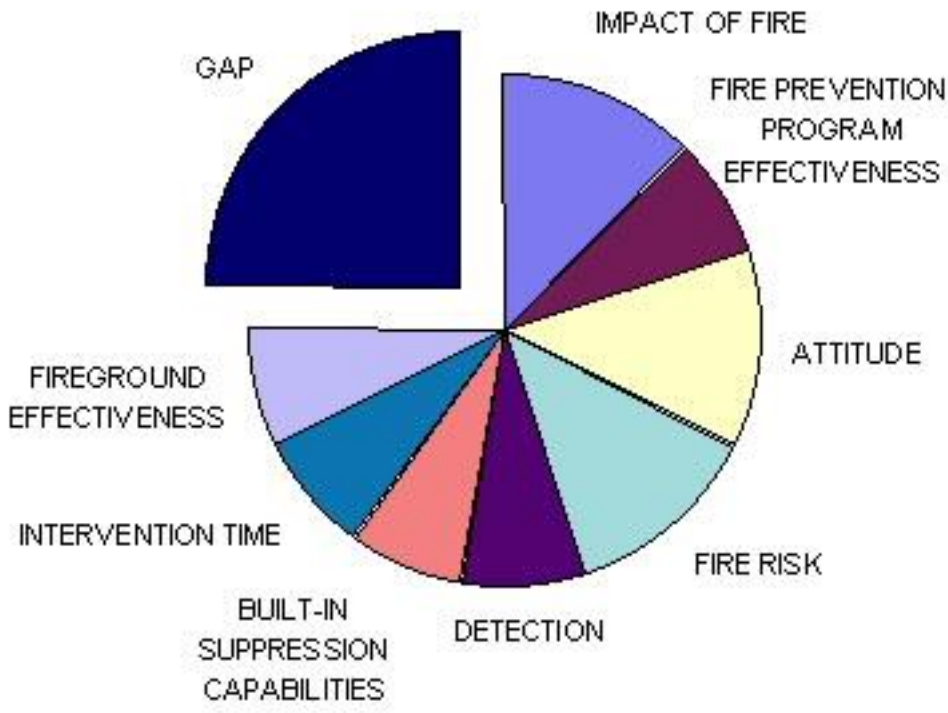
Community Master Fire Protection Plan

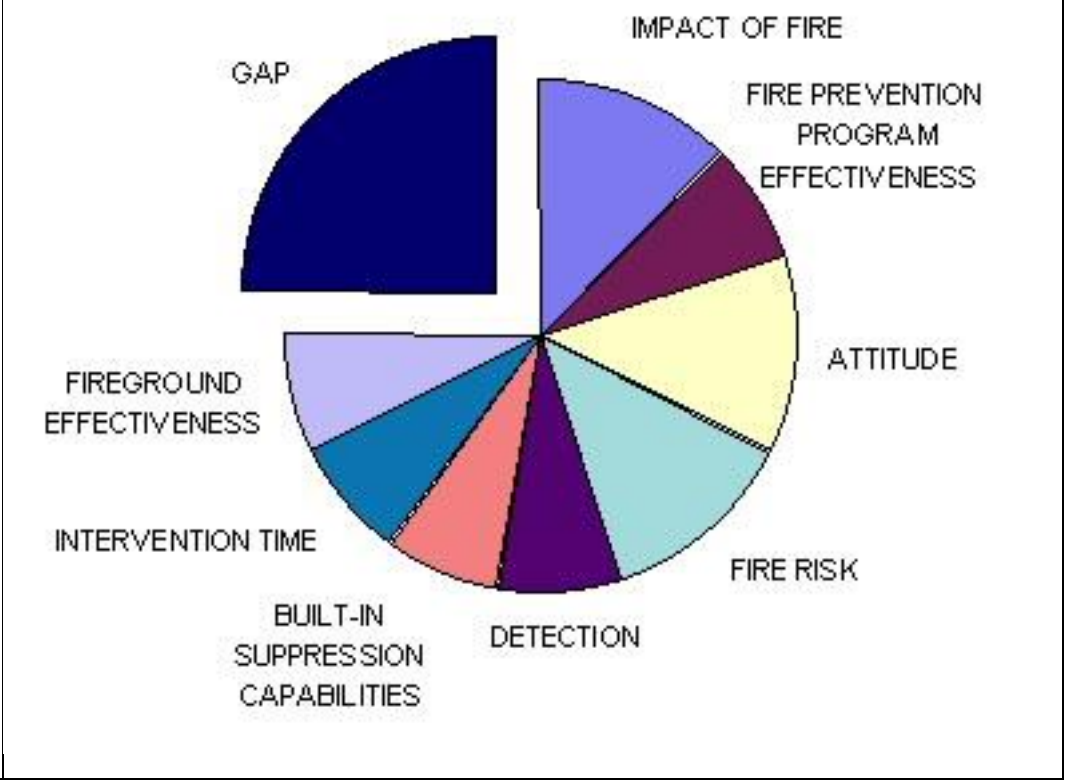
Every fire department should be guided by a master or strategic plan. This *Community Master Fire Protection Plan* traditionally focused on the identification of fire hazards and planning an appropriate suppression force response. Today, hazard or risk assessment has expanded well beyond the fire problem in the community to include emergency medical incidents, hazardous materials incidents and many other emergency situations. Paradigms are being shifted to emphasize the concept of fire prevention and control systems as communities attempt to effectively reduce losses experienced. This document should include plans for human resources and program financial support as well as the many external influences that impact on the fire service. The information contained with the *Community Master Fire Protection Plan* should provide a clear and concise overview of the most recently adopted organizational goals and objectives, budgetary commitments, mission statements and assessments of organizational activity. The document should cover a long range planning period of five to ten years.



This chart shows each of the factors which make up the comprehensive model. Although the chart is divided equally, each factor will in reality contribute differently to the total level of protection provided to a community.

This chart shows how the comprehensive model can be applied to a typical fire department. The "gap" depicts the difference between the existing level of protection and the ideal.





It is critical that the fire department be guided by a written philosophy, general goals and specific objectives which are consistent with the legal mission of the department and are appropriate for the community it serves. These should all be integral components of the Community Master Fire Protection Plan.

Application of the Comprehensive Fire Safety Effectiveness Model will enable municipalities to make informed choices by providing an objective and innovative approach to public fire protection - a new way of thinking. Communities are able to determine if the level of service provided matches the risk in the community.

1. **Impact Of Fire:**

The impact of fire in any community can be significant with far reaching consequences. Not only do fires result in deaths and personal injuries but they also cause substantial property and environmental loss. Often overlooked are factors such as the historical value of unique local properties as well as the potential for lost tax assessment. There are many communities in Ontario where the loss of a particular occupancy will have a serious impact on the local economy. Involvement in fire often has a negative psychological impact on those affected.

Every community should carefully assess the total impact of fire. This assessment should be used as a basis for a Community Master Fire Protection Plan that addresses all areas of community fire safety including fire prevention and life safety as well as the delivery of suppression and rescue services.

- Does your community have a property whose loss would result in a significant financial burden to the community?

- Does your community have a property whose loss would result in a significant impact of local employment?
- Does your community have a property which if involved in fire would pose a significant environment risk?
- Does the master fire protection plan adequately consider the impact of a major fire?

2. **Fire Prevention Program Effectiveness:**

- Perhaps the most important component of and community's fire protection services is the effectiveness of it's fire prevention program. Legislation, regulations and standards pertaining to fire safety focus primarily on fire prevention. Enforcement of these codes is one of the most effective ways of reducing the loss of life and property due to fire. In addition, public fire safety education programs have the potential to substantially reduce the loss of life and property due to fire.

  Every community should strive to provide an adequate, effective and efficient program directed toward fire prevention, life safety, risk reduction of hazards, the detection, reporting of fire and other emergencies, the provision of occupant safety and exiting and the provisions for first aid firefighting equipment.

- Does your community have a fire prevention and public education policy that adequately addresses:

  - inspections?
  - public education?
  - code enforcement?
  - investigation?

- Does your community provide inspections upon request?
- Does the fire department respond to complaints?
- Does your community's fire prevention program address public life safety in structures from pre-construction planning until demolition through application of the Building Code and Fire Code?

3. **Public Attitude:**

North Americans tend to be more complacent about fires and the resulting losses than other parts of the industrialized world. Communities often accept the consequences of fire and provide community support. Comprehensive insurance packages are available to mitigate damages.

Communities need to assess the resident's attitudes toward fire to determine what role it plays in determining the extent of fire losses. Properly designed public fire safety education programs will significantly improve public attitudes toward the prevention of fire. This will result in lower fire losses.

Every community should assess public attitudes toward fire and life safety issues. This assessment should be used to develop and deliver public fire safety education programs to enhance community fire safety.

- Do the residents of your community demonstrate an interest in public fire safety?
- Is there a general awareness of fire safety in your community?
- Is there a sense of personal responsibility for one's own safety within the community?

4. **Fire Risk:**

The characteristics of your community affect the level of fire risk that needs to be protected against. Older buildings pose a different set of problems than newer buildings constructed to current construction codes. High rise, commercial and industrial occupancies each present unique factors, which must be considered. Construction, occupancy type, water supply, exposure risks, furnishings and the risk which the combination of these factors pose to the occupants must be assessed. The presence of effective built-in suppression and/or protection measures can reduce the fire risk.

36% of all structural fire alarms and 46% of all structural fire deaths in Ontario during the period 1990-1994 occurred in single family, detached, residential occupancies.

Every community should carefully assess its fire risk. The results of this risk assessment should be used as a basis for determining the level, type and amount of fire protection provided and should be a critical factor in the development of the community master fire protection plan.

- Has your community assessed the fire risk?
- Does your community have a master fire protection plan which takes into account the results of your fire risk analysis?
- Has the fire department identified all the possible actions it could take to reduce the number of fire incidents that occur in the community?
- Does your community planning process consider the impact of new developments and industries on the fire department?

5. **Detection Capabilities:**

The presence of early warning detection capabilities notifies occupants and allows them sufficient time to escape. It also allows for earlier notification of the fire department. Communities who encourage the widespread use of early warning detection systems have the potential of significantly reducing notification time, which, when coupled with effective fire department suppression, results in a corresponding reduction of loss of life, injuries and damage to property from fire.

Every community should develop and implement programs that promote the use of early warning detection systems in all occupancies. These programs should be a fire protection priority.

- Does your community have a program to ensure that all occupancies are provided with adequate early warning detection devices?
- Does your community have a program to ensure that residents are familiar with the importance and proper maintenance of early warning detection devices?
- Does your community promote the use of direct connect early warning detection devices in residential as well as commercial, industrial and assembly occupancies.

6. **Built-In Suppression Capabilities:**

Traditionally, the use of built-in suppression has been limited to fixed fire protection systems associated with assembly, commercial, industrial and manufacturing occupancies. Application of this

concept has been limited in the residential environment. These systems, particularly the use of automatic sprinkler systems play an important role in minimizing the effects of fire by controlling its spread and growth. This enables the fire department to extinguish the fire more quickly and easily.

Although effective in newer buildings, it is often difficult if not impossible to provide for built-in suppression systems that effectively control fires in wall cavities and concealed spaces associated with certain older types of construction or reconstruction.

The use of built-in suppression systems should be a fire safety priority in all communities. Programs should be developed and delivered that promote the advantages of built-in suppression systems for residential, commercial, industrial and assembly occupancies.

- Does your community promote the use of built-in suppression devices in all types of occupancies

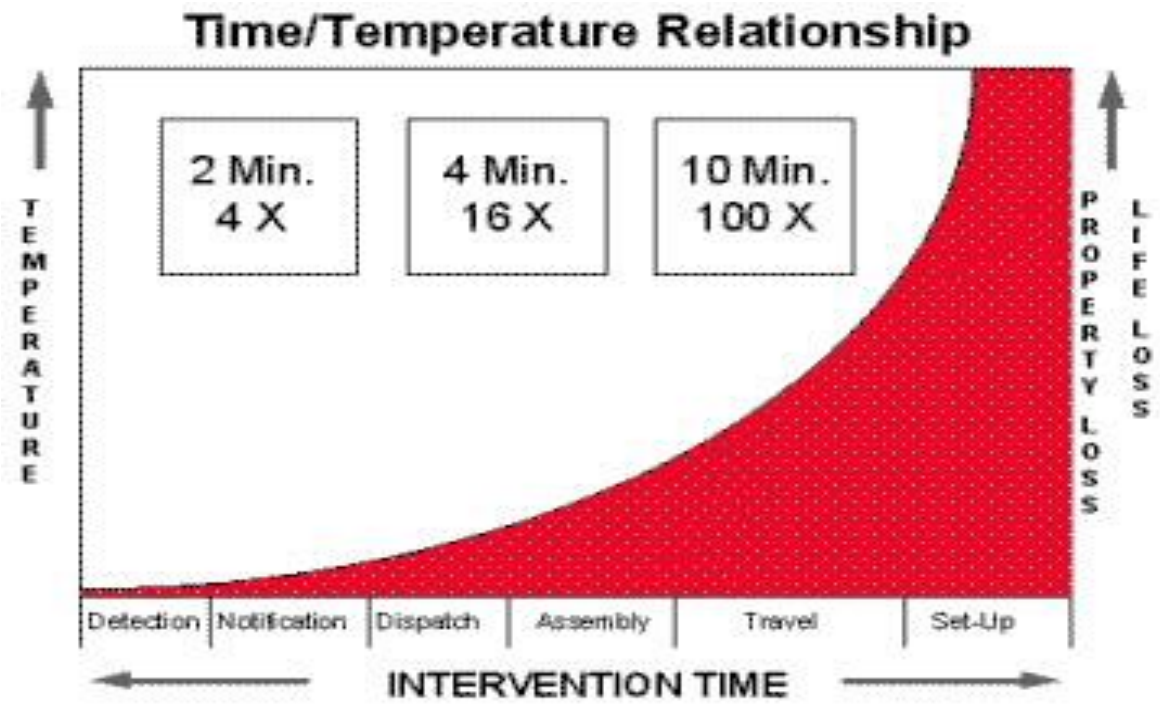
    - residential?
    - commercial?
    - industrial?
    - assembly?
    - institutional?

- Does your community consider built-in suppression devices and early warning detection as an alternative to traditional concepts of fire protection?

7. **Intervention Time:**

This is the time from ignition until effective firefighting streams can be applied to the fire. There are many factors influencing this component of the model:

- the time required to detect the fire
- notification time from the public
- notification time to the firefighters
- preparation time for the firefighters to leave the station
- the distance between the fire station and the response location
- the layout of the community
- impediments such as weather, construction, traffic jams, lack of roads, etc.
- set-up time
- Fire department intervention time is crucial in determining the consequences of a fire in terms of deaths, injuries and loss of property and damage to the environment. Effective fire prevention and public education programs can reduce intervention time which will result in increased fire department effectiveness.



Every community should develop and implement a range of programs and initiatives that reduce intervention time. These programs and initiatives should address all aspects of intervention time from the time required to detect the fire to the set-up time of the fire department.

- Are all occupancies in your community equipped with suitable smoke alarms and provided with fire emergency escape plans?
- Do all residents in your community know how to report a fire or other emergency?
- Does your community have a common fire emergency reporting number?
- Is the fire department dispatched by an appropriate dispatch facility?
- Does the community's master fire protection plan consider the different turn-out times for volunteer and/or full-time firefighters?
- Has the department instituted an appropriate fire department training and education program?
- Are all structures within the community clearly identified using an accepted numbering system?
- Has the department instituted a policy of having the closest fire department respond even though that fire department may be from another municipality?

8. Fireground Effectiveness:

The fireground effectiveness of the fire department has a wide range of benefits for your community. Not only does the fire department's performance affect the degree of damage to the environment and property, it also has a direct relationship to personal injury and death from fire. Many factors influence the effectiveness of any fire department. Included in these factors are:

- fire department organization
- community support of fire department
- firefighter availability
- firefighter and fire officer training
- adequate resources which are properly maintained

- time effective response to emergency incidents

The fire department should strive to provide an adequate, effective and efficient fire suppression program designed to control/extinguish fires for the purpose of protecting people from injury, death or property loss.

- Does your fire department have a comprehensive training program and evaluation system for all positions?
- Does the fire department have a system to ensure that an adequate number of trained personnel respond to all emergencies within a reasonable time period?
- Is your fire department provided with adequate resources to safely and effectively handle the risks it will be called upon to mitigate?
- Does the fire department use standard operating guidelines to define expected fire department actions for the wide variety of situations it might encounter?
- Does your fire department have automatic response agreements to guarantee an adequate level of personnel at all times?

The answers to the questions in this document will provide you with some indication of the level of fire safety in your community, however this is only the start. Application of the OFM Comprehensive Fire Safety Effectiveness Model will permit you to develop a plan for the safe, effective and economical delivery of fire protection services in your community.

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.

Further assistance is available from your local OFM representative